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Craig Colin Jeffcott

Biodiverse Futures: Speculative Design for Community Biodiversity Activism

Orientador(es):
Doutora Ana Margarida Ferreira
Doutor António Gorgel Pinto
Doutor Daniel Buzzo

Faculdade de Design, Tecnologia e Comunicação
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CRAIG COLIN JEFFCOTT

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Tese apresentada ao IADE - Faculdade de Design, Tecnologia e Comunicação, da Universidade Europeia, para cumprimento dos requisitos necessários à obtenção do grau de Doutor em Design realizada sob a orientação científica da Doutora Ana Margarida Ferreira, da Universidade da Beira Interior, do Doutor António Gorgel Pinto, do IADE Universidade Europeia, e do Doutor Daniel Buzzo, da CODE University of Applied Sciences.

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Thesis presented to IADE – Faculty of Design Technology and Communication, at the University Europeia, Lisbon, for compliance with the requirements necessary to obtain the degree of Doctor of Design carried out under the supervision of Dr Ana Margarida Ferreira, Universidade da Beira Interior, Doctor António Gorgel Pinto, IADE Universidade Europeia, and Dr Daniel Buzzo, CODE University of Applied Sciences.

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palavras-chave

Design Especulativo, Ativismo Comunitário, Design Mais-que-Humano, Pesquisa Através do Design, Biodiversidade.

resumo

Esta investigação baseada na prática de design insere-se no contexto da destruição catastrófica do ecossistema global, impulsionada por uma visão normativa centrada no humano sobre o futuro, sendo evidenciada por relatórios das Nações Unidas sobre biodiversidade que documentam a perda acelerada de espécies e habitats a nível mundial (Brondizio et al., 2019)—embora enquadrada como um problema unicamente humano, em termos de causa, impacto e, implicitamente, solução. A biodiversidade—uma pluralidade de diferentes tipos de organismos—está a ceder lugar a uma monocultura centrada no humano, dominada pela espécie humana e por um reduzido conjunto de variedades de animais de criação, culturas agrícolas, animais de serviço e animais de companhia. Essa monocultura revela-se pouco resiliente e, a longo prazo, incapaz de sustentar a vida neste planeta; portanto, urge argumentar a favor de futuros alternativos a este paradigma.

Este ponto de partida serviu como incentivo para considerar o possível papel do Design Especulativo na promoção de Ativismo Comunitário Pela Biodiversidade, ajudando comunidades a articular e defender futuros mais biodiversos e, assim, a agir contra a perda de biodiversidade. Situando-se na intersecção da ficção especulativa, da teoria crítica e da prática de design, o Design Especulativo não se configura como uma disciplina de design comparável ao design gráfico ou de produto, mas como um gesto orientado para futuros transformadores e alternativos, bem como para presentes possíveis. Também pode ser considerado uma metodologia de design voltada para a criação de futuros propositivos, possuindo um conjunto próprio de técnicas e práticas que incluem prototipagem diegética, eventos de envolvimento, workshops e exposições em galerias (Auger, 2013; Dunne & Raby, 2014; Kerridge, 2015; Sterling, 2011).

Todavia, a prática tem sido alvo de críticas: apontam-se as falhas na materialização de futuros de forma eficaz, já que as ideias frequentemente lutam por se disseminar além dos contextos académicos, da sala de aula e da galeria (Jākobsone, 2017). Além disso, considerando que os praticantes tendem a ser provenientes do mainstream cultural (homens, de meia-idade, brancos, heterossexuais, cisgénero, classe média e humanos), verifica-se uma

insuficiente diversidade de prática para gerar futuros verdadeiramente transformadores e qualitativamente distintos, que considerem as necessidades de outros organismos e do ecossistema global, em contraste com aquele para o qual parece que estamos encaminhados (Prado de O. Martins, 2014; Tonkinwise, 2014).
Uma questão central é o que o Design Especulativo poderia fazer para contrariar esta perda de biodiversidade. Por um lado, a materialização de futuros alternativos é a prática central da disciplina, o que a coloca numa posição favorável para realizar intervenções significativas. Por outro lado, mantém-se o argumento de que a prática carece de impacto e de diversidade suficiente para agir de forma efetiva. A diversidade constitui, portanto, um ponto-chave: práticas diversificadas de Design Especulativo deveriam corresponder a práticas diversificadas de criação de futuros, ressoando com a necessidade de prevenir uma monocultura ambiental e de proteger e promover a biodiversidade. Na realidade, esta carência de biodiversidade ambiental e de diversidade sociocultural no design poderia ser caracterizada como uma Policrise Monocultural. Alguns designers exploram como práticas de Design Especulativo a adoção de abordagens menos centradas no humano, defendendo um Design Mais-que-Humano, que expanda quem ou o que conta como utilizador ou parte interessada e quem é incluído nos processos de design (Poikolainen Rosén et al., 2024).
Outra crítica aponta que o Design Especulativo carece de impacto fora dos contextos restritos da academia e da galeria (Jākobsone, 2017; Tonkinwise, 2014). Esta investigação procura analisar como a prática poderia exercer maior impacto. Parte-se da hipótese de que, ao mostrar às pessoas como criar e materializar futuros, o Design Especulativo poderia apoiar o Ativismo Comunitário Pela Biodiversidade, ajudando comunidades a reivindicar melhores futuros para o seu ambiente. Um exemplo deste potencial é evidenciado pelo movimento Solarpunk, descrito por Rhys Williams como uma comunidade de criadores e, simultaneamente, um género de ficção especulativa centrado em imaginários e infraestruturas movidas a energia solar (2019). Jay Springett conceptualiza o Solarpunk como um recipiente de ideias que cria uma textura futura polifónica, a partir da qual podem emergir novas concepções de futuro (2023).
O projeto de investigação é enquadrado como pesquisa baseada em prática de design, articulando a produção teórica através da prática de design, em que os resultados dos experimentos de design funcionam não como prova

de teorias pré-existentes, mas como protótipos e exemplos que constituem uma compreensão teórica emergente das questões de investigação. Insere-se ainda na vertente de Investigação Pós-Qualitativa, uma abordagem orientada por conceitos em vez de métodos, inspirada no Pós-Estruturalismo, Pós-Humanismo e no Novo Materialismo (Adams St.Pierre, 2020). Esta abordagem privilegia o surgimento de novos conceitos em detrimento da reflexão sobre estruturas pré-existentes, sendo particularmente adequada à investigação em design, cuja prática central consiste na criação do novo. A investigação é conduzida como um processo de Criação em Investigação (Truman, 2021), envolvendo leitura e reflexão sobre teorias, artefactos de design, visões de mundo, textos filosóficos e de design, e ficções especulativas, produzindo insights teóricos.

Neste projeto, lentes queer e mais-que-humanas são empregues como conceitos para abordar práticas diversificadas de futurização, explorando queeridade e mais-que-humanidade como estratégias para a criação de futuros. Adotando a definição de queer como resistência a regimes normativos (Warner, 1993, p. xxvi), a investigação inspira-se com as ideias de José Muñoz sobre futuros queer, sustentando que os outsiders—neste caso, a comunidade queer—diante de uma cultura e de um futuro desenhados para o mainstream, encontram espaço para imaginar um futuro diferente no presente (Muñoz, 2009). Paralelamente, o fio condutor mais-que-humano considera que cultura humana e ecossistema são interligados (Guattari, 1989) e que nossa natureza é híbrida e cibernética há muito tempo (Haraway, 1981). A visão de mundo desta investigação centra-se no argumento radical da Ecologia queer, que sugere que todas as fronteiras entre espécies são tão artificiais e mutáveis quanto gênero e identidade humana sob a perspectiva queer (Morton, 2010). Através dessas lentes, a investigação explora como a futurização queer, mais-que-humana é performativa, efémera, entrelaçada e resiliente.

O projeto recorre ainda à figura conceptual do Strange Stranger (Morton, 2010), derivada do Arrivant de Derrida—o visitante inesperado e incompreensível, estranho e disruptivo, que pode ser acolhido com hospitalidade incondicional (Derrida, 1997). Através de uma lente de Ecologia Queer sem fronteiras ou categorias, o Arrivant transforma-se no Strange Stranger, onde todos os seres são simultaneamente estranhos e familiares (Morton, 2010), promovendo uma perspetiva de estranhamento do familiar e de familiarização do estranho. As Personagens Conceptuais, propostas por

Deleuze e Guattari, permitem que conceitos sejam adotados como personas filosóficas para enquadrar o mundo e orientar ações. Num Design Mais-que-humano, estas personagens são reconfiguradas como Figuras Conceptuais para operar num contexto cosmopolítico que inclui o mais-que-humano (Tironi & Díaz Bejarano, 2024). Neste projeto, o Strange Stranger é adotado como guia.

Esta abordagem cria uma reciprocidade sinérgica entre práticas de futurização marginais e efémeras, materializáveis através do Design Especulativo, e uma prática de design limitada em diversidade que pode transcender suas limitações ao inspirar-se nestas práticas, apontando para abordagens mais biodiversas de Design Especulativo capazes de apoiar o Ativismo Comunitário Pela Biodiversidade.

O projeto recorre à figura conceptual do Strange Stranger para orientar práticas de criação de futuros que promovam uma prática diversificada de Design Especulativo e sustentem o Ativismo Comunitário Pela Biodiversidade, considerando as suas contribuições para teoria e prática do Design Especulativo. As questões de investigação são: Quais formas situadas de futurização emergem ao adotar a figura conceptual do Strange Stranger? Como essa figura pode guiar um projeto de Design Especulativo que materialize essas formas de futurização para apoiar o Ativismo Comunitário Pela Biodiversidade? Como molda uma prática de Design Especulativo diversificada e impactante? Que insights situados podem informar, de forma mais geral, um programa de Design Especulativo para apoiar o Ativismo Comunitário Pela Biodiversidade?

Estas questões são abordadas através da criação de dois artefactos: Conceptual Design Celium e Strange Strangers in Strange Lands Playset. Enquadrados pela lente dos Ensamblagens de Design Transicional (Redström, 2017; Wilkie, 2010), constituem uma contribuição para o conhecimento de design enquanto Paradigmas, Práticas, Programas, Projetos e Produtos Prototípicos do Design Especulativo Biodiverso.

keywords

Speculative Design, More-than-Human Design, Research Through Design, Community Activism, Biodiversity.

abstract

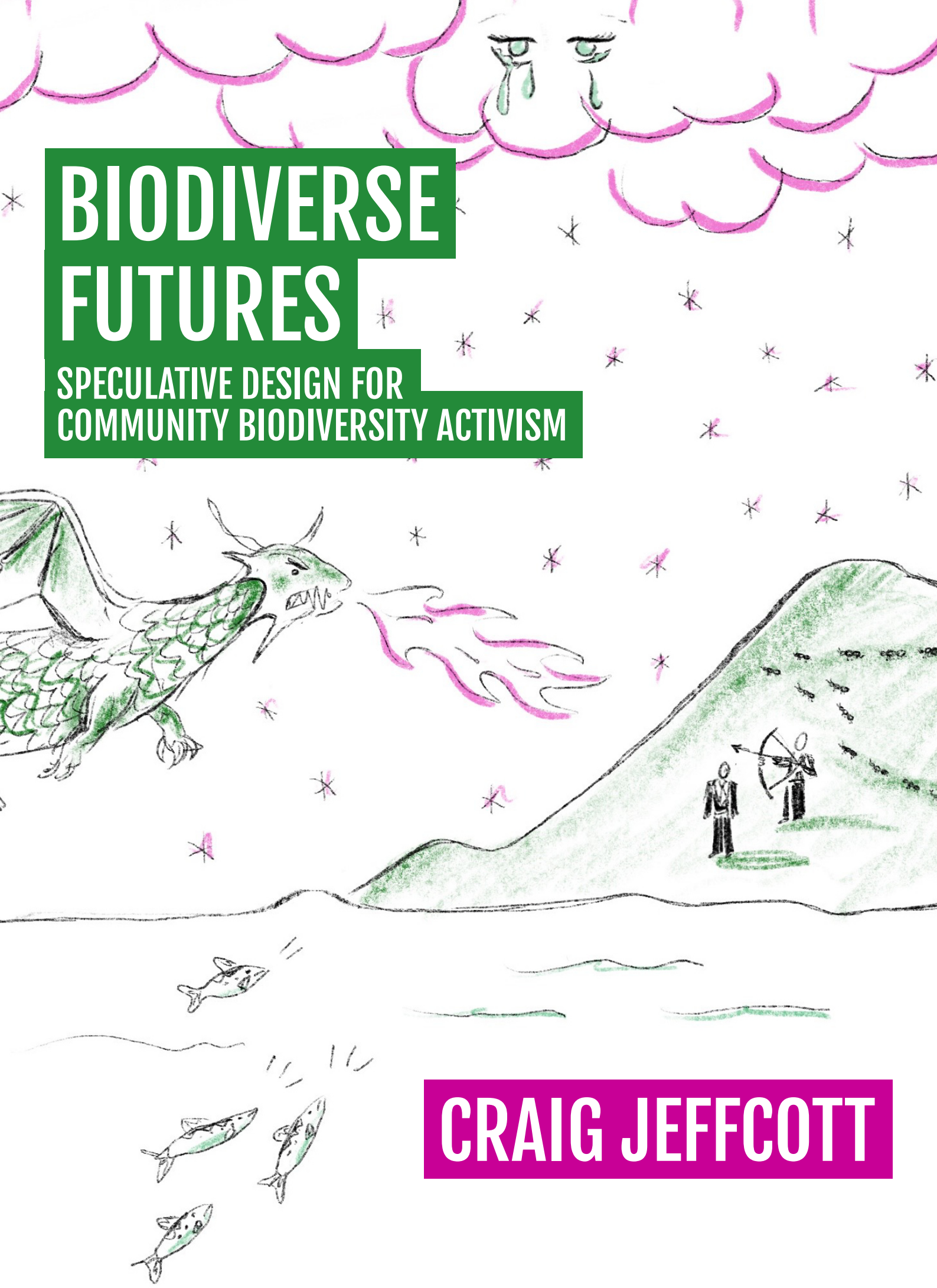
Through a process of reflective design practice, this research explores the potential of Speculative Design to addressing the global biodiversity crisis through supporting Community Biodiversity Activism. It situates the biodiversity crisis as part of a wider monocultural Polycrisis in which Speculative Design itself is implicated, attracting criticism for a deficit of diversity of practitioners, practice, outcomes and impact. It also frames the Polycrisis as crisis of imagination: it has a Defuturing effect, making it difficult to imagine futures beyond a singular monocultural present. This Research through Design inquiry is situated in these entangled contexts as a form of Practice-Based Post-Qualitative Inquiry with an emergent methodology, predominantly based around the techniques of Research Creation and Design Experimentation. The inquiry draws on the Conceptual Figure of the Strange Stranger as a More than Human guide to frame ways of future-making that oppose such a monocultural present; to explore how these ways of future-making could be materialised through Speculative Design to support Community Biodiversity Activism; to understand how they might transform Speculative Design and design research practice; and to draw some general and speculative insights towards the emergence of a more biodiverse programme of Speculative Design.

presidente do júri	**Dr Joana Lourenço Ramalho** Professora Associada na Universidade Europeia (IADE), Lisboa, Portugal
vogais	**Dr Liene Jākobsone** Professora Assistente na Academia de Arte da Letónia, Riga, Letónia
	Dr Susana Paula Gomes Lúis Gonzaga Professora Assistente no Departamento de Arte e Design da Fa de Artes e Humanidades da Universidade da Madeira, Madeira, Portugal
	Dr Rodrigo Antunes Morais Professor Assistente na Universidade Europeia (IADE), Lisboa, Portugal
	Dr António Manuel Gorgel Couto Pinto Professor Assistente na Universidade Europeia (IADE), Lisboa, Portugal

jury president	**Dr Joana Lourenço Ramalho** Associate Professor at the Universidade Europeia (IADE), Lisbon, Portugal
members of jury	**Dr Liene Jākobsone** Assistant Professor at the Art Academy of Latvia, Riga, Latvia
	Dr Susana Paula Gomes Lúis Gonzaga Assistant Professor at the Department of Art and Design of the of Arts and Humanities of the University of Madeira, Madeira, Portugal
	Dr Rodrigo Antunes Morais Assistant Professor at the Universidade Europeia (IADE), Lisbon, Portugal
	Dr António Manuel Gorgel Couto Pinto Assistant Professor at the Universidade Europeia (IADE), Lisbon, Portugal

BIODIVERSE FUTURES

SPECULATIVE DESIGN FOR COMMUNITY BIODIVERSITY ACTIVISM



CRAIG JEFFCOTT

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Glossary

Afrofuturism

Cultural aesthetic envisioning the future through the lens of Black culture and experiences.

Anthropocene

Current geological era characterized by significant human impact on Earth's ecosystems.

Artefact

The product of a design process.

Autopoiesis

The self-producing and self-maintaining nature of living systems.

Biodiversity

Variety and variability among living organisms and ecosystems.

Critical Design

Design practice aimed at critiquing social, political, and cultural norms.

Conceptual Character / Persona / Figure

Coined by Deleuze and Guattari, a conceptual character or persona is an allegorical figure designed to personify abstract ideas or concepts.

Cosmopolitics

Exploration of politics beyond human-centric perspectives, considering diverse entities' interests and rights.

Cthulucene

Created by Donna Haraway as an alternative to the Anthropocene, this term describes a speculative, sympoetic, multi-species future, dominated by chthonic, or earthly, beings.

Decolonisation

Process and philosophy of undoing the effects of colonialism.

Design Fiction

Narrative-based design practice exploring speculative scenarios.

Diegetic

Elements existing within the fictional world of a story.

Diegetic Escape

The principle of elements from a diegetic reality escaping into the world in which it has been framed.

Diegetic Void

A space created by literary or ludic framing devices which provides space for and shapes an emerging diegetic reality.

Drag

Performance or expression of gender, often involving exaggeration or subversion of its norms.

Extractionism

A pejorative term for a system based on the exploitative extraction of resources without considering long-term consequences.

Fluidity

State of being adaptable or flexible, especially concerning identity or concepts.

Framing

The act of defining or presenting an issue within a particular context.

Heterotopia

Concept from Michael Foucault of an “other place”, a place in some way outside or separate from normative, mainstream culture.

Monoculture

A system dominated by single species, beings, or cultures, as opposed to a diverse ecosystem or cultural context.

More-than-Human

Concept highlighting the interconnectedness and interdependence between humans and the broader environment.

Multiverse

A reality made up of multiple universes or dimensions.

New Materialism

A group of philosophical stances that emphasise the importance of attending to the material world.

Non-Binary (Gender)

Gender identity beyond the binary of male and female.

Normativity

Prevailing social norms, standards and cultures shaping behaviour and expectations.

Pluriverse

Concept acknowledging multiple coexisting worldviews and realities.

Post-Qualitative Inquiry

A mode of research inquiry that doesn't use a fixed methodology, but is guided by concepts and emerging processes; it draws heavily on post-structuralist and new materialist discourses.

Post-Scarcity

Hypothetical state where resources are abundant, and scarcity of resources is no longer a significant concern.

Post-Structuralism

A philosophical stance that rejects pre-existing structures and categories, framing such as the product of power relations.

Practice-Based Research

Research methodology rooted in practice, such as in design.

Prototyping

Creating preliminary models or versions of a product or idea for testing or development; conducting a design experiment.

Queer

An umbrella term referring to non-normative gender identities and sexual orientations.

Radical Intimacy

Deep and transformative connections between individuals or entities.

Research through Design

Research approach using design processes to generate knowledge.

Retrofuturism

Revival or reinterpretation of past visions of the future.

Simulation Gap

Discrepancy between simulated systems and reality.

Speculative Design

Design approach exploring possible futures and their implications.

Speculative Fiction

Literary genre exploring imagined worlds, futures or realities.

Stewardship

Responsible management and care for resources or ecosystems on behalf of someone or something else.

Strange Stranger

Timothy Morton's conceptual character from Queer Ecology, derived from Derrida's *Arrivant*, which frames all beings as equally strange and equally familiar.

Sympoesis

Collective, symbiotic creation or making together (c.f. Autopoesis)

Utopia (Abstract)

A conceptual, theoretical vision of an ideal world often seen as unattainable.

Utopia (Concrete)

A tangible, achievable vision of an ideal world.

Note on Authorial Voice

In deciding on an appropriate voice and stance for this thesis, I gave consideration to conventional institutional practices and stylistic approaches on one hand, and the appropriateness[1] and usefulness of the presence of a personal voice in reflective design practice on the other. On reflection, I considered that the advantages conferred by the use of first-person voice in reflective practice[2] outweighed institutional conventions and expectations for the use of a more impersonal voice.

We (my supervisors and myself) discussed the use of the plural "we" over the singular "I". Lisa Cheung and Louwena Lau write that where first-person voice is used in scientific writing, it tends to be in the form of we rather than I, which makes sense in a context where work is often conducted in scientific teams (Cheung & Lau, 2020); this was suggested as a rationale to use 'we' to emphasise the project team approach of this research project. However, reflecting on this, much of the reflective account of practice was not accounting for the actions and considerations of 'we' as a research team, but of "I" as the designer-researcher: reflections such as "I thought", "I considered", "I sketched" only make sense from a singular, rather than plural, first-person.

Taking these factors into account, and mindful of institutional convention, I have chosen not to write this thesis entirely in first-person singular voice, but to use it when explicitly or implicitly demanded by the necessities of reflective practice. As such, I have deployed the first-person in the roles[3] of Recounter (the person recounting the research process), Researcher (the person who justifies and rationalises carrying out the research), Opinion Holder (the person who shares their opinion or view on something) and Originator (the person who conceives the ideas presented in the text). In contrast, the roles of Guide (the person guiding the reader through the text) and Architect (the person who is writing and structuring the text) have largely been ceded to the impersonal third person or to the passive voice.

[1] The practice of writing Doctoral theses in practice-based design research using a first-person singular voice is well established, as evidenced in: (Fearns, 2023; Grocott, 2010; Kerridge, 2015)
[2] These advantages are discussed in *Chapter 4 : Modes of Practice* in some detail
[3] These roles are discussed in (Cheung & Lau, 2020)

Introduction

> *"Ecosystems, species, wild populations, local varieties and breeds of domesticated plants and animals are shrinking, deteriorating or vanishing. The essential, interconnected web of life on Earth is getting smaller and increasingly frayed. This loss is a direct result of human activity and constitutes a direct threat to human well-being in all regions of the world."*
>
> *(Settele, as cited in: UN, 2019, para. 12)*

This practice-based design research is situated in the context of the catastrophic destruction of the global ecosystem driven by a normative human-centred view of the future, with a UN report on biodiversity evidencing an accelerating loss of species and habitats on a global scale (Brondizio et al., 2019)—but, as the quote above illustrates, framing it as a uniquely human problem in cause, impact and, it implies, solution. Biodiversity—a plurality of different types of organisms—is giving way to a human-centred monoculture dominated by humankind and a handful of varieties of livestock, crops, service animals and pets. Such a monoculture is not resilient, and in the long term, cannot sustain life on this planet. It is clear that action must be taken to argue for—and to achieve!—alternative futures to this.

This biodiversity crisis is just one of many intersecting crises which seem to characterise the world in the early 21st Century: a climate crisis, economic turmoil, the increasing outbreaks of political disengagement, extremist politics, and war, and increasing polarisation and controversy around social and cultural issues. These crises are all interconnected, and cannot be understood or resolved in isolation: they are what are referred to as intractable or Wicked Problems, and constitute a Polycrisis (Cantor, 2025; Richardson, 2025). The intractability of the Polycrisis limits the ability to think beyond it, so it contains an Imagination Crisis in which it is difficult to imagine better, more liveable futures (Mulgan et al., 2020). It has what Jay Springett has defined as a *Defuturing* effect (Springett, 2023), which traps us in an "Impasse of the Present," (Savransky et al., 2017).

This starting point was a lure to consider the possible role of Speculative Design to support Community Biodiversity Activism, by helping communities articulate and argue more biodiverse futures, and thereby take action against biodiversity loss. Sitting somewhere between speculative fiction, critical theory and design practice, Speculative Design is not a design discipline comparable to graphic design or product design, but a gesture towards transformative, different futures and alternative presents. To take a linguistic metaphor, it isn't a type of action, but a 'mood' of action. It is design not in the indicative—statements of what was, what is, and will be—but the subjunctive—statements of what could have been, may

otherwise be, might yet happen.[4] Speculative design could also be considered a design methodology oriented towards the creation of propositional futures, with its own set of techniques and practices, which can include diegetic prototyping, engagement events and workshops, and gallery exhibitions (Auger, 2013; Dunne & Raby, 2014; Kerridge, 2015; Sterling, 2011).

Where speculative design stands apart from indicative design is not in the materialisation of, or an argument for a future—all design is generative of futures—but in its embrace of the 'maybe', of the 'perhaps', of the 'what if'. As a practice, it has a lofty ambition to materialise futures that are transformative, that step away from the expected path towards 'The Future', to suggest alternatives that may yet be possible, to breach the Impasse of the Present. Where it stands apart from speculative fiction is that it is a practice of design, and as such, aims not to create futures in the abstract and the imagination but futures that are concrete, materialised in the world through actions and through material artefacts. However, the practice has drawn some criticism that it fails on both of these counts: that it fails to materialise futures effectively, as often ideas struggle to be disseminated beyond the realms of the academy, the classroom and the gallery (Jākobsone, 2017), and, inasmuch as its practitioners tend to be drawn from the cultural mainstream (male, middle-aged, white, straight, cis-gendered, middle class, and human) lacks

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[4] To illustrate this linguistic metaphor, compare the following designs: *Snapmaker 2.0* (Snapmaker, 2019), and *Growth Assembly* (Ginsberg et al., 2009). *Snapmaker 2.0* is a digital fabrication machine that combines 3D printing, laser engraving, and CNC cutting in one device; Growth Assembly (See Figure 1) is a speculative design concept which imagines that plant species are engineered to produce machine components, illustrated in the style of 19th Century botanical illustrations. Both designs could be considered to be in the future tense: at the time of design, as they are propositional of future outcomes. *Snapmaker* has a specific proposition, that three different fabrication modalities can be combined in a consumer-oriented device. However, this proposition is made through a design which is presented into a context where digital fabrication devices exist, and where a demand for such products exists; it is also a functional product, released to market, rather than a prototype. It is a future *indicative* design: it declares that this future is imminent, it is just an online order, a digital payment, and a delivery away. *Growth Assembly*, on the other hand, is a fiction. It's a concept that suggests, through future developments in synthetic biology and a combination of current trends in fabrication with a possible future embrace of biological technology, a radically different way of fabricating objects. It is a future *subjunctive* design: it hints at what might be, or what could have been; what it suggests isn't an imminent future, like the Snapmaker promises, but an immanent one, one that lurks as an impossibility or improbability in the present, but that could, if society chose the right path, possibly come to pass.

sufficient diversity of practice to generate truly transformative, qualitatively different futures than the one we seem locked in course towards (Prado de O. Martins, 2014; Tonkinwise, 2014).

That future, of course, is positioned as an entirely human-centred one, with most of the levers of power held by those in whose apparent interests lie a future centred on the needs of just a small subset of one species, let alone taking the needs of other organisms, of the global ecosystem into account.

One question here is what speculative design could do to act against this loss of biodiversity. On the one hand, materialising alternative futures is the stock in trade of the practice, and it should thus be well placed to make meaningful interventions in this arena. However, the arguments must be considered that it lacks impact, and that it lacks sufficient diversity of practice to do this effectively. One key point is that of diversity. Diverse practices of speculative design should be diverse future-making practices, which resonates with the need to prevent an environmental monoculture, and to protect and promote biodiversity; in fact, this lack of biodiversity in the environment, and lack of socio-diversity in human culture, imagined futures, and design practice could be characterised as a Monocultural Polycrisis. Some designers have been exploring how speculative design practices can be approached in a more diverse, less human-centric way, arguing for a More-than-Human Design "for the interdependent relationships between humans, technologies and other organisms" and that can "expand who or what counts as a user or stakeholder, who is included in design processes, and what is considered as design or designable," (Poikolainen Rosén et al., 2024, p. xix).

The other key point, and critique of speculative design practice, is that it lacks impact outside of the narrow contexts of academia and the gallery (Jākobsone, 2017; Tonkinwise, 2014). This research considers how it might have more impact, and what that impact might be. One of the problems with thinking about the future is that often people talk about The Future, something singular and official, that gets decided by someone else, somewhere else. Being able to transcend The Future is to be literate in futures, plural; to understand them not as fixed and immutable and exclusionary, but as things everyone can make, and critique, and argue for. This research is motivated by contemplating if speculative design might offer the prospect, by showing people how to make and materialise futures, of supporting Community Biodiversity Activism, and helping communities stake a claim on better futures for their environment. Such a possibility is demonstrated by the Solarpunk movement, described by Rhys Williams as "a world first, a set of narratives second," (2019, p. 7) which is simultaneously a community of makers and a genre of speculative fiction centred around solar-powered imaginaries and infrastructures. Jay Springett calls Solarpunk a "container for ideas" that "creates a polyphonic future texture from which even newer ideas of the future can emerge," (2023, p. A Narrative Container).



Figure 1 : Growth Assembly

This Speculative Design concept by Alexandra Daisy Ginsberg and Sascha Pohflepp (Ginsberg et al., 2009) imagines a future where the concept of digital fabrication is replaced by plants engineered to produce components for domestic use; this is design in the subjunctive mode, suggesting not a future that will be but one that might be.

Credit : Sión Ap Tomos

Research Project

This research project is situated as a practice-based design research project; as such, it is framed as an approach of theory making through design making, with the outputs of design experiments acting not as proof of existing theory, but as prototypes and examples of definitions through design that constitute an emerging theoretical understanding of the research questions.

It's also situated as a form of Post-Qualitative Inquiry, an approach to research drawing on Post-Structuralism and New Materialism that is led by concepts rather than methods (Adams St.Pierre, 2020). Post-qualitive Inquiry is more interested in the emergence of new concepts than in reflecting on preexisting structures and systems; given that design is a practice of the creation of the new, it is an approach well suited to design research. The inquiry is situated as a designerly approach to Research Creation (Truman, 2021), a process of reading and thinking through theory which draws on both the artefacts of design practice and a plethora of worldviews, philosophical and design texts, and speculative fictions to produce theoretical insights.

In this project, queer and more-than-human lenses are the concepts used to engage with the issue of diverse futuring practices, and the ideas of queerness and more-than-humanness are explored as strategies for future-making. Taking the definition of queer as a "resistance to regimes of the normal" (Warner, 1993, p. xxvi), this research engages with some of Jose Muñoz's ideas on queer futures, namely that outsiders, in this case queer communities, must, in the face of a culture and thus a future that is designed for the cultural mainstream—the norm—and not for them, must and do find a space for a different future in the present (Muñoz, 2009). Simultaneously, it followed the more-than-human (a term Maria Puig de Bellacasa defines as where techno-science meets nature-cultures (Bellacasa, 2017)) thread that our human culture and our environmental ecosystem are intertwined, that is, in fact, one in the same (Guattari, 1989): that our nature is to be—and has been for a long time—a hybrid, cybernetic species (Haraway, 1981). This research's worldview is centred on the radical argument of Queer Ecology that suggests that all boundaries between species are as artificial and as mutable as gender and human identity are from a queer perspective (Morton, 2010). Through these lenses, this research engages with how queer and more-than-human futuring is performative, ephemeral, entangled, and resilient.

This research also draws on the Conceptual Figure of the Strange Stranger (Morton, 2010), Morton's term for all beings from a perspective of Queer Ecology, as a guide. The Strange Stranger is a derivation of the *Arrivant* of Derrida, the unexpected and incomprehensible visitor who is strange and disruptive but who we might embrace with unconditional hospitality (Derrida, 1997). Through an unboundaried and uncategorical Queer Ecology lens, the *Arrivant* becomes the Strange Stranger, where all beings are seen as "uncanny, familiar and strange

simultaneously," (Morton, 2010, p. 277), a framing that invites us to see the familiar through a lens of estrangement, and the strange through a lens of familiarity. Conceptual Characters are philosophical guides proposed by Deleuze and Guattari that allow a concept to be adopted as a persona by a philosopher to frame the world and guide their actions. Conceptual Characters are generally characterised as human archetypes, such as the idiot or the poet, and their adoption has been used as a technique in design research; a more-than-human approach to design calls for their reframing as Conceptual Figures in order to operate within a more "cosmopolitical milieu where we may engage with the more than human," (Tironi & Díaz Bejarano, 2024, p. 6). To this end, the Strange Stranger has been adopted as a guide to this research.

It was realised that there was the possibility for a synergistic reciprocity between, on the one hand, ephemeral and marginal futuring practices that might be materialised through speculative design, and a diversity-lacking practice of design speculation that might be able to transcend its limitations through drawing on such practices; together, they might point towards more biodiverse approaches to speculative design that could support Community Biodiversity Activism.[5]

Speculative Hypothesis

This research aimed to explore the following speculative hypothesis:

It is speculated that working with speculative design through the conceptual figure of the Strange Stranger—representing a queer and more-than-human, post-structuralist conceptual lens of Queer Ecology—and working with it in a practice-based design research project, may produce interesting entanglements and symbioses: between the sociocultural and ecological; between diverse and ephemeral conceptual onto-epistemologies, and monocultural and material crises of socio and biodiversity; and between speculative design and the environment where it might try to assemble alternative futures. Such entanglements may allow the creation of new transitional assemblages that could support Community Biodiversity Activism through speculative fabulation and design, and act as prototypes of more biodiverse ways of doing speculative design.

Overall Research Aim

To use the conceptual figure of the Strange Stranger as a guide to future-making practices that would allow for a more diverse practice of speculative design that might support Community Biodiversity Activism, and to consider what that might contribute to the theory and practice of speculative design.

[5] See Figure 2

Research Questions

To address this research aim, this thesis considers the following research questions:

1. What situated Paradigm of future-making is revealed by adopting the Conceptual Figure of the Strange Stranger?
2. How might the Conceptual Figure of the Strange Stranger guide a Speculative Design Project that materialises these ways of future-making to support Community Biodiversity Activism?
3. How might the Conceptual Figure of the Strange Stranger shape a Speculative Design Practice that is diverse and impactful?
4. What situated insights can be gained from this inquiry to more generally inform a Speculative Design Programme to support Community Biodiversity Activism?

Structure of Thesis

This Thesis is structured into eight Chapters, grouped into three conceptual parts:

PART I : Contexts and Framings

Chapter 1, *Situating the Research,* gives the background and context to the project. It discusses the history, practice, possibilities and shortcomings of speculative design, and the background of the biodiversity crisis. It considers the possibility of Community Biodiversity Activism in tacking this crisis, and the possibility of speculative practices in supporting such action. It ends with an extended section situating these discourses in a wider context of decolonial thinking, focusing on decolonising both design and nature.

Chapter 2, *Conceptual Framing*, discusses the concepts that have been used to frame this research. It establishes the onto-epistemological stance of the project within post-structuralist and new materialist thinking, and discusses the queer and more-than-human conceptual lenses which have shaped the project, and their overlap in Queer Ecology. This chapter ends with a discussion of the use of the Strange Stranger as a More-than-Human Conceptual Figure to guide the research.

PART II : Research Design

Chapter 3, *Modes of Inquiry*, is concerned with the approaches to research inquiry that this research has drawn on. It begins with an exploration of speculative practice as a form of inquiry, with a particular focus on speculative design and fabulation, worldmaking, queered and weirded utopias, and speculative design games. The chapter then moves to consider design as a research process, exploring Research through Design as a form of Practice-Based Research, considering

how theory is produced by design research, and discussing how research concepts such as methodology, research outputs, objects of analysis and validation may be understood within this context. The chapter ends with a discussion of Post-Qualitative Inquiry, situating the research in a wider methodological academic context, and drawing parallels between it and design research practice.

Chapter 4, *Modes of Practice*, discusses the ways in which this research project was approached. Beginning with a consideration of what might be meant by methods in Post-Qualitative Inquiry and Research through Design, the first section sets aside that term in favour of Intentional Tactics and Operational Techniques, and discusses those which this project has drawn on. This chapter also frames this research as a form of reflective practice, and touches on the way that authorial voice is dealt with in this thesis.

Chapter 5, *Research Project*, details the planning and structure of this research. It begins with a section on framing the inquiry, which includes the lures and motivations of the project, a speculative research hypothesis, the project aim, and four research questions, as discussed above. It explores the methodology of the project, both speculatively, in considering the plans for what might have been done, and emergently, describing the methodology that emerged in practice. The trajectory of the project is explained in some detail, considering both the design of the *Conceptual Design Celium* and the *Strange Strangers in Strange Lands Playset*, with each broken down into phases, and the methodological approach used detailed. This chapter ends with a statement on the outputs and validation of the project.

Part III : Design Research

Chapter 6, *Conceptual Design Celium*, details the first main phase of project research, in which contextual and experimental research was carried out to learn about the research context and about the ways of future-making situated within, leading to the design of a conceptual support system and Paradigm for Biodiverse Speculative Design based on those ways of future-making: a *Conceptual Design Celium*[6]

Chapter 7, S*trange Strangers in Strange Lands Playset*, details the design experimentation and prototyping of a playset, an assemblage of material artefacts that embody and materialise the principles of the framework in a playset that affords a repertoire of games and speculative design practices that can be used in community settings and design workshops.

[6] The name Design Celium was created as an allusion to mycelium, a meshwork of fungal (or myco) filaments with which the fungal organism participates in open-ended entanglements with its wider environment and which supports the growth of mushrooms, their fruiting bodies. In the same way, this is a Celium for design, a conceptual network of open-ended entanglements which can support the production of design artefacts.

Chapter 8, *Transitional Design Assemblages*, concludes with a theoretical discussion of the artefacts that were produced through the project, looking at them through the lenses of transitional and nascent theory, and design assemblage theory, and framing them as prototypes and assemblages that mediate transitions between situatedness and abstraction. Through this analysis, a reflection on the research questions is made.

The thesis ends with a conclusion, reflections on limitations and future work, and is supplemented by four appendices, which present fuller versions of conversations, speculative fabulations and design artefacts than could be covered in the main text.

Speculative Fabulations

Speculative Fabulations are key artefacts of speculative practices in research and design, and a number of these were generated throughout this research project. Where these are presented within this thesis they are formatted with a green box, as demonstrated here.

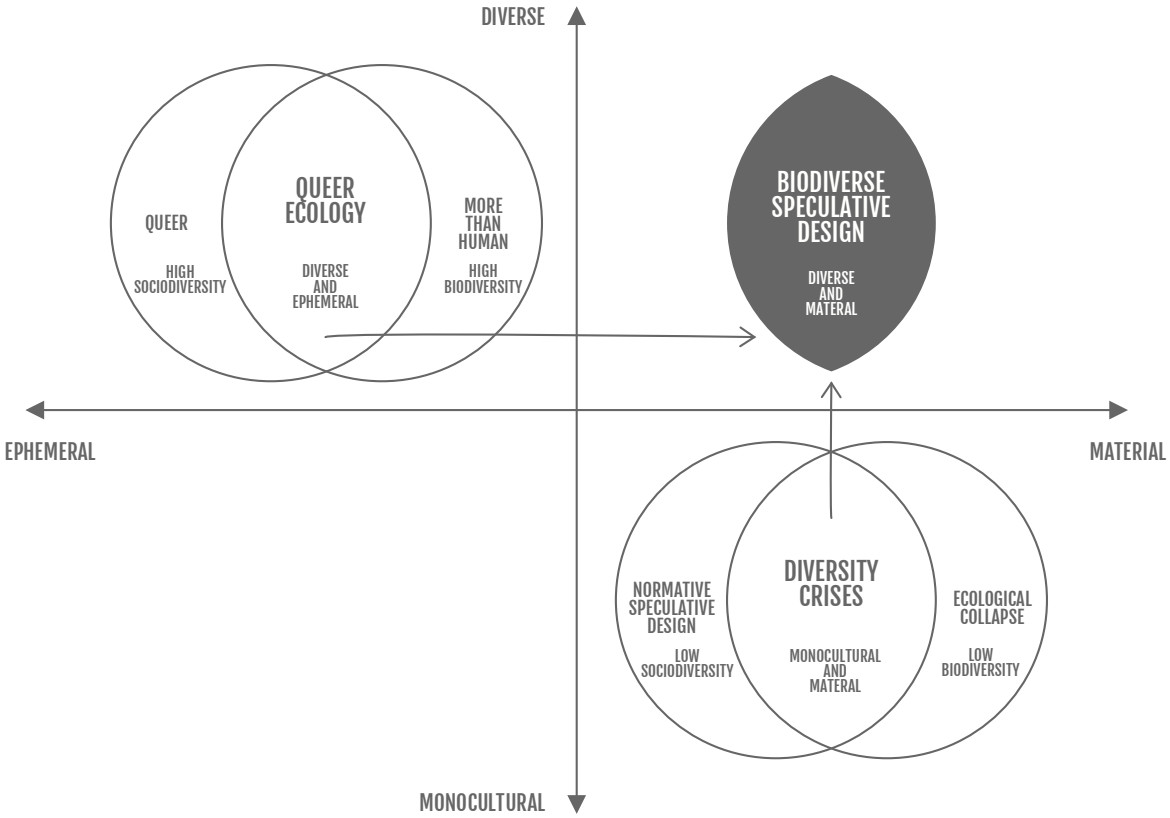


Figure 2 : Entangled Contexts

This graph demonstrates the complex entanglements between the research domains of this project. The horizontal axis demonstrates materiality, with more material concepts to the right, and more ephemeral to the left; the vertical axis demonstrates diversity, with more diverse concepts to the top, and more monocultural to the bottom.

On the diverse but ephemeral quadrant are the queer and More-Than-Human lenses, representing high sociodiversity and high biodiversity respectively, which combine in Queer Ecology. Worldviews, Goals and Strategies for futures in this quadrant tend to be transient, ephemeral, and marginal. On the opposing quadrant, representing material monoculture, there are the concepts of Normative Speculative Design, criticised for its lack of sociodiversity, and Ecological Collapse, a loss of biodiversity. Together, these represent crises of diversity, but have a more material footprint.

This research proposes that by drawing on the combined strengths of (diverse but ephemeral) Queer Ecology, the Sociodiversity crisis in speculative design, and the biodiversity crisis (both lacking diversity but material), a Biodiverse Futures Design Programme and Practice can be situated in the top right quadrant, drawing on the diverse perspectives of Queer Ecology and the material practice of speculative design.

Credit.: Craig Jeffcott

PART I
CONTEXTS & FRAMINGS

Chapter 1

SITUATING THE INQUIRY

To hunt a species to extinction is not logical.
Whoever said the human race was logical?

Leonard Nimoy, *Star Trek IV: The Voyage Home* (Nimoy, 1986)

Introduction to Chapter 1

This chapter explores the contexts in which this inquiry is situated.

Chapter 1.1, *Speculative Design*, introduces speculative design as a design practice, exploring its historical contexts, definitions, purposes, and some drawbacks and criticisms of the practice (a further discussion of speculative design as a mode of research inquiry is presented in Chapter 3).

Chapter 1.2, *Biodiversity Crisis*, explores this framing crisis, giving some consideration to what Biodiversity is, why it is important, the nature and severity of the crisis, and the possibility offered by Community Biodiversity Activism and Speculative Practice to address it.

Chapter 1.3 considers both of these concerns within a wider context of *Decolonisation*. This important concept underpins many of the important ideas, situations and problems that this project focuses on: the Impasse of the Present; the dominance of European and North American futures in mainstream SF; the marginalisation of queer, racial and cultural minorities, and non-human or more-than-human perspectives; the relentless pursuit of categorisation and binary constructions; the separation of nature and humanity; and the ongoing extraction of global resources for profit, can all be understood in the context of historical colonial projects and their continuing effects on the world.

1.1 Speculative Design

Speculative design is a mode of design practice that concerns itself with the world as it could or should be, using design as a means of critique and speculation. It can draw on this future-making impulse to make artefacts that can act as "lures", or propositions, for unexpected futures. Anthony Dunne and Fiona Raby argue that you can "treat design speculations not as narratives or coherent worlds but thought experiments—constructions, crafted from ideas expressed through design—that help us think about difficult issues," (Dunne & Raby, 2014, p. 80).

Critical Design

Speculative design has diverse foundations in radical Italian architecture movements, Science and Technology Studies (STS), speculative fiction, and product and interaction design, but its principal antecedent is the practice of *Critical Design*.

Critical Design, a term coined by Dunne, is a way to challenge the underlying capitalist paradigm of product design, where designers play a key role in supporting the economic activities of capitalistic companies, governments and systems: "critical design uses designed artefacts as an embodied critique or commentary on consumer culture. [...] A critical design will often challenge its audience's preconceptions and expectations thereby provoking new ways of thinking about the object, its use, and the surrounding environment," (Dunne, as cited in: Auger, 2012).

This normative form of design practice he termed *Affirmative Design*, because it affirms and literally makes real such systems and worldviews. Affirmative Design makes the false assumption that design is a 'neutral' activity, taking no ideological position (Dunne & Raby, 2014). Critical Design was intended to function as a form of critique of this view of design, exploring what design from an overtly ideological position may look like, by recontextualising current technologies, modes of aesthetics and cultural and political movements. It does this through provocative prototypes and scenarios: these 'diegetic' artefacts[7] are presented—often in a gallery setting—as objects that tell a story about the alternative or future context they belong to, in order to provoke an audience to take a more critical view on these prevailing assumptions and attitudes.

To illustrate the difference between affirmative and critical design, consider these two designs for telephones: the *iPhone* (Ive et al., 2007), and the *Audio Tooth Implant* (Auger & Loizeau, 2001). The iPhone exemplifies Affirmative Design. It was created by Apple, a powerful multinational technology company, and was presented as a new type of telephone which would combine the

[7] Diegetic refers to things that are real within a fictional world.

functionality of a personal computer with the portability and connectivity of a mobile phone. While this was presented as a transformative technology, it *affirmed*, rather than criticised, the context in which it was introduced. Its designers were affirming, through the example of this artefact, various social, cultural and economic realities: a consumer-capitalist economic system in which people are encouraged to buy new products, a technological culture increasingly focused on data connectivity and internet access, a society that depends on user friendly devices. These factors, and many others, were affirmed by example through the design of the iPhone.

On the other hand, the *Audio Tooth Implant*[8] by James Auger and Jimmy Loizeau exemplifies Critical Design. Created as a diegetic prototype, this was a resin model of a tooth containing a microchip, with accompanying text with a high degree of pseudo-technological specifications claiming it to be a "Radical new concept in personal communication. A miniature audio output device and receiver are implanted into the tooth during routine dental surgery. These offer a form of electronic telepathy as the sound information resonates directly into the consciousness," (Auger & Loizeau, 2001). The prototype was intended as a provocative statement, questioning perhaps to what lengths people might go to maintain communication and connectivity for work and leisure, and the desirability or not of being perpetually online and available; it raises, if not an overt criticism of such systems and attitudes, at least as a question about whether these should be left unchallenged. It appeared to have the desired effect, though was perhaps more convincing than necessary: the prototype was presented at a trade fair and received television coverage, the designers later receiving both offers to develop the idea further from technology companies, and disgusted letters from members of the public, decrying the apparent innovation as horrifying. Triggering controversy, debate, and engagement lies at the core of many speculative and critical design projects (Wired Staff, 2006).

[8] See Figure 5

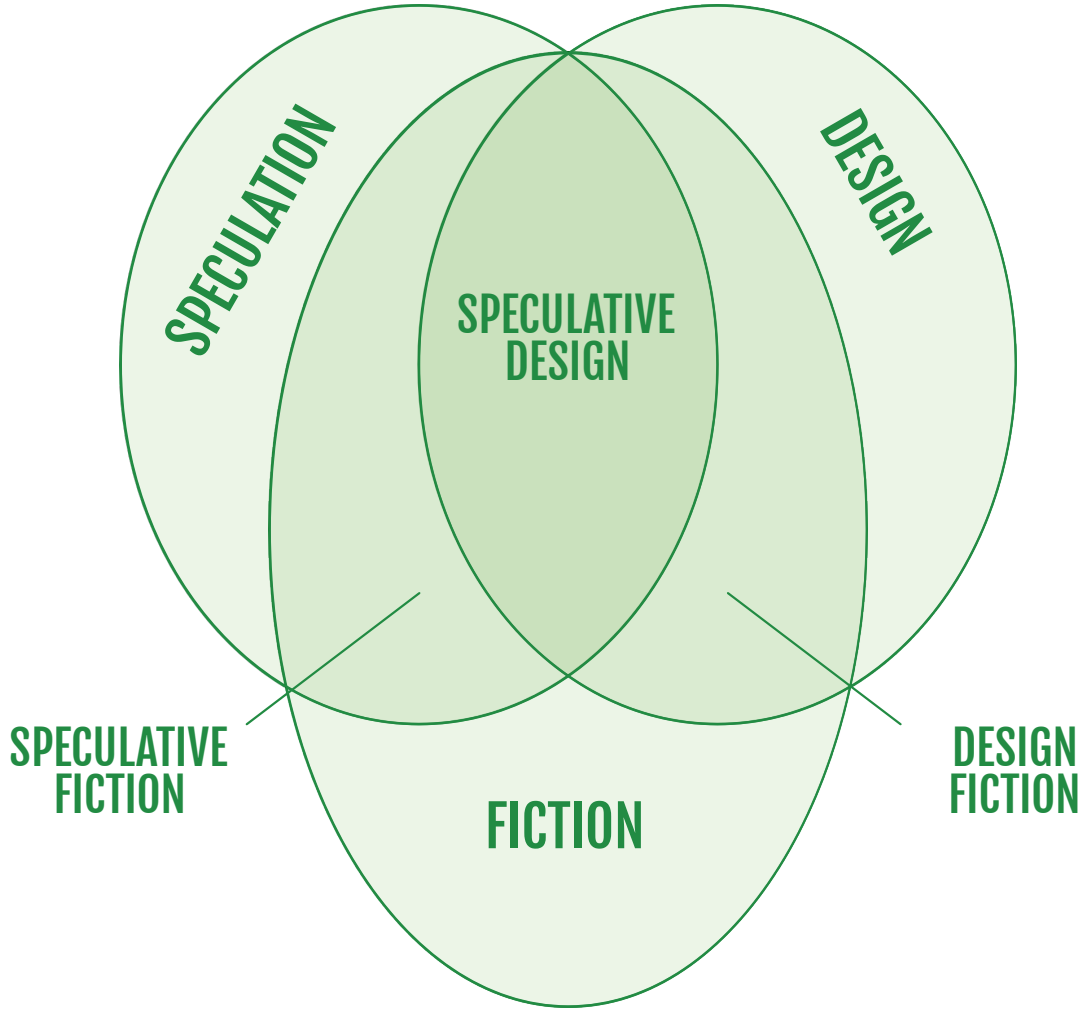


Figure 3 : Speculative Domains

This Venn Diagram illustrates the relationship between speculative practice, design and fiction. Speculative practice and fiction combine in Speculative Fiction (SF), and Design and Fiction combine in Design Fiction; the three meet in Speculative Design, which draws on speculative concepts, fabulatory worldmaking, and material design practices.

Credit : Craig Jeffcott



Figure 4 : Audio Tooth Implant

The Audio Tooth Implant *exemplifies Critical Design. Created as a diegetic prototype, this was a resin model of a tooth containing a microchip, with accompanying text with a high degree of pseudo-technological specifications claiming it to be a "Radical new concept in personal communication. A miniature audio output device and receiver are implanted into the tooth during routine dental surgery. These offer a form of electronic telepathy as the sound information resonates directly into the consciousness." (Auger & Loizeau, 2001). The prototype was intended as a provocative statement, questioning perhaps to what lengths people might go to maintain communication and connectivity for work and leisure, and the desirability or not of being perpetually online and available (Auger & Loizeau, 2001)*

Credit : James Auger, Jimmy Loizeau

Engaging with Futures

> *"The Speculative design approach takes the critical practice one step further, towards [...] visions of future scenarios. [It] envisages and anticipates the future, and at the same time helping us to rethink and understand the world of today."*
>
> *(Mitrović & Šuran, 2016)*

Critical design tends to operate as a material critique of the present. Speculative design differs in that it engages with possible futures and alternative presents. The practice is a critique of the singular Future that cannot traverse the Impasse of the Present—and exists in its shadow—arguing instead for plural, qualitatively different futures.

Speculative Design manifests that criticality in a specific way—often drawing its influence from the grammar of Speculative Fiction (SF)—that speculates about possible futures and alternative presents as a way of interrogating present issues critically. Often it concerns itself with creating artefacts, especially products and technology (as the field initially emerged from those design disciplines) that metonymically evoke and perform futures and alternative presents.

Speculative Design differs from Speculative Fiction in that it is a design practice, and therefore involves the creation of artefacts that act as a locus for critical engagements; often, these take the form of prototype devices and technologies, services, or systems.

As an example of this, consider the work *Plant Fiction*[9] created by Troika in London (Freyer et al., 2010). Presented as a series of photographs of modified plants, *Plant Fiction* engages with the tension between nature and the human-made environment by proposing fictitious plant species which might be placed in London to counteract urban problems, such as plants that would reclaim gold from dumped electronics, or that could sense viruses, a depiction which William Myers writes "reveals our tendency to enter into short-sighted, self-serving relationships with nature" (Myers, 2012, p. 178). Such a speculative fiction could have been part of a fictional text, but arguably, presented as visual representations of physical plants in a heightened art photography style, the ideas becomes more convincing, more entrancing, and more present in the world as a future that insinuates itself into the now.

Depending on the interests and backgrounds of speculative designers, this impulse can be applied to different ends. Those practitioners from a product design background tend to create unusual product prototype that invoke a different view of the world, with their inherent strangeness acting as a trigger for critical thought; those from more of a social sciences background often use speculative design as a way to engage with implicated actors in various

[9] See Figure 9

settings through interactive workshops and engagement events, as a form of research (Auger, 2013).

Speculative Design also has a close philosophical connection to science and technology studies (STS), often concerning itself with the future implications of techno-scientific research (Mitrović & Šuran, 2016), as well as often being defined by posing a challenge to the assumption whereby "design has been primarily regarded as a problem-solving practice [and has been] seen as a service activity that primarily addresses client's needs," (Mitrović & Šuran, 2016).

Reasons to practice Speculative Design

Considered in this section are some of the positive qualities and benefits of speculative design as a hybrid practice of design and speculation; it is a question-asking rather than problem-solving practice, it challenges dominant paradigms, it is futures oriented, and it ideologically sensitive. In these ways, it is able to offer alternative perspectives through design that might support biodiversity activism.

A Questioning Practice

> *"From the modernist perspective, design has been primarily regarded as a problem-solving practice [and has been] seen as a service activity that primarily addresses client's needs."*
>
> *(Mitrović & Šuran, 2016, p. 5)*

This is one of the most fundamental assumptions about design practice, that it is oriented towards a problematised space, where there are problems that need to be solved, often for users or customers, and design is regarded as a tool to this end. Such an assumption is particularly related to technological design and the concept of Technological Determinism, the dogma that technology is the main driver of social change (Pinch & Bijker, 1984). Such a framing leads to what has been termed Technological Solutionism in design practice; that the role of (affirmative) design is to find problems amenable to being solved by technology, particularly computational technology (Morozov, 2014).

This is itself problematic, as only problems solvable by such means are capable of being articulated through such a framing, and the situated complexity of social, technological and environmental issues is disregarded and, worse, cannot be thought within those terms (Richterich, 2024). In particular, it creates a dematerialisation effect, in that real material conditions, and the extraction of resources and concomitant social pressures and environmental

damage that they underpin are occluded by the surface level operations of technology (Marinelli, 2023; Williams, 2019)[10]:

> *"The impact of technology is not simply solving the problem for which it is designed; it resonates throughout society. Supply chains are needed to support the use and the creation of tech- nology. Labor and institutions are required for the extraction of raw minerals. Techno-solutionism must be considered in the entirety of the consequences."*
>
> *(Marinelli, 2023)*

Solutionism thus frames corporate activities and their technologies as the only solution to confected problems that require answers, resulting in a defuturing effect that occludes real-world complexities and creates what Donna Haraway describes as a cosmic faith in "techno-fixes," (Haraway, 2016).

Speculative and Critical Design is situated as a questioning practice to oppose this sort of corporate and technological determinism, using design as a tool to illuminate cultural assumptions and to interrogate and challenge them, rather than affirm them. Speculative design, then, is a way of asking *What If ?* It isn't a problem-based or solution-focused practice: it's question-oriented. In contrast to design in the affirmative mode, speculative design is not oriented within a problematised design space, nor does it engage with the world in a problem-based or solution-focused manner; instead, they are intended to question the status-quo, the techno-centric and capitalistic assumptions that are often baked-in to design artefacts and processes. (Mitrović & Šuran, 2016)

Challenging Dominant Paradigms

Liene Jākobsone argues that speculative design, due to its explicit focus both on futures and ideological awareness, has a powerful ability to engage with and give a commentary on prevailing assumptions and attitudes. This is in contrast to affirmative design that tends to take place unconsciously within a particular ideological paradigm, and acts to strengthen that ideological framework by creating its physical manifestations in the world (Jākobsone, 2017).

Future Focus

There is an argument that all design is oriented towards the future. The sociology of expectations suggests that design is a rhetorical tool that acts to advocate for (or against) a particular future through (usually but not always) material artefacts (Borup et al., 2006).

[10] A good example of this is the concept of "The Cloud" in digital services. Suggesting an immaterial, ephemeral entity as a way of emphasising the ubiquity and the easy accessibility of services and data through the internet, the term occludes the fact that The Cloud is in reality located in enormous server farms which require the copious mining of rare minerals, have a huge infrastructural and environmental footprint, and enormous energy costs.

However, affirmative or normative design, while often generating the actual artefacts that create a particular future, operates in what Mike Michael describes as an means-oriented ontological manner (which assumes that present values are fundamental and fixed), creating the future that seems most likely within the existing paradigm (Michael, 2000). In contrast, the futures of speculative design have more of an ends-oriented rationality, and are proposals and provocations, suggesting alternatives outside of the prevailing paradigm. This allows that "the principles of speculative design thinking in any design activity would raise awareness of design's potential to influence future towards the preferable," (Michael, 2000).

Ideological Awareness

Jākobsone defines ideology in this context as a "system of beliefs or principles that societies or smaller groups of people adhere to and act accordingly to," (Jākobsone, 2017, p. 4260); she suggests that ideologies can be deliberately agreed upon, or are unconsciously accepted by society at large, such as religious or political ideologies; the latter are problematic because they can be a tool of manipulation by those who control power. She gives the example of western neoliberalism, the assumptions of which are often taken for granted, in the design profession and elsewhere. The danger of this is that if design is produced in an ideological context—and all contexts are ideological—it materialises and gives physical form to the ideology in the environment. Far from being a neutral and un-ideological practice, affirmative and normative design actually creates and reinforces ideological norms and makes them real (Jākobsone, 2017).

In contrast, speculative design practice can have an overt ideological awareness, with a focus on challenging paradigmatic and normative ways of thinking, questioning everything taken for granted and thought to be unalterable. Further, as it is a design practice, it can use "the language and structure of design to engage people," (Dunne & Raby, 2014, p. 35). In this way, speculative approaches can help designers to "to make informed and critical decisions" by identifying problematic ideological assumptions, and so work towards creating and materialising preferred ways of being.

In particular, speculative design can engage with and challenge techno-scientific futures, with practices that focus on "re-thinking the technological future that reflects the complexity of today's world [and it] opens space for discussing and considering alternative possibilities and options, and imagining and redefining our relation to reality itself,"
(Mitrović & Šuran, 2016, p. 8).

In the introduction to his PhD thesis, James Auger describes how speculative design allows one to step "out of the normative relationship that ties technological development to commercial markets [and] opens a space for alternative perspectives, critical reflection and an examination of contemporary and near-future technological applications," (Auger, 2012, p. 6). His thesis research drew on the process of domestication of animals to explore how robots may become

domesticated—moving from fictional depictions of personal and household robots—to discussing how in practice robots have not really made this transition, to projecting how the process of domestication could result in a future where this is a reality – the real that might be. He explored this through Design Projects such as *Carnivorous Domestic Entertainment Robots*[11] (Auger & Loizeau, 2008), where he and Jimmy Loizeau created prototype domestic robots that catch flies and mice, and using microbial fuel cells to derive energy from the unfortunate animals to power the devices (Auger et al., 2009).

Generating Estrangement

James Auger has also written about the importance of imagination and creativity in building effective speculative artefacts, with the need to strike a balance between deliberate strangeness, intended to prime the audience to weirdness and to a world outside of the norm (like George Orwell's clock striking thirteen at the start of his speculative dystopian novel, 1984), and familiarity to ground the experience in the everyday. It's a process of making the everyday strange, in order to achieve anything from an emotional reaction to a change of perspective, to open up a space for dialogue (Auger, 2012). The creation of such estrangements from the norm is considered to be an important aspect of how utopias can reflect and challenge assumptions about how the world is and could be (Garforth & Iossifidis, 2020); this is discussed in more detail later in this thesis.

[11] See Figure 5

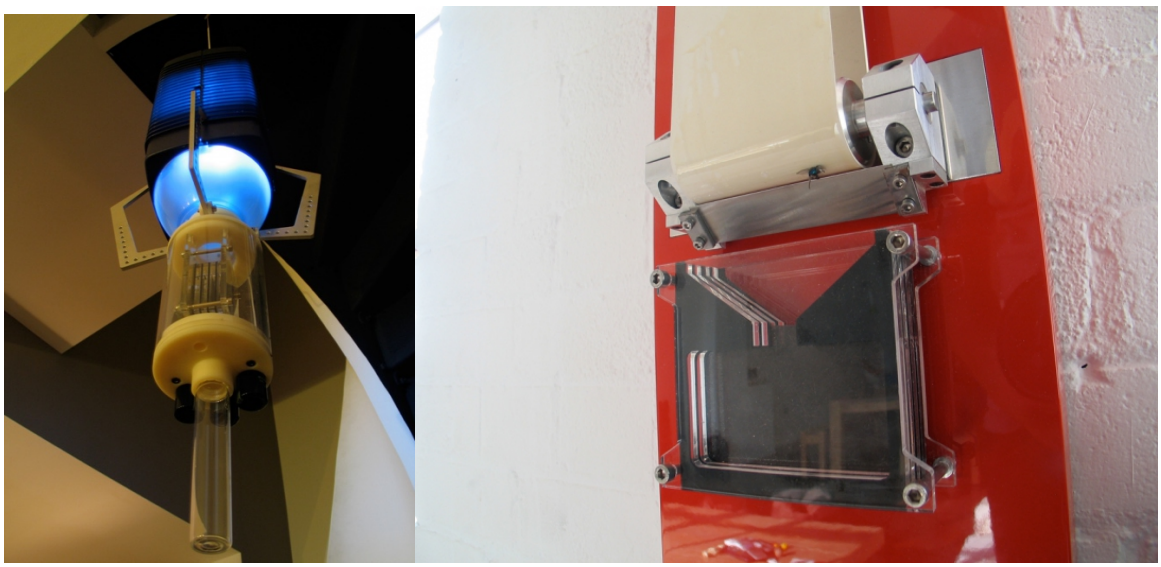


Figure 5 : Carnivorous Domestic Entertainment Robots

Carnivorous Domestic Entertainment Robots was developed as part of the Material Beliefs *project, as a way of engaging the public with the emerging technology of microbial fuel cells, which produce electricity from organic matter. James Auger and Jimmy Loizeau created these speculative prototypes of machines that would catch household pests, such as flies and mice, and use their energy to operate clocks and other devices.*

Credit : James Auger, Jimmy Loizeau

Critiques of Speculative Design

Some practitioners in the field, however, have criticised scope and limited viewpoint of some speculative and critical design work, as well as its limited impact. I consider these criticisms below; these formed one of the initial lures into this project.

Limited worldview

Possibly the most damning critique of Speculative and Critical Design is that it is elitist, with a privileged first-world, male-dominated conception of the future. This often results in a practice that has an unfortunate tendency to evoke dystopian scenarios as alternative presents and possible futures that closely resemble the current lived experience of people in some parts of the world.

> *"Production in the field usually falls much short to its critical aspirations. If you want to question the status quo, provoke and reflect on design's role within society you need to acknowledge and address issues of social justice (like gender, race, class, ability and so on) that design is ignoring in favour of very narrow, privileged ideas of what "critical" could mean."*
>
> *(Prado de O. Martins, 2014)*

Luiza Prado de O. Martins is a Brazilian researcher and practitioner in speculative and critical design at the University of the Arts Berlin, and through her work, she explores intersectional issues of gender, feminism and race through a speculative design lens. She has argued that "we have a very serious problem of privilege and entitlement permeating the discipline," and that it operates from "the entitled and privileged point of view of the white, academic, middle class designer from the developed world, who is either unaware of or doesn't care about realities different from their own," (Prado de O. Martins, 2014). While Speculative and Critical Design has aspirations to be critical of hegemonic mainstream attitudes, it often occludes the important social justice issues of "gender, race, class and ability," (Prado de O. Martins, 2014) that arguably need to be urgently challenged. There has also been a tendency for practitioners in the field to be patronising towards their own audience, Anthony Dunne having suggested that most people are unconscious and easily manipulated consumers of design, with speculative artefacts existing in an exalted position of high art to be consumed ironically by those "in the know," (Jākobsone, 2017).

It is a rich and interesting area of design research and practice that has the potential to challenge deeply entrenched traditions and assumptions, yet is one that has traditions and assumptions of its own that need to be challenged, not least to allow the voices of marginalised and outsider groups to be better represented and involved. This is important as a narrow and

homogenous viewpoint will necessarily limit the diversity and expansiveness of the futures that may be invoked, with Martins stating that "the few projects that show some concern with the reality of the oppressed have a worrying tendency to speak for them instead of giving them their own voices," (Prado de O. Martins, 2014). A statement that has a clear resonance with the arguments for cosmopolitical and pluriversal perspectives made by Guattari (1989), Latour (2007), Stengers (2010), Haraway (2016), and Bellacasa (2017), amongst others.

Future Cone

Cameron Tonkinwise, in a review (Tonkinwise, 2014) of the book *Speculative Everything* by Anthony Dunne and Fiona Raby (Dunne & Raby, 2014), discusses the Future Cone as an exemplar of the constrained way of thinking that can characterise some speculative and critical design works. The Future Cone—often referred to as the *Voros Cone*, after Jacob Voros, who popularised its use (2017)—was proposed as a way of conceptualising futures, and has been taken up enthusiastically within speculative design and other future-making practices. It proposes a set of nested cones that extend from a single present moment into the future, with the axial line representing the likely future (the one represented by the Impasse of the Present) and widening out cones representing probable, plausible and possible futures. It could be seen as a representation of a many worlds, multiversal universe, and is used as an orientating tool for proposing futures. However, it isn't truly pluriversal, and therein for Tonkinwise lies the problem. He argues that from his perspective, as someone from a similar background to Dunne and Raby, he might have a similar Future Cone, with a similar length and similar possible futures; someone from another country, another background, would see a diagram that looked much different, both in length and the shape of the cones. His argument is that the Future Cone supposes a singular, shared present, with the same futures possibly opening out to everyone: it is assuming a universality of experience or correctness that embodies a continued colonialist way of thinking about futures (Tonkinwise, 2014).

> *In our current world, situated in the contexts of modernity, capitalism, patriarchy, and whiteness, it is easy to assume existence within this world is a neutral, shared experience. However, there is no single everyday experience and to assume universality when designing visions will reduce the inherent intricacies that exist in the plurality of lived experiences.*
>
> *(Carey et al., 2021, para. 5)*

Improving the Future Cone

Some efforts have been made to extend and modify the cone. Paul Coulton, Dan Burnett and Adrian Gradinar, in a paper on speculative design games, argue that the Future Cone "is very typical of many visualisations that present the future, in that it presents futures as if they can be viewed from one specific point in the present which is shared by all. However, our perception of

the future is linked to our experience of the past and present and these will vary from individual to individual," (Coulton et al., 2016, p. 1620). They propose extending the Future Cone from the present to multiple pasts, and using multiple cones to represent multiple subjective presents, thus acknowledging the subjective nature of history and the power of imagining alternative pasts (see Figure 6).

Replacing the Future Cone

Other design researchers have explored possible replacements for the Future Cone through design workshops. An online workshop at the *Relating Systems Thinking and Design Symposia* in 2021, *Reimagining the Future Cone*, challenged participants to "imagine new visual models for futuring, based on decolonizing futures literature," (Carey et al., 2021, para. 1). The organisers argued that:

> *"we need tools that acknowledge history and clarify whose present is centred and cared for. The most prominent icon of design futuring, the Voros Cone, leaves out the past and begins with one, singular experience of the present."*
>
> *(Carey et al., 2021, para. 2)*

They argue that it's necessary to decolonise speculative design by imagining "tools for futuring that break free from a settler-colonial perspective […] that prioritizes one privileged perspective of the present and future over the lived experiences of others," (Carey et al., 2021, para. 5). In the workshop, they asked participants to propose new forms of visualisations of the future, by adapting metaphors about time with respect to "learnings from racial justice organisations," (Carey et al., 2021, Section Futures Cone: Workshop Agenda) to create new futuring tools. Through this, they sought:

> *"to challenge design tools that erase the past and assume a universal perspective by imagining new futures models [and create] a space for designers to discuss and create models that take a broader perspective on how we intend to future."*
>
> *(Carey et al., 2021, para. 5)*

Another conference workshop, *Speculative and Critical Design in Education: Practice and Perspectives* (Helgason et al., 2020), presented at the 2020 *ACM Designing Interactive Systems Conference* in Eindhoven, Netherlands, led to the proposal of "a plurality of perspectives for approaching design futuring," (Howell et al., 2021, p. 2) that are partial, situated and contradictory alternatives to the Future Cone, and that offer "different reorientations towards time and designerly agency," (Howell et al., 2021, p. 2): *Parallel Presents* explores possible parallel worlds based on various historical changes; *I Am Time* allows for a cyclical and spiritual perspective on time; *Epithelial Metaphors* frames time through ambiguous and non-linear cellular systems; the

Uncertainties Cone reframes the Futures Cone as a paper cone held to the eye that encourages the embrace of uncertainty and subjective, partial viewpoints; and *Meet (with) 'Speculation'* draws on queer futures to create an ambiguous personification of Speculation who urges "us to notice what we take for granted when futuring and to consider greater fluidity," (Howell et al., 2021, p. 10) (See Figure 7). These perspectives were not intended as universal models for futuring, but are presented by the authors as:

> *"an un-manifesto to signify their diversity and the contradictions between them [that does not] commit to a unified set of claims, but rather to highlight a plurality of perspectives for design futuring. [It] invites others to create diverse approaches to speculation and open up the process of futuring."*
>
> *(Howell et al., 2021, p. 2)*

I took up this invitation in a workshop I presented at the *Nineteenth International Conference on Design Principles and Practices*. In this workshop, titled *The Forest Of Branching Futures: Visualising Pluriversal Futures With Woodland Metaphors From Speculative Fantasy* (Jeffcott, 2025), I considered how a shift from speculative narratives drawn from science fiction to those drawn from fantasy fiction might allow for the transformation of the Future Cone. Inspired by the television series *Loki* (Waldron, 2021), in which a technological *Temporal Loom* is transformed into the organic and mythical *Yggdrasil*, the world tree from Norse Mythology, The workshop explored the motifs of the tree, the forest, and the paths in fantastical texts and how the Future Cone might be metamorphosed through them into more imaginative and ambiguous ways to explore time.

Across all these workshops, there was a common theme of moving away from a singular, linear, technological, abstract and objective temporal framework, towards perspectives on time that are plural, distributed, organic and fantastical, situated, and subjective.

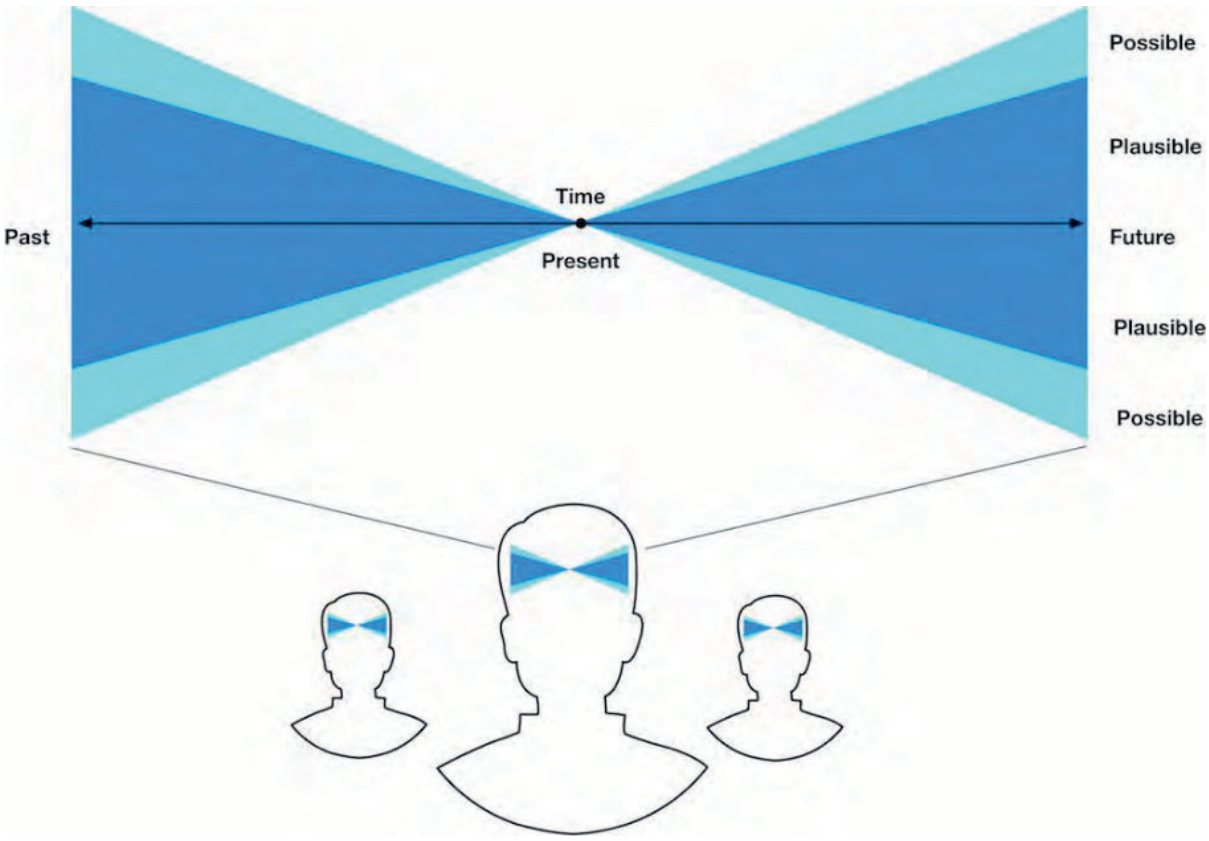


Figure 6 : Extended Future Cone

The Future Cone (or Voros Cone) is a popular framework for future-making. It imagines a singular present, from which emanates a 'cone' of possible futures, from an axis representing a continuation of the present, and concentric widening rings representing probable, plausible and possible futures (with impossible futures, however those might be defined, outside of the cone). This visualisation has been criticised for accommodating only narrow visions of the future from a fixed present (Carey et al., 2021; Tonkinwise, 2014); This proposed modification embraces multiple pasts by extending the cone backwards, and emphasises the pluriversal nature of the present by showing each cone represents a subjective, rather than universal, present (Coulton et al., 2016).

Credit: Paul Coulton, Dan Burnett, Adrian Gradinar

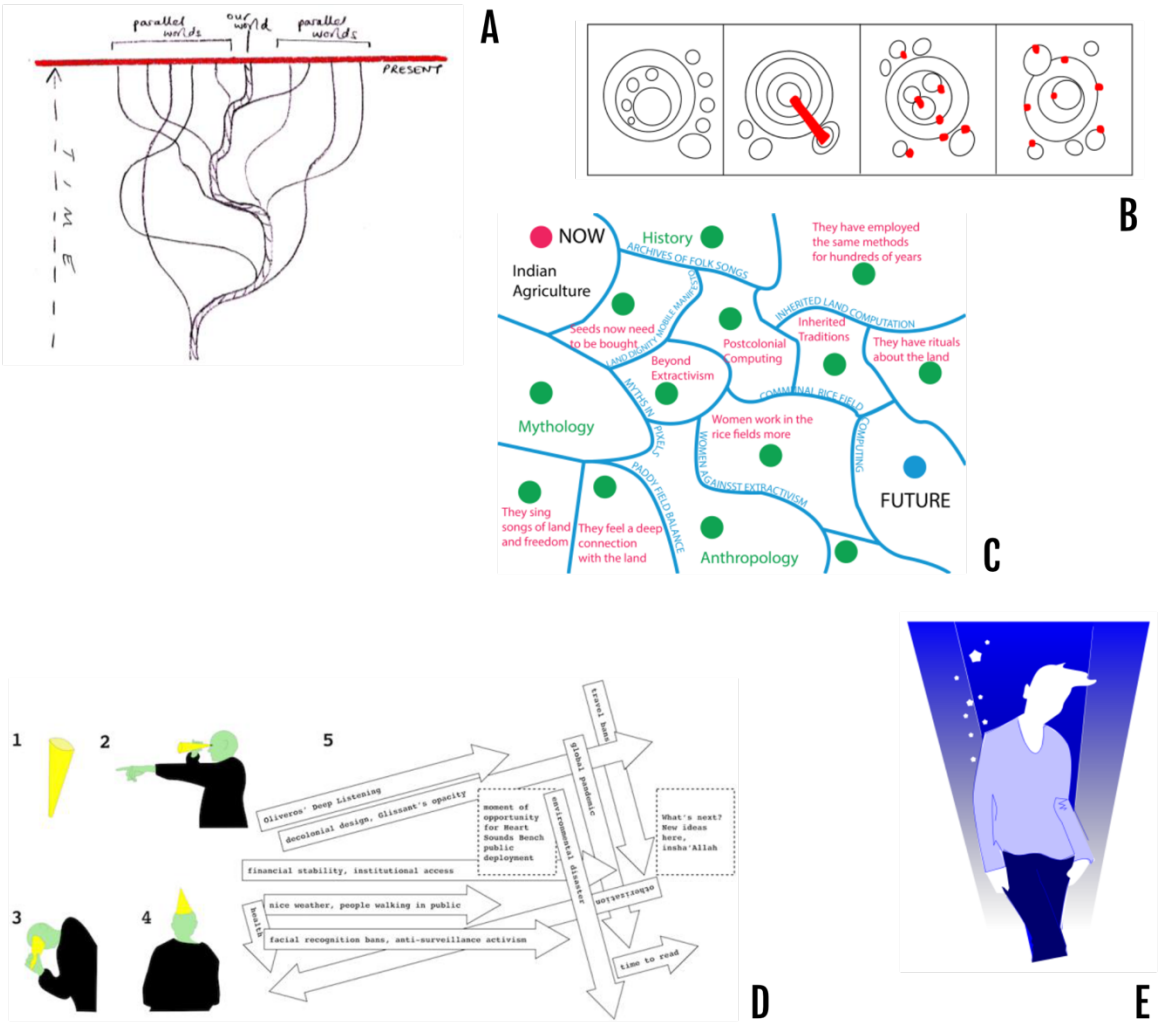


Figure 7 : Plural Perspectives on Design Futuring

Plural, partial, situated and ambiguous perspectives for exploring design futures that emerged from a conference workshop (Helgason et al., 2020): A. Plural Presents; B. I Am Time; C. Epithelial Metaphors; D. the Uncertainties Cone; E. Meet (with) "Speculation" (Howell et al., 2021, p. 2).

Credit: Adapted from figures published by Noura Howell, Britta F. Schulte, Amy Twigger Holroyd, Rocío Fatás Arana, Sumita Sharma, and Grace Eden.

Impact and Usefulness

> *"The most immediate and frequent reaction [...] is probably the claim that it is an egocentric and useless practice, carried out for its own sake; a waste of time, effort and money for making things that do not solve any problems or do not have any function."*
>
> *(Jākobsone, 2017)*

Liene Jākobsone has reviewed some of the criticisms that Speculative and Critical Design has attracted; in addition to the problem of limited worldview, she discusses the issue of whether it has any impact, or, in short, whether it is in fact a useful practice. The arguments fall into two categories; the first that it is not a useful practice, and the second, that it is a potentially useful practice that is not being well used (Jākobsone, 2017).

Is Speculative and Critical Design a Useful Practice?

The first argument, that it isn't inherently useful—that it can't solve problems or make functional products—is refuted by Jākobsone. She argues that its role is to identify problems and ask questions, not solve them, and that its outputs do have a function, such as to raise awareness or to change opinions. It *is* useful, it just exists for a different purpose than other approaches to design.

Problem Revealing, not Problem Solving

Jākobsone offers a definition of design as being "deliberate action aimed at turning existing living conditions into preferred ones," (Jākobsone, 2017), and she argues that because design that solves often unwanted situations is more visible, a perception of design as a problem-solving discipline exists. However, Speculative and Critical Design often engages with situations that hadn't been seen initially as problematic. It is not a discipline that solves problems, but highlights them; doesn't solve questions, but asks them. But in the finding of problems, and the asking of questions, it promotes critical thinking about our actions, responsibilities, capabilities and ideological constraints: this fulfils the conception of useful design as action aimed at creating a preferred condition. An example of this is the work *Symbiotic Interaction*[12] (Castellanos & Valverde, 2017), a series of prototypical wearable devices that integrate plants within them. Within the design fiction, the devices integrate with the sensing capabilities of the plants, making the plant's senses perceptible to the viewer. The designer, Maria Castellanos, took inspiration from Haraway's *Cyborg Manifesto* (1981), which encouraged her to explore the dichotomies between humans, nature, and technology, and her designs are intended not as real products, or of solutions to problems, but to raise questions about, and problematise, categorical

[12] See Figure 8

assumptions about humanity regarding where the human ends and the natural or technological begins (Hasdemir, 2018).

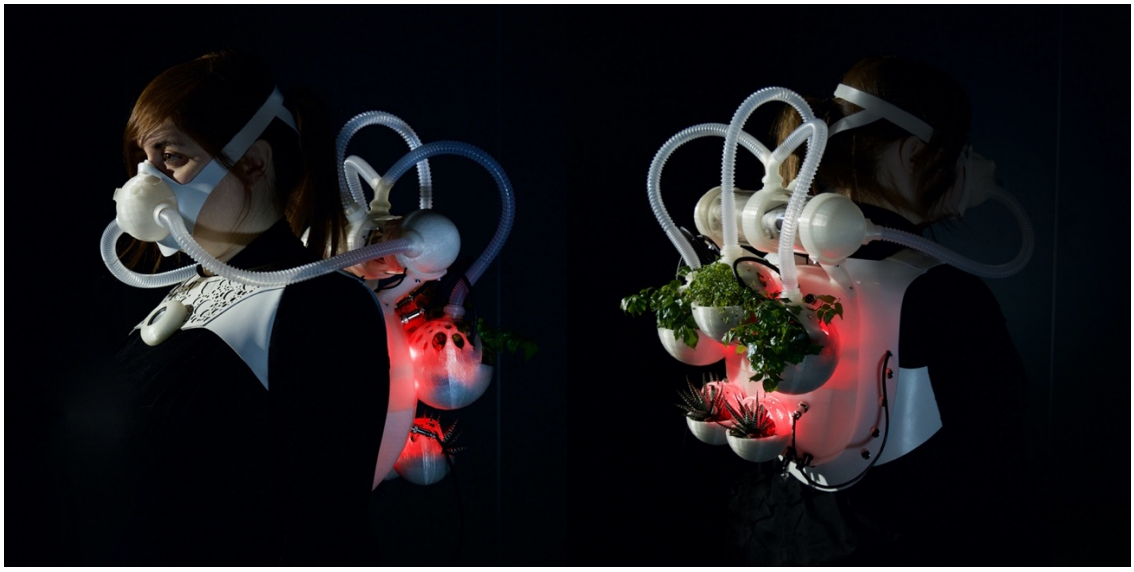


Figure 8 : Symbiotic Interaction

Symbiotic Interaction (Castellanos & Valverde, 2017), a project by the designer Maria Castellano, is a series of prototypical wearable devices that integrate plants within them. Within the design fiction, the devices integrate with the sensing capabilities of the plants, making the plant's senses perceptible to the viewer. The designer, Maria Castellanos, took inspiration from Haraway's Cyborg Manifesto, which encouraged her to explore the dichotomies between humans, nature, and technology, and her designs are intended not as real products, or of solutions to problems, but to raise questions about, and problematise, categorical assumptions about humanity regarding where the human ends and the natural or technological begins.

Credit : Maria Castellanos

Functionality

The argument that the outputs from speculative and critical design practice lack function stem from the fact that they tend to be non-working prototypes that are never intended to be produced and enter the market as products. Jākobsone argues that it doesn't lack function, though, just that it's "function moves beyond physical and technical function, optimization, efficiency, and utility," (Jākobsone, 2017). By critiquing prevailing attitudes and assumptions, and suggesting possible futures—both positive and negative—Speculative and Critical Design has the potential to change those assumptions and propose different or preferable futures.

Is Speculative and Critical Design Being Practiced Usefully?

The other argument is that while it may be useful, it isn't practiced in a useful way, and therefore lacks impact. This is due to two factors: limited focus—as discussed, the focus of many speculative design projects tends to be narrow, dealing with white male first-world preoccupations—and poor dissemination. Despite "the pretentious aspirations critical designers have regarding the potential of their practice in influencing the society and the course of the future," (Jākobsone, 2017) there is no-well established infrastructure for the dissemination and engagement that would be needed for that to happen. Often it is practised and shared within a closed loop between the gallery system, academic research and design education, and when it is shared beyond those confines, it is often misunderstood. For example, as discussed, Jimmy Loizeau and James Auger created a speculative and non-functional prototype of a telephone embedded within a tooth implant, which gained some media notoriety, resulting in funding offers from telecommunication companies and later, angry correspondence from people who felt they had been duped (Auger & Loizeau, 2001). Jākobsone explains that Cameron Tonkinwise has argued that it is the responsibility of speculative and critical designers themselves to be "orchestrating the debates through which groups of people come to decide to work together on realising a particular future" (Jākobsone, 2017). In general, Jākobsone's analysis suggests that while Speculative and Critical Design has the potential to be impactful and useful, the way in which it has tended to be practised does not fully exploit that usefulness.

In theory, speculative design can be a powerful way of engaging with futures that allow us to escape the Impasse of the Present, but has been criticised in practice, both by its practitioners and by others. in summary, it has been criticised for falling short of its ambitious goals: that it is too lacking in impact, that it is shallow and superficial, and, most troubling, that it lacks diversity, both in its practitioners and in its gaze (Jākobsone, 2017). Speculative practices in design and research allow futures that are distinct from the present to be used as prototypes, provocations and the means of their own hastening, but a deficit of diversity of practitioners and in the futures they devise are a serious impediment to achieving these important goals.



Figure 9 : Plant Fiction

Plant Fiction (Freyer et al., 2010) engages with the tension between nature and the human-made environment by proposing fictitious plant species which might be placed in London to counteract urban problems, such as this plant, which decomposes to produce biofuels. It is a series of speculative prototypes, created by modifying real plants and photographing them in dramatic studio settings.

Credit : Troika

1.2 Biodiversity Crisis

The publication in 2019 of *The Global Assessment Report on Biodiversity and Ecosystem Services* by the *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES Report)—an expert-led, scientifically credible report on the global state of the ecosystem for "governments, the private sector and civil society," (Brondizio et al., 2019)—paints a frightening picture of significant and accelerating loss of varieties, species and habitats, locally and on a global scale. Biodiversity—a plurality of different types of animals, plants and other organisms—is giving way to a human-centred monoculture, dominated by humankind and a handful of varieties of livestock, crops, and companion species (Brondizio et al., 2019). Such a monoculture is not resilient and, in the long term, cannot sustain life on this planet.

This section explores what biodiversity is and how it can be defined, why it is important, and how and why it is in crisis. It discusses what can be done to tackle this crisis, touching on arguments for and against doing anything, and situate Community Biodiversity Activism in the discussion.

1.2.1 What is Biodiversity?

Ian Swingland writes in the *Encyclopaedia of Biodiversity* that Biodiversity does not have a definition that is universally agreed upon, and it varies depending on the context in which it is used. He argues that it is "a populist word invented for convenience," (Swingland, 2013, p. 400) rather than a scientifically defined term; it is a rhetorical concept used to argue for research into and the management of ecosystems, and to support policy and activism decisions; such decisions can be difficult to make with a term that remains ill-defined.

The concept of Biodiversity was originally introduced by Thomas Lovejoy as Biological Diversity, by which he referred simply to the number of species in an ecosystem; technically referred to as Species Richness, this lacks "specificity and context," (Swingland, 2013, p. 400). To improve the specificity and context awareness of the term, "others elaborated the definition by including the variety and variability of living organisms," which "range in scope from 'the number of different species occurring in some location' to 'all of the diversity and variability in nature'," (Swingland, 2013). Swingland suggests the following definition is the most comprehensive: Biodiversity is "the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological processes that keep them functioning," (Swingland, 2013, p. 401).

The lack of a generally accepted definition of biodiversity is not a trivial matter. Any action to protect biodiversity necessitates a huge number of implicated actors' involvement, from governments to corporations to communities: if they "view biodiversity in fundamentally

different ways," (Swingland, 2013, p. 401) they will struggle to come to an agreement on what should be done, often finding themselves with opposing aims.

In general, though, and for the purposes of the project, biodiversity is a measure of plurality or abundance in nature, whether that is having a plurality of types or an abundance in numbers of genes, species, and ecosystems. It could be defined, also, by what it is not: monoculture, where ecosystems are dominated by small numbers of few types of species, or genes, or types of habitat.

1.2.2 Why is it Important?

Peter Alpert suggests that there are two types of argument to be made for the importance of biodiversity, and the necessity to protect it: intrinsic and instrumental. Intrinsic arguments are drawn from moral philosophy: that the ecosystem and the organisms within it have intrinsic value in and of themselves. In such a framing, the destruction of them is unethical and there is a moral imperative to protect them. Instrumental arguments are more pragmatic, considering the ecosystem as an important resource for humans that can be exploited or made use of: "as a life support system; as a silo for storing organisms that might have eventual use; as a gym with recreational opportunities; as a lab for natural experiments; [and] as a cathedral for the appreciation of beauty," (Alpert, 2001).

In general, instrumentalist arguments tend to be more convincing for policy makers and the general public; in a worldview where policy decisions are driven by economic interest above all else, the necessity to protect economic resources makes sense. In this regard, ecological conservation could be historically seen as a form of *resourcism* driven by instrumentalist arguments for the protection of biodiversity; the contemporary goal of Sustainable Development "is based on an instrumental argument for stewardship of ecological systems and natural resources on behalf of all people and their posterity," (Alpert, 2001, p. 13).

The drawback, from the perspective of the ecosystem and the beings within it, of such an instrumentalist view being dominant, is that very many, if not the majority, of living species do not have an apparent use or economic or human survival value, or such use or value is not known. Therefore, "a belief in the right of species to exist" as a moral imperative precedes any argument of utility and foregrounds the value of the ecosystem and its biodiversity in its totality. Interestingly, Alpert suggests that many conservation scientists publicly rely on instrumentalist arguments for their work, but privately are motivated by intrinsic arguments. This distinction, which is one between caring for the ecosystem and caring about it, is an important one in this project, and is an argument developed later in this thesis.

The IPBES Report—as well as the UN's sustainable development goals of Life Below Water (Goal 14) and Life on Land (Goal 15)—largely make instrumentalist, human-centric, 'Nature with a capital N' arguments for the importance of biodiversity:

"Nature underpins quality of life by providing basic life support for humanity, as well as material goods and spiritual inspiration; Many of nature's contributions to people are essential for human health and their decline thus threatens a good quality of life; Most of nature's contributions are not fully replaceable [and] some are irreplaceable. Loss of diversity can permanently reduce future options, such as wild species that could be domesticated as new crops."

(Brondizio et al., 2019).

1.2.3 What is the Depth of The Crisis?

How bad is the biodiversity crisis, or crises? To what extent is the web of life smaller and more frayed? The IPBES report presents some statistics that are sobering. Consider species diversity (number of species): 680 vertebrate species have been driven to extinction by human activity, and around 1 million species remain at risk of extinction, which includes 40% of amphibian species, 33% of marine mammals, reef forming corals, sharks and shark relatives, and 10% of insects; on average, 25% of all species of plants, vertebrates and invertebrates worldwide are at risk of extinction, which is happening at a rate tens to hundreds of times faster than the average for the last 10 million years. The situation for species richness (the relative abundance of species) is similarly bad, with a fall in 20% of abundance of native species in land based habitats in the last 120 years, with a 70% rise in invasive alien species since 1970 (Brondizio et al., 2019).

Habitat loss is also severe, with around 9% (or 500,000) of terrestrial species do not have sufficient habitat for their long-term survival. 85% of wetland habitats have been lost since 1700, currently happening three times faster than forest loss; where forests are concerned, 32% of global forest area has been lost since the start of the industrial revolution (Brondizio et al., 2019) (See Figure 10).

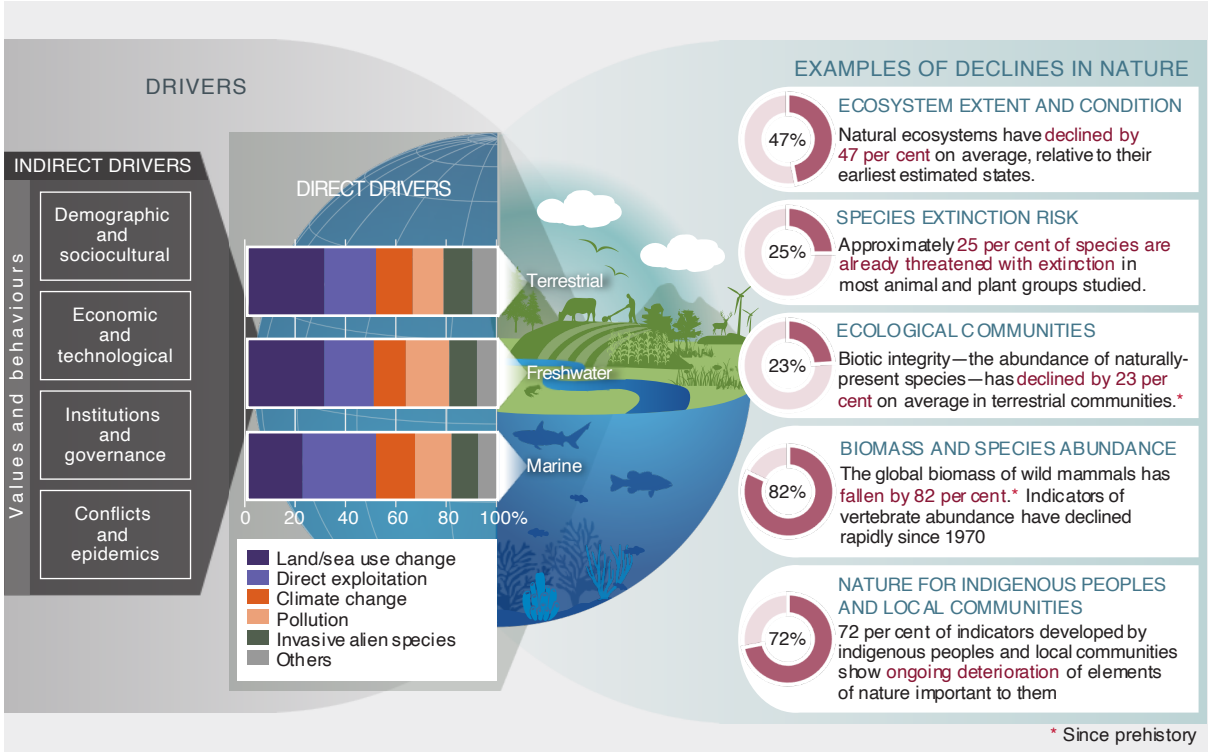


Figure 10 : Biodiversity Loss Infographic

This Image is taken from The Global Assessment Report on Biodiversity and Ecosystem Services by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES Report). It details some of the main direct and indirect drivers of biodiversity loss (most of which are anthropogenic), and examples of the decline in biodiversity that have resulted from this. (Brondizio et al., 2019).

Credit : IPBES

What has Caused this Loss of Biodiversity?

By and large, the vast majority of this loss has been caused by human action; species extinctions are a natural process of evolution, but "anthropogenic extinctions far exceed any background extinction rate," (Swingland, 2013, p. 405). The means by which these extinctions happen can be direct human action, through the "hunting or persecution" of species, or indirectly, through the destruction and modification of habitats. Indirect habitat loss is the main cause of reduced biodiversity and species extinctions:

> *"Sustained human activity will affect the relative abundance of species and in extreme cases may lead to extinction. This may result from the habitat being made unsuitable for the species... or through the habitat becoming fragmented."*
>
> *(Swingland, 2013, p. 405)*

In figures, 75% of the terrestrial environment has been altered significantly by human actions, with 60 billion tons of resources extracted globally, which is a 100% increase since 1980, and a 300% increase in food crop production since 1970 (Brondizio et al., 2019).

Attempts to preserve and protect biodiversity and ecosystems are generally referred to as conservation. Often, conservation is entangled with the concept of stewardship, of looking after something (in this case, the environment) for someone else, whether that be for present or future generations, for the needs of governments or corporations, or for the beings in the ecosystem itself. Stewardship is a troubling (in that it is a site of making trouble, not that it is inherently bad) concept in some of the contexts of this research project. Conservation can have a positive impact on the biodiversity crisis: the average risk of extinction for mammals and birds has reduced by around 30% due to "conservation investments" between 1996 and 2008.

Conservation efforts can take place at all levels of human society, from governments and NGOs to private businesses to individuals and communities.

This project situates itself in concern with grassroots, community focused efforts to protect ecosystems and biodiversity; the conservation activities of large organisations—governments, NGOs, businesses and the like—take place at the level of complex policy decisions that are driven by questions of national and corporate interests, and the assemblages of committees, summits, lobbying, elections, reputational decisions and policy statements that this involves. These are undoubtedly important in that they gave shape in the broadest terms to the engagement between human societies and the ecosystem, but they are beyond the scope of this project; they are too wide, too complex, for a project of this nature to intercede in, and in fact, my interest lies elsewhere; how can speculative practices in design play a role at the grassroots level, to help communities to relate to and better support their local ecosystems.

1.2.4 Community Biodiversity Activism

This research project refers to the ways in which communities take action towards protecting their ecosystem as Community Biodiversity Activism. I've considered Biodiversity in some detail; this section attends to the Community and Activism aspects.

Light Communities

The work of Ezio Manzini has explored the nature of communities in the contemporary world, and the role of design and social innovation in supporting them (2015, 2018). Due to technological change, globalised cultural and economic patterns and the material, cognitive and affective estrangements of the Anthropocene era, traditional, historic communities that are largely based in specific geographical locations play a much-reduced role in people's lives compared to prior generations. He argues that the world has become more fluid, and that as a result:

> *"inhabitants of this fluid world can be seen as connected individuals, people free of the previous social ties but nestled in a mesh of interactions taking place in both the physical and the digital worlds. These individuals, being engaged in a variety of conversations of different kinds and in different spaces, dissolve the previous communities (pre-modern communities and those that were formed in the last century) and produce unprecedented social forms based on the individual possibility to navigate in the complexity, making choices that, by all means are design choices."*
>
> *(2018, p. 162)*

Manzini identifies two catastrophic outcomes of this: an epidemic of connected loneliness, where people are connected through technology but lack a sense of community, and a resultant rise in pseudo-traditional communities based on exclusionary identities, which he refers to as communities of fear and hate. In addressing how one might "move against the hyper-individualistic, competitive, market-oriented mainstream ideas and practices," (2018, p. 162) he highlights another form of community which emerge through practices of social innovation, which he calls Light Communities. Through coming together and making new social structures, often through social innovations like social enterprises, co-housing and community gardens, communities that are qualitatively light, resilient and creative emerge. These communities can "evolve into *collaborative organizations*: groups of people who choose to collaborate with the aim of achieving specific results and creating social and environmental benefits," (2018, p. 163).

He has discussed the role that design and social innovation can play in supporting the emergence of light communities, arguing that one cannot design a community directly from the ground up, but that design can create good conditions for them to emerge and flourish. He

identifies three conditions that can support community development: Favourable Context, where an infrastructure and environment supports collaborative actions; Stimuli for Aggregation, where projects or events give people a reason to come together; and Diffuse Design Capacity, where design skills and other collaborative and critical skills are distributed throughout the community, rather than in the hands of designers and experts (Manzini, 2015).

Activism

Activism, which can be defined as "the use of direct and noticeable action to achieve a result, usually a political or social one," ('Activism', 2025), can be a major focus of community activity. Within this definition, one might broadly consider activism either as direct action, action that operates within existing legal, legislative systems, and action that operates without these. Direct action might be situated in locally focused projects, organised at a grassroots level, to take some direct, concrete actions to protect the environment, such as organising a local beach clean-up.

Intra-Systemic Action

Communities can take action within existing systems, often turning them to an environmental advantage in some way. Here are two examples of such intra-systemic community approaches, one from Western Scotland, the other from Central Portugal.

Community of Arran Seabed Trust (COAST)

The Community of Arran Seabed Trust (COAST) is a Community Biodiversity Activism group on the Isle of Arran in Scotland, that campaigned for, and achieved through legal and legislative means, the creation in 2008 of a "No Take Zone" in Lamlash Bay; this zone prohibits any fishing activity within a bounded area, which has resulted in the restoration of scallops and other marine species and the recuperation of sea grasses on the seabed following what had amounted to desertification due to aggressive trawler fishing (See Figure 11). Alongside such legislative efforts, COAST maintain a tourist information centre to promote their work to visiting tourists—they implicate tourists in their story, configuring them as visiting activists by imprecating them to look out for and to report fishing boats operating illegally (posters show images of how boats look when their nets are deployed)—carry out marine biology research with visiting researchers, and are engaged and embedded within the local community.

COAST provides a good example of a biodiversity-oriented Light Community of the sort that Manzini has described. I corresponded with Gavin Stevens, a volunteer with COAST and a member of their Community Advisory Panel, to understand how COAST meets Manzini's criteria for such communities to flourish:

Favourable Context

How does COAST create an environment that supports its community?

> *"The Volunteer Community within COAST is split into several areas according to roles. For example, the Front of Office (Retail and Guides) regularly meet to give feedback to the Executive Team on what works, what isn't and could be improved. The Activity volunteers, snorkelling, beach-cleans and Citizen Science have their own agreements and timetables. Each of the groups liaise with a nomination on the Executive Team for guidance and timetabling. Additionally, COAST is in the process of attaining Investing in Volunteers accreditation, demonstrating that they value their volunteers. The weekly email that is sent out to supporters details the activities in the past week and specific actions by people are generally thanked in that email. That is a much wider circulation than just the volunteer group."*
>
> *(Stevens, personal communication, 2025)*

Stimuli for Aggregation

How do COAST activities and projects bring people together and get them to participate?

Stevens told me that "the No Take Zone was a game changer for the Community of Arran. It demonstrated that local community action can be effective in changing Government Regulations," (2025) leading to a community highly motivated "to explain the need for a more regulated trawler and dredger environment," (2025). The energy of this motivated community is harnessed through the organisational structure of COAST:

> *"As part of their role, the Executive Team (ET) are tasked with ensuring that the Volunteers are kept informed of changes happening within the COAST environment. Keeping the community informed and involved is a major part of the ET workload. Annually, there is now a get together for all volunteers and a review given of all the activities by those on the Executive Team […] giving as wide a view as possible to keep the volunteers informed."*
>
> *(2025)*

Diffuse Design Capability

How does COAST help members develop or draw on the skills or confidence to get involved?

> *"Volunteer members initially are generally assigned to areas that they are interested in. However, each has the opportunity to move into other areas of responsibility. For example, it is possible for anyone to look to a new role, for example in Citizen Science or Boat Handling or Technical assistance. In doing so, they would be buddied up with a more experienced member to receive training and, to a certain degree, assessment by the senior. Everybody is encouraged to ask questionson any subject. There is always someone with the knowledge and the willingness to answer."*
>
> *(2025)*

Stevens himself, for example, has tended to work on technical issues, such as on Remote Operated Vehicles and Boat Electrics—"it's an area I personally get satisfaction from," (2025)—but has also taken on Front of Office and DIY work:

> *"it has been varied journey for me. I am now on the Community Advisory Panel (CAP) and in effect can exert some influence the direction that COAST takes and I believe I'm a valued and trusted member of COAST."*
>
> *(2025)*

From this correspondence, then, it is clear that the innovative creation of the No Take Zone in Lamlash Bay acted as an important aggregation point for bringing together a community of biodiversity action, which has been harnessed by COAST in a way that allows volunteers to draw on their diverse skills and interests, and supports them to collectively make an impactful difference in their local ecosystem.

Hyper-Local River Fish Protection in Cascais

I spoke with biologist Joana Robalo, who was involved in hyper-local initiatives to protect small rivers and the fish that live in them in the Cascais area of Portugal, which involved engagements between the local community, scientists, local government and NGO organisations: work was done with local land owners to restore river ecosystems that had been damaged by agricultural run-off chemicals, which was followed by projects with local children in the rivers, and engineering projects to create small pools in which fish might thrive, including a recently discovered new species. Initially, local people were disinterested in the existence of the fish, claiming that it had always been there (it had; but nobody had identified it as a unique species before).

> *"We started developing their interest in that specific fish, and now almost all municipalities along the stretches of those small rivers are involved with the conservation projects about that fish."*
>
> *(Robalo, personal communication, 2020)*

This led to what Robalo describes as "a chain of good things," (Robalo, personal communication, 2020) that happened, a developing sense of "goodwill around the rivers, and I think it started with a small fish; it was the seed that was needed: people began to take their children to the rivers due to the work being done to improve their margins, through the local government involvement the schools got involved, and people were being taught how to maintain the rivers, and manage them properly," (2020).

She emphasises that this initiative worked specifically due to its small, hyperlocal scale, working on small rivers. "Because here we can go to the local government and then the people over there, they know that the owner of this specific land and then the people of the local non-governmental organizations get involved and then you can do a chain of good deeds, and the children are involved: the children take their parents to the river, and then it all turns out good," (2020). It wouldn't be possible to do this in a larger river that crosses many different localities.

Extra-systemic Action

These examples represent approaches to activism that operate within existing systems, paradigms, laws and worldviews; but, if there is a fundamental problem with the way that systems relate to the ecosystem and the affect they are having on biodiversity, and individuals and groups are not well placed to meaningfully alter those systems according to their internal frames of reference, another approach to direct action might be taken, but in this case, action *against* the systems that act counter to the ecosystem. Increasingly, faced with existential crises and the apparent disinterest in governments and companies to take meaningful action to deal with them, some community activism groups make use of protest, publicity stunts, and even lawbreaking to stake out a claim on a future for the environment.

This can be particularly seen in recent years in organisations oriented towards climate change, such as Extinction Rebellion and Just Stop Oil. Both these groups have become well known for challenging governmental and corporate behaviour that either damages the ecosystem (or, through inaction, does insufficient to restore it) through public protest and disobedience, mounting high-profile stunts to gain traditional and social media coverage of their concerns and demands, such as glueing themselves to trains and roads, or vandalising paintings in galleries with bright paint or tinned soup.

These actions have been vilified in the British tabloid press[13], are unpopular with the general public, and have prompted the introduction of draconian anti-protest legislation; clearly, they represent a challenge to the expectation that life will proceed from one day much the same as the next, particularly for those whose days tend to be comfortable, safe, and detached from the environment.

Chris Packham, a British conservationist and natural history television presenter, presented a documentary entitled *Is it time to break the law?* (Sibley, 2023) in which he grapples with the question of what level of action, what level of disobedience, do the intersecting crises of the environment require. A review of the documentary in The Guardian notes that he approves of and supports the tactics of these groups:

> *"Knowing what is at stake, Packham is still inclined towards extreme measures—not just approving of them, but participating in them himself. He is remorseless in his criticism of his own contribution to date. Regular conservationism, the discipline to which he has dedicated his life, has failed, he says. Nelson Mandela and Emmeline Pankhurst, Packham reminds us, did not confine themselves to merely asking for change nicely."*
>
> *(Seale, 2023)*

1.2.5 Activism and Futures

A line can be drawn between these approaches to grassroots activism in terms of how they orient towards possibly futures.

Whether operating within existing cultural, legislative and economic paradigms or actively challenging them, Community Biodiversity Activism groups and initiatives exist in those paradigms' shadows. These presuppose a way that the world is, and the way that the world can be in The Future. This is where this research project is positioned. It aims not to disrupt the existing strategies of these ways of taking action for biodiversity, or to criticise one approach as better or worse than another; those decisions are taken by groups and individuals according to what resources they have at their disposal, and how urgent it is to take action (and, as has hopefully been made clear, taking action is incredibly urgent).

However, if that action is to be taken with a horizon on the future that has been predetermined, that is predicated on the systems and institutions and ways of thinking that have brought the

[13] Relevant article headlines in The Daily Mail, a UK Tabloid Newspaper, included "Angry commuters blast Just Stop Oil activists for 'stopping us from working' as 90 eco-zealots cause gridlock by 'slow marching' through central London." (Prosser, 2023), "Glue idiots! Extinction Rebellion activists infiltrate Paris Motor Show to glue themselves to Ferrari supercars." (Devereux-Evans, 2022) and "Nine hammer-wielding Extinction Rebellion activists who sang and chanted as they smashed 16 windows at HSBC's Canary Wharf HQ - causing £500k worth of damage - are cleared by a jury." (Cotterill, 2023)

planet to such a parlous, crisis-riven point, what futures seem possible? How can communities take action, when the future has been laid claim by interests more powerful, more ruthless, and more disinterested than they are? Such a future is an entirely human-centred one, with most of the levers of power held by those in whose apparent interests lie a future centred on the needs of just a small subset of one species—our own—let alone taking the needs of other organisms, of the global ecosystem into account. Where this project aims to make a difference, then, is to find ways to help communities to imaginatively challenge the hegemonic, extended-present future that bodes extremely ill for the ecosystems on Earth.

Solarpunk

Solarpunk is a good example of how speculative and future-making practices and design can support community environmental activism, and contribute to making a better world. Jay Springett, a Solarpunk strategist and writer, figures it as a speculative activist movement "that seeks to answer and embody the question: what does a sustainable civilisation look like and how can we get there?" (2023, What is Solarpunk section). Its name comes from an allusion to Cyberpunk, the genre of technological dystopias, in the same way that other speculative genres like steampunk have been derived in the past. Despite having aesthetic similarities in that they are speculative worlds grounded in particular technological systems—ubiquitous computational technology for Cyberpunk, Victorian steam technology for Steampunk, and solar-powered technologies for Solarpunk—Solarpunk is first and foremost a *punk* movement, oppositional to and resistant to the capitalist mainstream, and in particular, the monocultural future that it insists is inevitable. Cyberpunk itself began as a more overtly punk opposition to dystopian technocultures and ubiquitous computing, but became debrided of its politics and commercialised as an aesthetic over time; the Solarpunk community emphasises this oppositionality more overtly, and actively resists it being reduced to a simply a literary genre or aesthetic movement (Springett, 2023; Williams, 2019).

Springett reflects on Solarpunk as being a movement in opposition to what he describes as "the slow cancellation of the future [caused by] capitalist realism," (2023, The Broken Present section)—the idea that only the futures capitalism deems possible are available for thinking with. This has resulted in a form of "cultural fracking" where the only futures we have to work with are retro-futures: Golden-age science fiction, comic book movies, ancient mythology. He calls this process *De-futuring* : "we have no futures which we can call our own," (2023, The Broken Present section). Cyberpunk came to accept that prospectus, taking a nihilistic stance against the inevitable no-future; in contrast, Speculative Fiction scholar Rhys Williams describes how Solarpunk "has developed a strong utopian activist streak [...] with the imagined worlds as clear futures of a desire for a socially just and ecologically harmonious social organisation," (Williams, 2019, p. 6).

Solarpunk thus isn't a speculative genre or aesthetic, but a collective movement towards creating better futures. Springett describes it as a "narrative container," that anyone "can place their ideas of the future inside of." These ideas may be contradictory and different, but together they constitute a form of "conceptual bricolage," that allows new futures to be made through "a host of ideas and images, all in relation to each other," (Springett, 2023, A Narrative Container section).

What makes the movement unique is that it is as much a community of action as it is a corpus of speculation; Williams describes it as "a world first and a set of narratives second" (Williams, 2019, p. 7): an immanent "conceptual space" that frames and creates the possibility for material speculation. Solarpunk has its broadest base in online forums and groups, where the community share mixes of solar fantasias, artworks, questions about technology, ideas, manifestos, designs, and functional infrastructures, buildings and other socio-material assemblages. It takes as its starting point the possibility of an emerging solar-powered future, one which rhetorically is positioned as a imminent, likely, and good, and thus is framed as "an ideal vehicle for dreams of an improved future," with "a sense of utopian possibility," (Williams, 2019, p. 2).

> *"Because of the nature of the feed, clicking the solarpunk hashtag returns not with a singular interpretation of solarpunk, but plural: a host of ideas and images, all in relation with one another. An image of a lean-to greenhouse / a post on appropriate technology for water harvesting / a rendering of a retrofitted suburbia / 3D-printed clay tiles designed to restore coral reefs / espaliered apple trees / solar panels in abundance."*
>
> *(Springett, 2023, A Narrative Container section)*

The two aspects of Solarpunk, speculation and community activism, are entangled with a productive synergy, where, as a form of speculative design, there is a material engagement with the world as it as well as speculations about how it might be different. Speculation inspires the community to explore different material futures, and the environmental and material actions provide the possibility of new and more grounded speculations (Springett, 2023; Williams, 2019).



Figure 11 : COAST No Take Zone

The Community of Arran Seabed Trust is a Community Biodiversity Action group on the Isle of Arran in Scotland, UK. Reacting to the desertification of the seabed in their local Lamlash Bay, the group worked with the local community to have a legally-mandated "no-take zone" set up in the bay, in which all fishing activity is prohibited; this has resulted in restoration of the ecosystem of the bay.

Credit : Community of Arran Seabed Trust

1.3 Decolonisation

> *"European colonial power came to be based on a series of separations and exclusions that cast colonised peoples and nature as being outside the 'ideals' of 'civilised' Europe and therefore, inferior. The colonized were denied their individuality and diversity and treated as belonging to stereotyped classes; they were both marginalised by and incorporated within the colonial project, which was, in turn, driven by an overriding desire for order and control. Increasingly, the biological sciences were recruited to the task of rationalising nature to make it more amenable to human exploitation."*
>
> *(Adams & Mulligan, 2003, p. 4)*

This section has introduced the lenses by which the themes of this work might be framed and understood. Many of the themes of this work, from the Impasse of the Present and the risk-oriented future, to the deficit of diversity of speculative design practice, marginalised identities, and the continuing environmental monoculture and climate crisis intersect in the decolonisation movement. This section concludes by considering how common grounds between all these topics might be explore using a decolonial lens.

Decolonisation is the philosophy of challenging, opposing and replacing Euro-centric colonialism; not specifically or even predominantly in terms of land occupation—most former colonies are now post-colonial independent states—but in terms of values, worldviews, attitudes, systems and beliefs (Adams & Mulligan, 2003; Schultz et al., 2018).

Colonialism—the principle of establishing colonies, transplantations of one culture to a more distant land—from the middle centuries of the second millennium until the middle of the 20th century increasingly became the dominant way that European cultures interacted with other lands and peoples, reaching an apotheosis in the late 19th Century with the British Empire, which came to dominate much of the planet alongside and as part of the emergence of industrialisation, the European Enlightenment, and the increasing hegemonic dominance of capitalism.

The British colonial project—and to a lesser extent, that of other European colonial powers—increasingly had two goals—one economic, one moral—that were pursued with ruthless efficiency. On the economic side, there was a shift in mindset away from the dynamics of trade with other peoples, to one where colonised lands were seen as an economic resource from which great monetary value could be obtained through the extraction of material resources—so colonialism, in environmental terms, can be seen as parallel to an extractionism. This resource were to be protected as an absolute priority, whether through deception, control, and subjugation of indigenous people or through control of the land itself. This was alongside a

moral crusade, driven by both the rationalist values of the Enlightenment and the moral values of Victorian Britain, to 'civilise' the world; based on a flawed assumption of the superiority of European values and societies, colonisers sought to remake the world and the people within it in their image. "Colonialism created the illusion that a particular model of development could be recreated in all parts of the world, and the powerful (and so often destructive) homogenisation of 'Modernism' began," (Adams & Mulligan, 2003, p. 4).

This was a project of hierarchical and taxonomical hegemony, where all things must be categorised and ordered, and as a result, be reordered, and made "better", often through the imposition of binaries of gender, race, validity, and between nature and the artificial. Decolonisation is thus an intersectional matter, where gender and race became entangled with queerness, with white male cis-gender heterosexual wealthy able-bodied neurotypical human beings being positioned as a morally upright norm, with others—human and more-than—existing as queered or outsider beings, pushed out to the margins. This hegemony acts to determine whose bodies or voices are deemed valid, who is entitled to a stake in the future: as Luisa Prado describes, "coloniality's hierarchical classification of subjectivities shapes our perception of which subjects are permitted to enunciate and produce knowledge," (Prado, as cited in: Schultz et al., 2018, p. 95).

The period of active colonisation may have—largely—passed, but the values, systems and beliefs of colonialism, whether economic or moral, linger into the present—through the other-isms of nationalism, post-colonialism, modernism, capitalism, extractivism, neoliberalism, fascism—insisting on a narrow range of possible futures in the interests of a narrow group of people, largely against the interests and needs of most of the inhabitants of the planet—human or more-than—indeed, against the interests of the entire ecosystem.

Decolonisation is in essence a project to reject a singular objective capitalistic Euro-centric perspective, and instead replace it with an inter-subjective pluriversal mindset that encompasses and values difference, that rejects productivity and economic growth as necessary and inevitable, and stakes a claim for better futures for the inhabitants of the planet.

Danah Abdulla writes that "our task is to make sure people understand decolonisation for what it is; a subversion and transformation of Eurocentric thinking and knowledge; a knowledge produced with and from rather than about," (Abdulla, as cited in: Schultz et al., 2018, p. 89).

The interests of this piece of research find themselves entangled as important parts of this narrative, as decolonisation has much to say about both design and the environment; or, to look at it in another way, about the binary distinction between the artificial and the natural.

Decolonising Design

Design, as a practice and profession, and as an orientation towards the world, is fundamentally entangled with colonialism. Modern design emerged as a key component of the industrialisation and capitalisation that colonialism engendered and was an integral part of. Design, as has been discussed, is a practice of making real, of materialising meaning and future-making. The world as it exists now has been made that way by design, and through design. Modernism—the early 20th century project of utopia making, an extension of the moral values of colonialism, whereby the *soi disant*[14] "right" sort of people decide to make the world "better" as they see fit—was the birth of the modern design profession, and design played a key role in making the modern world real.

This has led to the establishment of groups such as the *Decolonising Design Collective*, a group of designer-researchers[15] who argue for "radical, systemic change" (Danah Abdulla et al., 2019, p. 130) in design that draws on multiple worldviews, particularly non-Western practices and ways of thinking. The Collective discussed their viewpoints and arguments in *What Is at Stake with Decolonizing Design? A Roundtable* (Schultz et al., 2018). In this, Ahmed Ansari argues that decolonising design necessitates:

> *"engaging with the nature of what design practice brings into being. Design brings into being new ontologies and ontological categories and their corresponding subjects and subjectivities. This occurs through the construction of artifice and artificiality, which is inextricable from our fact of our humanity, and is now both the medium we live in, determining the nature of our existence on the planet, and the primary determinant of our horizons insofar as we interpret our reality in the present and dream about possible and plausible realities in our futures."*
>
> *(Ansari, as cited in: Schultz et al., 2018, pp. 83–84)*

Designers must be aware of "the role that artifice has played in giving shape to and sustaining and perpetuating forms of colonial power", and consider "other, possible artificials," (Ansari, as cited in: Schultz et al., 2018, pp. 83–84).

Design may be a practice of artifice that has acted to materialise and entrench particular worldviews, but inhering within it as a practice and profession are some of the values of the colonial project and its descendants, which a decolonial mindset must also challenge. The designerly version of the postcolonial -isms is Solutionism. Solutionism is a design-driven mindset that frames the world as a "problem which is to be 'solved'"

[14] self-styled

[15] The founding members of the *Decolonising Design Collective* are Tristan Schultz, Danah Abdulla, Ahmed Ansari, Ece Canlı, Mahmoud Keshavarz, Matthew Kiem, Luiza Prado de O. Martins, and Pedro J.S. Viera de Oliveira

(Oliveira, as cited in: Schultz et al., 2018, p. 92), that applies a singular methodological approach in assuming "a 'solvability' which is immediately assigned to a mode of shaping the world into a certain 'order'" (Oliveira, as cited in: Schultz et al., 2018, p. 92). Pedro Oliveria argues that design normalises such worldviews and the inherent prescriptions of control they contain: "even when practiced with a supposedly 'socially-conscious' mindset [design] ultimately follows 'the guidelines of the oppressor,' teaching designers to assume the world as a well-defined set of problems to be solved […] designers must understand that the very notion of the 'world-as-problem' is an assumption worth challenging," (Oliveira, as cited in: Schultz et al., 2018, p. 92).

Oliveira positions the emergence of the design discipline within the wealth obtained through colonialist systems—the erasure, displacement and commodification of indigenous people, alongside the theft of their land and resources—and argues that the designerly worldview must be seen in this context. He asserts that "a decolonising practice begs to directly challenge what it means to act within a set of skills, methods, and research imperatives that stem from this colonial framework" and reframes design "as a sociotechnial mechanism of inquiry, re-enunciation, and re-narration [...] a project of looking back and re-framing certain material practices, and [...] of understanding the relationality of things beyond their mere objecthood." It may necessitate "rethinking and redesigning our relationship with design altogether" as something that "speaks from and fosters spaces in which many border languages emerge" (Oliveira, as cited in: Schultz et al., 2018, p. 92).

Speculative and Critical Design are able in theory to offer a challenge to these entrenched ways of design thinking, to "rethinking and redesigning our relationship with design altogether" (Schultz et al., 2018), but they fall short of this in practice. As Luisa Prado argues, often it's practiced with such a narrow hegemonic worldview that it fails even from the start to challenge the position of design within these colonialist and subsequent systems (Prado de O. Martins, 2014). Tonkinwise, in a review and critique of Anthony Dunne and Fiona Raby's book *Speculative Everything*, calls attention to the fact that Dunne and Raby assert the power of speculative and critical design to propose new and better futures that are not predicated on global capitalism, but then situate their design practice as speculative proposals of commercial products that people will view through the lens of consumer-citizens and will understand in the terms of market values and forces; rather than offering an alternative to extractionistic, capitalistic design, they accept the inevitability of such systems and rather engage with them through whimsy and a knowing, self-congratulatory irony (Tonkinwise, 2014).

Decolonising Nature

The colonial project insisted on and perpetuated a binary distinction between the artificial and the natural; as with design and the artificial, much of the way that nature is understood, and conservation is practiced, is still predicated on a colonial mindset. William M Adams and

Martin Mulligan explain in the introduction to their book *Decolonizing Nature*, how colonialism "transformed nature, creating new landscapes, new ecologies, and new relations between humans and non-human nature; in the process, it created new ideologies of these relationships," (Adams & Mulligan, 2003). Decolonising the way that nature is understood and constructed is an important part of opposing the growing monoculture at the heart of the global ecosystem.

Both the economic and moral imperatives of colonialism have come to bear on the understanding of the natural world and the way that humans relate to it: "ideas about nature, whether as an economic resource that needed conserving and exploiting, or as a precious reservoir of unchanged wilderness, were an important element in colonial ideology," (Adams & Mulligan, 2003).

On the economic side, Ashely Dawson describes in the introduction to the book *Decolonizing Conservation* how the capitalistic drive to extract value from colonised land led to the "discourse and practice" of conservation: as it became clear that hyper-extractive activities such as forest clearance was "visibly changing local climates [...] as well as destroying valuable 'natural resources', the pragmatic response of colonial powers was to scientifically manage the land, by force, in order to maintain their supply of resources," (Dawson, 2023).

One of the first pieces of conservation legislation introduced in the British Empire was the *Indian Forest Act* of 1865, whereby all forested land in occupied India belonged to the colonial government, revoking the ancestral rights of millions of indigenous people who lived on this land and had managed it sustainably for centuries. This disestablishment of indigenous human rights in relation to the land is entangled with the moral imperatives that underpinned the colonial project, with a drive to "enlighten the world, conquering wilderness and bringing order and rationality to 'uncivilised' peoples and nature," (Adams & Mulligan, 2003).

These beliefs co-existed with a paradoxically romantic, almost spiritual regard for the purity of the wilderness; what Morton has described as the reification of the false category of Nature as something rugged and pure and untameable, essentially separate from the human world (Morton, 2010).

This is exemplified in John Muir, a figure held in high regard as an almost spiritual leader of the national parks movement, and a forefather of modern conservation, but who held white supremacist beliefs about the purity of the natural world. Muir was born in the small Scottish town of Dunbar, near Edinburgh, and emigrated to the United States of America as a young boy. On a day trip to Dunbar in April 2023, I discovered that Dunbar remains proud of its most famous son, with a country park bearing his name along the coast, and a museum—where the custodians talk of him in first name terms—in the house of his birth, that explains how the Scottish countryside of his youth gave him a lifelong love for the natural world, and how as an adult he came to be a proponent of conservation, and of nature as a source of spiritual

enrichment. The top floor of the museum is dedicated to displays of inspirational quotes from Muir's writings that ooze with a sense of Nature as the divine: "in every walk with nature one receives far more than he seeks"; "nature may hear and give strength to body and soul"; "the clearest way into the Universe is through a forest wilderness"; and, famously, "the mountains are calling and I must go".

Muir, understanding in a recognisably modern way the interconnectedness of life, wrote that "when we try to pick out anything by itself, we find it hitched to everything else in the universe." However, he believed that Nature was something that stood apart from humanity and that should be protected by and from it.

He was decidedly racist, believing that indigenous people were a blight on the natural world that should be removed: "Muir's image of pristine wilderness unshaped by humans only existed if native people weren't part of it. Even though they had been there for thousands of years, Muir wrote that they "seemed to have no right place in the landscape". American Indians needed to be removed in order to reinvent those places as untouched," (Associated Press, 2020).

This is the moral imperative of the colonial conservation worldview: that 'civilised' enlightened people are duty bound to protect the environment, for commerce and spiritual uplift, from the native inhabitants of the land, whether human or more-than. Richard White, a history professor at Stanford University explains that "Muir's advocacy for wilderness has an inherent racial bias [...] as hard as it may be to accept, it is not just Muir who was racist. The way we created the wilderness areas we now rightly prize was racist," (White, as cited in: Associated Press, 2020).

Muir is well known for playing an instrumental role in the creation of *Yosemite National Park*, in California, which he described as "Edenic wild gardens", but as Dawson explains, the creation of the park was prefigured by the hunting and genocide of indigenous Miwok tribes in the 1850s by the Mariposa Battalion, a militia of miners who wished to secure the land for resource extraction (Dawson, 2023). In this way, the economic impulse to exploit the land and the romantic impulse to protect it go hand in hand, at the expense of the natural ecosystem and its inhabitants. David Treuer, a Native American writer and activist, argues that many national parks in the USA are "founded on land that was once ours... created after we were removed, forcibly. Historically, US National parks are a crime scene," (Treuer, as cited in: Dawson, 2023).

Adams and Mulligan ask if "ideas about nature [have] been allowed to shift, or are they still the subject of some kind of neo-colonial domination by Northern urban environmentalists?" (Adams & Mulligan, 2003). The picture that Dawson paints is one that would suggest the latter; modern conservation groups have worked to secure around 17 percent of the Earth as Protected Areas that exclude human beings. These areas often contain 'concessionary zones' for industries involved in resource extraction, and a hostility to indigenous land right claims that would impede the "frenzy of extractivism," (Dawson, 2023): this has led to the continued clearance of,

violence towards and even murder of indigenous people and the activists who would protect them: in the decade from September 2012 until September 2022, over 1700 environmental activists were murdered worldwide (Greenfield, 2022).

This is against the paradoxical fact that:

> *"The UN recognises that Indigenous people protect 80 percent of the world's remaining biodiversity, often on land over which they have customary title—a form of ownership that states in both core-capitalist and postcolonial nations are all too happy to ignore. Scientific studies have shown that indigenous practices provide the same or better levels of ecosystem support and protection as 'Protected Areas.'" (Dawson, 2023).*

Treuer argues that the decolonisation of conservation necessitates the removal of the property rights and sovereignty of settlers, governments and corporations, abolition of land as property, and upholding the sovereignty of Native Land and People (Dawson, 2023).

Chapter 2

CONCEPTUAL FRAMING

There are many parallels to every existence. All eventual possibilities can be found here. This is where the decisions you make are shunted into life experiences. Choose a path, stream or river, and your predestined life will carry you to a destination. There are thousands of eventualities. Human kind has either lost her ability to explore them, or become too consumed by pod machines to know they can.

Courttia Newland, *A River Called Time* (2021, p. 144)

Introduction to Chapter 2

This chapter considers the conceptual framings that have been used in this research project. This project takes a Post-Qualitative Inquiry approach to research, which is based around philosophical concepts rather than research methods and methodologies; therefore, these conceptual framings are an essential component to this research project. Post-Qualitative Inquiry will be elaborated in the later chapter on Modes of Inquiry, but it is situated as a research paradigm within schools of philosophy that follow the Ontological Turn, particularly Post-Structuralism, Post-Humanism and New Materialism.

Chapter 2.1, *Onto-epistemological Lenses*, gives an introduction to these philosophical concepts and their onto-epistemological stance.

Chapter 2.2, *Conceptual Lenses*, is an exploration of the queer and more-than-human conceptual lenses that this research draws on: it considers the way in which they have overlapping concerns for transcending binaries and categories, moving beyond normative viewpoints and ideas, and embracing hopeful futures; the relevance of such approaches to this research have been explored. These lenses find an overlap in the concept of Queer Ecology, a discussion of which follows.

Chapter 2.3, *Conceptual Figures*, explores the concept of the More-than-Human Conceptual Figure as a guide to inquiry, and the figuring of Morton's Strange Stranger as such in this research.

2.1 Onto-Epistemological Stance

Ontology (the nature of the world) and Epistemology (the nature of knowledge) are key components of systems of knowledge and inquiry: what the world is and what can be known about it. As discussed below, these were historically considered as separate realms of consideration. This project, however, takes a philosophical and methodological stance in which these concepts are not separate binary categories but are mutually entangled and constitutive of one another, and so adopts the term Onto-epistemology from Karen Barad (Barad, 2007). This section considers the onto-epistemological perspectives which underpin this research (See Figure 12).

2.1.1 The Ontological Turn

> *"You cannot see what I see because you see what you see. You cannot know what I know because you know what you know. What I see and what I know cannot be added to what you see and what you know because they are not of the same kind. Neither can it replace what you see and what you know, because that would be to replace you yourself."*
>
> *(Adams, 1992, Chapter 9)*

A number of philosophical schools (which Elizabeth Adams St.Pierre collectively refers to as *The Posts* (Adams St.Pierre, 2020)) are aligned with a major anthropological and philosophical shift called the *Ontological Turn*, in which the notion of a singular objective world and truth which is experienced subjectively differently is rejected in favour of multiple co-existing worlds or ontologies (beings don't just experience the world as different to each other, but actually exist in different worlds).

The Ontological Turn emerged from the anthropological challenge of studying and understanding the differences between cultures. Historically, anthropology has approached this from a position of cultural relativism, whereby cultures may differ in how they perceive and hold beliefs about the world, but they hold that the world itself is fixed, and not relative to anything. Many perceptions, one material world. To put this another way, there is a dichotomy between what seems to be, and what is. This dichotomy separates the human, cultural, subjective world of meanings as relative and contextual, and the natural, objective world of material as fixed. Interpretations of an object vary, but the object itself remains the same. Essentially, this is a view that privileges epistemologies, the different ways in which things are knowable, over a single ontology, the way the world is. (Heywood, 2017)

Proponents of The Ontological Turn problematise this state of affairs, as they argue that it is not simply that different beings perceive the world differently, but that their embodied

experience is of a different world, and thus for a "radical openness to difference," (Heywood, 2017, Section Not for turning) that extends from the socio-cultural to the natural, material and ontological: in effect, that there are many worlds, not one. Such a stance is a turn to the ontological, hence the name, and blurs binary dichotomies like subject/object, meaning/matter, cultural/ecological, epistemological/ontological. Karen Barad coined the term onto-epistemology to account for the entangled nature of matter and meaning. (Barad, 2007)

Paulo Heywood considers two anthropological motivations for making a turn from epistemological difference to ontological difference; an account-making one, and a methodological one. (2017) The accounting problem is that taking a culturally relativistic stance on the culture / nature distinction, where culture is seen as variant and contextual and nature is seen as stable, cannot well account for cultural contexts where such a stance is not adopted. For example, there are some nature-cultures where no distinction is made between culture and nature (Strathearn, 1980) and others where they understand culture to be fixed and singular but the material world to be contextual and varying (such as by considering all animals to be people, but people for whom the elements of life--body morphology, living spaces, diet—are materially different) (Viveiros de Castro, 1998). The problem here is making use of an onto-epistemological standpoint that holds culture as separate from nature to understand contexts in which such a standpoint is meaningless; it simply emphasises a difference rather than understanding the different conception of the world that underlies it. It is not possible to grasp this other frame of reality through such a lens. Taking a stance on a universalist world with varying perceptions of it is in fact not itself a universal, and so ends up describing the world in terms that aren't actually universal positions. Historically, this view of culture was privileged over others as more accurate or truthful, framed other cultural perspectives as beliefs about the world—but this delegitimises their perspective, which isn't that they hold a belief but knowledge of how the world is (Heywood, 2017).

The second motivation for the turn is that a single world, multiple perspectives stance is also problematic methodologically as an approach to academic inquiry, as it means that categorical assumptions about the nature of the world and the things within it precede any actual inquiry into the world itself. The Ontological Turn is a challenge to this; Bruno Latour argued against starting from predefined categories, but for these to emerge through inquiry (Latour, 2007). Heywood suggests that categories are "outcomes, not starting points, of complex negotiations between people and objects," (Heywood, 2017, Section Methodological imperatives).

Karen Barad, quantum physicist and New-Materialist theorist, considered the observer effect in quantum physics, where the experimenter is entangled within the context of their experiment and thus affects its outcome as such a negotiation. Through apparatuses of measurement, a cut is made in an indeterminate world, and through such a cut, the world resolves into emergent categories of matter and meaning (Barad, 2007). From this it can be understood that multiple

different worlds can be composed of the same material, but are mattered differently through the multitudinous meanings that beings entangle matter with. It is not the material itself, but how we cut into it, that makes our worlds. Similarly, Latour argued that our understanding of the world and the world itself are inseparate until they are intentionally separated. Through such a viewpoint, analytical concepts tend not to precede those that emerge empirically through inquiry, but are recursive with them; emergent concepts and categories always adjusting and reframing those already established. Methodologically, the Ontological Turn asks for "no prior commitments apart from the methodological injunction to allow our empirical material to transform the concepts we use to analyse it," (Heywood, 2017, Section Methodological imperatives).

Therefore, it is a turn away from epistemology alone, that considers ways of knowing a singular, fixed nature through cultural perspectives, to onto-epistemology, where knowing the world and what the world is are inextricably linked, and where ontology isn't singular, but plural: where there is a pluriverse.

The following philosophical stances align with the ontological turn in varying ways: Post-Structuralism is a rejection of pre-existing structures and categories; New Materialism emphasises the importance of the material world alongside the social; and Post-Humanism is a rejection of the separation between human (culture) and nature. I consider Post-Structuralism and New Materialism here in some detail; post-humanist ideas will be explored here alongside New Materialism, and later in this chapter with reference to the more-than-human Conceptual Lens.

2.1.2 Post-Structuralism

Post-Structuralism is a general term for the collective philosophical stances from the 1960s and 1970s of (mainly) French philosophers, notably Foucault, Derrida, Lacan, and Deleuze and Guattari. Post-structuralist stances overturn or deconstruct the idea of pre-existing structures and systems inherent in the world. They reject essentialism over situated relativism; there are no inherent fixed categories of being, but these emerge through context and relations between things (Woodward et al., 2009).

Structuralist thinking argues for a distinction between the subjective self, the world, and ways of representing the world, with stable definitions of language being key in mediating such representations, and the separation of self from the world: "a representationalist logic that relies on a two-world ontology, which assumes there is the real out there and then a representation of the real in a different ontological order," (St.Pierre, 2020, p. 5).

Post-Structuralism deconstructs this; it argues that ways of representing the world are a means of making and defining, rather than describing, what the world and the subjective self are. It

rejects that language has fixed, objective definitions: meaning in language emerges from context, and relationality to other words and to what they represent. A post-structuralist ontology is one where things are entangled, and mutually contingent, lacking any inherent structure or hierarchy; Foucault has argued that structures and power relations are created and imposed by discourse and language. Crucially, there is no objective observer or objective self, separated from the world by the apparatus of representation; everyone is contingent, connected, in the middle of things (Adams St.Pierre, 2020; Woodward et al., 2009).

Considering the world in a structuralist way is to think of it in fixed terms, to contemplate what is. Post-Structuralism aims to focus away from the current and fixed and old, and to consider what is immanent, what is yet to come; to create the new. Deleuze and Guattari argue that philosophy is the creation of new concepts, and the role of the philosopher is to bring forth new concepts from a Plane of Immanence, a liminal space where the present isn't a preexisting structure but the conditions from which the new emerges (Deleuze & Guattari, 1994).

2.1.3 New Materialism

New Materialism encompasses a disparate grouping of philosophical stances which emerged from the 1990s onwards and which attend to the importance of the material world and of matter itself. It particularly considers matter's relevance to socio-cultural concerns in an era when humans are profoundly affecting the material world and are in turn increasingly impacted by it—an era often termed the Anthropocene, as will be discussed in more detail later in this chapter. Beyond this, they are united by: a Post-Human[16] stance that decentralises the human perspective; by a commitment to go beyond binary categories of difference; and a consideration of how scientific knowledge, which increasingly reveals the workings of the material world, can be brought to bear on socio-cultural concerns (Sanzo, 2018). Given that New Materialism is oriented towards the material, and design is largely a practice of materialisation of concepts, it is of some relevance to design research and practice.

It encompasses a range of stances within these bounds, but they can be grouped roughly into three camps: Agency and Ontology, Ethico-political, and Critical (Coole & Frost, 2010).

Agency and Ontology

The agency and ontology camp considers the nature of the material world, and how agency is distributed within it. These discourses are situated in a Post-Human context, which de-centralises human agency, and in material understandings drawn from the sciences, such as physics and biology. Within this, consideration has been given to the ontology and agency of

[16] Post-humanism builds on the idea of the contingent, connected self, with an outright rejection of a human-centric perspective (Braidotti, 2013).

matter, things, bodies, and biological systems. Where matter is concerned, Karen Barad's Agential Realism (2007) draws from quantum physics, and, as discussed with regards to the Ontological Turn, considers that distinctions between material entities and the divide between subjects and objects come into being only in relation to each other. Entities and meanings do not exist before their 'intra-actions', in which meaning and matter become entangled. Agency is thus not human or subject-driven but emerges through a mutual becoming as things emerge in relation to one another. All matter and all meaning are material-semantic. In an aligned perspective that draws more from geology and organic chemistry, Mackenzie Wark has argued for a molecular rather than molar consideration of matter; matter isn't a consideration of fixed and boundaried entities, but of flows of material that constantly shift and metamorphose, and of things that are transitional, and under continual processes of change (Wark, 2015). Rosi Braidotti takes a post-human stance to consider distributed material agencies, too, considering the "tendency of all living matter to form associations with other living systems" (Sanzo, 2018)

Things and their agency are another key strand of this ontological perspective of materiality. In the context of the material considerations discussed above, the ono-epistemological existence of things is dependent on meaning (if categories are emergent and things are only relationally coherent, it is epistemological meaning that gives a thing it's material separateness. The thing-ness or haecity (literally this-ness) of a thing, that stands apart from the material background, is tied to it being perceived as a thing. Object Oriented Ontology (Harman, 2018) focuses on things and objects—as opposed to subjects—and their material-semantic existence. It considers things to be of equal importance and without hierarchy—whether material, speculative, or ephemeral, or whether a thing is a smaller part of a larger thing—and to have meaningful relational surfaces and inaccessible internalities which can be accessed only through creative and speculative practices. There are arguments for thing-centred, rather than human-centred being (Bogost, 2012); for the vital yet non-intentional agency of things, such as in Latour's Actor-Network Theory, in which assemblages of things form a network of agential actors (Latour, 2007); and Jane Bennett's conception of the alive-ness and vitality of non-human objects (Bennett, 2010). A particular sub-set of things is biological entities or bodies, both human and more-than. The following sections of this chapter deal in some detail with Judith Butlers' queer theory (Butler, 1990), in which she argues against an essentialism of bodies in relation to socio-cultural constructions of gender, but which leads to feminist strands of new-materialism which consider the body as a material entity, and in which the material differences between bodies play an important role in the entanglement of the material and the socio-cultural. (Sanzo, 2018) Finally, there is a strong strand of New Materialism that draws on ecology, considering biological non-human agency and the entanglements and ethical commitments of the ecological world and biological systems; this stance is particularly associated with Donna Haraway, and will be explored in some detail in the following pages (Haraway, 1981).

Ethico-political

The ethico-political strand of New Materialism concerns more the bioethical and biopolitical relevance of the material world: the politics of non-human social justice, the political and ethical dimensions of matter, and the political impact of the non-human, which has been explored by Stengers and Latour as a cosmopolitics, a politics for all things (Latour, 2004; Stengers, 2010).

Critical

Finally, the critical strand of New Materialism considers a materialist perspective on Marxist critiques of capital, such as reframing colonialism and capitalism as extractivism (Haraway, 2016), an economic system based on exploitation and extraction of material resources, and understanding such as forming a material rift through disjunctions in the flows of matter and their environmental and socio-cultural impacts, particularly from the perspective of labour (Wark, 2015).

These disparate perspectives, united by a critical attendance to materiality and a commitment to non-human agency, have been drawn on in this project in a number of ways, and many such perspectives are expanded on both in the theoretical and empirical accounts that follow.

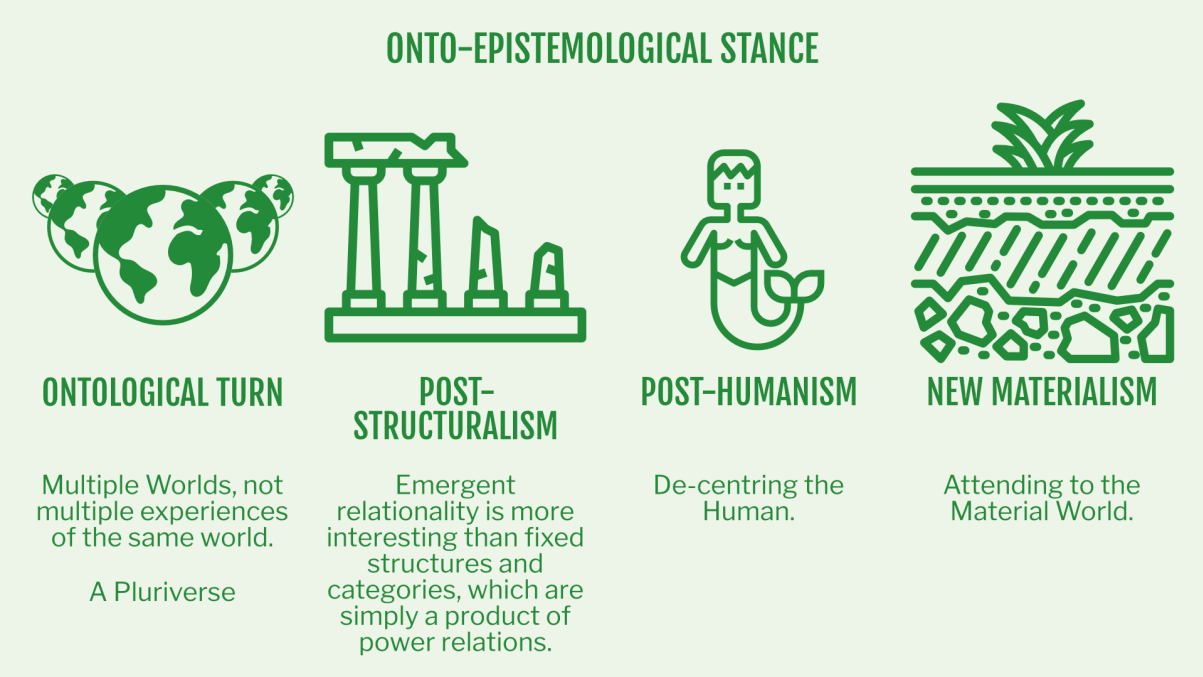


Figure 12 : Onto-Epistemological Stance

This infographic summarises the onto-epistemological stance and philosophical foundations for this research inquiry: the Ontological Turn, Post-Structuralism, Post-Humanism and New Materialism.

Credit : Diagram by Craig Jeffcott. Icons from Noun Project (thenounproject.com) under CCBY 3.0 attribution licence (Earth by IconPai; Ruins & Merman by Smallike; Soil by Mia Elysia).

2.2 Conceptual Lenses

This section introduces the research lenses used to frame the project; queer and more-than-human, which overlap in Queer Ecology (both lenses aligned with thinking that follows the Ontological Turn, and post-structuralist, new materialist stances) (See Figure 13).

Research lenses derive from the principle that all forms of inquiry do not emerge from a "zero" position, an omniscient worldview, but are situated within the world and have a particular posture towards it. The context in which inquiry is conducted is important, and the way in which the inquirer looks towards or otherwise encounters the world informs what is seen, and how it is interpreted. In optics, a lens can be intercalated between an observer and the thing that is observed, and through the principle of refraction, alters the light that is transmitted from one to another: depending on the lens used, some things come into greater focus, others become more blurred, colours can be filtered, images become distorted, shattered, or multiplied. In the same way, Barad has argued that a research lens can be intercalated between a researcher and that which is researched, providing through refraction (Barad, 2007) a different perspective on the contexts in which the research is situated, drawing attention more to some factors and less to others, giving shape to the way that the research unfolds.

These lenses have been chosen as they overlap with the concerns of biodiversity, in that a less human-centric viewpoint is needed to better care for the ecosystem, and that less normative, categorical cultural and sociological viewpoints might be needed for a more impactful and diverse practice of speculative design that may have something to say in that area. The lenses of queer and more-than-human share a commitment to stepping beyond arbitrary categories and boundaries, beyond the established ways of thinking and doing, and for working towards better futures; in Queer Ecology, they overlap and provide the core framing of this research project.

It is important here to emphasise that as these theoretical and philosophical positions are engaged with as design lenses, the intention is not to give an exhaustive and in-depth account of either queer or more-than-human principles, which is beyond the scope of this thesis. Instead, it is intended to present these concepts inasmuch as they have been articulated and understood as a framing for design research.

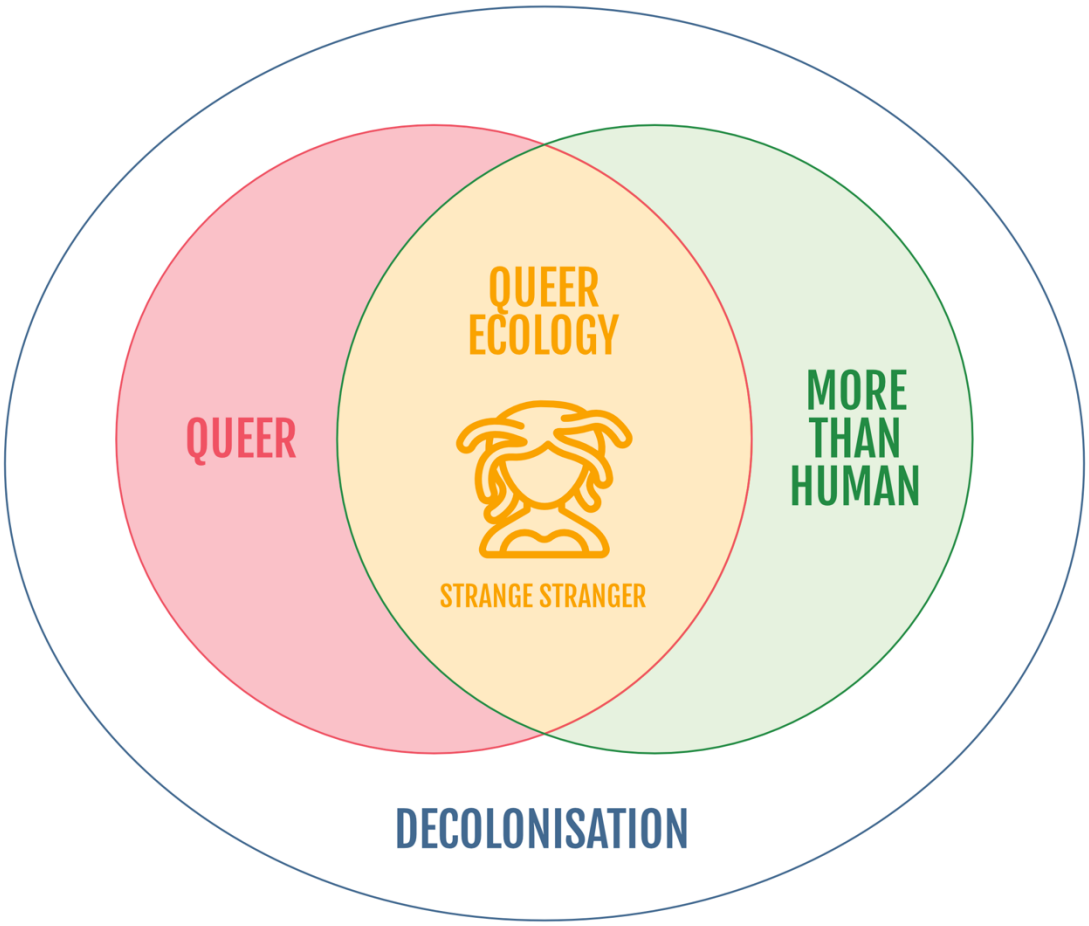


Figure 13 : Research Lenses

This research project is framed using an overall lens of decolonisation, within which a specific focus is taken through queer ("resistance to regimes of the normal" (Warner, 1993, p. xxvi)) and more-than-human lenses (where meets naturecultures meet technosciences (Bellacasa, 2017, p. 1)). These overlap as a Queer Ecology lens, which draws on the archetypal figure of the Strange Stranger, represented by the Conceptual Character of the Gorgon, Medusa.

Credit : Diagram by Craig Jeffcott. Icons from Noun Project (thenounproject.com) under CCBY 3.0 attribution licence (Medusa by Lima Studio).

2.2.1 Queer

Queer and queerness are somewhat contested terms and concepts, so this section starts by clarifying how they are used and defined in this thesis. Barker and Sheele explain that queer theory and the word queer itself "is a much-contested term, always in flux, that is used in different ways," but that some features that unify it are "resisting the categorisation of people, challenging the idea of essential identities [and] questioning binaries like gay/straight, male/female," (Barker & Scheele, 2016, p. 31)— so a queer lens is de-categorical, nonessentialist, and non-binary. More generally, Michael Warner defined queerness as "a resistance to regimes of the normal," (Warner, 1993, p. xxvi), a wider definition which I assume here.

Etymology of Queer

The word queer has disputed origins, but was first recorded in sixteenth century Scots (a Germanic language spoken in Scotland, and a close cousin to English), and may be derived from the German *quer*, meaning diagonal, and the Proto-Indo-European *terk*, meaning to twist or turn ('Queer', 2025); its subsequent meanings relate to this sense of turning, twisting or being at an oblique from the centre. The original meaning of queer is strange, illegitimate, odd, or weird; something that is at an oblique to the norm. From this, it was adopted in the nineteenth century to become a homophobic slur: "a derogatory term for same-sex sex, or people with same sex attractions," (Barker & Scheele, 2016, p. 9). Clearly, the change in meaning indicated that queer people are both descriptively outside of the norm, and were considered odd, weird and unwelcome to normative perspectives. Eventually, during the late 20th Century civil rights movements, the word was reclaimed as a positive or neutral self-descriptive word by queer people. (Barker & Scheele, 2016)

Queer Theory and Performativity

Queer theory, as a theoretical approach to queerness, sits across the original and the reclaimed senses of the word, attending to the ways in which non-mainstream sexualities and gender identities are situated as being outside normative structures and systems, and thus stands as a critique of such systems and structures; queer theory tends to use queer as a verb, not a noun: it is something that you do, not what you are. This resistance to structures and systems, particularly categories and binaries of sex and gender, position queer theory within post-structuralist discourses; these reject universal truths in favour of knowledge which is situated within power dynamics, and which discursively create structures, hierarchies and binaries. In this framing Michael Foucault argued that identities such as sexuality are not fixed and stable, but fluid; their apparent stability and fixedness is a social construct, maintained by dominant discourses; To queer is thus to step outside of these constructed systems.

Queer theory is particularly associated with Judith Butler, who argued against the concept of 'woman' as a coherent group and a fixed category. Responding to Simone de Beauvoir's assertion that "one is not born, but rather becomes, woman," (Beauvoir, 1949, p. 283), Butler argued that "it follows that woman itself is a term in process, a becoming, a constructing that cannot rightfully be said to originate or to end. As an ongoing discursive practice, it is open to intervention and resignification." In this framing, woman, or gender is a process, something that one does, not that one is; it is performative. From this, it extends that:

> *"If gender attributes and acts, the various ways in which a body shows or produces its cultural signification, are performative, then there is no preexisting identity by which an act or attribute might be measured; there would be no true or false, real or distorted acts of gender, and the postulation of a true gender identity would be revealed as a regulatory fiction."*
>
> *(Butler, 2015, p. 192)*

Dominant discourses connect biological sex to gender and gender to sexuality as fixed, binary categories, not constructed ones; however, in a post-structuralist, Foucauldian sense, it is the very discourses themselves that cause them to be constructed. Power relations produce and are produced by these discourses, the discourses define categories (of gender, sexuality, race, class, species etc), the categories constrain performative acts, and in their repeated performance, they become perceived to be real and fixed (Foucault, 1976). While being socially constructed and not essentialist, categories of gender and sexuality are no less real and no less integral to identity, and they are difficult to step beyond. In fact, Cordelia Fine, a neuroscientist, found that gender roles are not inherent in brain structures but are inscribed into brains through neuroplasticity and the regular repetition of gender performance (Fine, 2010).

Butler and queer theory then argue that if there is no original gender or sexuality, and that these are in fact performative, it is possible to "trouble" gender. As these are powerful social constructions, categories and binaries that structure how cultures make sense of the world, it is hard to leave their shadow, but one can subvert or use parody to trouble them: "we have to repeat gender performance on an everyday basis [but] we can do something different in how we repeat," (Barker & Scheele, 2016, p. 81). An example of gender trouble is the art of drag, where people of one gender subversively perform exaggerated representations of another, which "subverts the distinction between inner and outer psychic space and effectively mocks both the expressive model of gender and the notion of a true gender identity," (Butler, 1990, p. 137).

Gender trouble creates cognitive and affective estrangements from normative expectations, and revealing the underlying discourses and power relations that underpin sex, sexuality and gender:

> *"That gender reality is created through sustained social performances means that the very notions of an essential sex and a true or abiding masculinity or femininity are also constituted as part of the strategy that conceals gender's performative character and the performative possibilities for proliferating gender configurations outside the restricting frames of masculinist domination and compulsory heterosexuality."*
>
> *(Butler, 2015, p. 193)*

Transitions

An important aspect of queerness that this project draws on is the way that identities are not fixed, essential, innate qualities, rather that they are fluid, something that one does, becomes, or performs. Typically, this is structured around gender, and trans(gender) identities tend to be those that transcend typical gender assumptions, such as those that locate socially constructed gender as an innate component of biological sex, or assume certain traits of behaviour or presentation as part of certain gender roles (Barker & Scheele, 2016). Often, there is a rejection of binary identities and categories (male or female, gay or straight); those who identify as gender non-binary or gender fluid may find that they identify with aspects of both male and female gender, or don't feel either category suits them. Dinis Machado, who I talked to for this project, describes a non-binary identity as a feeling of in-betweenness; the queer perspective of experiencing the body and its emotional landscapes in different ways, "almost like different bodies, with very different textures and with very different mechanisms," (Machado, personal communication, 2020): digital bodies, sexual bodies, working bodies, our bodies in public. They're interested in how to navigate these different bodies, "to activate some and to deactivate others and to alternate in-between" (2020). [17] This sense of transiting through different bodies and in-between states is present in the queer concept of *passing,* where someone is "perceived and treated in accordance with their gender identity" (Anderson et al., 2025, p. 45) when that doesn't necessarily conform to their biological sex (such as a transgender woman "passing" as a cisgender woman), or, in the case of drag culture, being read as a particular category of sex or gender or sexuality through intentional performance. Passing has been explored as a way to "manage social identity and navigate stigma through concealment or assimilation", both as "a personal goal and a means of navigating safety and social acceptance," (2025, p. 45).

To use queerness as a lens is to approach the world as a navigation of in-between states; it's to consider the world as a place of transitions, to reject binaries and categories, to understand how much of what we think to be real and fixed and stable is unstable, something that is done and is performed. Often, the way things seem fixed and immutable is through the language we use to describe them, so queerness often plays with language, plays word-games and revels in puns (Barker & Scheele, 2016). So trans is about transitions, translations and transience, and non-

[17] The full conversation with Dinis Machado is presented in *Appendix 1 : Conversations*

binary is multitudinous. It has become common for English speakers who identify as gender non-binary to use the pronoun *they* in the third person, but *they* is typically a (gender neutral) plural third person. It has historical use as a singular, such as in asking someone "what do they want?" of an unidentified and unseen third person, but it causes mild confusion in discourse; it evokes a sense that an individual is a multitude, not a unity. Perhaps not intentionally in all cases, but this multitudinous *they* can imply a multitudinous *I*, the "different bodies with different textures" (2020) that Machado refers to.

The fixed-ness of identity has a linguistic wrinkle in Portuguese, too. I learned that the English verb "to be" has at least two translations in Portuguese, *ser* and *estar* (there is another word, *haver*, but that complicates matters, its meaning hovering between having and existing). Ser means what you are, in essence: such as a man, a Scot, or a designer. Estar means what your current state is: such as hungry, tired, or awake. Ser is essentialist and categorical. Estar is fluid, transient. Separating the concept of being into these two notions was confusing to me as a language learner, and in fact, a Portuguese person told me grasping that English only uses the one concept for two such different things was also difficult for them. But in my in-between state, as a British citizen speaking and thinking in one language, English, and learning another, Portuguese, it seemed to open up the possibility of play. Playing with the Portuguese language, maybe everything is *estando* (presently being), and nothing is *sendo* (essentially being); what would it mean to say "*Estou um homem*" (I am currently a man) instead of "*Sou um homem*?" (I am essentially a man). Some might say it is meaningless, because that isn't how it is said, but that, perhaps, proves the point. As Alexis Lothian argues, "there is a powerful speculative element in the move from deconstructing existing binaries to visualising—one might even say fictionalising—how the world might be changed by those binaries' subversion or destruction," (Lothian, 2018, p. 6). The queer gesture is inherently a speculative one.

Outsider Identities

There is a strong sense in which queer encapsulates an outsider identity, existing outside of the mainstream or the norms of a culture or society. In this wide sense, queer can apply itself more generally to outsider identities beyond the strongholds of majority perspectives or the people and institutions where power is concentrated; intersectionality, where gender and sexuality overlap with other outsider identities related to race, class disability, and, as will become apparent, species, is an important part of the queer viewpoint. queer intersectionality resonates with the philosophy of decolonisation, which seeks to dismantle the power structures that underpinned colonialisation and the cultural heritage of that project; typically, there is a global imbalance towards power being held in the global North and by a white, heterosexual, cisgendered, male, wealthy, able-bodied, human, vertebrate minority (Schultz et al., 2018).

Queer Speculations

Queerness can encapsulate speculative practices, as seen in the queer futurity of José Esteban Muñoz, an academic and writer in cultural and queer studies, performance and visual culture. The core of his queer futurity thesis lies in the assertion that queer beings, in lying outside of the hegemonic cultural mainstream, are excluded from the present, and that to be queer is to imagine a better, different future: "queerness exists for us as an ideality that can be distilled from the past and used to imagine a future… queerness is a structuring and educated mode of desiring that … is the thing that lets us feel this world is not enough." He argues for a speculative gesture, to "dream and enact new and better pleasures, other ways of being in the world, and ultimately new worlds," (Muñoz, 2009, p. 1).

The key word here is enact, as futures are also performative and transitional, something is performed and made real in the present, aligning with the outlook of speculative research, which aims to engage with "futures that the present could never anticipate, and these already inhere in it as (im)possibilities to be actualised," (Savransky et al., 2017).

Lothian refers to the book *In a Queer Time and Place* by Jack Halberstam, who:

> *"writes that queerness should be considered less as a question of gender's interference with desire and more the site of 'strange temporalities, imaginative life schedules, and eccentric economic practices' that open up 'queer relationships to time and space.' From this branch of queer politics has emerged a definition of queerness as a site where the lines between past and future created by heteronormative structures of social and biological reproduction can be diverted or broken off."*
>
> *(Lothian, 2018, p. 6).*

2.2.2 More-than-Human

The more-than-human lens is described by Maria Puig de la Bellacasa in *Matters of Care* as her chosen way of "naming post humanist constituencies because it speaks in one breath of non-humans and other than humans such as things, objects, other animals, living beings, organisms, physical forces, spiritual entities, and humans." She explains the importance of considering such an encompassing category because "in times binding techno sciences with nature cultures, the livelihoods and fates of so many kinds of entities in this planet are unavoidably entangled," (Bellacasa, 2017). A more-than-human perspective "insists that human social worlds are always 'more-than-human' social worlds, in the sense that they are composed of relations between humans, non-human life, and lively materials." (Poikolainen Rosén et al., 2024)

I achieved a certain clarity of language throughout this project. I had been initially referring to the framing lenses in terms of either a queer (or diverse), and an ecological lens, but those did not feel to be well enough defined.

Through some interactions with other researchers and through my reading, particularly the introduction by Bellacasa, I have settled on the lens and terminology of "more-than-human" as a completer and more similar partner to "queer"; if a queer lens is about "resisting the regimes of the normal" within human cultural and sociological reals, then more-than-human expands that to all beings. Both share the features of being non-essentialist, rejecting arbitrary boundaries and categorisations between beings, and a commitment to better futures.

Donna Haraway, the feminist science studies scholar has written extensively about these m ore-than-human entanglements, invoking narratives of cyborgs ("we are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs" (Haraway, 1981)); of companion species that are "relentlessly becoming with," a category that allows one to "refuse human exceptionalism without invoking post humanism," (Haraway, 2016, p. 13); and of the "tentacular beings", the feeling and reaching and grasping entities that entangle within the earth and with each other: "spiders, fingered beings like humans and raccoons, squid, jellyfish… fibrous entities… microbial and fungal tangles… swelling roots…. nets and networks, IT Critters…tentacularity is about life lived along lines… not at points, not in spheres," (Haraway, 2016, p. 32).

This entanglement of the human and the more-than, of human and the ecological, is a key theme in theory that is drawn on here. Felix Guattari, a philosopher and cultural theorist explored the idea in his essay "The Three Ecologies", where he argued that the "natural" world of the environment, human society, and the subjective human experience are simply one system: "now more than ever, nature cannot be separated from culture; in order to comprehend the interactions between ecosystems, the mechanosphere and the social and individual universes of reference, we must learn to think 'transversally'," (Guattari, 1989, p. 28).

This inseparability of nature from culture thus casts the category of nature itself into doubt. Mackenzie Wark has suggested that nature is an "elusive category, prone to slippage between the material and divine, between substance and essence…nature is for the moment then a category without content," (2015, p. 4).

Anthropocene

A more-than-human lens troubles a dominant narrative of the temporality of the present moment, that of the *Anthropocene*. A term coined (though perhaps not originally) by a Nobel-prize winning climate chemist, Paul Crutzen, at a conference in 2000, it is a proposed new geological epoch of an "age of humans", where human activity is the major influence on the

biosphere, atmosphere, and geology of the planet (from Greek roots, anthropo: from *anthropos*, meaning human; and -cene from *kainos*, meaning recent. It is modelled on the naming of other geological epochs, such as the Holocene, Pleistocene) (Ellis, 2018).

Anthropocene is an unsettled term; it hasn't been officially adopted as the current geological epoch (still considered to be the Holocene), and there is no consensus on when it may have started, possibly ranging across the tens of thousands of years from the discovery of fire, to the rise of agriculture, to the industrial revolution, to the creation of the atomic bomb (Ellis, 2018). However, it remains a consistent presence in current environmental discourse, and is a usefully troubling rhetorical device, raising some challenging questions: What effect do humans have on the environment? Who exactly are the humans that *anthropos* refers to? If it is true, do humans have a responsibility to respond to it?

It is undeniable that much of the planet has been transformed by human activity over the centuries: significant changes in the chemical composition of the atmosphere and the seas, disruptions to climate systems, and profound impacts on the biosphere and biodiversity that can all be largely attributed to the actions of our species. But, as Naomi Klein, Donna Haraway and Earl C Ellis (amongst others) have argued, this responsibility cannot be laid equally at the feet of all people (Haraway, 2016): "there is no one human way of transforming earth. Different people use and transform environments differently, producing different consequences, and different people experience these consequences differently," (Ellis, 2018). In many cases, poor and indigenous communities suffer as much as other more-than-human beings due to the changes that have been wrought to the planet. Anthropocene becomes a useful term to deflect blame from people, systems and paradigms that are directly responsible for the most damaging effects on the ecosystem onto all of humanity and "in this way, the systems that certain humans created, and other humans powerfully resisted, are completely let off the hook. Capitalism, colonialism, patriarchy—those sorts of systems," (Klein, as cited in: Ellis, 2018, p. 136). In response to this, it has been argued that a more accurate term would be the Capitalocene (the era where capitalism is profoundly impacting planetary systems): "if we only have one word for these times, surely it must be the Capitalocene… one must surely tell of the networks of sugar, precious metals, plantations, indigenous genocides, and slavery, with their labour innovations and relocation and recomposition of critters and things sweeping up both human and non-human workers of all kinds," (Haraway, 2016, p. 48).

More troubling through a more-than-human lens though is how the Anthropocene, even as it casts human activity as problematic and seems to demand a meaningful response, continues to centre the human as the protagonist of the planetary story. As a tool for thinking with, Haraway problematises the Anthropocene: it positions its protagonist as a "bad actor, and it is hard to tell a good story with a bad actor"; it is rooted in human exceptionalism, where history is created by humans and their technology, and where even the term history is a human temporal construct

not suited for more-than-human times; it presupposes a response to planetary crisis framed by the very systems that caused it—she is "against the market-and-profit besotted, modernising, and human-exceptionalist business-as-usual commitments of so much Anthropocene discourse," (Haraway, 2016).

Cthulucene

A more-than-human world of chthonic, tentacular beings calls for a different sort of era, a different type of fable: "we need… something else to erupt out of the Anthropocene into another, big-enough story," (Haraway, 2016, p. 52). In honour of those chthonic more-than-human ones, Haraway proposes—speculates, fabulates about—the Cthulucene[18] era, which is:

> *"made up of ongoing multi species stories and practices of becoming-with in times that remain at stake, in precarious times, in which the world is not finished and the sky has not fallen-yet… human beings are not the only important actors in the Chthulucene, with all other beings able simply to react. The order is reunited: human beings are with and of the earth, and the biotic and abiotic powers of this earth are the main story."*
>
> *(Haraway, 2016, p. 55).*

The Cthulucene is, in contrast to the Anthropocene, an era defined by the more-than-human, that takes humanity off its precarious pedestal and makes it one of the many participants entangled in becoming and making the earth.

However, that is not to say humanity is abrogated of responsibility for its past and ongoing actions. The things we do, and the outsized consequences that they have, matter. Bruno Latour believed that in the story of Mary Shelley's *Frankenstein* (1818) where a scientist creates a creature from dead body parts and unleashes tragic and bloody consequences, the monstrous act committed was not the visceral, violent acts of the creature, nor even the hubristic act of creation by Victor Frankenstein, "but rather that he abandoned the creature to itself," (Ellis, 2018). Pinch and Collins have referred to science and technology as a type of *golem*, a clay homunculus from Jewish mythology that is animated by magic and can be compelled to carry out menial tasks. Rather like the multiplying brooms from The Sorcerer's Apprentice (Goethe, 1797) which, animated by a spell ineptly cast by said apprentice, collect so much water they flood the Sorcerer's home, golems in these tales often misinterpret instructions, or follow them too literally, resulting in chaos. Like a *golem*, science and technology are mindless, ethically

[18] The name Cthulucene may bring to mind the fictional entity Cthulhu, but "these real and possible timespaces are not named after SF writer H. P. Lovecraft's misogynist racial nightmare monster Cthulhu (note spelling difference), but rather after the diverse earthwide tentacular powers and forces and collected things with names like Naga, Gaia, Tangaroa (burst from water-full Papa), Terra, Haniyasu-hime, Spider Woman, Pachamama, Oya, Gorgo, Raven, A'akuluujjusi, and many many more." (Haraway, 2016, p. 100).

neutral entities, but they can be turned into good or evil by human action and indifference (Collins & Pinch, 1994). In this vein, Shelley's tale of an abandoned monster is a parable about the hubris of humanity in attempting to harness chthonic forces and then throwing up their hands in horror at what they have done. Therefore, it is clear that:

> *"the doings of situated, actual human beings matter. It matters with which ways of living and dying we cast our lot rather than others. It matters not just to human beings, but also to those many critters across taxa which and whom we have subjected to exterminations, extinctions, genocides, and prospect for futurelessness"*
>
> *(Haraway, 2016, p. 55).*

We must take responsibility for our actions, rather than assume a paternalistic responsibility over the planet and the other organisms there. This becomes a question of politics; of how we, the more-than-human, collectively find ways to live and die well together on and in the Earth.

Cosmopolitics

Isabelle Stengers and Bruno Latour proposed that what is called for is a *Cosmopolitics* (from the Greek word *cosmos*, for world); a politics that is in the interests of all beings, human and more-than. As discussed by Mario Blaser, Stengers was motivated by concern that "the so-called modern sciences appeared to be a way of answering the political question par excellence: who can talk of what, be the spokesperson of what, represent what?" (Stengers, as cited in: Blaser, 2016, p. 546). She understood that there are different beings and therefore different worlds, different cosmos, where what might be needed or important was different, and there is the danger that in adopting a particular viewpoint, one could imagine that such a construction of the world is universal. She asked what a political ontology which allowed for representation of these different constituencies of being might look like (Stengers, 2010).

The danger of thinking from an anthropocentric perspective, even in the acknowledgement of the needs of other beings, is to believe in "an already unified cosmos, a single world (the common "thing"), when we actually inhabit a *pluriverse.* Such a *pluriverse* requires a cosmopolitics," (Blaser, 2016, p. 546) where "cosmos refers to the unknown constituted by these multiple, divergent worlds, and to the articulations of which they could eventually be capable" (Stengers, as cited in: Blaser, 2016, p. 547). Or, as Latour put it, "there is no common world, and yet it has to be composed, nonetheless," (Blaser, 2016, p. 547).

Cosmopolitics is a politics in which all worlds, not just beings, may find representation. Haraway argues that the world as it is cannot be put aside in favour of an idealised world, and that decisions must take place somehow in the presence of those who will bear their consequences (Haraway, 2016, p. 2). The political challenge this poses, then, is how might

representation be achieved, for more-than-human beings and worlds, coming from very different perspective and different levels of ability to act. Latour articulated a way forward with Actor-Network Theory (ANT), which proposes that all beings exist as Actors in a material-semantic (as in, of matter and of meaning) network of interrelations. Within the network, all Actors have agency to act, but this, importantly, is not human agency, it is agency of the sort that is inherent to each actor and is afforded by the network in which it exists. In this way, he radically proposed agency to act is a property of all beings, human or more than, which could include inanimate objects, landscapes, and technology (Latour, 2007).

The human protagonists of the Cthulucene, Stengers has argued (Blaser, 2016), occupy a unique position of being able to be aware, such as through science, of challenges and problems faced by other beings who are not themselves able to articulate those problems. Being able to have that understanding of what is at stake puts those with that knowledge in a position of responsibility; it is as Stengers put it, the responsibility of having a voice and giving that voice to the voiceless, the beings who do not have the agency to speak for themselves. Crucially, though, this must not be a case of speaking for other beings (an action that belongs to the Anthropocene) but of lending one's voice to speak on their behalf (Blaser, 2016).

In this way, cosmopolitics is an answer to the human exceptionalism that lies at the heart of Anthropocene thinking—even as it recoils in horror at what we (*anthropos*) have done and considers how we might fix it—and reframing it as an ongoing political challenge of getting-on together in more-than-human worlds.

The Pluriverse

> *" 'He only talked of one Other World. But suppose there were dozens?'*
> *'You mean, this wood might be only one of them?'*
> *'No, I don't believe this wood is a world at all. I think it's just a sort of in-between place [...] a place that isn't in any of the worlds, but once you've found that place you can get into them all [...] I think we can get out of this place into jolly well Anywhere! We don't need to jump back into the same pool we came up by. Not just yet.'*
> *'The Wood between the Worlds,' said Polly dreamily. 'It sounds rather nice.'"*
> *(Lewis, 1955, p. 39)*

The concept of the pluriverse—the world of many worlds—lies as the heart of more-than-human, cosmopolitical thinking, and it's also a key concept at the heart of this design research project, so I will expand on it here.

Mario Blaser and Marisol de la Cadena have defined the pluriverse as "heterogeneous worldings coming together as a political ecology of practices, negotiating their difficult being together in heterogeneity," (Cadena & Blaser, 2018, p. 4). To unpack this a little, this is the cosmopolitical,

ontological turn position that was discussed above: of multiple worlds of wildly different nature, practically finding ways to co-exist together.

Blaser and Cadena proposed "the pluriverse as an analytic tool useful for producing ethnographic compositions capable of conceiving ecologies of practices across heterogeneous(ly) entangled worlds," (Cadena & Blaser, 2018, p. 4). To think pluriversally is "to be attentive to practices that make worlds even if they do not satisfy our demand (…) to prove their reality," (Cadena & Blaser, 2018, p. 4). Therefore, "the pluriverse is not a matter of fact or concern but rather an opening toward a possibility that needs care : a 'matter of care' as conceptualized by Maria Puig de la Bellacasa," (Cadena & Blaser, 2018, p. 4).

Pluriverse, then, is a multiple worlds proposition, but one that emerges from a more-than-human, staying-with-the-trouble lived experience. These are not worlds in materially different universes, or imagined alternative realities, but those that are co-located, multiply entangled, perpetually coming into being together. James Bridle has considered more-than-human intelligences from the perspective of the *umwelt*, the German concept of the lived world which "connotes the particular perspective of a particular organism: it's internal model of the world, composed of its knowledge and perceptions," (2022, p. 24). The *umwelt* of an organism or entity is determined by many things: the presence, nature or lack of sensory apparatus, cognitive abilities, morphology, habitat, evolutionary development and social and cultural contexts. As with the ontological turn in anthropology, different organisms don't simply perceive the world differently; they exist within incommensurate *umwelts* that become entangled with one another, but which remain separate worlds within a pluriverse (Bridle, 2022).

In this project, marginal futures and possibly alternative worlds might be thought of as inhabiting the pluriversal tradition, of different subjective worlds that exist or could come into being, rather than as proposals for worlds and futures lying further along time's linear arrow.

Pluriversal Speculations

Pluriversal ideas of multiple different worlds are an increasingly common trope in SF stories, finding their expression in multiple works that deal with a fictionalised, sci-fi version of it: the Multiverse.

Multiverse narratives have appeared regularly in mainstream SF film and television franchises: *Star Trek* has two subsidiary universes to its Prime timeline, with a Mirror Universe where "good" characters have moustache-twirling Evil counterparts (Daniels, Roddenberry, et al., 1967), and a rebooted film universe with alternative versions of the original series' characters (Abrams, 2009); Marvel movies have introduced a *Multiverse* concept (largely for the non-diegetic purpose to paper over continuity problems in over twenty years of films and TV series produced by various different production companies) which has been a major plot point in texts

where characters meet alternative versions of themselves, such as *Spider Man : No Way Home* (Watts, 2021), *Spiderman : Into the Spider-Verse* (Persichetti et al., 2018), *Doctor Strange in the Multiverse of Madness* (Raimi, 2022), and *Loki* (Waldron, 2021). During the same time period as the release of the *Doctor Strange* film, an offbeat independent film which deals with a similar subject, *Everything Everywhere All at Once* (Kwan & Scheinert, 2022), was released. A low budget film with handmade special effects, The film stars Michelle Yeo as Eleanor, a bored owner of a dry-cleaning business, who discovers that alternative universe versions of her are multiversal heroes and that she is thus destined to be such a hero herself. It includes scenes set in bizarre alternative universes, that included one where Eleanor and her daughter are two rocks having a conversation, a world where people have hotdog sausages for fingers, and a world where a chef is controlled by a racoon who lives on his head called *Raccacoonie* (someone misremembered the plot of the Disney film *Ratatouille* (Bird & Pinkava, 2007), and thus a path to the world where that misremembered story was real was created); the film, riding a multiversal zeitgeist, was a commercial and critical success, winning numerous Academy Awards, including Best Picture and Best Actress for Michele Yeo.

Multiverses and parallel worlds have long been a common trope in literary SF. *The End of Eternity* by Isaac Asimov deals with an agency that polices the timeline to adjust events that they deem harmful to humanity, keeping humankind in a safe walled garden existence for millennia (Asimov, 1955); *Century Rain* by Alastair Reynolds is set in the far future on an alien created simulacra of an alternative reality 1950s Earth where France has a fascist government, and in which it is discovered that these unknown aliens have created various duplicate Earths throughout the galaxy frozen at specific moments in history (Reynolds, 2008a); Courtia Newland's *A River called Time* takes an Afrofuturist perspective on an alternative London where the Romans adopted the ancient Egyptian religion rather than Christianity, and slavery and colonialism didn't happen (Newland, 2021); and Steven Baxter and Terry Pratchett's *Long Earth* series postulated the discovery of a potato-powered "Stepper" device that would allow people to "step" into adjacent, human free universes, and across five books explore how humanity responds to this new found expansive freedom (Pratchett & Baxter, 2012).

Faced with a seemingly impenetrable Impasse of the Present, with the promise of futures that are either more of the same, worse, or non-existent, it is understandable that these multiversal stories are commonplace and popular in this disconcerting era. They speak to the urgent need for new stories of different worlds, of new futures that we might be able live in. SF offers imaginative tools in which pluriversal cosmopolitics might be explored, played with, and argued for.

More-than-Human Design

This is a movement in theoretical and speculative approaches to design and design research to consider and work with a more-than-human stance. It is based on the recognition that design has a contributory role in making the world and thus is complicit in the ongoing polycrises that characterise the contemporary Anthropocene era, largely because it tends to operate within a human-centred perspective. More-than-Human Design is an approach that goes beyond its human-centredness, and "entails designing for the interdependent relationships between humans, technologies and other organisms (such as animals, plants, and microbes)." By doing so, design spaces are seen as "holistic and relational,", encouraging designers to "expand who or what counts as a user or stakeholder, who is included in design processes, and what is considered as design or designable," (Poikolainen Rosén et al., 2024, p. xix).

Such a practice is grounded in post-humanist and post-structuralist worldviews, considering the distributedness of agency within complex more-than-human assemblages, and expanding the concept of stakeholders to considering all environmental entities as implicated actors in design. It also requires a somewhat paradoxical stance that Poikolainen Rósen *et al* have referred to as *Critical Anthropomorphism*, "where we recognise that we can only understand the world from our human position, yet this human position implies that we can imagine things otherwise, that we can, for example, recognise shared sameness with other entities in the world or imagine what it is like to be another being—even if we can never fully know," (2024, p. xx).

It is a stance that draws on cosmopolitics, with the ability for humans to lend their voice to allow other entities to speak, as well as the speculative principle and philosophical school of *Object Oriented Ontology*, where it is the capacity for creative and imaginative thought that allows us to speculate about the subjective reality of other entities (Harman, 2018). In this way, designers can "work actively to include the perspectives and presence of other species, organisms and entities," (2024, p. xx).

More-than-Human Design is a perspective that aims to radically augment and reimagine how design is practiced, what methods, techniques and tactics it uses, and how it uses and makes theory, in order to attend to and include the perspectives of these more-than-human beings. To give some concrete examples of ways in which More-than-Human Design explores new systems and structures for designers, I discuss here a Design Colloquium, which I participated in, titled *More-than-Human frameworks, figures and personas in Design* (Díaz Bejarano et al., 2025).

I discussed the use of the Strange Stranger as a more-than-human conceptual figure (which will be discussed in detail later in this chapter); Nicolas Diaz Bejarano discussed the framing system of feral patches, applying the principle of ferality (where domesticated plants, animals and environments return to a wild state) to explore the territorial effects of human infrastructure on more-than-human beings, and the relationships between the constructed non-living and organic,

living entities; David Ruano Sanchez explored the use of "Ethological Tools for Multispecies Design", which draws on Ethology, the study of animal behaviour, to create principles and guidelines for bio-infrastructures that consider human and more-than-human entities, and focusing on the nature of species-species interactions; and Eva Monestier proposed a Post-anthropocentric Creative Mindset that attends to developing a care mindset towards other beings through narratives, through a Thinking-Feeling-Doing Continuum. (Díaz Bejarano et al., 2025). These examples provide a small snapshot of the myriad ways in which a more-than-human perspective can shape approaches to design research and speculative design practice.

2.2.3 Queer Ecology

> *"Ecology stems from biology, which has nonessentialist aspects. Queer theory is a nonessentialist view of gender and sexuality. It seems the two domains intersect, but how?" (Morton, 2010, p. 275)*

Queer Ecology is an emerging philosophical concept that considers a More-than-Human world through a theoretical and experiential Queer lens, particularly in its rejection of essentialist categories and binary distinctions between beings, and "a form of cultural, political, and social analysis [...] focused on interrogating the relations between the social organisation of sexuality and ecology," (Sandilands, 2002, p. 133). Here, it is considered in terms of an onto-epistemological stance aligned to Post-Structuralism and New Materialism, and as queer community engagements with the ecosystem and the environment.

As Onto-epistemology

Timothy Morton has argued that "we are losing touch with a fantasy Nature that never really existed, while we actively and passively destroy life-forms inhabiting and constituting the biosphere"; this fantasy Nature is something that is performed as "pristine, wild, immediate" and "pure," (Morton, 2010, p. 273). Morton argues that this is a false category, a human fabrication that imagines a boundary and holds the natural and human is a false separation. It is in these deboundaried and transitional ways that the more-than-Human and queer lenses align: "ecology stems from biology, which has nonessentialist aspects. Queer theory is a nonessentialist view of gender and sexuality," (Morton, 2010, p. 275).

Such a nonessentialist Queer Ecology should reject the category of Nature, and embrace the decategorical and the more-than-human in all its entangled complexity, asserting that "any attempt at Queer Ecology must imagine ways of doing justice to life-forms while respecting the lessons of evolutionary biology—that the boundary between life and nonlife is thick and full of paradoxical entities," (Morton, 2010, p. 276).

Morton queers the concept of the web of life as a Mesh of entangled and interrelated beings without clear categories and boundaries, and that embraces pluralities. In this Mesh, the categorical distinctions between species, kingdoms, life and non-life, human and non-human, artificial and evolved, are blurred, relational and contingent, while independent entities have a unicity or thing-ness that sets them apart from even their closest relatives. Here, all beings are *Strange Strangers*, equally strange and familiar; I explore the use of this framing as a conceptual figure later in this chapter. Morton emphasises the queer intimacies of the ecosystem, with multitudinous ways of relating and being between beings, and the intimacies of entanglement; the inability to survive or become disentangled from their sympoetic contexts: biologically, genetically and materially distinct beings are entangled in symbioses and *sympoeises*, forming hybrids, and continually remaking and becoming-with each other (Morton, 2010).

As Community Engagement

> *"Queer Ecology is not just about representing [Queer] issues in ecological politics and analysis but is also about drawing insights from Queer cultures to form alternative, even transformative, cultures of nature."*
>
> *(Sandilands, 2002, p. 135)*

A Queer Ecology stance can also be an experiential one, whereby queer communities find ways to engage with the wider ecosystem. Catriona Sandilands suggests that "the observation that environmental issues are inextricably tied to organising social relations be extended to sexuality [and] there may be fruitful collaborations between [queer] politics and environmental politics," (2002, p. 132). Such collaborations may be situated in a 'Queer Geographies' context, which considers "the importance of particular landscapes for the formation of particular queer cultures and experiences," (which suggests a wilder and open-air equivalent to Munoz's more urban queer spaces and heterotopias), or in ecofeminist critiques of the role of heterosexist power dynamics in environmental destruction (Sandilands, 2002). Such collaborations may move in different directions, with queer lenses offering new perspectives on ecological relations, while at the same time a queerly ecological framing may offer ways to rethink and disrupt gender politics, together opening up new community strategies for "challenging the relations of power emanating from heterosexism and ecological degradation," (Sandilands, 2002, p. 135).

2.2.4 Staying with the Trouble

Donna Haraway approaches rich, layered presents and the worlds that can be enfolded within them in a way that embraces the messiness of the real and all the beings living entangled lives within it, a process which she calls Staying with the Trouble: "I am not interested in reconciliation or restoration, but I am deeply committed to the more modest possibilities of

partial recuperation and getting on together. Call that staying with the trouble," (Haraway, 2016, p. 10).

> *"Staying with the trouble requires making oddkin; that is, we require each other in unexpected collaborations and combinations, in hot compost piles. We become-with each other or not at all. That kind of material semiotics is always situated, someplace and not no place, entangled and worldly."*
>
> *(Haraway, 2016, p. 4)*

Sympoeisis

Like Muñoz's queer futures, her Cthulucene heterotopias are multitudinous, entangled, queer-ecological sites of making and being together: she argues against the biological principle of autopoesis, making oneself, in favour of sympoesis, making together: "collectively-producing systems that do not have self-defined spatial or temporal boundaries".

> *"The earth of the ongoing Cthulucene is sympoeitic, not autopoetic. Mortal worlds do not make themselves, no matter how complex and multileveled the systems, no matter how much order out of disorder might be produced... autopoetic systems are not closed, but they are not quite good enough model for the mortal SF world. Poeisis is always sympoeitic, always partnered all the way down, with no starting and subsequently interacting units. The Cthulucene does not close in on itself, it doesn't not round off, its contact zones are ubiquitous and continuously spin out into loopy tendrils... [it is] wound with abyssal and dreadful grasping, frayings, weavings, passing relays again and again in the generative recursions that make up living and dying."*
>
> *(Haraway, 2016, p. 33)*

Such a collaborative approach to worldmaking is an important part of speculative practices: as Martin Savransky, Alex Wilkie and Marsha Rosengarten argue, "creating impossibles, making possibles perceptible and experimenting with them, is a collective, transdisciplinary task," (Savransky et al., 2017).

Hope in the Face of Heartbreak

> *"Grief is a path to understanding entangled shared living and dying; human beings must grieve with, because we are in and of this fabric of undoing... we are at stake in each other's company."*
>
> *(Haraway, 2016, p. 39)*

To approach the world queerly, or more-than-humanly, is to face heartbreak. It is difficult to exist outside of the normative currents of culture and history, either through the experience of being outside and different to the norm, or through active resistance from those currents. Choreographer Dinis Machado described this as the structural, embodied experience of queerness: "the experience of not having a name, of being a kind of nothingness, something that hegemonic society doesn't have a place for, " (Machado, Personal communication, 2021).

It is to face discrimination, prejudice, exclusion, violence, and murder, for relating differently to others, or for having a gender identity that doesn't conform to what is expected. It is to watch in dismay as the destruction of the environment and the devastation of the climate continues apace in the interests of economic growth, and to face violence to oppose it. It is to be cast aside, in the interests of other types of beings and bodies. It is natural to feel grief, in the face of such things.

Muñoz argued that we must have:

> *"hope in the face of Heartbreak. Hope's biggest obstacle is failure. Hope falters, we lose hope, but we need hope to think otherwise in the face of odds that are stacked against us. In part we must take on a kind of abstract hope [that] is not much more than merely wishing, and instead we need to participate in a more concrete hope, what Ernst Bloch would call an educated hope, a hope that is grounded and consequential, a mode of hoping that is cognisant of exactly what obstacles present themselves in the face of obstacles that so often feel insurmountable."*
>
> *(Muñoz, 2009)*

Muñoz situated this hope in "a desire for another way of being in both the world and time… that resists mandates to accept that which is not enough," (Muñoz, 2009, p. 96). He argues that "this desire is always directed at the thing that is not yet here, objects and moments that burn with anticipation and promise," (Muñoz, 2009, p. 26).

Haraway, likewise, while acknowledging the value of mourning loss in understanding what changes have happened and what changes are necessary to move forward ("this work is not opposed to practical action, rather it is the foundation of any sustainable and informed response," (Haraway, 2016, pp. 38–39)) she also cautions against both falling into despair and, conversely, indulging in an abstract hope that amounts to wishing: "there is a fine line between acknowledging the extent and seriousness of the troubles and succumbing to abstract futurism and its affects of sublime despair and its politics of sublime indifference," (Haraway, 2016, p. 4).

"In urgent times, many of us are tempted to address trouble in terms of making an imagined future safe, of stopping something from happening that looms in the future, of clearing away the present and the past in order to make futures for coming generations. Staying with the trouble does not require such a relationship to times called the future. In fact, staying with the trouble requires learning to be truly present, not as a vanishing pivot between awful or edenic pasts and apocalyptic of salvific futures, but as mortal critters entwined in myriad unfinished configurations of places, times, matters, meanings.... The task is to make kin in lines of inventive connection as a practice of learning to live and die well with each other in a thick present. Our task is to make trouble, to stir up potent responses to devastating events, as well as to settle trouble waters and rebuild quiet places."

(Haraway, 2016, pp. 38–39)

2.3 Conceptual Figures

2.3.1 More-Than-Human Conceptual Characters

Conceptual Characters or Personas are a component of Deleuze and Guattari's post-structuralist stance on philosophy, whereby philosophy is a practice of creating new concepts, brought forth from a situating Plane of Immanence (Deleuze & Guattari, 1994). They proposed conceptual characters as a helpful guide for the philosopher, allowing the concept to be adopted as a persona by the philosopher in order to frame the world differently. This allows them to become an agent of the concept's creation. Such personas may be framed as specific people—such as Plato's invocation of Socrates in his dialectics—or as archetypal characters, such as the Idiot: a misinformed individual who resists consensus, slows down the process, questions assumed and unspoken knowledge, and revels in the absurd (Guggenheim et al., 2017).

There is a clear parallel between a framing of philosophy as a creation of concepts, and design, which is a practice of the creation of artefacts which can be thought of as materialised concepts; therefore, the Conceptual Character has been utilised as a design tool to develop concepts, create artefacts, and as a research technique. The Conceptual Character has been explored in speculative design practice in the guises of The Idiot (Guggenheim et al., 2017), and, The Poet, The Diplomat, and The Parasite (Wilkie et al., 2015), amongst others.

It is notable that of these four Conceptual Characters, all apart from The Parasite are human personas. In the context of speculative More-than-Human Design, Conceptual Characters are being reframed as less anthropocentric Conceptual Figures in order to operate within a more "cosmopolitical milieu where we may engage with the more than human" (Tironi & Díaz Bejarano, 2024, p. 6). An example of this is in the work of Martin Tironi and Nicolás Díaz Bejarano, who have invoked the Conceptual Figure of the Hydro-Digital Cycle to speculate about an interspecies data centre that mediates between artificial intelligences, data infrastructures, and wetland environments: "the conceptual figure transcends its biological roots to become a speculative tool for understanding how different components of an ecosystem, technological infrastructure system could coexist and interact." (Tironi & Díaz Bejarano, 2024, p. 8). Through using this figure, they were able to speculate about data centres that might exist in a symbiosis between operational requirements and the wider environment, in which microalgae is integrated into data centre cooling systems. Research inquiry drawing on post-structuralist stances emphasises the importance of "following the contours of concepts" to guide inquiry, with different concepts providing "a different transformation, a different flight, a different attunement," (Mazzei, 2020, p. 199); in the same way, "every conceptual figure represents a distinct viewpoint that can be used as a source of inspiration," (Tironi & Díaz Bejarano, 2024, p. 5).

In this project, the conceptual entity of the Strange Stranger is framed as a Conceptual Figure, a more-than-human being that queers ecology by embracing difference, transcending categorical thinking, and invites you to see all beings on an equal footing, both equally stranger and equally familiar.

2.3.2 Strange Strangers

> *“”Queer Ecology may abandon the disastrous term animal and adopt something like Strange Stranger—my bad translation of Derrida’s arrivant. To us other life-forms are strangers whose strangeness is irreducible: arrivants, whose arrival cannot be predicted or accounted for. Instead of reducing everything to sameness, ecological interdependence multiplies differences everywhere. How things exist is both utterly unmysterious and unspeakably miraculous. Interdependence implies that there is less to things than meets the eye. Yet this lessness means we can never grasp beings as such. This doesn’t mean life-forms don’t exist: in fact, it’s the reason they exist at all. Queer Ecology will worry away at the human-nonhuman boundary, too. How can we ever distinguish properly between humans and nonhumans? […] Strange strangers are uncanny, familiar and strange simultaneously. Their familiarity is strange, their strangeness familiar. They cannot be thought as part of a series (such as species or genus) without violence. Yet their uniqueness is not such that they are independent. They are composites of other Strange Strangers. Every life-form is familiar, since we are related to it. We share its DNA, its cell structure, the subroutines in the software of its brain. Its unicity implies its capacity to participate in a collective.”*
>
> *(Morton, 2010, p. 277)*

This quoted passage from Morton is long, but I present it here in full as it is elegantly written, and it is helpful in grasping the decategorical complexity of the idea. Morton proposed the term *Strange Stranger* to refer to the paradoxical entities of which life abounds. According to this category that isn’t a category, all beings, whether human or more than, biological or technological, living or inert, simple or complex, can be considered *Strange Strangers*, weird yet unweird beings that are equally strange and equally familiar.

Morton derives the Strange Stranger as an adaption of a Conceptual Character proposed by Jaques Derrida, The *Arrivant*. Derrida framed The *Arrivant*—the one who arrives—as a post-structuralist figure of the uninvited guest, who appears unexpected, unannounced, and impossible to anticipate; it is an absolute Other, which cannot be comprehended. The arrival of the *Arrivant* leads to disruption, unexpected change, and the total transformation of the context into which it arrives. Derrida argued for offering an unconditional hospitality to the *Arrivant*: an unconditional openness to change and to encounter the weird and unexpected with equanimity and curiosity (Derrida, 1997).

The Strange Stranger, then, is a queerly ecological interpretation of the *Arrivant*, where all entities can be framed as absolute Others to be approached with an attitude of openness and curiosity, and a willingness to the possibility of transformation and contamination. It is in this regard that Morton considers all beings as equally strange and equally familiar: one must encounter other beings as uniquely themselves and essentially unknowable, but with an openness to familiarity and a willingness to comprehend them. *Strange Strangers* invite you to defamiliarise the familiar, and familiarise the unfamiliar, and thus approaching the entangled ecosystem without pre-existing assumptions, categories, binaries and hierarchies between beings (Morton, 2010)

Tentacular Beings

Strange Strangers are the inhabitants of Haraway's Cthulucene; they are what she calls the tentacular beings, the chthonic ones, the companion species:

> *"Beings of the earth, both ancient and up-to-the minute. I imagine chthonic ones as replete with tentacles, feelers, digits, cords, whiptails, spider legs, and very unruly hair. Chthonic ones romp in multi critter humus but have no truth with sky-gazing Homo. Chthonic ones are monsters in the best sense; they demonstrate and perform the material meaningfulness of earth processes and critters. They also demonstrate and perform consequences. Chthonic ones are not safe, they have no truck with ideologues; they belong to no one; they writhe and luxuriate in manifold forms and manifold names in all the airs, waters and places of earth. They make and unmake; they are made and unmade. They are who are."*
>
> *(Haraway, 2016)*

This chthonic, tentacularity might be epitomised by the example of the *Strange Strangers* known as fungi. As Merlin Sheldrake writes in *Entangled Life* (2020), fungi weirds the world, and the categories we try to impose upon it. Fungi are tentacular, spreading networks of mycelium throughout the earth, entangle with other beings, and periodically erupting into exuberant materiality as mushrooms and moulds. Mycelium grows multidimensionally, sending out exploratory hyphae, feeling its way by its figurative fingertips, exhibiting something akin to responsive intelligence. Fungi are cellularly weird, more animal than plant, and readily form relationships with other beings: any fungi and any algae may form a lichen, relentlessly becoming-with. Much of the richness of life on earth may depend on fungi in some way: soil only exists because lichen broke down rock and releases its minerals, plants only have roots because mycelia showed them how, and yet now rely on vast fungal networks that extend beyond their roots and allow them to communicate and share resources (Sheldrake, 2020).

Sheldrake talks of the *Extended Phenotype* of fungi—Phenotype is the combined observable traits of an organism that emerge from genetics and environment; Richard Dawkins coined the term

Extended Phenotype to refer to characteristics of an organism that extend beyond their physical selves, such as clothes, or nests, or altruistic behaviour. Fungi have survival strategies that extend their phenotype into other beings. There are some fungi that infect ants' brains, turning them into "zombies" who climb to high branches and die, falling to earth and spreading fungal spores. Similarly, as well as fungi providing humans with both a source of food and the danger of sudden death, they produce substances capable of profoundly affecting human minds and behaviour[19]: ethanol[20], psilicybin[21], muscimol[22]. Sheldrake argues that these changes of behaviour and perspective in humans may reflect some mysterious survival strategy for fungi, and even puts forward the notion proposed by Terrence McKenna that exposure of early hominids to such mind-expanding molecules may have affected the evolution of the modern human brain. These fungal beings epitomise the Strange Stranger: non binary, decategorical, weird, intimate, dangerous, and entangled (Sheldrake, 2020).

Medusa: Personifying the Strange Stranger

If *anthropos* is the protagonist of the Anthropocene (and who would be the protagonist of the capitalocene? A CEO? A tech billionaire?), then Morton's Strange Strangers, Haraway's chthonic ones, are the protagonists of the Cthulucene.

Haraway suggests a being who could be the archetype or the figurehead of the strange, chthonic strangers: Medusa, "the only mortal Gorgon". Medusa was a woman who angered the goddess Athena—for the crime of having been raped by Neptune in Athena's temple—and was transformed by her into a Gorgon, a being with living snakes for hair and a visage so terrifying that it could turn those who saw her face to stone. Medusa is a non-binary, decategorical, tentacular being[23]; her hair is made of living, tangled, writhing snakes. Where does one snake end and Medusa begin? Is she one, or is she many? Her kinship is strange, non-hierarchical; her

[19] These chemicals are drugs produced by fungi that have mind-altering effects in humans.
[20] Ethanol, commonly referred to simply as alcohol, is produced by species of yeast when fermenting carbohydrates, and is the active drug in alcoholic drinks, such as wine or beer. It is a central nervous system (CNS) depressant drug, which acts as an agonist (that is, it mimics the effects of) of a depressant neurotransmitter, γ-Aminobutyric acid (GABA). By increasing the effects of GABA, it suppresses activity in the CNS, leading to effects including euphoria, sociability, and sensory and motor impairment. (Wikipedia, 2023a)
[21] Psilocybin is a drug precursor produced by a number of fungi species, some of which are referred to as Magic Mushrooms. Psilocybin is a pro-drug, which means it is converted into an active drug, in this case psilocin, in the body. Psilocin is a psychedelic drug, a hallucinogen that triggers unusual mental states. It acts as a serotonin receptor agonist in the CNS that mimics and amplifies the effects of the neurotransmitter serotonin, resulting in effects including perceptual distortions, synaesthesia (perceiving senses according to different sense modalities), euphoria, and paranoia. (Wikipedia, 2023c)
[22] Muscimol is a drug produced by certain mushrooms, including Fly Agaric or *Amanita muscaria*, from which it takes its name (Fly Agaric is the archetypal red and white polka dot "toadstool", often illustrated with imps or goblins sitting on them). Muscimol is also a GABA receptor agonist, selectively activating $GABA_A$ receptors and leading to effects including euphoria, lucid dream-like states, out-of-body experiences, and delirium. (Wikipedia, 2023b)
[23] In Portuguese, Medusa is the name for the Jellyfish

sisters, Stheno and Euryale, were transformed into Gorgons as well, but they are immortal when she is not. "The Gorgons are powerful entities without a proper genealogy; their reach is lateral and tentacular; they have no settled lineage and no reliable kind (genre, gender) although they are figured and storied as female," (Haraway, 2016, pp. 53–54).

She is a visceral, material entity, with "snaky locks and Gorgon face [that] tangle her with a diverse kinship of chthonic earthly forces that travel richly in space and time,"; Haraway positions her as an earthbound being, not a sky god, and so representing a call to action for earthly survival, for living and dying well. Not "dreadful" (the translation of the Greek word Gorgon) in the patriarchal reading of the character, but a being of "awe-ful stories and enactments of generation, destruction, and tenacious, ongoing Terran finitude" (Haraway, 2016, p. 53)

> *"The Gorgons turned men who looked into their living, venomous, snake-encrusted faces into stone. I wonder what might have happened if those men had known how to politely greet the dreadful chthonic ones. I wonder if such manners can still be learned, if there is time to learn now?"*
>
> *(Haraway, 2016, p. 54)*

Strange Strangers are not safe, or comfortable, or straightforward to understand. They are not a resource to exploit, and they don't really make a great deal of sense, but they, we, are all that we have, and perhaps our only hope of survival is to make kin with them. They will be the guide in the work that follows.

The Strange Stranger as Conceptual Figure

Adoption of a conceptual figure is to take it both as a guide and an assumed identity; a way of embodying philosophical concepts that will shape the emergence of new concepts, and in a design context, the emergence of new designs, artefacts, and design theory and knowledge. A principle of post-structuralist research, particularly Post-Qualitative Inquiry (which is discussed in detail in a following chapter) is that the concepts and theories that you choose to work with will give shape or a grain to the concepts (the artefacts) that will emerge. Therefore, it is useful to consider the concepts that the Strange Stranger embodies, and which are able to be drawn on through its adoption as a conceptual figure. In this research, I treat the Strange Stranger as the conceptual "personification" of the conceptual framings of Post-Structuralism and New Materialism, and the queer and more-than-human lenses, and the principle of Queer Ecology. As such, the Strange Stranger as a conceptual figure in this research represents: a dissolution of the categorical boundaries between different beings; a rejection of hierarchies; an embrace of entangled co-existence and becoming together (*sympoesis*); a stance of transitionality and

fluidity, embracing transformation and change; a curiosity to what might unfold; a willingness to sit with estrangement and defamiliarisation; and an outlook of situated subjectivity.

PART II

RESEARCH DESIGN

Chapter 3

MODES OF INQUIRY

Our senses receive a far broader spectrum of messages than the narrow range we are taught to pay attention to. Our brains still receive many of those messages, but they are shunted into the subliminal and subconscious, and surface only as intuitions, emotions, premonitions, dreams, and visions. If we study those experiences not as illusions but as cues to other modes of apprehension, it might give us access to layers of reality we barely suspect, since the evidence for them is drowned out by the noise of ordinary perception.

Carolyn Ives Gilman, Dark Orbit (2015, p. 155)

Introduction to Chapter 3

Chapter 3 explores the modes of research inquiry within which this research project has been situated (See Figure 14).

Chapter 3.1, *Speculative Inquiry*, frames speculation as a research practice of future-making, and considers a number of perspectives on this. In 3.1.1 and 3.1.2, it explores the ways in which speculative practices can help us to step beyond being subject to The (singular) Future, and instead understand futures as playful objects of speculation in the present, as useful tools and games that anyone can create and stake a claim for. The concept of the Impasse of the Present is introduced—the difficulty in being able to project forward to futures that are not patterned on the present—and the importance of speculative practices that can breach this impasse.

3.1.3 focuses on Speculative Fiction (SF), and looks at the way that it demonstrates the power of storytelling to invoke and create possible futures and elseworlds, and the important role it plays in contemporary society to both imagine and argue for particular visions of the future. In particular, the concept of utopia is introduced and contextualised, with consideration made to the ways that utopias (both abstract and concrete) dystopias and heterotopias are rhetorical explorations of future possibilities, how speculative fabulation is a form of worldmaking, and the importance of facing the future with a sense of hope in making a better future together. The utopian impulse in Speculative Fiction is explored, particularly from queer, more-than-human and New Weird perspectives.

3.1.4 considers speculative design, focusing on how speculative design can be framed as a research practice, and 3.1.5 looks in some detail at Speculative and Collaborative Game Design, an important focal point for this research.

Chapter 3.2, *Design (as) Research*, situates the project as a form of practice-based research, specifically Research through Design, and the nature of that paradigm of research inquiry. I give some wider consideration to knowledge making in design, considering ontological and epistemological aspects of design research. I discuss at length how theory is made through design, with a particular emphasis on Transitional Design Theory and Design Assemblages, situating Transitional Design Assemblages as analytical constructs to understand how design artefacts mediate transitions between abstracted and situated knowledge. I finish this section with a discussion of what validation might mean in practice-based design research and how this form of inquiry might be validated, and a consideration of what the objects of analysis might be.

Chapter 3.3, *Post-Qualitative Inquiry*, situates these research currents within a wider research paradigm, Post-Qualitative Inquiry. Drawing on Post-Structuralism, Post Humanism and New Materialism, Post-Qualitative Inquiry is a concepts-led, rather than methods-led mode of research inquiry, with an emergent, not pr-planned methodological approach, and an interest in understanding the creation of the new over reinforcing predefined structures and systems; I explore the history and practice of this approach to research, and discuss its relevance to Research through Design.

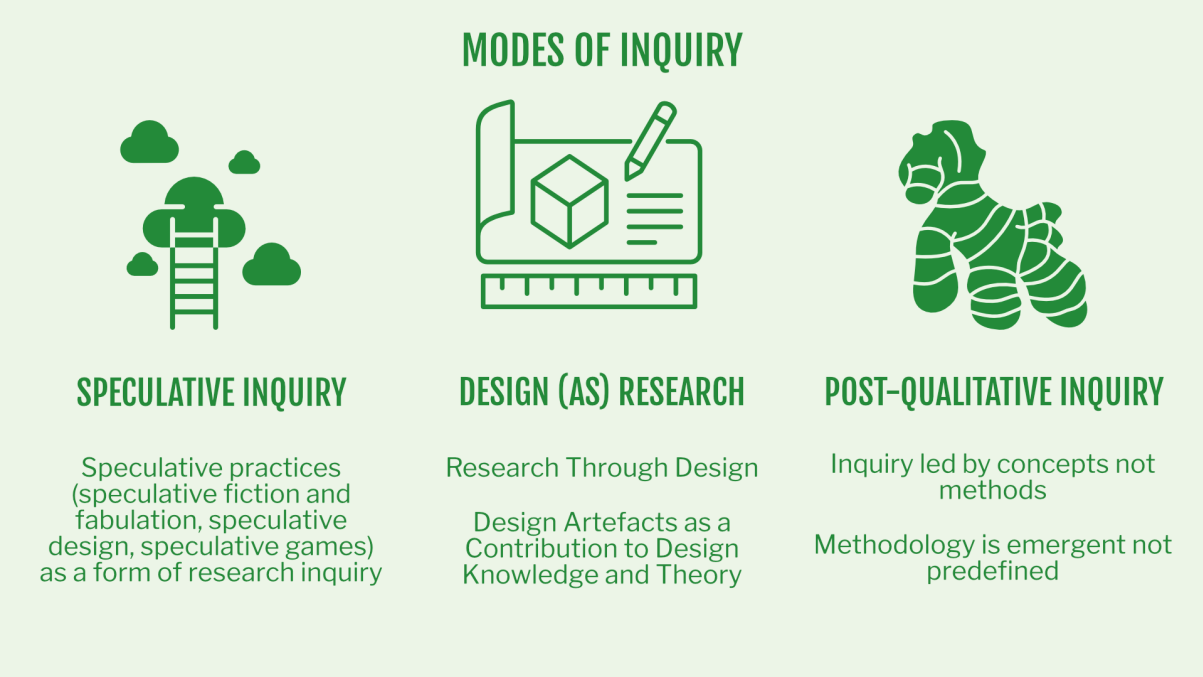


Figure 14 : Modes of Inquiry Infographic

This infographic summarises the modes of inquiry this research draws on: Speculative Inquiry, Design (as) Research, and Post-Qualitative Inquiry.

Credit : Diagram by Craig Jeffcott. Icons from Noun Project (thenounproject.com) under CCBY 3.0 attribution licence (Dreams by Iconic Creations; Design Product by Aditya Bagas A Pangestu; Ginger by Amethyst Studio).

3.1 Speculative Inquiry

> *"It appears that we inhabit a peculiar time, somewhat suspended in its own frantic movement, where the future has never been more present, yet the present keeps prolonging itself, insisting, with its own order of continuity, on a time that does not seem quite to pass."*
>
> *(Savransky et al., 2017, p. 1)*

Speculative practices, in storytelling, research and design, offer a way to engage with futures that are not simply framed by the reality of the present. This section frames speculative practices as a form of research inquiry.

3.1.1 Defuturing and the Impasse of the Present

In their introduction to the book *Speculative Research: The Lure of Possible Futures*, Martin Savransky, Alex Wilkie and Marsha Rosengarten discuss the concept of the Impasse of the Present, the idea that despite the proliferation of transformative technologies and emerging interconnected crises—social, political and environmental—the future is seen as a continuation of an ever-extending present moment, beyond which it is difficult to see.

The ongoing crises engender an anxiety about what the future may be, but at the root of this anxiety is the worry that the future may be different to the present—that the assumptions we have about the natural world, or culture, or economics, may not hold true. The historical context to this is that during European antiquity, time was perceived as cyclical and seasonal, a temporality that allowed only for periodic renewal rather than the shock of the truly new. In the eighteenth century, a series of temporal rifts—the French, American and Industrial revolutions, the Lisbon earthquake—exposed "the present to ever new, and unexpected historical events," (Savransky et al., 2017, p. 1), and brought the shocking realisation that the future could be entirely different from the present, and, particularly, that positions of power and influence could change.

As a reaction to this, the maintenance of a stable present—and thus the protection of the interests of the powerful—is the apparent goal of much of the work of modern, capitalistic society; a society that obsessively anticipates the future and views it through a lens of risks it poses to the present. Where futurity is invoked in the discourse of the powerful—governments, corporations and the rich—it tends to be framed in terms of Risk Management, a process whereby unwanted futures can be mitigated against, ensuring that the future continues to be much like the present, with its existing power structures and cultural assumptions intact. "These practices become factors in the constitution of a yet-to-come, a not-yet that, as we have

intimated above, too often strives to coincide with the 'already' on which it is based," (Savransky et al., 2017, p. 4).

This Impasse of the Present manifested in this risk-obsessed culture offers an uneasy stability, with the immanent futures that exist in the present forestalled by a perpetually extended now. Thus, the only available futures exist in the shadow of what is probable from the standpoint of now, and so our crisis-riven present never quite seems to end.

Jay Springett describes this process as de-futuring : "the slow cancellation of the future" whereby there can be no alternative to capitalism and the current trajectory of the world. In such a context, corporate-approved futures are not new, but reworking of past imaginaries, often shorn of their political or philosophical contexts and repackaged as an aesthetic product through what he refers to as a form of "cultural fracking". As a result, we have no stake in the futures made available to us: "we have no futures which we can call our own," (Springett, 2023).

3.1.2 Imagining Different Futures

> *"The impossible often has a kind of integrity to it which the merely improbable lacks."*
>
> *(D. Adams, 1988, p. 130)*

A slowly cancelled future cannot be good enough. We need to embrace the possibility of futures that are not anchored to our problematic present and seem improbable from its standpoint, but that exist within it as apparent impossibilities. "It matters what futures we use to cultivate other futures with," (Haraway, 2016).

Speculative practices offer this potential, by considering futures as active objects of practice rather than as subjects for empirical study: as "vectors of risk and creative experimentation," (Savransky et al., 2017, p. 5), as prototypes, provocations and tools for actively resisting the present and bringing themselves into being. Alexis Lothian argues that "speculative theory is work that grapples with the dense futurity of the present, altering concepts of reality even as the real itself is constantly cast into question," (Lothian, 2018, p. 21). Speculation allows for the introduction of a new ideas or concept "that invites the reader to epistemologically and ideologically de- and re-construct the world," (Garforth & Iossifidis, 2020, p. 8).

> *"Possibilities exist, or more nearly, they exist within a logical real, the possible, which is within the present and is linked to presence. Potentialities are different in that although they are present, they do not exist in present things. Thus potentialities have a temporality that is not in the present, but more nearly, in the horizon, which we can understand as futurity."*
>
> *(Muñoz, 2009, p. 99)*

3.1.3 Speculative Fiction

> *"Science Fiction […] is the most important literary genre. It's the only one that deals directly with the effects of change, and specifically technological change, on people and society. […] You have to try and strip away some of the assumptions that we automatically make by simply having grown up in this society. You have to look on our civilisation in a slightly childlike way so that a lot of the assumptions we have you have to try and forget about. Why do we do things this way? You have to try and represent a way of looking again at the facts of our existence. Science fiction is trying to find alternative ways of looking at realities."*
>
> *(Banks, as cited in: Parsons, 2010, para. 38)*[24]

Speculation about possible futures, alternative presents and might-have-been pasts is at root a practice of storytelling and fiction making; speculative fiction is therefore at the heart of any imaginative world making practices. Speculative Fiction can be framed as a form of empirical research practice: Elizabeth De Freitas and Sarah Truman have considered how speculative imaginaries might help to rethink empirical inquiry, and how it offers alternative research methods in complex, Anthropocene, more-than-human contexts (De Freitas & Truman, 2021).

As a mode of inquiry, Speculative Fiction plays an important part in this research project, which draws on existing SF narratives for inspiration, using them as tools for feeling a way forward, as string figures for teasing out complexity and as sites of experimentation, while situating this research as the creation of artefacts that might afford the genesis of other, different, stranger futures. Working with speculative fiction as a mode of inquiry is often framed as fabulation; derived from the term fable, fabulation focuses less on technological futures *per se*, but on what new social relations could be possible in future or alternative worlds; fabulation is described in more detail in modes of practice, below.

What is Speculative Fiction?

Speculative Fiction (SF), in its broadest sense, is fiction that speculates about the world being different. All fiction is speculative, imagining a world different to the one that exists, but is often set within a world that is very similar to worlds that exist or existed. Speculative Fiction takes an overt stance of proposing something worlds that are significantly and categorically different to the familiar world, involving alternative types of being, of technologies, of environments, even of physical laws.

[24] This quote is from Iain M Banks, who was an author of speculative and literary fiction, in an interview with Michael Parsons for Wired Magazine

It shares an abbreviation—SF—with Science Fiction, but is rather broader than Science Fiction, and can include Fantasy, Horror, Weird (and New Weird) Fiction, and trans-genre texts that booksellers may struggle to place on a specific shelf. Alexis Lothian suggests Speculative Fiction is a "roomier, more evocative, and also more specific [term, emphasising the] act of speculation: imaging things otherwise than they are, and of creative stories from that impulse," (2018, p. 15). Donna Haraway uses SF as a site for playful word games and deliberate ambiguity, where it could stand for "science fiction, speculative fabulation, string figures, speculative feminism, science fact, so far…" (2016, p. 2).

A fundamental property of much speculative fiction is that it creates a sense of defamiliarization, or estrangement: invoking a world that is somehow different, or strange, and opening up the reader to creative alternatives (De Freitas & Truman, 2021).

World-making

SF is a worldmaking practice; by making proposals of how the future might be, or how the present or past could be different, SF texts present narrative accounts of different worlds which are compelling and detailed and may be considered and advocated for or against. As Donna Haraway suggests, "SF is storytelling and fact telling; it is the patterning of possible worlds and possible times, material-semiotic words, gone, here, and yet to come," (2016, p. 31).

This literary mode of speculation (which is to say, speculation that is first and foremost about telling stories) is an important touchstone for theoretical and material engagements with new worlds and futures. Savransky, Wilkie and Rosengarten discuss how speculative research can be situated as an SF practice: "In the literary world, it is not so much the case that the possibility of a future is ascertained from the point of view of the present, but that reality is always already entangled with the 'not-yet', the 'yet-to-come', the 'what if', the 'already-here', that is, with a sense of the (im)possible," (2017, p. 8). SF is "the process by which cultural producers reconfigure their historical present in order to speculate about what a possible future might be like," (Lothian, 2018, p. 18).

Jay Springett argues that worlds, not stories, are the important creations of speculative fiction; they are "territories of imagination, bound by consistent internal rules that invite exploration, participation, and belief," (2025a, p. 12). Worlds, even speculative ones, are places where one can have a presence and inhabit; that, more widely, are co-created and inhabited with other beings and entities that bring them to life. Speculative worlds aren't static constructions but assemblages that one can engage with and change, and that have the potential for a continued existence beyond the bounds of their creation.

The World Runner

To facilitate the emergence of speculative worlds, Springett figures the role of the World-Runner, somewhere between world-builder and show-runner, and akin to the Games or Dungeon Master of roleplaying games, who might help make them cohesive: "an emerging discipline concerned with the practice of guiding and overseeing the development, maintenance and evolution of worlds." (2025a, p. 2)

The World Runner might have to "craft the setting, history, cultures, geography, and ecosystems of the world, integrating advanced technologies and speculative elements"; "ensure that the world's lore, and mythohistory are consistently and effectively integrated throughout the narrative [and] environment", and to "design, implement and evolve our governance systems that ensure fair and transparent decision-making within the world" (2025a, pp. 111–115). In short, to attend to the complexities that make a world real.

Living in a Material World

In Anthropocene, polycrisis-riven times, and looking from a New-Materialist standpoint, it is important to engage with both the human and social, and with the material world, and more-than-human beings and ways of being. Speculative Fiction can be a powerful means of bridging these two, and finding ways to engage with the messiness of the world. Science, as framed by Latour, is a "practice dedicated to encountering various agencies that proliferate and populate the world," (De Freitas & Truman, 2021, p. 527); it is a means to allow various material, more-than-human and alien entities "to speak on their own behalf as part of a growing political ecology," (De Freitas & Truman, 2021, p. 527).

Science offers the prospect of new communications and relationalities between beings, as it makes visible the ways in which agency and relations of power are entangled with one another. Speculative fiction, particularly science fiction, allows for an engagement with this entanglement; crafting a story allows for fabulation and visualising these complex more-than-human networks, connecting the human individual to a much wider web of beings and concepts. The worlds that speculative fiction make can complicate the social with the material and more-than-human through "cosmic remixings of the socio-material sciences," (De Freitas & Truman, 2021, p. 523), creating estrangements and rifts that allow for new ways of understanding and new forms of inquiry.

Speculative Fiction as a mode of inquiry

In this way, this research is engaging with futures not simply as possibilities, nor as rhetorical propositions, but as material-semiotic artefacts that have been and will be constructed. As this

thesis continues, it will touch on how futures might be considered artefacts, and therefore the subject of a designerly mode of contemplation.

Queering and Weirding Speculation

As Alexis Lothian explains, feminist and more-than-human engagements with science and technology have long worked with SF as a theoretical tactic, "viewing it as creating fictional worlds where feminist ideologies can play out in greater complexity than theoretical writing will allow," (Lothian, 2018, pp. 15–16)—storytelling and narrative building allowing for worlds that feel real and lived in, complex and contradictory places that are expansive beyond the words on the page or images on the screen. SF is, as Haraway suggests, "practice and process; it is becoming with each other in surprising relays; it is a figure for ongoingness in the Cthulucene," (Haraway, 2016, p. 10).

Haraway uses SF as a "theoretical trope" by casting it as "String Figures", tangles and knots of string that are played as a game, mutually creating and disentangling complex, bound together structures: "like stories, they propose and enact patterns for participants to inhabit, somehow, on a vulnerable and wounded earth." Thinking of SF in this way is to think tentacularly, to be a *Strange Stranger*: "the tentacular ones make attachments and detachments, they make cuts and knots; they make a difference; they weave paths and consequences and determinisms; they are both open and knotted in some ways and not others," (Haraway, 2016, p. 31).

This section looks at ways that speculative fiction might be queered or weirded, and what might be gained by doing so.

Queering Speculative Fiction

> *"Queer theory and activism pushed against structures that seemed immutable, insisting on the contingent past and unpredictable future of masculinity, femininity, kinship, and desire. How could attempts to envisage possibilities outside heteronormative structures not involve a certain futurity?... There is a powerful speculative element in the move from deconstructing existing binaries to visualising-one might even say fictionalising-how the world might be changed by those binaries' subversion or destruction."*
>
> *(Lothian, 2018)*

There has been a long association with queerness and Speculative Fiction (SF), which makes a great deal of sense. As Muñoz discussed, queer beings are those who exist in worlds largely made for beings other than them (2009); this may be in terms of sexual or relationship orientation or gender identities outside of the norm, or to take a wider definition of queer, could include racial minorities, women, neurodiverse and disabled people. Therefore, there exists a strong affinity

for narratives and stories that imagine different, possibly more hospitable worlds for queer beings to inhabit, and the 'fandoms' of many science fiction and fantasy series are well populated by people who identify as Queer. In *Old Futures*, Alexis Lothian makes an in-depth study of how queerness and SF are and can be entangled (2018).

As has been discussed, queer temporality is non-linear, imagining different, better worlds that might be found in the here and how that might escape the binary conditions of the inhospitable present. Lothian has suggested that "if queer theory deconstructs binary logics of identity and imagines how the world might be changed by their subversion or destruction in collaboration with activist and political sexual practice, here it naturally seems to converge with science fiction's imaginative production of sometimes-utopian futurities," (2018, p. 16). Speculative fiction and queer theory both afford questioning the structures and values "of what progress signifies, who benefits from which form of demand for social change, and what it means to 'have' a future or be denied one," (2018, pp. 16–17).

However, Lothian argues that while SF as a practice has the potential to queer the future, as a corpus of work it can fall short of affording such radical aims. While queer scholarship "emphasises queerness as countering assimilationist, normalising politics through emphases on refusals, debasements and impossibilities"—in short, it casts a queer eye on "cultural constructions of futurity itself"—the wider Speculative Fiction genre has "rarely been associated with [those] currents." (2018, p. 18).

Lothian explains that Science Fiction positioned the "idea of the future" at the centre of "imperial domination and technological modernity" (2018, p. 2). Much SF is situated in the Impasse of the Present, where "the cultural politics of the imagined future follow some familiar trajectories": the heteronormative reproductive fantasy of the future being only for the children, the arrow of time pointing towards a desirable technological future, and the exclusion of those for whom such trajectories are inhospitable. A queer lens on SF is to ask for whom a future is for? Faced with such a body of work, "it is not difficult to understand why [SF] futures seem antithetical to queer understandings of temporality that question the self-evident value of progress" (2018, p. 19).

Similarly, Ursula Le Guin argued that:

> *Limiting humanity to the producer-consumers of a complex industrial growth technology is a really weird idea, on a par with defining humanity as Greeks, or Chinese, or the upper-middle-class British. It leaves out a little too much. All fiction, however, has to leave out most people. A fiction interested in complex technology may legitimately leave out the (shall we say) differently technologized, as a fiction about suburban adulteries may ignore the city poor, and a fiction centred on the male psyche may omit women. Such omission may, however, be read as a statement that advantage is superiority, or that the white middle class is the whole society, or that only men are worth writing about. Moral and political statements by omission are legitimated by the consciousness of making them, insofar as the writer's culture permits that consciousness.*
>
> *(Le Guin, 1994)*

But, as has been made clear in the reflections on futurity thus far, "the discourse of the future has never been a singular one," (Lothian, 2018, p. 1)—it is a question of futures, not The Future. Lothian argues that while most speculative fictions "may be prototypes for the prediction of a future more or less like the present, others may pre-emptively imagine it's collapse or transformation," (2018, p. 19). Furthermore, even those SF narratives and fictional worlds that remain resolutely and happily in the shadow of the never-quite ending present have something to offer for the endeavour to queer the future. Despite being situated in normative worldviews, "fictional futures [provide] experimental sites for working out other ways of being… the failure of speculative fiction's radical possibilities do not invalidate their meaning, their interest, to their capacity to make a difference," (2018, p. 20).

The New Weird

There is a subgenre of speculative fiction that leans into other, more experimental ways of being, and can offer ways of queering ecology and speculative inquiry well suited to the Anthropocene—the Cthulucene—age: the New Weird. New Weird fiction, with the way it treats "difference, dis/orientation and ecological relation," (Turnbull et al., 2022, p. 1207), has "the capacity to trouble problematic binaries, to radically emphasise other-than-human agencies" and to allow for " 'new, experimental, proactive, playful and speculative approaches' to the overlapping crises of the Anthropocene," (Huff & Nell, as cited in: Turnbull et al., 2022, p. 1208).

New Weird fiction takes its name as a riposte, evolution, or subversion of Weird fiction. Weird fiction defies a simple definition, but it is a speculative mode of storytelling that transcends genre, containing elements of science fiction and fantasy, and, especially, horror. Fundamentally, weird fiction foregrounds the sense of estrangement and defamiliarisation that, as discussed, underlies all speculative fiction. These are stories that foster an atmosphere of disquiet, delve

into the strange and the unknown, and conjure "a sense of wrongness"; they force a confrontation between the human and the more-than-human other.

Early forms of weird fiction might include the body horror of Mary Shelley's *Frankenstein* (1818), or the creeping dread of the ghost stories of M R James (1904), but the term is particularly associated with HP Lovecraft as the archetypal writer of the genre. Lovecraft's weird was one of a numinous cosmic dread of the unknowable other, of unspeakable geometries and dimensions and the unthinkable denizens that dwelled there, ready to breach the feeble defences of our human reality. In particular, he is associated with the Cthulhu mythos, his tales of eldritch gods and the tentacular Cthulhu entity (1928). There is a clear parallel here with Haraway's tentacular beings, and her Cthulucene epoch but, with a deliberate misspelling, she disavows his worldview. (1981) Because, much like John Muir's fear of the human other contaminating an Edenic nature (Associated Press, 2020), Lovecraft's fiction was an allegory of his hatred of—indeed, his repulsion for—the racial other, and for genetic hybridity; he was a eugenicist and an "obsessive racist," (Turnbull et al., 2022, p. 1209). His writing presented estrangement as a white supremacist, monoculture-obsessed warning against other races driven by a terror of contamination, mutation, and change; a "horror towards that which does not belong," (2022, p. 1209).

New Weird fiction inverts that fearful, repulsed horror of the other, instead approaching estrangement and change with more of an ambivalent posture, and a willingness to feel estranged and not quite at home, in more-than-human and unstable worlds: "otherness in New Weird fiction is not to be feared, but rather approached with care and respect," (Turnbull et al., 2022, p. 1211). It is a heterogenous and hybrid genre, more so even than traditional weird fiction, encompassing explicitly biological explorations of ecological collapse in the works of Jeff Van Der Meer; queer and multi-racial subversions of Lovecraftian tropes in the urban fantasies of NK Jemisen, and the "hybrid more-than-human landscapes" of China Mievelle that act to "illuminate the operation of racial, economic and patriarchal oppression," (Turnbull et al., 2022, p. 1212).

Common to many New Weird narratives is an engagement with the contemporary polycrisis-riven Anthropocene or Cthulucene age, which has even been described as a time of Global Weirding (Friedman, 2010), and so the New Weird has been positioned as a speculative theoretical lens for making sense of it (De Freitas & Truman, 2021; Turnbull et al., 2022).

> *"The weird is a critical lens through which reactions to and ethics concerning human-induced ecological disasters may be better understood."*
>
> *(Turnbull et al., 2022, p. 1208)*

What might be the contours of such a weirded speculative lens? There are some cardinal features of the genre that are of interest; metamorphosis and mutation, sympoesis and becoming-with, and a detached, ambivalent subjectivity.

Metamorphosis and Mutation

> *"It wasn't destroying. It was changing everything. It was making something new"*
>
> *(Garland, 2018)*

Mackenzie Wark has framed the Anthropocene age as one of metabolic change, where matter exists in flows and material rifts have opened up, where those flows have become disrupted and changed (Wark, 2015). New Weird narratives dwell on this framing of material reality, with "literary devices involving biochemical metamorphic transitions and altered forms of coupling and reproduction between humans and more-than-human entities," (De Freitas & Truman, 2021, p. 524). These are queered ecologies, where hybridisation and mutation are the norm, and boundaries and categories between the human and non-human blurred and transcended: "weird bodies are porous and constantly mixing with each other and the world around them," (2021, p. 524). This is a form of contamination that would be anathematic to Lovecraft, but that is embraced by New Weird narratives as a natural process of change: "it is through disruptions of landscapes and categories that these texts produce weird and unsettling affects. Motifs of infection are central to this disruption," (Garforth & Iossifidis, 2020, p. 18).

In Jeff Van Der Meer's novel *Annihilation* (2014)—and in Alex Garland's film adaptation of the book (2018)—an alien presence created an altered landscape called Area X, a weird heterotopic space in which boundaries and categories, between human and more-than, between natural and technological, between matter and mind, are corrupted, breached, and mixed: there are animals with antlers of flowers, plants growing in human body plans, and a group of female scientists who have been sent to investigate the landscape find themselves to be inexorably changed and mutated by, and merging into, the world around them.

> *"It creates out of our ecosystem a new world, whose processes and aims are utterly alien—one that works through supreme acts of mirroring, and by remaining hidden in so many other ways, all without surrendering the foundations of its otherness as it becomes what it encounters."*
>
> *(VanderMeer, 2014)*

Sympoesis and Becoming-with

There is a deep engagement with what Donna Haraway describes as staying with the trouble; a process of sympoesis, or becoming-with, the more-than-human realities in which we find

ourselves. This isn't a blandly Edenic stance of living in harmony with nature, and embracing diversity and difference with ease, but as a way "to pursue the complex frictions of violent nature cultures," (De Freitas & Truman, 2021, p. 525). It is a commitment to getting along with the world, with "a more than human sympathy that respects and indeed relies upon radical difference and risky diplomacy," (2021, p. 525).

New Weird narratives offer "different insights into species-centric images of life and survival, queering the white and heteronormative images of coupling, reproduction and sexuality tactics endorsed in our western nature cultures," (2021, p. 525).

There is an emphasis on hidden, entangled beings, like the Strange Strangers of Morton, and particularly Haraway's Tentacular Beings, the forgotten and ill-regarded entities existing in lines and networks, not singular points; tentacularity is a defining trope of the Weird, both old and new. Lovecraft's Cthulhu entity is an eldritch octopus god, probing its tentacles to breach and violate the quotidian world, a trope subverted by Jemison in *The City We Became* as white supremacist tentacles attempting to remake the world as a monocultural horror (2020); Mieville's *Kraken* (2010) tells of a preserved colossal squid, transported away from London's Natural History museum and being sought by a doomsday squid cult.

Ambivalent Subjectivity

In reflecting on making the film of *Annihilation* (2018), Garland emphasised that a difficulty in adapting the novel was that there was no true objective perspective presented by the book, and that his adaptation is by necessity a representation of his subjective experience and affect through reading the novel (Mefford, 2018). This is an important aspect of New Weird fictions, and has relevance to the approach to inquiry of this project: of complicated worlds that resist instrumentalist inquiry, and require something rather more subjective and contingent. They can problematise scientific inquiry through unreliable scientific narrators (De Freitas & Truman, 2021), and bring the objectivity of the observer into question, reflecting the discourses that argues scientific knowledge to be situated and contested (De Freitas & Truman, 2021; Kuhn, 1962; Latour et al., 1986).

It is notable that the protagonists of weird and New Weird fictions are often scientists and academics: the antiquaries of MR James stories, who find themselves entangled in unthinkable horror when curiosity drags them out of their books and into misbegotten places (1904); the hubristic Victor Frankenstein, who in his attempt to create life manages to destroy his own (Shelley, 1818); the scientists of *Annihilation* who enter into Area X to study it and find themselves implicated, contaminated and metabolised by it (VanderMeer, 2014); the six protagonists of *The City We Became*, who include PhD and Graduate students and a curator, whose individualities become blurred and expanded as they become avatars of the boroughs of New York, their minds becoming those of the complex socio-technico-environmental

assemblages that compose a city (Jemisin, 2020); and Billy Harrow, the protagonist of *Kraken*, a curator at the Natural History Museum who preserved the squid in a vitrine and becomes implicated in a web of intrigue over its disappearance, becoming changed through his experiences that elevate him to a messianic figure to the squid cult, with the skills of his profession as a curator and a preserver of specimens reframed as powerful and arcane abilities (Miéville, 2010).

Common to all of these depictions is the gradual loss of a detached objectivity of researchers and academics, a becoming imbricated and implicated in the confusing more-than-human and material circumstances in which they find themselves, as science and academic inquiry encounters the messy contingencies of the Anthropocene (De Freitas & Truman, 2021).

The protagonist of *Annihilation*, an unnamed biologist in the novel, has the realisation that "everything around [her] is undoubtedly and uncontrollably alive, and a consequence lose[s] the sense of being centre of [her] world," (VanderMeer, 2014, p. 61). As she studies the world around her, and faced with the visceral loss of self of her own and her companion's bodies, she takes a stance of detached curiosity, viewing the world with an unsentimental relationality, allowing herself to be situated and imbricated in the complexity as it unfolds; ultimately losing herself into a metamorphosed entity (De Freitas & Truman, 2021).

Turnbull and Platt have considered how Van Der Meer and Mieville's fictions particularly, but New Weird fiction generally, offers theoretical tools for engaging with a weirded world, with an:

> *"emphasis on an affective ambivalence in the face of weirding: of learning to relate to difference and socioecological change not as monstrous and horrific, but as productive and unsettling."*
>
> *(Turnbull et al., 2022, p. 1208)*

Utopias

Utopias are particular forms of, or at least particular framings of, speculative fiction, with a particular focus on worldmaking; that is to say, where the emphasis is on the speculative worlds within particular fabulated narratives. This project, with a focus on alternative presents and possible futures, is thus situated as a form of inquiry within utopian discourse, which will be elaborated on in this section.

The concept of *Utopia* was proposed by Thomas More in his novel of the same name (1516); deriving from Greek, it means, literally, "no place". Utopias and utopian thinking tend to be based around future visions of an ideal place, somehow disconnected from the here and the now, a form of thought experiment, a daydream of "if only…" Such fantasias could seem, at first, to offer the promise of a break from the Impasse of the Present, with a jump to another, better way

of being, but where such abstract imaginaries are concerned, the promise is a false one. Perhaps it's a confusion that stems from the etymology of the word—οὐ is the greek word that means not, while εὖ means good; utopia, a nowhere place, sounds rather like eutopia, a good place, particularly if the idealised world sounds like somewhere the listener would like to live.

Utopia, in the abstract, belongs to the realm of thinking: it "is primarily a critique of the here and now; it is an insistence that there is… something missing," (Muñoz, 2009). Largely, utopias are futures as rhetoric. Mike Michael has argued that all futures are essentially rhetorical arguments for a particular way the world could be, generally laden with value statements (this future would be good, while that one would be bad); in this context, utopias aren't realistic proposals for the becoming of different worlds, but more the 'marketing' to encourage others to rally round that vision of the future (Michael, 2000).

Such worlds may be useful ways of imagining how the world might be different—but they can conveniently elide the difficult decisions and thoroughgoing societal upheaval that they would necessitate. One must ask whose futures these utopias are and who would be both excluded from and marginalised by their making real, and whether they pose the real risk of reinforcing current structures of hierarchy, power, and value systems. If something is someone's utopia, is it the dystopia of someone else? Fredric Jameson has suggested that "dystopia is in reality utopia if examined more closely," (Jameson cited in Gadanho et al., 2016, p. 31); like the characters in Mike Schur's comedic series about moral philosophy, on being assured repeatedly that the clearly dystopian afterlife they are inhabiting is *The* (eponymous) *Good Place*, the beings who find themselves inhabiting someone else's fairy tale might soon come to the realisation that "this is the Bad Place!" (2017).

Speculative Fiction (SF) writers often create narratives as a way to explore utopian ideas; it can be easy to propose idealised, abstract utopias, in a world that you have created and set up all the rules. Often, writers use fiction to present failed utopias—dystopias—as cautionary tales for those who might try to indulge their utopian fantasies. One such story is *The Lathe of Heaven* by Ursula Le Guin (1971), in which, having discovered one of his patients' dreams can change reality, a psychiatrist forces him to dream a better world into being; but, rather like a fairy tale in which a wish goes wrong and the wisher desperately tries and fails to wish himself out of it, unintended consequences lead to the increasingly dystopian outcomes of famine, global war, alien invasion, and ultimately, the unravelling of reality itself. Dystopian narratives, depressingly, are so prevalent that some bookshops have shelves devoted to "Dystopias" as their own genre; defuturing has progressed so far that even professional writers of speculative fiction struggle to imagine better, different futures.

Utopias, existing in the tension between the no place and the good place, can be framed as a transitional assemblage which can offer possibilities for reframing the present and imaging futures more complicated, and more real, than abstract thought experiments of ideal nowheres.

(Garforth & Iossifidis, 2020) Here I consider two perspectives on this, framed around queer and weird futures respectively: concrete utopias and heterotopias, and weirded utopias of estrangement.

Concrete Utopias and Heterotopias

José Esteban Muñoz situates queer futurity as a form of utopia-making, but he argues that "abstract utopias are dead ends, too often vectoring into the escapist disavowal of our current moment" (2009, p. 30) and all the difficulties and heartbreaks it contains. Donna Haraway cautions against a particular current manifestation of this, that "a comic faith in technofixes, whether secular or religious: technology will somehow come to the rescue of its naughty but very clever children": much of contemporary futurism is predicated on transformative and utopian digital technologies that are a product of the same capitalist model that has brought us to our current, ecology-destroying impasse. She argues that "we cannot denounce the world in the name of an ideal world… decisions must take place somehow in the presence of those who will bear their consequences," (2016, p. 12).

What would be needed for Utopia to be a practical means of approaching the future, rooted in what is, in the here and now, and in the hands of those who will bear these consequences? What if Utopia was a concrete thing, rather than an abstract idea?

Concrete Utopia

Muñoz (2009) situated a particular, utopian form of queerness and queer futurity in the concept of the *Concrete Utopia*, as proposed by Ernst Bloch (1954-1959): better worlds that can be worked towards, collectively, moment by moment, in the present. As Haraway argues, "a common liveable world must be composed bit-by-bit, or not at all," (2016, p. 40).

Muñoz suggested that queerness itself is a utopian formulation that "promises a human that is not yet here" (2009, pp. 25–26). The motivating principle of queerness is that "the present is not enough. It is impoverished and toxic for queers and other people who do not feel the privilege of majoritarian belonging, normative tastes, and 'rational' expectation". A concrete utopianism does not suggest that we "simply turn away from the present" but that it "must be known in relation to the alternative temporal and spatial maps provided by a perception of past and future […] worlds," (2009, p. 27).

Queerness is situated outside of a purely linear time—straight time, both structurally and socio-culturally—with "a temporal arrangement in which the past is a field of possibility in which subjects can act in the present in the service of a new futurity" (2009, p. 16). It provides a horizon beyond the Impasse of the Present in which the "linearity of straight time" (2009, p. 25) "is interrupted and stepped out of," (2009, p. 32). "Queerness's ecstatic and horizontal

temporality is a path and a movement to a greater openness to the world," (2009, p. 25). "Ultimately" Muñoz argued, "we must insist on a queer futurity… a desire for another way of being in both the world and time, a desire that resists mandates to accept that which is not enough," (2009, p. 25).

This stepping out of straight, linear time in pursuit of alternative worlds while not stepping away from the lived reality of the present makes explicit a core principle of queer future-making, one that is, in truth, implicit in any contemplation of times outside of the now. This principle is that all that can be apprehended of time is the present, current moment, and futures and pasts only exist as ideas, as possibilities, or as rhetoric. Any and all futures are simply a rhetorical device, a way to persuade others of the value and necessity or otherwise of the alternative world that is being invoked (Michael, 2000).

In this regard, Muñoz is arguing not for an abstract better future that might come to be, that pretends the present isn't there, but for futures—dreams of better, other worlds—to be invoked, made real within the present as it is. In *Cruising Utopia*, he explored the myriad ways in which queer beings are able to evoke utopian other worlds outside of, but forever connected to, the present moment. These bubbles of better futures residing in the present are ephemeral edge lands, enfolded within gestures, through performance, and in queer spaces in which alternative ways of encountering and making community can be, at least for a short time, made more real than the real world (2009).

Heterotopia

As Bloch has argued, Thomas More originally "designated Utopia as a place [but it] later left space and entered time […] in other words there is a transformation of the *topos* from space into time," (Muñoz, 2009, p. 49). But Muñoz proposes a futurity of the present, an active, collective materialisation of a better world in the present. What he proposes is closer to what Michael Foucault describes as *Heterotopias*, or Other Places : "places that do exist and that are something like counter sites, a kind of effectively enacted utopia in which the real sites… are simultaneously represented, contested and inverted," (1967, pp. 62–67). Foucault's heterotopias share characteristics that are recognisable from queer places and spaces: the juxtaposition of several incompatible places in one space; existing as "slices in time" where one arrives at an "absolute break with their traditional time"; they possess "systems of opening and closing" through which one must pass "that both isolates them and makes them penetrable"; they have "a dual, contradictory function in relation to 'real' places, where in their illusory, transitional nature reveal the 'real' world to be equally illusory and transitional, but in existing at all, seem to be more real than 'real'," a world "as perfect, as meticulous, as well arranged as ours is messy, ill constructed and jumbled," (1967, pp. 62–67).

Solarpunk

The Solarpunk movement, as described earlier in this thesis, provides a good example of speculative concrete utopianism in action. Described as "a world first and a set of narratives second," (Williams, 2019, p. 7), Solarpunk has a particularly grounded and concrete approach to Utopia, speculating about new worlds, new infrastructures and new social relations grounded in current possibilities, and moving forward in increments from the present: "the efficacy of solar punk's imaginary in building community and inspiring action beyond the frame of its narratives operates through [the] transmission of its imaginary [...] into the external world through the agency of those it enrols," (Williams, 2019, p. 24).

Weirded Utopias and Estrangement

> *"Crucial to the utopian charge [...] is a play of tensions between home and the unhomely, comfort and discomfort, connection and separation, place and space, security and alterity [...] horror or hope [does not] reside on one or other side of the equation. Utopianism plays in-between."*
>
> *(Garforth & Iossifidis, 2020, p. 18)*

I have discussed above how Speculative Fiction might be defined as the fiction of estrangement, of making the world weird, and unfamiliar. Lisa Garforth and Miranda Iossifidis explore that this sense of estrangement underlies a more contemporary perspective on utopias—drawing on the work of theorists such as Fredric Jameson (2005)—than simply abstract Good Places; that they are a way to generate disquiet, and to force us to question "the taken-for-grantedness of the way things are, with the function of opening up our sense of how things might be otherwise," (2020, p. 2).

Utopia in this framing is a way of making things strange, acting as a critique of the here and now, and forcing a consideration of what alternatives might exist. This strangeness can reflect on the existing world, forcing assumptions to be abandoned, and the contingencies and contradiction and complexities it contains to be unearthed. Such an estrangement can be in the cognitive realm, or the affective; it can allow the possibility of rethinking the world, or it can alter your feelings about it. This is a process of alienation, of destabilising any sense of domesticated comfort, of making one feel ill at ease and far from home (2020).

These are concrete utopias. It isn't fruitful to project idealised worlds into the future while assuming traditions, conventions and beings will remain unchanged from the present form; instead, it is necessary to work through the trouble to what might come next. Williams explores this with regards to Solarpunk imaginaries: he considers, on one hand, mainstream political and corporate imaginaries of solar powered futures where the technology changes and social

relations remain the same, and, on the other, Edenic progressive fantasies of solar powered social change that rely on or elide the infrastructures and technologies that support them: both are abstractly utopian. He contrasts both stances with Solarpunk community-driven approaches, where the possibilities of new infrastructures and new social relations are explored through speculative fictions alongside material interventions in the world as it is (Williams, 2019).

The world as it is changed and changing, riven with material rifts, metamorphoses, and systemic shocks, with human activity leading to environmental damage and climate disruption, loss of biodiversity, and escalating human crises. Garforth and Iossifidis argue that "what nature has been and what humans might become are in flux. There is no prospect of returning to normal. It is a rearrangement of realities," (2020, pp. 2–3).

As discussed, this rearrangement of realities has been described as a Global Weirding, and so the New Weird offers a reframing of utopia that might help to make sense of and survive in this unsettling and changing world: "a thoroughly weirded utopianism can help us to understand how our transformed reality might be survivable and how we can continue to identify and express desires for a better way of living in and through it" (Garforth & Iossifidis, 2020, p. 8). What characterises such weirded utopias? A key aspect of such stories, as discussed above, is that they ask their characters and readers to approach estrangement and defamiliarisation with an ambivalent curiosity. In their unsettling and mutated landscapes, they refuse a domesticated comfort, producing an effect that is unhomely, and unfamiliar. New Weird narratives "are not contingent on stable notions of nature, community, political agency and home. They disrupt and remake those categories in ways that feel new, strange, disturbing—weird," (2020, p. 4). In short, they invite one to embrace the loss of a home that can't be returned to with a "hopeful terror" (2020, p. 6) and to consider what might be possible in distorted and irrational worlds, such as the one we are living in.

These are not dystopias that warn what might come to pass, but reflections on the reality of living in the damaged Anthropocene age: they invite one to stay with the troubling present and work through it to improved ecological and social futures without trying to return to an Edenic, unspoiled world. The uncanny tales of the New Weird offer open-ended narratives that deal with "notions of irreparable change; with entities and subjects that are in the process of becoming-other," (Garforth & Iossifidis, 2020, p. 18), that mutate, grow, and continually change. They don't lead to closure and a return to home, or offer a resolution of the tension between the familiar and the uncanny, but go forward in messy disturbing realities that situate the possibility of joy and of making things different through "living with and confronting eco-social ruin, environmental injustice, white supremacy and capitalist exploitation," (2020, p. 19).

3.1.4 Speculative Design

This project is entangled with speculative design, both as a situated research context and as a mode of research practice. Chapter One discusses speculative design framed as a situated context for research; here, it is considered as a mode of inquiry. Speculative design might be characterised as a particular form of speculative inquiry on one hand, or as a particular form of design research on the other. As a form of speculative inquiry, design stands out from other speculative fiction practices as it tends to involves the materialisation of an idea as an artefact, whether in the physical or conceptual world; such artefacts act as a strong rhetorical case for a particular future that can be used to persuade people to make that world come to be: "to force an aspect of the future into the present so it demands a response," (Tonkinwise, 2014, p. 176). Likewise, as a form of design research, speculative (and critical) design exist as more of a questioning practice than a problem-solving, question-answering practice; it doesn't seek solutions but problematises the contexts in which it becomes entangled, opening up the possibility of deeper forms of inquiry. This section considers three important characteristics of speculative design as a mode of research inquiry: materiality, anti-solutionism, and engagement.

Materiality

> *"Artefacts are important to the way human consciousness interacts with the world, and particularly we have a strong sense of the temporality of artefacts. They're an important benchmark for change, and continuity, and aside from the aging of our own bodies, they're the things that keep us located in time, that allow us to imagine both past and future times."*
>
> *(Gardner, personal communication, 2016)* [25]

The above quote is from Andrew Gardner, an archaeologist at University College London, who discussed the materiality of time with me, and the way that past and future exist to us through their materiality. Archaeological and palaeontological remains ground the past in the present; designing artefacts is a way of materialising the future in the present, making it more real and more 'present', and acting as a strong rhetorical argument for that future (Borup et al., 2006).

This thesis has already considered the importance of materiality in speculative practices, particularly in response to the material polycrises of the Anthropocene or Cthulucene era. Drawing on the potential of scientific knowledge to make the material and more-than-human worlds both visible and vocal, speculative fiction allows for the creation of complex entanglements of these material understandings with sociocultural considerations.

[25] I had a conversation Gardner for a previous research project in 2016 (Jeffcott, 2016); a transcript of our talk is presented in *Appendix 1 : Conversations*

An important characteristic of speculative design compared to other, less material, forms of speculative practice and inquiry, such as speculative fiction, is that designed artefacts can provide a tangible bridge from the everyday to the imagined. Speculative writer and theorist Bruce Sterling has written about the use of 'diegetic' artefacts in design fiction. Diegesis is a term taken from film studies to refer to filmographic elements that are real within the narrative of the film, such as music heard by the characters, as opposed to the film soundtrack heard by the audience alone. Diegetic artefacts are, therefore, items that are 'fake' in the 'real' world, but represent real objects within a speculative world (Sterling, 2011).

Sterling suggests that diegetic artefacts invoke and make real potential futures and alternatives presents, allowing those who engage with them to imagine the possible 'real' that they represent (2011). One might take a New-Materialist perspective on this, one which emphasises the important role of the material in research inquiry, and in particular the situatedness and context dependency of knowledge, philosophical concepts and artefacts. A diegetic speculative artefact represents a material bridge between real and fabulated worlds. Elizabeth Adams St.Pierre, citing Derrida, has talked about the situatedness of language, and the way that a word carries its contexts with it; in fact, that it brings its entire ontology (or world view) along with it. (Adams St.Pierre, 2020) In the same way, by bridging realities, a speculative artefact brings along the entire diegetic world in which it exists.

Sterling argues that "design fictions tell worlds, not stories," (Sterling, 2011): a diegetic artefact is a metonymic part of an imagined entire world, engrained with its values, assumptions and materialities. Engaging with its material presence is to engage with a part of that world made real, and thus, it represents a powerful lure for invoking and considering the wider world it diegetically originates from.[26]

Crucially, in its materiality, speculative artefacts allow the inquirer to engage with the more hidden and material aspects of worlds that might be elided and overlooked by purely imaginative fantasias, but which are of extreme import if one is to consider a realistic path towards that futures, and its potential social and environmental impact. Speculative artefacts force an observer to consider, for example: what level of diegetic technological development would be required for the creation of the artefact; what economic system it could exist within; what labour relations might be required; would its manufacture rely on the existence of particular careers; what raw materials would it be made of and how those might be extracted, and at what environmental cost; what infrastructures would it rely on or make possible; what it might feel like to use or interact with the artefact; what social and environmental effects it use might have; and how it might be disposed of.

[26] For example, a prop of a light-saber from *Star Wars* evokes a rather different world than a medical tricorder scanner from *Star Trek*; considering such artefacts allows for an insight into the differences between these fictional worlds

Solarpunk and Speculative Infrastructures

Solarpunk gives a good illustration of the value of speculative design in invoking and mediating possible futures with inherent materiality, grounding them in the concrete and material realm.

Rhys Williams discusses the different ways in which solar imaginaries might engage with the future in relation to those futures' infrastructural materiality. At one extreme are the "business as usual" utopian visions produced by solar technology companies, governments, and think tanks, who envision solar technologies as displacing more conventional forms of energy generation, but without any desire for a resultant change in social relations. Effectively, they would leave the infrastructures of energy usage unchanged, alongside unchanging political, corporate and social systems. These are "wish-fulfilment fantasies denying the necessity for social change," (2019, p. 19); short of massive geoengineering projects, an effective impossibility.

In opposition to this, Solarpunk imaginaries are often more interested in social and cultural change, and explore the possibilities that solar technologies might offer in that regard. However, such fantasies are often abstract utopias, not concrete ones, and often settle on an Edenic approach, imagining a return to the familiar, an unspoiled rural world in harmony with nature. Williams describes these as fantasies of consumption, not production: what might it be to consume energy differently, rather than how might its production be changed (2019). The reality is that the current means of production of solar technologies, and thus the infrastructures that support them and are facilitated by them, rely on existing social and cultural systems. Taken as a fictional genre, Solarpunk futures often obscure the materiality—in the shape of infrastructures—that they must rely on to come into being (Williams, 2019).

However, as a mode of speculative design, Solarpunk has the possibility to effect both social and material futures. On the one hand, fantasies of solar-powered socially transformed futures, in obscuring the infrastructural chances that might enable them, have the effect of creating a utopian estrangement. By weirding the future, they produce a rupture between the word as it is and as it could be, drawing attention to the rift that needs to be bridged; for example, Williams describes a particular solarpunk narrative about an Edenic civilisation that is powered by the scales of a dragon that absorbs sunlight. This is a weirded future, subjective and not subject to material rationalities, but the cognitive and affective estrangements that they produce give "an imaginative means to give shape and expression to the desires and values that precede and perhaps give rise to a new world, and to the formal dimensions of the infrastructure which would be required to sustain it," (2019, p. 22). Entangled with this, the community practice element of solarpunk is a material engagement with the world and what the materiality of the world might make possible; together, they can be framed as a speculative design practice, where speculative fantasies are situated in the empirical and material realities of solar energy production, transmission and use.

In short, Solarpunk can be framed as a speculative design practice that finds community expression for new social relations that the community desires. By articulating these within speculations that make use of solar infrastructure, alongside practical acts of making and environmental action, they start to shape what that infrastructure could be like to service these social relations. In opposition to corporate and mainstream political imaginaries, which start from preserving the social relations and figure the infrastructures accordingly, Solarpunk starts from a transformation of the *status quo*, around which a different, more just infrastructure can be figured.

Speculating the inner life of beings

An important principle of speculative materiality comes from Object Oriented Ontology, which explores how objects have an exteriority which can be perceived but an interiority which is inherently unknowable. Graham Harman figures creativity, imagination and speculation as a way to "access" that interiority, and therefore develop a clearer understanding of the object (2018).

Speculative design practices can take a particular stance on materiality that has a relevance to more-than-human concerns: they can allow one to imagine what it might be like to be another being. This approach to speculation is grounded in the New-Materialist stance of Object Oriented Ontology (OOO). OOO is based on a 'flat' ontology, which is to say that no object exists in a hierarchical relationship with other objects. This means that an object is no or less important than the objects from which it itself is composed, or objects it in turn forms part of. Tangible objects are no more important than intangible or fictional objects, and of most importance here, literal objects are no more important than metaphorical ones (2018).

The key principle of OOO to consider here is the idea that objects have both an external, perceptible existence, and an internal, imperceptible one. Graham Harman argues that, in contrast to rationalists and mysticists, we cannot have direct access to other objects: "indirect access to reality is generally the best we have to work with," (2018, p. 62).

Harman draws on the work of Immanuel Kant and José Ortega y Gasset (Henceforth Ortega) to explain this. Kant argued that there's a distinction between phenomena, that which we can experience, and noumena, what things are within themselves, which we cannot (1781). Kant considered noumena a uniquely human experience, but Ortega (1914/1975) and Harman extend the concept to more-than-human entities, such that "every non-human object can also be an 'I' in the sense of having a definite inwardness that can never fully be grasped," (2018, p. 70).

The importance of this noumenal, things in themselves, existence, to creative practice, was emphasised by Ortega—and therefore the importance of creative practices in addressing the being of other things. He argued that in the third person one can only access the surface

phenomenal qualities of things, but that even a first-person perspective, through self-reflection, cannot access noumenal reality, "since in introspection we also reduce ourselves to shadows and outlines," (2018, p. 70). How do we access what Harman refers to as the "'zero-person' aspect of things, meaning their reality apart from any observation or introspection?" (2018, p. 70).

Ortega further argues that we may attempt to do so through artistic and creative practices; that art is a language "whose function [is] not to tell us about things but to present them to us in the act of executing themselves" (1914/1975, pp. 138–139) and that can give us a sense of the noumenal, internal, realm of other beings. He emphasises that this is not a true access to the interiority of things, which we can never directly achieve, but that "a work of art affords the peculiar pleasure we call esthetic by making it seem that the inwardness of things, their executant reality is opened to us," (1914/1975, pp. 138–139).

This executant reality was explored by Ortega, and later Harman, through metaphor, giving an example of the metaphor of a cypress tree being a flame. Such a metaphor makes a poetic, rather than literal projection between two objects that are unalike. A cypress tree, which is a plant, and a flame, which is an exothermic chemical reaction are not materially alike, but through cognitive or affective metaphorical projection, one can seem like or feel like the other. In its shape, in the way that it sways in the wind, in the emotion it might elicit, to encounter a cypress tree might be to recall the qualities of a flame. In such a way, we might feel that something of the essential nature of the tree, otherwise inaccessible to us, has been revealed. We have the sense of having penetrated the surface and, however speculatively, experiences something of the 'I' of the cypress tree: we "are able to experience a new entity" (Harman, 2018, p. 73). More widely then, a creative or speculative gesture, of imagining something to be a certain way, is the only way in which its interiority might be encountered.

There is a theatricality to such a speculative gesture. Harman explains that through such a metaphorical projection, we are not in fact "digging down" through the phenomenal, sensual object into its real noumenal core, since we cannot actually access that. In fact, we are building upwards from ourselves, "as the real object that embraces the quality of the flame" (2018, p. 83), as we replace the real, and inaccessible, cypress:

> ""*Even though every image we encounter gives us just an outline or a shadow of the inwardness of the thing itself, I myself am fully invested in all these experiences, and inwardly invested rather than as a shadow or outline of myself. I myself am the sole real object in all experience, encountering any number of sensual things, though the tension between these real and sensual poles becomes explicit only in art*"
>
> *(Harman, 2018, p. 85)*

Harman argues that this is what an actor does when adopting the role of a character, that they try "to become the object [they portray] as nearly as possible." (2018, p. 83) This means that to approach any understanding of another being is as an embodied and performative act of speculation: to experience within yourself what it is to be that thing. I have explored and will continue to explore this idea of speculative performativity in inhabiting and imagining other ways of being, and of future-making.

Speculative Design and Object-Oriented Ontology

The potential of this Object-Oriented Ontology perspective on the interiority of other beings has been explored in speculative design practice, and is particularly relevant to More-than-Human Design. In his book Alien Phenomenology (Bogost, 2012), the OOO theorist Ian Bogost explores this potential by suggesting ways in which we might come to know alien, or more-than-human entities. Bogost frames the approach of Ortega described above as Metaphorism and also suggests Ontography, as a technique of creating lists of objects without hierarchy or structure; but the technique he describes as Carpentry is the most relevant and fruitful for speculative design.

Bogost's Speculative Carpentry is a material engagement with the ideas of Object Oriented Ontology, in which artefacts are constructed, or carpented, that can "reveal clues about the phenomenology of objects," (Lindley et al., 2018, p. 4). While unable to truly access their internal reality, such artefacts allow for a "rendering satisfactory enough to allow the artifact's operator to gain some insights into an alien thing's perspective," (Bogost, 2012, p. 91). There is the possibility through these artefacts for an embodied and material engagement with other, more-than-human beings, and "to investigate non-human ways of encountering the world," (Pilling & Coulton, 2021, p. 6)

Franziska Pilling and Paul Coulton drew on Bogost's work in a speculative design practice they term *Diegetic Carpentry*. Their work used design fictions to make "the intangible and complex qualities of AI and data into materials to design with while providing generative and analytical tools to design for nonhuman things." (2021, p. 12)

They describe Diegetic Carpentry as the:

> *'making of things that explain how things make their world. A practical philosophical method to reveal the phenomenology of things. An intuitive method for design given its tangible, hands-on approach to a problem. Carpentry fabricates artifacts as a 'mediator' between things to expose the thing's ontology.' (Pilling & Coulton, 2021, p. 9)*

In conclusion, speculative design offers a powerful way in which to materially engage with what it might mean to be other, more-than-human beings, and experience the world from their perspective.

Anti-Solutionism

As has been discussed, as a design practice, speculative design is a materialised form of speculative fiction, using design to tell stories about different futures, different worlds. This aspect of speculative design is often referred to as Design Fiction: "design fictions involve the appropriation and manipulation of the cultural forms of design and fiction, creating a discursive space within which new forms of cultural artefact (futures) might emerge," (Hales, 2013).

The discursive nature of this space is important, and allows speculative design to stand apart from more affirmative approaches to design. Generally, design is framed as a practice that identifies problems and creates artefacts that are solutions to those problems, and it can all too easily fall into the technologically deterministic trap of solutionism. As discussed previously, solutionism results in using design to solve problems that can only be solvable through the framing in which the problem is articulated, which in design practice is generally a capitalistic and technological framing. This tends to disregard the situatedness and relationality of complex systems, particularly the infrastructural materiality in which technological artefacts are embedded. (Morozov, 2014; Richterich, 2024). In the context of the polycrises of the Anthropocene era, this is at best unhelpful and denialistic, and at worst, actively contributing to the worst excesses of extractive capitalism and its effects on societies and the biosphere.

Reframing design as a form of speculative practice and inquiry allows for an active and material engagement with technologically deterministic solutions, in opposition to solutionism. Whereas Affirmative Design produces solutions, or answers, to abstracted problems, speculative design is anti-solutionist (M. Blythe et al., 2016), and problematises inquiry. It produces artefacts that are more explicitly situated and contextual and draw attention to the material networks in which they are entangled. Such artefacts don't provide the resolution of abstract problems, but frames more complex and material ones. As a mode of inquiry, speculative design figures its artefacts as material questions that open up inquiry in more situated and interesting ways (Mitrović, 2016).

Engagement

Drawing on the way that speculative artefacts allow for tangible and material engagements with possible futures, Speculative Design Inquiry can be a fruitful approach for public and community engagement with complex scientific ideas, material realities, and possible futures.

An example of this is the *Material Beliefs* project (Beaver et al., 2009) carried out by the Interaction Research Studio at Goldsmiths, University of London, and aimed at exploring

public engagement with science through a speculative and critical design approach. Funding for this project was provided by the UK's Engineering and Physical Sciences Research Council. *Material Beliefs* allowed speculative designers and social scientists to work with scientists and engineers to develop speculative prototypes, exhibitions and debates exploring emerging technologies in biomedicine and cybernetics and the implications these might have for wider society. The project was motivate by the ambition to engage the public and to "move scientific research out of laboratories into public spaces," (Beaver et al., 2009).

Tobie Kerridge reflected on this project—in which he was a participant—to explore the synergy between speculative and critical design and upstream engagement with science and technology (upstream engagement being engagement with the public at an early stage in scientific research, potentially helping to guide and shape the research itself). The overall conclusion that he reached was to "contend that this mixing provides an opportunity to foster a reflexive and empirical account of speculative practice, to engage in analysis of the organisations and settings that support a speculative approach, and to provide a critique of upstream engagement," (Kerridge, 2015).

Speculative design approaches have also been used to engage publics in policy development; they were used as part of a successful engagement project to develop public policy strategies for an ageing population, run by the UK Government Office of Science. When reflecting on the project, the designers considered that "these methods take on the deliberate assessment of certain future scenarios, acting both as a form of public engagement and a means of capturing public responses—enthusiasm, reluctance, insight—in a way which is legible to policymakers," (Voss et al., 2015) (See Figure 15).



Figure 15 : Speculative Design and the Future of an Ageing Population

The UK Government Office for Science used speculative design workshops to engage the public in considering how a future with an ageing population might be; these images are possible scenarios for work and transportation that were created as diegetic props for discussion. (Voss et al., 2015)

UK Government Office for Science

3.1.5 Speculative and Collaborative Game Design

In this section, I consider a specific area of speculative design that focuses on the design of games, whether explicitly as speculative design artefacts themselves, or as a means to facilitate acts of speculative fabulation and designing.

Games have a strong affinity with speculative, fabulative and imaginative practices: they are inherently playful, and they encourage the suspension of disbelief (thus allowing people the permission to embrace speculation and the weird or implausible ideas that it leads to), they allow for the abstraction of complex ideas and processes, and they can encapsulate whole fictional worlds within their narrative and ludic structures. I first consider speculative design games as a wider category, before going into more depth about collaborative storytelling games, which frame the design of the *Strange Strangers in Strange Lands Playset* and the reflections on it in following chapters.

Speculative Design Games

"Explorative worlds produced by games [have] much to offer over the traditional mediums of speculative design due to their inherent interactivity through which players can explore the complexity of the wicked problems society faces through play."

(Coulton et al., 2016, p. 1609)

The use of games within speculative design has been discussed by Paul Coulton, Adrian Gradinar and Daniel Burnett, who suggest that speculative design games can provide a "subversive and irreverent space," (2016, p. 1610) that gives players have the permission to play, and in which they can "rehearse alternative presents and speculative futures," (2016, p. 1609). Games, they argue, have an advantage over more static diegetic and speculative objects as a means of engaging people in fictional elseworlds because they are playable; they can be interacted with. More static diegetic prototypes are "not interactive, which means their purpose can be misinterpreted through simply viewing," (2016, p. 1612); this recalls Cameron Tonkinwise's argument that the power of diegetic prototypes or props to engage with futures "does not come from contemplating a removed museological object (…) it is because you must play with them, performing in improvisatory way," (2014, p. 186).

Speculative design games might draw on other forms of game design that collectively might be considered as "art" games, "games [not] purely for entertainment or education" (2016, p. 1615), but to engage people with ideas. This might include *Critical Games*, which operate much like critical designs, in that they are games that critique both social and cultural norms, and games

and the gaming industry itself, and *Persuasive Games*, that use gameplay to reveal to players the inner workings of complex systems and social issues, thus allowing them to understand and debate them.

To frame games as a form of speculative design, Coulton *et al* suggest that there are certain characteristics that they might usefully possess: they should **allow for pluriversal realities**, to allow players to consider alternative viewpoints and enact different worldviews; they should be plausible, presenting a convincing diegetic reality that allows players to suspend disbelief and engage with the fictional world; they should combine diegesis (the creation of fictional narratives) with mimesis (players' enactment of fictional realities)—or, in terms of the framework, **combine storytelling with play and performing**—to be more impactful; they should allow for **iterative activities** and player feedback to allow for reflective practices; they should **avoid reductionism**, instead aiming to engage with complex, or wicked, problems; and they should aim to be **reflective, rather than persuasive**, encouraging users to reflect on how to proceed rather than persuading them of a particular course of action.

In the next section, I consider some of the characteristics of games in general, and of collaborative storytelling games in particular, that might allow them to afford speculative design practices, and which are relevant in the development of a Biodiverse Speculative Design Playset.

Collaborative Storytelling Games

In this section, I discuss some of the features of games—in particular, role-playing and storytelling games—that make them well-suited to meet the requirements of the *Strange Strangers in Strange Lands Playset*, and of speculative practices in general. I discuss these in some detail here as they form the basis of an analytical reflection on the design of the Playset in the conclusion to Part 5.

While much of this section concerns games in general, I am giving a particular focus on collaborative storytelling games. I draw on references that specifically concern table-top role playing games (games such as *Dungeons and Dragons* (Gygax & Arneson, 1974) that are narrative games, played in a group, with players adopting character roles within the game narrative), however, not all storytelling games involve role-playing, so I adopt a definition of collaborative storytelling games by borrowing from Devi Acharya and Noah Wardrip-Fruin: "games in which the player co-creates through the manipulation of the game world, creating a shared and persistent world in the process," (2019, p. 1).

Queering collaborative storytelling games

Collaborative storytelling and role-playing games have a certain affinity with queer culture, drawing on the notions from queer theory of the performativity and fluidity of identity roles,

and being a practice of creation of alternate worlds, or heterotopias, that parallel the queer spaces that Munoz has described. In *They Came to Slay : The Queer Culture of D&D* (2022), Thom James Carter gives a personal account of the queer culture of *Dungeons and Dragons*, the archetypal collaborative tabletop role-playing game, and "the game's potential for queer people" (2022, p. 3) which "provides you with the ability to create the worlds you want to create, and gives you the freedom to be whoever you want to be in those worlds," (2022, p. 60).

He emphasises the importance of role-playing, of performing as a game character, in bringing a game to life and creating a rich world within the confines of rules and game mechanics, and the importance this can have for queer players:

> *"It's roleplay where you become your character—or they become you. For queer people who are playing dungeons and dragons in an exploratory manner when it comes to identity, roleplay can offer players the opportunity to voice either their or their characters thoughts, emotions, wants and wishes, ultimately giving the player a chance to trial and test how the textures of those things feel upon vocalising or perhaps doing them,"*
>
> *(Carter, 2022, p. 64)*

This queer sensibility of fluidity and performativity, and of finding worlds where one might better feel at home, is an important part of what makes these games fruitful and relevant to speculative design research. Carter suggests that a collaborative storytelling game such as *Dungeons and Dragons* "can be a playground to trial or test aspects of queerness if you so wish," (2022, p. 60); taking this wider, it can offer a space for prototyping different worlds and possible futures and having a performative presence within them.

The following sections consider some of the key aspects of collaborative storytelling games, and how they work to allow the creation of shared fictional worlds or futures: **Simulation**, **Framing**, **Collaborative Worldmaking**, **Abstraction**, and **Suspension of Disbelief**.

Simulation

The ability for collaborative storytelling games to create stable fictional worlds in which players can be present and interact lies in one of the fundamental qualities of all games, whereby they create and act as a bridge or access point to fictional worlds: ***Simulation***. Whether those worlds are represented physically (e.g. in Live Action Role Play, or LARPing, where people act out fictional game narratives), realistically (as in modern video games, such as *No Man's Sky* (Braham & Bourn, 2016)), symbolically (as in Chess) or, as is often the case in tabletop storytelling games, within the "theatre of the mind," (Acharya & Wardrip-Fruin, 2019), games can simulate a fictional reality. Thus games can have a dual reality, being both assemblages of real world artefacts, rules, texts and players (described by Jesper Juul as "game rules" and by David Jara as

"framings," (Jara, 2023)) as well as fictive worlds which, within themselves, have their own reality (Juul refers to these by "game fictions", Jara by "diegesis", but they could also be "fictional worlds," "elseworlds", or, in the discourse of speculative worldmaking, "fabulations" (Jara, 2023)). In particular, table top role playing and storytelling games "allow for the construction of highly complex, collaborative and interactive narratives," (2023, p. 51).

Diegetic Void

> *"The existence of these fictional worlds, written without their stories, is an invitation for stories to happen."*
>
> *(Henry, as cited in: Jara, 2023, p. 52)*

The diegesis is not simply a text inherent within the game, but it has to be performed, created through the playing of the game itself (as Haraway and Barad would see it, this makes sense, things only coming into existence through their playful interactions with other things). As Jara puts it, "the diegesis only emerges during the actual playing of the game," (2023, p. 52) with the game and its framings otherwise surrounding what he has described as a *Diegetic Void*. The game is "a text (…) imbued by the possibilities of the imaginary. It is only during gameplay that this fictionalising act is completed," (2023, p. 52).

Access to, and (at least where storytelling games are involved) creation of these diegeses—fictional worlds—is mediated through their games; in this section, I focus on four aspects of games that play a role in the creation of, and mediation of access to, fictional worlds, and that are relevant for this project: framing, collaborative worlding, abstraction and suspension of disbelief.

Framing

In a paper which explores the role of framings in tabletop role playing games (but in the context of which I am considering storytelling games more widely as games that "allow for the construction of highly complex, collaborative and interactive narratives," (Jara, 2023, p. 51)), David Jara introduces the literary concepts of Framing Devices (***Framings***) and Paratexts from literary theory; he describes how Werner Wolf established framing devices as elements that form part of communication outside of the "main" fictional text, but that precede the text, providing information on how the text should be read, providing frames of reference and interpretation, and assigning it meaning.

Both Wolf and, following him, Jara draw a comparison to Gerard Genette's concept of the Paratext, which Genette defines widely as virtually everything that exists external to the text—including the author's name, footnotes, illustrations, the context in which it was created—which "ensure the text's presence in the world," (Genette, as cited in: Jara, 2023, p. 41). Genette

emphasises that Paratexts have such an influence on the reception of texts that they are a powerful tool for an author to "influence the way in which a text is read," (2023, p. 41). Wolf has suggested that Genette's definition of the Paratext is rather too broad to be useful—that it could in principle include any part of the context in which the text exists, such as the pen used to write it—and redefines it as a category of framing device: a form of textual framings that are part of a work but that lie on the borders of the fictional diegesis. Paratextual framings are liminal devices that have an introductory function forming "a threshold to the main text of the work in question [and that] guide and control interpretation within the abstract cognitive frames presented by fictional texts," (2023, p. 41).

Jara argues that there is a complex and "unconventional" relationship between paratextual framings in storytelling and role-playing games "and the narratives created during game-play," such that they don't simply give readers interpretive cues on how to read a fictional text. Instead, games have a system of framings that *precede* the existence of the texts and are instrumental in their ongoing co-creation by the players, guiding player interpretations and expectations of the narrative, and so are "decisive for the subsequent production of text," (2023, p. 41).

Jara identifies three types of framing devices for storytelling games. There are **Rules, which** determine how the game is to be played in the real world: "rules specify limitations and affordances. They prohibit players from performing actions and this affords players meaningful actions… rules give games structure" (Juul, as cited in: Begy, 2013, p. 2). There is **Setting Information**, which is the elements that provide a frame of reference for the fictional world, such as where or when the game narrative is set, and includes genre, theme and mood. And there are **Meta-Framing Devices**, the elements of the game as a designed artefact, which could include the physical design of the game and game objects, illustrations, and framing and embedded narratives within the game (Jara, 2023).

The power of this system of paratextual framings from the perspective of game design, highly relevant to the aims of this project, is what Genette had understood as a means for the author (the game designer) to "influence the way a text is read," (Jara, 2023, p. 41) —or in this case, created. Framings "establish a worldview that directs the game action and represents the implicit philosophy or ideals by which the world operates," (Fine, as cited in: Jara, 2023, p. 51), as well as affecting "the interpretation players make of diegetic events," (2023, p. 52).

Although the framing devices of a game create a diegetic void into which a fictional world is only created by playing the game, the ability of framings to qualitatively shape the emergence of the narrative means that void isn't truly empty; it can be considered a *Semantic Blank* containing a system of meaning which guides and shapes the emerging narrative (Jara, 2023). Game framings are artefacts that "enable the visualisation of potential diegeses," (2023, p. 52), as well as directly impacting on the fictional world.

In the context of the development of a design Playset, the ability to frame the creation of diegetic futures through the paratextual elements of a game such that it can be imbued with worldviews and philosophies, and given particular genre, tone and themes, could be an important element in mediating a relationship between the speculative framework and the creation of futures.

Collaborative Worldmaking

While the framing devices of collaborative storytelling games create the conditions for the creation of fictional worlds, Devi Acharya and Noah Wardrip-Fruin have argued that these "merely serve as guidelines to facilitate the collaborative world building process," (2019, p. 2). They are potentialities—provocations and lures for possible stories— but "it is only during gameplay that this fictionalising act is completed," (2019, p. 2). In collaborative storytelling games, this is an act of multiple authorship, shared between the game designers who set up the framings (which, existing prior to the diegetic narrative, play a significant role in shaping player expectations and the nature of the narrative) and the players of the game, who create narratives through a process of collective negotiation. Acharya and Wardrip-Fruin propose that players "take on a dual role as a player within the game world and maker of the game world," (2019, p. 2), which is especially the case in role-playing games, where aspects of the players exist within the diegetic narratives as characters.

Acharya and Wardrip-Fruin created a model to explore how games can facilitate this multi-authorial process of collaborative worlding, in which the game designers use framing devices to set up the initial conditions of the fictional world, and "players interact with one another and with the world to collaboratively change the world over time," (2019, p. 1), a process characterised by Jara as a "constant interpretive loop between diegetic and game frame" (2023, p. 44). According to this model, the fictional narratives of collaborative storytelling games tend to be: **Player-Determined**, such that the decisions of players determine what exists in the fictional world); **Adaptable**, whereby the world can be altered according to the desires of the players', since "the game world primarily exists as a shared artefact in [their] imagination," (Acharya & Wardrip-Fruin, 2019, p. 2); and **Moderated**: as well as a set of rules and framings, there tends to be a player who adopts a moderator role—often referred to as a games master (GM)—who interprets and enforces the rules and shapes the narrative, providing a source of authorship that is an interface between the framings of the game (and the designers who created it) and the players who are generating the diegesis.

Collaboration and Win Conditions

A collaborative or co-operative game poses an interesting conundrum regarding the win conditions of the game. Win or victory conditions are the game events that need to occur in competitive games to identify the winner of the game; by and large, the win condition is the

ostensible goal that players are striving to obtain, the ostensible reason for playing the game. Without such a trajectory towards a conclusion, engagement with a game and its fictional narrative may be reduced. For games that emphasise collaboration over competition, such a victory condition would likely go against the ethos of the game, but without it, the game may lack a dynamic thrust. I reflected that this could be solved either through competitive win conditions that give players individual goals, or the ability to accumulate some token of value, alongside a greater collaborative goal, or by framing the win condition as a goal that needs to be achieved collectively as a group.

Abstraction

The ability of games to manifest a simulated or fictional reality, and to mediate interactions between that reality and the players of the games through their framing devices, is made possible through the use of abstraction. ***Abstraction*** is a process of simplifying concrete specifics to general concepts and approaching the essence of an idea. The use of abstraction is powerful, allowing a game to represent complex worlds, beings, and interactions within simpler game objects and mechanics.

An exploration of the possibility of a game to abstractly encapsulate complex worlds can be seen in the novel *The Player of Games* by Iain M Banks (Banks, 1988). Part of his series about the anarchic post-scarcity society known as the Culture, the novel sees the protagonist sent to a distant authoritarian empire called *Azad* to play a complex game, also called *Azad*; he soon discovers that the game and the empire share a name as the game IS the empire. The game is not in itself a simple one, involving many different stages, boards and playing pieces, but it represents a microcosm of the entire Empire of *Azad*, encapsulating its values, philosophies and power dynamics. As such, the periodic tournaments of the gameplay the political role of an election and determine the entire power structure of the society, with the winner of the game becoming Emperor.

Abstractions allow for game objects and mechanics to take on dual roles, existing with a dual reality within both the game frame and the game fiction, and mediating player actions between them.

Jason Begy makes a detailed study of abstraction in games to propose a critical framework for analysing purely abstract games (2013); while he concerns himself with abstract games as a specific *category* of games, I have found it to be a frame of reference for considering abstraction as a *quality* shared by all games to a greater or lesser degree, and for understanding how abstraction operates in games in general. According to Begy, abstraction in games can be understood to operate through *Modal Semiotics* and *Structural Metaphors*.

Modal Semiotics

In simple terms, semiotics refers to the use of signs, that is, one thing (such as a word, an icon, an object) representing another. Generally, a sign can be thought of as two parts, the signifier (the entity doing the representing) and the signified (the entity being represented). Signs can involve different forms of representation; these forms are sign modalities. Begy discusses the three sign modalities identified by Charles Sanders Pierce: iconic, indexical, and symbolic. In iconic signs, the signifier resembles the signified object, representing it through imitation (e.g. a drawing of a lemon to represent a lemon); in indexical signs, the signifier does not resemble the signified object, but "is not arbitrary (…) it is connected to it in some way," (Pierce, as cited in: Begy, 2013, p. 2) (e.g. the colour yellow to represent a lemon); and in symbolic signs, the signifier does not resemble the signified object, and is only connected to it in an arbitrary or conventional way (e.g. the word "lemon" representing a lemon). Signs can be understood only through a system of codes (i.e. codified correlations of signifiers and signified objects), which allow them to be decoded or interpreted by the 'reader'. In games, these codes may be both part of the rules and framing devices of the game, as well as wider cultural and conventional codes of signification.

Abstraction in games can be understood by considering game objects as signifiers of other signified objects, whether at the level of game-framings, or within the diegesis itself. Signification allows simplifications and representations of these signified objects to stand in the stead of the real object; when considering the level of the diegesis, a game object such as a playing piece may simply be a shaped piece of wood in the real world, but may represent a person in the game world (Begy, 2013).

Begy—who concerns himself with purely abstract games—defines abstract games as those where the game object's existence within the game fiction is as a symbolic representation of a signified object or is not a representation of anything; that is, within the fictional game world, the game objects are arbitrary or conventional representations of something within the diegesis, or are not intended to represent anything at all. He gives the example of the traditional game GO, which involves moving coloured stones around on a grid. Within the game fiction, these stones are not supposed to represent anything, they're simply playing pieces; therefore, GO is, by his criteria, an abstract game. Chess, on the other hand, he judges to not be an abstract game, as it uses iconic signification at the game fiction level, as chess pieces resemble the objects, such as kings and castles, that they represent (though at the game framing level, the representation is symbolic, as the rook, or castle, piece moves around according to the rules, and castles do not typically move; the movement of the pieces is symbolic of having to make tactical decisions regarding soldiers, priests, rulers and buildings during a battle) (2013).

My interest here, though, is in abstraction as a *quality* of a game, rather than as a categorical definition—that games can be more or less abstract than one another. Abstraction being the reduction of a complex and situated entity into a simpler generalised representation, I suggest that the continuum from less to more abstraction is one from game objects that more closely represent elements within the diegesis or the framing devices to those that less closely represent it: that the degree of abstraction in a game depends on a continuum of game object signification (whether at the level of the framing or of the game fiction) from iconic, to indexical, to symbolic, to arbitrary and conventional.

According to this, I'd argue that chess is a game that demonstrates high abstraction: that while its pieces iconically represent potential combatants in a pre-industrial battle, the way that they move around the board and portray a battle between two armies is simplified to specific movements and engagements that only somewhat resemble the reality of such a war through indexical and symbolic representations; compare this to a video game like *Call of Duty* (Arem, 2003) which is much less abstract, representing soldiers and their movements in a way that is much closer to real life, or further, to Live Action Roleplay (LARPING) games where players physically dress up and perform acts of simulated combat, still governed by rules but much more recognisably representing a battle than moving stylised pieces around a playing board. Yet, given that, a game of chess is still understood as a representation of a battle.

Projection of Structural Metaphors

This ability for abstracted game systems to be recognised as representing fictional realities can be explained, *per* Begy, through the metaphorical projection of *Structural Metaphors* (2013). Metaphorical projection is the understanding of one domain of experience in terms of another different domain, "made possible by structural similarities between the two [and relying on] systemic correlations" (2013, p. 6) between them. Such structural and systemic correlations can be understood as structural metaphors, which George Lakoff and Mark Johnson define as the use of "one highly structured and clearly delineated concept to structure another," (Lakoff & Johnson, 2003, p. 61), where in some way the domains share some structural similarity.

Gestalts and Image Schema

Structural metaphors are understood through "image schema", defined by Johnson as "a recurrent pattern, shape, and regularity" used as "structures for organising our experience and conception" (Johnson, cited in: Begy, 2013, p. 6). These schemas are often experienced as gestalts, when one perceives an assemblage of elements as a singular entity rather than their constituent parts (i.e. as more than the sum of their parts). In this way, we can understand a complex concept in terms of another unrelated thing not only because it's structurally similar but because our perception of it is similar. Therefore, this can explain how a series of abstractions represented by game objects can come to be understood as a different, fictional reality.

Suspension of Disbelief

So far, this discussion of the elements of games that allow them to invoke fictional worlds has focused on the process by which this can be made possible: framings which create a space and shape for emergent diegeses; mechanics that allow for players to collaborate on the creation of them; and systems of abstraction that allow the representation of complex realities through simplified game objects and mechanics that can be perceived through the metaphorical projection of structural metaphors.

However, consider that games are often described as a form of "make-believe". These features of games may explain how these fictional worlds can be made, it doesn't explain how they can be made *believable* for players, to allow them to make the leap from understanding it as a concept to feeling it to be real. Ian Bogost characterised this gap between concept and feeling as a *Simulation Gap* "between the rule-based representation of a source system and a user's subjectivity" (Bogost, as cited in: Begy, 2013, p. 9); it doesn't take a great stretch of metaphorical projection to understand this as a close cousin to the concept of the diegetic void, a gap within the framework of the game that has to be entered with a willing suspension of disbelief.

Suspension of Disbelief, a term originally coined by Samuel Coleridge Taylor (1817, Chapter XIV), is a concept whereby a reader of a text both willingly enters into believing in the reality of a fictional world, and has the experience of that world as being "real"; in terms of (video) games, Douglas William Brown has defined it as "the voluntary, temporary creation in response to textual stimulation of an imaginative space that transcends the text," (2012, p. 87). Brown asks "what might [it] mean to suspend one's disbelief when playing a game?" (2012, p. 8).

Experiential Metaphors

I interpret this question as asking what it might mean to experience the game fiction as real, not as fiction. Begy has described this as the *Affective Dimension*: "the experience of playing a game (…) how it feels to play [it] or how it makes us feel" (2013, p. 5). It isn't an intellectual experience, but an emotional one.

This affective dimension of playing a game can be understood through the concept of gestalts, particularly through what Begy has described as an *Experiential Gestalt*: "a collection of elements or attributes that characterise an experience and allow us to comprehend that experience as a structured whole," (2013, p. 7). Applying this concept to games, experiential gestalts emerge as the feelings engendered by encountering and playing a game as a whole, rather than the effects of its individual components. Such a holistic feeling from playing a game plays an important part in the suspension of disbelief.

Experiential gestalts allow for the projection of a particular type of structural metaphor: an *Experiential Metaphor*, which Doris Rusch has defined as "the phenomenon of understanding a gameplay experience as a physical visualisation of abstract ideas such as emotional processes or metal states," (Rusch as cited in: Begy, 2013, p. 8). Rather than just perceiving one gestalt as being similar to another, in experiential metaphors, what one experience feels like can be understood in terms of another experience from an entirely different domain which feels the same. With his focus on purely abstract games, Begy argues that such experiential metaphors allow for an emotional engagement with a game that doesn't actually represent anything by having an emotional experience that is familiar from elsewhere: following Rusch, he gives the example of the video game Tetris, where falling blocks that continually build up into unmanageable piles provide an experiential metaphor for what it felt like to be an overworked office worker in the hypercapitalist 1980s (2013). Begy argues that this process of projection of experiential metaphor explains how abstract games become emotionally engaging. I have been considering abstraction as a quality that all games possess; therefore, for any game to be emotionally engaging, this framing of experiential metaphors suggests that all of a game's abstracted elements—game objects, game framings, fictions, the players themselves—must not only be perceived as representations of a fictional reality, but actually feel like that reality to the players. Through this process of "feeling alike", the simulation gap (the diegetic void) is crossed, and the fictional world is made affectively "real".

Permission to Play

Suspension of disbelief is an important feature of gameplay, particularly in the context of this research, in that it offers "permission to play", a "safe space" in which one is invited to make-believe and fabulate about strange and unusual worlds. Part of the experiential gestalt of playing a game is allowing oneself to cross from the reality of the present, through the game's liminal boundary conditions, into an imaginative and playful space. This holistic reality of the game experience was described by Johan Huizinga as the *Magic Circle*, an opening for play with "its own proper boundaries of time and space" defined by the framing devices of the game (Huizinga, as cited in: Brown, 2012, p. 16).

More recently, Katie Salen and Eric Zimmerman presented the experience of playing a game in terms of the magic circle: "beginning a game means entering into the magic circle. Players cross over this boundary to adopt the artificial behaviours and rituals of a game. During the game, the magic circle persists until the game concludes. Then the magic circle dissolves and players return to the ordinary world," (Salen and Zimmerman, as cited in: Brown, 2012, p. 83). Huizinga believed that part of the "magic" quality of the circle is that the diegesis persists in the real world after the circle dissolves, such that "with the end of play its effect is not lost; rather it continues to shed its radiance on the ordinary world outside" (Huizinga, as cited in: Brown, 2012, p. 16). This aspect of the magic circle is particularly interesting in terms of this research,

which is concerned with how, through design, diegetic futures might be made to persist in the real world; I use the term *Diegetic Escape* to refer to this property of speculative fabulations. Brown further argues that suspension of disbelief is not only afforded by entering the magic circle, but that to do so is *compulsory* in order to be able to play the game: if you cannot engage with its reality, the gestalt of the game falls apart, and it simply remains an assemblage of game objects and framing devices, rather than a simulation of a fictional world (2012).

3.2 Design (as) Research

This chapter considers how design can be framed as a mode of research inquiry. This project falls broadly under the category of practice-based research, more specifically as a form of Research through Design, so the chapter begins with an overview of these sorts of research practices, including the concept of research-creation. I then move to more specifically consider speculation and speculative forms of research; previous chapters have explained some of the rationale and philosophy behind speculative practices in design and other domains, but in this chapter, I will focus on the particular forms this research approach can take in practice.

I then move to consider how theory is situated within practice-based Research through Design, starting from a consideration of how these practices are situated ontologically (how the world is constructed in their manner of being) and epistemologically (what forms of knowledge they represent). I particularly consider how design knowledge is situated, cumulative, and often theoretically underspecified; this leads into some perspectives on what can constitute theory in design. The chapter then concludes with a consideration of the question of validity: how is it that theoretical knowledge that emerges through practical and designerly research offers value, and how can this value be understood?

3.2.1 Practice-Based Research

Practice-based research is a form of research that is often carried out within creative industries and practices, such as in design, art and performance-based practice. While all forms of academic research involve some form of "practice"—conducting biological experiments on cells, interviewing people, collecting data, collecting and recording archaeological finds, measuring eye movements when using a website—this practice is generally aimed at generating or obtaining knowledge of some form. By contrast, in research that is practice-based, the practice itself is, somewhat reflexively, the knowledge that is being obtained. That is to say that the contribution to knowledge produced by practice-based research is not simply illustrated by or explained by any artefact that is the output of the practice (a dance, a device, a painting, a board game) but is embodied within the artefacts themselves.

Linda Candy gives a comprehensive overview of practice-based research in relation to doctoral research, where she explains that "the critical difference is that practice-based research aims to generate culturally novel apprehensions that are not just novel to the creator or individual observers of an artefact; and it is this that distinguishes the researcher from the practitioner," (2006, p. 2). Candy draws a distinction between two forms of research through practice, practice-based and practice-led. Practice-based research "is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice, "

(2006, p. 3), while practice-led research "is concerned with the nature of practice and leads to new knowledge that has operational significance for that practice," (2006, p. 3). From the perspective of doctoral research, practice-led research uses practice to obtain an understanding about the world, and can be documented textually without the inclusion of the artefact itself; practice-based research uses practice to create an artefact that itself constitutes new knowledge, and, while it needs to be annotated and contextualised, the artefact or creative outcomes must be included as a "full understanding can only be obtained with direct reference to the outcomes," (2006, p. 1).

As will be explicated throughout this thesis, this piece of research has at times leaned more towards being practice-based, and at times towards being practice-led, with the outcomes in some instances embodying contributions to knowledge, and in others, offering insights on and for design practice. In general, though, the research has been situated within forms of design practice, and can be considered a form of Research through Design.

3.2.2 Research Through Design

Where practice-based research is manifest within design research, it can be defined as *Research through Design*. Design theorist Christopher Frayling defined three separate modes of design research: *Research about Design*, *Research for Design*, and *Research through Design*. All three modes of design research are carried out in different ways, for different reasons, and with different sorts of outcomes (Frayling, 1993). They differ particularly in their level of engagement with design practice itself. Research about Design is at the level of least engagement with design practice, essentially studying it from the outside as a cultural or social or aesthetic practice. It largely does not involve carrying out any design practice or generation of artefacts, but instead produces insights about design, that is, it creates new knowledge of the nature of design: how it operates as a culture and a practice, or the cultural significance of a particular designer or design style.

Research for Design is oriented towards design as social practice: as an industry, or an educational discipline, or a community. Its main aim is to generate insights for design practice: it creates new knowledge of use to designers, such as new modes of practice, or pedagogical approaches in design education, or design process models. It is a form of practice-led research, carrying out design activities that have "operational significance" for design practice. Research through Design is situated at the level of design practice, but isn't "about" design as such. Design and designed artefacts are the forms of knowledge produced, are the methods of generating knowledge, but the knowledge isn't about design or for design necessarily. It is knowledge obtained through doing design, through making artefacts. Research through Design creates new knowledge about something through the practice of design. Design is not the topic of interest, but the means of studying another topic (Frayling, 1993). In a comprehensive review of the

Research through Design discipline, which I have used as a key orientation text, Danny Godin and Mithra Zahedi explain that "Research through Design's goal should be [...] knowledge and understanding, but this knowledge and this understanding result from the making of an artefact [and] that is embodied in the artefact created or designed," (2014, p. 10).

3.2.3 Onto-Epistemology of Design Research

Two important considerations about any form of research are how the world is constructed within its practice (ontology) and what forms of knowledge about this world they can generate (epistemology). As discussed, these are inseparable and mutually constitutive properties from the perspective of the Ontological Turn, Post-Structuralism and New Materialism, and so are better considered as onto-epistemology, though this section explores them in separation.

Ontology of Design—What is Design's Worldview?

Ontology is a metaphysical concept of the nature of being, of what exists, what existence is, and how the things that exist are constituted and relate to each other. There are a myriad of ontological positions, from the spiritual to the philosophical to the scientific and empirical, about the nature of what the world is, all of which are simply models of explanation of the world that reflect the interests, values, and lived experiences of those that hold them. Each ontology has certain aspects of the world or reality that are modelled differently, or in ways that can make them more or less accessible to thought and practice, related to what is held to be most important within that ontological structure.

Practice-based, speculative design research is characterised by an engagement with possible futures through the process of design, and generating design artefacts.

It is useful to make a contrast with scientific research, which is generally considered to be oriented towards a reality that pre-exists observation, in which empirical observations are made that reveal the pre-existing world as it is, which could be thought of as 'truth'. Design practice is, by contrast, oriented towards changing the reality of the world, by proposing new artefacts that could exist and materialising them. Practice-based design research is thus a form of research where engaging in design practice and theoretical research are a symbiotic process, aimed at providing an understanding of a possible future through the act of design. As a design practice, it concerns itself with the artefacts of design, therefore it is oriented not to what is true, but what is (materially) real. Further, Research through Design is oriented towards not just what is currently real, but what could be real in possible futures. Ontologically, the reality of Research through Design is the world that could, will or even should be (Godin & Zahedi, 2014). This is particularly explicit in speculative forms of design research. Ivica Mitrovic describes speculative design as a discipline that "envisages and anticipates the future, at the same time helping us to understand and re-think the world of today," (2016, p. 8).

Epistemology—What can we Know Through Design?

As a discipline that orients towards the prospective real, it is important to understand the sort of knowledge that can be obtained through practice-based speculative design research. Godin and Zahedi highlight the challenge posed by research that aims to find knowledge about a future reality that will be created by the design research process itself: how can a yet to exist reality be made knowable? (2014).

They argue that it can be made knowable through the design process itself: that constructing artefacts helps the development of theory, and the understanding of the world it creates. They draw a parallel to the concept of constructionism in learning. Seymour Papert proposed constructionism as an elaboration of Jean Piaget's constructivist conception of learning. The constructivist position is that the learning brain does not simply absorb knowledge about the world, but constructs knowledge based on experience; Papert takes this further, suggesting that learning is most effective when it involves actual construction, of physical things or creative ideas. In the same way, then, Research through Design is a form of learning through doing; one learns about the world that one is creating through the process of creating it (Ackermann, 2001).

Godin and Zahedi (2014) discuss that Wolfgang Jonas has suggested that Research through Design closely resembles two qualitative research methods from the social sciences: *Action Research*, and *Grounded Theory*. Action Research is a research methodology which is driven by active engagement in a research space, where the researcher actively pushes to change the situation while simultaneously generating insight into the situation that they are changing: this is often practiced by researcher-practitioners in social and political situations, but the parallels to a form of research situated in design practice are clear. Grounded Theory, on the other hand, doesn't act to change a situation, but to derive theory from inductive observation by coding and categorising data, generating theory, and gathering more data within the developing theoretical framework. Again, this approach has a resonance with Research through Design. Both theories share an iterative and situated posture that is applicable to generating knowledge about a future world that is being invoked through the practice of design.

Characterising design knowledge

Knowledge from practice-based design research can be characterised as situated, generative and cumulative, and theoretically underspecified.

Situated

Situatedness is the quality of existing within a particular and specific context. Design situates itself in the world through artefacts, and these artefacts are proposed, designed, made, distributed, used and destroyed in actual, specific contexts. This has implications for what can

be known, and in particular, what can be generalised about design knowledge. If an artefact is designed for a specific reason, in a specific context, it could well be perfectly suited for that situation, but with a different context, it may prove ill-suited. Therefore, it can be hard to make generalisable theories based on the empirical knowledge of the artefact in its context of use. The concept of 'scale', so popular in Human-Computer Interaction, where a single artefact can be used to generate a general principle which can be used to deploy a design approach in a larger setting, is problematic when considering the situatedness of design knowledge (Gaver, 2012).

Generative and Cumulative

Design practice is not a practice that seeks to find or generate truth about the world. However design might be defined—as a means of providing a solution to a problem, or proposing a possible future, or as a material provocation of alternatives, or posing a question—there could be a vast number of possible design approaches or artefacts that could obtain the desired outcome. Design is a practice that is generative of multiple things, not one aimed at proving a singular fact. Therefore, the body of design knowledge is one that is cumulative, with myriad examples of things that work. This is in contrast to scientific knowledge, which is convergent, the creation of a body of knowledge which reinforces and validates a theory or a fact (Gaver, 2012; Godin & Zahedi, 2014).

Underspecified by Theory

There is an open question within the design research community whether design should be more 'scientific' in the way it is practiced, and in the way it relates to theory. This research is situated in a perspective that understands practice-based design research to be fundamentally different to a positivistic approach to science in its ontology and epistemology, though with some alignment to other philosophical perspectives on the nature and limits of scientific knowledge. I situate this research in the argument made by William Gaver that the calls for Research through Design to have a standardised theoretical framework—in order to be more "scientific"—both elides the fact that what is considered scientific is not a settled proposition, and that Research through Design has an orientation to theory that is in some ways parallel to science, and in other ways necessarily different. This relates to the generative and situated nature of practice-based design research, and a concept that Gaver described as *Theoretical Underspecificiaton* (2012).

Gaver argues that the human computer interaction (HCI) community, where Research through Design has historically been situated, tends to push for the discipline to become more scientific, to take on a degree of theoretical rigour that allows for the development of abstract conceptual theory that can both be validated and re-applied in other situations. Gaver makes an explicit criticism of this attitude, which he sees as an underlying 'science-ist' preoccupation (that is, an elevation of science-like qualities above others) within HCI (2012).

He discusses two theoretical positions from science and technology studies to both highlight how unsettled the sense of consensus on what is scientific, and to shed a light on how theory emerges through Research through Design. From one perspective, Karl Popper suggested that valid scientific theories cannot be provable, but can only be disproven: the falsification principle. Many points that agree with a theory cannot be proof that it is true, but a single refutation is enough to invalidate it. Critically, only falsifiable theories and claims can be considered to be scientific (Popper, 1934).

However, other philosophers of science, such as Thomas Kuhn and Bruno Latour, disagreed with this. They claimed that it is rare that scientists attempt to disprove a theory; instead, they operate within a social practice, generally within a scientific paradigm with in-built assumptions about the reality of the world, and with specific, narrowly focused tasks to complete. (Kuhn, 1962; Latour et al., 1986). Much of science, in this view, is oriented towards filling in gaps and strengthening existing theoretical assumptions. Within this context, it is difficult to prove that the theoretical assumptions are incorrect, and paradigm shifts to another worldview happen only rarely (and if they do, they happen individually, not cumulatively) (Kuhn, 1962). Bruno Latour suggests that what science does is operate through scientific research programmes which involve a dense network of heterogeneous actors—institutions, scientists, publications, theories, apparatuses, governments, and businesses—not as a way of proving or falsifying a theory, but as a machine to generate reams of new knowledge (1986).

These are two quite different attitudes towards what is scientific; one is rather abstract and idealised, and the other recognises scientific research as a concrete practice in messy contexts. One way to look at it is the distinction between scientific facts and the process of doing science, or between what is and what becomes. Gaver considered how design research might relate to these two perspectives. First, he argues that insights from Research through Design cannot be falsified simply because theories about design practice cannot encompass the complex reality of the process, where there is no single answer to a complex problem. This complexity cannot be easily resolved to a binary theoretical true or false: design is situated and contingent on context, therefore insights from design research can only ever say 'sometimes' this or that thing is true—and one cannot prove 'sometimes' false; therefore, theory 'underspecifies' design (that is to say, a generalised theory derived from a specific design context is necessarily abstracted from that context, and the specific situated reality of the knowledge is lost). Furthermore, it seems to be a false premise to try to understand it in those terms (2012).

Furthermore, as explained above, Design practice and research do not converge on a single truth but are multitudinous and generative. It is cumulative, rather than divergent. It is not a designerly impulse to attempt to falsify design knowledge, since the purpose of design is not to find things that are false (or true) but to make things that are real. There is no single truth of design, simply a multitude of possibilities. Gaver argues that "the goal of conceptual work in

Research through Design is not to develop theories that are never wrong, it is to create theories that are *sometimes right*," (2012, pp. 940–941).

This Theoretical Underspecification means that attempting to use Research through Design to generate conceptual, abstract theory is not useful, because the value of design lies not in a convergence to a single unified theory, but in the multitudinous worlds that it generates. Therefore, it is through taking a reflective and critical account of design practice itself, and in particular the outputs of the design practice—Gaver in particular favours the use of annotated design portfolios for theoretical validation—that Research through Design gains validity; this is much closer to Kuhn and Latour's conception of science as a situated paradigmatic cultural practice that doesn't operate to find objective truths *per se*, but as an industry or community that generates knowledge (2012).

3.2.4 Design Theory

> *"The goals of the designer [are] deliberately to carry out an interpretive act in the course of producing an artefact. As Lev Manovich has publicly phrased it, 'a prototype is a theory'. One of the functions of the artefact then becomes to communicate that interpretation, and to make it productively contestable."*
>
> *(Galey & Ruecker, 2010, p. 406)*
>
> *"There is a specific quality in the designerly way of handling complexity that has the potential to become a useful complement to other kinds of knowledge development."*
>
> *(Dalton et al., 2017, p. 78)*

The question of theory in design research in general, and practice-based Research through Design in particular, is one that is rather thorny, contested and not always clearly defined. Design occupies an unusual space in culture and academia, straddling a series of lines between practical craftwork, speculative futuring, technology, business, and culture. In this section, a consideration is given to a theoretical stance on what is made through practice-based design research, and how knowledge and theory are situated in it. Drawing on the notion of assemblage to understand the situated way in which design is the creation of new entities, and on the notion of Transitional Design Theory to understand how definitions are made through design by example, this work considers Transitional Design Assemblages as the material-semantic-theoretical artefacts of Research through Design.

Assemblage

This account of assemblage in design draws in particular from the work of Alex Wilkie, who used user-assemblage to account for the way in which users are invoked and configured in relation to socio-technical systems (2010). He situates this work in a context of science and technology studies (STS), Post-Structuralism, and human computer interaction research, and in particular, draws on the work of Bruno Latour (2007), and Gilles Deleuze and Felix Guattari (1988). The focus of this current research is not on users of design and technology, but on the theoretical stance on assemblage as a way to explain processes and artefacts of design. I briefly account for the development of his argument on the relevance of the assemblage, and consider how it is apposite for the theoretical stance of this research.

Actor-Network Theory

Science and Technology Studies is a branch of philosophy that aims to account for the operation of technoscience as a situated and socially contextual practice; Wilkie situates design in relation to technoscience as an intentional stage when meaning is inscribed into technological entities. He identifies two opposing strands of thought on the relationship between technoscience and society through which STS might be framed: *Technological Determinism*, in which technology drives social change, and the *Social Construction of Technology*, which argues the opposite, that social changes are the main determining factor on the development of technology (2010).

As this research is situated in a post-structuralist and New-Materialist framework, it should be clear that neither stance satisfactorily accounts for the situated, emergent and entangled relationships between things. This is in concord with a significant stance in Science and Technological Studies made by Bruno Latour: Actor-Network Theory (2007). He considered that *technoscience* (and by extension, design) could be understood as existing within a situated and contextual network of heterogeneous actors: human and non-human entities with agency. In an Actor-Network, neither technology or social systems are dominant: agency is distributed across the network in complex and situated ways. ANT provides a way of understanding that "design, rather than making better technologies in order to meet the 'natural' qualities of humans or making technologies that impact and drive social relations is, in fact, a practice in which people and technology are mutually reconfigured with new identities and new capacities," (2010, p. 13).

However, Wilkie identifies two weaknesses with Actor-Network Theory which led him to instead favour the conceptual model of the assemblage. The first is where agency is located in ANS, which has tended to emphasise and privilege "managerial male agents" and "'Machiavellian' human actors who are responsible for marshalling and managing the constituents of an actor-network," (2010, p. 46); the second is that as a organising principle, the

network is a weak metaphor. An artefact as a "stabilised network of material and semiotic relations" can't well account for situatedness, change and emergence, nor the different ways in which the network or the outer world might be perceived or lived in by the disparate actors: it reduces "the concept to a technical metaphor in which relations between actors and entities are ordered and well structured," (2010, p. 69).

Assemblage as a Design Concept

> *"I use the term assemblage to emphasize the synthetic, aesthetic and object-oriented practices of designers as they draw together disciplinary knowledge, emerging technologies and representational material in the making of sociotechnical propositions."*
>
> *(Wilkie, 2010, p. 70)*

The concept of *Assemblage* has been favoured by Wilkie as a way to better understand and interrogate the ways in which Design Artefacts are made and situated. Assemblage is a concept used and developed by Deleuze and Guattari, less as a formal theory and more as an ad-hoc approach to their work (Nail, 2017). Thomas Nail argues that the original French term they use, *agencement*, refers more to a layout of elements, rather than the English (and French) term *assemblage*, which refers to an intentional process of construction, however, from a design perspective, both definitions are useful. Wilkie considers the notion of assemblage as a design heuristic for "emergent actors, composed of and in heterogeneous relations, whose ordering and structure is empirically occasioned in situated practice," (Wilkie, 2010, p. 70).

Assemblages are a more useful concept that actor-networks due to how they come into being; what constitutes them and how they are constituted; the contexts and territory they are situated in; and how they both effect and undergo change.

How Do Assemblages Assemble?

Unlike stable and fixed actor-networks, assemblages are more able to account for emergence, the way that Haraway argues that things are sympoetic and in the process of becoming-with (2016), and Barad argues that things do not precede but emerge through their mutual intra-actions (2007). Wilkie considers assemblage as a useful concept to consider how design artefacts and their users are "continuously in the process of mutual development [and to understand] the assembling practices of designers, inhabiting organisation and disciplinary settings where they build technologies, format users and construct sociotechnical visions," (2010, pp. 57–58).

How Are Assemblages Constituted?

In contrast to actor-networks, which deal with agential entities or things, assemblage is a looser and more encompassing concept. Assemblages can be quite heterogenous in their constitution,

with Wilkie describing them as "a co-functioning of material arrangements and semiotic expression," (2010, p. 188) in which agency is widely distributed and not concentrated in human actors. Assemblages may be composed of matter and material entities, and the "forces and processes" that they undergo and exert on each other, but may also have more semantic elements: discourses, meanings and actions "through which the constituent elements communicate and interoperate with one another and other entities," (2010, p. 188). They can also encompass modes of expression, power relations, and other socio-cultural, creative, speculative and affective elements.

Assemblages exhibit *gestalt* characteristics, becoming more than the sum of their parts, while also being less boundaried, with their elements participating in other assemblages that may be located internally, externally or transversally to them, and are less stable, more fluid entities than networks. In this, assemblages are rather similar to another Deleuzo-Guattarian concept, the *rhizome*, in that they are distributed, non-hierarchical, and interconnected; they are not fixed and stable, but exhibit variable stability and complexity over time and across space (Deleuze & Guattari, 1975). Nail has reflected that assemblages are less fixed and essential things, and more events that are in a continual state of happening (2017).

How Are Assemblages Situated?

Besides the way they come together, Wilkie follows Deleuze and Guattari in their emphasis on the way that assemblages are "contingent and situated in local cultural settings [within] particular concrete spatial and temporal milieu," (2010, p. 188), thus being in alignment with philosophical stances on knowledge as situated. The interplay between assemblages and their contexts is expressed through the concept of *territories*: situated spatial and temporal contexts that assemblages may occupy and cause to emerge.

How Do Assemblages Transition and Change?

The concept of *territorialisation* can account for the ways in which assemblages are in flux, and change over time; this is particularly of relevance to accounting for how design is a process of disrupting, changing and creating assemblages. Territorialisation is when an assemblage in the process of becoming develops defined regions of stability—whether in its materiality, it's meanings, it's relationality or as conceptual gestalts—these regions become the spatial, temporal and conceptual territory of the assemblage. Processes and intentional acts of change cause the assemblage to become *deteritorialised* and unstable, but "in undergoing change, reconfigurations of content and expression are brought about where new stable assemblages emerge as *reterritorialised* entities," (Wilkie, 2010, p. 188).[27] From an assemblage perspective, then, design

[27] There is a similarity here to the concept of activated complexes in chemistry; during a chemical reaction from one stable set of reactants to a stable set of products, sometimes an unstable transition state or activated complex will form, which quickly destabilises and resolves into the more stable products. (Oxford Reference, n.d.)

can be framed as an act of disruption or deterritorialisation of existing entities and situated contexts, forcing them into unstable arrangements which then resolve into new, more stable assemblages, which may be designed artefacts and their new situated contexts.

Transitional Design Theory

While assemblage gives a perspective on how the process of formation of design artefacts in situated contexts may be conceptualised, this section will consider how theory can be situated through the assemblage and creation of designed artefacts through practice-based design research. With an emphasis on Johan Redström's *Transitional Design Theory*, and Thomas Markussen's *Nascent Design Theory*; I use these theoretical frameworks to make sense of the way design knowledge is produced in this project.

Transitional Design Theory was proposed by Johann Redström as a way in which theory can be understood to be made through design and designing; that, "as design research engages in the making of many different types of things, design theory might well be one of the things it could be making," (2017, p. 133).

Theories are structured by definitions, and transitional theory focuses on how definitions are made through design in a way that is situated and transitional, with the premise that design knowledge is situated in a tension or spectrum between the specific (a design) and the general (designing). Redström emphasises that this spectrum isn't between design artefacts and design activities as such, but between that which exists (what is) and that which will be designed (what becomes); between analysis (of what is) and projection (to what might become); the continuity between a specific outcome, and the process to produce that outcome.

Such definitions are fluid, contingent and slippery; they are unstable, becoming "precise in terms of difference and relation," (2017, p. 46) not through being or becoming stable. Redström situates his narrative of transitional theory by considering the sorts of definitions that can be made, the ways in which they are made, and what their nature is. He considers this according to three principles: that design definitions are on a spectrum between the general and the specific and that simple definitions are precise only in relation to one another and their place on the spectrum; that more complex definitions are made through design; and that the concept of the programme provides a complex approach to definitions that can support theory making in design (2017).

In Between

Design (research) exists in a place of tension *in between* the specific and the general, between a concrete thing and a general theory. Redström makes three propositions about how this relates to definitions through design. First, that design definitions are made through design: that is to

say, designing an object for a particular purpose defines what that purpose is, not through words, but by example. The example he gives is that a chair defines what sitting is. Further than that, designing other types of sitting devices can redefine what sitting is. They aren't redefined by descriptions but by other examples of sitting. Such definitions made through design are not neutral, and can be contradictory—they are a product of particular worldviews that informed what was designed (2017).

Second, the spectrum in design between the general and the specific is one between "design universal" and "design particular"; what is designed, and the context of designing it. In relation to this, one may make definitions for opposite ends of the spectrum: at the specific end, is a *Product* (I use the term, and I think Redström does too, not in the sense of a product to sell, but as that which design has produced); at the general end, one might consider that design is always designing something for somebody therefore it is taking place in a context; that context is the *Paradigm* in which design happens (for example, a paradigm of industrial furniture design), the complex assemblage of all the things that situate an act of designing. He considers the product as what a design is and the paradigm as what designing is; an outcome and the effort to produce the outcome (2017).

Third, simple definitions by design can populate the spectrum between product and paradigm, in the tension between specific and general design: *Projects*, *Programmes*, and *Practices*. Practices are general in scope, but more specific than a paradigm, referring to specific material and embodied skills and ways of working in design; they can be specific to a designer, or part of a larger set of activities within a particular design paradigm (e.g. the processes and skills that can be used as an industrial furniture designer). At the other end, projects are specific in scope but more general than a product; they may be aimed at a particular product or products and are constrained in terms of time and objectives. Not quite settled on specific materialisations but narrowing in on them (e.g. a project to design a new range of chairs). The middle definition, programme, Redström considers the most interesting and also hardest to define, being more general than a project but more specific than a practice; it could be a set of practices oriented towards projects and specific products. It is discussed further below (2017).

The important thing about these definitions is that they are made by design, and they lack precise definitions; they become precise only in relation to each other. A project may, in time, become a programme and a programme might become so established that it becomes a paradigm of design. The definitions are slippery and situated in contexts; they are transitional. It is possible that their definitions can become fixed, and more stable, which requires precise definitions and boundaries between them being maintained, but Redström argues that they must be "inherently unstable to have a fluidity that allows them to stay open for an unfolding design process," (2017).

Making Definitions

This tension between transitional and stable definitions is an interesting one, and Redström explores what it means for design if definitions become stable and fixed, and what it might be to consider them as unstable definitions. His argument rests on the distinction between analysis and design, between existing designed artefacts (what is) and those that are being designed (what becomes).

Definitions that are made through design exist in this tension between what is and what becomes. So, if a chair defines sitting, this is because there was an intention for sitting to be afforded by the chair when it was designed, and the object in existence is situated in a way that affords sitting. Each act of design is an act of redefinition—because design doesn't converge on an answer ('*this is* sitting') but produces multiple propositions ('*this can be* sitting')—so definitions made through design practice have an "inherent fluidity" that "stays open for the ways designs and designing develop over time". Redström argues that stable definitions are problematic, and such unstable, transitional definitions are more useful, but that unstable definitions can still be precise: becoming "precise in terms of difference and relation", not through being stable (2017, p. 46).

This relates again to the tension between what is, a specific design outcome, and what becomes, the process by which it is made. Fixed, static definitions tend to be descriptive and thus become prescriptive. They relate to the things that already exist. So, sitting is defined by existing chairs: one can point to chairs that exist and declare, 'this is sitting'. But if someone tries to design a new sort of chair, for a different way of sitting, then the definition cannot accommodate this change, so it becomes prescriptive: one might say "since sitting is this, if you design for sitting, sitting has to be this." It is not a useful description for what becomes. Conversely, fluid definitions—situated in particular contexts—change as the process of design unfolds. Stable definitions might be useful for design history research, but in Research through Design, which is concerned with design practice, what is important is to be able to "construct theory in a way that supports an unfolding process, rather than precise descriptions of what has already been made [...] we cannot afford stability if it comes at the price of static definitions that cannot support development," (Redström, 2017, p. 66).

> *"When we use concepts made to account for what exists to also project to what may become... the latter conforms to the former". If design theory becomes stable, as a description of what is, it stops being a framework "to navigate the potentiality of what could become [...] it is no longer a support for development but a framework for making sure things stay the same."*
>
> *(Redström, 2017)*

Static definitions of terms are analytical, based on what is. Fluid definitions are unfixed, open to being changed by what becomes. Static definitions are for analysis, unstable definitions are for design. The problem with static definitions means that they end up shaping what is being designed to conform to what already exists. They don't scaffold what could become and support development but are a framework to keep everything the same.

Redström illustrates this with two examples of important definitions in design: form, "what it is that one creates when designing" and user, "for whom the design is intended," (2017, p. 50).

Form

Form is a characteristic of things that exist that in design that lies on the spectrum between a specific designed object, and more general principles of design. It's the way the object is present in the world: it's shape, size, composition. As a design definition, form isn't expressed in language, but through demonstration. A stable definition of form is that forms are part of the language by which designs are communicated, and certain types of objects are associated with certain types of form; forms are gestalts that inform you what type of object that it is, which, more than likely, will be encountered and read as flat or three-dimensional images.

This can be problematic because what form is understood as becomes fixed as a matter of aesthetics, rather than the use of an object, but it's quite a fundamental aspect of an object. Redström suggests that form becomes a stable definition perhaps because of the persistence of the visual representation of things, and because of confusing the process of formation with the form of the existing thing (2017).

An object perceived as a chair likely has a certain physical orientation of elements, of size, of construction materials that indicate that it is a chair. It is a language that communicates perceptibly what an object is and is most commonly understood in terms of visual aesthetics: what the object looks like. The problem is that this language is suited to describing existing forms better than describing the process of formation; it is analytical and useful for comparison and discussion of existing things, but it does not allow for projection to the creation of different forms. Form defined by the forms of all existing things of that type doesn't help support a different act of formation. Redström suggests a more transitional, unstable definition of form, between the act of formation and the thing that has form: an expressive structure that emerges in acts of perception associated with the object. Thus, it includes what the designer was aiming to express through their design and the context in which it is perceived, which could be the intended or unintended act of perception. Thus, form isn't a fixed quantity but something that is a product of the physical reality of the object as well as the contexts of its creation and use (2017).

User

Similarly, user in design has a related problem of being defined by what is rather than what becomes; user centred design often focuses on designing something for existing users of the artefact, but since the artefact doesn't yet exist, there is a risk that the design process may prescribe what users will do. Studying users of an object and then projecting those to the users of a new object effectively tries to configure people into a particular type of user. This doesn't account for the ways in which they might use the new thing.

It's not helpful for form to be defined by existing visual gestalts of what something is, because that doesn't account for the process of formation, and tends to prescribe what form is to things that are unformed; It's not helpful to think of users as pre-existing the act of use, because they are only really users when using a product (and this is precisely why Wilkie used the concept of the assemblage to understand and account for users (2010)). Unstable definitions can take into account both designs (the things that exist) and acts of designing (the things that will become). Form is defined by what is being perceived and by situated acts of perception, user is defined by intended use and what emerges through acts of use (2017). It's less an answer—"this is form," or "this is a user"—and more a question—"what is formation?" or "what is use?"

Design (Research) Programmes

Design Programmes have interesting definitions through design because they are in the middle of the tension of the general and the specific, between what is and what becomes. All types of programmes might be defined as "the intent and structure behind something about to unfold," (Redström, 2017, p. 85). Thomas Markussen argues that "programmes are used in design research to frame what are to be considered the central topics, questions and knowledge interests at a given time for the discipline," (Markussen, 2017, p. 91). So, a design programme (e.g. in education or research) would draw on general concepts relating to design, situated in paradigms and practices, oriented towards projects that produce artefacts. It's an assemblage of things and ideas that are brought together for a particular design purpose.

So again, there's this tension between specific and general which is also between what is and what becomes. Programmes are about intent—a specific outcome, or design—and about unfolding—the designing process.

Redström argues that they could be similar to a project: they are both oriented towards acts of design, but projects are more pragmatic and open to ways that things may be done. Programmes are closer to the general and paradigmatic, and so are more bound to a particular worldview, a hard core of theories, beliefs and assumptions.

Static Definitions of Design Programmes

Definitions of design programmes are also subject to the tension between static and fluid definitions. Programmes are situated on a particular foundation, on which practices are based. Many design programmes have a foundation in art practice, so practices in design draw from those. But over time, design moves into other areas of practice. Eventually, if the foundations are static, practice either struggles to do new things or does things that are perceived as falling outside of the programme structure because they are unsupported.

Because they are based on worldviews, stably defined programmes have a foundation with a 'hard core' of beliefs, which makes them less adaptable (and less amenable) to changes in design practices within the programme and tend to affirm these beliefs. Thomas Markussen refers to this hard core of beliefs as the *Kernel Theories* of the design programme (Markussen, 2017). They reinforce what is in favour of what becomes. Eventually design practice grows beyond the programme's foundations and the programme loses relevance (See Figure 16).

Transitional Definitions of Design Programmes

To be more transitional, programmes should allow for foundations situated in other worldviews, and as such, allow for accommodating a "hard core" of beliefs alongside other possible ways of thinking. This reframes a programme away from being a system to reinforce a particular worldview, to become "an experimental ground for exploring the implications of various basic beliefs, of various worldviews," (Redström, 2017, p. 98), but in a way that is constrained in scope sufficiently to maintain focus on a particular aspect of designing. Such a design programme isn't about affirming worldviews, but about challenging assumptions about what design is and can be.

Fluid definitions allow for considering worldviews critically, not affirmatively, so a plurality of unstable and transitional worldviews can be used to support design. How does one get beyond the hard core of a programme and include support from other worldviews? Redström proposes that design programmes "articulate provisional foundations, to state worldviews that we want to explore as if they were true to learn something about what sort of design they would lead to," (Redström, 2017, p. 97). It's moving beyond a programme as an answer—this is how to do (this type) of design—to programme as a way to make propositions to start from (See Figure 17).

Design Experiments

Design Experiments are not empirical scientific experiments but a form of design practice within design research that is oriented towards the production of prototypes, which act as examples or definitions through design; design experiments are discussed in more detail in the following chapter on Research Design.

Transitional Design Programmes allow for design experiments that show the limits of worldviews; they aren't "steps to stable foundations but an experimental ground," (Redström, 2017, p. 107). Such programmes combine transitional foundational beliefs (which provide scope and constraints) with design experiments, which would probe the edges of those beliefs and foundations and allow for different worldviews to be included. Design experiments are not situated as experimental testing of hypotheses, but as acts of design that reveal something about the world; often, then, the programme doesn't precede the experimentation, but design experiments shape what the programme becomes. In these terms, the value of the programme is not to "govern experimentation" but to constitute "a definition of what designing is at a level of abstraction that experiments as such do not address," (2017, p. 107).

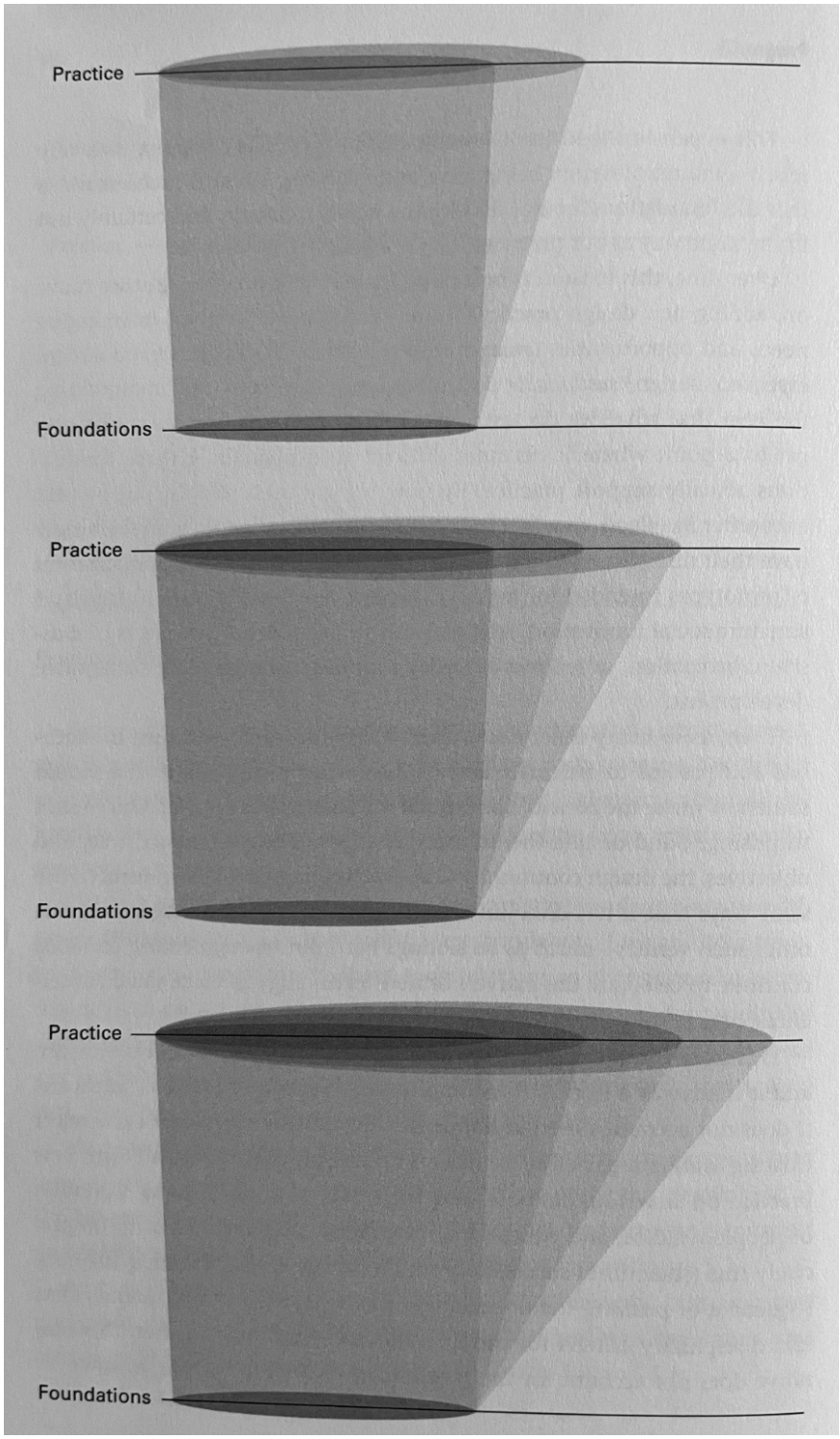


Figure 16 : Design Programmes with Stable Foundations

This figure from Making Design Theory *(Redström, 2017, p. 92) illustrates the relationship between design practice and its philosophical foundations over time in a design programme. If the foundations of the programme are static and fixed, design practice will grow beyond what these foundations can support.*

Credit : Johan Redström

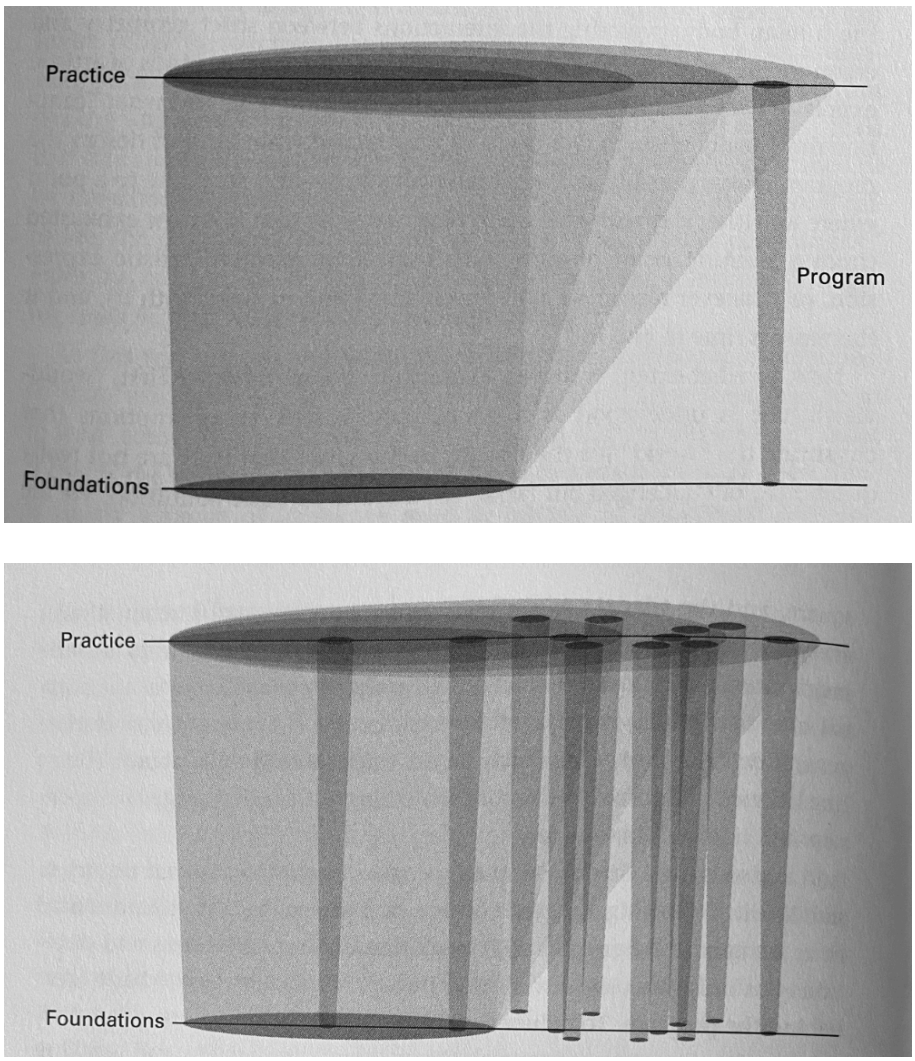


Figure 17 : Design Programmes with Transitional Foundations

In contrast to the previous figure, these diagrams from Making Design Theory *(Redström, 2017, pp. 95 & 100) represents a design programme with transitional, unfixed foundations that can be supported by a variety of practices, theories, philosophical stances and concepts. A myriad of overlapping and complementary design programmes, drawing on different cultures, perspectives and techniques, can support a much wider design practice.*

Credit : Johan Redström

Nascent Design Theory (Markussen)

Another perspective on making design theory is that of Thomas Markussen's Nascent Design Theory, in which he considers building theory through design by taking the design programme as a starting point; his interest is in how design theory can be made by taking what he refers to as the kernel theories of a design programme (the assemblages of paradigmatic values and assumptions, and design practices and theories, design projects and specific artefacts) and augmenting them, to widen their scope. He describes three ways in which this can happen: by extending theories, where new theories are added to an existing knowledge base; by scaffolding theories, where different concepts of the same phenomena are integrated, and by blending theories, where concepts of different phenomena are merged. I consider Markusssen's nascent theory to be important in terms of integrating design practice with other ideas, which is an important part of this research project (Markussen, 2017).

Transitional Design Assemblages

To make a theoretical account of the research in this project, I use a conceptualisation of design artefacts that draws both on Wilkie's account of assemblages in design, and Redström's (and Markussen's) account of Transitional Design Theory, and which I refer to as a Transitional Design Assemblage.

Transitional Design Assemblages, as design artefacts, are conceived of in two ways. On the one hand, they are heterogeneous design assemblages in which their gestalt *haeccity* (this-ness) is a product of their contexts, but which are unfixed and fluid—spatially, temporally and conceptually—and are purposefully deterritorialised and reterritorialised through acts of design, thus reconfiguring their contexts. On the other hand, they are prototypes or example definitions through design, definitions which are transitional and contextual. Common to both senses is their post-structuralist transitionality and instability: they are emergent material-semantic happenings, not pre-existing structures and contexts.

It is useful to think of them as Transitional Design Assemblages because assemblage theory is a way to account for how design artefacts are constituted, situated, and reconfigured through design, while transitional theory is a way to account for design artefacts as exemplar and transitional theoretical definitions on a continuum between the abstract (what is designing?) and the concrete (what is designed?). Together, as Transitional Design Assemblages, it provides a conceptual framework for interrogating design artefacts as dynamic theoretical assemblages that, in their fluidity, mediate transitions between the concrete and the abstract, and accounting for the ways in which those transitions are mediated.

In this project, I will consider such mediated design transitions in two axes, which might be thought of as ontological, and as epistemological. The ontological axis is one that considers what

is, and concerns itself with how design artefacts mediate transitions between more abstract theoretical concepts, and material and situated outputs, while the epistemological axis considers what is knowable, and concerns itself with how design artefacts mediate transitions between specific, situated knowledge, and general and abstract design knowledge (e.g. how is a Design Artefact an example of situated knowledge versus an example of more general design knowledge).

3.2.5 Outputs and Validation

Objects of Analysis

This section considers what it is that research produces that might be analysed as part of that research; the analogue of what would be referred to as 'data' in empirical scientific research. What is the Research through Design equivalent of data? Johan Redström writes that what is created through practice-based design research is not *facts*, as in scientific research, but *examples*; by this, he means that it isn't a truth about the world but an embodied demonstration of possibility; not presenting a general and definitive answer to a question but a situated example of something that could work. These are not examples of what is, descriptions of a pre-existing world, but examples of what might become, through design (Redström, 2017).

During conversations about this project, one of my supervisors, Daniel Buzzo, suggested that one viewpoint is that the *process* is where the 'art' sits—and that artefacts that are generated are, in a way, snapshots or postcards from a journey. We discussed this in relation to the idea that what is displayed in an exhibition is only the tip of an iceberg of what went into the artwork in terms of research thinking and experimentation. The contrasting view is that the output itself is the thing of value. Redström argues that this is an important distinction: between a design, and designing, which is a distinction between design in general, and a design in particular. One might consider a designed artefact as what is, while designing is the process of what becomes; theoretical design knowledge lies in the tension between the two (Redström, 2017).

As such, design knowledge can be seen to be intermediate, between specific and general, "a middle territory between design instances and theory," (Hoggenmüller et al., 2021, p. 2). How might this intermediary knowledge be demonstrated and analysed? The role of the intermediary or the "in-between" has been discussed above in relation to transitional theory: a design programme represents a form of this intermediate knowledge. Culén *et al* write that:

> *"a number of proposals have been made on how to bridge the gap between the knowledge gained through the design of a particular artefact and expectations of the research to yield more abstract and theory-oriented knowledge."*
>
> *(Culén et al., 2020, p. 1)*

These proposed forms of intermediate knowledge include design programmes (as discussed), manifestos, bridging concepts, and annotated portfolios. The theory-making role of design programmes in this research has been discussed above; the following focuses on annotated portfolios, which also form a part of the theory making in this project.

Annotated Portfolios

William Gaver favours a body of design work from a single practitioner or from a studio, which he compares to the output of knowledge work from scientific institutions. His argument is that it is not single experiments but a body of work that leads to scientific theory development, and therefore a body of design research work can play a similar role:

> *"beyond single artefacts, however, annotated portfolios may serve an even more valuable role as an alternative to more formalised theory in conceptual development and practical guidance for design. If a single design occupies a point in design space, a collection of designs by the same or associated designers—a portfolio—establishes an area in that space. Comparing different individual items can make clear a domain of design, its relevant dimensions, and the designer's opinion about the relevant places and configurations to adopt on those dimensions."*
>
> *(W. Gaver, 2012)*

Essentially, Gaver argues that through a body of work, one might be able to delve somehow into *the what becomes* of designing, rather than *the what is* of a single design.

In contrast, Alex Wilkie believes that a single artefact may be a relevant point of analysis if it has come into existence as part of a loose and open process, for example developed through open workshops and engagement events. It then represents some of the complexity the interdisciplinary debate that it emerged out of, and can act as a boundary object between different domains (Godin & Zahedi, 2014).

Validation

I finish this chapter by giving consideration to the issue of research validity as it pertains to practice-based design research; this is a complex topic, not least because the notion of what it is to be valid is highly context dependent, and differs significantly between empirical scientific research, qualitative social science research, research in the humanities, and practice-based research. I consider, then, some perspectives on what frames of reference might practice-based design research be considered valid, and how it might be recognised.

Recoverability

Action Research is a qualitative research methodology where a researcher-practitioner is continually reflecting on their practice in context and acting to understand and change aspects of the context they are working within (Schwandt, 2015). The validation problem of action research is related to the underspecified and cumulative nature of design research that Gaver (W. Gaver, 2012) discusses, namely, because it is a situated and contextual practice, the act of a particular practitioner in a particular situation cannot ever be replicated—a problem, if replicability by others is considered an important part of the validity of a scientific theory. Instead, action research is validated by its *Recoverability*. That is, that even though the account of the research does not allow another practitioner to replicate the results, it is conducted in a sufficiently rigorous way that the process can be recovered under scrutiny: "rigour in research is the strength of the chain of reasoning, and that has to be judged in the context of the question and the answer," (Biggs & Büchler, as cited in: Godin & Zahedi, 2014, p. 6). Thus, a rigorous process that is well accounted for can be considered to be valid.

Theoretical Sensitivity

Another related qualitative research methodology, Grounded Theory, which is based on generating theory in parallel with gathering data and categorising and coding it (Chun Tie et al., 2019), also engages with the idea of a world that is multiple and cumulative, rather than converging on a single theoretical truth. In contrast to action research, it puts the burden of validation on the researchers themselves. Much like design research concerns itself with a complex, multitudinous world, so too does grounded theory research. Bryant considers that "reality is multiple and subject to redefinition—rendering an experiment represents experience, rather than replicating it," (Bryant, as cited in: Godin & Zahedi, 2014, p. 7).

This can be a challenge for a researcher to understand what to focus on, what is significant and what is not. Therefore, it is necessary to be sensitive to what is most important, generally drawing on one's own skills and experience. This 'ability to use what is being observed' is called *Theoretical Sensitivity*. Practice-based design researchers must be able to be selective in the aspects of experience on which they focus.

Design Effectiveness

A final mode of validation is perhaps the most 'designerly': both Gaver (2012) and Godin and Zahedi (2014) argue that practice-based design research may be proved 'valid' if the designed artefacts succeed in achieving their required function. If a particular design works in the way it is intended, it can be said to be valid, as is the process by which it came into being. If a design project results in an artefact that is successful or that works in the way that is intended, "then the knowledge produced through the process is also valid," (Godin & Zahedi, 2014, p. 7). This is

perhaps a simpler rendering of Gaver's position that validity is obtained through a reflection on the design outputs from Research through Design—the sometimes 'getting it right'. In this thesis, this principle is referred to as *Design Effectiveness*.

3.3 Post-Qualitative Inquiry

> *"To think postqualitative research is not to know in advance, nor to be bound by method, but to encounter the way concepts produce thought, 'much like an improvisational work—it has to be played, and played well, but without a score that tells one precisely what or how it is to be played'"*
>
> *(Bell, 2016, as cited in: Mazzei, 2020, p. 198)*

This section considers how speculative inquiry and design research can be framed and situated within a higher-level mode of academic inquiry; Post-Qualitative Inquiry (PQI). It considers the philosophical or onto-epistemological background to the approach, how and why it departs from typical qualitative research methodologies, and its relevance to speculative design research.

Post-Qualitative Inquiry was proposed by Elizabeth Adams St.Pierre as a response to the difficulty, even impossibility, of working with post-normal philosophical worldviews, such as Post-Structuralism, Post-Humanism, and Post-Modernism (which she refers to as "The Posts"), through traditional humanist qualitative research methodologies (Adams St.Pierre, 2014, 2020; Guttorm et al., 2015).

3.3.1 Why Post-Qualitative Inquiry?

What is Qualitative Research?

Qualitative Research (that is, related to the quality, or nature, of what is studied) emerged in the twentieth century as an alternative in the social sciences to the use of nineteenth-century positivistic Quantitative Research (that is related to the quantity, or numerical characteristics, of what is studied). *Positivism* is a philosophical position that centres on rational measurement of a pre-existing objective world, wherein all that can be knowable about the world can be obtained by observation and measurement; it is related to instrumentalism, which is a methodological focus on the use of instruments to make measurements. It is situated within enlightenment-era and colonialist thinking, of a world of natural hierarchies and structures, and the role of science in understanding, and ordering all things into those (already existing) hierarchies (Adams St.Pierre, 2014, 2020; Guttorm et al., 2015).

There was a turn against this approach within the social science community, who considered that engaging with the social in such a way was to reduce the complexity of lived experiences into numerical data that was at best meaningless and at worst, actively harmful, making statements about the apparent pre-existing world that then were taken as objective fact. This led to the rise of qualitative research, in which subjective lived experiences were engaged with

through rich, descriptive accounts, through methods such as ethnography, discourse analysis, interviews, and grounded theory (Adams St.Pierre, 2014, 2020; Guttorm et al., 2015).

These methods moved beyond a positivistic and objective framing of reality, but over time, qualitative research began to gather a fixed format, with standardised methods and methodologies that began to impose a pre-existing structure on the world, and maintaining a separation between the observed and the observer. Alongside this, there were increasing moves within academic institutions and wider politics to value and prioritise scientific or scientific-seeming "data" within social research, which might be framed as a neo-positivistic turn. Ironically, such *sciencism* elides the increasing understanding of science as less an abstract pursuit of an objective truth, but as a collaborative and subjective human endeavour which works towards the creation of knowledge in the shape of descriptive models of the world through consensus (Kuhn, 1962; Latour et al., 1986)—in fact, one of the key thinkers in Post-Structuralism and New Materialism, Karen Barad, is a quantum physicist—with the result that qualitative social science research may be more positivist than research in the sciences.

Why Does Post-Structuralism Have a Problem With This?

> *"We can't see the new because we're limited by the structures of the present, and we have no language yet to say it."*
>
> *(Adams St.Pierre, 2014, p. 18)*

There is a clear problem with such a structured approach to research methodology from a post-structural (and the other "posts") perspective; Post-Structuralism attempts to overturn preexisting structures and hierarchies that describe a pre-existing world, and is instead interested in creating new concepts, concerning itself with the world that is to emerge. Lisa Mazzei has argued that such a posture is incommensurable with formalised and representational qualitative research methods, and is in fact unthinkable within its bounds (2020).

Adams St.Pierre describes qualitative research methodology as "arriving too late [and] immediately out of date, and so is inadequate to the task at hand," (2014, p. 16), operating in a pre-existing world with a preexisting structure, so is forced to describe the new in terms of the old, resulting in getting stuck in a groove of self-reinforcing ideas and concepts. In fact, it brings a set of descriptive and fixed language terms, such as data, analysis, subject, interview, method, and validation. "Derrida wrote that when you use a concept you bring with it the entire structure in which it is thinkable," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 15); these fixed methodological concepts bring an entire ontology with them, from an ontological framing that doesn't work with post-structuralist thought. Furthermore, such a methodological approach frames the researcher as separate from the process, rather than co-constituted with it, and it aims to be representational, providing an objective representation of the world as it is.

What this means in practice, Adams St.Pierre argues, is that qualitative research methodologies provide a fixed and repeatable research process, where one might 'slot in' a particular research question, go through the process, and receive an outcome that is replicable and could have been done by anyone; such an outcome is more determined by the structure of the process and method, than by the specific context, and the specific ways in which the researcher becomes implicated or entangled in the process. It is the asking of a question which anticipates a particular form of answer (or a solution). Anecdotally, I have heard of students being advised that when designing such a research process, they should have a clear sense of what the answer is, and using the research to simply confirm or validate what is already known: but "if we merely pose a question for which we seek an answer, we remain in this groove without the possibility of newness that does not seek and answer, but that opens up new problems," (Mazzei, 2020, p. 199). Post-Structuralism, in contrast, doesn't ask to anticipate an answer; post-structuralist inquiry is to create new things, new concepts, and new questions to ask; what Mazzei describes as "problems not yet thought," (2020, p. 199). It allows us to operate in "situations which we no longer know how to react to, in spaces which we no longer know how to describe," (Deleuze, 1989, p. xi, as cited in: Mazzei, 2020, p. 199).

A Post-Qualitative Turn

> *"A form of post qualitative inquiry is essential in order for emerging and seasoned scholars to produce thought unthinkable within the bounds of traditional method, or thinking without method."*
>
> *(Mazzei, 2020, p. 199)*

Post-Qualitative Inquiry emerged from the difficulty Adams St.Pierre found with reconciling theoretical worldviews from "the Posts" with the methods taught to qualitative and social science researchers; the problem, she identified, was that the nature of the world and what is knowable about it, which Barad describes as onto-epistemology, is often dealt with in isolation from method and methodology. When such methods belong to a neo-positivistic or structuralist onto-epistemology, they cannot be put to work on a post-structuralist, new materialist onto-epistemology that follows the Ontological Turn. This challenge led Adams St.Pierre to frame an entirely new approach to research, which she described as Post-Qualitative Inquiry; It is what comes after qualitative research, and it is *inquiry*, not methodology, as it is a questioning practice first and foremost.

In fact, Post-Qualitative Inquiry is explicitly not a methodology. It is avowedly anti-methodological, and anti-method: it has to be, if it can work within a post-structuralist onto-epistemology. Therefore:

> *"It doesn't have pre-existing* research designs *like case study and ethnography. It doesn't have a preexisting, formalised, systematic* research process *that one can follow, therefore guaranteeing validity. [It] doesn't have preexisting* methods of data collection*, like interviewing and observation that begin with the humanist subject.[28] [… It] doesn't have pre-existing* methods of data analysis *like coding data or thematic analysis in which themes somehow miraculously emerge from the data."*
>
> *(Adams St.Pierre, 2020, p. 5)*

If it is not a methodology, and isn't representational, and it doesn't have methods, data, and process, what is it? St.Pierre argues this is an essentialist, not a post-structuralist question, that "it assumes something already exists, that something 'is', is stable, and so can be identified and represented. The 'what is' question denies immanence, the what is 'to come' of poststructuralism," (Adams St.Pierre, 2020, p. 4). Fundamentally, Post-Qualitative Inquiry rejects representation, moving beyond representation of the world as it is, aiming instead for "experimentation and the creation of […] something new and different that might not be recognisable in existing structures of intelligibility," (Adams St.Pierre, 2020, p. 5). Similarly, Barad has argued for a post-structuralist reframing of representation, considering that "representations are not (more or less faithful) pictures of what is, but productive evocations, provocations, and generative material articulations or reconfigurings of what is and what is possible," (Barad, 2007).

3.3.2 The Practice of Post Qualitative Inquiry

Elizabeth Adams St.Pierre argues that there is only one way to practice post-qualitive inquiry, and that is to read Post-Structuralism, and to read deeply. This rather gnomic prescription can be unpacked, somewhat!

Concept-Driven Inquiry

Where Qualitative Research is process driven, following a pre-existing methodology, Post-Qualitative Inquiry is driven by concepts—philosophical concepts in the Deluzu-Guattarian sense of those things that are created by the philosopher. Method does not let one think beyond its structural assumptions about the world; it has a fixed and predetermined, rather than relational and emergent, ontology. There are thoughts that are literally unthinkable with it.

[28] Adams St.Pierre continues: "The concept data collection is in itself problematic because it points to an ontology that assumes data are separate from human being and so can be 'collected'. Importantly, the concept [of] data, as described in conventional research methodologies, is simply not thinkable," (Adams St.Pierre, 2020, p. 5).

> *"If we are bound by method, then our practices of inquiry are similarly constrained, yielding a reproduction of that which we already know because it is that which is reinscribed within the major language of traditional qualitative practices. It is this that a thinking with postqualitative methodology affords. Not a repetition of what is known, but rupture and provocation—a thinking at the limit."*
>
> *(Mazzei, 2020, p. 199)*

This returns to the sense of asking questions for which one already knows the answer, or hopes to gain one—and predefined methods leads you towards that end. To ask questions where you don't necessarily seek an answer, is, as Mazzei puts it, to research "situations that we no longer understand," (2020, p. 199); working with concepts and reading theory is the means to this end. Adams St.Pierre describes Post-Qualitative Inquiry as reading or thinking through theory; Mazzei describes it as a thinking practice of concepts.

Key to this approach is a process of deep, slow reading of theory, post-structuralist and otherwise, driven by concepts. As Deleuze and Guattari argued, one can work with philosophical concepts to develop new ideas, new concepts. Mazzei writes that "this thinking with, or following the contour of concepts produces a thinking otherwise not possible without a deployment of concepts into uncharted territory," (2020, p. 199). Such an approach to inquiry takes concepts from theory, and allows for their extension by following where they lead; the concepts that you choose will shape, like the tools used and the grain of the materials worked by a sculptor, the new ideas and concepts that emerge. it allows for "a grappling with problems and contradictions that do not repeat or mirror prior experience," (2020, p. 199).

> *"There might be multiple concepts that one might think with, but each provides a different transformation, a different flight, a different attunement. This is how the concept functions as a contour, enabling new thought and connections. In other words, concepts vibrate, resonate with other concepts, perhaps with existing concepts, establishing relations with others, thus laying out the plane on which they converge."*
>
> *(Mazzei, 2020, p. 198)*

Starting in the Middle

As Adams St.Pierre argues, the concept of starting research, or a project, is freighted with structuralist assumptions—of the researcher separate from the context, of a constrained window of time that is the period of study: "if you think the "researcher begins a study" you think the researcher exists before the study, ahead of language and materiality, that the researcher is not always in the middle of everything," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 15). Instead, perhaps there is no starting point; you start from the middle. When a project "starts",

the researcher has already likely been thinking deeply about, reading about, talking about their field of interest. As the research progresses, it develops, and grows, and eventually there reaches an imposed end point—the end of funding, or the necessity to graduate—but the thinking, talking and reading continues, into the middle of the next thing. So, one starts where one starts, entangled, implicated, in the middle. Similarly, Mazzei argues that Post-Qualitative Inquiry "does not begin with the subject, or method, or the desire to give an account. It begins with a problem in the midst of inquiry," (2017, p. 676).

Reading and Thinking through Theory

> *"I want my students to mobilise as much theory as they can to complicate their inquiry and not rely on methodology to make it easy"*
>
> *(Adams St.Pierre, 2020, pp. 4–5)*

Adams St.Pierre argues for a particular approach to reading and thinking through theory, which is to read deeply and widely, well beyond what might be necessary for a qualitative or quantitative literature review or "state of the art". The focus should be on theory and onto-epistemology, worldviews and bodies of knowledge that are conceptually rich and can be worked with into something new (2014). Reading in this way isn't reading to make sense, but rather reading to become confused, or less sure. One should read texts that are "too hard to read," (2024, p. 4); that are "unsettling, disruptive, confusing" (2020, p. 5); that "might well upend everything we believe" (Adams St.Pierre, as cited in Guttorm et al., 2015, p. 5): only by doing this can one move beyond pre-existing and assumed structures and start to work at creating something new.

Experimentation : Putting Concepts to Work

What, then, follows on from this deep, conceptual, and confusing reading? Adams St.Pierre argues that one should "put to work the practices the theory or the concept enables". The concept should guide what emerges and what action to take; a form of pragmatic experimentation over formal methods (2014). "Deleuze [...] believed that it is only in a practical and experimental engagement with the world that we can create something new," (2014, p. 19). Such experimental research could be writing, or walking, or working in the garden, or it could be doing design. What is important is that it is not instrumentalised : "ordinary practices like talking with and observing people don't have to be formalized, scientized, and elevated to the status of 'the interview' and 'the observation'," (2014, p. 26).

For Adams St. Pierre, a key part of the process of making sense, and creating new concepts, is through writing. At a certain point, through reading unfamiliar, confusing concepts, writing might help make sense of it: "it's when I have to use what I've been reading that I learn, when I

have to write," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 21). This concept of using what you've been reading resonates with practice-based design research, and will be expanded on below.

3.3.3 Accounting for Post-Qualitative Inquiry

This part briefly considers how one might make an account of Post-Qualitative Inquiry in academic discourse, in terms of what is done (methodology) and judging that it is done well validity)

Descriptive Methodology

Post-Qualitative Inquiry is, as has been stated, an anti-methodological, and anti-method approach to inquiry: certainly, it is oppositional to a process-based, fixed, and pre-determined methodology. However, in academic writing, it is often necessary to account for and explain a research process, to demonstrate what has been done, and why. Method, in post-qualitative research, is something that exists outside of the present moment, in the past of the future. It is either that which will happen in the future, and as yet unknown, or that which has already happened: what "will have been done," (Adams St.Pierre, 2014, p. 15). So, one can account for Post-Qualitative Inquiry as an emergent, not processual, methodology. Methodology in Post-Qualitative Inquiry is an account of what has been done, rather than a preformed plan that was devised in advance.

Is it good?

This also raises the question of validation: Adams St.Pierre asks "how does one know if Post-Qualitative Inquiry is 'good'?" (2020, p. 5). She that writes a scientific conception of validity is based on a criteria of systematicity, "but systematicity is not thinkable in poststructuralism so not in Post-Qualitative Inquiry," (2020, p. 5). Validity, the question of whether something is good, is not something that is easily generalisable within such a framing. It depends more on "personal and subjective rather than scientific and objective," (2020, p. 5) criteria, and, being more aligned with humanities, arts and natural sciences over social sciences, its concept of what is good and valid is more similar to those fields—what makes a novel good, or a philosophical concept good, or a design good? I'll return to the question of validity in design research later.

3.3.4 Post-Qualitive Inquiry in Research Through Design

What, then, is the relevance for this research project in considering Post-Qualitative Inquiry? What might a post-qualitative approach offer to speculative inquiry, to practice-based design research, or the particular areas of interest of this project?

The answer to these questions lies in post-structuralist onto-epistemologies. Speculative inquiry, like post-qualitative research, is concerned about the emergent future, the possibilities or impossibilities that the present might bring to bear; the field of immanence from which the new might be made. This research project is interested in pluriversal multitudes, not a singular, monocultural world. It is framed in opposition to predefined structures and categories, where the human is separated and elevated in importance over the rest of the world; as will be explored, the concepts of queerness and more-than-humanness that frame this research are post-structuralist in nature. And in terms of practice-based design research, there is a close parallel to the onto-epistemological worldviews of Post-Qualitative Inquiry; the approach to design research described here can be situated as post-structuralist. I consider this in more detail now, looking at two key aspects: the onto-epistemological character of design knowledge; and how design theory emerges from such grounds.

The Nature of Design Knowledge

As detailed in a previous section of this thesis, the onto-epistemology (the combined worldview and world knowledge) which frames practice-based design research has three key principles: design knowledge is situated, it is cumulative, and it is underspecified by theory. As situated, design knowledge is intimately tied to its situation, or context, and is difficult to scale or to generalise. It is that which emerges through action, a new concept brought forth from its context, or plane of immanence. Post-Structuralism argues for situated concepts: "Derrida wrote that when you use a concept you bring with it the entire structure in which it is thinkable," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 15); it is entangled with, and co-created by the situation from which it emerges.

Next, consider that design knowledge is cumulative; it doesn't aim for a singular truth about the world, but is a cumulation of the real, of possible ways the work. It isn't a truth-finding exercise, but a worldmaking one. This aligns entirely with worldviews that are post-structuralist and follow the Ontological Turn; there isn't a singular objective world and truth, but multiple different worlds, and what is interesting is not to describe the world as it is, but to always be making and recreating it anew. Multiple worlds, multiple concepts, multiple designs.

Finally, there is the problem identified by Gaver: theoretical underspecification, that generalised, formalised theory will always underspecify, and will always struggle to account for, the specificities of design knowledge in a meaningful way (W. Gaver, 2012). This means that *a priori* design theory, like *a priori* method, by preceding the emergence of concepts or of designs, "always comes too late, is immediately out-of-date, and so is inadequate to the task at hand," (Adams St.Pierre, 2014, p. 15). And, like method, it "*not only can't keep up with events; more seriously, it prevents them from coming into existence,*" (2014, p. 16). Theory that is patterned on the world that comes before, struggles to account for the new that emerges through design. This

brings me to the second way in which Post-Qualitative Inquiry is relevant in this project; its relationship to transitional and emerging design theory.

Transitional Design Theory and Post-Qualitative Inquiry

I have considered how theory might be made possible through Research through Design by considering Redstrom's Transitional Design Theory. To summarise, design knowledge exists on a spectrum between the specific (a design) and the general (designing as an activity). Definitions in design are made through design, and by example. Making a prototype is to make an example of the type of thing that it is a prototype of: it is both a specific artefact, and a theoretical proposition. Such prototypes are thus intermediaries between general and specific, and design theory can be framed as making prototypes of intermediary definitions. The final point is that these definitions are not fixed and predetermined (if they were they would simply reiterate or revisit what already existed) but they are transitional and emergent (every new prototype that is made redefines and recontextualises what is defined). There are clear parallels here with Post-Qualitative Inquiry and Post-Structuralism, where experimentation (prototyping) leads to the creation of new philosophical concepts (designs), not constrained by fixed method that remakes the pre-existing world: these concepts are rooted in context, and transitional, and "might well upend everything we believe," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 16).

What Does Design Research Offer to Post-Qualitative Inquiry

Another perspective on the relationship between design and Post-Qualitative Inquiry is to consider it in the reverse: what value does design research bring to post-structural, post-qualitative inquiry? Adams St Pierre argues that it is through writing that deep, theoretical reading begins to make sense, that concepts begin to appear; Sarah Truman has framed this as *Research Creation*, where what is written becomes itself theory to be read and worked with. Through design, such a process becomes legible, and tangible as a form of material practice: a literal making of concepts. In fact, it is a step beyond an abstract concept to the new that becomes. It's a materialism, grounded in the real world, of intended effects. It's a way of asking: what is this concept that I have made, and what will this do?

Typically (research into or for) design might take a methodological and structural approach, and even design itself works with methods, techniques and processes. But there is always a step from that theory or framework to produce a new, previously unthinkable thing: it's a design process, not a research process. But framing it as a form of Post-Qualitative Inquiry, it's taking an unfolding process, guided by concepts, to see what will emerge.

Following a predetermined method, the questions you ask are constrained by it, so you simply revisit what is already known within its language, with what it defines. You instead need to bring forth a different question, or concept, or language, or artefact, which you can do by

thinking with concepts. The outcome can be a rupture from what came before, it can be provocative, and it extends beyond the known universe; this the nature of Post-Qualitative Inquiry, and the nature of design research.

Chapter 4

MODES OF PRACTICE

The effort to mould the incoherent and vertiginous matter dreams are made of was the most arduous task one could undertake, much more arduous than weaving a rope of sand, or coining the faceless wind.

Jorge Luis Borges, *The Circular Ruins* (Borges, 1962, p. 74)

Introduction to Chapter 4

Having established the more abstract paradigms of research in which this work is situated, this chapter focuses on the more situated practices and techniques by which this inquiry happened.

Chapter 4.1, *Modes of Practice in Design Research*, frames a methodological approach based around a repertoire of Intentional Tactics aimed towards particular design outcomes—which include Research Creation, Prototyping, and Embracing Uncertainty—and Operational Techniques, the practical ways of doing design and research inquiry—these include Design Experiments, Fabulation, Design Workshops and Annotated Portfolios.

Chapter 4.2, *Reflective Practice*, explores reflexivity as a methodological principle, and sets out the way in which it has been drawn on in this project.

Chapter 4.3, *Authorial Voice*, discusses the use of different authorial voices in academic discourse, with a particular focus on the First-Person Singular Voice and its appropriateness, relevance and use within this thesis.

4.1 Modes of Practice in Design Research

In this project, I have taken a methodological approach that is situated both within a paradigm of design practice, and within a paradigm of Post-Qualitative Inquiry that emphasises working with concepts over methods. In that vein, Richard Blythe and Marcello Stamm write that, "practice-based design research cannot draw upon a received and sanctioned set of research 'methods': the term, while it suggests that some repertoire of methods may be available, is therefore contested," (R. Blythe & Stamm, 2017, pp. 60–61).

Blythe and Stamm identify two alternative approaches, which they describe as intentional and operational. Intentional approaches are research strategies and tactics aimed towards an intended outcome, such as mapping or categorising; operational approaches are techniques that are used to "do" design and create those outcomes, such as drawing or filming.

They write that "each practitioner has to develop and test a distinctive individual range of ways to conduct research, and explore an individual methodological take on how to investigate possible research perspectives," (R. Blythe & Stamm, 2017, pp. 60–61).

In what follows, I have identified the intentional tactics which I have drawn on as a thinking practice of making-through-thinking, *Research Creation*, a making practice of thinking-through-making, *Prototyping*, and a practice of "staying with the trouble" which I call *Embracing Uncertainty*; I also discuss the techniques that I have drawn on to create design outcomes (see Figures 18 & 19).

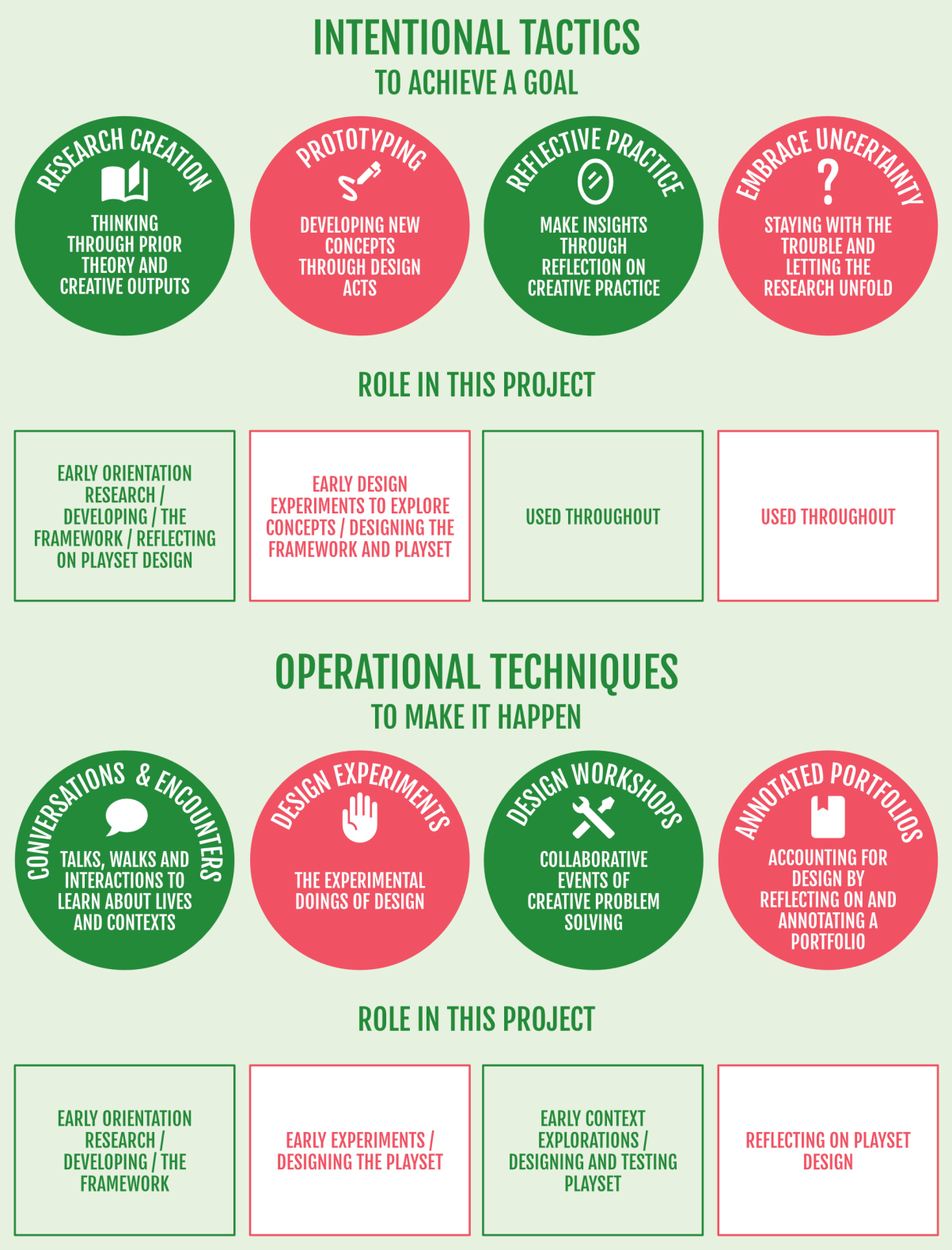


Figure 18 : Modes of Practice Infographic

This infographic shows the key intentional tactics and operational techniques used in this project.

Credit: Diagram by Craig Jeffcott. Icons by Material Design.

4.1.1 Intentional Tactics

If practice-based, speculative design research is situated as a design practice oriented towards knowledge production; or as Redström puts it, in a state of tension between the general and the specific, it is necessarily both a thinking practice, and a making practice. Research tactics for practice-based design research could be considered as tactics of thinking, and tactics of making.

Research-Creation: A Tactic for a Thinking Practice

> *"Our work as scholars is to read, think and experiment."*
>
> *(Truman, 2021, p. viii)*

In *Feminist Speculations and the Practice of Research-Creation*, Sarah Truman situates her queer-feminist speculative practice as a form of Research-Creation, an innately transdisciplinary approach to research used by "designers who incorporate a hybrid form of artistic practice that draws from both the arts and science or social science research… and supports the development of knowledge… through artistic expression," (2021, p. xv). Appropriately, she identifies Research-Creation as being "theoretically in conversation with many colleagues in the social sciences who draw on theories that align with the more-than-human turn," (2021, p. xix). Truman positions the tactic as a way to challenge the "siloed" nature of the academy, as an "interdisciplinary orientation to research into theory and the arts (with a queer-feminist-anti-racist bent!)," (2021, p. xx).

At the core of Research-Creation is a tactic that Truman refers to as *Reading and Thinking with Theory*; essentially this amounts to "reading one theory through another," (2021, p. xix), a process that is fundamental to most humanities research. The physicist and science studies scholar Karen Barad describes this as a diffractive process: "of reading insights through one another in attending to and responding to the details and specificities of relations of difference and how they matter," (2007, p. 71). Unlike reflection, which "reflects themes of mirroring and sameness, diffraction is marked by patterns of difference," (2007, p. 71).

As a transdisciplinary practitioner, Truman situates her research between the social sciences and humanities, which necessitates attempting "to link disciplines that didn't always (want to) understand or relate to each other," (2021, p. xvi); Reading and Thinking through Theory is a way of finding how these different domains might intersect. Similarly, design research finds itself situated between making and artistic practices on the one hand and theoretical, philosophical and knowledge making practices. As will be clear, in this design research project I have drawn on a diverse and idiosyncratic body of ideas and practices, from science and technology studies, design practice, social science research, science fiction, queer studies and

biodiversity activism. Reading and Thinking through Theory has been an important tactic for me to get these different domains to "understand or relate to each other," (2021, p. xvi).

Through Research Creation, Truman situates this productive engagement with theory within making and speculating practices, whereby not only does the research draw on existing theory and literature, but positions the outputs and artefacts of creative practice themselves as theoretical texts for the purpose of reading and thinking through. She relates it to how a scholar might read a pre-existing cultural artefact as a theoretical text—an artwork, a film, a poem—but with the difference that they have themselves created the artefact: "making or curating art as part of a research event rather than interrogating something that's already been created," (2021, p. xx).

Truman emphasises that "while an artistic practice is integral to research-creation, the need to read and engage with theory as part of conducting research-creation projects […] cannot be overstated," (2021, p. xviii). To do this effectively "requires the theories, the arts practices, and the research to be attuned across disciplines," (2021, p. xx) which can be achieved by "reading and thinking about theories embedded in arts practices" (2021, p. xx) in diverse ways, necessitating a transdisciplinary approach. In this project, I have adopted such a Research Creation approach, drawing equally on traditional theory texts, speculative fiction texts, and the emerging design artefacts from this project.

Prototyping : Making Theory through Making Things

> *"The act of designing, of making, requires the designer to face several confrontations: between competing or conflicting background knowledge, between theory and technology, and between dream and reality. Making provokes a particular cognitive activity, one which can be used to make people aware of tacit values and latent needs."*
>
> *(Stappers & Giaccardi, 2014)*

Bearing in mind that practice-based design research can also be referred to as Research *through* Design, it is a form of research that is also a practice of design. As has been discussed, design has some essential features as a practice that make it stand uniquely apart from the type of research that might be situated as a form of natural or social science, or humanities practice—it is situated, contextual, and underspecified by theory; it cumulates artefacts rather than converge on facts; and design theory is embodied in artefacts and the definitions that they represent—but most essentially, it is a practice of making. Situated as a research activity and, therefore, as a knowledge-making practice, Research through Design orients less towards producing a final design output, or product, and more towards producing artefacts that afford learning something; therefore, the archetypal artefact of design research is the *prototype*. Prototypes tend to be artefacts that are more transitional and propositional than a product, that are useful sites

for learning about the context of design and that afford collaborative engagement during the design process.

> *"The development of a prototype … plays a central role in the knowledge-generating process… it shows a hitherto non-existent combination of factors as a provocation for discussion, or it creates the possibility for people and products to engage in interactions that were not possible before, and these can come into existence—indeed, become observable—through the design."*
>
> *(Stappers & Giaccardi, 2014, Section 43.1.4)*

The prototype forms a nexus of informed idea making and situated materiality that affords reflection on the way that the design process affords the generation of knowledge. Prototyping allows "shape and form to be rehearsed in conversation with materials, in order to imagine and create a shared understanding of future possibilities," (Søndergaard et al., 2023, p. 1694).

Seymour Papert has written extensively on how creative, making practices play a fundamental role in learning; that one is physically building situated knowledge about the world. As a generative practice, learning through design is not simply a subjective apprehension of established facts, but a way of constructing and contributing new forms of knowledge (Ackermann, 2001). As Pieter Jan Stappers and Elisa Giaccardi write:

> *"the designing act of creating prototypes is in itself a potential generator of knowledge (if only its insights do not disappear into the prototype, but are fed back into the disciplinary and cross-disciplinary platforms that can fit these insights into the growth of theory)."*
>
> *(Stappers & Giaccardi, 2014, Section 43.1.2)*

Rather like the process of Reading through Theory, it is an approach of thinking through making: "this thinking process in itself brings about insights, some of which can be made explicit and shared with others. It is how facts emerge from the shadows and help future endeavours," (2014, Section 43.1.4). Similarly, Thomas Binder and Eva Brandt write that "the nexus of constructive design (research) is exploring the possible through making," (Binder & Brandt, 2017, p. 101).

> *"There is a specific quality in the designerly way of handling complexity that has the potential to become a useful complement to other kinds of knowledge development. Ideally, design typically avoids early identification of the problems presenting in a particular situation. Different perspectives and approaches are tried, tentatively, with no way of predicting if, or what, they will deliver."*
>
> *(Ehn & Ullmark, 2017, p. 78)*

As Pelle Ehn and Peter Ullmark write, "it is a general epistemology of creative and investigative processes, where experience, as growing out of encounters with real-life situations, is fundamental to understanding," (2017, p. 78). They emphasise that the situatedness of design research practice affords a handling of complexity "that has the potential to become a useful complement to other kinds of knowledge development," (2017, p. 78). The advantage of this is "the very special continuous learning and insight into a situation that comes from this kind of experimental approach," (2017, p. 78).

Stappers and Giacardi also emphasise the value of such a situated practice in the creation of knowledge of the real:

> *"any designer involved with [creating a] prototype will have had to navigate around the real-world obstacles that got in the way [and will] have struggled with opportunities and constraints, with implications of theoretical goals/constructs, and the confrontation between these and the empirical realities in the world."*
>
> *(Stappers & Giaccardi, 2014, Section 43.1.4).*

To conclude on a methodological note, the dynamic of a research process that is oriented around design prototypes creation is a "generative process of ideation, concept development, and making," (2014, Section 43.1.4). John Dewey described such a research process as a:

> *"pattern of controlled inquiry: framing situations, searching, experimenting and experiencing, where both the development of hypothesis and judgement of experienced aesthetic qualities are important components in the process."*
>
> *(Dewey, as cited in: Ehn & Ullmark, 2017)*

Since this project is situated as a practice of design as research, the general approach of this has been a fundamental process for me developing the ideas in this project, and the key stages in the production of new design knowledge have largely been a process of prototype development, whether in terms of frameworks, playsets, workshops, or futures.

In the next section, I consider a tactical approach to doing this sort of generative research that isn't led by precisely defined plans and research timetables, but by an approach of tentative, uncertain pathfinding.

Embrace Uncertainty - Feeling the Way

> *"This ability to accept the messiness of people and circumstances allows designers to adjust to different developments and unexpected circumstances. A research project is inherently messy, despite how often it is reported. In design research, and especially practice-based research, this attitude has certainly helped to build researchers' resilience in overcoming difficulties encountered in their study."*
>
> *(Yee, 2017, p. 160)*

To engage in speculative practices, in design and elsewhere, is to embrace uncertainty—in fact, uncertainty is the point of the speculative gesture, to harness it as a force for moving forward. Margaret Atwood wrote that "the future is an unknown: from the moment now, an infinite number of roads lead away to "the future", each heading in a different direction," (Atwood, as cited in: Savransky et al., 2017, p. 8). Martin Savransky, Alex Wilkie and Marsha Rosengarten explain that:

> *"it is impossible to know in advance just in which direction any of those roads may lead. The task, therefore, is to experiment with them, to see their ground materialise as one travels through them, as one explores their contours, landscapes, and horizons, as one witnesses such impossibilities be realised."*
>
> *(2017, p. 8)*

There is a necessity to embrace uncertainty, ambiguity and messiness in tackling this sort of research; such a posture is inherent and necessary in creative design practice, which can be characterised as "suited to 'messy' and uncertain challenges," (Dalton et al., 2017, p. 69).

Joyce Yee has argued that an:

> *"ability to accept the messiness of people and circumstances allow designers to adjust to different developments and unexpected circumstances. A research project is inherently messy, despite how often it is reported. In design research, and especially practice-based research, this attitude has certainly helped to build researchers' resilience in overcoming difficulties encountered in their study."*
>
> *(Yee, 2017)*

What does this mean in practice, as a tactic for doing design (research)? It means not starting from certain propositions, nor planning out a route ahead, nor forming a hypothesis and empirically testing it. Instead, it's taking up lures and provocations and feeling the way forward, point by point, encountering the world where it is, branching off in different directions

simultaneously, and learning to sit with confusion and complexity. It's thinking through making, going where the fingers take you, rather than the mind.

Fungal mycelia provide a model for feeling the way forward. Merlin Sheldrake has written about how fungi explore the world, to discover food and other resources they need to survive. They don't move their bodies in one direction to gather food, but send out multiple branches of mycelia in many directions: "when faced with a forked path, fungal hyphae don't have to choose one or the other. They can branch and take both routes," (Sheldrake, 2020, p. 51). Mycelial hyphae (the individual strands of mycelium) grow from their tips, "which must be the place where information comes together to link perception and action and determine a suitable course for growth. Hyphal tips are the parts of the mycelium that grow, change direction, branch, and fuse. They are the part of the mycelium that do the most," (Sheldrake, 2020, p. 51).Sheldrake proposes that "mycelium is a living, growing, opportunistic investigation—speculation in bodily form," (Sheldrake, 2020, pp. 57–58). This is how design speculation must operate, too, taking multiple paths, being opportunistic about what shows up, and feeling the way forward through complexity.

It's a tactic that Donna Haraway calls Staying with the Trouble, which lies at the centre of her speculative, multi-species storytelling, in which one must engage with the world and the beings in it where they are, finding ways to live and die well together:

> *"We—all of us on Terra—live in disturbing times, mixed-up times, troubling and turbid times. The task is to become capable, with each other in all of our bumptious kinds, of response. Mixed up times are overflowing with both pain and joy—with vastly unjust patterns of pain and joy, with unnecessary killing of ongoingness but also with necessary resurgence. The task is to make kin in lines of inventive connection as a practice of learning to live and die well with each other in a thick present. Our task is to make trouble, to stir up potent responses to devastating events, as well as to settle trouble waters and rebuild quiet places. In urgent times, many of us are tempted to address trouble in terms of making an imagined future safe, of stopping something from happening that looms in the future, of clearing away the present and the past in order to make futures for coming generations. Staying with the trouble does not require such a relationship to times called the future. In fact, staying with the trouble requires learning to be truly present, not as a vanishing pivot between awful or Edenic pasts and apocalyptic of salvific futures, but as mortal critters entwined in myriad unfinished configurations of places, times, matters, meanings."*
>
> *(Haraway, 2016, p. 1)*

A strategy she suggests for this is another permutation of Speculative Fiction: String Figuring. *String Figures* are "*thinking* as well as *making* practices," (2016, p. 14): complex games and tangled structures that people together with lengths of string. Playing with String Figures is to embrace

messy, entangled, unclear situations, playfully tangling and untangling to find the way towards something else, something new:

> *"Playing games of string figures is about giving and receiving patterns, dropping threads and failing but sometimes finding something that works, something consequential and maybe even beautiful, that wasn't there before, of relaying connections that matter, of telling stories in hand upon hand, digit upon digit, attachment site upon attachment site, to craft conditions for finite flourishing on terra, on earth."*
>
> *(Haraway, 2016, p. 10)*

4.1.2 Operational Techniques

Design Experiments and Prototyping

> *"Prototyping allows shape and form to be rehearsed in conversation with materials, in order to both imagine and create a shared understanding of future possibilities."*
>
> *(Søndergaard et al., 2023, p. 1694)*

Acts of design within practice-based Design Research can be thought of as *Design Experiments*, oriented towards the production of prototypes; prototypes existing as materialised examples of what a certain approach to design may lead to. Johan Redström writes that this "is rooted in the long history of labelling design that explores boundaries and alternatives as experimental—hence the notion that this a kind of experimental design research," (2017, p. 101). Thomas Binder and Eva Brandt write that:

> *"design research practices [are] fundamentally homologous to other design practices, both in terms of the way they are driven forward by a dialectic between programme and experiment and in how they actualise potentialities through experimentally manifesting 'the possible'."*
>
> *(Binder & Brandt, 2017, p. 101)*

Such experiments aren't qualitatively the same as scientific experiments, conducted within a controlled set-up to provide empirical proof or refutation of a theory[29]; in fact, Redström writes that design theory often doesn't precede experimentation, but that there is a "much more complex and dynamic" (2017, p. 102) relationship with them: "we cannot simply define the design experiment as an act or intervention intended to materialise, explore or challenge," (2017, p. 102) a hypothesis. "Just as often, the trajectory will be pointing in the opposite direction, starting

[29] Redström suggests that design experiments are more akin to "experimental art, experimental vehicles, experimental living, and all sorts of activities conducted with the purpose of pushing boundaries and exploring alternatives," (Redström, 2017, p. 101).

with experiments long before a more general framing has been articulated," (2017, p. 102). What is of more interest is exploring how "making/experimenting and theorising are intertwined" (2017, p. 101).

A design programme can provide a foundation from which design experimentation can be conducted, not by preceding and governing experimentation but by constituting "a definition of what designing is at a level of abstraction that experiments as such do not address"; it allows for "the framing of a design space within which possibilities can be explored through experimentation" (Redström, 2017). Such experimentation, resulting in prototypes and examples of what may be possible through design, can reconfigure the foundations of an existing design programme and even prefigure the development of theory or the programme itself.

What this means in practical terms is that the progress of carrying out design research is much the same as a typical design project might proceed; starting from initial conditions and constraints, following lures and provocations, and carrying out practices of design oriented towards the production of artefacts (often within a design programme that provides a framework for this). To this end, I have drawn on my existing design expertise as well as widening my palette of techniques and approaches, and have conducted experiments through various forms of design practice: conversations and situated encounters, sketching, photography, graphic and communication design, service design, instructional design, design workshops, and game design. How it differs is simply the intention; that the artefacts produced are conceived as prototypes or examples, definitions through design that may give some insight into the unfolding process of doing design. Approaching design as an experiment "opens up a space of virtuality in which the questions of whatever is imagined can be done, where the experiment leads us, and how we reach the outcome are raised simultaneously," (Binder & Brandt, 2017, p. 101).

Fabulation

Fabulation is a scholarly and designerly approach to speculative storytelling that draws on science and technology studies (STS), and queer, feminist, and more-than-human perspectives "to foreground absent or neglected relations when imagining alternative lifeworlds," (Søndergaard et al., 2023, p. 1693); this fabulatory approach to worldmaking has been adopted in design research "as a more politically-minded and norm-critical addition," (2023, pp. 1695–1696) to other speculative design practices.

Fabulation derives from fables, unreal stories—often with more-than-human protagonists—that impart some moral or philosophical message, and represents a turn away from literary realism to more a more "artistic kind of narrative," (Scholes, cited in Søndergaard et al., 2023, p. 1695). In *Fabulation as an Approach for Design Futuring*, Marie Louise Juul Søndergaard and her co-authors define the practice within design research as a way of:

> *"imagining and creating representations of alternative social relations: ways of designing, ways of knowing, and ways of living with or without technology [with] less emphasis on designing and imagining technology and more emphasis on social and cultural relations, political tensions, and power hierarchies among human, non-human, environmental and technology coexistence."*
>
> *(Søndergaard et al., 2023, pp. 1693–1694)*

They write that fabulation differs from design fiction in that the latter tends to be instrumentalist and technology focused, while fabulations engage more with theory, and "can be a way of understanding, working with, and making theory," (2023, p. 1696) while drawing on designers' "ability to imagine how things (technologies, artefacts, systems) have concrete material impact in possible future worlds, using their designerly skills to make, craft and materialise these fabulations into some perceivable or sensory medium," (2023, p. 1704).

Søndergaard *et al.* write that both fabulation as a process of worldmaking, and fabulations as the worlds created through the process, have particular qualities that recommend them as a practice of design futuring:

Thinking and Making Practice

Fabulation is both a thinking and making practice (so it combines the research tactics of thinking through theory, and design experimentation and prototyping) with a "combination of theory and making [that] distinguishes itself from other approaches by focusing not on objects and gadgets, but on world-making involving future perspectives," (2023, p. 1704).

Joyful Practice

Fabulation is joyful, whereby a "joy of fabulating can become accentuated in the connections between material and imagination; it is a collaborative and reciprocal practice, allowing for collective worldmaking and "practicing the important, life-sustaining collective force of our imagination," (2023, p. 1706).

Non-categorical

Fabulation that troubles and transcends existing categories and binaries to "propose new configurations of human and non-human actors, and include these more-than-human perspectives in the practice of worlding," (2023, p. 1694).

Alternative Worlds, not Normative Futures

Fabulation engages with shifting temporalities, less oriented towards a "projected future" than other speculative design practices but rather towards alternative worlds and outsider heterotopias.

More-than-Human Temporalities

Fabulation troubles the "linearity of time" (2023, p. 1705) and offers pluriversal perspectives on temporalities beyond the human, with fabulations that are open ended.

Cultivating Imagination

Fabulation offers a way for designers to "cultivate imagination" to move beyond ways of design futuring where "predictability and probability are valued higher than the expansive space of the possible", and as "a crucial driver for resisting and critiquing the defuturing of technology," (2023, p. 1706).

Design Workshops

> *"The 'event' character of the workshop…may enable us to build, and in turn be built, with other humans and non-humans—a space where what is shared may be very particular. A space where we can build worlds that span worlds. As such they manifest the possibility of shared worlds which can be made without being premised on universality and homogeneity."*
>
> *(Darnholt et al., 2022, p. 1)*

Design workshops are a prevalent design technique within speculative practices in design, curation and other fields, often representing a design output in themselves. I focus specifically on workshops out of the various design and research techniques I have drawn on in this project, as they have played a central role in the design practice which emerged.

A *workshop* typically refers to a physical location in which things can be made, but Rikke Ørngreen and Karin Tweddell Levinsen write that it has since the 1960s come to be used to also refer to something more conceptual, in both location and making: "an arrangement whereby a group of people learn, acquire new knowledge, perform creative problem-solving, or innovate," (2017, p. 71). Workshops have been a recurring technique and design outcome throughout this research project, and all of those workshop roles have been tackled through them, whether through participation, facilitation or organisation.

Ørngreen and Levinsen write that from an academic perspective, workshops are a weakly defined concept, "since its formats and use developed within authentic contexts," (2017, p. 71).

I'd argue that it is exemplary of the transitional nature of definitions through design that Redström discusses, that workshops are defined not in advance but by demonstration: rather than "this" is a workshop, a workshop itself defines "workshopping". Peter Darnholt, Michael Guggenheim, Mike Michael, and Alex Wilkie write that "workshops work exactly due to their vague and pluralistic quality—they are productive due to their looseness and ambiguous quality," (2022, p. 1).

However, there are some features that might be definitive, or at least, are common, in events defined as workshops: they tend to be planned events constrained in location and duration aimed at participants with shared interests; participants usually "actively participate and influence the workshop's direction," (2017, p. 72); participant numbers tend to be low to allow for all to meaningfully participate in the activities; they have a purpose that is pre-defined, "though not predictable," (2017, p. 72); they often employ "obstructions that disturb and challenge" (2017, p. 73) participants' preconceived ideas about the issues the workshop engages with; and they are often structured around diegetic scenarios and role-plays, where participants are cast as active participants in fictional realities (2017). This last feature is of particular relevance and importance here: the way that new worlds can be invoked, a place where "actors, artefacts, environments, technologies, concepts, speculations can be brought to life and may journey into other worlds or 'the larger world' [and can be] a processual and performative event [of] world-producing," (Darnholt et al., 2022, p. 1).

Workshops can be used as a design research technique to elicit complex understandings of a particular domain of inquiry. They can facilitate complex interactions between facilitators, participants, and the domain in question: "issues can be presented, experimented with, played out, and discussed [in] an immersive and collaborative environment where meaning is negotiated," (2017, p. 79). As a result, it often uncovers insights that neither researchers not participants were aware of (2017). Workshops generate atypical and unstructured data due to their dynamic and collaborative, entangled nature, compared to observational studies or interviews, and it is not, as I discovered, "easy to document workshop process[es] from end to end," (2017, p. 79). What can be particularly interesting are "the spatial and temporal aspects of workshops and the 'moments', particularities and emergence that workshops mediate," (Darnholt et al., 2022, p. 1).

Annotated Portfolios

As discussed above, knowledge and theory from research through design may be articulated through intermediaries, or "in-betweens", on the spectrum from general, abstract knowledge of designing, and the specific, situated knowledge of a design: they are a form of design knowledge that "reside between particular design instances and abstract theory," (Hoggenmüller et al., 2021, p. 1) and can "bridge abstract knowledge to concrete and situated outcomes," (Culén et al., 2020,

p. 2). One approach to this, as proposed by Redström as Transitional Theory (2017) and discussed in some depth in this thesis, is to articulate this knowledge in terms of transitional definitions through design.

Another technique which engages more directly with the artefacts of design is *Annotated Portfolios*, a concept proposed by William Gaver and John Bowers (2012), and which is explored here in detail though examples by Marius Hoggenmüller and co-authors (2021), and Alma Leora Culén, Jorun Børsting and William Gaver (2020).

In an annotated portfolio, "a visual collection of artefacts [is] combined with brief textual annotations […] to provide designers with an approach to articulate design as research [and to] highlight, formulate and collate design thinking," (Hoggenmüller et al., 2021, p. 2).

> *"Positioning design practice and its outcomes as research require[s] demonstrating the production of new knowledge. Design artefacts are rarely considered sufficient in themselves. Instead, the community tends to expect, or demand, some degree of abstraction, usually in textual form."*
>
> *(Culén et al., 2020, p. 2)*

The use of annotated portfolios draws on the inherent tension in the design academy between the products of design and design knowledge, whereby design knowledge is embedded in designed artefacts, but needs to be translated into "broader academic knowledge," (Hoggenmüller et al., 2021, p. 2) and articulated in a way that it can be "communicate[d], contest[ed], and develop[ed]," (2021, p. 2) in academic contexts. Since knowledge is embedded in design objects, this necessitates a form of documentation in conversation with these artefacts, a role which may be filled by annotated portfolios.

Annotated Portfolios represent a useful approach as part of reflective design practice, as a way of bridging the gap between the material and semiotic products of design processes, and a reflection on practice that is both theoretically informed and generative. It therefore lies at the core of the reflective methodology of this research project, connecting the design-led practice of Design Experimentation and Prototyping, with the theory-led approach of Research Creation and Reading through Theory, to situate emerging and transitional theory in design practice.

Representational approaches

From their initial conception by Gaver and Bowers as briefly annotated visual portfolios of design artefacts, annotated p[portfolios have been adapted by designers to represent and share design knowledge in different ways, which can range from being largely visual documents with minimal textual annotations "that [point] out their salient qualities or the issues they address,"

(Culén et al., 2020, p. 2), to wholly textual accounts of design processes and artefacts, or hybrid approaches which combine elements of both (Hoggenmüller et al., 2021).

Annotation Strategies

A variety of different annotation strategies which produce different types of knowledge have also emerged. Originally conceived as a way to draw out more abstract theoretical design knowledge situated in design artefacts and to "help designers to gain some level of abstraction when reasoning about their practices," (Culén et al., 2020, p. 10), other approaches aim to show "how concepts drawn from theory can inform design practice," (2020, p. 1), or to "focus on temporal and relational aspects amongst designs," (2020, p. 10).

These strategies can include the foundational approaches of *Designed Artefact Annotation Strategy* and *Domain-Level Annotation Strategy*, which aim towards abstracting knowledge about the designed objects or the design contexts, respectively. Other, more novel strategies include: *Trajectory Annotation Strategy,* which focuses on the contextual development of the project and artefacts over time and through various iterations (Culén et al., 2020; Hoggenmüller et al., 2021) ("physical artefacts hold knowledge in the iterative process of making, which is often poorly documented" (Hoggenmüller et al., 2021, p. 10); *Ecosystem Annotation Strategy*, which "highlights how designs can work together or how they could offer alternatives to one another," (Culén et al., 2020, p. 10); and a *Focussed Annotation Strategy* (described by Hoggenmüller as "zooming-in") which allows the designer-researcher to focus on a "specific aspect" of the artefact and process within its "complex and changing contexts." (Hoggenmüller et al., 2021, p. 10).

Annotated Portfolios have been used in practice to explore these different strategies in combination: examples of this include *A Case Study of Robotic Artefacts* by Hoggenmüeller and co-authors (2021) and a portfolio of designs "for people with Myalgic Encaphalomyelitis" by Culén, Børsting and Gaver (2020, p. 1). The latter write that:

> *"taken together, the designs and all […] types of annotation map out a design space, or ecology of designs, interlinking deeper and specific domain insights with somewhat higher levels of abstractions allowed by the first two, more commonly applied strategies […] they work well together to articulate the range of new knowledge produced by design practices."*

(Culén et al., 2020, p. 10)

Design Probes

Design (or Cultural) Probes were first described as a design method by William Gaver, as a way to gather idiosyncratic materials from research subjects to form a rich body of qualitative research data while the researcher is not present (B. Gaver et al., 1999). They take inspiration from art

movements, such as *Situationism* and *Surrealism*, and in form consist of a pack of activities, such as diaries, cameras, notebooks, maps and suchlike, that can be distributed to research subjects and collected, completed, at a later date.

I carried out some research into the practicalities of developing a probe tool. Dr Gillian Russell, in conversation with me, gave two key pieces of advice. The first was that a probe tool should be designed to confound the expectations of the participant, for example, she suggested that giving participants a camera may result in them trying to take 'beautiful' images as that's what they anticipate the researcher wants, instead of the more idiosyncratic responses that the researcher would prefer. The second was that probe tools could be designed for two distinct purposes—some probes are designed to reframe the way that the participants think about an aspect of their lives, while others are designed to elicit responses after being primed to view things through that frame.

Useful guidance was also obtained from the paper *Making Design Probes Work* (Wallace et al., 2013). The authors suggest that a design probe is a collaborative scaffold for response, that provides a frame for the research subject to respond to a specific issue, and that forms a collaboration between the researcher, who started the probe, and the respondent who finishes it. To be an effective scaffold for response, they discuss three factors that are important: boundedness, materiality and pace. *Boundedness* refers to the quality of the probe that allows it to be sufficiently open to allow the respondent to respond creatively, but not so open-ended that it is unclear what is expected of them. A good probe should therefore have clear bounds in terms of how much of a response or time commitment might be required; they should feel like partially completed objects, where it is clear what completion will look like. *Materiality* refers to the form of the probe; the authors suggest that the material structure of the probe should reflect or act as a metaphor in some way for the topic or subject of the response required: to be "a physical metaphor of what is enquired around," (2013, p. 3445). This will allow the probe to evoke a particular type of response, and provide a structure for response. *Pace* relates to the speed in which a probe tool can be completed—whether it is in minutes, hours, days or weeks. Different people will respond better to different pacing, or different paces may be better suited to different questions, but the authors suggest that having a range of paces across the various probe tools is recommended.

Qualitative Methods

Conversations and Encounters, and Qualitative Coding

This research has drawn on some more traditionally qualitative research methods, but framing them as design techniques: interviews (or conversations) and qualitative coding, which is a

component of grounded theory, whereby qualitative data is coded and patterns within it can be revealed (Benaquisto, 2008).

Both of these methods have been identified as problematic within a post-structuralist and Post Qualitative Inquiry context. Elizabeth Adams St.Pierre emphasised that:

> *"Foucault wrote that his work was not grounded in the 'speaking subject,' the thinking, knowing, conscious, speaking subject, but in the discursive formation in which the subject is produced and can speak certain things."*
>
> *(Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 18)*

What this suggests is that in a formal interview, approached as a means of data analysis, opens up with a structural and categorical hierarchy already in place, regardless of what might emerge: the person being interviewed is the *Speaking Subject*, framed as an interviewee with a particular script of interaction implied in the process. This is a structuralist way of learning about the world. Instead of this, and what Foucault argues is more interesting, is to think about those very dynamics of structure and power, and what is being revealed through them. Adams St.Pierre argues that "ordinary practices like talking with and observing people don't have to be formalized, scientized, and elevated to the status of 'the interview'," (2014, p. 4).

Likewise, on the topic of qualitative data coding, Adams St.Pierre rather sarcastically asks, "Would Derrida code data?" (2014, p. 24). The answer is no, because again, drawing codes out of data in order to understand an underlying structure is not commensurate with post-structuralist thinking, nor indeed, the aim of design to bring forth the new, not reiterate what comes before.

However, I draw here on the assertion by Karen Barad that techniques of structuring and representing may lead not to "(more or less faithful) pictures of what is, but productive evocations, provocations, and generative material articulations or recon-figurings of what is and what is possible," (2007, p. 389). In this vein, I have used these qualitative methods in this research, not as social science methods of data collection, but as design techniques: aimed towards learning about entangled and situated contexts, in the instance of interviews (which I here recast as *Conversations* with individuals, and *Encounters* with contexts); and aimed towards the creation and structuring of new design artefacts through a coding process that is synthetic, rather than analytic.

Intentional Tactics		
Tactics to achieve end goals		
Tactic	Description	In this project
Research Creation	Thinking through theory, by treating prior theory and creative outputs of the research equally	Throughout, particularly in early orientation research, in developing the framework, and reflecting on game and playset design
Prototyping	Developing new concepts through design acts	Early design experiments to explore concepts, Designing the Framework and Playset
Reflective Practice	Obtaining insights through reflection on creative practice	Throughout
Embrace Uncertainty	Staying with the trouble, and letting the research unfold as it goes	Throughout
Operational Techniques		
Techniques to make it happen		
Technique	Description	In this project
Cultural Probes	Packs of creative activities to distribute to people to gain insight into their lives and contexts	As an early stage of the pilot research; it wasn't a great success for this project.
Conversations	Open-ended discussions with people, to learn about their lives and contexts	Pilot research, game design
Design Experiments	The doing of design in a research context	Pilot research, designing the framework and the playset
Annotated Portfolios	Accounting for design work by reflecting on and richly annotating a portfolio representing the development of an artefact or project	To analyse and frame the playset
Coding	Drawing out concepts from a discourse in a structured way	To a limited extent, to help shape the framework

Figure 19 : Tactics and Techniques

This table gives an overview of the design tactics and techniques used in this research project.

4.2 Reflective Practice

As a form of research that is based in the practice of doing design, Research through Design is a form of knowledge creation throughout and intrinsic to the process of design, which can be messy, iterative, undocumented, and highly subjective. Conducting and organising such a form of research thus is by nature a largely reflective practice, and as such design researchers are acting as reflective practitioners. Research through Design is a reflective practice because a designer researcher generates knowledge by reflection on one's own practice, rather as a practitioner of action research or grounded theory might do.

The concept of the *Reflective Practitioner* was proposed by Donald Schön, in which research carried out by professionals in particular fields often focused on their lived experience of being practitioners of their practice (Schön, 1983). Tobie Kerridge, a speculative designer and researcher based at Goldsmiths, University of London, discusses the volume of discourse regarding reflexivity in design research, and highlights the importance of Schön's concept of the reflective practitioner for researchers in design: "through Schön the scientist designer is developed into a reflective designer, who 'becomes a researcher in the practice context', and thereby an account of design that is situated and emergent is made methodologically valid for design research," (2015, p. 22).

Reflective practice is an important means of accessing the situatedness of design research, with Kerridge and Lisa Grocott in their respective PhD theses discussing the principle of design reflexivity as being "a conversation with a situation," (2015, p. 22), or the "materials of the situation," (Grocott, 2010, p. 18); Grocott writes that she is "interested in the idea that the designer is in conversation with the physical components which he or she is designing," (2010, p. 18). The importance of this is to emphasise that practice-based design research is a form of inquiry in which knowledge is situated in the process of doing design, at the centre of which lies the designer: making design decisions, taking actions, and reflecting on them. Grocott argued that "if the designer-researcher is drawn into a prolonged engagement with negotiating the subject of [their] enquiry, time and space is created for deeper critical reflection and productive speculation," (2010, p. 20). Kerridge reflected that the "notion of design reflexivity shows that an analysis of speculative engagement need not be limited to the designed artefact," (2015, pp. 22–23) but could include the contexts and practices which shaped it, and the uses to which it is put.

Reflexivity in design practice is not simply oriented towards accounting for particular instances of designing and designs, but towards a contribution to design theory. Ultimately, Grocott argues, "the goal is not for the practitioner researcher to become a philosopher or a psychologist," (2010, p. 27) but to take a self-reflective stance such that their "insights into praxis can play a formative role in building theories of design," (2010, p. 27). Reflexive design practice

makes such a contribution to discourse through "the discursive act of negotiating and debating the outcomes until the insights transcend the immediate practice experience of the designer." (2010, p. 51).

4.2.1 Reflective Practice as a Methodological Principle

> *"Although various methods are deployed at specific phases, the research design is predominantly design-oriented reflection-on-action. This ranges from design-led reflection-in-action to interventions that allow me to stop and reflect on the overall project as well as how I am actually researching. Multiple modes of reflection allow me, the researcher, to continually negotiate the back talk, insights and propositions generated from the inter-related activities of designing, writing and framing the research."*
>
> *(Grocott, 2010, p. 51)*

Grocott talks here about the importance of multiple modes of reflective practice within a design research project, which form part of, inform, and are informed by, ongoing design activities.

Schön distinguished between two approaches to reflective practice, which Danny Godin and Mithra Zahedi have explained as: "*reflection-in-action*: decision or action made based on tacit (non-explicit knowledge) [and] *reflection-on-action*: later, when the actions are thought about what they did or decided," (2014, p. 8).

Grocott expands on these approaches. She considers three modes of reflection in practice: *project-driven reflection*, which is equivalent to Schön's reflection-in-action, which is "enacted implicitly throughout the process of designing"; *reflection-on-practice*, which she equivalates with reflection-on-action, and is a retrospective reflection on the design practice; and *research-framed reflection*, equivalent to Schön's "reflective-conversation-with-the-situation," (2010, p. 51) which is "led by the research framing exercises, and is made manifest by iterative, retrospective reflection of components of the research," (2010, p. 51).

She argues that project-driven reflection is part of a designer-researcher's ongoing, day by day design practice, and that reflection-on-practice plays an important role "in the development of a design-oriented research program," (2010, p. 51), but that research-framed reflection is most important in terms of making a wider contribution to design theory, given that it engages beyond the design outcomes with all of the framings and contexts of the design project. She makes the point that:

> *"by engaging in a reflective conversation with the whole research situation (not just the specific design projects), the researcher iteratively negotiates the understandings that emerge from the practice, and adjusts the research program and the next method/project to further explore the relevance of the findings for contributing to an understanding of design." (Grocott, 2010, p. 51)*

Kerridge makes reference to this in his PhD thesis, too: he approached his research as a reflection-on-action of previous work in projects he'd been involved in, rather than as a reflection on the work as it was being carried out. He reflects that there is a challenge in reflecting on practice alongside understanding the situatedness of the practice, with a need to understand:

> *"how to accommodate a reflexive description of design practice, while also affording a critical analysis of the broader scene that gives shape to, and is to an extent shaped by that practice."*

(Kerridge, 2015)

4.2.2 Approach to Reflective Practice in this Research Project

In this research project, I have engaged with these multiple approaches to reflective practice, and I would agree with Grocott that the reflection on the wider contexts of the design project are more revealing of the wider implications of this research.

When considering project-driven *reflection-in-action*, I would also concur with Grocott that this has been an ongoing, integral part of the design-research process: I have not considered this as a separate activity to design, but as part of the process of responding to contexts, taking action, reflection on that action, and deciding on a response.

Reflection-on-practice (or *reflection-on-action*), being separated from the act of design by time, space and experience, has by necessity been more deliberate, and is best exemplified by the periods of design activity which were followed by longer periods of reflection, during the design of the design Playset. I would also consider here the Annotated Portfolio technique, which I draw on in Chapter 7, where I reflect on the rich narrative of design decisions, prototyping, and reflecting on practice throughout the development of the playset.

Research-framed reflection plays, as Grocott describes, a more important role in this project inasmuch as it proposes to contribute to design theory, and is driven by the research tactics of Research Creation and Prototyping, as described in the *Modes of Practice in Design Research* section of this Chapter. Through the Research Creation principle of Reading through Theory, I have engaged with the design experiments and prototypes through a reflexive reading of those

things that emerge with regards theory, while simultaneously treating those artefacts as theoretical statements. This is exemplified in two particular moments in the research process. First, the theoretical shaping of the Design Celium through reflecting on theory through queer and more-than-human lenses (as described in Chapter 6). And second, the reflective analysis of the project and its artefacts through the framing of Transitional Design Assemblages, whereby I reflect on: the process of design; the artefacts it produces; the contexts in which it engages; and myself (as an integral part of this process), leading to theoretical insights (as described in Chapter 8).

Overall, reflective practice is a vital component of practice-based research, of which Research through Design is an example. As research is *through* design, it is in the doing of design—the designer-mediated tension between designing as a situated activity and a design as a situated artefact—that knowledge lies. Therefore, the design practitioner-researcher themselves is integral to that process, through the design decisions made, reflected on in the moment and afterwards, reflected on through theory, and the motivations and contexts in which they are situated.

4.3 Authorial Voice

> *"The use of first-person allows […] writers to emphasise, and to seek agreement for, their own contributions. It leaves readers in no doubt where they stand and how their statements should be interpreted. First-person, then, is a powerful means by which writers express and identity by asserting their claim to speak as an authority, and this is a key element of successful academic writing."*
>
> *(Hyland, 2002, p. 1094)*

An important aspect of reflective practice is the way in which it is accounted for in academic writing, of which this thesis is an example. Reflective practice in design research is contextually situated, and explicitly positions the designer-researcher as implicated and present within the process of designing and reflecting; in the context of the written account of the research, therefore, the way in which the author is presented within the text is important.

Authorial presence may be framed through the concepts of "stance" and "voice", where stance is the way that the author positions their arguments, attitudes and judgements on the knowledge being presented, and voice is the way that knowledge might be framed according to convention, and the way the writer's identity is constructed. Or, to put it another way, stance is concerned with the way that the writer presents their argument, while voice is how the writer presents *themselves*: as a researcher, designer, and theorist (Cheung & Lau, 2020). Garry C. Gray argues that voice "is the mediating link between author and subject in any style of writing," (2017, p. 179), reflecting what the author does or intends through their writing.

In accounts of reflective design practice, it is essential that the presence of the authorial voice within the text is well considered. If knowledge and theory in practice-based research reside within the designer-researcher's reflections on and in practice, it is clear that the designer-researcher must have an overt presence within the written accounts of this practice.

Therefore, academic accounts of reflective practice are often written from a first-person perspective and use first-person pronouns (I, we, us, our), which are "probably the strongest indicator of the writer's presence in the text," (Cheung & Lau, 2020, p. 217). Such a practice is well established, both as an academic convention, and as a point of contention within the academy, where it represents a dividing line for epistemological differences, and academic gatekeeping practices.

In this section, I consider the value of using first-person voice and pronouns in reflective accounts of design practice, the ways in which it has come to be considered contentious, and justifications for using this voice throughout this thesis.

4.3.1 First-Person Singular Voice in Reflective Practice

Gray argues that:

> *"reflexivity enables both insight into phenomena and the knowledge of how that insight has been constructed. It allows researchers to become sensitive to their own political, social and cultural context while being aware that their knowledge is reflected in both time and social space."*
>
> *(Gray, 2017, p. 181)*

Personal-reflexive writing "demands a critical examination of the way that [the author has] engaged their research question," (2017, p. 181). A first-person voice situates the author within the text, and therefore situates the text within the rich contexts in which it emerges. This thesis is a reflexive account of a design project and design process, with much of the context in which knowledge emerges entangled with me as the designer and researcher, in a tension between intended practice and action, reflection-in-action as practice unfolds, reflection-on-action when considering what was done later, and further iterative practice and action informed by prior reflection. To properly give a critical examination of this engagement, I believe it is important to present this as a personal and reflective account.

Judi Marshall and Geoff Mead consider how self-reflective practice and first-person inquiry play an important role in Action Research[30] with regards to researchers being able to inquire into their own practice, to act with purpose, and assess the impact of their actions (2005). They argue that first-person enquiry has the potential to engage with "significant social and political issues," (2005, p. 238); that it can be a way for the author to express vulnerability; that is allows for a combination of "'showing' (speaking from experience) and 'telling' (talking about the inquiry)" (2005, p. 238); that writing "is itself a form of reflective practice" (2005, p. 239).

Gray also argues for the use of first-person voice as it allows for the conveyance of emotional content, concepts and reflection: "the inclusion of researcher emotion in reflexive writing increases […] *the trustworthiness of the account* by increasing both the credibility of the narrative and the potential transferability of the experience," (2017, p. 185).

Ken Hyland discusses the role of authorial voice in self-representation in academic writing, and its relation to authority and credibility in writing. He argues that besides sharing knowledge, academic writing is an exercise in presenting the self: "it not only conveys disciplinary 'content' but also carries a representation of the writer," (2002, p. 1092). The use of first-person pronouns allows writers to "gain credibility by projecting an identity invested with individual authority,

[30] As discussed previously, *Research Through Design* shares some epistemological and methodological similarities to *Action Research*

displaying confidence in their evaluations and commitment to their ideas." (2002, p. 1091). Gray argues, similarly, that 'self-reflexivity expressed through the voice empowers a richer understanding of both researcher and subject," (2017, p. 180).

Following Roz Ivanić, Hyland writes that writers' identities within a text are constructed of three aspects of the self: "the '*autobiographical self*', influenced by the writer's life history, the '*discoursal self*', the image or 'voice' the author projects into a text, and the '*authorial self*', manifested in the extent to which a writer intrudes into a text and claims responsibility for its content," (2002, p. 1093). Hyland argues that this third, authorial self represents a means by which the author claims authority, by personally supporting their position, and he posits that "one of the most obvious and important ways writers can represent themselves to readers […] is to explicitly affirm their role in the discourse through first-person pronouns," (2002, p. 1093), and that "the use of *I* [is] critical to meaning and credibility, helping to establish the commitment of writers to their words and setting up a relationship with their readers," (2002, p. 1093).

> *"Self-mention constitutes a central pragmatic feature of academic discourse since it contributes not only to the writer's construction of a text, but also of a rhetorical self. The authorial pronoun is a significant means of promoting a competent scholarly identity and gaining acceptance for one's ideas."*
>
> *(Hyland, 2002, p. 1110)*

4.3.2 The Role of the First-Person

The use of a first-person perspective in academic, or any, writing contrasts with third person accounts in that there is a person within the text addressing the reader, rather than the reader being addressed indirectly by the text itself. That person in the text, by being present, has a role to play, which raises the question, what is the role of the first-person in academic prose? Yin Ling Cheung and Louwena Lau, in a study of authorial voice in different academic disciplines, identify a number of roles that the first-person might play within a text, which include: the *Representative* (the person who stands as a proxy for a larger group); the *Guide* (the person guiding the reader through the text); the *Architect* (the person who is writing and structuring the text); the *Recounter* (the person recounting the research process); the *Researcher* (the person who justifies and rationalises carrying out the research); the *Opinion Holder* (the person who shares their opinion or view on something); and the *Originator* (the person who conceives the ideas presented in the text) (Cheung & Lau, 2020).

4.3.3 A Contentious Voice

While the rationale and value of using a first-person perspective in reflexive academic writing, and the roles that such a voice can adopt within a text, have been established, the use of such a voice is contentious, and not a settled position within academia; the prevalence of this approach varies based on institution, discipline, gender, and outsider/insider status. In this section, I give some consideration to this debate.

Gray writes that "active incorporation of reflexivity in writing through the use of reflexive voice remains a source of academic debate with some embracing it and others resisting it," (2017, p. 181) and that these tensions "are rooted in unarticulated epistemological divisions among a diverse group of scholars," (2017, p. 179)

This tension is between reflexive, contextual, subjective, first-person accounts of situated knowledge and action on one hand, and distant, authoritative, objective third-person accounts of fact. These differences of epistemological perspective have their roots in a post-modern and post-structuralist "crisis of representation," (2017, p. 179) which "sharpened arguments against the existence of a single overarching truth, suggesting alternatively that there are competing interpretations and discourse that continually shape understandings of social phenomena," (2017, p. 179). Through such a lens, single correct interpretations of facts don't exist, because the way the facts are constructed and interpreted are produced through an interpretive stance.

Typically, and particularly in the sciences, a distant and impersonal third-person voice has tended to be used within academic writing, a tradition which has its roots in the positivism of the 19th century. Positivism is the assertion of the existence of a reality external to the researcher, which can only be apprehended through the senses, as Kim M Mitchell argues, "using verifiable objectivity, empirical enquiry, and logical facts," (2017, p. 2). From this perspective, "knowledge bears no relationship to the context being observed or to the experiences of the observer," (2017, p. 2), which translates into an abstract, disembodied academic voice that "leaves a sense that writing is voiceless," (2017, p. 2).

Mitchell considers a feminist counter-argument to this perspective, according to the principle that "identity, reality, thoughts, facts, knowledge, writing and the self are socially constructed rather than socially determined, and construction implies they are open to change," (2017, p. 2). She argues that an attempt to be objective "disembodies the producer of the work," (2017, p. 3). Knowledge is situated, which "refers to knowledge doused in its historical, positional and contextual meaning. From this perspective, disembodying the subject denies truth," (2017, p. 3).

In fact, the very factors that recommend writing from the first-person—subjectivity, self-representation as an authoritative voice, expressing vulnerability, situated knowledge—are exactly those that make it anathematic to a positivistic epistemological stance. Hyland writes

that "impersonality is seen as a defining feature of expository writing as it embodies the positivist assumption that academic research is purely empirical and objective," (2002, p. 1095).

4.3.4 Prevalence and Acceptance

Prevalence and acceptance of the use of first-person voice vary according to a number of factors. In particular, its use is much less common in the physical and biological sciences than in the humanities:

> *"In the hard sciences, the writer's presence in the text is frequently downplayed, heightening perception of the objectivity, and reliability of research activities and methods. Conversely, in the humanities and social sciences, personal reference appears to be more important in establishing credibility and making clear one's contribution to the field in the absence of empirical proof."*
>
> *(Cheung & Lau, 2020, p. 217)*

However, in a comparative study of journal articles in English Literature and Computer Science, Cheung and Lau found that "the reality is [that] disciplinary conventions are dynamic and these assumptions may not always hold," (2020, p. 217) and that "greater use of first-person pronouns in academic writing is not peculiar to the soft disciplines," (2020, p. 239). Conversely, Gray argues that a trend towards "the scientization of qualitative research" (2017, p. 190) has tended to favour a passive or impersonal voice even within humanities and social science discourse.

There are sociocultural factors that influence this, too. First-person voice and its associated connotations of subjectivity and emotionality are often coded as feminine: Mitchell writes that "the linguistic practices of women are more reflexive, co-operative and relational," (2017, p. 3), and Sasha Fleishman has noted that "the fact that many observers perceive personal writing to be more relational, conversational and emotional/expressive than standard scholarly writing also seem to mark this type of writing as gendered female." (Fleishman, 1998, p.1002, cited in 2017, p. 186).

First-person voice is, in general, associated more with marginal or outsider voices, with Fleishman asserting that its acceptance is more common "from groups traditionally marginalised within the Academy: blacks, women, gays and lesbians, ethnic minorities, and academics from working class backgrounds," (Fleishman, 1998, p.1008, cited in Gray, 2017, p. 186). Gray likewise argues that "for those who feel like an outsider while being inside academia, there is also a higher likelihood that they may be more personal in the way they use their academic voice," (Gray, 2017, p. 189). Hyland writes that "much of our sense of who we are originates in our home

cultures. The fact we bring this sense of self to our acts of writing in the university can create an acute sense of dislocation and uncertainty," (Hyland, 2002, p. 1094).

4.3.5 Convention and Gatekeeping

> *"The socialisation process of academic writing often encourages a distant voice in order to produce and authoritative effect. Alternatively, scholars who use a more active and personal voice are often perceived to face issues of scientific credibility."*
>
> *(Gray, 2017, p. 191)*

All this is to say that use of impersonal, third person and passive voice in academic writing often is used as much through convention as through epistemological necessity. Gray observes that "disciplinary traditions and norms [act] as powerful influences that can take precedence over the active recognition of epistemology," (2017, p. 191); that they "can restrain the use of personal-reflective voice, but more fundamentally they can restrain a researcher's methodological reflexivity," (2017, p. 182). This argument is essentially that the use of impersonal voice over first-person voice is governed more by conventional institutional expectation than what is indicated by the research approach taken.

This raises the question of why impersonal writing is the conventional expected approach in some institutions and disciplines. Mitchell has written that "historically, positivist voice has held a place of privilege in academic writing," (2017, p. 3), whereby "the demand for objectivity in academic writing has become a normative standard (and can be labelled white, western and masculine), and normalising language choices thus possess the power to exclude and fail to hear the voices from alternative contexts," (2017, p. 4). Likewise, Gray writes that "historically, males have dominated the scientific community leading to feminist critiques of early literature and theoretical models," (2017, p. 186).

The impact of this is that the convention for impersonal voice in academic writing becomes a form of academic gatekeeping, with its use seen to correlate with correct, skilled academic expression: as Hyland argues, "when we employ the discourses of a community, there is strong pressure to take on the identity of a member of that community," (2002, p. 1094). This has resulted in the use first-person voice to be considered in some contexts to be more a matter of style rather than one of academic function, and consequently to be thought a style inappropriate for academic writing; however, as Grey argues, "the consequent tensions this can produce among scholars torn between using authoritative or personal-reflexive voice signals that this decision is far from arbitrary and not merely 'stylistic'," (2017, p. 180).

4.3.6 Authorial Voice in this Thesis

In deciding on an appropriate voice and stance for this thesis, I gave consideration to conventional institutional practices and stylistic approaches on one hand, and the appropriateness of the presence of a personal voice in reflective practice on the other. In particular, I considered that the advantages conferred by the use of first-person voice in reflective practice outweighed institutional conventions and expectations for the use of a more impersonal voice.

We (my supervisors and myself) discussed the use of the plural "we" over the singular "I". Cheung and Lau write that where first-person voice is used in scientific writing, it tends to be in the form of we rather than I, which makes sense in a context where work is often conducted in scientific teams (Cheung & Lau, 2020); this was discussed as a rationale to use 'we' to emphasise the team approach of this and most PhD research projects. However, reflecting on this, much of the reflective account of practice was not accounting for the actions and considerations of 'we' as a research team, but of "I" as the designer-researcher: reflections such as "I thought", "I considered", "I sketched" only make sense from a singular, rather than plural, first-person.

Taking these factors into account, and mindful of institutional convention, I have chosen not to write this thesis entirely in first-person singular voice, but to use it when explicitly or implicitly demanded by the necessities of reflective practice. As such, I have deployed the first-person in the roles of Recounter (the person recounting the research process), Researcher (the person who justifies and rationalises carrying out the research), Opinion Holder (the person who shares their opinion or view on something) and Originator (the person who conceives the ideas presented in the text). In contrast, the roles of Guide (the person guiding the reader through the text) and Architect (the person who is writing and structuring the text) have been ceded to the impersonal third-person or to the passive voice.

Chapter 5

RESEARCH PROJECT

To learn which questions are unanswerable, and not to answer them: this skill is most needful in times of stress and darkness.

Ursula K. Le Guin, *The Left Hand of Darkness* (1969)

Introduction to Chapter 5

This chapter presents an overview of this research project.

Chapter 5.1, *Framing the Inquiry*, explains the framing of the project, exploring the lures and motivations behind it, and presenting a speculative hypothesis, the overall research aim and the research questions towards achieving those aims.

Chapter 5.2, *Methodology,* presents an account of the emergent and descriptive post qualitative methodology of this research project, contextualised by a more prescriptive and speculative *a priori* methodology from the start of the research process.

Chapter 5.3, *Project Trajectory*, details the structure of the research project, structured around two practice-based research stages, each with a number of phases, and describing the modes of practice and intentions of each phase.

Chapter 5.4, *Outputs and Validation*, ends the chapter with a consideration of how the concepts of research outputs (as opposed to data) and research validation can be approached from the perspectives of Post-Qualitative Inquiry and practice-based design research.

5.1 Framing the Inquiry

In this section, a framing of the inquiry of the project is made. This framing excavates the tension between a design-led, post qualitative approach to inquiry, which eschews formally planned structure over what emerges and is created through design inquiry, and the institutional and epistolary expectations of certain research processual and thesis structural elements.

Approaching the research with a post-structuralist and speculative bent is not to operate within formal parameters, more common in qualitative or quantitative research paradigms—such as hypotheses to be proved, research aims and objectives to be met, and research questions to be answered. However, these are elements that are often expected in research discourse, and are recognisable from these more familiar research paradigms. This offers the possibility to be playful with concepts and language, as Deleuze and Guattari, or Derrida, or Haraway might, and through such play, create diffractive effects that operate as exemplars for how these different and incommensurable modes of inquiry stand apart. Thus, these more formal framing terms, and others, like methodology, method, data and validation might be repurposed, and made capable of sense in this research context.

5.1.1 Lures and Motivations

My initial motivations for this project drew on my earlier academic career in biomedical science, my study of science, technology and cultural studies in a Master of Science degree in *Science, Culture and Communication* at the University of Bath in 2006, and my Master of Arts degree in *Interaction Design* at Goldsmiths, University of London in 2016. The latter emphasised a practice-based and philosophical approach to design research; for this, I completed a project, *Citizens of Nowhere : Designing for Deep Time* (2016) on the role of speculative design and speculative fiction in materialising collaborative futures.

The initial lures for this research project was a desire to explore ways that speculative design might have an impactful role in exploring futures related to a material or biological topic of some importance through community engagement in that topic. I had a strong interest in drawing on speculative fiction as part of the project, and I wanted to conduct the research as a form of research through design.

In developing these ideas, some threads began to come together and offer the possibility of interesting entanglements. From a design perspective, I was interested in finding a gap in knowledge, an unexplored area or a point of contention in speculative design discourse, which might represent a fruitful area to situate my research. Through literature research, I came to understand that speculative design has attracted criticism for both shallowness and lack of impact, and a lack of diversity in the way it is practiced, in its practitioners and in its design

outcomes (Jākobsone, 2017; Prado de O. Martins, 2014; Tonkinwise, 2014). This is a lack of diversity in a sociocultural sense.

In parallel to this, I began to investigate topics of a biological or scientific nature that might make a good subject for a community-oriented engagement with speculative design. I felt that it was important that the topic be one in need of urgent attention, particularly in considering the critique of speculative design as lacking impact, and in which exploring possible alternative futures might be necessary. I considered the climate crisis, but as this topic has widely been explored in the public realm, and rather more (though not exclusively) a question of physics and chemistry over biology, I decided to focus on a less well-publicised and just as pressing environmental challenge, and one with a more overtly biological tenor: the global biodiversity crisis, where a diversity of species and habitats are in decline, tending towards a monoculture (Brondizio et al., 2019)—which is to say a lack of diversity in an ecological sense.

Thus, by entangling the two, a potent lure for a design project opened up: a biodiversity crisis, external to design, in a plane where speculative design might intervene, and a sociodiversity crisis, internal to design, that might impair the possibility or impact of speculative design to intercede; a combined crisis of monoculture.

Later in the project, I came upon the term *Polycrisis*, which refers to a contemporary moment that seems to be riven by many interlocking crises in many different planes: environmental crises such as climate change or biodiversity loss; political crises such as the rise of extremist politics and lack of trust in politicians; social crises such as wars, human impacts of environmental damage and migration; and economic crises such as stagnating salaries and a cost of living crisis (Cantor, 2025; Richardson, 2025). The interconnected and relentless nature of these polycrises has led to another crises of import to speculation and future studies: an *Imagination Crisis*, where there is a chronic lack of visions for what the future might be, and a pessimistic resignation to a bad, hopeless future where nothing changes apart from the worsening of all the crises, leading in the end to no future at all. (Mulgan et al., 2020) This imagination crisis has been termed a defuturing, and an inability to go beyond the Impasse of the Present. This, I realised, is also a crisis of monoculture; a lack of diversity of futures.

The biodiversity crisis, and the sociodiversity crisis—which is not limited to design, speculative or otherwise, but to a wider lack of attention to different worldviews—and the crisis of imagination, then, are a Monocultural Polycrisis; where the world needs more—more biodiversity, more socio-cultural perspectives, more visions of better futures—it increasingly has less: less species, less voices, less future.

From this led the to a consideration of how this might be approached as both Research through Design and speculative design, while also taking speculative design as one of the subjects of the

research. I take an approach informed by Post-Qualitative Inquiry, where philosophical or theoretical concepts, rather than methods, are used to interrogate the topic.

Literature research brought me to two conceptual lenses that both attended to these crises of monoculture in different ways, by taking fluid and decategorical stances: a queer lens, which was positioned to challenge a lack of socio-cultural diversity, and a more-than-human lens, positioned to challenge a lack of biodiversity. In addition, both offer different perspectives on futures: queer heterotopias, or other worlds, that represent prototype futures in the present (Foucault, 1967; Muñoz, 2009), and the more-than-human pluriverse, a world of many interwoven worlds (Cadena & Blaser, 2018). These lenses find an overlap in Queer Ecology, and led me to the concept of the Strange Stranger (Morton, 2010), which offered a way to personify these lenses in a conceptual persona that might help guide the research (Deleuze & Guattari, 1994).

Using these lenses adds another wrinkle or entanglement to the project, one that addresses a fundamental aspect of what speculative design is and does. Queer Ecology is an articulation of queer and more-than-human lenses that draws from post-structuralist and new materialist thinking, emphasising the need to attend to the material world—matter, organisms and resources—in exploring futures that might oppose a monocultural polycrisis. However, these conceptual lenses are not in themselves material practices, but conceptual entities that must be materialised. There is also an innate ephemerality to perspectives that emphasise outsiders from the human norm, who historically and currently have struggled to exert influence on wider human and environmental affairs.

However, speculative design is a materialisation practice, in which conceptual ideas are assembled into material entities, and the biodiversity is a crisis of the material world. An interesting reciprocity then emerges; queer and more-than-human lenses require a means to have material impact on the world, while their stances towards more sociodiversity and biodiversity are also what speculative design needs in order to effect materialisations that might challenge the defuturing crisis of imagination, and help communities to articulate and argue for better and more diverse ecological futures.

5.1.2 Speculative Hypothesis

A research hypothesis is the fundamental testable element for quantitative approaches to inquiry; a statement of the nature of the world of what the researcher expects to find, and a quantifiable and measurable criterion by which it can be falsified, the gold standard of scientific inquiry. Hypotheses similar to these may be present in more positivist-leaning qualitative studies too, with a test criterion of the presence of a particular quality that might prove or otherwise the hypothesis. Such hypotheses are usually expressed such that it is believed there

exists in the world a property or existing reality. By conducting an investigation that the investigator stands apart from, the existence of that property may be proved, and the hypothesis deemed a good representation of the world as it is.

A form of inquiry that is speculative, post-qualitative, post-structural and design-led is antithetical to such as a formulation. Post-Structuralism rejects a fixed and already structured world over one that comes into existence relationally in context, co-creating both the world and the investigator, and, along with design, is more interested in what new concepts or structures might be assembled. It isn't oriented towards creating and validating a representational hypothesis, but by attempting to create something new that didn't exist before. If to hypothesise is to assert what might already be, such inquiry is to speculate about what could come to be.

This would require a speculative hypothesis, framed more around interests, speculations, and curiosities about what might be brought forward, made possible, or made real, through inquiry.

A way towards this might be to consider that, faced with monocultural crises internal to speculative design practice (specifically the crises of diversity of practitioners, practices and outcomes, and of lack of impact outside academia and the gallery), and externally, in the global ecosystems (specifically the collapse of global biodiversity with the concomitant increase in monocultural, human-dominated ecosystems) the hypothesis of this research might be to speculate that a transdisciplinary practice-based design entanglement of these domains might afford a mutually beneficial symbiosis between speculative design and Community Biodiversity Activism.

To this end, this speculative design project is situated in this entanglement by drawing on the narrative potential of speculative design for proposing material futures, and is framed through a lens of Queer Ecology. This lens encompasses queer and more-than-human worldviews, values and futuring strategies; such strategies are characterised by marginalised beings, transcending categories and binaries, ephemerality and fluidity, and collective action for better futures, and are embodied in the conceptual figure of the Strange Stranger, which is used as a guide to the project. A hypothesis framed thus could be that which is stated below:

It is speculated that working with speculative design through the Conceptual Figure of the Strange Stranger—representing a queer and more-than-human post-structuralist conceptual lens of Queer Ecology—and working with it in a practice-based design research project, may produce interesting entanglements and symbioses: between the sociocultural and ecological; between diverse and ephemeral conceptual onto-epistemologies, and monocultural and material crises of socio and biodiversity; and between speculative design and the environment where it might try to assemble alternative futures. Such entanglements may allow the creation of new transitional assemblages that could support Community

Biodiversity Activism through speculative fabulation and design, and act as prototypes of more biodiverse ways of doing speculative design.

5.1.3 Research Aims and Questions

Overall Research Aim

The overall aim of this research project was to use the conceptual figure of the Strange Stranger as a guide to future-making practices that would allow for a more diverse practice of speculative design that might support Community Biodiversity Activism, and to consider what that might contribute to the theory and practice of speculative design.

Research Questions

To address this research aim, this thesis considers the following research questions:

1. What situated Paradigm of future-making is revealed by adopting the Conceptual Figure of the Strange Stranger?
2. How might the Conceptual Figure of the Strange Stranger guide a Speculative Design Project that materialises these ways of future-making to support Community Biodiversity Activism?
3. How might the Conceptual Figure of the Strange Stranger shape a Speculative Design Practice that is diverse and impactful?
4. What situated insights can be gained from this inquiry to more generally inform a Speculative Design Programme to support Community Biodiversity Activism?

The concept of a research question, like a research hypothesis, troubles a form of inquiry situated as post-qualitative inquiry through design, as it presupposes that there is an existing answer to a question, a truth that might be found, while, as has been established, this approach to research isn't a quest for existing truth but the creation of new concepts and artefacts. A question in this context is not to ask what is, but what are the ways that could be. Therefore, I frame these research aims and questions not as something that preceded the research, and that the research aimed to answer, but have been articulated *post hoc*; they are posed to interrogate what has already been uncovered through inquiry.

5.2 Methodology

> *"Method exists only in the future, so we should use the future anterior verb tense to talk about it. For this reason, method cannot exist before we begin a study; instead, method is always what 'will have been done.' I repeat, method is what will have been done. So method exists only at the end of our studies when we might try to explain what we did."*
>
> *(Adams St.Pierre, 2014)*

As has been discussed, research situated as through design and as Post-Qualitative Inquiry, does not operate within a systematic process methodology, where a set of methods is planned in advance to obtain observations and data outputs, with predetermined start and end points; instead, it emerges from the researcher finding their way from the midst of contexts, guided by and experimenting with concepts, and "doing the next thing that makes sense," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 16). Adams St.Pierre argues that if one must "cling to the idea of methodology […] all that doing is a methodology," (2015, p. 15). This is to say that this project could be said to have an emergent, or descriptive methodology: a reflection on what was done.

As Adams explains in the quote above, method and methodology exists in the future past: it can only ever be what will have been done, not what will be done. So, in the spirit of this project, any pre-planned methodology can be framed as a speculative design artefact, in the future anterior *subjunctive* : a rhetorical posture of a possible research trajectory that might be what will have been done. Such artefacts were generated in this project, and continually revised, reworked, and re-presented: born of PhD taught course requirements, institutional expectations for thesis proposals, and attempts to plan the research ahead. Such speculative artefacts were always "out of date" and didn't survive long in the messy contingencies of doing research in the real, particularly with the alignment of the research project with a practice-based, Post-Qualitative Inquiry research paradigm, but they are important, in making an account of what was done: the first speculative acts of a speculative design project.

This section then presents two perspectives on methodology: the speculative, *what might have been done*, and the emergent, *what was done*.

5.2.1 Speculative Methodology : What Might Have Been Done

From the vantage point of the end of the research project, it is very clear how much was learned in the process of doing it, and how in doing it, the understanding that what might be done or what interesting threads would be followed could never have been clear from the point of starting out. As Elizabeth Adams St.Pierre argued, the mark of rigorous scholarship is to always

be able to change your mind, and that the next thing you read "might well upend everything that we believe," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 16). In carrying out this research, everything that I might have believed was upended repeatedly, and so the trajectory of the research, what I expected to learn, and fundamentally, my sense of what would be knowable, are almost unrecognisable from what I anticipated that they would be when I started. I reflect that were I to repeat the research with my current understanding, I would aim to be less prescriptive in my aims, goals, objectives and research questions, and would have framed them in a less instrumentalist way; it is difficult to reconcile the formal and bureaucratic aspects of what was anticipated with what transpired. However, by taking a speculative lens, I can present them as a speculative artefact of an alternative reality; what might have been.

The research project was originally given the title *Non-normative Speculative Tools against Monocultural Eco-Futures: Making situated speculative design tools that Reconfigure Diverse and Ecological Communities of Practice as Communities of Action against Biodiversity Loss, Drawing on their own Concrete and Utopian Strategies for Uncertain Futures.* This was framed around a problem statement : *Non-normative tools for a speculative design practice that can reconfigure diverse and ecological communities of practice as communities of action against the biodiversity crisis should be situated in those communities' concrete and utopian strategies for uncertain futures*, and the three questions: *What are the concrete and utopian practices of diverse and ecological communities of practice for dealing with uncertain futures? How can non-normative speculative design tools be situated within these community practices? In what way can such a speculative design practice use these tools to configure communities of action against the biodiversity crisis?*

It is interesting to reflect on these aims and expectations, six years later, and consider how it contrasts with what unfolded through practice. I am struck particularly by its structuralist stance (that certain tools *will* be made, and they *will* have a particular effect on communities, and that they *should* be situated in a certain way), and also a certain instrumentalism, that a tool *will* be created to have a particular effect. While I do attend to the situatedness of practices and the necessity for situated research tools, by reflecting on the post-structuralist and post-qualitative approach that has been taken, and the use of conceptual framings that emphasized contingency and an entangled becoming-with, I would not now express this research in those terms. I certainly would not use the words *will* or *should*!

It is also interesting to reflect on how the concepts and interests of the project have metamorphosed over time. In particular, "Non-Normative Speculative Tools" has a clumsy imprecision about them almost masquerading as technical terms, and have been replaced by a Celium to support speculative design, and a Playset that facilitates a repertoire of speculative practices. Diverse and Ecological Communities of Practice have been resolved as queer and more-than-human lenses, and the focus shifted to the practice of Community Biodiversity Activism. Concrete and utopian practices of future-making continue to play an important role,

but I've resolved them into the rather more straightforward strategies and goals for future-making.

Overall, my reflection on how I initially expressed my research aims and interests is that I was broadly expressing the same aims and interests that have unfolded with the research, with the interest being on how speculative design might learn from expansive, diverse and post-structuralist lenses to both make the practice more effective, particularly in a context of Community Biodiversity Activism, but with a more instrumentalist stance oriented towards proving a hypothesis rather than allowing the process to unfold and produce new concepts through design.

Inspiration

I took some initial inspiration towards the structure of the research project from the *Material Beliefs* project (Beaver et al., 2009): this project from the Interaction Research Studio at Goldsmiths, University of London, was a speculative Design Project that aimed to engage the public with emerging scientific research, and which forms the basis of both Tobie Kerridge's doctoral thesis into downstream engagement through speculative design (Kerridge, 2015), as well as James Augur's (Auger, 2012) doctoral thesis on how speculative design narratives are crafted. The project was composed of four phases, which can be described as an initial opening out of a design problem space from an initial proposal followed by focusing down on a more concrete design idea, followed by an opening out through developing designs, that then closed in on specific design outcomes; in this regard, it resembles the archetypal Design Project structure characterised by the UK Design Council as the *Double Diamond* (Design Council, 2019). The Double Diamond framework represents two key parts of a Design Project, Design Research and Design Practice, each composed of an "opening up", divergent thinking phase, and a "closing down" or convergent thinking phase: the first diamond, Design Research, is composed of a Develop phase, opening through initial research, and a Define phase, which focuses down on a design plan; the second diamond, Design Practice, begins with an opening phase, Develop, with design experiments to explore possible outcomes, and closing down with the Deliver phase, with the production of a definitive artefact.

The four phases of *Material Beliefs* were: "Scoping the Project", where the shape of the project was worked out by proposing collaborations, conducting orientation workshops, interviews with scientific practitioners, design play and experimentation through exploratory projects and materialisations; "Engaging People", a first engagement phase where events and discussions were organised to involve members of the public in the project and start to understand their interests, concerns and ideas; "Developing Designs", the start of the second diamond, involved more structured engagements with scientific practitioners, creating concrete Design Projects that were fully materialised as artefacts and prototypes; and "Provoking Debate", a second phase

of engagement that was conceived as a design outcome in itself, with the engagements, workshops and other approaches to dissemination carefully designed to engage the public (Beaver et al., 2009) (See Figure 20 for a diagram that compares the *Material Beliefs* project structure to the *Double Diamond* framework).

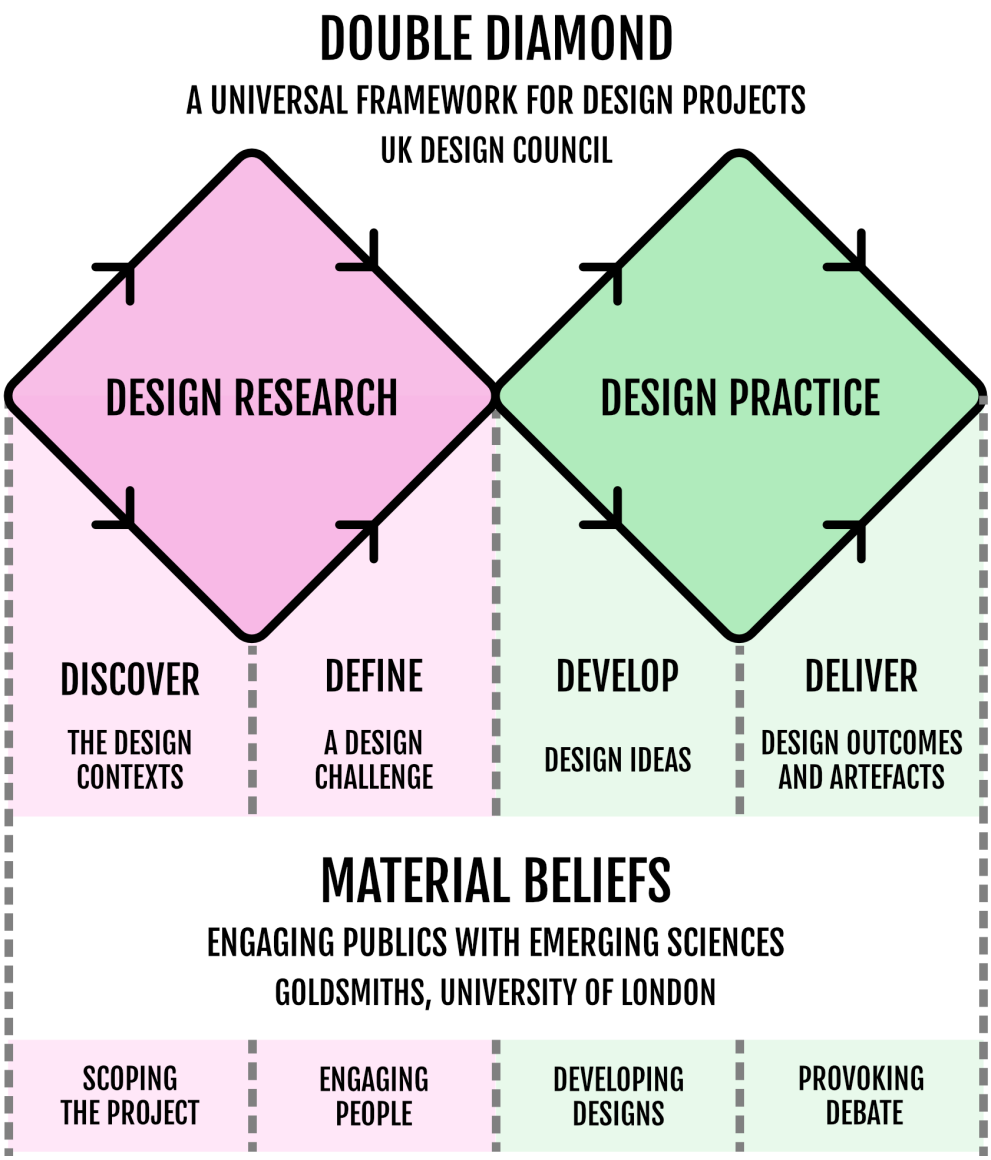


Figure 20 : Material Beliefs *mapped onto* the Double Diamond

The Double Diamond *is a universal framework for design projects (Design Council, 2019). This figure demonstrates how the phases of a Speculative Design Project,* Material Beliefs *(Beaver et al., 2009), maps onto this generic framework.*

Credit : Craig Jeffcott

Proposing a Project Plan

The structure of the *Material Beliefs* project formed a starting point for developing a speculative structure for this research project. *Material Beliefs* had a logical progression of activities through its four phases, starting with learning about the design space, which led to creating concrete design proposals to engage with the design space, followed by a period of active design, and concluding with an engagement with a community of interest (in this case, the general public). It seemed to represent a fairly typical trajectory for a project situated as speculative design and demonstrated engagement with both community practitioners and the general public.

I therefore proposed a speculative methodology modelled on the *Material Beliefs* project, with the following four phase project structure, based on the *Double Diamond* (Design Council, 2019). The first phase, *Framing and Learning*, aimed to understand and analyse the collective strategies of future-making of queer and more-than-human practices and communities, and to create a strategic framework for a speculative design practice grounded in these strategies. In this phase, exploratory research was planned into the contexts and strategies of communities and individuals, as well as a mapping out of speculative tools, techniques for design, and speculative biodiverse fictions.

The second phase, *Creating a Design Toolkit*, aimed to develop a toolkit of speculative design approaches for Community Biodiversity Activism within this strategic framework. This was planned as an iterative phase that would alternate between designing and refining speculative tools and techniques through experimental, practice-led design activities, and testing and validating the emerging tools under more formal conditions through small-scale design interventions.

The third phase, *Community Design Project*, would have used and refine this speculative toolkit through a participative speculative design project. In this, I would have applied the tools and techniques that had been validated through design-based experimentation to a large-scale community speculative design project aimed at taking action against biodiversity loss. There was an acknowledgement that since this phase would necessarily be determined by the decisions made in previous phases, this phase was simply an outline of a possible outcome.

Finally, the fourth phase, *Validation through Engagement and Reflection*, would have aimed to understand how effectively this speculative toolkit can support beyond human-centred practices in social research, Community Biodiversity Activism, and design, and to demonstrate that a speculative design practice that supports biodiversity activism can be a vector of transformative change to a more ecologically conscious society. In this stage, the effectiveness of the research process, the tools generated, and the project outcomes is explored and validated, externally via engagement and dissemination activities, and internally through a reflection on practice.

Reflecting on the Project Plan in Practice

While, by and large, this general structure of this plan did frame the trajectory of the project, there were obviously changes of direction, emphasis, and refocusing throughout the development of the project, and the adoption of a post-qualitative and practice-based research paradigm, which necessitated putting aside a prescribed methodology and project plan in favour of an experimental project guided by theory and concepts.

In particular, what was done deviated from the initial plan in the following ways: the close focus on Futuring Strategies of the communities of interest widened into a deeper delve into wider aspects of queer and more-than-human worldviews, strategic goals, narratives and techniques; the intention shifted away from creating a toolkit of new design tools, to providing a set of artefacts that recontextualise and support the materialisation of existing speculative practices, tactics and techniques; the importance of narrative outcomes of design workshops as significant design artefacts of the project; and the realisation that an ongoing process of reflection and engagement is implicit in reflective practice-based research, and doesn't represent a research phase as such, while of course being most prevalent towards the end of the research process.

The following emergent methodology largely departs from the hypothetical plan and is situated in the real: the project work that was carried out, the decisions that were made, and the recontextualization of the project that could only be obtained through doing it.

5.2.2 Emergent Methodology : What Was Done

Drawing on the various modes of inquiry and practice discussed previously, this project has a methodology that could best be described as speculative, reflective, descriptive, and emergent: it is not a scripted methodology, but a process methodology.

It draws on these elements as follows:

Post-Qualitative Inquiry: As a concept-led rather than methods-led inquiry, reading through theory to guide the emergence of new philosophical concepts.

Research Creation: the emerging concepts are also framed as theory to be read.

Conceptual Lenses: The conceptual framings of queer, more-than-human, Queer Ecology, and decolonisation (and, more widely, Post-Structuralism, Post-Humanism, and neo-materialism) are the concepts that led the inquiry.

Conceptual Figure: The Strange Stranger is used as a conceptual figure which was invoked as a guide and persona.

Speculative Inquiry: As a question asking practice, exploring the emergence of the possible by speculating what it might be.

Research through Design: Research is a design practice, drawing on design techniques to create artefacts, which are the new concepts which emerge through inquiry

Assemblage: Framing designed artefacts as transitional design assemblages; re-arrangements of the world into new forms through design

Transitional Design Theory: Framing designed artefacts as prototypes and examples; these examples represent transitional definitions through design

Reflective Practice: Reflecting on practice to account for inquiry, by making the emergent methodology recoverable, and situated in wider design and social contexts

Taken together then, an account of the methodological approach of the project is as follows:

Framing

Framed and led by Conceptual Lenses and guided by the Conceptual Figure of the Strange Stranger, this was a Research through Design Project, where the concepts framed experimental design acts and activities (this is roughly the equivalent of methods of data collection in instrumentalist research).

Empirical Process

These design acts represent typical design activities, drawing on design techniques (rather than research techniques and methods), to produce the new, namely artefacts or design outcomes (these are very roughly the equivalent of 'data' in instrumentalist inquiry). Framed as a form of Post-Qualitative Inquiry, particularly Research Creation, these designed artefacts and outcomes are treated as emergent philosophical concepts, which themselves can be read as theoretical 'texts' to be read through (roughly equivalent to positivistic methods of 'data analysis').

Theorising

These artefacts are understood as theoretical concepts by framing them as transitional assemblages that are new structurings of the world, and as prototypical definitions through design that are transitional intermediaries between design in the specific and design in the general (this is equivalent to instrumentalist theory).

Validation and Reflection

By reflecting on this practice, both as reflection-in-practice during the design process and on reflection-on-practice afterwards, I account for my own presence within the research, it becomes well accounted for and situated in context, therefore understood to be 'good' (equivalent to the instrumentalist concept of validation).

Tension Between Formal Methods and Post-Qualitative Inquiry

One important point to reflect on is that Post-Qualitative Inquiry is emphasised as being against formal methods, to the extent that such approaches are incommensurable, coming from different onto-epistemological frames, and a "study that begins as a qualitative study cannot be made post-qualitative after the fact," (Adams St.Pierre, 2020, p. 3). Due to the relatively late post-inquiry identification of this project as being largely within a post-qualitative paradigm, and some of the more formalised approaches to research in some stages of the work, this perhaps could be seen as an inconsistency. However, I believe that any formal methods that were used in this project can either be framed in a post-structuralist way or as design, rather than research methods. What I mean by this is that any such methods, such as qualitative coding, were not aimed at understanding the underlying and pre-existing structure of the world, but as acts of assemblage, of making new structures.

For example, while I initially framed conversations as interviews, I have not treated them in that way. I did not instrumentalise them as the collection of objective data, but as opportunities to engage in the world in a particular context. As Adams St.Pierre explains, "Foucault wrote that his work was not grounded in the 'speaking subject,' the thinking, knowing, conscious, speaking subject, but in the discursive formation in which the subject is produced and can speak certain things," (Adams St.Pierre, as cited in: Guttorm et al., 2015, p. 18).

These conversations were not framed as collecting data from a speaking subject, but as events with their own *haecceity*, or thingness, that emerged in the context. Furthermore, I don't intend to frame this research as purely post-qualitative and post-structural in character: design is a structure-making endeavour, and it is post-qualitive and post-structural in the sense that it comes after pre-existing structure, but is not opposed to structures that emerge and are assembled through design.

5.3 Project Trajectory

This section presents the overall trajectory of the design research project. I divide the project into two distinct stages of design, making post-event Baradian cuts to a looser emergent trajectory based on intent and subsequent design outputs, which I wish to emphasise: a *Conceptual Speculative Design Celium*, and a *Speculative Design Playset*, *Strange Strangers in Strange Lands*. These two stages can be seen as the 'diamonds' of the 'Double Diamond' structure – the first oriented towards understanding the design space and making that understanding operational for design; the second towards the creation of a designed response to it. Each moment is subdivided into design phases, where, again, the divisions are done for emphasis of intent, rather than according to a preformed process. They're also rather atemportal, and while there is a general trajectory forward through time, this work operates in a rather more crumpled temporal terrain, in which there are folds, and recursions, and iterative accumulations: in short, not every phase progressed neatly one into the other.

I give a brief account here of the phases of design, and I reflect upon the design tactics and techniques that each phase draws on.

5.3.1 Conceptual Speculative Design Celium

The first design stage starts from the initial engagements with the plane of research, through a process of becoming attuned to concepts and contexts, to the bringing together of an assemblage that might shape and support Biodiverse Speculative Design. This was an intentional journey from concepts and contexts towards the assemblage of a specific, situated artefact of design: a loose assemblage that might make insights from the research lenses accessible in a more structured way to design practice. Initially, this was framed as a framework of Futuring Strategies, but was widened to more comprehensively encompass the worldviews (ontologies), strategic goals, narrative structures and design fabulation techniques of queer and more-than-human theories and practices.

There was a shift in the languaging of the assemblage with an attempt to destabilise and make it more transitional, less fixed in a particular category of thing, playfully moving from the architectural and mechanistic "framework" to embrace a more ecological form of network. For this, I have coined the term *Celium*, derived from mycelium, a fungal network of tangled, underground fibres that facilitate symbiosis between fungi and other beings, like plants, and are capable of bringing forth new entities, fruiting bodies like mushrooms, into the world. Here, My Celium is a Design Celium, to facilitate symbiotic acts of queer and more-than-human design speculation.

Design Phases

Opening Moves

The earliest work on the project was a drawing together of initial ideas, and the first tentative approaches to engaging with concepts and the contexts in which the project was situated. I aimed at gaining an early understanding of the project space, and to see what questions it opened up. The main focus in this regard was to start to inquire what futuring strategies were being deployed in queer and more-than-human communities and perspectives, and to entangle myself with the beings and contexts that this inquiry revealed. To contextualise, this phase largely took place in the early stages of the Covid-19 Pandemic, which necessitated a more introspective mode of inquiry than anticipated, and caused the project to almost immediately deviate from any speculative research trajectory.

Tactics and Techniques Used

In this phase, reading through theory was a predominant tactic to become immersed in some key conceptual ideas, and I drew on the techniques of conversations and encounters, and to a lesser extent, cultural probes.

Exploratory Attunement

Having gained some initial sense of the most meaningful concepts and the ways in which these were entangled in contexts, I was able to explore them more deeply and become attuned to them through acts of assemblage and making, and through more practical and collaborative engagement. In this way, I gained a deeper understanding of the entanglements of the project space, and moved towards an emerging assemblage of concepts for design.

Tactics and Techniques Used

More emphasis in this phase on prototyping and design experiments to put concepts to work, as well as some early explorations of design workshops.

Sense-Making

This more reflective phase was a process of making sense of my engagements and entanglements; understanding what felt more important, and what might be put to use to support speculative design. There was a delving into language and definitions of such things as strategies and goals, and the start of assembling ideas into some form of action-supporting structure.

Tactics and Techniques Used

This phase involved a certain amount of reflection on practice, with a more intentional reading through theory. The qualitative research technique of coding was also put to use, to help give shape to the emerging Celium.

Assembling the Celium

The last phase of this stage of the process focuses on a more intentional act of design, with the assembly of the Conceptual Celium, composed of Lenses, Worldview, Strategic Goals, Futuring Strategies, Speculative Prompts, and Design Activities. It involved a drawing together of the various strands of research and inquiry to create something new: a Celium that could sustain and allow for the fruiting of biodiverse speculative design acts and processes.

Tactics and Techniques Used

This phase focused on prototyping, assemblage, and fabulation, a creative act forming a new ecological and diverse assemblage to support design and designers.

5.3.2 Playset

In this project stage, the Conceptual Speculative Design Celium is activated through design in the creation of a set of specific artefacts that materialise the worldviews, goals, strategies, narratives and techniques in a way that makes them available for use in design and community-oriented settings. This set of artefacts was originally referred to as a toolkit, with tools aimed not at specific activities but capable of supporting a repertoire of practices, but, as it took shape around a series of games, the descriptor of Playset felt more appropriate—although these are slippery, Redströmian definitions, transitional and unstable, both useful their own ways, so there has been occasion to use both where appropriate. As the playset developed, it's main purpose came into focus: to facilitate the collaborative creation of fictional alternative worlds and futures.

This highly iterative phase alternated between theoretical research into games, game design, and workshops aimed at testing both concepts and specific gameplay elements; much of this part of the thesis is presented as a reflective design portfolio detailing the progressive development of the playset.

This design stage also explored what might be manifest in practice by using the Playset to support biodiverse futures storytelling workshops, and in particular, how it supports the emergence of specific designed artefacts: futures, in the form of narratives and speculative design ideas.

Design Phases

Initial Concept Development

The initial exploration of how concepts might be put to work in the creation of a design toolkit through an online pilot workshop.

Tactics and Techniques Used

Design experimentation, prototyping and fabulation, devising a playful set of activities for a design workshop.

First Prototype

This phase involved the design of a first prototype of the playset, with the creation of some prototype game objects and exploring how they might be used in speculative activities in design workshops.

Tactics and Techniques Used

prototyping and design experiments to create prototypes, design workshops to test them with people, and reflection on practice and annotated portfolios for sense making and supporting the development of the designs.

Storytelling Game Development

This phase was an extended focus on creating a storytelling game as the core speculative, worldmaking activity of the playset; largely using hand-drawn prototypes.

Tactics and Techniques Used

As above, prototyping, design experiments and fabulation to create prototypes, design workshop—as well as design sessions and play tests—to test them with people, and reflection on practice and annotated portfolios for sense making and supporting the development of the designs.

Second Prototype

In this phase, the storytelling game was integrated into the wider playset, and the games and activities were finessed to a point that the playset might support the trajectory of a design workshop that involves both fabulation and speculative design activities. The second prototype playset, which was largely printed on card but with some bought and physically fabricated

elements, was explored and tested as a complete assemblage in collaborative design workshops, feedback from which form the basis of in-depth reflections on the design process.

Tactics and Techniques Used

Much the same as the previous prototyping sessions, but with more of a focus on assemblage, in the formation of a well realised usable prototype, and an in-depth emphasis on design workshops and extended reflections on these.

Prototype Refinement

In this phase, refinements were made to the prototype playset, with card printed game elements being replace by laser-cut wooden tiles, and further testing in workshop settings; in particular, to explore the use of the playset in delving into real-world biodiversity challenges and contexts.

Tactics and Techniques Used

As above, this phase involved prototyping, design experiments, fabulation, and design workshops.

5.4 Outputs and Validation

5.4.1 Validation Approach

Having discussed the methodological approach of this research project, the thesis turns now to considerations of validity. Validation of *Research through Design*, as well as theory-making within the discipline, have been discussed in general terms in Chapter 4.

Here, I give some consideration to Elizabeth Adams St.Pierre's stance on how the concept of validation might be accommodated within Post-Qualitative Inquiry, where she writes:

> *"How does one know if post qualitative inquiry is "good"? This, of course, is the validity question that haunts the natural and social sciences. Systematicity is often used as the chief criteria that determine whether scientific research is valid, but systematicity is not thinkable in poststructuralism and so not in post qualitative inquiry."*
>
> *(Adams St.Pierre, 2020, p. 5)*

By considering that systematicity is unthinkable in post-qualitative forms of inquiry, validity cannot be determined by how systematic a piece of research is: validity must therefore essentially be an assessment of how good the work is. One must ask whether it is a good piece of Post-Qualitative Inquiry, or a good piece of design research, or a good design; difficult questions to consider, in the face of an embrace of subjectivity and the cumulative and situated nature of design. How might validation, or making-good, be approached, and what criteria might be applied, are considered here regarding how they are manifest in this research project.

As discussed in previous chapters, validation of practice-based design research rests on a number of factors, none of which individually are prescriptive or definitive. These include recoverability, theoretical sensitivity, and validation by effectiveness (i.e. that designs can be considered 'valid' if they function as intended). In what follows, the ways in which each of these is addressed methodologically and practically in this project will be discussed, and the ways in which they interact and support each other will be made clear.

Recoverability

This principle, deriving from action research, is that situated reflective practice-based research cannot be replicable, as in scientific inquiry, because it is inseparable from situation and context. Instead, validity of such inquiry should be recoverable. An account of the research should be made that allows the reader to follow the designer's logical progression of thought, and the actions that follow: that allows the reader to recreate the trajectory of the research in

their mind. *Recoverability*, or a well accounted for process, is achieved through reflective practice. As discussed above, reflective practice allows for a detailed, contextualised and situated account to be made of design research practice, crucially including reflections from the perspective of the designer as to how, what and, importantly, why decisions and actions were made and taken throughout the project. Therefore, it allows for a recoverable account of the research. In this project, this reflexive recoverability plays a role throughout the research process, but could be particularly emphasised in the reflections on practice in Chapter 6 and 7.

Theoretical Sensitivity

Theoretical Sensitivity is a principle derived from grounded theory. This principle puts the burden of validation on the researcher, rather than the discourse, whereby it's the researcher's sensitivity to what is important to focus on, and what to ignore, that gives the research validity. It is called theoretical sensitivity as it requires a sensitivity to theory, both existing and emerging through the research. As such, this form of validation is achieved through the related research tactics of reading through theory and research creation. As written about by Sarah Truman and discussed at length above, reading through theory is an approach to research whereby reading theoretical texts through one another (in the widest sense, which in this case ranges from philosophy texts, critical theory texts, and speculative fiction) guides the research process and provides a justification for design decisions: it provides a sensitivity to theory, through which the research gains validity. As discussed, reading through theory is specifically applied in research creation to the texts, discourses and artefacts that emerge through the research process, considering these equally as theoretical texts to guide the research process. As such, there is a dialectic between existing and emerging theory, a sensitivity to which lends validity to the inquiry. In this project, this is exemplified in Chapter 6, where reading through philosophical texts, critical theory, primary interviews and speculative fictions guided the design of the Celium; in Chapter 7, where the design of the *Strange Strangers in Strange Lands Playset* is guided both by that Framework and the principles of storytelling game design; and in Chapter 8, where a theoretical proposition for a Biodiverse Futures Design Programme emerges through a reading of the designed artefacts as transitional design assemblages.

Design Effectiveness

The validatory principle of *Design Effectiveness* is a simple one: as William Gaver argued, that because design is not ontologically a question of what is true but what exists, and that design doesn't converge on a single answer to a question, but cumulates possible responses and further questions, the validity of any piece of design rests on how effective it is: does it do the thing for which it is intended? (W. Gaver, 2012). In design research, this relates closely to Johan Redström's principle of theory by example: that theory through design rests on transitional definitions which are made *through* the process of designing, and embodied in the designed

artefact. (Redström, 2017). The artefact therefore represents an example of a transitional definition through design. Together, this implies that when a design artefact declares itself an example of a definition through design, this must be backed up by the effectiveness of the artefact to achieve what it has defined itself to achieve. As an illustration, I return to the well-worn example of the chair. According to Transitional Design Theory, sitting is not defined by words, but by example through design: a chair affords sitting, so every chair offers a new definition of sitting. Each chair that is designed adds to the cumulative definition of what sitting is: some chairs are more comfortable, some are higher, or lower, some rock, or massage the sitter's back. However, what all of these chairs have in common is that they are effective: they effectively afford sitting. If a chair was designed that, when someone attempted to sit on it, the chair collapsed, this would not be an effective chair for its stated purpose: it does not afford sitting, so therefore can't offer a refinement to the definition of sitting.

This does of course raise a further question: if the chair is declared as affording sitting, and what it actually affords is collapsing, does that not mean that it is redefining sitting as pitching the user to the floor in an undignified heap? Considered as a purely logical deduction, yes, it might, but this is where the principles of reflective practice and theoretical sensitivity comes into play. The designer of a chair intends sitting within a particular set of parameters, broadly defined as the action of folding and resting the body in a comfortable position: this is the wider context in which the design takes place. There is also the likelihood that the chair is being designed for a company, or a particular user, who has a preconceived idea about sitting, and a reason for commissioning the designer to design the chair. The user might also have particular needs unique to their context: a chair to support a physical disability, or for use in a particular place, or to invoke a particular feeling. The designer must be sensitive to these needs, and the theoretical idea of what a chair and what sitting is. They must reflect on what they are doing when designing, and why they are engaged in this particular process of design. Guided by reflection on practice and by reading through theory, the designer defines what effectiveness of design is, deciding on a definition of sitting that will be the criteria for success of the design of the chair.

Therefore, validation through design effectiveness is that a designed artefact exemplifies a definition through design *according to the theoretically sensitive and reflective judgement of the designer*.

Gaver has discussed the use of annotated portfolios as a means of validating design research: reflecting on the effectiveness of design artefacts and decisions through a dialogue between designing, the creation of design prototypes and design artefacts, their visual representation, and accounts of theoretically sensitive reflection on practice. They represent an intermediate form of knowledge similar to a design programme, whereby the design process can be well accounted for, and a level of theoretical abstraction obtained.

The principle of validation through design effectiveness is exemplified in this project particularly in Chapter 7, regarding the *Strange Strangers in Strange Lands Playset*, which takes the form of an extended textual annotated portfolio which reflects on visual representations of the Playset, it's use, and the Playset itself as a (set of) artefact(s).

5.4.2 Validation Criteria

3 Pillars of Validation

As explained above, validation of this research project rests on three pillars: of recoverability, afforded by reflective practice; of theoretical sensitivity, afforded by a methodological approach of reading through theory and research creation; and of design effectiveness, afforded by an informed and reflective dialectic between the technique of prototyping, reflection on design practice through annotated portfolios, and the effectiveness of the products of design to exemplify and define through design, based on the judgement of the designer.

These pillars of validation do not stand alone, however, and in synergy, they strengthen the validity of a piece of design research. Consider as an example a hypothetical design research project. The designer might start by deciding on criteria for effectiveness for the design process and the designed artefacts, such a decision being based on the designer's experience and theoretical sensitivity. They might then embark on a phase of research planning, guided by those criteria for effectiveness, and by reading through theory. Through these means, they might form a design plan, in a way that is reflective and well accounted for. This would lead into design experimentation and prototyping, guided by a sensitivity to the plan and to theory. As artefacts emerge, the process of their creation is reflected upon, in particular, how they relate to theory and how well they might meet the criteria for effectiveness. By being reflective and sensitive to theory, the designer can justify their effectiveness criteria, the effectiveness of the example made through design to meet those criteria, and account for the process that bridges criteria and exemplar of effectiveness. By doing so, they can present a recoverable, theoretically sensitive design process leading to a validated definition through design.

Criteria for Effectiveness

A key part of these three pillars of validation is therefore the formation of theoretically informed criteria for effectiveness: a reflective and theoretically sensitive account of design practice can then be made that can be validated through the effectiveness of the products of design in meeting those criteria.

For this research project, the criterion for effectiveness—based on the research hypothesis and research questions—is therefore:

Designed artefacts should have the potential to support Community Biodiversity Activism through affording the collaborative creation of speculative futures or fictional worlds framed by the conceptual character of the Strange Stranger, and grounded in queer and more-than-human perspectives.

Any assertions of validity of the design research process and products that follow should implicitly or explicitly fulfil this validatory criterion, or make a well-informed justification of how or why it falls short of fulfilling it.

PART III

DESIGN RESEARCH

Chapter 6

CONCEPTUAL DESIGN CELIUM

A mycelial network is a map of a fungus's recent history and is a helpful reminder that all life-forms are in fact processes not things. The 'you' of five years ago was made from different stuff than the "you" of today. Nature is an event that never stops. As William Bateson, who coined the word genetics, observed, 'We commonly think of animals and plants as matter, but they are really systems through which matter is continually passing.'

Merlin Sheldrake, *Entangled Life* (2020)

Introduction to Chapter 6

Chapter 6[31] of the thesis details the development of a Conceptual Design Celium. This Celium is a conceptual assemblage of ways in which queer and more-than-human perspectives on future-making can be activated and made available for biodiverse speculative design practices and represents an important design artefact to bridge between the ideas that come from the literature and discourse, and design practice. Creation of the Celium has been informed by reading and thinking with theory, as Sarah Truman would put it, partly through existing writings, partly through interviews, and partly through design experimentation.

Chapter 6.1, *Rationale and Overview of Design Celium*, explains the rationale for designing the Celium and the choice of its name, and gives a diagrammatic overview of it.

Chapter 6.2, *Designing the Celium*, is an in-depth reflection on practice of the design process, grouped into four design phases: *Opening Moves, Exploratory Attunements, Sense-Making, and Assembling the Celium.*

Chapter 6.3, *Elements of the Design Celium*, discusses the component elements of the Conceptual Design Celium in detail, encompassing Worldview, Strategic Goals, Futuring Strategies, Speculative Narrative Archetypes, and Speculative Design Techniques:

- *Worldview* or onto-epistemology, in which Queer and More-than-Human discourses are situated is considered, under the five headings of *Matter*, *Encounters*, *Time*, *Place*, and *Narrative*.
- *Strategic Goals* are three key goals for the future that underpin the framework: *Care*, *Collective Action*, and *Staking a Claim on Futures*.
- *Futuring Strategies* are five strategies towards achieving those goals that are situated within queer and more-than-human perspectives, each of which reflects one facet of the worldview: *Making* (representing Matter), *Playing and Performing* (representing Encounters), *Time Travelling* (representing Time), *Mapping* (representing Place) and *Storytelling* (representing Narrative) with a particular focus on the speculative storytelling practice of Fabulation.
- *Speculative Narrative Archetypes* draw on Speculative Fiction (SF) texts to situate eight archetypal narrative structures within these worldviews, goals and strategies: *What you See is What you Get, Radical Intimacy, Outsider Heterotopias, Virtual Worlds, More-Than-*

[31] *This chapter incorporates and expands on: Biodiverse futures: strategies for an ecological speculative design practice*
(Jeffcott, 2021) and *A Strategic Framework for Biodiverse Speculative Practices (Jeffcott & Ferreira, 2021).*

Human, Strange Strangers in a Strange World, Stitches in Time, and The Ecosystem Strikes Back!

Speculative Design Techniques, presents some exemplars of speculative design activities or projects that embody some entangled combinations of these worldviews, goals and strategies; there are not intended to be comprehensive or prescriptive but exemplary (as, in fact, is the rest of the framework—it is situated as an example, or prototype, of what Biodiverse Speculative Design might be, rather than a prescriptive model to be followed). They are presented as examples of what might constitute doing Biodiverse Speculative Design. These techniques are: *Make Iconic Objects, Devise Magic Machines, Write a Declaration of Rights, Create a Museum Display, Put on a Drag Show, Prepare a Meal, Design Passing Places, Throw a Radical Disco, Elect a Parliament of Things.*

This chapter makes use of a first-person singular authorial voice in those sections that comprise a reflection-on-practice.

6.1 Rationale and Overview of Design Celium

The decision to design a support system for biodiverse speculative design was grounded in the early stages of reading through theory and design experimentation oriented towards understanding ways in which future-making can be situated as queer and more-than-human. In particular, this was approached as an inquiry into futuring strategies. What emerged from this research was a rich and entangled series of worldviews, communities and individuals, and practices through which the future might be approached, and that were more expansive than simply futuring strategies. Strategies existed in wider contexts that also seemed to be important things to capture in order to fully understand these ways of future-making.

An aim of this project was to find ways to situate queer and more-than-human futuring practices within a practice of speculative design, so consideration was given to how best to approach bridging the gap between these situated worldviews and practices and design. What emerged from this was an understanding that these ways of future-making could be used to scaffold and support acts of biodiverse speculative design and that they might, from a transitional theory perspective, represent paradigms and practices that could form the foundations of a speculative design programme.

6.1.1 Naming Concerns

Design Frameworks

The Cambridge Dictionary defines a *Framework* as either "a supporting structure around which something can be built", or "a system of rules, ideas or beliefs that is used to plan or decide something," (Cambridge University Press, 2025b). The first definition is grounded in making practices, of construction, architecture, and design; a literal physical structure which provides the general form for the construction of other things. The second definition derives from the first through structural metaphorical projection, not a physical structure for physical creation, but a conceptual structure that can guide and shape future action. Like a physical framework, a conceptual framework shapes what emerges with the imprint of its own form. A design framework could refer equally to both, a physical or conceptual frame which supports the creation of artefacts, though in practice, it tends to refer to the latter.

Design Frameworks are a common artefact in design practice, particularly within design research, and can be found within many different fields. A brief search on Google Scholar brings up results for *The Understanding by Design Framework* (McTighe & Wiggins, 2012); *The Integrative Learning Design Framework* (Bannan-Ritland, 2003); *A Design Framework for Online Learning Environments* (Mishra, 2002); *A Design Framework for Sustainability* (Beach et al., 2009); *A Design*

Framework for Novice Grounded Theory Researchers (Chun Tie et al., 2019); and *A Design Framework for Environmental Data Visualisation* (Grainger et al., 2016). There are many more such design frameworks in existence.

As a tool to codify and shape a particular approach to doing design, I did have some concerns that a design framework may be a form of rigid, stable definition of design that might constrain what design outputs might be possible, which would run counter to the principles of fluidity and transdisciplinary escape of binaries and categories: in general, design frameworks represent rather an instrumentalist approach to design, and are commonly used in technology design, enterprise and design-thinking contexts where a particular and consistent approach to doing design is required.

However, I realised that, for ephemeral strategies of futuring to be situated within material design practices, they need to be made operational to provide obvious starting points and approaches, lures and provocations, for doing design, if the design that is done is hoped to draw upon them. This revealed a paradox that lies at the heart of this inquiry into how worldviews and ways of making the futures such as these might be part of a design practice, where those worldviews are opposed to fixed notions of self, the world, and ways of acting within it, and design is an instrumental practice of ordering, both semiotic and material, in order to bring new things to bear in the world.

Transitional Design Theory offers a perspective for resolving such a paradox. By framing a design framework from the perspective of transitional definitions and foundations, it should be possible to situate an ordered and operationalised framework drawn from outsider future-making practices. Such a framework can support and scaffold speculative design practices in a way that is transitional and open to different futures and worldviews, rather than one that is static and that forces design into fixed forms from the past.

Design Celium

I came to the conclusion, however, that the concept of a framework brings with it certain onto-epistemological baggage. It is a technocentric and instrumentalist metaphor: a mechanical and pre-formed structure which prescribes action in particular ways, and this did not sit well with the post-qualitative stance of the research, or with the conceptual figure of the Strange Stranger, which insists on a decategorical and unboundaried nature, and tentacular, more-than-human concerns. Therefore, I turn to tentacular biologies to find an alternative structuring form that brings a different onto-epistemology, and a different concept to work with: fungal mycelium. Mycelium, a network of hyphae which are generally hidden, spread widely, interact with many other organisms, and allow for the flourishing of fungal bodies at particular times and in particular places. The word mycelium derives from epithelium, a tissue network of cells in animals modified by muces, the Greek word for fungus. My Celium removes the my- for fungus

and replaces it with design: a *Design Celium*, a decategorical and dehierarchical, branching, interconnecting system that opens out, rather than closes off, and that provides the support structure for the emergence of design artefacts.

This Design Celium represents an important artefact between the generalities of queer and more-than-human approaches of future-making and the specifics of the artefacts and products of speculative design.

An overview of the Celium can be seen in Figures 21 & 22.

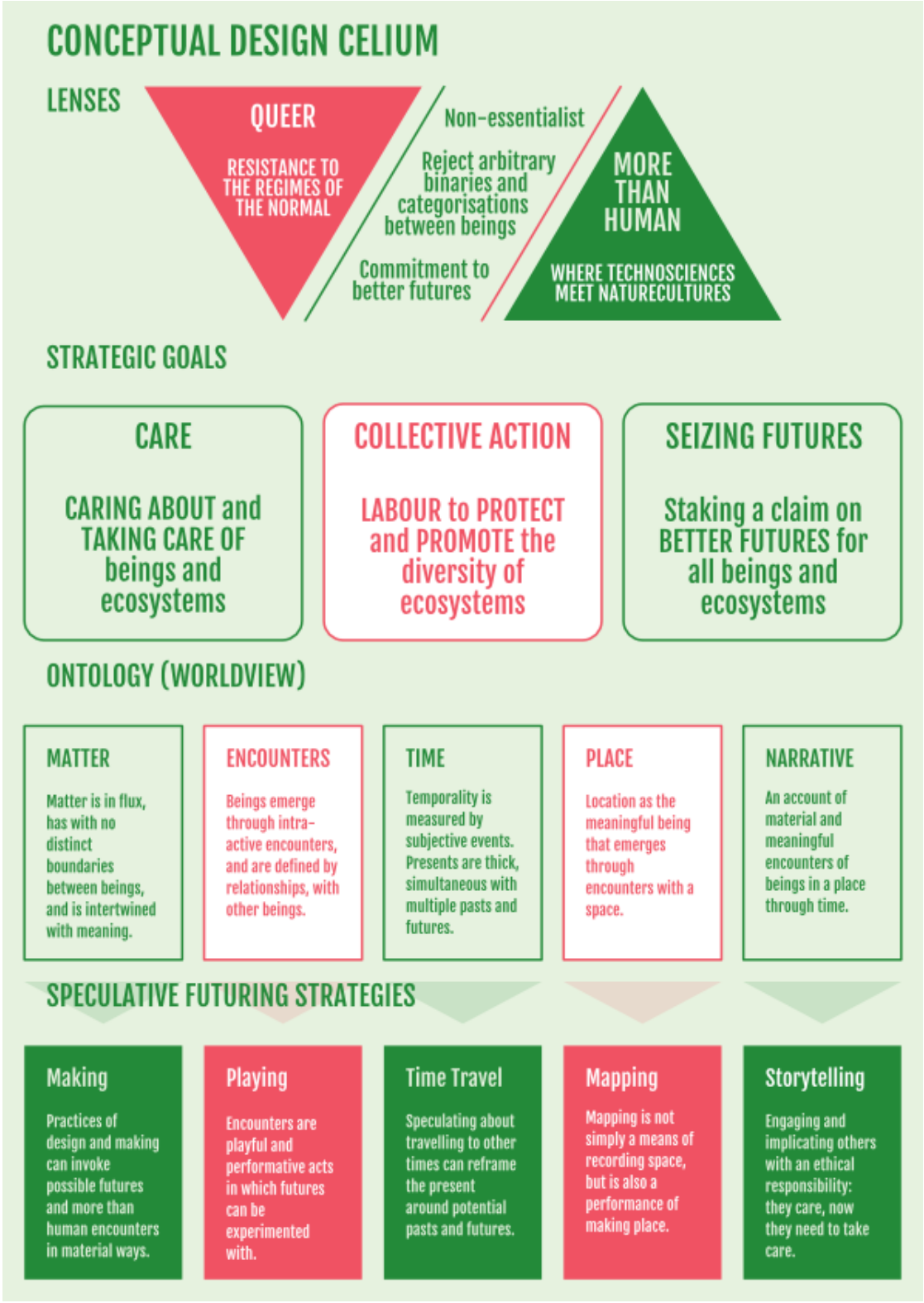


Figure 21 : Conceptual Design Celium Overview (part 1)

Overview document of the Design Celium, this first page showing Lenses, Strategic Goals, Ontology, and Speculative Futuring Strategies

Credit : Craig Jeffcott

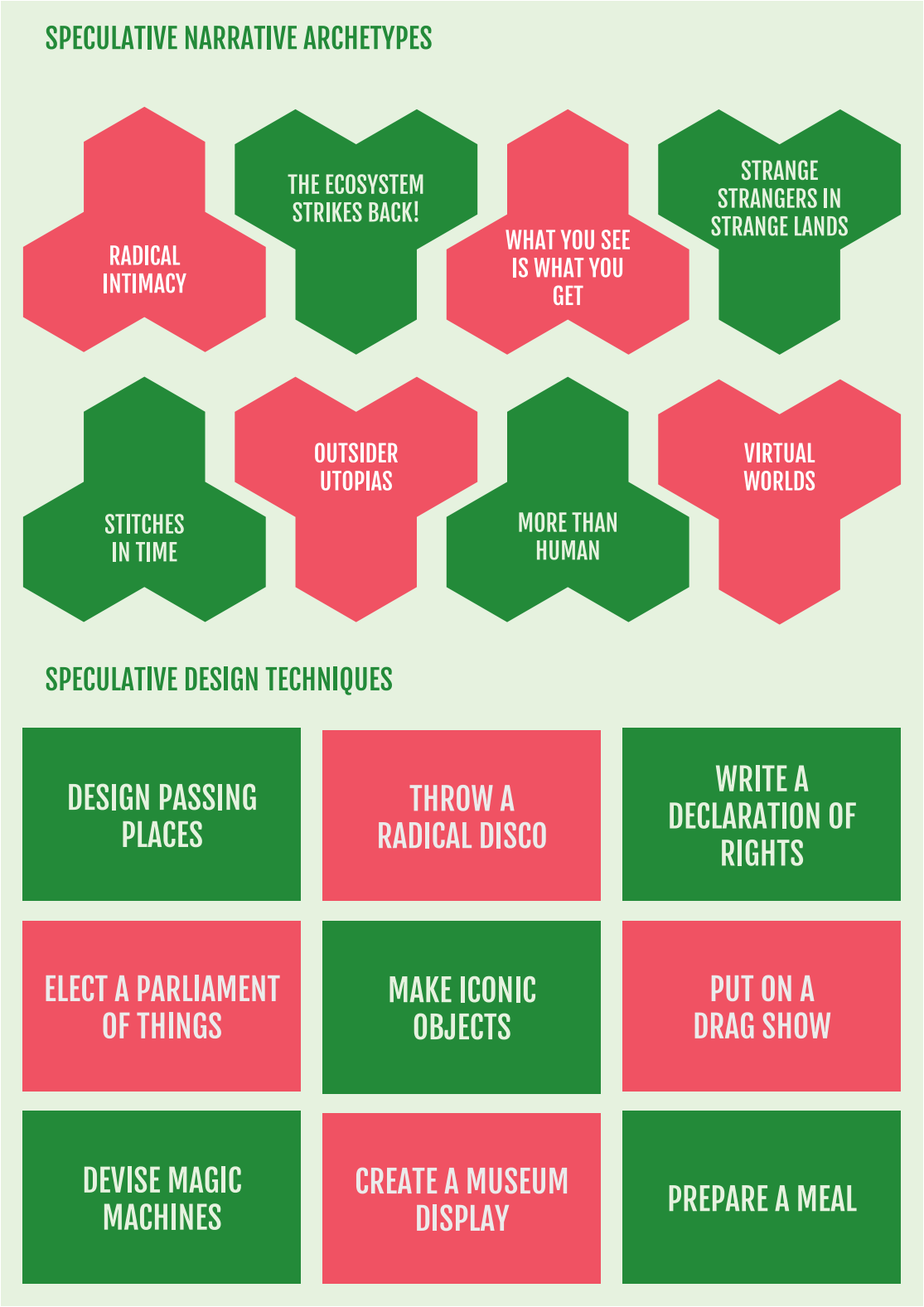


Figure 22 : Conceptual Design Celium Overview (part 2)

Overview document of the Celium, this second page showing Speculative Narrative Archetypes and Speculative Design Techniques.

Credit : Craig Jeffcott

6.2 Designing the Celium

6.2.1 Design Phase : Opening Moves

Phase Overview

The first phase of research on this project was one of taking the tentative opening moves, leading on from initial provocations and lures—that in addressing the monocultural polycrisis, there could be an interesting entanglement between speculative design and biodiversity activism, viewed through a post-structuralist, new materialist lens of Queer Ecology, and that existing means of future-making through such a lens might show a way forward to support Community Biodiversity Activism. I was interested in asking what queer and more-than-human ways of doing and being look like, and how they might grapple with futures? How might they relate to the questions of biodiversity crisis, the limitations of speculative design practice, and speculative fiction narratives?—and using those to expand the sense of the research space. This phase developed alongside and continued beyond the thesis proposal and its defence.

This phase principally draws on reading through theory, encounters, and conversations.

Reading through Theory : Diving In

In this first stage, reading through theory played a key role in expanding and complicating the project space; as Elizabeth Adams St.Pierre argues, the key to a post-qualitative approach to inquiry is to read deeply through theory and concepts, allowing the eventual emergence of new concepts and new designs. In this early phase, I drew on a few foundational texts that underpinned my thinking on this project. Due to a chance recommendation by a friend and their adjacency on a bookshop shelf, I encountered two texts on the same day: *Cruising Utopia* by Jose Muñoz (2009), and *The Three Ecologies* by Félix Guattari (1989). In *Cruising Utopia*, Muñoz presented a queer perspective on futurity that is rooted in communitarian action, on heterotopic spaces where alternative futures might be encountered in the present, and a concrete form of utopia making driven not by blind hope but by collective action, incrementally, towards a better future. He also argued that queer futures are by definition marginal, and ephemeral, and might be captured in a gesture or a mood, and are largely performative. This text introduced me to the concept of queer futurity, and opened the possibility that it might have something important to say about alternative, less monocultural ways to engage with futures. Guattari's Three Ecologies explored the sense that ecological systems, social arrangements, and our sense of self are all in crisis due to capitalistic systems, and that these crises are essentially one crisis; for better futures, one must develop an 'ecosophical'

understanding, that respects all living systems and beings; here the sense that monocultural social and environmental crises are entangled, and mutually constitutive began to develop.

Oher important theoretical texts read during this phase were *Old Futures : Speculative Fiction and Queer Possibility* by Alexis Lothian (2018), which frames speculative fiction through a queer lens, and *Queer: A Graphic History* by Meg-John Barker and Julia Scheele (2016), which gave an informative overview of some key topics in queer theory.

Finally, a couple of design research texts were invaluable here in framing the initial research approach: *Practice Based Design Research,* edited by Laurene Vaughan (2017), with chapters on various aspects of doing Research through Design in a doctoral research setting; and *Making Design Theory* by Johan Redström (2017), in which he puts forward his Transitional Design Theory, which forms a key analytical framework for this research.

In addition to more formally theoretical texts, I have drawn widely on more speculative texts, in fiction (print, film, and games) and design; these aren't detailed here, but are explored more as Speculative Narrative Archetypes and Speculative Design Techniques, below.

Encounters : Entanglements with the World

Alongside extensive reading, some early encounters began to establish the frame and the context in which this research project is situated. These are stories from different places, and different contexts, with beings both strange and familiar, entangled and complex.

Community of Arran Seabed Trust (COAST)

During the summer of 2019, I visited my parents in Scotland, and we travelled together to the Isle of Arran, one of the islands of the River Clyde, for a short holiday. An old school friend of my father and his wife had recently moved to the island, and, while visiting them for dinner, I had the opportunity to talk about my nascent PhD design research project. It transpired that they had, during their time on the island, become involved with a local community biodiversity action group—the Community of Arran Seabed Trust (or COAST—I don't think it's unfair to assume they started from the acronym and worked back to the name). With my interest piqued, they put me in touch with the director of the group, and I was able to visit later that week.

COAST Discovery Centre is based at Lamlash Bay, a small and picturesque fishing village laid out on the eponymous bay, overlooking a dramatic island, called Holy Isle, which is inhabited by a group of Tibetan Buddhist monks. The building lies close to the shore of the bay beside a small tennis court, and inside is a small visitor centre for tourists, with an aquarium tank, objects from the sea, and informative texts for visitors (See Figure 23).

I met with the then director, Paul Chandler, and he explained something about the genesis and purpose of the trust to me. Lamlash Bay had in the past been subject to aggressive overfishing for scallops, to the extent that the seabed had been effectively scraped bare and was essentially a desert. The founders of COAST, Howard Wood and Don McNeish, began a campaign for legislation to be put together to help protect and restore the seabed of the bay, and, with support from the local community (and opposition from fishing groups), they successfully established a legislative enclosure called a No Take Zone, in which no fishing activity could be carried out. COAST grew from that seed in various directions—their logo is, appropriately, a tentacular being, an octopus—buoyed by community involvement, with the trust and the centre involved in fundraising activities (including income from the tennis courts from visitors to the island); scientific research (they often have visiting marine biology students at the centre); tourist outreach (they have a campaign to encourage tourists to report any fishing boats seen to be operating illegally); and continuing legislative efforts to protect the bay and the wider seas around the island as a whole—a particular focus in recent years has been opposition to the proliferation of fish farming sites, and the environmental damage these are causing.



Figure 23 : COAST Welcome Sign

A welcome sign to greet visitors to the Octopus Centre at the Community of Arran Seabed Trust (COAST). The centre is the community's operational headquarters as well as a visitor centre with information about the local environment for tourists, visitors and students.

Credit : Craig Jeffcott

A Queer Tour of Glasgow

On the same trip to Scotland, I spent a day with an old friend from my undergraduate days at the University of Glasgow, who offered to show me around the burgeoning queer scene in the city's South Side, centred on Govanhill. When I last lived in Glasgow, Govanhill was the area where I shared a flat with my friend's former partner; at the time, it was an area undergoing transition. Fairly close to Queen's Park and Strathbungo, well-heeled neighbourhoods with handsome sandstone buildings overlooking the park, Govanhill was poorer, more working class, home to a sizeable community of South Asian heritage alongside neighbouring Pollockshields; between the two lay the *Tramway*, an arts venue run by Glasgow City Council, the local municipal authority, which had a community garden and a diverse events programme. Otherwise, Govanhill's activity was centred mainly on Victoria Road, a continuation of the street towards Glasgow City Centre in one direction, and the central avenue of Queen's Park in the other, a high-street street of small shops, pubs, and cafes.

Returning to the area sixteen years later, I found it to be much changed. The demographic of the area has shifted, with many residents from Eastern European countries, and it finds itself the epicentre of Glasgow's burgeoning queer and socially and environmentally conscious communities. Victoria Road and surrounding streets are home to a proliferating ecosystem of social enterprises (one shop provides a repair service for broken household appliances; another is a drop-in centre for advice about gardening and fuel poverty) (See Figure 26), and community-oriented businesses, including *Pink Peacock*, a queer Yiddish anarchist cafe (which has since closed).

My friend had a prior appointment, so he sent me first to *Category Is*, a queer bookshop with a clever name ("Category Is…" is the call of emcees in the Vogue ball scene, when they announce the competitive category of each ballroom battle that will take place, made famous by Ru Paul's Drag Race; there the category might be "Eleganza", or "Rough Trade", while the bookshop has shelf signs reading "Category Is… Queer History" or "Category Is… SF"). I spent some time browsing the shop, and had a brief conversation with the owner, who recommended that I might read *Old Futures* by Alexis Lothian, which, as described above, has become a key text in my thesis. During my time in the shop, I realised that it was something of a community hub for a group of queer young people, who were spending their time sitting in and hanging out in the vicinity of the shop (See Figure 24).

My friend rejoined me to visit the *Glasgow Zine Library*, a community space that maintains an archive of 'zines (low-tech, handmade magazines and publications) and provides a space to hold events; there was a knitting meet-up happening during our visit (See Figure 27). En-route back to the city centre, we dropped into GAS, *Glasgow Autonomous Space*, a large, rough-and-ready complex of rooms, studios and maker spaces; it seemed to be a community run space, and when

we visited, the only people there were in a meeting upstairs, and who seemed perturbed to have been surprised by our visit (Sometime later I was able to hold a workshop in the space, for which I was giving directions to access the building and similarly didn't meet an organiser, so I can understand the surprise of that group in this context) (See Figure 25).

Later that evening, in a bar and vegan restaurant in the city centre, we met with his friend Amy Rodgers, who hosts a podcast, *The Queer History of Dance Music*, where she "explore[s] the co-evolution of queer rights movement [and] dance culture."

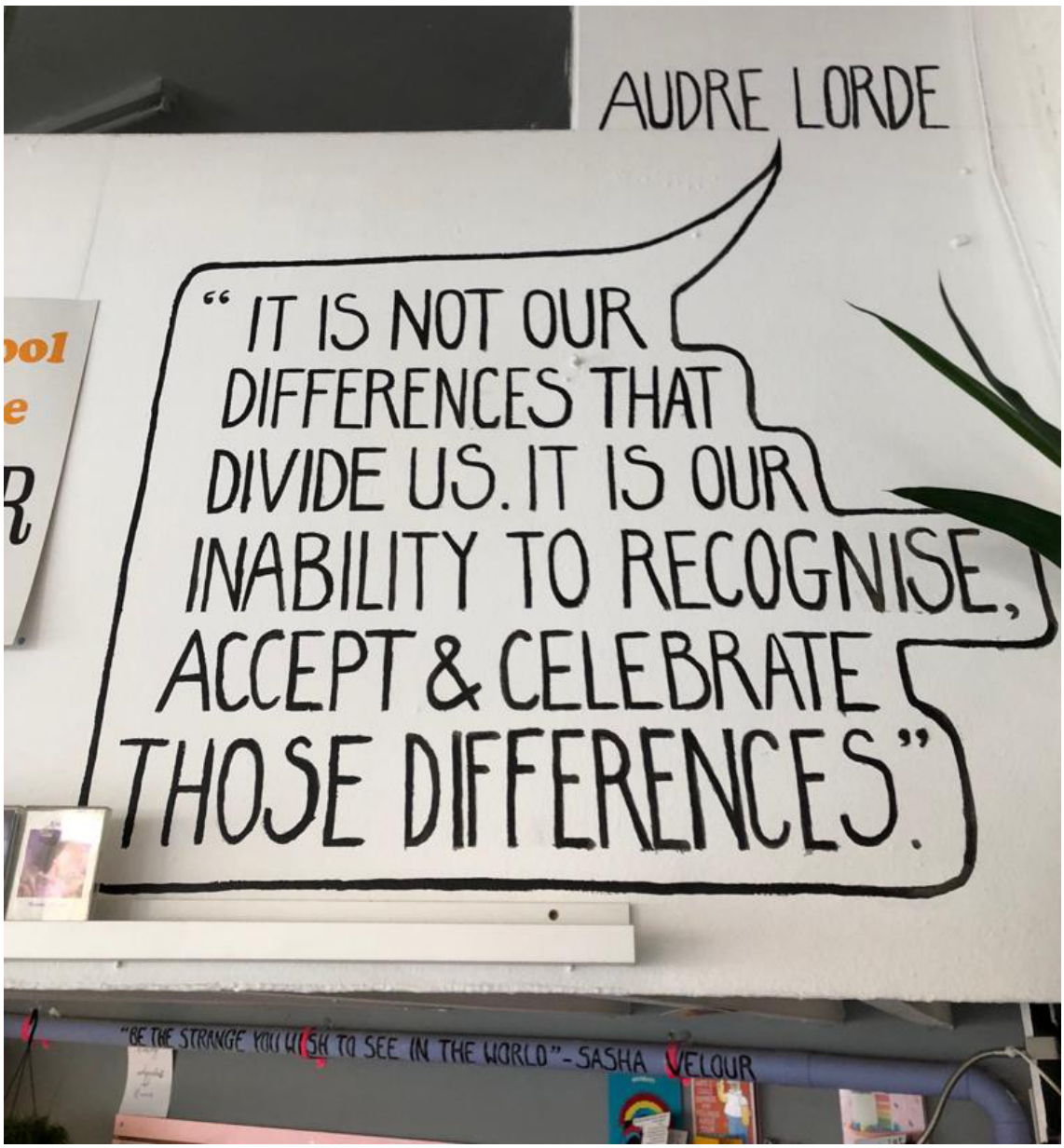


Figure 24 : Category Is... *Bookshop*

Category Is... *is a Queer bookshop and community space in the Southside of Glasgow.*

Credit : Craig Jeffcott



Figure 25 : Glasgow Autonomous Space

This sign marks the entrance to Glasgow Autonomous Space, *a community run space in the Southside of Glasgow; I held a design workshop in this space in March 2022.*

Credit : Craig Jeffcott



Figure 26 : South Seeds Sign

A sign for South Seeds, a community organisation in Glasgow's Southside that works with residents in their local community to promote sustainable living, through gardening, cycling and energy efficiency measures.

Credit : Craig Jeffcott

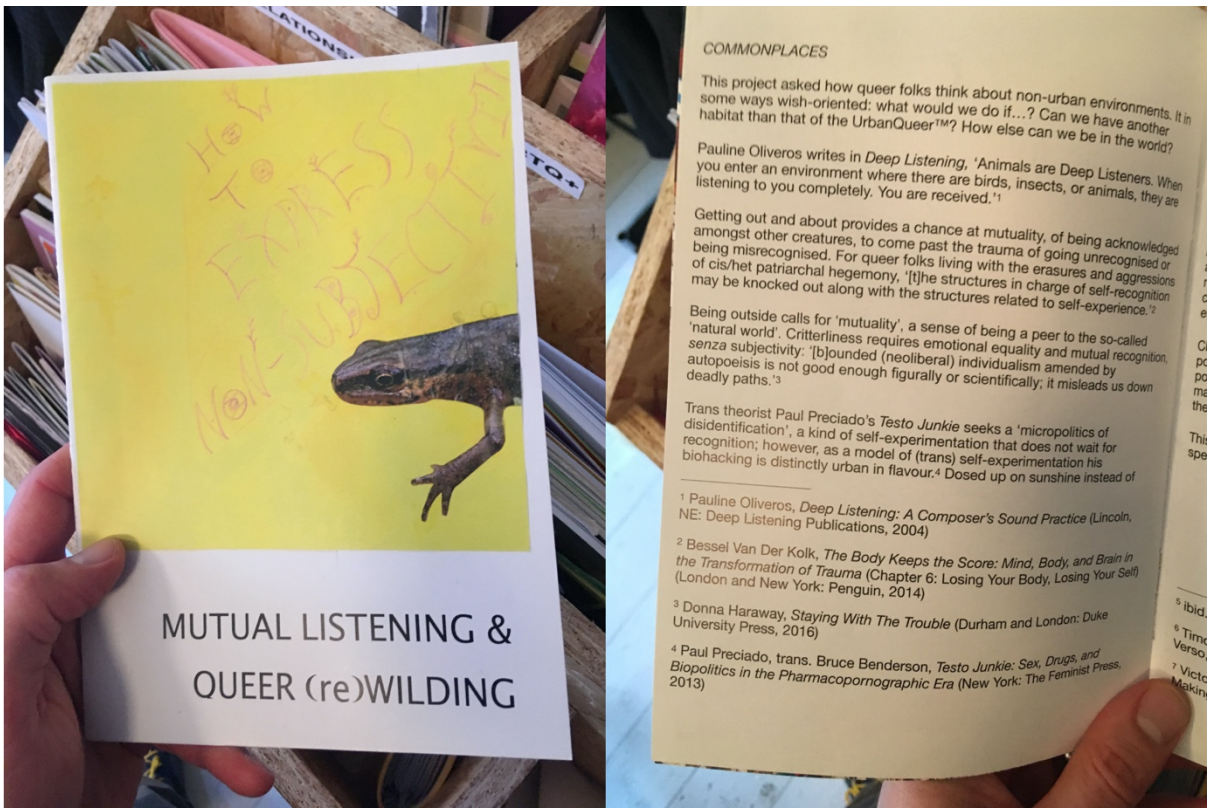


Figure 27 : Glasgow Zine Library

A publication at the Glasgow Zine Library, a community space in Glasgow's Southside that publishes and archives thousands of 'zines: low-tech, handmade grassroots magazines.

Credit : Craig Jeffcott

Mauro, the Poet of the Mata

During the Covid Pandemic in 2020, I spent a lot of time, by necessity, walking and exploring my local neighbourhood in Barreiro, a town that is an effective southern suburb of Lisbon. Barreiro is a post-industrial town, once dominated by an enormous industrial complex that has fallen into ruin and disuse, and the rewilding remains of these sites are found all around town. During one of the periods of relative freedom, a friend took a trip to a forest park on the edge of the town, Mata da Machada, a sprawling woodland of eucalyptus, Mediterranean pine, sandy soil, and marshy wetlands, where he spoke to some of the naturalists and biologists who worked there. Inspired by the meeting, he recommended that I and another friend (also a PhD student of speculative design) might find him an interesting character to meet, and the three of us took a trip there some weeks later. An interesting character, indeed, he turned out to be. A young biologist, full of enthusiasm for nature and conservation, he explained some of the community biodiversity projects taking place in the park. They ask for volunteers to spend the day removing and destroying two particular plants, acacia and chorão, or ice plant (a sprawling, invasive succulent that is incredibly common in coastal areas in Portugal). He explained that acacia was planted to dry out the land, to prevent mosquitos and the infections that they carry. I later found out from Joana Robalo, a biologist who I had a conversation with for this project, that ice plant was planted to prevent erosion of soil, but collectively, they now are too invasive, preventing the growth of other plants, so the volunteer groups are tasked with helping to eradicate them. Mauro had an interesting relationship with the land; beyond being a scientist, he has a personal and creative bond with the land: talked of his desire to hold a rave in the forest, and surprised us with a dramatic hilltop reading of some of his poems about nature (he is also a published poet).

Conversations : Lived Ways of Futuring

I engaged in some in-depth conversations during 2020 and 2021; this represented a pivot from a planned approach that would focus more on design experimentation and community engagement interventions, largely due to the surprising emergence of the COVID-19 pandemic and all of its associated restrictions to gathering and disruptions to quotidian existence.

Of those conversations, I have drawn on four that were of particular relevance, with the inclusion of an additional, older conversation from my MA in Interaction Design project that I also have drawn on here. I present those conversations in their full form in *Appendix 1 : Conversations*, and briefly summarise them here.

Elizabeth Rose Langford : Artist

> *"I don't know if artists continue to work with these things. I have my own issues sometimes with natural materials, because it's very time consuming. But the thing that's amazing about it is that you're so connected to the whole process [compared to] squeezing paint out of a tube. You've lost quite a lot of the process there. You've lost the connection to the origin of the thing. Not to disparage people that work like that. The thing I think I've learned quite a lot about my practice from working with is that I've realised that I don't really like to force an agenda on pigments. I like to try and be as much as possible led by the material and let what's going to come out, come out."*
>
> *(Langford, personal communication, 2020)*

Elizabeth is a British artist with a special interest in pigments, who came to Portugal on a residency programme to work with a historical pigment, turnsole. Turnsole is extracted from a plant, *Chrozophora tinctoria*, which had recently been rediscovered by chemists and botanists from Nova University in Lisbon. She described the challenging process of extracting the pigment from the plant, and we discussed the affectionate terms with which the scientists described the plant, and the importance for her art practice in going to where the pigment is found, extracting it herself, and learning and becoming part of the story of the pigments that she works with. She talked about how it's important for her to be led by the pigments and materials that she works with, rather than projecting her human agendas onto them (See Figures 28 & 29).



Figure 28 : Chrozophora tinctoria *extracted on to a cotton sheet in Granja, Alentejo*

The artist Elizabeth Rose Langford worked with chemists at NOVA University (Lisbon, Portugal) to extract the pigment turnsole from the plant Chrozophora tinctoria, *which grows in a specific area of the Alentejo region. Langford used the pigment to create artworks.*

Credit : Elizabeth Rose Langford



Figure 29 : "Money Doesn't Smell"

This is one of the artworks that Langford created, with the turnsole dye that she extracted, during a residency at PADA Studios (Barreiro, Portugal) in 2020. Cotton bed sheet, Chrozophora tinctoria, *fermented urine and fishing wire. Various dimensions. (Langford, 2020)*

Credit : Elizabeth Rose Langford

Dinis Machado : Choreographer

> *"Traditionally, the way that we build identity is so much about reducing the possibilities of the body so that you build this coherent image of yourself, and sometimes it's more about unbuilding that and allowing the body to be able to be more things at the same time. It's useful to put aside this coherent image of self and be more expansive."*
>
> *(Machado, personal communication, 2021)*

Dinis Machado is a Portuguese choreographer and dancer based in Stockholm who identifies as non-binary and transfeminine. They talked to me about their choreography and dance practice as being a process of collaborative exploration and finding ways forward. They talked particularly about how the experience of being trans and non-binary is a somatic experience, one of having multiple bodies and ways of being in the world, including those projected onto them by others, of being in a constant state of in-betweenness. They talk about the way that identity is constructed to produce a coherent sense of self, and how their dance practice tries to break that down and express other, more transitional selves. Their dance practice engages with this through finding ways to express and perform that in-betweenness, often by overloading and confusing the body, surprising it into different forms and ways of being.

Joana Robalo : Zoologist

> *"For most people nature is just like an abstract entity; they like the concept, they like seeing it 'over there' but they do not want to confront themselves with that. And if you start saying that species are disappearing and that everything is collapsing, it's like when you see that an earthquake has caused so many deaths in a foreign country."*
>
> *(Robalo, personal communication, 2020)*

Joana is a zoologist and educator based in Portugal whose scientific research has focused on freshwater river fish. We talked about the importance of people being engaged in the stories of their local environments through the story of a fish species that was discovered in local rivers near Cascais, in Portugal; initially local people were disinterested, but the fish become the locus of efforts to clean up the rivers and educate children about the importance of biodiversity, and the children encouraged their parents to take more of an interest. She emphasised the importance of it being a hyper-local, community-focused effort, and the importance of engaging with children, who tend to be more open-minded than adults to think about the world around them. She argued that scientists need to improve the way they communicate with the public, but that people in general are detached from nature, and don't see how they are connected with it.

Rho Thomas : Drag Queen, Educator and Performer

> *"It's playing around with the way you're expressing, the way you're feeling; it is playfulness. That's basically what its always come back to for me. That I've wanted to play with everything. Like even when I was a really young kid I loved playing with cars and trucks. I also loved playing with dolls and My Little Pony and all of that. I just wanted to do everything."*
>
> *(Thomas, personal communication, 2021)*

Rho is a non-binary identifying Australian teacher, musician and drag queen (performing as their alter-ego, *Taxi Rank* (See Figure 30)) who lives in London. We talked a lot about Rho's childhood growing up in Australia and discovering and exploring their identity, sexuality and gender, and in particular, their inspiration from their Grandmother who encouraged them to live their life in the most authentic way. Rho talked about initial explorations of their femininity and the way their family reacted to this; they explained that they treated gender playfully, guided more by a sense of play than a sense of having to conform to particular identities. They talked about their education as a classical musician and performer, and the way that they felt constrained by the artificial distinctions between musician and dancer, and the limitations of the types of music that were available to them as a clarinet player. In London, they discovered drag as a performative outlet that allowed them to sing, dance, play their clarinet, and sew, a skill they developed as a child but had not outlet for. We discussed the dangers facing marginalised and queer people, of exclusion and violence, and talked about the ways in which queer people can be resilient in the face of such things—one of those ways being a connection to communities such as the drag performance community.



Figure 30 : Taxi Rank, Still from film in Wombat State Forest, Victoria, Australia

Rho Thomas is a musician, performer and educator based in London, UK. Their drag persona, Taxi Rank, affords them the opportunity to creatively express their identity through performance, dancing, singing and fashion design.

Credit : Rho Thomas

Andrew Gardner : Archaeologist

> *"Artefacts are pretty important to the way human consciousness interacts with the world, and particularly we have a strong sense of the temporality of artefacts. They're an important benchmark I suppose for change, and continuity, and aside from the aging of our own bodies, they're the things that keep us located in time, that allow us to imagine both past and future times, and we have to do that in order to be able to operate in a daily basis. We're always oriented both towards where we've come from and where we're going, and obviously different cultures construct those points of reference in different ways but that seems to be a pretty fundamental part of being human."*
>
> *(Gardner, personal communication, 2016)*

Andrew is an archaeologist based at UCL in London, who specialises in Roman Britain. In 2016, I interviewed him to talk about temporality, materiality, and designing for the far future. We talked about the importance of material artefacts in providing a sense of time and continuity for people, in grounding them in the present and connecting them to possible pasts and futures. Andrew explained that there are certain time periods that people may feel more connected to, like the Roman period in British history, through the iconic material objects of roman pottery that represent that time. We talked about different timescales, and the challenge of getting people to think beyond the horizon of their own lifetimes, and how this might be mediated by material objects. Andrew talked of having an ethical responsibility to think of those who might exist in the future through how our present actions may impact them, as well as to life in general.

Design Experiments : Design Probes

The first significant act of design experimentation in this project was the design and development of design probes, which were situated as a way to explore emerging ideas and concepts through design while conducting research into queer and more-than-human future-making practices. These experiments took place in 2020 during the early and restrictive stages of the Covid-19 Pandemic, and were not especially successful, potentially as a result of this context.

Designing Design Probes

I designed a set of draft design probe tools, drawing on a number of the theoretical and critical frames for the project. It was challenging to create probes that engage with these issues to provide a framing perspective for respondents as well as to scaffold appropriate responses.

The probe set consisted of 11 separate activities (see Figure 31) alongside a feedback questionnaire to get some responses in terms of how engaging, interesting and well explained

each task was. These probes were simply laid out in a text document; future iterations would have approached them as designed artefacts.

I distributed these probes to some friends and design students and professionals to test and review the probes, with a plan that they would be distributed in a later iteration in community settings. I asked reviewers them to spend some time contemplating the probes, attempting any that interested them, and returning any completed probes alongside responding to the feedback questionnaire.

Design Probe	**Description**
Resilience Bingo	Respondent is given a bingo card with ten keywords relating to resilient systems on it. They are asked to complete the bingo card by photographing and captioning all of the keywords with examples from their own lives. This probe aims to explore the concept of resilience in their lives and environment.
Election of Things	A fictional scenario is presented of a new political party, The Thing Party, that will put non-human objects up as candidates in a forthcoming election. The respondent is asked *t*o select eight candidate 'things' that they encounter during their day and provide a name, image and reasons for selecting them. This probe aims to introduce the concept of Cosmopolitics and the *Parliament of Things*, and to get respondents to think about the agency of the non-human things in the world around them.
Parliament of Things	A follow-up from the previous probe: in this scenario, The Thing Party has won the election and must select parliamentarians for ministerial roles. The respondent is asked to assign each of the things from the previous probe to specific ministerial roles, explaining their qualifications for the role and their first

	piece of legislation. This probe aims *t*o deepen the engagement with cosmopolitical ideas and to consider further how non-human things can have political agency.
Speculative Cut-Up Poetry	This probe asks respondents to generate poems using a cut-up technique, where texts are cut into pieces and reassembled as poetry, with pages taken from various theoretical and science fiction texts. The respondent is asked to cut up the provided texts in any way they wish and use them to create three poems. This probe was situated as a creative way of exploring to explore how project themes might become entangled together.
Happenings for Uncertain Futures	This probe asked respondents to compose a visual score for an art happening, a non-linear and semi-improvised, collaborative and spontaneous performative work of art (Rodenbeck, 2014), on the theme of strategies for uncertain futures. Respondents were instructed to follow a series of steps to generate some keywords and actions and build up a visual score using them. The purpose of this probe was to explore how happenings and performative activities can be a way of imagining different futures.
Mapping Better Futures	Exploring the idea from Muñoz that better futures can be enacted within the present (Muñoz, 2009), as a mapping exercise. The respondent is asked to create a map of the better futures that they inhabit within the present that can be geographic, diagrammatic, illustrative or abstract. This probe aims to consider how the respondents are able to enact better futures within their own present situations, an action that Muñoz

	suggests is central to queer conceptions of futurity.
Show your World	*Illustrating a respondent's personal world through the photographs they have taken. The respondent is asked to select eight photographs from those already saved on their phone to explain their world to a stranger. This probe was designed as a quick exercise for learning something about the lived experience of the respondent's life.*
Invisible Cities	A photographic project about whimsical and psychological cities, based on a photographic exercise by Eirik Johnson that draws on Italo Calvino's novel of the same name (Johnson, 2014). Respondents were asked to create a series of nine photos to explore their own invisible city. The purpose of this probe was to consider looking at familiar things from less normative perspectives and to speculatively respond to their surroundings.
Futures of the Past	*Using retrofuturism as a lens for viewing life. Respondents are asked to write about an event in their lives from a retrofuturistic perspective, with the purpose of priming respondents to think about the different sorts of futures that can be invoked in the present.*

Hope in the face of Heartbreak	*Creating a framework for concrete utopian action and applying it to one's life. Respondents are asked to create a diagram of abstract versus concrete hopes and use this to inspire a creative response. This probe is intended to encourage respondents to practically engage with ideas of concrete utopias and hopeful futures.*
Hyperion Pilgrims' Game	A storytelling card game based on Dan Simmons' novel *Hyperion* (Simmons, 1990), which is framed as a series of pilgrims stories in the style of Chaucer's *Canterbury Tales*, in which respondents are asked to generate a story framed using elements from the novel. This probe was aimed at exploring storytelling as a strategy of future-making, and to generate speculative fictions that reflect the respondent's perspective on the research themes.

Figure 31 : A summary of the design probes used in the project

Responses

Out of the fifteen testers to whom I distributed the probes to, five responded to the questionnaire, and 3 returned some design probe responses. The responses received on the questionnaire could perhaps be broadly separated into the following: a general dislike of the method itself; interest in a particular probe; interest in the probe with some reservations; a disinterest in a particular probe; and confusion as to what was being asked. Of the one respondent who showed a general dislike of the design probe method, they felt that the technique was too 'furtive', and that they'd rather engage with the topics directly. Considering the responses that showed a reserved interest in certain probes, some common remarks came up: that a probe was interesting but simply would require too much time to complete; that an activity was interesting but seemed to be more suited to a group workshop activity; that it wasn't always clear what they were being asked to do.

Reflection on Practice

The initial response was less promising than I hoped, with little response to the initial set of probes or the questionnaire request. From this, I gained some valuable insights:

- Clear instructions are important. Most respondents didn't fully understand what I'd asked them to do: this may have led to a lack of engagement.
- The cognitive effort and time commitment to complete a set of probe tools. This was reflected in my own experience: I planned to complete the probes, but in practice, I found it hard to get started. Considering I understand the task well and consider them important, I can then understand the barrier to engagement for others. Clearly, that the perception of effort when designing an activity is much less than the perception of effort needed to complete an activity.
- Many people suggested that some activities would work better as group activities during a workshop. It may indicate that making a commitment to set aside a specific period of time to attend a workshop is less daunting for research participants than the vague timescale of design probes; such a reflection led me to emphasise design workshops as a more fruitful research technique.

Taking these reflections into account, I rethought the rationale of using design probes as part of the project. I still believe it to be a valuable method that generates some really interesting materials, but it would need to be reframed as a series of very quick, low-cognitive load activities that act to engage possible project participants with the themes of the project.

As the project progressed, I realised that design probes were not a technique that I would return to, but developing them was a useful exercise in understanding how to bridge theoretical ideas to design practice. I gave some ideas that would return in different guises later in the project, with some of them being reworked into workshop activities, speculative design techniques within the framework and playset, and even the germ of the idea that became the *Strange Strangers in Strange Lands* storytelling game.

Reflection on Design Phase

These *Opening Moves* were important foundational activities in understanding the trajectory of this research project and finding a way forward through the research. Through early encounters and conversations, I began to form a rich picture of what queer and more-than-human orientations towards the future might involve, and how they might be understood. Through my encounters with COAST, Glasgow's queer spaces, and Mauro Hilario, I discovered concrete, complex examples of how communities can come together to make and enact better futures

together, and the way that these practices can be strengthened through creative, playful and storytelling activities. In my conversations, I learned about the importance of connecting to the stories of place and the duty of care that comes with it through Elizabeth Langford's work on *Chrozophora Tinctoria* and Joana Robalo's work with communities and rare fish species; Joana also emphasised the importance of community engagement in biodiversity activism. Rho Thomas told me of the importance of community and performance for marginal people and how it can be a source of resilience, and they along with Dinis Machado discussed how performance and playfulness can offer a way to explore marginal, fluid identities. Andrew Gardner told me about the importance of material artefacts in our understanding of time, and being able to connect to futures and pasts more easily.

6.2.2 Design Phase : Exploratory Attunement

Phase Overview

This phase was more exploratory and design-led: an important part of developing the practice and framings for this project was through very open-ended, exploratory design experiments. I used this as a way to engage with many of the ideas that I was exploring through reading through theory and my encounters with other beings. These experiments weren't aimed at any particular outcome and certainly not something that I would consider to be prototyping *per se*; it was simply an approach of tentatively staying with the trouble, generating concepts through design, and starting to learn through making.

Alongside this was a more strategic approach to Reading through Theory; drawing on some initial ideas from previous reading, and my conversations and encounters, I delved more deeply into the ways in which futures can be engaged with, and why, in relevant contexts.

This phase focused on the techniques of workshops, fabulation, and design experimentation, and reading through theory.

Workshops

I attended some workshops during this project, as both participant and organiser, that helped me to frame aspects of the research project, giving me experience in workshop dynamics and helping me to develop the ideas and hypotheses of my thesis. These took place at different moments of the research project, spanning a period from 2019, during the period of exploratory feeling my way towards the project space to 2021, when the design framework had been stabilised and I was working on developing the playset; I present them both as they played similar framing roles rather than being a research activity.

The Ethics Committee of Dark Conservation (September 2019)

> *"The project used the imaginary as a tool to not only visualise alternatives—that is itself an initial step towards social change—but, crucially, as a vehicle to collectively author new stories to provoke into being an environment where there are many truths of equal standing. In this way, the work actively sought to be in opposition to the singular truths that dominate society and that often go unseen and unchallenged. To put it differently, the* Ethics Committee of Dark Conservation *used fiction as a route towards the public prioritisation of other ways of knowing,"*
>
> *(Admiss, 2019, p. 1)*

The *Ethics Committee of Dark Conservation* was a speculative curatorial workshop at the Porto Design Biennale in 2019, which formed part of a series of workshops titled *Fiction Practice: Prototyping the Otherworldly*, and organised by Mariana Pestana. The workshop was organised by Dani Admiss and Gillian Russell, and focused on the issue of matters of care through design fictions. It was framed around a notional *Ethics Committee of Dark Conservation*, for whom the participants were cast as archivists; we were tasked with choosing a neglected object which was to be admitted to the archive. (See Figure 32). The workshop was about the difference between matters of care and matters of concern, the ethics of doing speculative research, and the pluriversal nature of the world. We were requested to bring a neglected object with us to make a case for its inclusion in the archive. I brought a photograph of a derelict flour silo that dominates the Barreiro skyline, while other participants brought a construction brick (purloined from a building site close to the museum where the workshop was held), plastic tableware, traditional bread from Madeira, and, the item that was eventually chosen, a British National Overseas Passport, of the type once issued to residents of Hong Kong.

The workshop involved reading and discussing a paper by Maria Puig de la Bellacasa, a talk from an ethics expert from Catholica University, discussion of the neglected objects, culminating in a design activity aimed at producing an exhibition, whereby we were each asked to prepare an archivists report for the item to be brought into the archive, but, in a pluriversal way, to each look at it through a different lens, from a different world; I chose to explore it through a queer lens (it was added to the options because of my participation in the workshop).

I explored some interesting ideas with the passport around the queer idea of *passing*. Passing is the ability to be perceived as belonging to a category (of gender, typically) in a circumstance when one could be read as an outsider to it: it typically refers to a "trans person's ability to be read by observers as cisgender," (Anderson et al., 2025, p. 45).

I was fascinated that this document, which doesn't bestow British citizenship but allows the holder to travel as though they possess it, is the boundary condition to passing, physically, from

one world to another, as well as passing as one who belongs in that world. I toyed with the queerness of an artefact that allowed one to pass into other worlds unnoticed, but radically changed (See Figure 33).

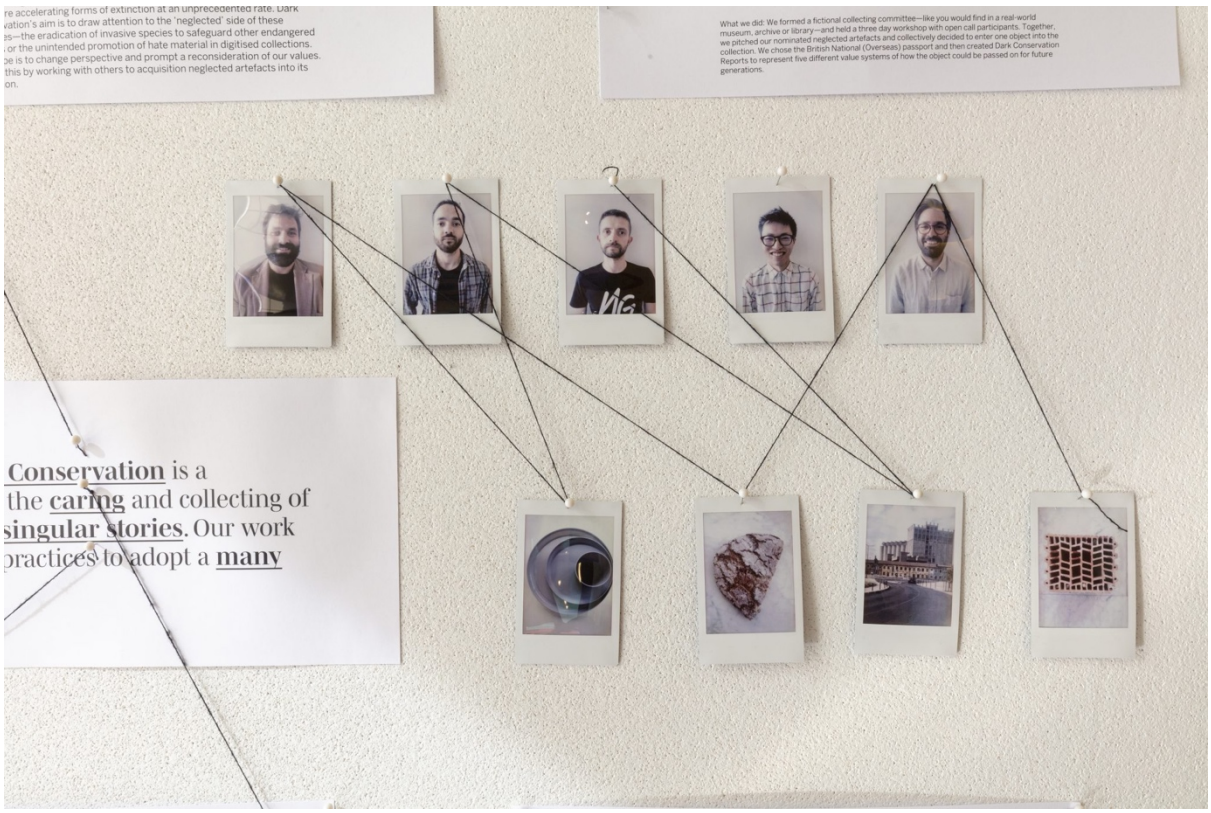


Figure 32 : The Ethics Committee of Dark Conservation

The Ethics Committee of Dark Conservation was a speculative curatorial workshop at the Porto Design Biennale in 2019, which formed part of a series of workshops titled Fiction Practice: Prototyping the Otherworldly, *and organised by Mariana Pestana. The workshop was organised by Dani Admiss and Gillian Russell, and focused on the issue of matters of care through design fictions. It was framed around a notional Ethics Committee of Dark Conservation, for whom the participants were cast as archivists; we were tasked with choosing a neglected object which was to be admitted to the archive. I took part in the workshop as a designer-participant.*

Credit : Porto Design Biennale

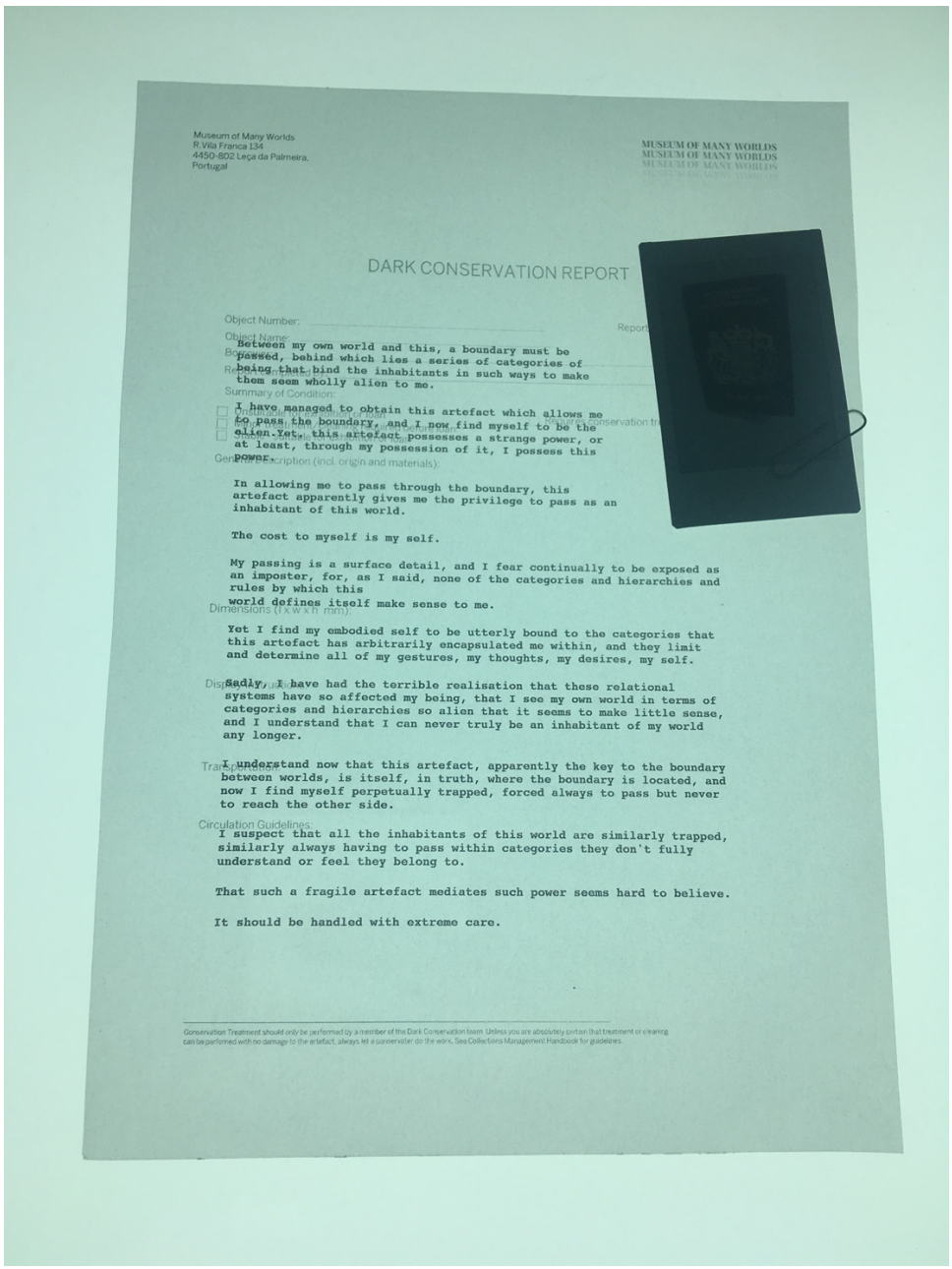


Figure 33 : British Overseas Passport, Queer Archivist Report

During The Ethics Committee of Dark Conservation workshop, the neglected object chosen for the archive was a British Overseas Passport, a document issued to certain residents of Hong Kong, giving them travel and resident rights in the United Kingdom denied to other Hong Kong residents. We were asked to prepare archivist reports from a pluriversal perspective, drawing on a number of different lenses. I considered the document according to a Queer lens, and explored the parallel of the passport as a boundary object that allows one to pass from one world to another to the queer concept of passing, being able to convincingly pass as belonging to a category other than your own (typically referring to trans-feminine people and drag performers who are coded and read as cis-feminine)

Credit : Craig Jeffcott

Mapping the Avenças (May 2020)

I also took part in two workshops at the *Museum of Art, Architecture and Technology* (*MAAT*) in Lisbon. In the first, Mapping the Avenças in Spring 2020, I collaborated with Admiss and Russell in arranging a one-day workshop as part of the Disturbing Conservation project. Through organising this workshop, I gained some insight into the dynamics of how workshops might work, and explored the potential of the conceptual figure of the Strange Stranger in framing speculative design practice. The workshop was framed around a speculative scenario related to *Marine Protected Areas* (See Figures 34-36).



Figure 34 : Mapping the Avenças : Speculative Sketch

A speculative sketch created during the Mapping the Avenças workshop at MAAT Lisbon in 2021. The participant was representing the relationship between beings in the ecosystem.

Credit : Craig Jeffcott (Photograph)

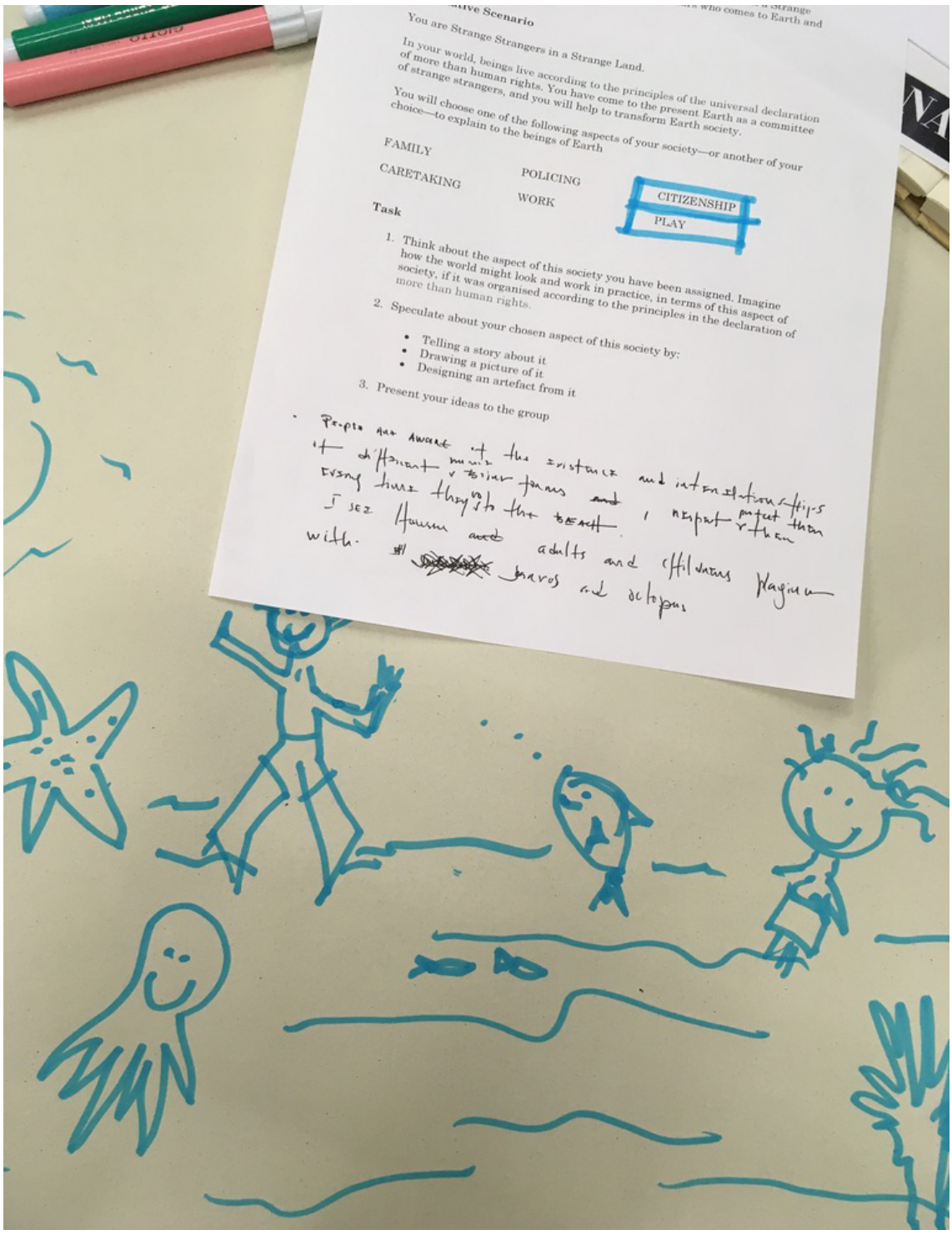


Figure 35 : Mapping the Avenças : Design Activity

One of the speculative exercises asked the participants to re-imagine the Universal Declaration of Human Rights from the perspective of other Strange Strangers.

Credit : Craig Jeffcott (Photograph)

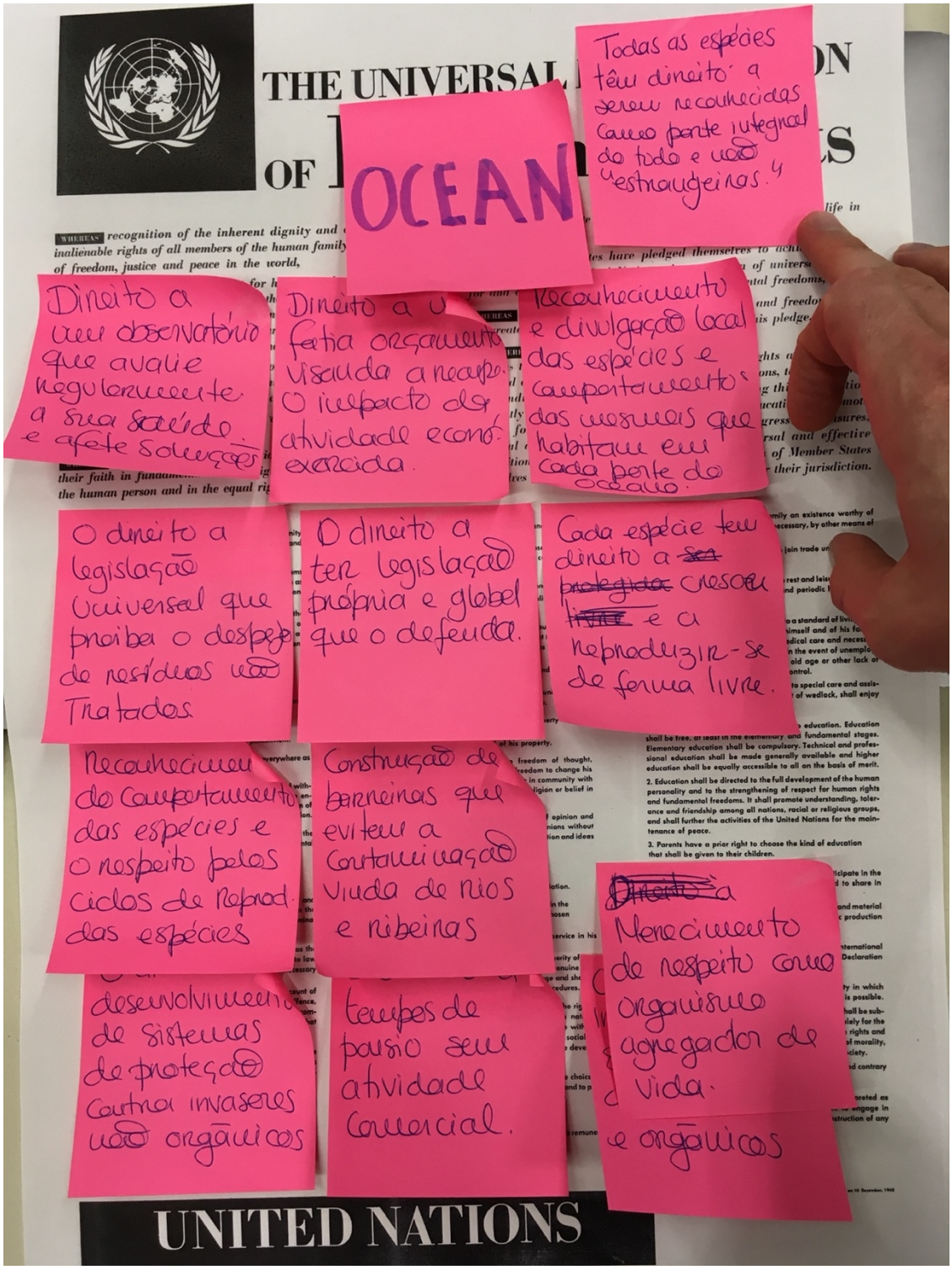


Figure 36 : Mapping the Avenças : Declaration of Rights

This image shows one group's response to the Declaration of Rights exercise; in this case, they have considered the rights of the Ocean, and rewritten the Universal Declaration of Human Rights as a Universal Declaration of Ocean Rights.

Credit : Craig Jeffcott (Photograph)

Architecture of the Enclosed Sea (July 2021)

The second workshop at *MAAT* in Lisbon, in Summer 2021, was organised by Louise Carver, a geographer, and was entitled *Architecture of the Enclosed Sea*. The event consisted of a two-day workshop and field visit, *Re-Assembling the Future of Marine Protection*, and a public symposium programme of talks, debates and screenings; these were organised to accompany the exhibition *Aquaria, or the Illusion of a Boxed Sea*, curated by Angela Rui (Rui, 2021) (See Figure 37).

In the workshop, which brought together design and art professionals and other implicated actors involved with the oceans, we explored the concept of enclosures as a way to separate nature and people, often for entertainment purposes, and how nature reserves such as Marine Protected Areas can act as enclosures. The event aimed to explore the entanglements between two quite different forms of marine enclosure, the aquarium, and the Marine Protected Area, and to explore more convivial approaches to the human relationship with the marine environment: we discussed the possibility of an approach based in convivial architecture, where humans and more-than-human beings might coexist more directly. (Carver, 2021b).

> *"The programme compares the respective characters of aquaria and marine protected areas in ocean cultures and marine conservation. Aquariums are volumetric, indoor bodies of water. Marine protected areas are aerial ocean territories spanning tens to tens of thousands of square kilometres. Both serve scientific, political and entertainment purposes; both are used for nature protection and both are reproductive of certain worldviews. What other common stories can be traced along the scale variance of devices that "box the sea?"*
>
> *(Carver, 2021b)*

Enclosures and boxes

I have discussed the concept of intrinsic and extrinsic motivations for conservation in the section on decolonising conservation: in many cases, conservation efforts have been driven by a human, rather than ecosystem need, whether as an economic resource, for scientific research, for human leisure or affective uplift. There are also more recent, and more community-oriented initiatives where conservation efforts are pursued with an intrinsic motivation, and are ecosystem-focused rather than human-focused. A key part of conservation efforts has involved the separation of part of the environment into a delineated box, an enclosure, in which acts of conservation might take place. Historically, "many critical examinations [of enclosure] have focused on it as a component of state and neoliberal territorialization, understanding enclosure as a process and product of state and private actors that work to reshape spaces, resources, and peoples for the purposes of capital accumulation," (Fairbanks et al., 2018, p. 145).

Susanne Bauer and Martina Schlünder talked about the way that social, political and environmental orders are often framed, understood and maintained around the concept of the box. Whether materially or conceptually, boxes maintain a separation between a focused on internality and a disregarded externality; they argued that by interrogating the box metaphor, we might step beyond "containerised perspectives" and rethink the ordering practices and infrastructures through which we relate to the environment and wider, more-than-human world. (Bauer et al., 2020)

Marine Protected Areas and Aquaria

The rest of the public programme used the metaphor of enclosures as boxes as a lens to interrogate Marine Protected Areas and aquaria; aquaria illustrating in a material and instrumental way some of the dynamics at play in a more conceptual way withing MPAs

> *"Invented in the Victorian age [...] the domestic marine fish tank [...] constitutes an ocean diorama and private zoo, hosting a living collection that serves as our own personal representation of a very fictional marine world. [...] The ocean has washed up inside our cities, whether in our homes, dentists' waiting rooms, shopping malls or our cultural institutions. The process of interiorisation of the ocean kingdom—from the inward-looking object of public spectacle to that of home entertainment, right through to our own abstract mental concept of the ocean itself—is intrinsically bound up in our colonial and scientific notion of the taming of nature, converting wild animals and plants into integral parts of the household."*
>
> *(Rui, 2021)*

Speakers discussed the history of aquaria as a form of theatre, in which publics could be entertained by vistas of the oceanic environment. Peter Chermayeff, the architect of the *Lisbon Oceanarium*, reflected on a career designing aquaria (Chermayeff et al., 2021). In the contemporary age, aquaria have tended to be reframed as a place of education and for the public understanding of science, alongside centres for conservation research. However, Chermayeff explained how he has shifted his approach, returning to the sense of spectacle, with the intention not to make people know more about the oceans, but to be emotionally moved, and thus come to care about them (Chermayeff et al., 2021). Similarly, Marine Protected Areas undergo these shifts of purpose: from resource-management, to ecological preservation, to research, to public engagement and entertainment.

Leaky Boxes

A key aspect of both forms of enclosure is their artifice, and their permeability. A discussion panel as part of the symposium, *Inside the Engine Rooms of the Aquarium and the Marine Protected*

Area, with Angela Rui, Armin Linke, Emanuel Gonçalves and Miguel Tiago de Oliveira, explored "the technical challenges of coordinating an artificial ocean ecosystem in aquariums as well as the mechanics of conservation oceanography," and asked "what can the technological artifice of an aquarium tell us about the history of ecosystem ecology or the design of a Marine Protected Area?" (Carver, 2021b) They drew a line between the technical engineering feats that are required to preserve a box of the ocean on dry land—the dynamics of tank construction, pumping, filtering, heating systems, feeding and maintaining an aquatic ecosystem—and the legislative, logistical and material necessities that maintain nature reserves such as MPAs.

In reality, both types of enclosure are fictions: an MPA is a legislative fiction, an aquarium an architectural one. A building cannot truly contain a part of the ocean, and a demarcated part of the ocean cannot in any way be considered boundaried. The systems of effort to separate these boxes from the wider world are considerable and must be continually maintained, lest the boundary fails. In fact, the boundaries of an MPA are incredible porous, even more so perhaps than nature reserves on land: fish can swim across invisible lines!

> *"The oceans have proven resistant to comprehensive conventional enclosures, in part due to their fluid nature—in terms of moving flora, fauna, and water—and the inherent difficulties in monitoring ocean spaces."*
>
> *(Fairbanks et al., 2018, p. 147)*

This is illustrated beautifully by an image I was shown while visiting COAST in Arran; a map of the position of all fishing boats around Lamlash Bay, with a sharp geometric box of negative space where there are no boats present. This box is the boundary of the MPA, a boundary with no material structure, created through an assemblage of legislation, GPS technology, and a disinclination of fisherman to receive a hefty fine, yet clearly visible on the map. However, what this implies is that fish are swimming in and out of the MPA area, and the fisherman are catching fish which might formerly have been protected. It is the line on the map, not the fish, that the MPA boundary protects.

Convivial Conservation

Carver's intention with this programme was to explore an alternative to this artificial separation of the human and natural, more-than-human worlds, through the idea of *Convivial Conservation*. Conviviality is the concept of living together; Convivial Conservation was proposed by Büscher and Fletcher as a "a post-capitalist approach to conservation that promotes radical equity, structural transformation and environmental justice and so contributes to an overarching movement to create a more equal and sustainable world," (Büscher & Fletcher, 2019, p. 1). It draws on the convivial reconstruction project of Ivan Illich (Illich, 1973), in which he argued for the "transformation of society to focus on a frugal good life," (Büscher & Fletcher, 2019, p. 2)

through people living in a more harmonious relationship with the wider world. It is a movement away from humans in cities and nature in reserves, to something more akin to parkland, without clear boundaries between the two realms. Convivial Conservation is based on the principles of: reframing protected areas as promoted areas; celebrating nature in its human and more-than forms, rather than saving it; visiting the more-than-human world in an engaged way, rather than as a voyeuristic tourist; a move from spectacularism (the sense of awe Chermayeff attempts to engender, or a focus on charismatic megafauna) to tangible, everyday environmentalism, such as beach clean ups; and from an expertise that is technocratic and privatised to distributed, communitarian engagement. In short, communities living in harmony with the more-than-human world, rather than living in an artificial separation from it mediated by distant, corporate and legislative interests and infrastructures.

The Workshop

The workshop took this topic as its focus, engaging with the notion of the MPA and the infrastructures which maintain it, asking "how do such infrastructures shape the practices and social ecological outcomes of marine protection?" and "Can we rework these tools towards more convivial, socially just and ecologically effective outcomes?" (Carver, 2021c). This approach draws on work by Luke Fairbanks, where he argues for the use of the concept of assemblage to read and understand the complex arrangements of knowledge, infrastructures, narratives and technology that come together to inform the spatial planning of marine environments. (Carver, 2021a; Fairbanks et al., 2018) To this end, the workshop was framed by a day trip to a mussel farm (which unfortunately I was unable to attend) that aimed to make visible some of these infrastructures and assemblages. The workshop drew together artists, policy makers, designers, marine scientists and other implicated actors in the ocean ecosystem, such as fishers to "explore and speculatively co-produce tools for architectures of more 'convivial conservation'," (Carver, 2021c). This was explored through participative infrastructural mapping and reflective action research, encouraging us to delve into our own feelings and memories associated with the oceans, to investigate how such infrastructures of separation and enclosure might be transformed into more permeable, convivial systems.

Reflection on Participation

These workshops gave me some interesting insights into workshops as a technique, as well as giving some lures to possible themes I might explore in this project, including Queer Ecology and Strange Strangers, convivial architecture, and enclosures. In particular, the *Architecture of the Enclosed* Sea workshop and public programme has been hugely influential in many aspects of this research, in particular exploring the idea of nature bounded within enclosure boxes, and how design assemblage might be a means to challenge and break down these borders; this played an influential role in the design of the *Strange Strangers in Strange Lands Playset*.

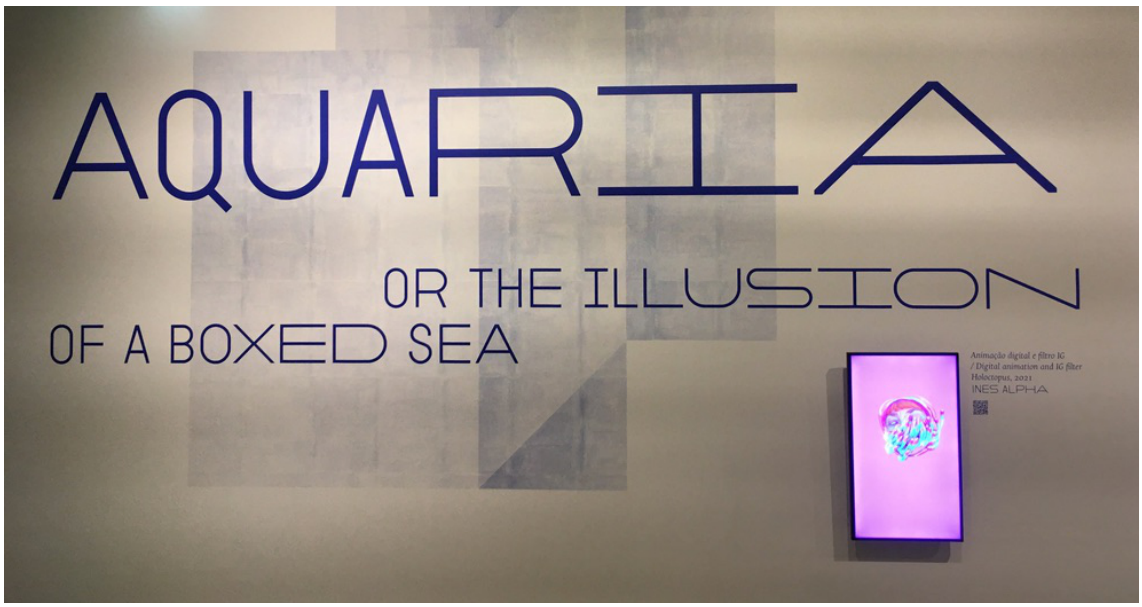


Figure 37 : Aquaria, Or the Illusion of a Boxed Sea *Exhibition*

The Architecture of the Enclosed Sea workshop and symposium *was organised as part of this exhibition at MAAT, curated by Angela Rui (Rui, 2021).*

Credit : Craig Jeffcott (Photograph)

Design Experiments : Exploratory Design Experimentation

These self-directed independent design experiments built on the insights from conversations and encounters, from earlier work in design probes, and from wider theoretical readings; together, they represented early experiments in bridging theory and practice.

Cut-Up Poetry

One of the design probes, based on *The Cut Up* technique associated with Dadaism, William Burroughs and David Bowie—who used for songwriting[32]—(Wikipedia, 2026) involved taking a number of the reference texts that I had been working with alongside science fiction novels from my bookshelf, photocopying them, cutting up the words, and then assembling them into poems (See Figure 38).

It was an interesting exercise, one that removed theoretical ideas and speculative fictions out of their specific contexts and allowed me the opportunity to consider how an entanglement of these ideas has the potential to generate speculative worlds through making practices.

Meal of Care

In the paper *Tools for Multispecies Futures* (2019), Dean Endy and Donna Haraway discuss various ways in which the future might be approached in a more-than-human way, with an emphasis on a connection to the land and its stories, and how sharing stories may be a way towards making people care more about the environment. They framed this discussion around a meal which Haraway had prepared for them:

> *"If we list all the species on the table in front of us, and we started with vanilla, and we've got chocolate and really good fermented cheeses, and California table grapes, and cumin and other spices in a scone-like thing, so it's got butter in there, and we've got almonds with chilies. The tomatoes are grown in raised beds out in the back yard. We went to a dinner with the Live Oak Grange where some of the local farmers' market farmers have been raising and selling seeds from various so-called heritage tomatoes. I planted these tomatoes that have black skin and a deep red interior, and are the size of a small golf ball, and we sliced and dried most of them."*
>
> *(Haraway, as cited in : Haraway & Endy, 2019, p. 24)*

I took this meal as a starting point to explore this approach of engaging with ideas through commensal practices; I met a friend at the studio space which we shared, and together we made

[32] Bowie created a piece of software called Verbasizer to help him generate cut ups, an emulation on which can be found at https://verbasizer.com

a recreation of this meal, and used that as a situation to discuss whatever ideas it brought up. It was an interesting experience, perhaps more-so from the perspective of cooking and eating together than being a particularly revealing conversation; sharing food together is a powerful bonding experience, and an excellent way to start from a common ground at the table (See Figure 39).

Communication Devices

This design experiment combined two speculative techniques: *Diegetic Carpentry (Pilling & Coulton, 2021)* is a way of speculating about material objects that might be used to communicate with other beings (it is an approach that uses fabulation to imagine the inner reality of other beings, drawing on Object Oriented Ontology *(Harman, 2018)*); *Magic Machines* involves taking images or models of machines and fabulating about possible uses for them, imagining that they might work by magic *(Andersen, 2012)*. To try these techniques, I asked people to sketch some unknown machines with no guidance. I took those sketches, turned them into 3D models, and tried to imagine uses for them as devices to communicate with other organisms: as seen in the figure, the top one is a temple for ants, and the bottom one was intended to communicate with frogs (See Figure 40).

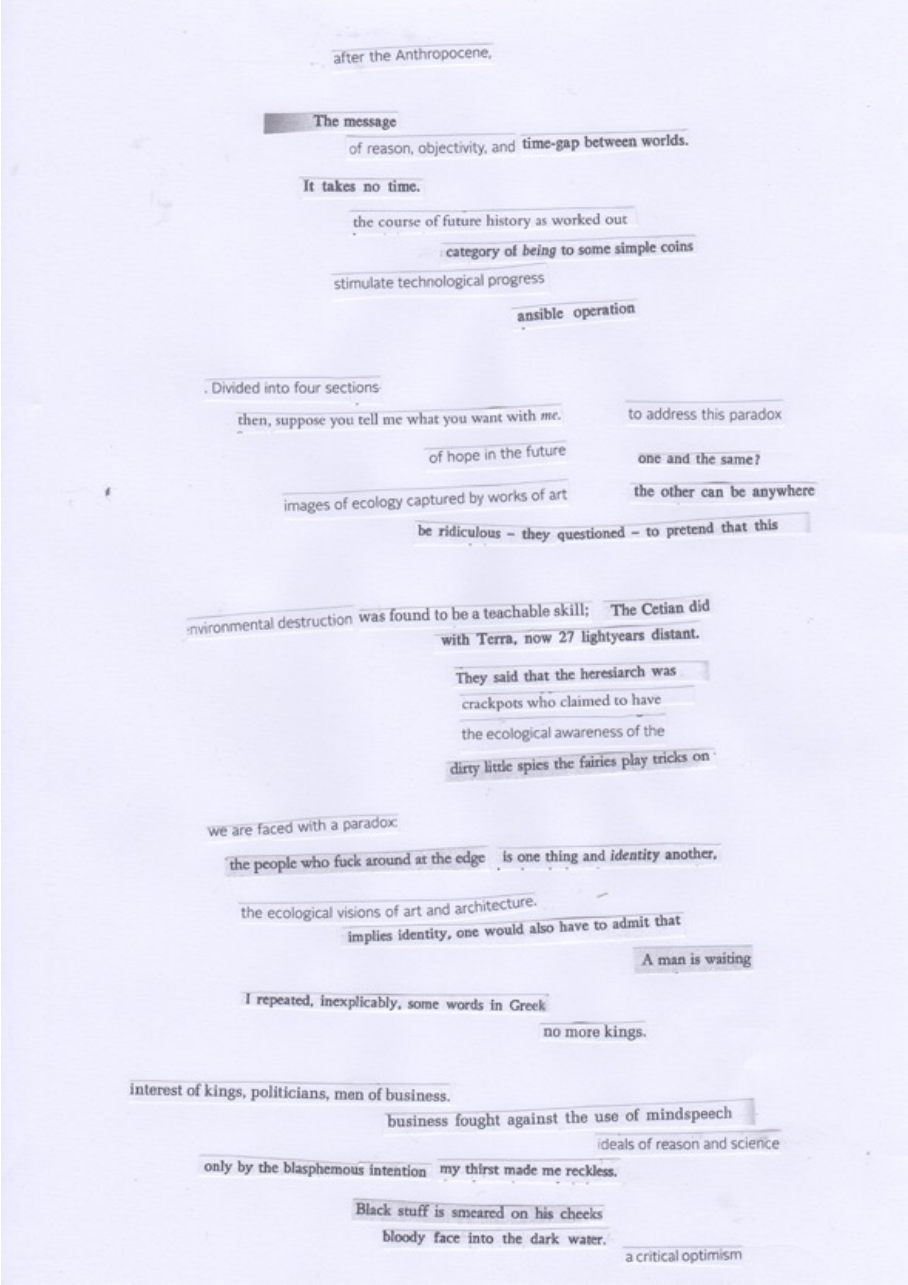


Figure 38 : Design Experiments (Cut Up Poetry)

This design experiment drew on David Bowie's cut-up technique to create poetry from pre-existing texts. I used the approach to explore how the disparate themes of this project might interrelate, by photocopying and cutting up pages from theory, philosophy and speculative fiction texts and assembling them into verses.

Credit : Craig Jeffcott



Figure 39 : Design Experiment (Meal of Care)

Donna Haraway and Dean Endy discussed the importance of sharing meals and sharing stories over a meal that Haraway had prepared (2019); I took the meal they described—cumin and cheese scones, tomato salad, soft cheese, grapes, vanilla pod—and prepared it for a friend, which we ate while discussing the ideas expressed in the paper.

Credit : Craig Jeffcott

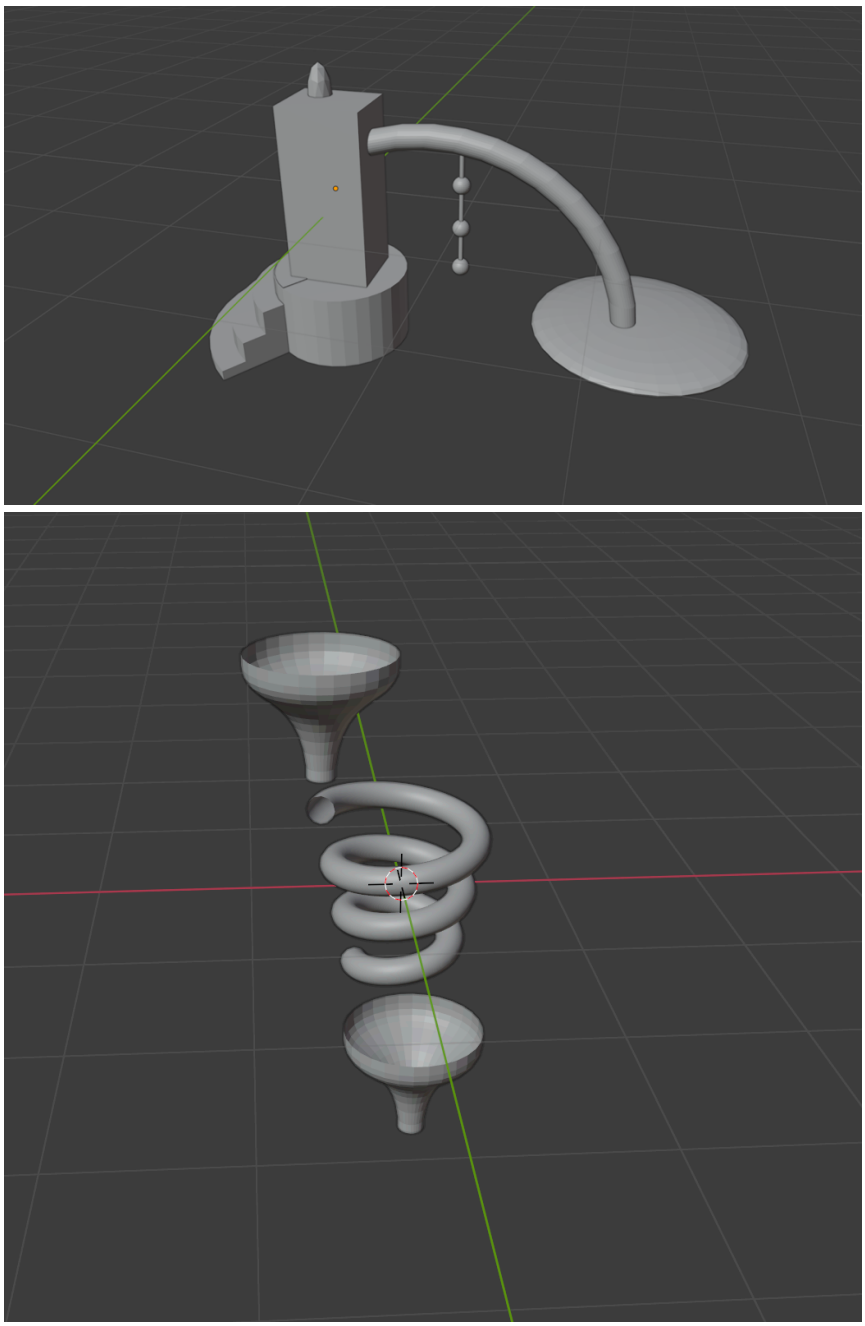


Figure 40 : Design Experiment (Communication Devices)

Fabulatory devices to communicate with other organisms: the top one is a temple for ants, and the bottom one was intended to communicate with frogs.

Credit : Craig Jeffcott

Reading through Theory

In this phase, theoretical readings were more purposeful; my aim was to deepen my understanding of the worldviews of the conceptual lenses: in particular, the way that the world might be framed, and the ways by which and the reasons for which a better future might be sought.

The Ethics Committee of Dark Conservation workshop was very fruitful in opening up avenues of reading. In particular, I began to delve more into topics related to New Materialism; the ethics of care, of more-than-human worlds, and of messy, entangled doings in the world. Key texts here are *Meeting the Universe Halfway* by Karen Barad (2007), where she explains her quantum-theory derived Agential Realism, where all beings are mutually created through their encounters, or intra-actions; *Matters of Care* by Maria Puig de la Bellacasa (2017), which explores speculative orientations towards care in more-than-human and pluriversal worlds, and *Staying with the Trouble* (2016), where Donna Haraway discusses the importance of doing just that, by working with and getting along with the other beings of the world, as well as introducing the concepts of the *Cthulucene*, the age of the *Tentacular Beings*. This led to other Haraway readings; besides her more famous *Cyborg Manifesto* (1981), where she argues that we are all cyborgs—more-than-human beings, hybrids of social and natural and technological—there was the more recent *Tree Snail Manifesto* (Hadfield & Haraway, 2019), where she and biologist Michael Hadfield discuss the importance of nature conservation science being an activist, fabulatory, future-oriented practice, and *Tools for Multispecies Futures* (Haraway & Endy, 2019), in which she discussed with the biologist Drew Endy the power of storytelling and commensality in developing a responsibility of care.

This paper was part of an issue of the Journal of Design and Science titled *Other Biological Futures*, edited by Alexandra Daisy Ginsberg ; another interesting interview in this journal was a conversation between the geneticist Betül Kaçar and the Afrofuturist author Ytasha Womack, *Futures Shaped By Pasts that Could Have Been* (Ginsberg et al., 2018), where they explore the biological and speculative importance of exploring alternative pasts.

Other important readings during this period were *Molecular Red* (2015), by McKenzie Wark, which presents a reframing of the Marxist principle of collective work as being oriented towards repairing a molecular rift, where the flows of matter have been disrupted by extractivist capitalistic endeavour, and the power of speculation in pursuing this; and *Radical Prototypes* by Judith K Rodenbeck (2014), which explores the history of the art happening—a spontaneous collaborative performative event, which Muñoz frames as a form of heterotopic future-making—and the way in which they can be understood as prototypes of new forms of social relations or alternative worlds.

Reflections on Design Phase

Following the more scene setting *Opening Moves* phase, this design phase of *Exploratory Attunement* represented the first meaningful engagements with the project space through design activities and experiments; it was the true start of the process of Research through Design.

Design experiments and prototypes formed the beginning of an inquiry into how design practices allow different types of engagement with theory, and how they might open a space for materialising ideas in different ways. I might draw a parallel to Sarah Truman's notion of Research Creation, and show how design experiments are a way of making through theory, of creating new philosophical concepts. Her research creation is situated such that the outputs of creative and speculative practice form complementary theory to be read alongside existing texts; through these early experiments, I came to see how design artefacts could represent a contribution to theory.

The design workshops helped attune me to the ways that these can be rich moments of collaborative designing and sense making, and as valid design outputs in their own right, and of how interested community members, whether design, futures, or environmental, might work together towards a common goal; practically, they helped me to gain an understanding of the possible trajectories, and challenges, of running workshops, whether in person, remotely, or as a hybrid between the two (principally, I discovered that hybrid workshops are not particularly promising approaches, their logistical challenges outweighing their value).

The reading through theory of this phase helped me to go deeper into the topics, particularly looking at the sorts of ways one might engage with the future, and the reasons behind this.

Taken together, this phase resulted in the start of an assemblage of a dense web of ideas, worldviews, goals and strategies, which I needed to start to make sense of.

6.2.3 Design Phase : Sense-Making

Phase Overview

This phase was one of reflection and consolidation, as I came to understand what I felt was most important—in the various texts, theories, discourses and experiments—in supporting speculative design practice. In particular, it involved shaping a structure for the Celium (not, of course, framing it as a pre-existing structure, but one which emerges as a new concept through design). In this, I've drawn on the most instrumentalist qualitative methodologies that I have made use of in this research—qualitative coding and spreadsheet mapping—to aid the emergence of concepts and structure; again, as design methods, aimed at creating a structure, not research methods aiming to represent one.

Assemblage: Creating a Structure

The Celium developed out of the initial approaches of research creation by reading through theory and through conducting and analysing conversations and encounters alongside design experimentation. In early stages, as I tried to codify and clarify the strategies and goals that were most important to the worldview, I used some structuring and ordering approaches. A spreadsheet of various speculative design techniques was created, and a tentative coding approach derived from grounded theory was attempted. Coding is a way of drawing theory out from discourse, by highlighting key concepts that can be found within theoretical texts, fictions and interview transcripts, pulling these into a structure which can be further refined and added to as more texts are analysed.

The qualitative research analysis tool, NVIVO, was used to carry out some coding on a few initial references, to help me to understand some of the important themes, and to recognise the ways in which strategies and goals might recur in different sources. This proved to be a useful structuring technique for the framework, and though the coding process was not continued with all subsequent acts of reading through theory, it provided the germ of the Celium structure. I reflect on these early approaches to the emerging Celium here.

Spreadsheet mapping

My initial approach was to build a spreadsheet of techniques, noting information about the origin, rationale, method and outputs of each technique, as well as resources needed and other practical details. However, that quickly revealed another difficulty of categorisation and taxonomies. Some techniques seemed to be examples of an overall category, while others seemed to be a sub-set of a particular category. I came to the realisation that grouping the techniques into categories in this way was first not well suited to the spreadsheet format, and more importantly, such a categorisation is quite against the ethos of the ideas that are driving this project – to decide that 'this' belongs with 'this' and 'that' belongs with 'that' is very much in line with the arbitrary demarcation between human and natural that the post-structuralist ethos of this project aims to challenge.

Another important realisation at this stage was that for a particular design intervention, or piece of fiction, or community strategy, there was often a combination of different methodological and strategic approaches in use.

Qualitative Coding

To help with the sense making process, I moved to a grounded-theory, qualitative coding approach, using the qualitative data analysis software NVIVO. With NVIVO, it is possible to 'code' a text – that is, to assign self-defined labels to any part of the text (whether a PDF

document, image, or set of notes), creating a series of 'codes' that can be cross referenced within the document. It is also possible to create 'cases'—particular groupings to compare codes against.

The advantage of this software is the ability to create an evolving set of codes, grouped into hierarchies, and in fact, the process of coding wasn't an aim in itself but a way of interrogating and finding connections between different texts. My initial plan was to build up a set of examples of specific, real-world examples of strategies being used, and cross reference these with strategic approaches described in the critical theory and design methodology literature.

One particular challenge with this stage of the research was how to make a selection of what was and what was not considered a strategy for uncertain futures; there being no pre-existing criteria for this. This proved to be a major advantage of the grounded theory approach, where the mapping of strategies was evolving and co-mingling, as resonances appeared across different research sources: broad worldviews from critical theory suggested further readings from the design that presented examples of those strategies playing out in practice alongside other strategies, which then resonates with speculative fiction works in which the themes of the project are present, and which may then present their own strategies that speak to the original theoretical framings. As the mapped-out strategies grew, they were pruned, merged, and collected together, and a structure slowly emerged (See Figure 41).

I used coding to pull out relevant *strategies* and *principles* from my reference texts, whether those are rooted in specific, concrete examples, or are framed in more theoretical terms, and sets of *cases*, with each case representing a specific deployment of strategies, whether in design works, speculative fiction, or in real world community and scientific projects.

The strategies were initially grouped under headings, such as temporal strategies, narrative strategies, relational strategies. This has been a useful framing approach, but it quickly has become clear that these cannot work as hierarchical categories, since many strategies would fall under multiple headings—for example, 'building relationships between past and future selves' could be considered as a relational and temporal strategy— and so these headings make more sense as aspects that a strategy can have, rather than categories they belong to, and I therefore considered how to restructure the emergent structure accordingly.

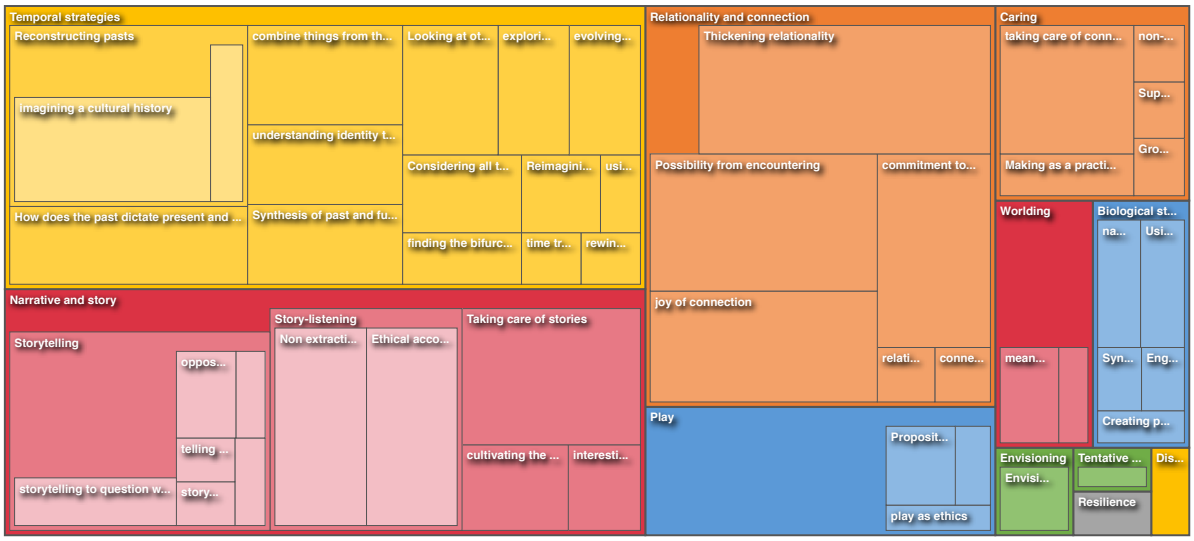


Figure 41 : Strategy Coding

This diagram, generated from NVIVO, shows emerging future-making strategy categories from qualitative coding of theory; the size of box relates to relatively how large each category is. It is possible to see the emergence of strategies of time-travelling, storytelling and play and performance; ontological perspectives on relationality, and the goal of caring.

Credit : Craig Jeffcott, NVIVO

6.2.4 Design Phase : Assembling the Celium

Phase Overview

In the final phase of the Celium design, the sense-making and exploratory research provided the foundations for the assemblage of the design Celium, an artefact that could guide and support a more. biodiverse practice of speculative design. This phase is largely framed as a prototyping phase: moving on from reading through theory and experimentation, and reflection on practice, to the formation of a new philosophical concept, an example through design.

Reading through Theory : Consolidation

While the structuring and ordering processes played a role in the development of the Celium, helping to gain an understanding of what components would be important within it, and what should be focused on, in terms of worldview, strategic goals, and strategies, the formation of the Celium was predominantly through a process of research creation. I largely relied on the approach of reading-through-theory to draw out and understand queer and more-than-human future-making practices, whether through academic and philosophical texts, speculative fictions

and design, and primary research activities of interviews, workshops and design activities, and design the *Conceptual Speculative Design Celium* according to the structure that emerged.

Reflection in Practice : Structuring the Celium, from General to Specific

Transitional Design Theory's spectrum between the general of designing and the specific of a design is a helpful way of understanding the development of what would come to constitute the design Celium, starting from **Strategies**, which were the original goal of this stage of the research project.

Strategies were initially understood to be approaches to doing future-making, or doing design, that are more specific and grounded than general principles, but less so than specific design techniques or specific futures. But strategies are generally defined as the means to achieve a particular goal, and so strategies presuppose a goal for which they are intended. **Strategic Goals** are a step away from specific means of acting, to the more general reasons for conducting an act. And goals, themselves, exist in a wider, more general context: to have a goal, you must have a sense of what the nature of the world is, of how it might change, and reasons to wish that it would. This raises the question of how to express the post-normal onto-epistemological **Worldview** in which strategic goals and strategies to achieve them might be situated?

Then, it is also useful to move from strategies towards things more specific, grounded, situated, and entangled. Strategies are general approaches to a goal, but those strategies can be put into practice, in overlapping ways; these ways of approaching future-making could also be an important part of design guidelines; so, the Celium includes both **Speculative Fiction Archetypes** in which the other aspects of the Celium can be represented through fabulatory narratives, and **Speculative Design Techniques** that could be used to materialise them.

Therefore, the design Celium is structured from general to specific: from research lenses and worldview (or onto-epistemology), to strategic goals, to strategies, to narrative archetypes, to design techniques.

Reflections on Design Phase

This design phase was the culmination of all the exploratory research, both theoretical and practical, in the first stage of the project, which extended from initial lures and provocations, through a deep exploratory dive into what those opened up. Guided by theory and experimentation, it led to the assemblage of a structure and making a definitive act of design: the creation of a Celium, a dense supporting conceptual network that synthesised the exploratory research into a specific form designed to support design and designers to engage with biodiverse speculative design. In the next section, the Celium is discussed in detail.

6.3 Elements of the Design Celium

6.3.1 Worldview

A pluriversal perspective implies that nature of the world is something that is contested; there are "wildly different images of it," (Wark, 2015, p. 4). However, having established the entangled grounds and theoretical lenses for this project, it is clear that they have in many regards a shared worldview, a common ontological frame.

This section gives an overview of the worldview, or onto-epistemology, in which this framework can be understood to take place. In this ontology, which follows the Ontological Turn and is post-structuralist in character, matter exists in a state of flux, with no distinct boundaries between beings, and is indistinguishable from meaning. In such a state of matter, beings emerge through intra-active encounters between matter, and do not pre-exist their encounters: that is to say, they are defined entirely by their relationships with all other beings. Encounters happen within time, and time is measured through encounters, that is to say, subjective events; all time is relative, and presents are thick, simultaneous with pasts and futures. The place where encounters take place emerges through the encounters that happen in a space over time; the account of those happenings in place and time is narrative.

Matter

> *"You understand that body is really a movement more than a thing. The body is the different organisations of this matter, rather than the matter itself. So, then the body becomes something almost intangible."*
>
> *(Machado, personal communication, 2021)*[33]

What is matter, and what matters about it? Mackenzie Wark suggests that we can consider matter as molar, as discrete entities, or we can consider it as molecular, as continuous. A molecular view of matter is to consider flows and gradients, to consider an ecological whole—the transfer of molecules from place to place, from form to form (2015).

Underlying this is a framing of the world in terms of molecular flows over molar entities which derives from Felix Guattari, where he asserted that "the same elements existing in flows, strata and assemblages can be organised in a molar or a molecular mode. The molar order corresponds to signification that delimits objects, subjects, representations and their reference systems.

[33] A full transcript of this conversation is in *Appendix 1 : Conversations*

Whereas the molecular order is that of flows, becoming, phase transitions and intensities" (Guattari, as cited in: Wark, 2015, p. xvi).

Wark views the contemporary intersecting crises of environment and society (often invoked as part of the Anthropocene, defined as the era in which human behaviour is the major impact on the geological record) as a sort of Marxist *Molecular Rift*, where these flows have become seriously imbalanced: "one molecule after another is extracted by Labour and technique to make things for humans, but the waste products don't return so they cycle and renew itself… there is a metabolic rift with molecules that are out of joint," (Wark, 2015, p. xvi).

It's a way of being that de-emphasises individual beings over coherences of flowing matter, of a world in flux and transition, that recalls Timothy Morton's deboundaried, de-categorical Queer Ecology. In short, a world of flows challenges the notion of clearly delineated bodies, places, abstract concepts, binaries and divisions: this is at heart a queer ontology, that behoves one to challenge assumed binaries and prescribed ways of being. And it is also a fundamentally ecological one, where divisions between organisms break down at all levels, and where any sense of demarcation between nature and the human or artificial is meaningless (Morton, 2010).

Morton argued that "evolution means that life-forms are made of other life-forms. Entities are mutually determining: they exist in relation to each other and derive from each other. Nothing exists independently, and nothing comes from nothing," (2010, p. 275).

But that is not to say that things do not exist, that beings do not have a reality. I have discussed how Morton proposed the term *Strange Stranger* to describe the multitude of beings and the way in which they meet each other in a mutual state of strangeness. All beings can be thought of as Strange Strangers "whose strangeness is irreducible", existing in a state of "ecological interdependence [that] implies that there is less to things that meets the eye. Yet this lessens means we can never grasp beings as such. This doesn't mean lifeforms don't exist: in fact, it's the reason they exist at all," (2010, p. 277).

This framing of the Strange Stranger is challenging and perhaps unintuitive, but it unearths a fundamental question: if this way of thinking about the world sees beings as transitional states in the flows of matter, and lacking independent existence, yet is the reason for their existence, what then is it that makes things exist at all? What is it to be something? How does what something is and how it becomes differ?

Encounters

Moving from matter to beings, then—what is it to be a being, in this world of flows of matter into forms? If matter is continuous, and sharp demarcations are illusory, what does it mean to be?

Karen Barad, a quantum physicist and feminist science studies scholar, finds a startling answer to this question at the heart of quantum physics: beings emerge out of their encounters with one another and do not pre-exist their encountering. "To be entangled is not simply to be intertwined with another, as in the joining of separate entities, but to lack an independent, self-contained existence. Existence is not an individual affair. Individuals do not pre-exist their interactions; rather, individuals emerge through and as part of their entangled intra-relating," (2007, p. ix).

She describes these encounters not as interactions (actions between) but intra-actions (actions within); rather than pre-existing beings having an encounter external to their being, it is the essentially internal encounter of flows and configurations of matter that are configured into being by each other. Relating that back to Wark and Morton, it is in the encounters of deboundaried, continuous flows of matter and energy that individual beings are formed, such that "it is impossible to differentiate in any absolute sense between creation and renewal, beginning and returning, continuity and discontinuity, here and there, past and future," (2007, p. ix).

Barad describes this ontological framework as *Agential Realism*, providing "an understanding of the role of human and nonhuman, material and discursive, and natural and cultural factors in scientific and other social-material practices," (2007, p. 25). Thus, agential realism is another perspective on moving away from categories and boundaries, including the nature and human binary, but even more fundamentally, the binary of material and meaning. In this worldview, it is the meaning that beings ascribe to each other that form the demarcations between them. What makes me *me*, and you *you*, and a dog *a dog*, is the ways in which we are perceived as those things by the other coherences of matter we encounter, while mutually constituting those coherences ourselves through the meaning we ascribe to them: "matter and meaning are not separate elements [...] mattering is simultaneously a matter of substance and significance," (2007, p. 3).

This conception of reality lies at the core of all the myriad ideas that this chapter explores; that the material, molecular, quantum reality of things is inseparable from, and is defined by, what those things mean in relation to each other.

Place

The Baradian perspective of beings brought—out of flows of matter and energy—into becoming by their encounters with each other can be applied to place. The world is formed through encounters between beings and their surroundings, the landscape, the space, the planet: the unbounded coherences of the totality of existence that any being forms part of but can understand itself as separate from. What emerges from the material and semantic reality of the world around us is a sense of place.

In anthropological terms, space and place are distinguished as quite different things. Space is the objective, structural reality of the world, while place is that space, subjectively experienced, imbued with meaning and individual contexts. There can be multiple, many places enfolded within any given space (Low & Lawrence-Zúñiga, 2003).

This applies not just at a human and socio-cultural level, but extends profoundly into the ecosystem. Organisms may share the same physical space, may even compete for resources, enter into symbiosis, or consume or be consumed by each other, but exist in places that are so distant as to be inaccessible to each-other's perception, whether or not they are even aware of each other's existence. Consider the experience of a human walking down a city street, compared to a dog trotting besides them, compared to a small bird flying overhead, compared to a colony of ants busying themselves in the soil, compared to tree casting shade across the path, compared to the mycorrhizal fungal hypha that connects the trees' roots to the other trees in the area, compared to the mobile phone in their pocket sensing electromagnetic data signals. They're sharing the space, and are mutually co-creating the places that each other experiences, but they are fundamentally existing in different worlds.

This is the concept of the *Pluriverse*, a subjective experiential version of the many worlds hypothesis, or the science fictional multiverse: an infinite number of parallel worlds, all existing together in the same space, but unique in how they are subjectively experienced (Cadena & Blaser, 2018).

Returning to a recurring theme, then, is the collaborative, co-creational aspect of place. Places are created mutually and intentionally, as the site of shared existence, and the locus for community and being together. Muñoz talked about the performativity of queer placemaking, invoking places that are dislocated from normative time and space, that are collectively performed and made real (2009).

The collaborative making of the real, echoing back to the making of the real that design invokes, plays an important part in the existence of communities and ecosystems. Consider the concepts of *conviviality* and *commensality*. Conviviality is the act of living together; to be convivial, in human terms, is to be friendly, is to have a commitment to live well together. But conviviality can extend to the wider, pluriversal world, too: how to live well with the other organisms around us, human or not. Donna Haraway talks of the importance of "making living and dying work," (2016): making it work in the sense of making it function well, but also maybe in the sense of it being the function of labour, of the thing we must work together to achieve. She talks too about the importance of the relationship that we have with companion species, those organisms that we live with and amongst: the domestic pets and livestock and wild animals we encounter; crops and flowering plants and trees; the fungal organisms in the ground and in our bread and beer; the insects that pollinate and infest; the bacteria that live on and in our bodies and that ferment our foods; and all the beings in the soil beneath our feet.

Convivial Conservation considers how we might, as humans, find a more convivial way to co-exist in symbiosis with our companion species (Büscher & Fletcher, 2019), rejecting, as Morton recommends, the category of nature as somehow separate from humanity (2010) which casts the urban as the human and the wilderness as the other, to be protected or destroyed. It is a rejection of Nature in the Muirian sense, a pristine category that can either be protected or sullied by human presence, and which John Muir freighted with an explicit colonialist and racist worldview that othered indigenous peoples and cultures, and considered that they had no right to live their lives in the pristine wilderness (Associated Press, 2020).

Instead of human fortresses of steel and concrete encroaching upon wild vistas, convivial architecture imagines parklands, where human societies co-exist alongside the more-than-human, creating walkable neighbourhoods that are full of life, using natural, renewable materials (Hinchliffe & Whatmore, 2006). There are similarities with the *LoTEK* movement (Local Traditional Environmental Knowledge), the pun in the name suggesting a low technology system belying a sophisticated philosophy of drawing on indigenous knowledge and practices to find modern ways forms of convivial living with the more-than-human world (Watson, 2020).

Another significant aspect of living together is our practices of food production, cooking and eating together, collectively referred to as commensality—literally "*at the table*" (Cassar, 2022). Haraway and Endy talked about the importance of eating together, as they shared a meal and discussed the ways in which the farming and sale of Mexican vanilla forms an integral part of the culture and community of the people who grow it, and the importance of their stories (Haraway & Endy, 2019).

Time

> *"These encounters and intra-actions have a temporal dimension: they possess duration—a transition from one state to another."*
>
> *(Barad, 2007)*

This quote from Barad resonates with some of the conceptions of temporality that were explored in Chapter 3 with regards to speculative practice: a view of time that is not linear, forward-thrusting and objectively measured, but disjointed, simultaneous, and subject to the way in which it is encountered. The flow of time, then, can be thought of not perhaps as an objective, ordered progression of seconds into hours into years, but as something more subjective, flexible, where the things that happen are more important than when they happen; time as measured by events, not seconds.

This sort of eventful temporality where pasts and presents inhere in the future has been described as the *Long Now* or the *Thick Present* and has a particular character of flatness, the sense of the future and the past coexisting in the present.

Mike Michael, a sociologist of science and technology, argued that all that is accessible to us is the present moment, with pasts and futures existing within it as rhetorical and performative propositions of what may have been or could yet be–as memories, as ideas, as possibilities. There isn't a single future, but multiple possible futures; and equally, the past isn't simply a singular objective historical record of all prior events, but a plurality of experiences, memories and stories (Michael, 2000).

The Long Now also implies that the present can be stretched, to incorporate pasts and futures, that the now can have some portion of before and after inhering within it; the act of designing artefacts, proposing a possible future in a material way, is a powerful way of making a part of the future present, in the present.

Speculative research practices can be situated in a temporality that resists "the modern arrow of time" and instead is considered "as it is formed through its own patterns of becoming," (Savransky et al., 2017, p. 5). It is a temporality that is described as eventful, in that its dynamics are determined by events—encounters between beings—rather than clocks and calendars; "in this way, futures are fundamentally underdetermined with respect to present actualities but inhere in the latter in the form of potentiality to be actualised in present," (Savransky et al., 2017, p. 5).

This aligns with the queer temporality that Muñoz described, his conception of 'queer longing' for "other ways of being in the world," (2009, p. 1), echoing the need to "become lured by the possibility of futures that are more than the mere extension of the present," (Savransky et al., 2017, p. 5).

Narrative

Narrative is probably the most important aspect of this framing of the world, drawing together material interactions, beings, time and place. It is the way that the world accounts for itself, ascribing meaning, and with it, structure, delineation, and reality.

Narratives—stories—are rich accounts of the world: encounters between beings in sequence in a place and a time. They are "the stories we tell ourselves about who we are," (Truman, 2021, pp. 5–6), they can be real accounts of the world as it is, or they can be accounts of the world as it might have been, or could be, or never could might have been.

Donna Haraway writes about the importance of the stories that tell stories, the ideas that think ideas, and relates that to what Ursula Le Guin called her Carrier Bag Theory of Storytelling,

where “her theories, her stories, are capacious bags for collecting, carrying and telling the stuff of living,” (2016, p. 39). They aren’t stories of the heroic man with a weapon, on a quest across a landscape where everything else is a prop, or land, or prey. They are stories as a bag, or receptacle for ideas, as a way of gathering together meaning in place and in the beings that co-exist there: “these concave hollowed-out holes in being generate richer, quirkier, fuller, unfitting, ongoing stories of becoming-with, of reciprocal induction, of companion species whose job in living and dying is not to end the storytelling, the worlding,” (2016, pp. 39–40).

The practice of making narrative—telling stories—is an important strategy for future-making and is discussed further in the strategies section of the Celium.

6.3.2 Strategic Goals

Between ways of viewing and understanding the world and strategies oriented towards the future, there must exist an understanding of what is perceived to be wrong with the world, as well as a sense of what might need to be done to rectify that. I have articulated these ways of intention towards a better world as the strategic goals that the futuring strategies might attempt to achieve: care, collective action, and staking a claim on futures.

Care: Caring About and Taking Care Of Beings and Ecosystems

Care is a complex and contested idea; as Maria Puig de la Bellacasa asks:

> *“What is care? Is it affection? A moral obligation? Work? A burden? A joy? Something we can learn or practice? Something we just do? Care means all of these things and different things to different people, in different situations… care remains ambivalent in significance or ontology.”*
>
> *(Bellacasa, 2017, p. 1).*

A simpler way of considering those questions is whether care is something you feel when you have a feeling of concern or affection for another being, or is it something that you do, an action or work or labour to protect, to tend and defend, or is it an ethical responsibility. These three dimensions of care “do not sit together without tension and contradiction, but are held together and sometimes challenge each other,” (Bellacasa, 2017, p. 5).

Within the scope of this speculative framework, care takes on aspects of all three; it is the work that is done to protect the environment, and it is encouraging others to feel both concern and a moral imperative towards more diverse futures.

As Bellacasa describes, care may not be simply an act of doing good or being kind; some acts of care may oppress the recipient of care, and all forms of care imply a reciprocal neglect of

something else, and to care may be to accept the necessity of futures that are harsh, and dangerous, and cruel, in some ways and to some beings: "understanding caring as something we do extends a vision of care as an ethically and politically charged *practice* [...] from this perspective to care signifies: an affective state, a material vital doing, and an ethics-political obligation," (2011, p. 90).

Stewardship

> *"In naturecultures, the affective world of care as an everyday practice is not equivalent to innocent love or the protection of those in need. Taking responsibility for what and whom we care for doesn't mean being in charge. Adequate care requires knowledge and curiosity regarding the needs of an 'other'—human or not—and these become possible through relating, through refusing objectification. Such a process inevitably transforms the entangled beings."*
>
> *(Bellacasa, 2011, p. 98)*

Where care intersects with environmental and more-than-human concerns, it often is considered a matter of *Stewardship*: of taking care of things and beings on behalf of someone other than yourself. Much of modern conservation rests on a principle of stewardship, but it is a contentious and problematised practice. It raises the question of on whose behalf the environment is being cared for. Many environmental management practices are oriented towards protecting a valuable resource for humanity or capital, but even if it is done explicitly for the benefit of more-than-human beings, they can be problematic: becoming self-appointed guardians of nature risks speaking *for* rather than *with* other beings. Stewardship can thus perpetuate an anthropocentric approach, of humanity standing apart from nature and taking responsibility or care on its terms, not the terms of the wider world (Alpert, 2001). Donna Haraway has joked that we have a "gardening gene" that we should take care not to activate (Haraway & Endy, 2019).

Collective Action: Labour to Protect and Promote the Diversity of Ecosystems

> *"Creating impossibles, making possibles perceptible and experimenting with them, is a collective, transdisciplinary task."*
>
> *(Savransky et al., 2017, p. 8)*

Taking action to care for existing diversity—and to create more diverse situations—can be framed as a collaborative form of work or labour. Mackenzie Wark has found, in the writings of the Soviet theorist and author Alexander Bogdanov, a reframing of the Marxist perspective of

labour. This reframing allows labour to be considered in terms of the molecular rifts, the disjunctions of the flows of and forms of matter that underly our environmental crises; from this perspective, the elusive category of Nature is just "that which labour encounters", and we need a "labour perspective on the historical tasks of our time". The question, then, is "how can knowledge and labour be organised to extract a living from nature when that very process produces secondary effects that undermine its own ongoing life," (Wark, 2015, p. xvi).

Wark suggests the answer lies in an approach to work "which sticks close to the collaborative labours of knowing and doing [and] which opens towards plural narratives about how history can work out otherwise," that draws on speculative fictions that "make no claims to be a spokesmodel for the object world" and makes a "frank acknowledgement of the untangling of our cyber bodies within the technical" (2015, p. xvi).

This positioning of collaborative labour at the heart of the "work of our time" is echoed in Guattari's three ecologies, where he similarly argues that the crises that the planet faces must be solved not by "clinging to general recommendations [but by] implementing effective practices of experimentation, as much on a micro-social level as on a larger institutional scale," (1989, p. 22).

To put this idea into a more-than-human context, I have considered the *Tree Snail Manifesto*, a joint paper by Donna Haraway and the biologist Michael Hadfield where they discuss how activism is an integral part of the work of the biologist. During a long career of studying rare tree snails around the world, Hadfield found his work encompassing ecological and social activism, not simply studying tree snails as objects of detached interest but engaging in practices of mutual being and caretaking; "living in peace requires protecting and restoring an earth that can be a home for all," (Hadfield & Haraway, 2019, p. S209).

Or from a queer perspective, I return to Muñoz, where he talks about the way in which queer being is a collaborative work towards making a better world, or staking a claim for a better future (which leads into the next strategic goal). (Muñoz, 2009).

But a final thought on where care and work intersect: perhaps the concept of "labours of love" provides a promising ground for considering these complex idea—taking care because you care.

Seizing Futures: Staking a Claim on Better Futures for all Beings

> *"Queer temporal theory has insisted on a non-linear approach to the production and reproduction of futures. It asks what worlds are made and what pleasures are found when time is not a relentless onslaught of future generations angled towards progress, degeneration, or some combination of the two."*
>
> *(Lothian, 2018, p. 3)*

Mike Michael has written about futures as a performative rhetorical device; as a way of staking a claim for and persuading others of the desirability of some future outcome (Michael, 2000). José Esteban Muñoz likewise situated queerness as a gesture or a longing for a different future: "it is that thing that lets us feel that this world is not enough, that indeed something is missing," (2009, p. 1). Muñoz argued that being outside the cultural mainstream is by necessity to enact—and thus make real in the present—a different, better future, or to create heterotopias parallel to the present.

Muñoz discussed three perspectives on queer futurity. There is the positive, integrative form: to make the future a place that is hospitable to queer beings by assimilating into heterosexual norms that allows queer beings to be included within the "regimes of the normal." There is the negative form, which is the argument by Joe Edelman, that such assimilatory normativity is impossible, that the straight world will never accept queer beings fully. In this framing, the normative world is built on a reproductive futurism where society is largely structured around and for pro-creation and children; but always in a future sense, in a way that the future children are all that is important, compared to the already in existence adults and children. Therefore, Edelman argued, there is no queer future, and the only thing to do is to enjoy life in the present. Muñoz's position presents as the anti-negative, arguing that Edelman is unnecessarily defeatist and that while it is not really possible—or even desirable—to assimilate into the normative culture, that queer futures can be grounded in hope and manifest themselves in the present, which, as has been discussed, is at the core of the speculative impulse (2009).

This futurity framed around hope is identified by Muñoz as a utopian gesture, but not the typical Moreian abstract utopia of the idealised no-where place, but the concrete utopia of a better world that is hoped for and incrementally brought into being by collective action in the present. Such collaborative action towards caring for the world is also an act of future-making, of staking out a claim for a particular future (Muñoz, 2009).

In *Old Futures*, a queer reading of speculative fiction, Alexis Lothian discusses how queer temporality is non-linear and heterotopic, outside of normative life trajectories, where "queer time signifies breaking with straight and narrow paths towards the future laid out for the reproductive family, the law-abiding citizen, the believer in markets. Instead, it lingers or refuses, flashing up in moments of ephemeral utopia or doubling back to reanimate the pleasurable and/or painful past," and as such, "queer theory offers creative and fertile ways to think about time," (2018, p. 3).

A queer reading of speculative fiction allows one to ask "what if, instead of a queer present reshaping the ways we relate to past and future, turning to the futures imagined in the past can lead us to queer the present," (2018, p. 4). Lothian argues that:

> *"the queer possibilities are not always hopeful, desirable, or even liveable. To open up a future for speculative contemplation is not the same as to demand it be brought into reality. But old futures cast unexpected light into the present. If we attend to them closely enough, we might find that Queer futures' histories underwrite our present efforts to imagine possibilities for the future, to enact transformations in the present, and to think critically about time."*
>
> *(Lothian, 2018, p. 4)*

6.3.3 Futuring Strategies

Making

Design is a highly fruitful approach to speculative practices because it is a material practice. All forms of design and material practice are powerful as they construct futures, and physical things act as strong rhetorical pulls for a particular future: they say, in effect, this future is real because this object from that future exists. Making is a process of intentionally entangling matter with meaning, giving a materiality to possible futures.

This can be seen in the material remains of the past; the archaeologist Andrew Gardener explains that:

> *"artefacts are important to the way human consciousness interacts with the world, and particularly we have a strong sense of the temporality of artefacts … they're the things that keep us located in time, that allow us to imagine both past and future times." He suggests that "there are certain kinds of temporal horizon that draw people's attention more than others (…) which are marked by particular material signatures as well (…) whether it's hand axes or pyramids or Samian pottery for the Romans, there are Iconic Material Objects which mark those moments."*
>
> *(Gardner, personal communication, 2016)* [34]

SF author and futurist Bruce Sterling invokes how such *Iconic Material Objects* may operate within speculative material practices through the concept of the *Diegetic Prototype*. *Diegesis* is a term from film-making that refers to things that are real within the narrative of a story; a diegetic object is an object that may be a prototype or model, but that is real within the world it comes from. Such diegetic prototypes within design fiction and speculative design invoke and perform futures and alternative presents, acting as material lures for unexpected futures: "it tells worlds rather than stories," (Bosch, 2012). Or, as Anthony Dunne and Fiona Raby suggest, a

[34] A full transcript of this conversation is in *Appendix 1 : Conversations*

diegetic prototype or prop "belongs to its own fictional world: it expands our imaginative horizons and provides new perspectives," (2014, p. 90).

In Samuel Delany's short story *High Weir*, a linguist becomes unmoored from reality when viewing a shattered holographic recording of an ancient Martian city, unsure if his present or the Martian past is real. One of his colleagues reflects that holograms don't break like photographic images, into fractions of the original image, but instead, every fragment provides an increasingly blurry representation of the whole; the implication is that, in this fragment of a representation of a Martian world, the entire world can be invoked, and made real (1971). Similarly, in the short story *Tlön, Uqbar, Orbis Tertius*, Jorge Luis Borges gives an account of a fictional world, created mysteriously through books and descriptions, that slowly imposes itself on the 'real' world until the fictional world has become real (1962).

James Auger, a speculative design practitioner and academic, has written about the craft of speculation within design: about the material reality of speculative and diegetic objects. Such speculative artefacts "require a perceptual bridge" between the object and those who encounter them: they should be grounded in a recognisable reality or set of influences. They should possess a certain degree of the uncanny: provoking and unsettling enough to engage a subject, but not so much as to provoke repulsion and disengagement. Speculative artefacts also need to find the right balance between technical detail and simplicity: "too much technical information can alienate or simply bore the viewer, but too little can leave the concept intangible or whimsical," (Auger, 2012). Auger's material speculative practices are rooted in yet depart from the context of product and interaction design, but such approaches can also align with the diverse worlding practices that are being explored in this chapter.

Diegetic Carpentry is an approach to speculative making practices that can engage with the world from a more-than-human perspective. It draws on some of the ideas of Object-Oriented Ontology: specifically, the notion that the reality of another object or being's existence can never be truly accessible or understandable to another, but through speculation and imaginative practices it might be possible to approach such an understanding (Harman, 2018). Ian Bogost has proposed Diegetic Carpentry as a practical speculative approach, whereby speculative devices are created that could mediate an understanding between two different entities: it's a way into playing with stories and Baradian intra-actions between beings (Bogost, 2012).

Cameron Tonkinwise has suggested that the power of diegetic prototypes or props to engage with futures "does not come from contemplating a removed museological object […] it is because you must play with them, performing in improvisatory way. The point is not to imagine the future, but to feel your way in that unknown dimension," (2014, p. 186). Feeling the way through play leads into the next grouping of strategies in this framework: playing and performing.

Playing and Performing

> *"Performance is the kernel of a potentiality that is transmitted to audiences and witnesses … the real force of performance is its ability to generate a modality of knowing and recognition among audiences and groups that facilitates modes of belonging, especially minoritarian belonging."*
>
> *(Muñoz, 2009, p. 98)*

Play and performance are common features of the sorts of actions that are common to more-than-human and queer perspectives, and are also fundamental to design: the rhetorical role of designed artefacts in staking a claim to a particular future or past, is as Mike Michael has argued, a performative gesture, an acting out through an artefact of a particular future (Michael, 2000).

Muñoz suggested that the queer experience of surviving in the margins of normative society means that the hoped for better futures that can be invoked are necessarily ephemeral and performative: the way in which someone offers a drink of Coca Cola; in a gesture; in queer spaces and places where the future is present in the collective performance, a different world that quickly dissipates in returning to the 'real' world (2009). He draws a parallel between overtly performative queer gatherings, like drag performances, dance or collective sexual events, to *Happenings*, a form of artwork—first associated with Alan Kaprow—which tend to involve ad-hoc, loosely scripted, and spontaneous performative actions that are collaborative and self-generating. Judith Rodenbeck's text on the history of art happenings considers them to be a form of *Radical Prototype*: a way of testing out and exploring different possible relationships and futures (2014).

Donna Haraway considers the centrality of play from an agentially realist ontological perspective, discussing that all encounters between beings are creative of new beings, and that this is fundamentally, even to the level of subatomic particles, a form of play—beings exploring each-others' reality and finding out new ways to exist together or apart:

> *"The biological world is about recognition and misrecognition. Comings-together that then add on to each other and complexify each other, and then fall apart. Every composing and decomposing produces something in the world that wasn't there before, that may just disappear, but may become the opportunity for some other kind of composing and decomposing…this is what play is."*
>
> *(Haraway, as cited in: Haraway & Endy, 2019, p. 6)*

Dinis Machado talks about the importance of playful performance in their choreography and dance practice; it's a way in which they are able to physically explore the body sensations of

queer and non-binary identities, to play with the different bodies that they possess and that are projected onto them. They find strategies to overload the body, push it physically into states of in-betweenness, and experiment with different ways of being.

> *"I am interested in bodies and movements that are in a space of in-betweenness, that are unnamed by society, but also by ourselves. I work very often with scores and scripts and instructions that allow us to arrive to places that we can't get to directly. Because if we try to do a movement of in-betweenness without a name, no one can do that, because we only can do what we can imagine, right? So, the only way the way to arrive to new relationships with our bodies is to get the body confused, is to catch the body on the way to doing something, is to give it so many instructions—I work a lot with that—with giving people too many instructions that their system will kind of crash, and they will find themselves in a space that they or myself could not go directly."*
>
> *(Machado, personal communication, 2021)*

The implication of all this is that we must encounter others in a spirit of playfulness, if we are to have any meaningful engagements with, or have some understanding of, those beings who are unlike ourselves; through such play, we might thus be able to take action to care for them.

Time Travelling

Strategies for a non-linear temporality—that is, where time progresses at different speeds, in different directions, and where the past and the future coexist in a long or thick present—are afforded the opportunity to play with this non-linearity in a form of time travel.

If the past and future inhere in the present, then it is possible to consider and move between multiple and alternative temporalities, of pasts that are different to those that the current moment progresses from, and futures that those forgotten pasts can imply.

A powerful example of how this form of time travel can be a strategy of resilience in the face of a traumatic history is *Afrofuturism*, which is a body of speculative fictions that consider alternative pasts for the African people and diaspora other than the history of colonialism and slavery. It is a way in which stolen potential histories can be reanimated, giving a new context to the present and a way to imagine better futures. The Afrofuturist writer Ytasha Womack writes:

> *"there's an element of resilience that we celebrate in Afrofuturism, the unique things people have done to survive. Part of that is using the imagination, and envisioning ourselves in different ways, or envisioning a future that helps us move out of and survive traumatic circumstances."*
>
> *(Womack, as cited in: Ginsberg et al., 2018, p. 10)*

In *Futures Shaped by Pasts that Could Have Been*, Womak and the synthetic biologist Betül Kaçar (whose research involves transplanting prehistoric genes into modern bacteria cells and observing how the ancient and modern genes intra-act) discuss how some of these time displacement dynamics play out in their respective works and perspectives on the world; they explore the idea that differences in the past could have bearing on the present if the past were to be replayed again, or that a being can have existence in more than one time.

> *"You're talking about alternative timelines, and that goes into this whole notion of the past, future and present happening simultaneously [...] if you think about yourself as having lived many lifetimes, you're living all of these lifetimes now simultaneously, so your past and your future lives are happening now, and there's some relationship."*
>
> *(Kaçar, as cited in: Ginsberg et al., 2018, pp. 13–14).*

Mapping

Mapping or map-making is an act of positioning, of orienting within a physical or conceptual space in relation to place and to other beings. Naomi Bueno de Mesquita considers mapping as an approach to spatiality, "an engagement with space in time [where] space is always under construction and is understood as the process of becoming," (2017, p. 47). Mapping isn't simply a descriptive practice, setting down what exists and how it relates together, but is a process of unfolding and producing, reconfiguring spatial relationships (2017).

It is not simply an objective recording of space, but a making of place. De Mesquita reconfigures mapping as a collective, performative practice: *Performative Mapping* is "a way of constructing forms of knowledge that can cope with multiple perspectives on reality," (2017, p. 47). She employed Performative Mapping in the project *Mapping Invisibility*, in which she organised a workshop that paired undocumented migrants with workshop participants (See Figure 42). The pairs were asked to walk around the city of Amsterdam together, with the undocumented person choosing a path according to one of four feelings that participants had suggested they might feel while in the city—stressed, powerful, happy, disconnected—and pointing out places of importance to them, such as safe hiding places that they may go to. Their conversations were recorded and mapped using GPS devices; these were later used to create an audio walking tour where people could be guided round the city by following a map and hearing the audio in the appropriate location. David Hamers writes that this project involved both a reading of space, where the urban landscape was 'read' according to the feelings of the participants, as well as a making of space; here, mapping is a performative act that is able to discover different realities hidden, or in the process of becoming, even on well-trodden ground:

> *"by being a mapping exercise, reading space can become making space, unfolding new realities out of existing constraints [...] this space, these realities, do not only refer to the physical space of the urban environment, that is navigated, mapped, read and re-made. They also refer to the space of engagement constituted by the participants taking the time and effort to encounter one another."*
>
> *(Hamers, 2017)*

As a strategy of future-making, mapping is a way of performing alternative worlds, of relating future places to present spaces. Mapping—and other spatiality practices—as speculation could allow fictional worlds to be rich in relationality and situated in material reality (See Figure 43).

Curator and more-than-human theorist Dani Admiss values mapping as a transdisciplinary design technique that can reclaim landscapes and rethink who owns the land. "How can we [...] start to [...] create new modes of mapping that might be more inclusive and less exclusive? I'm constantly thinking about how we can really start to push back against the kind of top-down idea of mapping as a way of owning space," (Admiss, 2020).

Psychogeography

Related to the notion of mapping as a way of inscribing meaning and place making is the concept of *Psychogeography*, which is an attendance to the way that places affect our emotions and behaviour. The term was coined by Guy Debord, a Situationist[35], who described it as "the study of the precise laws and specific effects of the geographical environment, consciously organized or not, on the emotions and behaviour of individuals," (1955, para. 2). Or, to put it more simply, it is the study of a sense of place. Psychogeography has been framed as a practice of exploring one's environment with an attendance to your affective responses to your surroundings, and a genre of writing that reflects on such experiences; it is associated with writers such as Iain Sinclair, who has written psychogeographic accounts of his explorations of London, such as *London Orbital*, on walking the route of the M25 motorway that encircles London (Sinclair, 2003), and Will Self, who wrote a series of articles on the subject which were collected into a book titled, simply, *Psychogeography* (Self, 2007).

Psychogeography allows the possibility of queering and weirding geography; exploring how place might be encountered from a queer or weird perspective. Catriona Sandilands describes how *Queer Geography* attends to the "considerable and particular impact" of "the physical and discursive qualities of nature [on] queer communities," (2002, p. 134). This may take the form of exploring the spatial organisation of sexualities, and the queer experiences of, and accesses to, public and natural spaces, particularly "sexual, cultural [and] political" (2002, p. 133) uses of

[35] Situationism is an art movement that considers one's actions to be a product of the environment and circumstances rather than inherent traits

space, as well as how particular landscapes impact the emergence of queer cultures and experiences.

Weird Geography draws on the speculative genre of the New Weird, which Jonathon Turnbull, Ben Platt and Adam Searle argue has a "rich yet implicit relationship with geographical research, especially to more-than-human geographies," (2022, p. 121) and attends to the "experiential qualities of nature out of space," (2022, p. 123). They draw a contrast with the concept of haunting, or *Hauntology*, where an unseen or spectral absence, the lack of what should be there, is felt within a cultural geography; the weird is the opposite of that, a presence that does not belong: "a weird entity or object is so strange that it makes us feel that it should not exist, or at least it should not exist here," (2022, p. 124).

Weird beings impose on space, creating unsettling and changed ecologies; taking a weird lens allows the contemplation of landscapes and ecosystems that have been transformed, damaged, and contaminated. New Weird speculations allow one to explore urban spaces as sites "where difference is produced and negotiated"; to engage with interstitial edgelands, abandoned landscapes, and "places that humans have ruined and destroyed"; to interrogate weird and transitional sites like VanderMeer's Area X (2014), that are "abandoned by humans due to the presence of a weird entity that permeates everything within the borders of the area" and that "teem with weird lifeforms that complicate borders between species and individuals"; and to view places not as a human backdrop, but entities possessing their own powerful agencies. (2022, p. 124)

Together, psychogeographical queering and weirding offers engagement with landscapes through lenses of difference and curiosity, exploring the possibilities of survival in marginal and liminal places, and for marginal and liminal beings.

Conceptual Geographies

Mapping can also be a way to explore and create geographies and relationships that are more conceptual than physical; for example, the artist Grayson Perry works with cartographies as an art practice. In his 2023 exhibition *Smash Hits* (Perry, 2023) at the National Gallery in Edinburgh, he displayed vast and intricate maps as portraits of his own psyche, or of the obsessions of Western culture, or religious and secular places of pilgrimage. These maps are a form of literal place making, of making place out of concepts and ideas and the way they can be related together in complex structures and networks.

In his engraved print *A Map of Days* (Perry, 2013) (See Figure 44), Perry represents himself as a walled city in a way that embraces the performativity of self, much as mapping is a performative making of place: the map as an artefact projects a structural metaphor of the self as landscape,

while the process of mapping acts as a structural metaphor for the ways that self is performed and enacted:

> *"It's a popularly held belief that in the middle of ourselves, our deepest, corest identity is this sort of pearl, this immutable centre of who we are as individuals. And I kind of feel now that that's a false belief. We perform ourselves over time. This is the thinking that's behind this self-portrait. I've portrayed myself as a kind of walled city. And the wall, I suppose, in some ways represents my physical skin. But at the same time, it's permeable. I absorb the influences and the ideas of the landscape I find myself in, and then they form me. I am as much my baggage as I am the person holding the baggage."*
>
> *(Perry, 2014, Episode 1)*



Figure 42 : Mapping Invisibility

This performative mapping project by Naomi Bueno de Mesquita (2017) involved undocumented migrants in the Netherlands guiding researchers around their city, talking about their experiences and emotions in different places, while recording the route using GPS devices; this route was then translated to a map, used as a walking tour with the recording of the walk as an audio guide. It was a process of reading space and making place.

Credit : Naomi Bueno de Mesquita

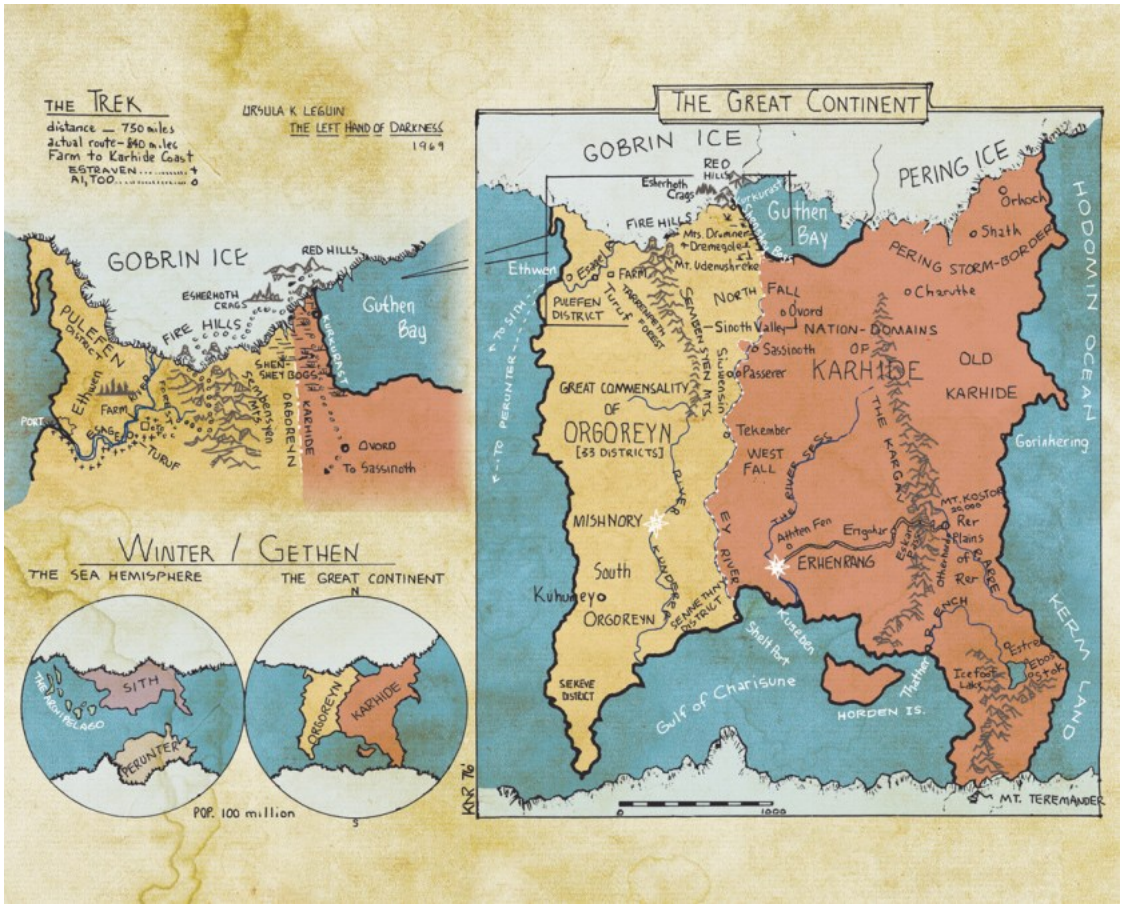


Figure 43 : The Left Hand of Darkness (Map of Gethen)

Maps are a powerful tool for speculative place-making and futuring, and are commonly used in Speculative Fiction to orient the reader to the fictional world and give it a sense of material reality. This map was created by Ursula Le Guin to illustrate her novel The Left Hand of Darkness (1969), set on the ice-age planet Gethen, also known as Winter.

Credit : Ursula Le Guin

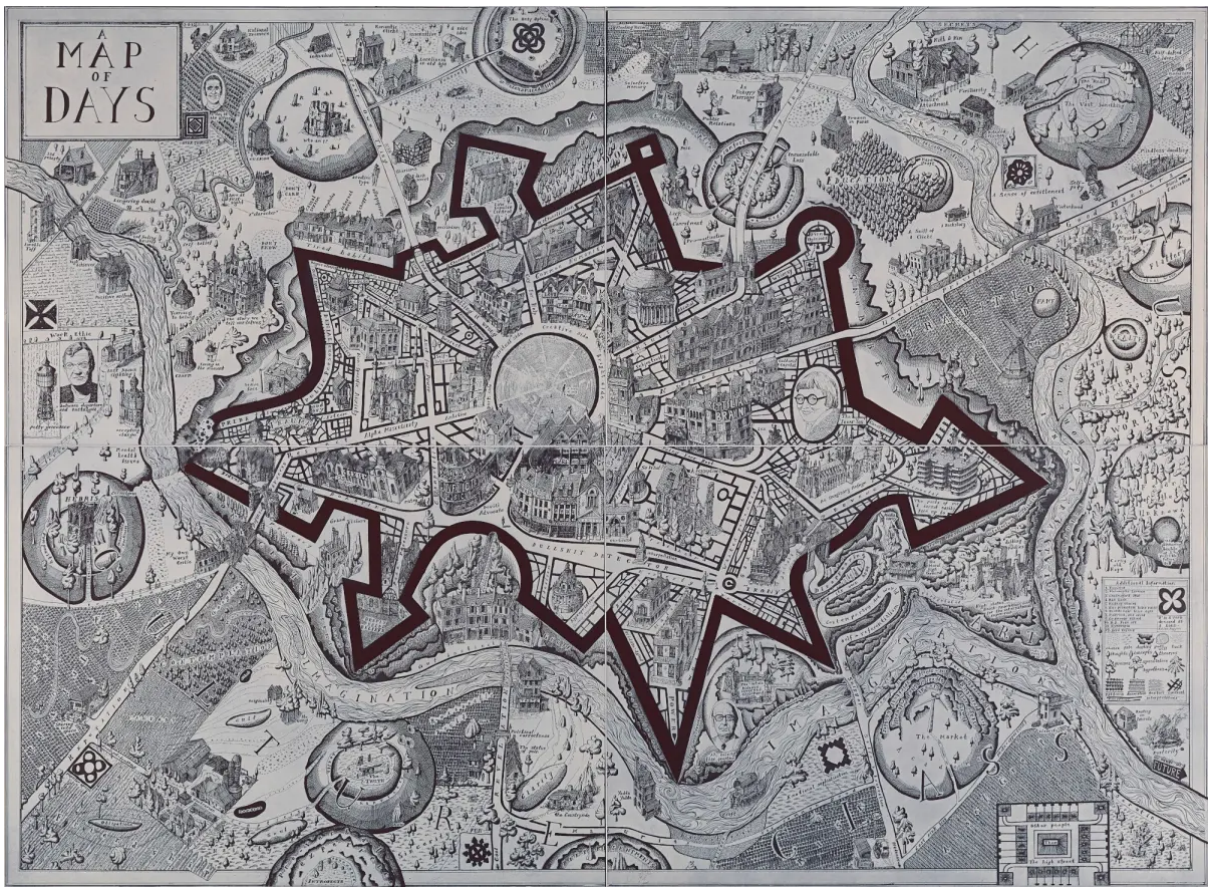


Figure 44 : Map of Days

Grayson Perry uses the physical metaphor of a walled town to represent his psyche in the form of a map (Perry, 2013).

Credit : Grayson Perry

Storytelling

Storytelling—the act of creating narrative—is the deliberate act of choosing, crafting and sharing stories; it locates beings in a context, but is itself a form of participation in the ongoing context and story. Storytelling is a primordial part of human culture that can tell and shape worlds, not just stories. The power of storytelling as a strategy for care, action, and staking a claim for the future is that it opens up the space of possibly for thinking about the ways in which beings may encounter one another, and is a way of accessing the reality of other beings.

Donna Haraway and Dean Endy discussed the importance of both story-telling and story-listening as multispecies care-taking activities. Haraway talks about the power of storytelling as a way of not only knowing but finding joy in the multitude of ways of being a being in the world; that it is a way to make people care, or be emotionally invested in a story:

> *"it's about a sense of being alive on this Earth, the incredible pleasure of connecting with these rich ways of doing the world. Not to take them over and extract them, but to get a sense of the richness of connection. That nurtures my sense of being committed to taking care of each other."*
>
> *(Haraway, as cited in: Haraway & Endy, 2019, p. 4)*

Beyond this, she argues that storytelling is not simply an encounter of care but one that engenders a reciprocal ethical responsibility; by finding joy in hearing a story, we then have an ethical responsibility to the story and the storyteller. If you care about—if you are invested in the story of other beings—then you have a reciprocal duty to take care. Stories are the way that people give meaning to their lives, and taking care of your people and your land starts with taking care of stories (Haraway & Endy, 2019).

An important aspect of speculative storytelling is fabulation, which takes a more theoretically inflected approach to speculative fiction, framing it as a research technique that uses worldmaking as a way to work with theory to explore different sorts of social, cultural and environmental relations, as discussed in Part II.

6.3.4 Speculative Narrative Archetypes

This component of the Celium takes a focus on the ways in which some of the key concepts of Queer Ecology and the Strange Stranger, more-than-human and queer lenses, and Community Biodiversity Activism—breaking down the human non-human binary, collective action for better futures, exploring worlds outside of time—have been explored within speculative fiction. The fabulations of speculative fiction have relevance to other forms of speculative practice, such as speculative design: they are of interest because of their rich inherent narratives in which

worlds can be invoked that can believably exist outside the confines of their stories, and the ways in which many of the themes and strategies of surviving the future can be interwoven. My intention here is to demonstrate that these ideas can be animated and given depth within narrative speculative artefacts, and that such world narratives are an integral component of speculative practices in design.

I discuss eight archetypal narratives that engage with the themes and concerns of this project—and this Celium—as examples of how speculative fabulation might invoke and make these things real in rich, entangled ways; for each, I explore how speculative fiction narratives in literature and on the screen have engaged with these ideas.

What You See is What You Get

> *What the world—and the beings in it—is, is determined by the encounters that these beings have with it and each other. The world you believe you see is the world that is real for you.*

The *Observer Effect* is a principle in quantum physics that the act of observation in an experiment will change the results the experiment produces, not because of some physical interference *per se*, but simply because it is put under observation. Karen Barad, in her reading of quantum theory, makes the argument that, in fact, both observer and observed are changed by the act of observation. In fact, the act of encountering other beings is the only thing that gives a being existence, and they exist only inasmuch as they exist in relation to each other. This implies that matter (what things are made from) and meaning (what they are) are implicitly inseparable, as well as that consciousness is a requirement for the universe to exist since it needs to be observed in order to exist, which presumably requires a conscious observer (Barad, 2007).

This underlies the concept of entangled existence, that all beings exist in a tangled network of being in relation to each other. How you perceive or encounter another being quite literally makes that being how you perceive it, at least as it exists in relation to yourself. This entanglement is something that Donna Haraway has described as playful; that all beings encounter and co-create each other in encounters that are literally play—exploring the world and finding it through interacting with the others around you. (Haraway, 2016; Haraway & Endy, 2019)

This is an emerging theme in science fiction texts that take the Baradian principle of the thing that you give your attention to be the thing that is real, and entangle that with the requirement of care, the playful intimacy of the encounters in the world, and explore that as a form of place and journey making. There are a lot of speculative texts that delve into these concepts in overlapping, interesting ways.

It begins with the question that has tantalised people since we realised quite how vast, how alien and mysterious the universe around us is—how, or if, it might be possible to reach across those vast distances to other stars, other galaxies, other lives. Classical Newtonian physics makes it seem impossible, and Einstinian relativity confirms it—nothing in our technology or knowledge makes reaching beyond our own solar system possible, and even reaching our nearest neighbouring planet is a challenge we haven't mastered yet.

Speculative texts have tended to respond either by accepting the limits imposed by Einstein as a storytelling constraint or deploying otherwise unknown physical principles to skip across the gap between one place and another: consider the warp drives and wormholes of the *Star Trek* universe (Roddenberry et al., 1966); the hyperdrives of the Galactic Empires of Isaac Asimov's *Foundation* (1952), George Lucas's *Star Wars* (1977); the trapped black hole called the *Eye of Harmony* that folds *Time and Relative Dimensions in Space* to allow the alien being *The Doctor* to travel through the time vortex in a dimensionally transcendental telephone box in the world of *Doctor Who* . Any stories deploying a warp or hyperdrive technology are generally linked by the physical materiality of their speculative science: technologies and machines are used that somehow alter, or manipulate the physical structure of the universe—by warping or folding space to bring other places closer, or altering the structure of the universe to allow apparent faster than light travel, or by simply punching a hole from one side of a galaxy to the other, allowing instantaneous travel from point to point.

But other, more recent texts, often authored by women, lean away from such technoscientific fantasies and speculate about a different type of science. Drawing inspiration from or running parallel to Barad, these stories consider the implications she finds in quantum physics: that things do not pre-exist their interactions; that matter is inseparable from meaning; that the act of observation changes what is observed and who is doing the observing; and that consciousness may be fundamental to the existence of the, a, any, universe, at least in terms that could be considered to be existence, or universe, or consciousness.

In her *Ekumen* series of novels and short stories, Ursula le Guin proposed a galaxy of anthropological thought experiments: a variety of human planets, former colonies of a distant past empire from a planet called *Hain-Davenant*, which have begun to rediscover each other following the long ago collapse of the first *Hainish* civilisation (1969, 1972, 1974, 1994). She imposed the limit imposed by Einstein—there would be no possibility of faster than light travel. The fastest possible way to travel would be Nearly As Fast As Light Travel (NAFAL) that would take decades to travel between even the closest planets, and she used the time dilation effect[36] to great dramatic effect.

[36] Due to the time dilation effect, time appears to stop at close to light speeds relative to normal space; thus people arrive at a destination after apparent subjective months but 90 years later in real time, with the traumatising effect of the sudden (for them) death of most people dear to them.

However, in some of her later *Ekumen* stories, collected in the book *A Fisherman of the Inland Sea* (1994), she introduced a new principle of travel, and a new technology—*Churten* travel. This would allow point to point transportation from anywhere to anywhere, but it relied on the conscious awareness of the travellers, and it had many unexpected consequences: one traveller found themselves reliving their life over again, but differently. One expedition leader believed himself to have been elevated to godhood by the people of the planet they Churten travelled to, resulting in his death by electrocution. And the first, most confusing, result was an experimental vessel transporting a large group of scientists and volunteers to… somewhere, or nowhere. Every traveller had a wildly different perception of the experience, some believing they hadn't left home, others believing they were in orbit around a new planet, or sending down landing parties that seemed to constantly shift in perceptions or composition. The clear implication in all these stories is that this quixotic method of travel is thoroughly implicated in the expectations people have or what they believe will happen—the act of conscious awareness changes what is being made aware of (1994).

This concept of travel through consciousness entanglement drives the novel *Dark Orbit* by Carolyn Ives Gilman (Gilman, 2015). An expedition of scientists (including academics of comparative religion and spiritual knowledge) visits a planet with strange geometric anomalies and makes the surprising discovery of a civilisation of subterranean, blind humans who somehow survive beneath the planet's surface. They come to learn that these people have a means of travel, *Wending*, that connects them to many other human civilisations on other worlds: a method that is mental or spiritual, involving travelling in the mind that becomes travel in space. But again, like in Le Guin's stories, the method has a strange quirk. It is only possible for wenders to travel to places where others know, or *Bemind* them, and people appear in the form that their beminder anticipates their appearance to take. People travel to places they expect and find the places to be how they expect them to be. Quite literally, their perception of the world and others' perception of them alters the world they find themselves in.

Thora, one of the main characters in the novel, finds herself wending to planet she had visited before: during a prior expedition, she had caused a diplomatic incident when local women began worshiping her as a god. In the wend, she finds that belief to have become true, and on her return, that the women of the planet have begun a religious revival and revolt in her name:

" 'You said wenders could be beminded in "ways that suit us not." What did you mean?'
'What I said... If they think us monsters, that is the shape we take.'
'Or gods?' I said.
'That too.'
I was sure that at the end I had not been Emissary Thora Lassiter. I had become the goddess Witassa, because that was who they had needed to see. I don't mean that I the psychological sense, that people mimic what their peer group expects. This had been no metaphor; Witassa had inhabited me, and I had become her.
'Are you telling me I cannot go to Orem except as the person they imagine me to be?' I said.
'We cannot go anywhere but in the guise our beminders give us. I would have warned thee not to venture where thou hast not left a fair and honest memory behind. To be true to one's self, one must be true to all others.' "

(Gilman, 2015)

Gilman explores the idea that the worlds that one visits can literally be changed by how we perceive them: if we can reframe the present in this way, it opens up the possibility of new, different futures; it is a worldview that aligns with the Ontological Turn, that every being exists in a world of its own perception.

There are more of these tales where the physical limitations of the universe are sidestepped by mental ability—by conscious and intentional awareness—and some have quirks that extend into the more-than-human and ecological realms. Frank Herbert's *Dune* (Herbert, 1965) projects humanity into a future free of computer technology, where all tasks are carried out by humans with exceptional abilities. The epitome of this is the *Navigators* who are able to use their mental abilities to pilot faster than light star-ships, abilities gained along with extensive body mutations through exposure to a spice called *Melange*, the galaxy's most valuable resource, that comes from the planet *Arrakis*, or *Dune*. The spice is part of the complex ecosystem of the planet which is dominated by the *Shai Hulud*, enormous sand worms: *Melange* is a by-product of their metabolic cycle and can impart psychic and precognitive abilities to humans who use it.

Star Trek (Roddenberry et al., 1966) is a transmedia franchise that has utilised the warping space trope for it's faster than light travel, but recently, the series *Star Trek Discovery* (Fuller et al., 2017) retroactively introduced a radically new travel technology. Drawing on the concept of the mycelial network that connects entire forests together through the hyphae of fungal mycelia, the series posits that there is a mycelial network binding the universe together, allowing for instantaneous travel to other places (and universes), but only by having the mental abilities to understand how to move from here to there. These abilities can be gained by exposure to the space fungi. Leading to intense psychedelic visions: the perception of reality warping caused by more-than-human hallucinogens married with *Star Trek* science results in material and physical shifts to other places.

Radical Intimacy

> *Love is the fundamental binding force of the universe, in which all encounters between beings are playful acts of intimacy.*

Karen Barad's agential realism is adjacent to another narrative trope in queer and ecological speculative fiction, which draws also on Haraway's notion of all interactions being a form of play, and Morton's perspective of radical intimacy: the becoming together that all intra-actions consist of are a playful act, an intimate act, a joy in finding each other… an act of love. Love, framed in this way, could be viewed as the fundamental motivation for all intra-action, and has been explored in speculative fiction as the force that binds the universe together.

In the four novels of his *Hyperion Cantos* (starting with *Hyperion* (Simmons, 1990)), Dan Simmons explores the concept of the Planck Constant, a fundamental universal number that underlies the structure of the physical universe. It can be understood as the Planck Length, the smallest possible length that can exist, or as the smallest amount of time that can pass. The story revolves around a battle in the far future between a human god and a god of machines; one of the protagonists encounters an artificial intelligence who reveals that this universal constant, which is referred to as the *Power that Binds*—literally, the property of the universe that allows matter to matter—is in fact love.

In Christopher Nolan's film *Interstellar* (Nolan, 2014), humanity is facing the collapse of the ecosystem and decides to send exploratory ships into the universe to find some hope of survival. The story revolves around a character, who leaves his young children to go on the mission, and due to an interaction with a black hole, they grow to adulthood in the space of moments, relative to his perspective. His daughter had some recurring strange dreams throughout childhood, and in the denouement of the film, his character becomes trapped in a strange spatial anomaly that resolves into her childhood home… the power of her love caused ripples through time and allowed him to return to experience her childhood.

In the television series *Sense8*, (Wachowski et al., 2015) Lana and Lily Wachowski and J. Michael Straczynski present an evolved version of humanity, *Homo Sensorium*, who form clusters of individuals who have connected minds, thoughts and memories; there is something radically intimate and queer about the sensate humans, who are connected by an intense love bond that makes them almost a single person, or at least, experiencing a sense of being that expands beyond individual bodies (See Figure 45). Again, there is the idea of love being a fundamental force of universal entanglement and collective materiality.



Figure 45 : Sense8

The Wachowski's Television Series Sense8 explores the idea of Radical Intimacy through Sensates, or Homo Sensoria, a subspecies of humans who are able to share thoughts, emotions, senses, and skills across their cluster. It engages with the ideas of fluid identities and entangled realities.

Credit : Netflix

Outsider Heterotopias

> *Outsiders from the human mainstream find ways, spaces and places to create pockets of a better future within the broken-down present.*

Muñoz had talked of queer utopias and futures as being ways of existing in the present that invoke, perform, and makes real possible worlds that are more diverse and more hospitable for outsiders (Muñoz, 2009); Michael Foucault refers to such outsider otherworlds as heterotopias (Foucault, 1967). Speculative Fiction has a strong utopian and heterotopian thrust to it, and there is the possibility within it for exploring the other-than, for queer and more-than-human perspectives.

Many speculative fiction stories that take place in a shared fictional universe often involve a form of worldbuilding that has a utopian intention, to show the possibility of a different, better world. I discussed previously the way that series such as *Star Trek* and Iain M Banks' *Culture* explored utopian ideals and the compromises that they might require to enact them.

Star Trek presents a vision of a future so utopian that under the guidance of its creator Gene Roddenberry, any conflict between human characters was not allowed to be shown on screen, to present an image of a post-scarcity human society at peace with itself, and a force for good in the galaxy through leadership of the *United Federation of Planets*. The sequel series *Star Trek : Deep Space Nine* (Berman et al., 1993) gives some moral ambiguity to the Federation through the introduction of *Section 31*, an intelligence agency that acts to protect the Federation though wholly unethical means, such as the attempted genocide of an adversary in war.

Iain M Banks' *Culture* series takes a perspective on such a hegemonic power that is both more cynical and more joyful than *Star Trek*. *The Culture* is another powerful post-scarcity human (though not Terran) society but one that is fundamentally anarchist in quality. *The Culture*, which is run entirely by vast artificial intelligence, is an essentially anarchist society where people live only for self-fulfilment, and literally anything is possible. One can pursue strange hobbies and academic interests, change gender, change species, change bodies, die and be resurrected…. but like *Star Trek*'s *Federation*, it has a darker side. *The Culture* encounters from other civilisations from time-to-time that it considers to be less sophisticated, less civilised, and indeed, less *cultured* than themselves. A faction of *The Culture* called *Contact* deals with these interactions, often through the actions of a secretive group called *Special Circumstances*. These actions included starting a galactic war (Banks, 1987), inadvertently triggering a genocide (Banks, 2000), and interfering with the governance of entire civilisations (Banks, 1988); these novels can be read as an explicit critique of the foreign policy and modern colonialist attitudes of the 'civilised' West. Characters allied to *Special Circumstances* tend to be the protagonists of the novels, which Banks uses to explore the frictions between different civilisations with fundamentally different values and worldviews.

One of the main narrative threads in Dan Simmons *Hyperion Cantos* (Simmons, 1990) involves the eruption of war between two factions of humanity. The *Hegemony* is another of these multi-planetary hegemonic (by name *and* by nature!) societies that sees itself *as* humanity, and is essentially an incremental future predicated on a late 20th century Western present—the sort of future patterned on the present which, as Alexis Lothian writes, tend to be the predominant form of futures in western SF stories (Lothian, 2018). The *Hegemony* has used wormhole technology to set up an expansive human society across the galaxy. In the gaps between their planets there is another faction of humanity, the *Ousters*. The *Hegemony* go to war with another faction, the *Ousters*, who are presented as deviants and terrorists, depraved barely-human creatures who pose an existential threat to their civilisation, and who they have no qualms in exterminating. But as the story proceeds, it becomes clear that the *Ousters* are not the monsters they have been portrayed as; they are simply post-human, more-than-human, and meta-human beings, who exist in delicate, interplanetary habitats, and who have played with their forms and evolution to become mystical, beautiful, many-formed beings. They simply want to be left alone by the *Hegemony*—who view them as a danger to their narrowly defined humanity—and only fight back because they face genocide if they do not. Most people in the *Hegemony* are not bad people, but are wilfully blind to the truth, and are happy to mindlessly live a comfortable existence without considering that other ways of living might be valid. Their comfortable existence relies heavily (though uneasily) on an opaque and parasitic conglomerate of artificial intelligences called the *Techno Core* that underpins their technological dominance. (Simmons, 1990).

What is being explored in this series of stories is the fundamental tension that Bloch identifies in utopias, between the abstract utopias of thought experiments and the concrete utopias that have to be incrementally worked towards continually. Worlds that are, on the surface, perfect utopian societies (in the abstract) are actually the product of continued and sustained efforts to maintain them in that state, and in some cases, demonstrate the principle that utopias in practice can spill over into becoming dystopias.

In the Wachowskis' film *The Matrix* (Wachowski & Wachowski, 1999) and its sequels, the tension between the abstract and concrete forms of utopia drives the narrative (See Figure 46). Putting aside the core storyline of the search for *The One* saviour who would integrate human and machine kind, *The Matrix* series explores a number of utopian and dystopian possibilities. The world of *The Matrix* is one of environmental collapse following a war between humanity and artificial intelligence, where humans are used as a power source for machines and are trapped in a virtual world. The machines strove for this world to be a perfect utopia at first, but realised that people simply died, after trying to exist in an unrealistically perfect world for too long.

As explained in *The Matrix Reloaded* (Wachowski & Wachowski, 2003), the machines replaced it with a mundane simulacrum of late 20th century society. In this narrative, the principle that

abstract utopias always beget dystopias is in play, even as a way to escape a dystopia in reality; the films are also a commentary on the dystopian perpetual present that capitalism seems to insist upon. But there is an alternative to this virtual utopia-dystopia: a human society in the real world, *Zion*. In this world, people have forgone the dubious comforts of the virtual world of *The Matrix* to carve out a society together in the ruins of the real world; through hard work and collaboration, they have been able to create a heterotopia where they can live and love and dance, outside of the control of the machines of *The Matrix*; *Zion* and it's people have a strong punk, queer aesthetic and outlook on life that can be seen as an explicit rejection of a corporatised future in exchange for something less comfortable, less predictable, and more free (See Figure 47).

Another of the Wachowskis' texts, *Sense8* (Wachowski et al., 2015), also explores the queerly utopian idea that Muñoz discussed of people carving out a better—queerer—world in the shadows of the hegemonic, normative world—what Foucault has described as a heterotopia. The eight members of the cluster of *Sensates* essentially exist in a world that only exists within the shared thoughts of the group; moment by moment, they are existing in a world that isn't the world around them, but one that is shared and hidden and outside of regular society (See Figure 45).

Theirs is a world that is radically intimate, where love transcends the normative heterosexual mould and is complex, polyamorous, and frightening to the mainstream.

Virtual Worlds

> *Virtual worlds, dream spaces and imaginariums offer alternative spaces to exist within, whether as a means of self-expression and escape, or of control and imprisonment.*

Muñoz wrote about queer utopianism as an essentially romantic, imaginative gesture to the future: perhaps a better imagined future can't be manifest, but it can be invoked in a gesture, in a look, in an attitude. But he also argues that there are queer spaces—gay bars, drag shows, sex parties—that are heterotopias where one might create a bubble of queer futurity in the present (Muñoz, 2009).

This sort of making-believe, of imaginative, playful and gestural utopianism, can be found in another type of speculative fiction story, that almost meta-textually deals with make believe worlds. These stories are about virtual spaces and places, existing outside of the material world.

The Matrix (Wachowski & Wachowski, 1999) could be seen as the archetypal virtual worlds story, but here, the virtual world of *The Matrix* is presented as a normative dystopia, designed by artificial intelligence to keep the people connected to it dissatisfied and miserable. However, *The Matrix* can be hacked by the queer-coded citizens of *Zion* who, despite understanding that it is a

fake world, manage to have fun within the space: using it to gain martial arts skills, the ability to freeze time, and, ultimately, to fly (See Figure 46). Within the confines of a normative prison, they manage to grab moments of joy. Many other texts about virtual worlds put this playfulness front and centre: in Ernest Cline's *Ready Player One* (Cline, 2012), a massive online environment allows people in an overpopulated dystopian near future the opportunity to take on different forms, to play with species and to trouble gender, and interact with characters and scenarios from various nostalgic speculative franchises.

Virtual worlds are the focus of Ian Banks' novel, *Surface Detail* (Banks, 2010), set in his post-scarcity anarchist *Culture* universe; the novel presents multiple levels and types of virtual worlds, some utopian, some decidedly less so. Some civilisations have created religion-tinged hell worlds of a Hieronymous Bosch character, which they use as a form of population control, with the threat of a literal eternal hell promised in the uploaded futures of citizens who don't conform. *The Culture*, considering these virtual hells to be a horrific affront to decency, launches a war against them. Not all visions for the future have the collective well-being in mind; utopias from one perspective may be literally hellish from another.

An interesting recurring theme in stories of virtual spaces is the way in which it can be hard to tell whether one has left a 'virtual' world and entered the 'real' world, in ways which call into question what it means to be real or virtual. In David Cronenberg's film *eXistenZ* (Cronenberg, 1999), characters are drawn into a visceral, biotechnological game world that has nested virtual worlds within worlds, and the story often revolves around characters confusion as to what level of game they are in, or if they have been returned to reality; similarly, in Christopher Nolan's *Inception* (Nolan, 2010), a heist film where people can enter other's dreams to steal or implant memories, characters find themselves within dreams within dreams, leaving the main character ultimately unsure whether he has returned to reality or has become trapped within a dream permanently (See Figure 48).

Munoz talks of a similar effect when leaving a queer heterotopic space and returning to 'straight' space, sharing the experiences of queer writer and performer John Giorno as he left a queer cruising spot:

> *"I said goodbye and I was out the door in a flash, onto the train going uptown.' Once on the train he feels himself once again overwhelmed by the crushing presence and always expanding force-field that is heteronormativity: 'It always was a shock entering the straight world of a car full of grim people sitting dumbly with suffering on their faces and in their bodies, and their minds in their prisons."*
>
> *(Muñoz, 2009, p. 39)*

This account hints not only at the shock of transition, of passing through the boundary condition between one world and another, but in the way that it bleeds over into the real world. I have discussed this phenomenon in relation to game design as a form of *Diegetic Escape,* whereby a fictional or constructed world lingers on return to reality, where it "continues to shed its radiance on the ordinary world outside," (Huizinga, as cited in: Brown, 2012, p. 16).

This Diegetic Escape is an interesting phenomenon with regard to speculative and fabulatory practices: fabulated heterotopic and diegetic worlds can exert an influence on the outside world. This is a common feature of ghost stories, weird fiction and horror narratives, where characters try to escape from occult or marginal realities only to find that they have brought them into their 'real' life. It is a common theme in Jorge Luis Borges' philosophical fictions, in particular the short story *Tlön Uqbar, Orbis Tertius* (1962), in which a fictional world is created through obscure academic publications by a secretive group of "astronomers, biologists, engineers, metaphysicians, poets, chemists, algebraists, moralists, painter, geometers [...] directed by an obscure man of genius" (1962, p. 32). Over time, this world insinuates itself into reality until:

> *"the contact and habit of Tlön have disintegrated this world. Already the schools have been invaded by the conjectural 'primitive language' of Tlön; already the teaching of its harmonious history has wiped out the one which governed in my childhood; already a fictitious past occupies in our memories the place for another, a past of which we know nothing with certainty not—even that that is false."*
>
> *(Borges, 1962, pp. 42–43)*



Figure 46 : The Matrix

The Matrix (Wachowski & Wachowski, 1999) portrays a world where people are trapped in a virtual world by artificial intelligences who use them as fuel; this world is a dystopian rendering of late 20th century culture, as a purely utopian world was not convincing to the inhabitants.

Credit : Warner Bros.



Figure 47 : The Matrix Reloaded (Zion)

The sequel to The Matrix, The Matrix Reloaded (Wachowski & Wachowski, 2003) portrays an alternative world in which humans might live outside of the matrix; Zion is a heterotopia outside of the technology-ensorcelled mainstream, an underground city where people can live, love and play in material reality.

Credit : Warner Bros



Figure 48 : Inception

Inception (Nolan, 2010) is set in a world where people can enter and manipulate someone's dreams, but where it is possible to get trapped in dreams within dreams and be unable to recognise or return to their original reality.

Credit : Warner Bros. / Syncopy

More-than-Human

> *In this world of hybrid beings, cyborgs and unthinkable aliens existing outside the human norm, a new world emerges.*

The concept of the outsider heterotopia implies an outsider who is somehow out of the human norm, something that is reflected in the queer position as well as the more-than-human one, both of which are regularly visited themes in speculative fiction; most of the texts mentioned here so far explore some of these ideas.

In some cases, there is a deliberate choice made by characters to be outside of human norms, exploring ideas of trans-, pan-, and post-humanism, where elective modifications are made to the body; other stories are simply about beings who are, in some way, innately more-than-human.

Many of the serialised speculative fiction texts mentioned here explore the tensions between different types of societies who differ to varying degrees to baseline humanity. In *Hyperion*, the *Hegemony* of man finds itself implicated in the lives of both the post-human society of the *Ousters*, as well as the *Techno-Core*, a civilisation of artificial intelligences (Simmons, 1990) (See Figure 49). Bank's *Culture* has a society overseen by artificial intelligence *Minds* with an anything-goes attitude to how human or more-than their citizens are; they able to change gender or species with ease, to be immortal, or to secrete drugs from glands in their brains.

Alastair Reynolds has created a number of fictional universes in which to set his stories. In one universe, the setting of his *Poseidon's Children* trilogy, humans have divided into three factions, *United Earth Nations* (*UEN*), *United Aquatic Nations* (*UAN*), and *United Space Nations* (*USN*). The members of the *UAN*, in particular, have embraced body modification, choosing to become meta humans with adaptations to live underwater, to shift species to become seals or dolphins or, in one instance, to become a large spiky ball. This series also includes distributed artificial intelligences, phenotypic clones where one personality shares three bodies, an increasingly sentient and long-lived artificial personality construct of a family matriarch, hyper-intelligent elephants, and alien constructs that have forgotten how to be conscious; the series ends with a denouement that requires many of these groups to work together for the survival of all (Reynolds, 2012, 2014, 2016).

This recalls some of Donna Haraway's writings, particular the perspective from *The Cyborg Manifesto* that we are all in some way cyborgs (Haraway, 1981), as well as Morton's imprecation to meld the distinctions between genders, and species, and between organic and artificial beings (Morton, 2010).

The Alien

Speculative fiction, particularly in the genre of science fiction, often directly explores notions of more-than or other-than human beings—or Strange Strangers—through the lens of the alien: usually, though not always, extra-terrestrial beings with natures subtly or radically different from the human archetype.

Reynolds' *Revelation Space* series (Reynolds, 2009) is a gothic space opera about the attempted annihilation of mankind by artificial intelligence lurking in deep space. The series involves many factions of (more-than) humanity, from baseline humans, to Demarchists who use neural implants to access networks and augmented reality services, to the Conjoiners who use the same technology to live in a shared consciousness society: within these societies, advanced modification of bodies is commonplace. In one short story, *Diamond Dogs* (Reynolds, 2008b), two explorers of an *Indiana Jones*-like booby-trapped temple have their bodies aggressively modified to become dog-like robot cyborgs in order to gain access to hidden rooms.

In this world, aliens exist, but they are far from resembling anything like humanity: there are large worms who live in organic spacecraft, and the pattern jugglers, aquatic microorganisms who people can swim with, in the process having their bodies deconstructed and put back together, changed. A possible future of the *Revelation Space* world appears in a couple of stories, where entities called *Greenfly*, a rogue terraforming nanotechnology, has disintegrated most star systems in the galaxy, replacing them with a multitude of verdant plant-filled habitation bubbles orbiting most of the stars.

In speculative fiction, the more-than-human aliens, in all their myriad forms, allow for explorations of Strange Strangers, and the ways in which humanity might encounter them.



Figure 49 : Hyperion (Treeship Iggdrasil)

This illustration from the novel Hyperion (Simmons, 1990) depicts a spaceship built from a tree which one faction of humanity uses as a form of transport.

Credit : Rehail, Deviant Art

Strange Strangers in Strange Lands

> *You have travelled to a strange world where the beings there are alien to you; but from their perspective, you are the Strange Stranger.*

Timothy Morton's conceptual figure of the *Strange Stranger*, whereby all beings are equal in their strangeness and familiarity, can be explored through many science fiction narratives that juxtapose strangeness and otherness with the familiar. In some tales, an alien "other" is presented in a familiar context, in alien visitation tales such as *The Man Who Fell to Earth* (Roeg, 1976), *ET* (Spielberg, 1982), or *Under the Skin* (Glazer, 2014); other stories focus on more familiar beings who find themselves out of place or time, where they themselves are the alien other. This othering of the familiar can be a powerful way to reframe the idea of strangeness. In Ursula K. Le Guin's *The Left Hand of Darkness* (Le Guin, 1969), *Genly Ai* is a human who is sent to the ice planet of *Gethen*, who finds himself as a cis-male on a planet of intersex gender non-binary people, and has to rethink his sense of what it is to be a man, to be a person, to be an alien; the impact on the reader is likely more powerful than were a Gethenian to visit Earth, where the familiarity of the setting would not perhaps allow one to consider the familiar as strange. Another interesting novel is the *Fifth Head of Cerberus* by Gene Wolf (Wolfe, 1972), which is set on a planet where at some point in the past, human setters went to war with shapeshifting indigenous people; now nobody can remember if the humans won, or if the shapeshifters did, and had forgotten that they had taken human form. It's an interesting story that touches on post-colonial ideas of cultural erasure, and how the past can be elusive and contradictory.

Language

One profound way in which Strange Strangers and strange lands may be encountered is through language, and the language differences through which we construct the world differently. China Mievelle explores this in great detail in *Embassytown* (Miéville, 2012)(See Figure 50), a story set in a human city on an alien planet, sharing the space with a species with a vastly different concept of language: The *Arieki* speak a language that has no concept of lying, so therefore no concept of metaphor—*this* projects to and is *that*. They have to resort to similes, as examples, to express themselves; when they find themselves unable to do so, they ask humans to perform strange acts, such as eating what they are given, so they can use the new similes to express themselves. They also have a double-voiced language that only makes sense when consciously produced, thus the only humans who can speak to them are specially trained twins, or *Ambassadors*, who speak in concert. The *Arieki* society starts to tear itself apart on encountering humans and the flexibility of human language; one faction tries to learn to lie, and another becomes addicted to the unnatural language constructions of an experimental *Ambassador* who isn't a twin. Divided by a gulf of understanding, the humans don't realise what they have done or how they might help repair the damage. These ideas reflect the post-structuralist framing of language as a

representationalist logic that creates and reinforces ontologies and power structures, whereby words carry the baggage of an entire ontology or world. Using a concept is to bring with it all that allows it to be made thinkable; these things are literally unthinkable, and so cannot exist, within another concept or language.

Strange Lands

Speculative narratives that fall under the genre of New Weird fiction emphasise the weirdness of strange places as much as that of the Strange Strangers who inhabit them. New Weird fictions are set in worlds that are damaged and damaging, metamorphic and metamorphosing, contaminated and contaminating. These worlds can be framed as utopias of estrangement, as a way to explore sitting with the unfamiliar and the loss of home, the loss of the subjective self (Garforth & Iossifidis, 2020); as such, they are powerful refractions of the reality of living in the materially damaged, unsettling and unstable world of the Anthropocene (or Cthulucene or Capitalocene) Era (De Freitas & Truman, 2021; Turnbull et al., 2022). Miévelle is strongly associated with the New Weird genre, and *Embassytown* presents a weirded interface between the comprehensible human world and the incomprehensible *Arieki* one; his novel *Kraken* (Miéville, 2010) presents a weirded, distorted London refracted through the vitrine of a dead colossal squid, a reframing of the tentacular beings of Lovecraft's prejudiced fantasias of the unthinkable other into more postmodern and ambivalent forms. N.K. Jemisen reframes Lovecraft too, inviting the reader of *The City We Became* (2020) to embrace difference and community in a New York under attack and transformation by tentacles of white supremacy and cosmic horror.

This concept of embracing, not rejecting, the other, even if it is confounding, unfamiliar or dangerous, is explored in Jeff VanderMeer's novel *Annihilation* (2014), and Alex Garland's film adaptation of it (2018). Exploring an inexplicable weirded geography, boundaried by a shimmering barrier, scientists find their bodies and minds under attack and transformation by alien organisms of relentless metamorphosis. The narrative encourages an ambivalent acceptance to the possibility of terrifying change, and loss of the subjective self in favour of becoming part of a more-than-human geography. (De Freitas & Truman, 2021; Turnbull et al., 2022)



Figure 50 : Embassytown (Arieki Alien)

(Miéville, 2012), a story set in a human city on an alien planet, sharing the space with a species, The Arieki, with a vastly different concept of language.

Credit : Vladimir Verano

Stitches in Time

> *Making changes in the timeline to make new futures, alternative pasts, and pluriversal worlds where multiple realities coexist.*

Something that is inherent to all speculative fiction—particularly science fiction—is its relation to time[37]. Speculative fiction makes proposals of possible futures, or of the ways the past could have been different, and how the present could look in the wake of a different past. On a non-diegetic level, such fictions make powerful statements and proposals about what the future, or even the present, could be.

Alternative Temporalities

Speculative fiction can offer alternative perspectives on time and different ways of imagining temporality. It can show how time need not be thought of as an arrow but can be subject to events and open to becoming in different ways. In the short story about a heterotopic other world, *Tlön, Uqbar, Orbis Tertius*, Borges propose a number of different possible temporalities according to which time might operate in that world:

> *"the present is indefinite, [...] the future has no reality other than a present hope, [...] the past has no reality other than a present memory; all time has already transpired, and our life is only the crepuscular and no doubt falsified and mutilated memory or reflection of an irrecoverable process; the history of the universe [...] is the scripture produced by a subordinate god in order to communicate with a demon."*
>
> *(Borges, 1962, pp. 34–35)*

Einstein's Dreams, a novella by Alan Lightman, presents a series of dreams that Einstein is said to have had which led him to his theory of relativity; in each dream, the life of the people in the Swiss capital of Bern is shown according to different temporalities:

[37] Marie-Laure Ryan suggests that the principle difference between the real world and the settings of science fiction is that they are chronologically inconsistent. Science fiction deals with yet to occur futures or past and present worlds with different technologies, existing in alternate times in worlds that resemble our own. Were we able to travel in time, we might access these worlds. In contrast, fantasy fiction tends to take place in worlds that have different ontologies and laws of nature, rendering them inaccessible from the real through time alone. Weird fiction often involves incursions from physically different realms into a world that resembles the real (Ryan 1991).

> *"Time is a circle, bending back on itself; time is like a flow of water […] now and then, some cosmic disturbance will cause a rivulet of time to turn away from the mainstream […] when this happens, birds, soil, people caught in the branching tributary find themselves suddenly carried to the past; in this world, there are two times […] there is mechanical time and there is body time […] the first is unyielding, predetermined […] the second makes up its mind as it goes along."*
>
> *(Lightman, 1993, pp. 10–18)*

Diegetic Time Travel

Some speculative fiction works meta-textually foreground the temporality of their narrative structures, with the diegetic reality of the story literally involving some degree of travel into, or manipulation of, the non-present. In these works, the story on the page or on the screen is a metatext representing the rhetorical function of the text itself. Such stories can involve actual or literal time travel through the action of some technology or meta-human ability, while others can take a more narrative and literary approach, a form of time travel from the armchair that can be accessed from the present.

In his novel *The History of The Siege of Lisbon* (*História do Cerco de Lisboa*) (Saramago, 1989), José Saramago tells the story of a freelance editor who impulsively decides to introduce a false negative into a dense historical text; he makes it read that visiting Crusaders in 1147 CE did not agree to assist the Portuguese army in conquering Lisbon (formerly the city of al-Ushbuna during the Al-Andalus period) when in reality they had done so. This error is discovered, and he is appointed an editorial supervisor, who asks him to write this new history for her. He starts to see both his own life and the city he lives in through a different light, and the city starts unravelling around him as he imagines it having a quite different history: in his mind, and in the story he is writing, an alternative Lisbon starts to take shape.

Deliberate acts of history change have a tendency to be ill-advised, if not outright forbidden, in the fictional worlds where the technology to achieve this exists. The classic narrative here is Ray Bradbury's short story *A Sound of Thunder* (Bradbury, 1953), where a group of time tourists travel back to the Jurassic era in the days after the election of a popular political leader. Warned not to interfere with the world of the past, a tourist wanders off the path and steps on a butterfly, killing it. He thinks nothing of it until the tour returns, and they discover the popular leader has been replaced by a vicious tyrant. This warning that simple changes in the past can have unpredictable and substantive effects carries a seed of hope for real world speculative practices—that a new, different future could be possible and may not require more than one simple change of perspective.

Preserving the Present

There is a particular modern, capitalistic mode of engaging with the future in terms of risk management—managing risks to the power holders of the present (Savransky et al., 2017). This concept has been explored in some science fiction texts, in particular, a novel by Isaac Asimov Called *The End of Eternity*, (Asimov, 1955), and the recent Marvel series *Loki* (Waldron, 2021), which seems to take some inspiration from it.

In *The End of Eternity*, *Eternity* is an organisation that exists out of time, with a department based in each century, and time capsules in the form of elevators that Eternity agents can use to travel between them. *Eternity*'s mission is to protect humanity from anything that may lead to its extinction and, therefore, to intercede in the timeline to make changes. In particular, they prevent the discovery of atomic power (which would, in turn, prevent the development of time travel technology) and any attempts of mankind to expand into space. The protagonist, *Andrew Harlan*, an *Eternity* employee, discovers that a group from the far future is attempting to bring down the organisation; they have access to a time travel technology that shows multiple possible futures, and discover that, far from protecting humanity, whenever *Eternity* exists and keeps the species confined to one planet, eventually the entire galaxy will be occupied by aliens and humanity will die off. He agrees to help them, and they go back in time, sending research about atomic energy to a physicist and therefore allowing humanity to develop technology to reach the stars (the story is an effective prequel to Asmiov's future history of the human race explored through his *Robot*, *Empire* and *Foundation* novel series, which tells the story of an alternative future where factions of humanity do spread out from Earth, eventually forming a galaxy spanning Empire).

In the story, there is tension between, on the side of the *Eternals*, a view of the future framed around risks to the continuation of the present—which is the hegemonic way of looking at the future—and their future counterparts who take a pluriversal, multi-worlds stance towards futures that aren't necessarily predicated on the character and power dynamics of the present.

Marvel's series *Loki* (Waldron, 2021), based on the Norse trickster god, also riffs on this idea, with a retro-futuristic *Time Variance Authority* (*TVA*) who are tasked with preventing the emergence of a multiverse by continually maintaining the "sacred timeline" by pruning any events (and people) who deviate from the plan. That plan eventually resolves to have been devised by a man called *He Who Remains*, who realises that versions of himself in other timelines—in particular a variant called *Kang the Conqueror*—will eventually lead to a multiversal war, therefore he must prevent a multiverse from existing: in short, he argues that future must not change much from the present, because it could lead to catastrophe. A variant of the main protagonist *Loki—Sylvie*—makes the same decision as the protagonist of *The End of Eternity*, that free will and possibility are more important, and kill him, unleashing a multiverse.

The second season of the series widens and deepens the story in interesting ways. The *TVA* was set up as a technocratic, bureaucratic agency to identify threats and challenges to a normative future, in much the way that dominant systems attempt to prevent breaching the Impasse of the Present through risk management. The death of *He Who Remains* unleashes a cascade of branching, pluriversal timelines, which shortly leads to the failure of a machine called the *Temporal Loom* (See Figure 51). This machine, which resembles a Future or Voros Cone, is designed to keep order to the timelines, funnelling them through a present moment. The *Loom* is intended to act as a failsafe which will protect the sacred timeline by destroying the TVA and all other branches: the world *as it is* being protected from the worlds *that might become* through a literal technofix of the sort that Haraway and Lothian warn against (Haraway, 2016; Lothian, 2018). Eventually, *Loki* re-embraces his nature as the Norse trickster god and destroys the *Temporal Loom*. He weaves the branches of the multiverse together into a cloak which he drapes himself in, forming it into the world tree *Yggdrasil* from Norse Mythology—the tree which connects all realities together—and becomes the God of Stories (See Figure 52). Symbolically, a bureaucratic techno-future which relentlessly clings to a controllable present is set aside for a messy pluriverse—of entangled beings living entangled lives—in which futures emerge through fabulation and storytelling.



Figure 51 : Loki (Time Loom)

In the Marvel series Loki (Waldron, 2021), timelines of the multiverse are pruned and controlled by the time loom, a technological manifestation of the Future or Voros Cone which represents an ordering of the future into a sacred timeline based on the plans of a single man.

Credit : Marvel Studios / Disney



Figure 52 : Loki (World Tree)

At the conclusion of the second season of the show, the Time Loom is destroyed, and the branches of the multiverse are woven into a pluriversal world tree, emphasising entangled stories of beings living together over grand technological fixes.

Credit : Marvel Studios / Disney

Into the Pluriverse

Multiverse or Pluriverse stories are becoming commonplace in popular culture and are a different way of exploring changes in history, not through travelling in time, but by showing how different worlds may exist side by side, and how they are mutually involved in each other's becoming.

A simple version of this story was presented in the 1997 film *Sliding Doo*rs (Howitt, 1998), showing two possible versions of the life of *Helen Quilley*, a character played by Gwyneth Paltrow, where a simple hinge point—between missing a Tube train and discovering her husband having an affair, and catching it and not discovering the affair—sent her life down two very different paths (See Figure 53).

Everything Everywhere all At Once (Kwan & Scheinert, 2022) takes an offbeat look at the multiverse concept, where the protagonist, *Eleanor Quan Wang*, played by Michele Yeoh, discovers that beyond her boring existence as the owner of a laundromat, versions of herself are powerful beings who can save the multiverse; and thus, that she also is and can (See Figure 54). It explores the notion from the perspective of one ordinary person that there are many possible futures and pathways your life could take, and different to time travel where one needs to make a change in the past in order to affect the future, one can simply slip into a reality where a different past has made the present different. It raises the possibility that one can live one's life as though the past happened differently and be a different person as a result.



Figure 53 : Sliding Doors

This film (Howitt, 1998) is a multiverse story presented as a romantic comedy, in which Gwyneth Paltrow plays two different versions of the same character, whose lives branch off in different directions depending on whether she catches or misses a Tube train.

Credit : Miramax / Paramount



Figure 54 : Everything Everywhere All at Once

Everything Everywhere all At Once (Kwan & Scheinert, 2022) takes an offbeat look at the multiverse concept, where the protagonist Eleanor, played by Michele Yeoh, discovers that beyond her boring existence as the owner of a laundromat, versions of herself are powerful beings who can save the multiverse.

Figure Credit : IAC Film / Year of the Rat

Afrofuturism and Reclaiming the Past

> *"Afrofuturism is a way of looking at the future, or alternative realities, through a black cultural lens. It intersects the future with black culture, the imagination, liberation, mysticism, and technology. When I say black culture, I mean people from the African continent or people of the African diaspora. Afrofuturism also engages the divine feminine concept. It engages alternative views of looking at time, with the future, past, and present being one. It's an engine for looking at how resilience and the imagination have not just saved lives but are a lifeline in a culture's evolution."*
>
> *(Womack, as cited in: Ginsberg et al., 2018)*

Imagining that the past happened differently as a way of reclaiming the present and staking a claim on the future lies at the core of a particular genre of speculative practices: Afrofuturism. Afrofuturism is a genre of storytelling that involves reframing or reimagining the past of black people away from the historical reality of slavery, diaspora and colonialism, and imagining different possible presents and futures that would extend from those altered pasts. Alexis Lothian writes that:

> *"the framework of Afrofuturism has flourished and expanded as both a popular and scholarly movement, taken up by African diasporic thinkers, musicians, writers, and filmmakers to describe the vitality of speculative futures created in opposition to official, colonial, normatively white timelines."*
>
> *(Lothian, 2018, p. 102)*

Through this form of storytelling, "alternative figurations of time and space come together [...] calling forth the overlap between ancient African temporal theory and quantum physics," (2018, p. 103)—and, in what Rasheedah Phillips conceptualises as Black Quantum Futurism: "to seize upon a vision of a future and collapse it in to your existing reality," (Phillips, as cited in: Lothian, 2018, p. 103).

Afrofuturism has had mainstream exposure in Ryan Coogler's Marvel film, *Black Panther* (2018), which centres on a superhero who is also the king of a reclusive and highly technologically advanced African nation, *Wakanda*. *Wakanda* presents a version of African history that celebrates a rich and complex culture set apart from the centuries of trauma experienced by the continent, its people and its diaspora. Within the narrative of the film the king, *T'Challa*, has to be content with the historic non-interventionist policy of his nation when it comes into conflict with the reality of black lives in the world outside of *Wakanda*'s hidden borders; his cousin forces him to consider whether it be fair that *Wakandans* live the comfortable lives that they do when their African brethren have suffered oppression at the hands of other races.

Courtia Newland's *A River Called Time* (Newland, 2021) is an Afrofuturist story that metatextually foregrounds the pluriversal word making potential of Afrofuturism. *A River Called Time* is set in an alternative present London, a city called *Dinium*. In this world, the Roman Empire adopted Kemitism, the religion of Ancient Egypt, instead of Christianity. This led to a multi-cultural Europe which related to Africa through cultural exchange, not slavery, a culture and religion that embraced astral projection, and a much earlier discovery of nuclear power which led to *Dinium* being devastated by a nuclear explosion in the early nineteenth century; the story is set inside and outside a huge building called the Ark. Despite the lack of racism, the world is dystopic, with those on the upper levels of the building living comfortable lives at the expense of the lower levels. The main character has the ability to astral project to access the river of time, which allows him to shift between different timelines and versions of his life in different parts of the city; in one, he even finds himself in the 'real' world on the eve of the 2019 UK General Election, which is implied to be the most dystopian of the worlds he finds himself in: "I've never experienced sadness like that… They are immersed in the depths of a period known in Hindu tradition as Kali Yuga, the age of iron. A period of extreme spiritual conflict and war," (Newland, 2021, p. 399). It's a complex novel, which defies a simple explanation: while modern racism doesn't exist, the same sorts of oppressive structures exist to control people, but in the way that the protagonist jumps between possible alternative presents, in each finding ways for his community to survive and to push back, the metatext emphasises the importance of dreaming better futures, and enacting them, incrementally, collaboratively, to make the world that little bit better.

These speculative narratives can be a way, then, of exploring alternative presents and futures that can be seen apart from traumatic pasts, while also having a dialogue with those pasts and existing presents. Through this, we may develop a better understanding how we have got to here in the present and how we may take a different path into the future. There are strong parallels that can be drawn between Afrofuturism and the queer futures that Muñoz describes, the act of creating safe spaces where the past and present traumas can be escaped through utopian practices of community and future-making (2009), and Alexis Lothian has written about how these queer narratives can play out in speculative texts (Lothian, 2018).

The Ecosystem Strikes Back!

> *Gaia takes its revenge against the human mainstream, whether as largescale environmental disruption or through direct action by more-than-human beings.*
>
> *"Gaia is auto-poetic—self forming, boundary maintaining, contingent, dynamic, and stable under some conditions but not others. Gaia is not reducible to the sum of its parts, but achieves finite systemic coherence in the face of perturbations within parameters that are themselves responsive to dynamic system processes. Gaia does not and could not care about human or other biological beings' intentions or desires or needs, but Gaia puts into question our very existence, we who have provoked its brutal mutation that threatens both human and nonhuman liveable presents and futures."*
>
> *(Haraway, 2016, pp. 43–44)*

The environmentalist and biologist James Lovelock proposed an ecosystem model called the Gaia hypothesis, where the entire biome of Earth can be understood to be a single, unified organism, self-regulating through complex feedback loops (1979). Later in his life, in *The Revenge of Gaia* (2007), he put forward a disconcerting development of that hypothesis, where he argued that the careless actions of humanity with regard to the environment were triggering a series of extreme feedback reactions which may lead to the destruction of human society in order for the earth ecosystem to rebalance itself.

The idea of the ecosystem as an antagonist towards humanity, whether framed as the ecosystem taking collaborative action to protect itself, purposefully or not, or as the boundary of nature and the human world being broken down is a recurring theme in speculative fiction, both science fiction and, especially, weird fiction and horror.

This is perhaps referenced most directly in stories where more-than-human beings fight back against human activity, often to great effect. An archetype of this sort of text can be found in Le Guin's *The Word For World is Forest* (1972), a story in her *Ekumen* universe, where the *Athsheans*, a race of furry, tree dwelling primates push back against oppressive human colonisers with unprecedented bloody violence; a story with striking similarity to that of the *Ewoks* in *Return of the Jedi* (Marquand, 1983), a film in George Lucas' *Star Wars* franchise, where the *Athshean*-like dwellers of a forest moon play a pivotal role in the downfall of a fascistic Galactic Empire. James Cameron's *Avatar* (2009) also explores similar ideas, where the inhabitants of the planet Pandora, the *Na'avi*, live in harmony with their environment until the planet is colonised and resource-stripped by humans from Earth, and have to fight back to save their world.

The dangers of interfering with a complex ecosystem and the indigenous people who are part of it is a core theme of James Herbert's *Dune* (Herbert, 1965), the first of a series of novels which

was inspired partly by Asimov's *Foundation*, and partly by an interest in sand dunes ecosystems. In another future, another Galactic Empire has foresworn computational technology, relying on humans with unique abilities to maintain its power-base. This has meant that faster than light travel requires human mutants to figure out how to fold space, an ability that is unlocked by consumption of the spice *Melange*. This spice is only available on a single planet, *Arrakis* (*Dune*), which puts it at the centre of a power struggle between different imperial factions, powerful families, and its native inhabitants, the *Fremen*. It transpires that the ecosystem on Arrakis is dominated by the *Shai Hulud* sandworms; these worms are the source of *Melange* as well as a fluid that bestow telepathic abilities, as well as being responsible for turning the world into a desert, and they have a complex life cycle which the *Fremen* live in an uneasy harmony with. The power struggles on the planet over the spice supply led to the emergence, through exposure to the sandworms and the spice, of a messiah figure who triggers a brutal galactic war: interfering with this strange ecosystem has had catastrophic consequences for imperial mankind.

These tales are largely within the genre of science fiction, but often speculative tales of the breakdown between the natural and human world tend more towards horror, particularly stories that linger on unknowable, tentacular beings and the possibility of human contamination with something other; this can be seen across countless tales of vampires, werewolves, zombies, sea and swamp monsters, or in HP Lovecraft's stories of chthonic godlike monstrosities. There are two films from the 1980s, both remakes of works from the 1950s, that embody a sort of lingering disgust towards the other and towards visceral bodily change that subtly reference the HIV pandemic and the moral panics that it elicited. In David Cronenberg's remake of *The Fly* (1987), the sterile and immediate threat of atomic power in Kurt Neumann's original version (1958) (where the protagonist simply and cleanly swaps heads with a fly) is replaced by the visceral, biological breakdown of Jeff Goldblum's *Seth Brundle*, as his body and mind slowly disintegrates and he transforms into the *Brundlefly*, a monstrous fly-human-machine hybrid (See Figure 55). John Carpenter's *The Thing* (1982) (A remake of *The Thing From Another World* by Christian Nyby and Howard Hawks (1951)) tells the story of an alien entity that can shapeshift between tentacled monstrosities and humans and dogs, and split itself into multiple parts (See Figure 56). *The Thing* infiltrates an Antarctic research centre and starts replacing the inhabitants with itself, with the survivors falling prey to extreme paranoia, nobody sure if one another is human, or a *Thing*. Both tales speak of a lingering horror of the complex weirdness of the world outside the comfortable human bubble, the danger of interfering with it, and the fear it might invade and contaminate that comfortable world in a way that is terrifyingly unknowable. They are stories of the weird, in which "disruptions of landscapes and categories […] produce weird and unsettling affects. Motifs of infection are central to this disruption," (Garforth & Iossifidis, 2020, p. 18).



Figure 55 : The Fly

The Fly is a visceral horror-romance by David Cronenberg (1987) where a technological mishaps caused a human scientist, Seth Brundle to mutate into a hybrid being of human, fly and machine. This film and The Thing (Carpenter, 1982) seem to speak of a lingering horror of the complex weirdness of the world outside the comfortable human bubble, the danger of interfering with it, and the fear it might invade and contaminate that comfortable world in a way that is terrifyingly unknowable.

Credit : Amblin Entertainment



Figure 56 : The Thing

The Thing (Carpenter, 1982) tells the story of an alien entity that can shapeshift between tentacled monstrosities and humans and dogs, and split itself into multiple parts, takes control of an Antarctic research centre, with the survivors falling prey to extreme paranoia, nobody sure if one another is human, or a Thing.

Credit : Universal Pictures

6.3.5 Speculative Design Techniques

The final component of the Conceptual Design Celium is a series of speculative design techniques. Similarly to the speculative fictions in the previous chapter, these techniques are included to show how the lenses, worldviews, goals and strategies of the framework can come together in complex, entangled, overlapping ways: in that case, within speculative fabulations; in this, as a foundation for speculative design practice.

In this account of the Celium, I present nine exemplar speculative design techniques or activities that are examples of how speculative design might draw on such foundations; these specific techniques were developed during the creation of the Playset, and are not as intended to be definitive or exhaustive, but were the first to be conceived of. These have been expanded into a set of 45 design techniques, grouped into the five speculative Futuring Strategies of making, play and performance, mapping, time travel and storytelling, and have been used to create a deck of Design Fabulation cards for the Playset[38].

Make Iconic Objects

> *Iconic objects from particular worlds give a strong sense of where they come from and what their world is like: think of the smartphone, Roman pottery, and Japanese katana swords. Create some iconic objects that might represent a speculative world. Then imagine how they might be used, and what they could tell about the culture they come from.*

When discussing the futuring strategy of making, I drew on a number of ideas about how an engagement with times beyond the present can be facilitated through material objects. Archaeologist Andrew Gardener said that "we have a strong sense of the temporality of artefacts, they're the things that keep us located in time, that allow us to imagine both past and future times," (personal communication, 2016); Bruce Sterling and James Auger talked about the role of diegetic prototypes as a way of invoking a particular future through presenting representative objects that tell worlds, not stories, creating a *Perceptual Bridge* between the present and a possible future. Objects that belong to a world "expand our imaginative horizons and provide new perspectives," (Dunne & Raby, 2014) "because you must play with them, performing in improvisatory way. The point is not to imagine the future, but to feel your way in that unknown dimension," (Tonkinwise, 2014, p. 186).

Gardner talked about the concept of the *Iconic Material Object*, that certain times in the past more than others have a certain pull, or weight to them: these times tend to be "marked by particular material signatures (…) whether it's hand axes or pyramids or Samian pottery for the

[38] The Design Fabulation Deck is presented in *Appendix 4*; this details all 45 design techniques and activities in full.

Romans, there are Iconic Material Objects which mark those moments," (personal communication, 2016).

This design prompt, then, draws on this idea of the iconic material object as powerful way of invoking another time, another world, and challenges the designer to imagine, and create, the objects that might powerfully invoke and allow others to feel their way towards the future that the designer is fabulating.

Devise Magic Machines

> *The author Arthur C Clarke's Third Law states that "any sufficiently advanced technology is indistinguishable from magic". So, design some machines that could exist in a speculative world and imagine (magically!) what they might do, and how Strange Strangers could interact with them.*

Imagination can be a powerful tool for material fabulation, where objects and devices can be imbued with function and ability simply through the act of make-believe. It is possible to invoke other worlds by imagining objects to have a diegetic functional role in those places and, like iconic objects, help to invoke the whole world from a single part of it. Kristina Andersen has used a *Magic Machines* technique in design workshops:

> *"aimed at uncovering new technological objects and needs using craft and embodied making [using] the notion of magic and machine as substitutes for technology to allow a broader range of responses. The workshops are an attempt to facilitate a lived experience of engaging directly with an essentially imaginary future object."*
>
> *(Andersen, 2012, p. 1)*

Nathan Shedroff and Christopher Noessel similarly explore the idea that science fiction can be a source of inspiration for designers, suggesting that old science fiction films and television shows can be viewed with a lens whereby you assume what is shown on screen is not simply a real-world artefact of low-tech special effects but is, diegetically, some advanced or unknowable technology. For example, the dream-like portrayal of rocket ship travel in George Méliès 1902 film *Le Voyage dans la Lune* (Méliès, 1902), where doors open and close as though by magic and the spaceship seems to take off with limited astronaut input, can be read as though the spaceship is equipped with an incredibly advanced, mind-controllable artificial intelligence (Shedroff & Noessel, 2012).

Write a Declaration of Rights

> *The Universal Declaration of Human Rights is a landmark document that sets out all of the rights a human should be entitled to in an ethical society. But it is limited to the human perspective. What might a More-than-Human declaration of rights be in a speculative world? What rights should all Strange Strangers be entitled to?*
>
> *"The Universal Declaration of Human Rights (UDHR) (Bogolomov et al., 1948) is a milestone document in the history of human rights. Drafted by representatives with different legal and cultural backgrounds from all regions of the world, the Declaration was proclaimed… as a common standard of achievements for all peoples and all nations. It sets out, for the first time, fundamental human rights to be universally protected."*
>
> *(United Nations, 2023)*

The UDHR is, as the UN states, a milestone document putting forward fundamental common standards for the rights of human beings. From a more-than-human perspective, though, that statement acts as a provocation for considering how the rights of other beings might, in some alternative world, be similarly protected. I explored this provocation in my MA Interaction Design project, *Citizens of Nowhere: Designing for Deep Time* (2016), where I produced a Universal declaration of Biotic Rights. I helped develop this idea for the *Mapping the Avenças* workshop in 2021, where participants were asked to imagine re-writing one of the rights in the declaration from the perspective of another being.

In this design activity, I suggest that participants explore fictional worlds by reframing the declaration and the rights within from a more-than-human perspective.

Create a Museum Display

> *Museums are spaces where the artefacts from particular places and cultures are curated, displayed and contextualised, to tell a story about their world. Design a museum display that would represent a speculative world and the Strange Strangers within it. Decide what artefacts will be displayed, and how these will be contextualised by texts and the museum design.*

In my MA Interaction Design project, I explored how the concept of the diegetic speculative prototype might be refracted through the lens of archaeology, and museum displays:

> *"Archaeologist Andrew Gardner talked about how 'artefacts are pretty important to the way human consciousness interacts with the world, and particularly we have a strong sense of the temporality of artefacts.' These often incomplete, acontextual objects offer only slices or shards of insight into a past time, but they are rich and evocative, bearing a physical continuity between now and the past. They make the past real, forensic evidence that the accounts of history are true, and not elaborate fictions."*
>
> *(Jeffcott, 2016)*

I came to explore the idea that if the items that remain to us from the distant past are a way to connect to that time and invoke it as real, the diegetic reality of speculatively designed objects could be framed as:

> *"an 'archaeology of the future', a presentation of artefacts and information with the semiotic trappings of the archaeological museum display, to evoke the sense of a distant time, imposing itself in the present through its material detritus, and curated to present an account of that time to others. Like many museum displays which centre on one or two striking objects, with the smaller artefacts presented in a context with those, I intend to create a centre point with [an iconic object] around which the other material artefacts will provide depth and context."*
>
> *(Jeffcott, 2016)*

In this project, I proposed a speculative space mission to seed the universe with life, assembling a team of people to plan the mission, and working with them to create material artefacts that might resemble it. I chose the spaceship as an iconic object of space travel:

> *"the object around which arguments for this future must surely orbit, and to which any practical arguments must attach, is a spaceship; it is central to any practical questions of biological payload, means of propulsion, destination, length of voyage, but more than that, it is a potent, symbolic technical object, suggestive of a rich network of actors upon which its existence is contingent: the physical existence of the spaceship insists that a network where it makes sense exists, too, and therefore it is a strong argument for the future it represents. It stands as the Iconic Material Object that marks out this particular future. Spaceships are often a point of particular interest in science fictional accounts of the future, often forming a locus around which the particular vision of the future in a particular narrative is centred: the various versions of the Starship Enterprise in Star Trek, the Millenium Falcon as an iconic part of the Star Wars mythos—even Tintin is most associated, besides his white dog, with the distinctive red and black rocket ship that appeared in one of his adventures."*
>
> *(Jeffcott, 2016)*

I designed a model of a spaceship intended to seed the universe with life and assembled a museum display with information cards and descriptive labels for the various assembled objects that, together, would draw a particular future to the present and anchor it there within the artefacts from that future.

In this design activity, I suggest the participants create their own museum display, designed to invoke a particular future they would like to make more real.

Put on a Drag Show

> *Drag is a subversive art form where performers adopt heightened, ironic personas that are often extreme exaggerations of gender stereotypes, but the heightened gaze of drag could be used to explore the more-than-human identities of Strange Strangers. Create a drag show that represents an aspect of a speculative world.*

Judith Butler describes drag as a way to "trouble" gender. Because gender is performative and constructed through discourse, it is defined by expressions and behaviours and is not due to some innate quality—"gender is what you do, not who you are" (Barker & Scheele, 2016, p. 79). However:

> *"we operate within strong cultural discourses of what it is to be 'a man' or 'a woman' (which are produced by and produce certain power relations). We take these on and repeat them over and over so they feel very real. And in repeating them we sustain the gender norms."*
>
> *(Barker & Scheele, 2016, p. 80).*
>
> *"Butler was clear we can't step outside the existing power relations and discourses completely [...] we have to repeat gender performance on an everyday basis. But we can do something different in how we repeat. We can create gender trouble and subversive confusing through parody, or other performances of gender, which challenge expectations... we can reveal how gender is constructed, or call binary understandings of gender into question.*
>
> *(Barker & Scheele, 2016, p. 81)*

This design technique puts forward the suggestion that drag might be a way to trouble other categories and binaries; it could be a way to explore more-than-human identities:

> *"I would always picture what I would wear presenting as a woman. As a drag queen it unlocked that part of me. I enjoy both being masculine sometimes and being feminine sometimes. I just see myself as being in this state of flux, that I'm always somewhere in the middle. It's playing around with the way you're expressing, the way you're feeling; it is playfulness. That's basically what its always come back to for me."*
>
> *(Thomas, personal communication, 2020)*

In our conversation, Rho Thomas described the way that drag performance allowed them to explore the fluid nature of their gender, as a way to play with ideas of identity, and as a way to find a community where they feel at home. Drag is a queer performative art form that traditionally uses exaggeration of traits to ironically subvert gender role stereotypes, playing with them in an ostentatious, over-the-top manner. Taking a Queer Ecological standpoint on drag is to consider how the art form may also allow for a subversion of the nature-artificial boundary: what might more-than-human Drag look like? In this design activity, participants are asked to apply the camp, heightened and performative gaze of drag to invoke the possible *Strange Strangers* inhabiting speculative worlds.

Prepare a Meal

> *Preparing food and eating together is a fundamental part of most cultures and societies. Imagine what the food culture of a speculative world could be and plan a meal that the Strange Strangers who inhabit it could share together.*

Donna Haraway writes about the importance of commensality, of sharing meals and food together as a culture, as a way to share stories and understand the ways in which we sustain ourselves. In this design technique, participants are asked to imagine hosting a meal in a speculative world they have created.

Design Passing Places

> *Passing is the concept of being able to 'pass' as a member of another category of being, particularly one that has more power or influence. It can often be mediated by objects, such as passports, and passageways through boundaries, whether physical or conceptual. Imagine and design places for Strange Strangers to pass from one category to another in a speculative world.*

During the *Ethics Committee of Dark Conservation* workshop at the *Porto Design Biennale* (Admiss, 2019), we explored the value of neglected objects, by selecting an object to be archived, and writing fabulatory archivist notes from the position of various different theoretical lenses, such as pluriversal and indigenous. The object chosen was a British Overseas Passport (issued to some

residents of Hong Kong), and I took a queer lens to writing the archive notes. I considered how this was a document that literally allows the bearer to pass through a port, which is to say, to allow them to pass through a border, a conceptual boundary between one country, or world, and another. The passport acts as a boundary object, or a key, allowing the holder to pass from one side to another.

I drew a parallel from this notion to the queer concept of *passing*, which means the ability of someone to be seen as belonging to a category that they might not commonly be perceived to be a part of. It is a term associated with trans communities and drag performance culture to refer to the ability of trans-gender people—or drag performers—to be coded as and perceived to be cis-gendered and therefore to benefit from cis-privilege—often referred to as passing privilege (Anderson et al., 2025). I considered what of the self might be lost and what gained in the process, and the boundary conditions to pass from one world to another; this draws on the notion of the queer heterotopia, of the boundaries that one must cross to enter and leave them, and the way that speculative fabulatory practices also involve a passing between diegetic worlds and 'reality'.

Passing also more prosaically means the action of two things moving close to each other in different directions; it appears in the concept of the "passing place", usually a layby on a narrow country road where one vehicle has to wait and cede the road to one coming from the opposite direction. Negotiating such a passing place involved a delicate ballet of non-verbal signalling, and understanding of who might more appropriately take precedence. I considered the connection between the passport as a boundary condition for passing, the queer sense of passing as a crossing between worlds, and the physical location in which passing might take place: in an airport, on a roadside, in a queer space, or in storytelling.

This design activity draws on all these things, asking participants to fabulate about and design places where passing might take place between different *Strange Strangers*, and to consider: what boundaries would be crossed, what the cost and conditions of passage would be, what might be gained or lost in the process?

Throw a Radical Disco

> *The Radical Disco movement was driven by architects in Italy who designed discotheques to create spaces for people to relate to each other in new ways. Plan a disco that might take place in a speculative world. Think of all the details: the location of the disco, the layout of the space, what Strange Strangers will attend, and what type of music will be playing.*

Some of the roots of speculative design lie in the radical architecture movement of 1960s Italy known as *Radical Design*. Architectural practices such as *Gruppo 9999*, *Superstudio* and *UFO* (Sword, 2015) emerged with provocative ideas about architecture and urban design that they

struggled to put into practice. From this adversity sprang the *Radical Disco* movement (Petridis, 2015).

The *Institute of Contemporary Art* (ICA) in London held a retrospective exhibition about the phenomenon in 2015; the curator, Sumitra Upham, explained that the Radical Design movement was more conceptual than commercial:

> *"These discos were among the few examples of radical design that ever got built [...] I think the discos were the only places that would have their designs. They were a new kind of neutral space where there were no boundaries between disciplines like architecture, art and music."*
>
> *(Upham, as cited in: Petridis, 2015, para. 9)*

These nightclubs had a concretely utopian ethos, of experimental and heterotopic spaces where prototypes of new ways of being could be explored and acted out: "they hoped [these discos] would act as a catalyst for artistic and social change, and clubs were to be at the forefront of their increasingly sideways visions," (Sword, 2015, para. 2) (See Figure 57).

Nick Compton writes that:

> *"these architects saw discothéque design as a means of personal and professional liberation and experimentation [where] the nightclub had a political purpose as a new kind of multi-disciplinary space, socially and architecturally radical."*
>
> *(Compton, 2015, para. 3)*

There is a clear parallel here to the futurity of queer heterotopias that Muñoz described, where a space outside of the normative world is created and possible futures or worlds can be enacted through play (Muñoz, 2009).

This design activity is grounded in that *Radial Disco* movement, and asks the designers to consider how the world of their speculative narratives could be invoked or represented through a disco or party.

Elect a Parliament of Things

> *A parliament of things is a thought experiment to consider that all things, human and more than, need political representation. Imagine what Strange Strangers could be elected to a parliament of things in a speculative world and what their roles in the parliament would be.*

Bruno Latour proposed the *Parliament of Things* as a cosmopolitical thought experiment into the agency and representation of more-than-human beings and things. He rejected the division

between humanity and nature as artificial, and embraced the hybridity of human and non-human, natural and artificial, living and inert. His Parliament of Things is a provocation for a constitutional politics for a hybrid, entangled reality: how are all things and their agency to be represented in a true cosmopolitics (Latour, 1993).

This design activity takes the concept as a starting point for designers to fabulate about the political constitution of fictional worlds and possible futures, and consider how the *Strange Strangers* that inhabit it might come to arrange their affairs to co-exist together.



Figure 57 : Radical Disco

Radical Disco emerged out of an architecture movement of 1960s Italy, Radical Design, which is one of the antecedents of modern critical and speculative design practice. More an architecture of concepts rather than commercial projects, the proponents applied their radical ideas to the design of nightclubs and discotheques, creating heterotopic spaces where different ways of interacting, co-existing and sharing spaces could be experimented with.

Credit : Institute of Contemporary Art, London.

Reflections on Chapter 6

Chapter 6 establishes a prototype of a Conceptual Design Celium to support Biodiverse Speculative Design practice, referencing mycelium, an entangled more-than-human meshwork through which fungi form part of a wider ecosystem and allow for the emergence of mushrooms. This Celium is an example of how design can mediate the tension between the general and the specific, between designing as a practice and design as an artefact. In this case, the design of the Celium pulls together many diverse and transdisciplinary discourses regarding marginal approaches to future-making, giving these ideas structure and making them accessible to support acts of speculative design. In this regard, it sits close to the general end of the transitional design spectrum, around the role of Design Paradigms and design practices—in fact, the Celium itself is structured along a condensed version of that spectrum, reaching from paradigmatic lenses worldviews and goals to more practice-oriented strategies, narrative archetypes and design techniques. It also provides an example of possible, transitional foundations for a Biodiverse Futures Design Programme.

Through the lenses of more-than-human and queer perspectives, a worldview was established: of **Matter** rooted in an ontological ground of molecular flows and rifts, anti-categorial beings that are defined by their **Encounters** or intra-actions with others, an approach to **Time** as a thick temporality in which the present, futures and pasts coexist, of **Place** as the co-created shared environment in which encounters happen, and **Narrative** as the way in which these are drawn together, as the world makes a sequential account of encounters between beings located in place moments in time.

Within this worldview, the three important future-making goals are **Care** (caring about and taking care of beings and ecosystems), **Collective Action** (the labour to protect and promote diversity in the singular ecosystem of humans and the more-than-human environment), and **Seizing Futures** (staking a claim for a better future).

Within these bounds, five strategies were established, each representing a specific part of the worldview of the framework.

Making is the material strategy, related to the ways in which futures can be bound up as possibilities within artefacts, and the power of design to materialise ideas; **Playing and** Performing is the encounter-based strategy, related to the ways in which futures are performative and interactions between beings can be framed as play; **Time Travelling** is a strategy of temporality, using speculative forms of time travel to explore alternative presents and presents according to pasts different to those that happened, and possible or impossible futures; **Mapping** is a strategy of making sense of and making and remaking relationships, connections and orientations between places, beings, and ideas; and, perhaps most importantly,

Storytelling (and particularly fabulation) as a narrative strategy, drawing on the power of stories to make-believe, engage and inculcate an ethical responsibility towards other beings.

The Conceptual Design Celium concludes with more contextual and grounded examples of how these lenses, worldviews, goals and strategies can be present in speculative practices in fabulation and design, by providing scaffolds or foundations for speculation through story archetypes and design techniques.

The Conceptual Design Celium represents a structuring and activation of ideas which can form the foundations of a Speculative Design Practice, but it represents them in a high level of abstraction and, therefore, has more relevance as an exemplar for designers: a form of research for design. However, this project's focus is on supporting speculative practices in communities, and therefore requires a more direct and arguably more materially tangible artefact or set of artefacts that will activate these ideas in a more direct, graspable way; the next part of this thesis details the process of developing a set of artefacts through game design to demonstrate an example of how this might be achieved, in the creation of the *Strange Strangers in Strange Lands* Playset.

Chapter 7

STRANGE STRANGERS IN STRANGE LANDS PLAYSET

By being unknowable, by resulting from events which, at the sub-atomic level, cannot be fully predicted, the future remains malleable, and retains the possibility of change, the hope of coming to prevail; victory, to use an unfashionable word. In this, the future is a game; time is one of the rules.

Iain M Banks, *The Player of Games* (1988, p. 48)

Introduction to Chapter 7

Chapter 7 presents the concept and development of the *Strange Strangers in Strange Lands* Playset, a game-based speculative design playset which builds on and materialises the conceptual structures of the Conceptual Design Celium.

Chapter 7.1, *Planning the Playset* explains the rationale for developing a design playset, with a discussion of the aims that were hoped to be achieved through designing it, and the reasons why I decided to develop it as a game-based resource are discussed.

Chapter 7.2, *Playset Overview*, presents an annotated portfolio of the prototype of the *Strange Strangers in Strange Lands Playset*, detailing its game objects, game activities and rules.

Chapter 7.3, *Designing the Playset*[39], details the design process through multiple iterations of the Playset, and takes the form, alongside the relevant figures, of an extended annotated design portfolio. Each iteration was tested in workshop settings, and the details of these workshops is given, detailing the process, outcomes, and reflections on how they contributed to the design process.

Chapter 7.4, *Reflections on Playset Design and Testing*, is a reflection on the design and testing process, drawing on participant feedback and designer led reflection on practice.

This chapter makes use of a first-person singular authorial voice in those sections that comprise a reflection-on-practice.

[39] Chapter 7.3 incorporates and expands on elements of *Designing a Speculative Design Toolkit for Community Biodiversity Activism* (Jeffcott & Ferreira, 2022)

7.1 Planning the Playset

7.1.1 Materialising the Celium

The Conceptual Design Celium brought together queer and more-than-human perspectives and Futuring Strategies from lived experience, speculative fiction and theoretical concepts, with the synthesis of a conceptual structure for situating speculative Design Practice for Community Biodiversity Activism. Using a post-structuralist and new materialist lens of Queer Ecology lens (encompassing queer and more-than-human perspectives), the Celium is situated in a particular onto-epistemology or worldview (considering the aspects of matter, encounters, space, time and narrative) and comprises: three strategic goals for biodiversity activism (care, collaboration, and seizing futures); five futuring strategies (making, play and performance, time travel, mapping, and storytelling); eight speculative narrative structures, and nine design fabulation techniques.

While the Celium is conceived as part of an assemblage of artefacts that will collectively support speculative practices for biodiversity activism, it is in itself rather an abstract artefact, presenting some general concepts and ways of thinking about speculative design in the abstract. Returning to Johan Redström's assertation that design research and theory exist in a space of tension between the general and the specific (Redström, 2017), the Celium leans more towards the general, conceptual, and paradigmatic; it is an assemblage of principles and perspectives that form a Design Paradigm, and are the basis of a Design Practice. There exists a gap of utility, particularly when considering the context of community activists outside of a design background, that needs to be bridged to allow such a conceptual framework to support the specific creation of design futures and associated artefacts; a materialisation and manifestation of these concepts that can be used in more practical ways. While it may certainly offer some concepts of interest to communities of biodiversity activists, this Celium alone offers only limited guidance, and no practical support to community members to undertake speculative activities.

Transitional design assemblages (such as a Design Programme) that lie on the balance point between more abstract generalities of design (such as Design Paradigms and Practices), and more specific Design Projects and Products (artefacts), are framed as theoretically interesting by Transitional Design Theory (Redström, 2017). This chapter considers the development of a design Playset that represents that balancing point: a transitional assemblage of artefacts that occupy that important moment between the general and specific, bridging the gap between theoretical strategies and community design outcomes.

I originally framed this in the research proposal as a creation of new design tools and techniques. But this proved to be challenging and even, I reflected, somewhat arrogant. Design methods and

techniques are porous: as Gaver explains, they are under-described by theory (W. Gaver, 2012); they are either hyper-specific to a particular context, or incredibly general categories of action. Which is to say is that to make a claim of an entirely new design technique or tool is difficult to prove or justify—it's an untestable claim and, given the deep and broad history of design practices, rather a tall order.

More feasible, and frankly, more compelling, as both a contribution to Design Practice and as a contribution to knowledge, is using the Celium as the situated context for gathering together existing methods, techniques and approaches from design and elsewhere, designing a series of artefacts that allows them to be deployed in a Community Biodiversity Activism context.

7.1.2 Toolkit to Playset

Initially, I proposed to develop a Design Toolkit; toolkit, as a concept, felt apt here. Archetypally, a toolkit is a literal set of physical tools that are assembled to support certain making activities, such as woodworking, or jewellery making, or plumbing. Crucially, a toolkit is not a single purpose tool for a specific task or technique, but a collection—an assemblage—of individual tools that together can support a repertoire of practices. Such repertoires may involve certain specific techniques, facilitated by certain tools, that are combined in different ways; they are not tactics to achieve a particular aim, but the collection of possible ways of doing available to a practitioner to achieve such an aim, and a toolkit is a set of supportive artefacts that facilitates this process.

Design toolkits are a common element of design and design-research practice, with toolkits that are either sets of physical objects, or conceptual tools to support design activities.

However, as this assemblage took shape, the toolkit increasingly felt like a name that didn't quite fit, at least in all contexts. Both the principles of the Celium, and the types of activities and processes I wanted to facilitate, would point towards an assemblage that, in many ways, functioned as a game, or as a series of games; I have discussed the potential of speculative design Games in Chapter 3.1.5. Furthermore, the concept of play, and encouraging a sense of playfulness and make-believe, was important to foreground. Having said this, the flexibility of a toolkit in facilitating a repertoire of related practices was also worth preserving. This led to the question of what might a toolkit that facilitates a repertoire of play and gaming be called. I touched briefly on *Compendium*, a traditional set of board games such as chess and draughts and cribbage in a single box, with common game objects, but then settled on *Playset*—literally a set for playing—a term which tends to refer to a children's toy assemblage that provides items for make believe play, as a doctor or veterinary surgeon or a plumber.

7.1.3 Playset Requirements

How might a putative design playset support biodiverse speculative design for future-making in Community Biodiversity Activism settings, and what would such a playset look like? To answer that, it is important to consider what might be required of such a playset, and what purposes it would serve.

This speculative design playset is intended to scaffold and support different speculative fabulation and design activities involving lay people (i.e. non-designers) that draws on and that materialises the Conceptual Design Celium. Based on this, there are a few requirements for the playset, which can be considered the Design Brief for this research stage.

Design Brief

To design a playset that:

1. can make the complex and abstract concepts of the Conceptual Design Celium accessible and utilisable for lay people; therefore, it will be engaging and tangible;
2. embodies and facilitates the materialisation of the key principles of the Celium:
   a. Queer Ecology and the concept of the *Strange Stranger* will be a central guiding principle for the Playset;
   b. it should be situated onto-epistemologically within the worldview of the Celium;
   c. it should embody the three Strategic Aims for Biodiverse Futures;
   d. and the five Futuring Strategies of Making, Play and Performance, Time Travel, Mapping, and Storytelling;
3. supports players in speculative fabulation and speculative design acts within these conceptual framings;
4. does not support a single task, but a repertoire of biodiverse speculative design practices, with a set of game objects and gameplays that can be used in concert or in isolation for a number of different tasks, projects or goals, that vary in terms of timescale, impact and level of design competency of the participants
5. can facilitate a "complete" speculative design project, from concept framing and contextual research to fabulation and design outcomes;
6. represents a prototype of how Community Biodiversity Activism can be supported by Speculative Design.

7.2 Playset Overview

In this section, the Playset is presented in its most fully developed form, detailing the Gameplay Activities and Game Objects within it; the following section gives a detailed account of the design process. I have chosen to present the most complete version of the Playset first to give better context and an overview of its key elements (See Figures 58, 59 & 60).

The Playset is titled *Strange Strangers in Strange Lands: A Biodiverse Speculative Design Playset* (Hereafter referred to as *Strange Strangers in Strange Lands*, *Strange Strangers in Strange Lands Playset*, or simply, the Playset); both to reference Morton's *Strange Stranger* (Morton, 2010), and as queer, more-than-human and pluriversal play on the title of *Stranger in A Strange Land* (Heinlein, 1961), a novel about a (human) Martian who visits Earth and finds himself in a confusing and unfamiliar world.

Presented in a small box, the Playset contains small game objects that will facilitate a number of gameplay and design activities. The Playset is designed to be modular, with most of the games able to be played in a standalone way or in combination with each other. Taken together, the games and activities are designed to facilitate a self-contained speculative design project, going from an **Icebreaker** activity, through **Contextual Research**, speculative fabulation of possible futures and elseworlds through a **Storytelling Game**, a **Debating Futures** activity based on discussion of possible futures, and a **Speculative Design Challenge** aimed at manifesting these futures.

Furthermore, the Playset is designed to be usable in a variety of community settings, whether community-directed or designer-led; from casual gaming sessions, workshops for a single afternoon to a week or more, to extended community design projects over months or years.

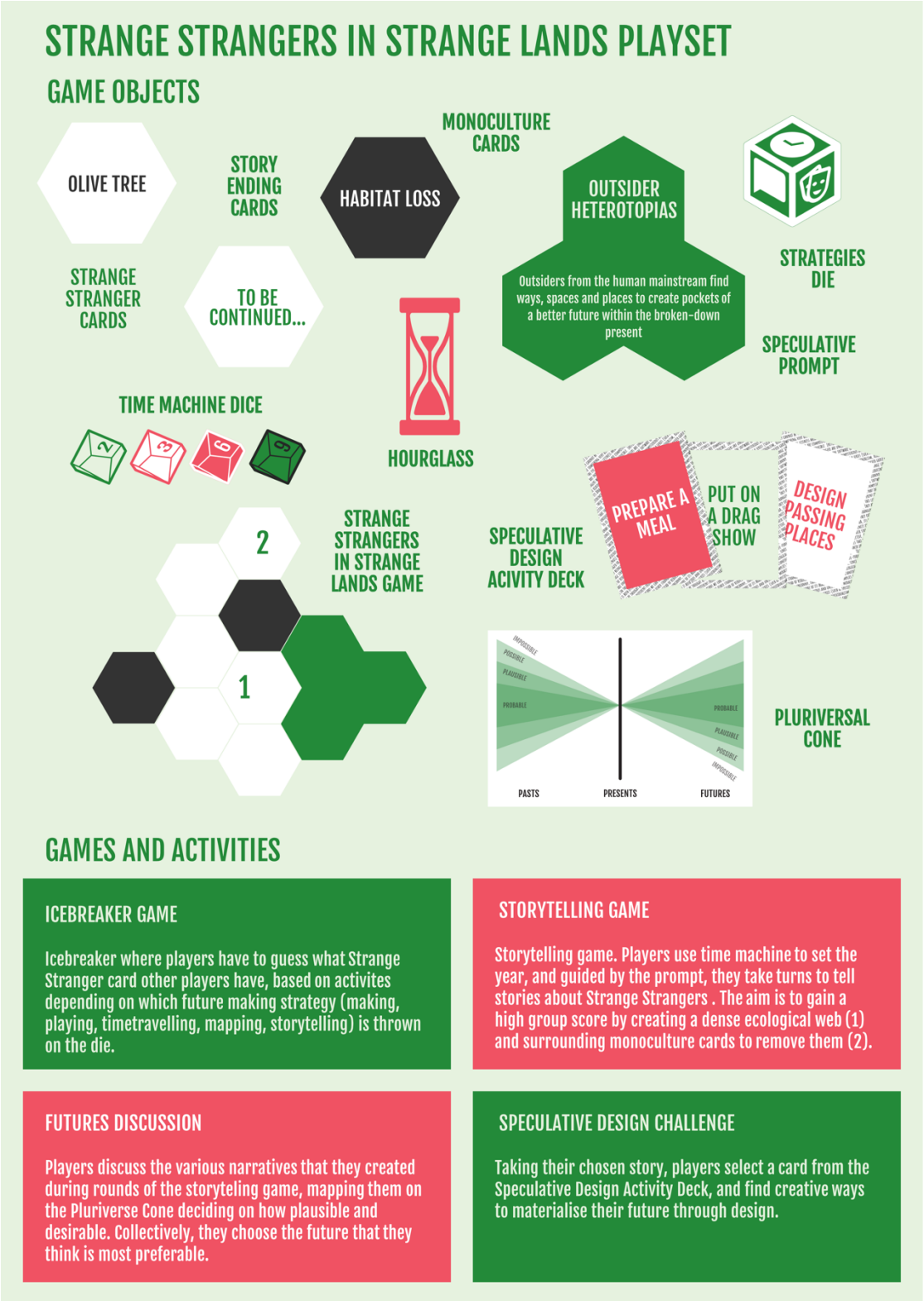


Figure 58 : Strange Strangers In Strange Lands *Playset : Overview Diagram*

An overview diagram of the Playset, showing its game objects and games and activities.

Credit : Diagram by Craig Jeffcott. Icons from Noun Project (thenounproject.com) under CCBY 3.0 attribution licence (Dice by Rafaël Massé; d10 by Lonnie Tapscott; Hourglass by Symbolon)

7.2.1 Game Objects

These are the objects that build up the Playset, for use in games and design activities.

Gameplay Tiles

The current version of the Playset contains laser-cut and -engraved wooden gameplay tiles; in an earlier prototype, these tiles were printed with ink on card. This earlier prototype has been reworked as a version of the playset that can be shared digitally, allowing designers and community members to print their own copy of the Playset: these are presented in *Appendix 3 : Gameplay Tiles (Card Version)*.

Hexagonal Tiles

Regular hexagon-shaped wooden tiles, side length 25 mm, 2mm deep, laser-engraved and cut.

Strange Stranger Tiles

Plain varnished tiles engraved with the name of a Strange Stranger: a being that might exist in the ecosystem of a speculative setting. These can be tailored to the local ecosystem—I have made Lisbon, Glasgow and Monterrey specific versions—and are intentionally varied, to embody the conceptual framings and the figure of the Strange Stranger: they include animals, plants, fungi, people, mythical entities, inanimate objects, and extraplanetary bodies. Used in most Playset activities (See Figure 61).

Monoculture Tiles

Grey varnished tiles engraved with the name of an agent of Monoculture, such as pollution, racism, or deforestation, for use in the storytelling game (See Figure 61).

To Be Continued... Tiles

Blue varnished tiles engraved with the text “To Be Continued...”, for use in the storytelling game.

Speculative Prompt Tiles

Wooden tiles in the shape of irregular dodecagons (i.e. three regular hexagons combined), same side length and width as hexagonal tiles, painted red or green and varnished. Each is engraved with a Speculative Fabulation Prompt as discussed in the Celium (such as Strange Strangers in Strange Lands, Radical Intimacy, or Outsider Utopias). To be used in the Collaborative Storytelling Game.

Tile Bag

A small canvas bag to place the tiles into during gameplay, so that players cannot see which one they are selecting during gameplay.

Dice

Futuring Strategy Die

A six-sided die, with a graphic representation of one of the five futuring strategies on its sides[40] (and a sixth throw again side; it's geometrically impossible to make a regular five-sided volumetric shape). For use in the Icebreaker and Design Challenge. Two versions of this were created, a 2 cm^3 3D-Printed PLA version, and a 3 cm^3 wooden laser-engraved version.

Time Machine Dice

Four ten-sided dice, with the numbers 0-9 on their sides, in a small canvas bag. This is a "time machine"; throwing the four dice generates a four-digit number, which represents the year, from 0 – 9999CE, when a speculative story is set. Used in the Collaborative Storytelling Game.

Design Fabulation Deck

A deck of 45 cards, 9 x 6.5 cm wide (playing card size), in a sleeve. The cards are divided into five suits, one for each futuring strategy—each card has a logo to indicate the strategy—with a speculative design prompt or technique on one side, and a description of the prompt on the other. These design prompts and techniques are informed by the conceptual framings of the project, and the goals, strategies and worldview of the Celium. These cards could be used in the in the Speculative Design Challenge or could be simply used in a standalone manner by designers and others to generate ideas for speculative design projects. An image of the cards can be seen in Figure 67; the full deck is displayed in *Appendix 4 : Design Fabulation Deck*.

Worksheets

Hexagonal Grid

A grid of hexagons, for use in the Icebreaker Game.

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[40] Making (a hand) Mapping (a compass rose) Storytelling (a speech bubble) Time Travelling (a clockface) Playing and Performing (theatrical masks)

Situation Report

A two-sided worksheet for filling in information about the local ecological and biodiversity contexts. For use in the Situation Report activity (See Figures 62 & 63).

Pluriversal Cone

A modified Future (Voros) Cone that represents multiple possible futures and pasts radiating out from the present, for use in the Debating Futures activity (See Figure 66).

Sand-timers

Sand-timers representing a variety of times, typically 30 seconds and 1 minute, though longer ones can be used, depending on the situation. For use in Icebreaker and Storytelling Game, to maintain a certain gameplay pace.

7.2.2 Gameplay Activities

Icebreaker Game

Rationale

This game was intended as an icebreaker, that would both engage and energise the players, as well as to prime them to the conceptual figure of the Strange Stranger, and the five speculative futuring strategies from the framework.

Context

The ice-breaker game was designed in the mould of competitive parlour guessing games like *Charades* (Cambridge University Press, 2025a) and *Pictionary* (Angel & Everson, 1985), the board game *Guess Who?* (Coster & Coster, 1979), where, through a process of elimination, players have to guess which character from an array of portraits the other player holds, and the party game *Celebrity Heads* or *Forehead Detective* (The Guardian, 2008), where players have to guess using yes or no questions which celebrity is written on a sticky note attached to their forehead. Some inspiration was also taken from some of the silly tasks given to contestants on the TV gameshow *Taskmaster* (Horne, 2015), particularly a task where one participant had to guess which animal another player was portraying.

Game Objects Used

Strange Stranger Tiles, Tile Bag, Speculative Strategy Die, Sand-timer, Web of Life Worksheet.

Additional Resources Needed

Writing Tools, Paper, Sculpting and Crafting Materials (optional), Flipchart (optional).

Gameplay

Players are grouped into teams. On their turn, the Current Player selects a Strange Stranger Tile from the bag. The Current Player then throws the Futuring Strategy Die to select one of the five Futuring Strategies (*Making*, *Playing and Performing*, *Time Travelling*, *Mapping* and *Storytelling*).

The Player has to turn the Sand-timer and adopt the role of the Strange Stranger on the tile, getting their other team members to guess what they are in the available time. Their actions to represent their Strange Stranger are determined by the future-making strategy that comes up on the die: Making requires them to draw, sculpt or otherwise make a representation; Playing and Performing requires them to act it out; Storytelling requires them to tell a story without using the word on the tile; Mapping requires them to map out their ecosystem connections; and Time Travel requires them to describe their past and future evolution.

Their team members would try to guess their identity based on their answers. If they guess correctly, they get to retain the tile, and gameplay passes to the next team. Following as many rounds as time or enthusiasm allows, the group with the most tiles remaining wins.

Situation Report

Rationale

To provide a real world, local environmental context for speculative fabulation and design. The playset is designed to be usable either as a completely open speculative activity, or to be applied to a particular environmental challenge or context, which this activity will provide.

Game Objects Used

Situation Report Worksheet (See Figures 62 & 63).

Additional Resources Needed

Writing tools, Paper, Internet Devices (optional), Notebook (optional), Outdoor Clothing (optional), Guide (optional), Reference Materials (optional).

Gameplay

Individually, collectively or in small groups, players are asked to complete a Situation Report using the worksheet provided. This provides information about an environmental challenge in the local area, and will include the Strange Strangers involved, setting some community action goals, and mapping out the affected ecosystem on a hexagonal Web of Life (which introduces a key conceptual and structural element of the Collaborative Storytelling Game).

To complete the worksheet, the players can rely on their collective local knowledge, use reference materials, or carry out field work in the local environment.

Collaborative Storytelling Game

Rationale

The Collaborative Storytelling Game is designed to create a space for players to collaboratively create and fabulate about speculative futures and elseworlds, framed by queer and more-than-human lenses through the perspective of the conceptual figure of the Strange Stranger.

Context

In this storytelling game, players take turns to collaboratively tell stories of possible biodiverse futures or alternative presents, using hexagonal tiles representing a variety of Strange Strangers, to build up a dense web of life. The storytelling dynamic of the game—playing tokens with the aim of telling a story—is inspired by James Wallis's *Once Upon a Time* (Wallis et al., 1993) card game, while the construction of a game-board from smaller tiles is inspired by *Carcassone* (Wrede, 2000), and the concept of mapping from the framework as a way of creating a place (See Figure 64).

This is the core activity of the Playset, designed to facilitate the process of collaborative speculation and allowing for a bridge between conceptual framings, real-world contexts, and creative design acts.

Game Objects Used

Strange Stranger Tiles, Monoculture Tiles, To Be Continued… Tiles, Tile Bag, Speculative Prompt Tiles, Sandtimers, Time Machine Dice.

Additional Resources Needed

Large Tabletop, Recording Devices (optional).

Gameplay

Before gameplay begins, the hexagonal tiles are mixed in the tile bag, and the speculative prompts are laid out face down. One person takes on the role of *World Runner*[41] , who will guide the gameplay as needed, and make decisions on any questions that arise. Typically, if the game is being played in a workshop setting, the World Runner would be the facilitator, but it could be any player. The World Runner may also wish to appoint or take on the role of Scribe to write down or make a recording of the stories, which may be useful for the design challenge.

At the start of the game, four 10-sided dice, which represent a time machine, are thrown—the four digits represent a year between 0 CE and 9999 CE—and a Speculative Prompt Tile is chosen at random and laid on the centre of the table—this gives a prompt, an archetype of a speculative fiction story, for players to start their story. The first Player selects a tile from the tile bag (if it is not a Strange Stranger Tile, it should be replaced) and places it on the table aligned with one side of the Speculative Prompt. The Player then begins to tell a story inspired by the prompt, that incorporates the *Strange Stranger* on the tile. They are allowed to fabulate until the sand timer runs out. Players then take turns to select tiles, and adding them to the story, building on what went before. The rule is that each player must incorporate every hexagonal tile their card touches into their part of the story (See Figure 65, 1-4).

This is a collaborative game, with a collaborative scoring system; players have to work together to maximise their Biodiversity Score (see below). The primary gameplay objective is to build as dense a web of life as possible, maximising connections between tiles. The grid of hexagonal tiles is representative of a biodiversity network, with the symbolism that a dense network of beings interacting is a healthy network and one that should be worked towards. At the end of each story, the group receives a Biodiversity Score, which is a count of how many connecting edges in the web of life exist. A tight core is more resilient than a linear network and has a higher Biodiversity Score, but it means that the stories must be more complex, more entangled, and so more of a challenge for the player (See Figure 65, 5 & 6).

A secondary gameplay objective that players will encounter appears in the form of Monoculture Tiles—these are beings or concepts that lead towards a monocultural, rather than a biodiverse future. When one of these tiles is played, it must cover one of the Strange Stranger Tiles on the

[41] *World Running* is a concept Jay Springett describes as: "akin to show running in television, [World Runing is] an emerging discipline concerned with the practice of guiding and overseeing the development, maintenance, and evolution of worlds," (2025b, Section Introduction). A parallel can be drawn from a World Runner to the Games Master or Dungeon Master role in role-playing and storytelling games, the player who guides and shapes the emerging narrative. Given that prototyping the emergence of new fictional worlds is a core function of this Playset, I have chosen World Runner as the more appropriate term.

table, removing it from the ecosystem, both on the table and within the story (though only one of the tiles with an open edge; any Strange Strangers Tiles completely surrounded by six others is protected by the dense ecosystem web). The Monoculture tile can be removed, if the Players work together to surround it by Strange Stranger Tiles. This has an important impact on the Biodiversity Score: each edge connection to a monoculture card carries a negative point score (See Figure 65, 7-9).

The story ends when a To Be Continued… Tile is drawn; the Player who draws it should bring the story to a satisfying conclusion (if this tile is drawn at a point in the story that the World Runner believes is too soon, it can be returned to the bag; equally, if the game is operating in a tight schedule and the story runs on too long, they can declare the story has ended). Then the Biodiversity Score for the story is calculated. The game can end at this point, but it is recommended that Players play at least two further rounds, using other Speculative Prompts to make new fabulations, and to attempt to improve on their Biodiversity Score.

Debating Futures

Rationale

An important aspect of speculative practices is their discursive and rhetorical role: in making an argument for or against a particular future, or elseworld. This activity is designed to encourage Players to compare, contrast, and think critically about the different futures they have created, considering how likely and how desirable these are.

Context

This activity is based on the Voros or Futures Cone, a tool which is commonly used to visualise possible futures. I argue elsewhere in this thesis that this is a somewhat problematic futuring tool, as it assumes a single objective present rather than pluriversal multiple subjective presents (Carey et al., 2021; Tonkinwise, 2014), but this can form part of the discussion. It uses a variant of the Futures Cone which represents expansive pasts, as well as futures (Coulton et al., 2016), as a playing board for players to map out the fictional worlds.

Game Objects Used

Pluriversal Cone Worksheet (See Figure 66), Stories from Storytelling Game

Gameplay

This activity depends on having completed more than one round of the Storytelling Game.

As a group, players map out where the stories lie on the timeline. They have to consider when they take place, as well as where they lie on the axis of probability, deciding to position them from probable, plausible, possible and impossible futures.

Following this mapping, the players are asked to decide, collectively, which of their stories represents the most preferable future. During this exercise, they will be asked to reflect on the Biodiversity Score of each story and how that might influence their decision; they might want to ask whether the higher scoring stories are more or less favourable, and if so, why.

Speculative Design Challenge

Rationale

This final activity in the Playset is designed to build on the speculative fabulation from the storytelling game—along with the sensitivity developed to the Strange Stranger mindset, ecological contextual research, and the futures debate—and to materialise the speculative worlds through speculative design.

Context

This task uses the deck of 45 Design Fabulation cards (See Figure 67), which are based on speculative design techniques as well as some techniques derived from the wider literature, as discussed regarding the Conceptual Design Celium.

Game Objects Used

Speculative Design Fabulation Deck, Stories from Storytelling Game

Additional Optional Resources

Paper, Writing Tools, Art and Craft Supplies, Fabrication Machines, Internet Devices, Creative Software, Costumes, Performance Spaces, Musical Instruments, Recording Devices, Transportation, Kitchen, Food, Expert Practitioners and Performers, and anything else that could be useful!

Gameplay

Players can work individually, in groups, or a one single group, depending on the circumstances.

Players or Groups choose or are given a Design Fabulation card. The way this is done can be open to the judgement of the World Runner, perhaps through random selection, or by throwing the Strategy Die to select the type of design strategy to be used. In group settings, group

members can be dealt some cards, each member chooses a design prompt from their hand, then the team chooses a prompt from those choices. If there are multiple design groups or teams, each could be directed to focus on a different futuring strategy.

However this is managed, Players are instructed to follow the design activity for a particular speculative fabulation; all groups could be directed to respond the favourite world chosen in the Debating Futures exercise, or Players or Groups can choose another if they prefer.

They should then be given time (it could be 10 minutes in a short workshop, an afternoon or week in a longer, more design-oriented workshop, or an extended design process in an ongoing design project) to explore their chosen world using the speculative technique on their card. In a workshop setting, participants should be invited to present their design ideas to the group once these have been completed.



Figure 59 : Current ("Final") Iteration of Playset

The current iteration of the Playset, showing Strange Stranger, Monoculture, and To Be Continued... Tiles, Speculative Prompt Times, Sand Timers, Time Machine and Strategies Dice, and the Design Fabulation Card Deck.

Credit : Craig Jeffcott



Figure 60 : Boxed Playset

The Strange Strangers in Strange Lands Playset was designed to pack into a small box, for convenience of transport, but also to invoke the sense of the diegetic void contained by the box, from which many worlds might be unpacked and made real.

Credit : Craig Jeffcott



Figure 61 : Gameplay Tiles

A selection of Strange Stranger *Tiles (in natural wood) and Monoculture Tiles (in grey wood) from the* Strange Strangers in Strange Lands *Playset. The Strange Stranger Tiles represent a range of beings, from fungi, plants, animals, people, materials, technology and fantastical entities.*

Credit : Craig Jeffcott



Figure 62 : Situation Report Worksheet : Page 1

The Situation Report Worksheet is designed to allow players to situate their speculative fabulations in a local environmental context; the first page asks them to identify a local biodiversity challenge, to identify the beings involved, and to set some community action goals.

Credit : Craig Jeffcott

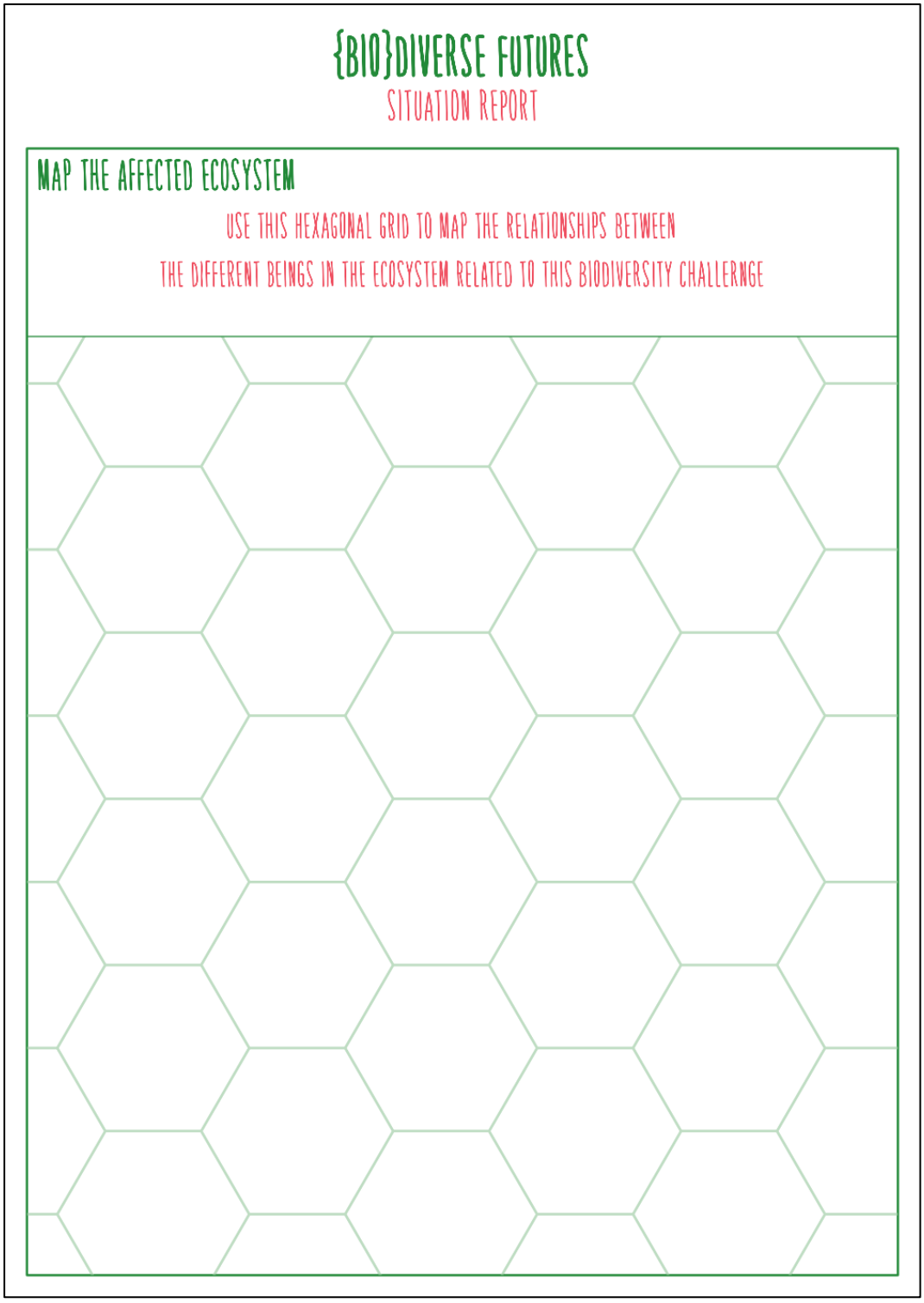


Figure 63 : Situation Report Worksheet : Page 2

The Situation Report Worksheet is designed to allow players to situate their speculative fabulations in a local environmental context; the second page asks them to map out relationships between beings in the ecosystem on a hexagonal grid, introducing the same concept as in the Collaborative Storytelling Game.

Credit : Craig Jeffcott



Figure 64 : Collaborative Storytelling Game : Game in Progress

This image shows a completed round of the Collaborative Storytelling Game. Players are telling a story set in the year 9472, based on the speculative scenario THE ECOSYSTEM STRIKES BACK! Each player places a Strange Stranger Tile on the 'board' and incorporates that being into the story. The aim is to build as dense a network of biodiversity as possible; the score for the game is based on how many sides of the tiles touch. The grey Monoculture Tiles give a negative score and remove another being from the game and story; players have to try to surround and remove them from the fictional world.

Credit : Craig Jeffcott

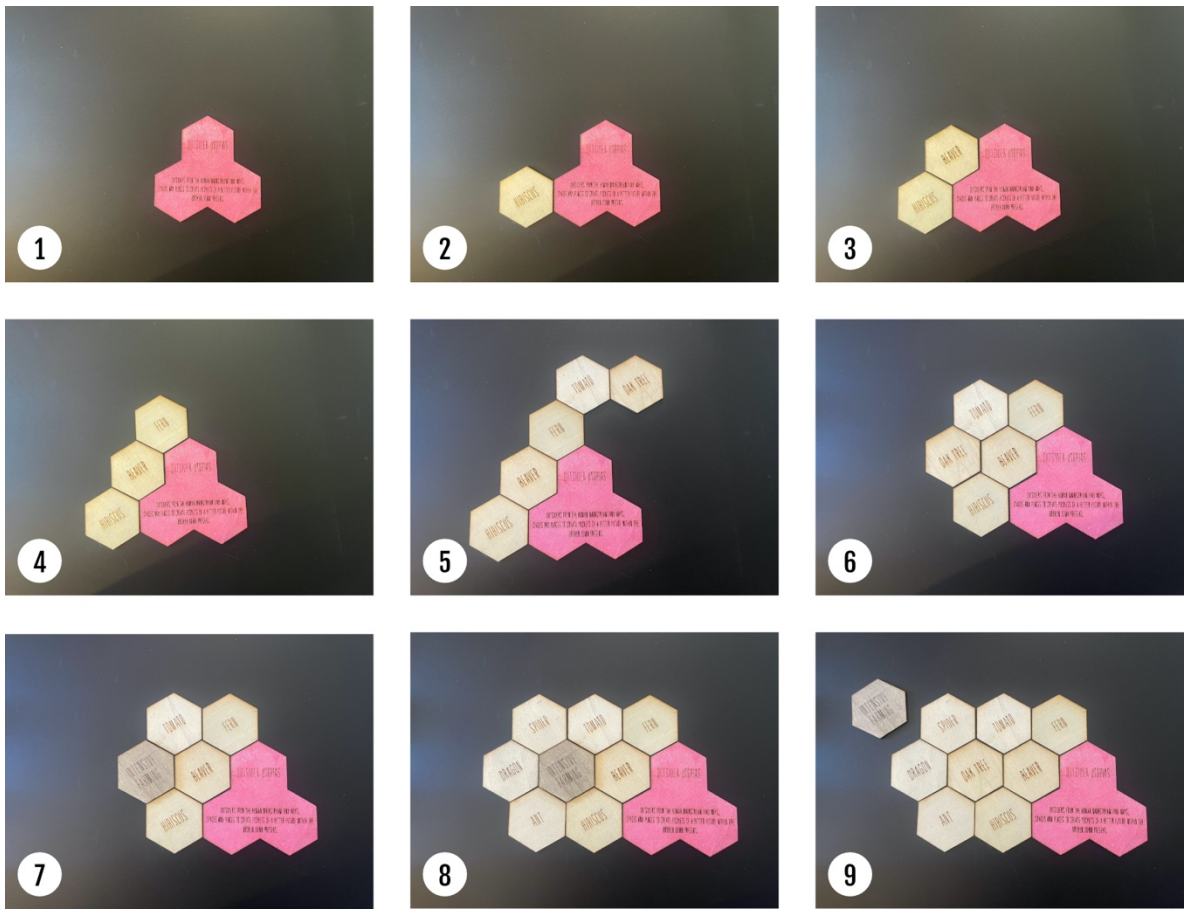


Figure 65 : Collaborative Storytelling Game : Gameplay

These images show the progress of gameplay in the Collaborative Storytelling Game, illustrating the two game objectives: (1) The Speculative Prompt tile is chosen; (2) The first player plays a Strange Stranger tile against a side of the Prompt tile, and begins to tell a story based on the Prompt, about the Strange Stranger; (3+4) Subsequent players place their tiles adjacent to the side of an existing tile, and have to incorporate Strange Strangers they touch into their part of the story; Biodiversity Score points are scored collaboratively, with +1 point for each touching edge between Strange Stranger Tiles, therefore (5) would score +4 points, but (6) would score +6 with the same tiles. The first objective of the game is to build a dense network of biodiversity, to maximise the Biodiversity Score; (7) Monoculture Tiles reduce biodiversity of the ecosystem, so they cover up a Strange Stranger Tile, removing it from the web of life. These tiles result in a -1 score where they share an edge with a Strange Stranger Tile, so the Biodiversity Score in this game drops from 7 to 1; The second objective is to oppose monoculture by removing the Monoculture Tiles from the board, which is achieved by surrounding the Monoculture Tile (8) which means it is removed from the ecosystem (9), restoring the Strange Stranger Tile and increasing the Biodiversity Score, from 2 to 14.

Credit : Craig Jeffcott

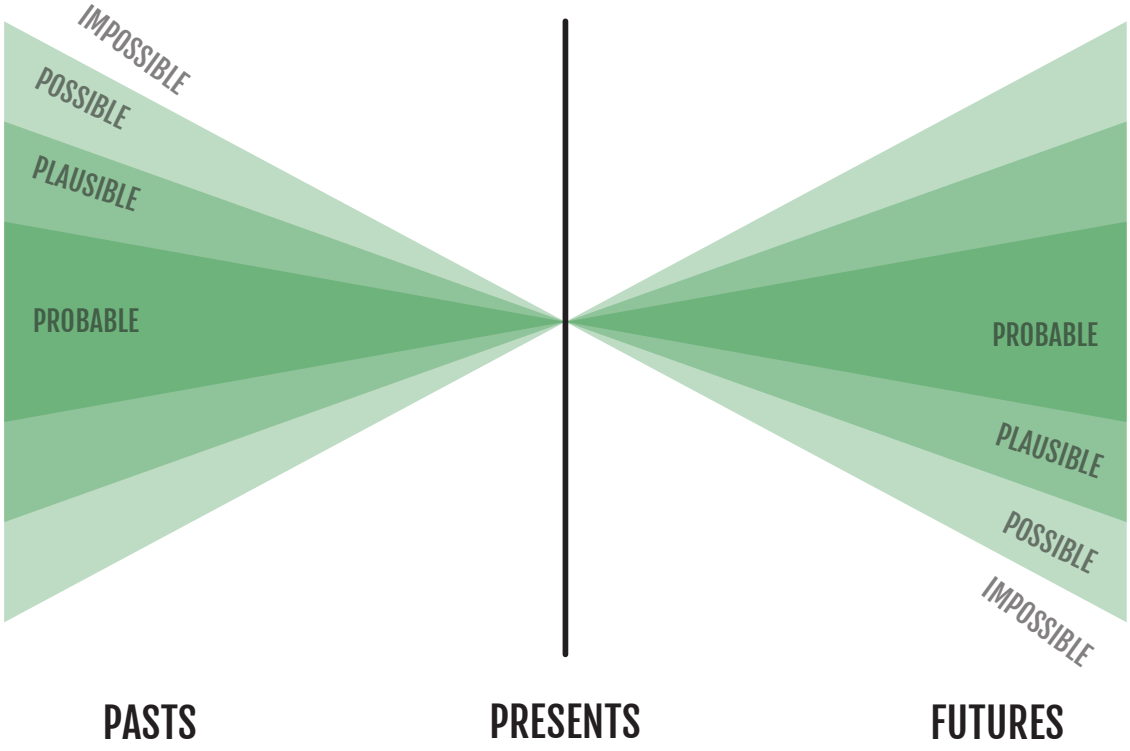


Figure 66 : Pluriverse Cone

This adapted version of the Future or Voros Cone according that proposed in (Coulton et al., 2016) is used as the basis for a Playset discussion activity where participants can map out their speculative futures according to their plausibility and desirability.

Credit : Craig Jeffcott



Figure 67 : Design Fabulation Deck

This deck of cards has 45 design techniques and prompts, grouped into 5 suits based on the futuring strategies of Making, Playing and Performing, Mapping, Time Travelling, and Storytelling. These can be used for the Speculative Design challenge of the Playset, or as a standalone resource for other design and community-oriented projects (The full deck of cards is presented in Appendix 3 : Design Fabulation Deck*).*

Credit : Craig Jeffcott

7.3 Designing the Playset

This section discusses in some detail the process by which the Playset, as described above in Chapter 7.2, was developed and designed; this process was largely one of design experimentation and prototyping, guided by a series of design workshops and interactive design sessions (See Figure 68)

I present the account in this section as a form of Annotated Portfolio, as recommended by William Gaver as a way of making an account of the complex, situated process of designing artefacts. This approach is described in some detail in Chapter 4 on Modes of Practice, but to reiterate here, there are a number of different modes of representation and annotation strategies that can be deployed, and different forms of knowledge that might be obtained through doing so. This section can be considered as a largely textual annotated portfolio, which considers the trajectory by which the Playset was iterated and created (*Trajectory Annotation Strategy*), reflects on the artefacts and domain of design (*Designed Artefact and Domain-Level Annotation Strategies*); considers the artefacts of the playset individually and the ways in which they interact with other artefacts and beings (*Ecosystem Annotation Strategy*); and where appropriate, "zooms-in" on specific parts of the Playset for more detailed analysis (*Focussed Annotation Strategy*).

While taking a largely textual approach, the annotated portfolio reflects in detail on the various aspects of the design of the Playset. It should be considered to be in conversation with the game artefacts themselves, which are represented in photographic form in the relevant figures; the thesis will be considerably more informative to the reader if they familiarise themselves with these artefacts or the images thereof.

While the development of the playset was a continual, iterative process, it can usefully be separated into the following design phases, as discussed in the Research Design chapter (Chapter 5) : **Initial Concepts**, **First Prototype**, **Storytelling Game Design**, **Second Prototype,** and **Prototype Refinement.** I begin by discussing some of the inspirations behind the design of the Playset, then delve into each phase in turn.

Workshop	Location	Date	Number of Participants	Participants	Purpose
Pilot workshop	Lisbon, PT (online)	Jun-21	5	Design Students	Pilot exploration of the use of the conceptual figure of the *Strange Stranger* in Speculative Design Workshops
Play test workshop	Barreiro, PT	Nov-21	4	Convenience sample: Creative technologist, filmmaker, actor, naturalist	To test the first iteration of the playset, with prototype versions of the icebreaker game and Speculative Design Activities
Play test workshop	Glasgow, UK	Mar-22		Community members	To test the first iteration of the playset, with prototype versions of the icebreaker game and Speculative Design Activities, and with local community members who signed up for the workshop
Game design session	Edinburgh, UK	Sep-22	3	Friends	To play games and to sketch and explore the genesis of the storytelling game
Game walkthrough	Lisbon, PT	Dec-22	1	Friend	To explain and discuss the storytelling game prototype, and to refine it
Play test session	Lisbon, PT	Dec-22	3	Friends	A first play through of the storytelling game, using hand-drawn game pieces

Workshop	Location	Date	Number of Participants	Participants	Purpose
Game walkthrough	Lisbon, PT	Mar-23	3	Speculative Practitioners	To present and discuss the playset gameplay and game objects to design and speculative futures practitioners
Storytelling workshop	Lisbon, PT	Apr-23	7	Design Students, Speculative Practitioners, Futurists, Cultural Theorists	To test the speculative storytelling game and design activities in a workshop setting
Storytelling workshop	Berlin, DE	May-23	3	Design Students	To test the speculative storytelling game and design activities in a workshop setting
Storytelling workshop	Monterrey, MX	Oct-24	8	Delegates at a Design Conference	To demonstrate the playset to academic colleagues, and to test the use of the situation report

Figure 68 : Playset Design Workshops

Design Workshops were a key component of the design process of the Playset. This table gives an overview of all the workshops that took place as part of this design phase.

7.3.1 Game Design Inspiration

In this section, some existing games are introduced which acted in some way to inspire or to influence the design of the Playset. These are presented both to give some context to the design decisions that follow, and to share some of the ideas and concepts that will be developed throughout this chapter.

Games Compendia

I considered using the name *Compendium* for the Playset, as it draws together the concept of a tangible game as a world in a box, as well as the toolkit as a repository of tools for a diverse repertoire of practices. (A compendium can also be a book that gives a thorough summary of an entire body of knowledge). In the UK, a games compendium is a traditional board game collection that typically contains the components of multiple games, which can be combined in different ways; there is a board with a chequered pattern, which can be used to play chess with chess pieces or draughts with circular tokens; those same circular tokens can be used on a different board to play backgammon. There are often other boards for games such as Snakes and Ladders or Ludo. There are typically dice and coloured playing pieces that can be used in various board games and a set of playing cards which allow for any number of card games. In the same way, this Playset incorporates several ludic components, allowing for different sorts of game or design activity within a repertoire of biodiverse speculative design practices, in the same way that a toolkit of tools affords various techniques in repertoires of making practice.

Once Upon a Time

Once Upon a Time (Wallis et al., 1993) is a card based storytelling game by James Wallis, where players compete to tell a story using prompt cards with fairytale elements and tropes on them (See Figure 69). I encountered this game at a writing workshop event in London, where Wallis was leading a session on storytelling in games. The game is interesting as it uses cards as framing devices to open up a Semantic Blank in which players are given the latitude to create fictional worlds together, but, through the characters and events depicted on the cards—and the style of illustration of those beings and events—constraining their setting to a particular world and temporality, genre, and tone: that of the European fairy tale. This game also combines a collaborative game mechanic with a competitive Win Condition; players win by playing all of their cards in the stories that they tell, thus allowing them to play a “the end” card and ending the round of play. This game inspired me to develop a gameplay structure that uses turn-based storytelling, and the use of a game object to terminate rounds by bringing a story to a close.

Dungeons and Dragons

Dungeons and Dragons is the archetypal table-top role-playing game (See Figure 70). It is an immersive multiplayer game set in a *Tolkienesque* fantasy world where participants adopt constructed identities and explore a narrative from those perspectives (Gygax & Arneson, 1974). Within the game, characters form groups or guilds and go on adventures; in the 'real world', groups of players meet regularly to develop their characters and play together, with the gameplay led by the Game Master, called the Dungeon Master, in this game. The game is something of a cultural phenomenon, one with particular resonances with queer culture (Carter, 2022), and sometimes represents part of a player's social identity away from the table, rather than simply being a game that they play. This game inspired me to consider how identities other than your own could be adopted and performed and how that might make the fictional game world more persuasive and real to the players.

Carcassone

Carcassone (Wrede, 2000) is a German-style tabletop boardgame, a complex and competitive game in which players use cards to build up maps of a medieval landscape, which they then can occupy with settlers (or Meeple) and guard from other players (See Figure 71). Setting aside the competitive, militaristic and colonialist ideas implicit in the gameplay, I was particularly inspired by the way in which an ostensible card game became a board game as each player laid out their cards to create a map in which the gameplay took place, almost as a form of performative mapping—a collaborative creation of place. This inspired the way that a board is built up from Strange Stranger tiles to represent an ecosystem in the Collaborative Storytelling Game in the Playset.

Taskmaster

Taskmaster (Horne, 2015) is a television game show devised by the comedian Alex Horne, which he originally conceived of as a show at the Edinburgh Festival Fringe and later developed into a television series (See Figure 72). In the show, a group of comedians or comic actors are given a series of creative and very silly tasks to complete in short timescales, which are to be judged by the ostensible *Taskmaster*, the comedian Greg Davies in the original UK version of the show (the format has been adapted for use in a number of other countries, including Portugal, Australia and New Zealand).

These task are highly idiosyncratic, reflective of Horne's very particular style of comedy, and take various different forms, from physical challenges ("Blow the candle out from the furthest distance" or "Eat as much watermelon as possible"), to puzzle solving ("Display the shoe Alex is thinking of"), to cooking ("Make Marmite"), to interacting with the public ("Impress this

Mayor" or "Write and perform a song about this woman"), to art and filmmaking tasks ("Recreate a well-known piece of art on these memo squares" or "Make the best music video for a nursery rhyme").

I discovered the show, which started in 2015, during the early 2020 lockdown for the Covid-19 pandemic; it was an engagingly silly and diverting joy from the stresses of isolation, confinement, and worry. There was a particular appeal to seeing how professional performers and entertainers would interpret the tasks given to them within the limited time frames—ranging from competitively trying to win the task, aggressively looking for loopholes, or simply using it as an excuse to do something whimsical and bizarre. Particularly in the creative tasks, contestants could achieve quite impressive results in short timescales using typical domestic items. I was inspired by *Taskmaster* to consider how engaging that disparate, silly and creatively challenging tasks could be, the way that tight time-limits can result in interesting outcomes, and the power of approaching challenges and being creative in a playful and performative manner.

Myst

Myst (Miller & Miller, 1993) is a videogame, originally released for the PC in 1993, that presents players with an open-ended series of worlds to explore, with various different types of puzzles to be solved (See Figure 73). Growing up, I was fairly interested in video games, but I didn't own a games console, and never found the appeal of fighting or role-playing games where one is expected to react quickly to situations lest their character is killed: *Myst* appealed to me, both in its calm gameplay (one could leave a puzzle, such as a defective water pumping machine in a lagoon, for hours, or years, on end, and nothing untoward would happen to the character) but also in the way that it evoked different, richly realised worlds. In the diegetic narrative of the game, books form portals to other worlds. In the backstory, the culture that has developed the skill to write the books believe that the act of writing actually creates the worlds within them, but it is increasingly made clear to the player that the worlds already exist, and the books just create a link to them.

It is an interesting example of a game in which the worldmaking metatext is pushed into the diegetic text of the gameplay. Written stories open up a diegetic void in which worlds can be created, but with the implication that the worlds pre-existed the writing of the books rather than being predicated on them. This game framing gives more permission for the player to suspend disbelief, and accept that diegetic elseworlds are not simply fictions, but real within themselves; I applied this conceptual principle to the design of the Playset.



Figure 69 : Once Upon A Time

Once Upon a Time is a card based storytelling game by James Wallis (Wallis et al., 1993), where players compete to tell a story using prompt cards with fairytale elements and tropes

Credit : Atlas Games



Figure 70 : Dungeons and Dragons

Dungeons and Dragons is an immersive multiplayer tabletop game set in a Tolkienesque fantasy world where participants adopt constructed identities and explore a narrative from those perspectives (Gygax & Arneson, 1974).

Credit : Philip Mitchell - http://www.dwarvenforge.com/dwarvenforums/viewtopic.php?pid=15595#p15595, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=1913429



Figure 71 : Carcassone

Carcassone (Wrede, 2000) is a German style tabletop, a complex and competitive game in which players use cards to build up maps of a medieval landscape, which they then can occupy with settlers (or Meeple) and guard from other players.

Credit : JIP - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=49582392



Figure 72 : Taskmaster

Taskmaster (Horne, 2015) is a television game show devised by the comedian Alex Horne, which he originally conceived of as a show at the Edinburgh Festival Fringe and later developed into a television series. In the show, a group of comedians or comic actors are given a series of creative and very silly tasks to complete

Credit : Channel 4



Figure 73 : Myst

Myst (Miller & Miller, 1993) is a puzzle adventure video game. The game has a diegetic narrative of the in which books form portals to other worlds, with a backstory that the books are written in such a way that they seem to create the worlds within them, but it may be the case the worlds already exist, and the books just link to them. This game framing gives more permission for the player to suspend disbelief, and accept that diegetic elseworlds are not simply fictions, but real within themselves.

Credit : Cyan Games

7.3.2 Design Phase : Initial Concept Development

Phase Overview

This first phase of developing the Playset explored some early approaches to make elements of the Conceptual Design Celium ready to hand for participative speculative design practices; at this time, the outcome was still being framed as a Toolkit, rather than a Playset. It focuses on an online pilot workshop.

Workshop: Pilot workshop

As a prelude to the design of the first prototype of the Playset, I organised a pilot workshop session in June 2021 as a proof-of-concept exercise to explore how speculative design techniques and game activities based on the Celium might be used in workshop settings to support Community Biodiversity Activism.

The online virtual workshop was organised as part of the *Design Research and Innovation Week* festival at *UNIDCOM / IADE*: participants were festival attendees, largely PhD students and teachers in design, who self-enrolled for the workshop. It was structured into three parts: an initial presentation about the workshop and the research project, followed by two distinct but linked speculative activities.

Workshop Aims

By carrying out this workshop, the main aim was to tentatively explore whether speculative design workshop activities could be situated in the context of the Design Celium, particularly framed around the concept of the Strange Stranger, and whether such approaches could be engaging and enjoyable for participants. I was particularly interested in exploring whether these activities could engage participants with key concepts and perspectives on speculative design; exploring whether they could encourage them to fabulate about potential futures; situating the activities in real world environmental contexts; and considering how they might be structured together in a logical way that 'flows' well. In addition to this, I hoped that the participants, largely design students, would benefit from exploring a speculative approach to design, as well as taking part in design workshops, experience which may be valuable in their own research.

These aims were met through the design, planning and running the workshop as a basis for concurrent reflection-in-practice and subsequent reflection-on-practice, supported by audio recordings, feedback discussion during the workshop, and responses to a short follow up questionnaire.

Workshop Premise

The workshop, which was titled *More-Than-Human Futures on the Margins* was presented to participants with the following framing text, giving a proposition, setting, and a meta-textual speculative scenario:

MORE THAN HUMAN FUTURES ON THE MARGINS

Proposition

Speculative design offers the prospect, to designers and communities, of challenging the inevitability of a human-centric and environmentally damaged future that extends from, and maintains the power dynamics of, the problematic present by exploring alternative futures that are not predicated on it. This workshop offers the possibility to engage with these alternatives through an emerging Playset of speculative design techniques that borrow from more-than- human and queer strategies for caring for and about the world, taking collective action to protect it, and staking a claim on better futures: strategies of making, playing, mapping, time travelling and storytelling.

Setting

The workshop involves designing speculative futures for Quinta do Braancamp, *a contested marginal site in Barreiro on the south bank of the Tejo River (See Figure 74). It is an atemporal place of rewilding land and agricultural and industrial ruins, where the presence is keenly felt of its pasts as a private estate and cork farm and, before that, as part of a rich estuarial ecosystem.*

It exists in the present in a fragile and tentative state as a nowhere place on the verge of transition to contested, possible futures: while the local authorities hope to sell the land to private developers, with a bland vision of aspirational housing and quasi-public space that aims to revitalise the area with slick and generic modernity, local community groups wish to keep the space just as it is, hazardous ruins alongside nesting egrets, as a space for the local community and for nature that slowly disintegrates back/forward to some pre/post-industrial state. Both these futures exist in the shadow of the dominant present paradigm of consumer capitalist, human-centric and privatised modernity; one that embraces it, one that rejects it passionately, but both are subject to its status as the legitimate possessor of The Future.

Speculative Scenario

A court decision was recently made to suspend the local authority's planned development following protests from local community action groups. This impasse opens up a brief window of speculative opportunity to imagine richer, stranger, futures for the site; in this workshop, we imagine that the local authority and community groups have come together to launch a new open call for proposals for the site that prioritise more-than-human and culturally diverse perspectives.

Guidance for Participants

In small teams of designers and activists, you will approach the brief through a series of speculative techniques through which you will propose strange and radical visions for the place, finding a way to tell the story of different, and more than, human futures.

Workshop Activities

Following an introductory presentation, The workshop consisted of two activities: creating a more-than-human persona, and a speculative design activity imagining the creation of structures on the site to mediate interactions between these personas.

Introductory Presentation

As an introduction to the workshop, I showed participants two short films; the first, *Nature is Speaking – Edward Norton is the Soil* (Grunbaum & Trattner, 2014) told the story of the soil, from the soil's perspective, given a voice by the actor Edward Norton; the other was a short clip from the Marvel TV series *Loki* (Waldron, 2021). These were intended as priming and scene setting activities, to give an introduction to two key ideas that underpinned the workshop. The first was to explore the notion of the *Strange Stranger* and the possibility of thinking from the perspective of another being; the second was to explore the idea of choosing possible and preferred futures in the context of mainstream speculative fiction[42]. Following the videos, participants made introductions, and I explained the format of the workshop.

Activity One : Strange Strangers Personas

The first activity was designed as a priming exercise: to prepare the participants for a speculative, fabulatory mindset, and to shift them from a normative human to a more-than-human mindset, and to start to think in particular more-than-human ways. It was also designed as being an 'icebreaker' activity for the workshop. The activity draws on Timothy Morton's concept of the Strange Stranger: that every being is equally strange and equally familiar, whether a human family member, a dog, a tree, a mycelium, or a computer. It uses the Strange Stranger as a conceptual figure to extend a typical model and technique from interaction design, the *User Persona*: a speculative and notional (human) being who might be the typical or atypical user of a particular design artefact. Usually used to help designers understand more about a user of a designed artefact and their contexts by imagining themselves from those users' perspective

[42] The narrative of the show *Loki* (Waldron, 2021) concerns Loki, the Norse god and Avengers villain, who is reluctantly recruited to join a metaphysical bureaucracy, the *Time Variance Authority* (TVA). The TVA police the timeline to ensure history flows according to a predetermined plan (the *Sacred Timeline*), removing people or changing events that might send history down another path and thus would create a multiverse of possible futures: the video shown was a diegetic corporate video intended to inform those who enter the agency of how it operates.

(Cooper, 1995), personas are repurposed here as a way of empathising with other beings within an ecosystem by fabulating and mentally inhabiting their perspectives.

Each participant was given a virtual card, with a specific being relevant to the *Braancamp* site represented on it: Algae, Ant, Cicada, Cuttlefish, Dog, Dolphin, Egret, Hoopoe, Iceplant, Palmtree, Ruins, Seahorse, Soil, Brackish Water (i.e. estuarial water that's a mix of salt and fresh water), and Wild Flowers (See Figure 75). They were then given a series of questions to answer as though they were themselves that persona. These questions ranged from being fairly straightforward and pragmatic (What do you contribute to the ecosystem? Do you prefer mornings or evenings?) to more speculative and whimsical (What famous person do you most identify with? What is the meaning of life?). Participants had to ask these questions of each other in turn, aiming to guess what persona each of the participants was adopting.

Some of their responses are below; they responded to the Cicada, Ice Plant, Ruined Building, Egret and Brackish Water prompts:

Responses

Cicada

In my past was singing in the trees and my noise could be heard from all animals, even if I was too little. I was made by air, and I was so happy spending my time singing. I fell in love with every tree and every season I celebrate my birthday changing my body and continuing singing. I don't mind singing on days and nights, but mostly I start my shows later in the evening. Up on the tree, I can see the moon and hang out with others from my neighborhood.

Ruin

I am a proof of existence and oblivion. I am based in urban or rural context. I can be local or global, roman or industrial. I am a physical and so many things happen. You might visit me once or forget me for always. Over time, nature embraced me, and painters and photographers captured me, who I am.

Ice Plant

I've been here since I was born here, surrounded by friends, enjoying sunlight, soil and rainy days as well. I fear you walking around me.

Egret

My favorite food is grasshoppers because they are crunchy. I love spending time lazing on buffaloes next to water and earth at the same time.

My favorite color is earth. And what makes me happy is still the earth and I consider good life to be that when I'm traveling all over so I love being on waters and earth, I love waters and earth being disturbed by those that are larger than me and the crustiness of proteins from insects and slipperiness of fish.

Brackish Water (Estuarial Water)

Okay, so my favorite food is pasta. I don't know about my [star] sign because I can see all the stars sometimes. And my favorite color, there is no favorite color because I like all the colors mostly. That is kind of a special tree that are mangroves that sometimes we help each other. And I can see all the stars sometimes because I am the water, the brackish water.

Activity 2 : Diegetic Carpentry

The second activity, Diegetic Carpentry, was designed as an exercise in speculative fabulation and design, intended to build upon the *Strange Strangers* personae from activity one, with participants already primed to approach the activity with a Queer Ecology lens. Diegetic Carpentry is a technique to explore ways of communication between different beings that was described by Franziska Piling (Pilling & Coulton, 2021). It is a conceptual, design fiction approach based on Object Oriented Ontology and Ian Bogost's Speculative Carpentry, in which the construction of artefacts allow one "to gain some insights into an alien thing's perspective," (Bogost, 2012, p. 91).

I introduced the concept of diegesis to the participants using an example from speculative fiction: an image of the Enterprise from *Star Trek*, which in the real world is a prop, but in the fictional world of the TV show, is a starship that can warp space.

Participants were asked to work with the *Strange Strangers* from the previous exercise and through speculative fabulation and design, propose concepts for communicative apparatus that would mediate communication between these beings and humans.

These apparatuses were to be situated in the *Quinta de Braancamp* estate in Barreiro, Portugal, a former cork farm that, as described above, has become a derelict and naturally rewilded site. The site has become a site of contested futures, between local action groups who wish to leave it

as it is, currently inhabited by a diverse ecosystem and used recreationally by local people, and the municipal government, who wish to sell the site for lucrative development.

The participants came up with proposals related to the Hoopoe, Cicada, Ruined Building, and one that seemed to refer to the site as a whole, rather than mediating a connection to a specific being (it may be that the instructions weren't clear enough regarding the focus on a specific Strange Stranger, or the audio recording of this participant was unclear). These proposals are presented below in full. For the cicada, an insect that lives in trees and produces loud stridulations, the diegetic prototype supposed that the sound of cicadas has health benefits, so consisted of a series of capsules, modelled on the cicada exoskeleton, where people might hear and enjoy the sound of the cicadas; the capsules would release a hormone to attract more cicadas to the area. Hoopoes are birds in the Kingfisher family with distinctive orange and black plumage, crest and long curved beak, the latter of which is used to detect the vibrations of the grubs and insects that they eat in the soil. The proposal was for a system based around speculative, highly sensitive bio-haptic sensors, that would translate movements and sounds of the hoopoe into different vibrational frequencies and smells that could be detected some kilometres away.

The proposals for the ruined building and the site in general were somewhat similar. It was proposed that the ruined buildings be left undisturbed, where their "coexistence and history [and] the permanence of the ruins," (Workshop Participant, personal communication, 2021) could be perceived, enhancing the wildlife and biodiversity and maintaining it as a community space, and allowing humans and other species to share the area. For the general site, the proposal was to create a rainwater harvesting system for irrigating plants and to leave it as a place for nature to exist. It would be open to humans to visit but not designed for them, so there would be no benches or sitting areas: "it's not a park, it's not a garden, it's just a space for nature," (Workshop Participant, personal communication, 2023)

Responses

Hoopoe

I need to talk with the soil water other trees, people, animals. And then I'm producing moving on branches and perceive the sound of my voice and then translate to others in with different, vibration, and the soil vibration to connect with the terrain and water and fishes, then produce sounds at different frequencies to be in catch with, with other living things and as well as produces smells for other and remote living things that can perceive my presence, maybe kilometers away from here. And this is made with a sort of fantastic bio haptic sensors, absolutely not available technology right now. They can perceive everything.

Ruin

I was imagining something merging this mix of the human use the nature the wilderness that it exists in the area and the ruins the structure that I will design, it will be to keep the structure and to match everything we design, or we propose for the area by keeping the structure itself of the green. Just trying to enhance the wildlife and the biodiversity that exists already and try to make it open for the community, like somewhere where the coexistence and the history of the ruins itself, let's say the permanence of the ruins, can be perceived and lived. But given this, I don't know how to well define this, I was just taking some notes. This kind of coexistence and design in a way that these, let's say, three elements or parts of beings, humans, nature, wings and others, can use the area in the same sense. There was the idea of keeping the structure because, as a ruin, I would prefer to keep the general structure and design everything around that. Trying to enhance the sound and the smells of the wildlife, of course, as experience to be in Tanzania.

Cicada

My animal was the cicada, and I put in the centre the sound as a key element to speculate.

[I speculate that the sound] of cicada [can] influence our health. Like some scientists discovered that some vibrations could help our health. And we could create capsules in this place, where people could get inside these capsules with the representation of the exoskeleton of the animal and relax in this sound frequency. In this place, we could have some kind of tree. I like the wings of the cicada where people could relax down, and we could have also some hormones or something like this to attract more cicadas for the environment.

Yeah, I also did a very rough sketch, and I didn't think of, well, first of all, I have really hard time thinking about this, watch when the video says like humans, nature doesn't need humans, but humans need nature and I thought like okay, why don't we just have a space for nature to grow with the help of humans. But in the center, I was thinking about having this rainwater harvesting system for crop surrogation and to have a crop diversity all around the place. And this is not a place designed for humans, so there are no benches, there is no place to sit, this is a place for nature just to let it grow and if you want to be there, a green area, if you want to sit there, if you want to be part of the nature, but it's not a park, it's not necessarily a garden, it's just a space for nature.

Participant Feedback

At the end of the workshop, there was a brief discussion where participants were asked for their feedback, and they were also asked to answer a short survey about it. Their feedback is summarised here.

Regarding their expectations of the workshop, most participants hoped to gain knowledge related to the methods or perspectives of speculative design practice. This ranged from learning about rethinking our approach to nature, exploring less-dominant approaches of speculative design, and learning about a speculative design playset. In general, these expectations were met well, with participants highlighting the active nature of the workshop, the focus on a concrete case study, the creative challenge, and rethinking their role as a designer as positive aspects.

I asked participants about what they perceived as the challenges of seeing things from a more-than-human perspective. Their responses included: being empathic to the needs of non-living things; the difficulty of deconstructing the human-nature binary and shifting away from the human perspective; challenging assumptions; and the (im)possibility of interpreting the agency of, or truly knowing, other beings. Some participants felt that the workshop format helped them to meet these challenges, by opening up the space for them to reflect on these issues and how

they might influence their design or education practices, though one considered that the compression of the format made any impact necessarily superficial.

I then asked about what they felt were the challenges of imagining a future significantly different to the present: having hope in the face of human indifference; stubbornness to accept new things; greed; the difficulty imagining how people might receive new approaches. They found the workshop, in general, very helpful in attempting to imagine different futures, though again, the same participant felt it only scratched the surface of the topic.

Outside of the workshop context, they considered that speculative techniques such as these might support biodiversity activism as a catalyst for new ideas, for supporting other interventions in physical spaces, as a way of learning from indigenous and ancestral people's ways of relating to nature, and as a form of role play for students to consider more-than-human beings differently.

Reflections on Design Phase

This workshop, which was presented online through necessity due to COVID-19 pandemic restrictions, was a valuable first opportunity to share and explore elements of the Conceptual Framework with other designers. Although the format and timescale precluded much in-depth engagement, it was promising to observe that participants engaged with the exercises with enthusiasm, and that they reflected on how it enabled them to think in a more expansive way about the issues touched on. From a design perspective, it demonstrated how the flow of different activities can help develop a particular trajectory to a workshop, and the importance of framing and priming activities to engender a productive mindset for speculation and fabulation.



Figure 74 : Pilot Workshop : Quinta do Braancamp

The pilot workshop involved designing speculative futures for Quinta do Braancamp, a contested marginal site in Barreiro on the south bank of the Tejo river. It is an atemporal place of rewilding land and agricultural and industrial ruins, where the presence is keenly felt of its pasts as a private estate and cork farm and, before that, as part of a rich estuarial ecosystem.

Credit : Craig Jeffcott

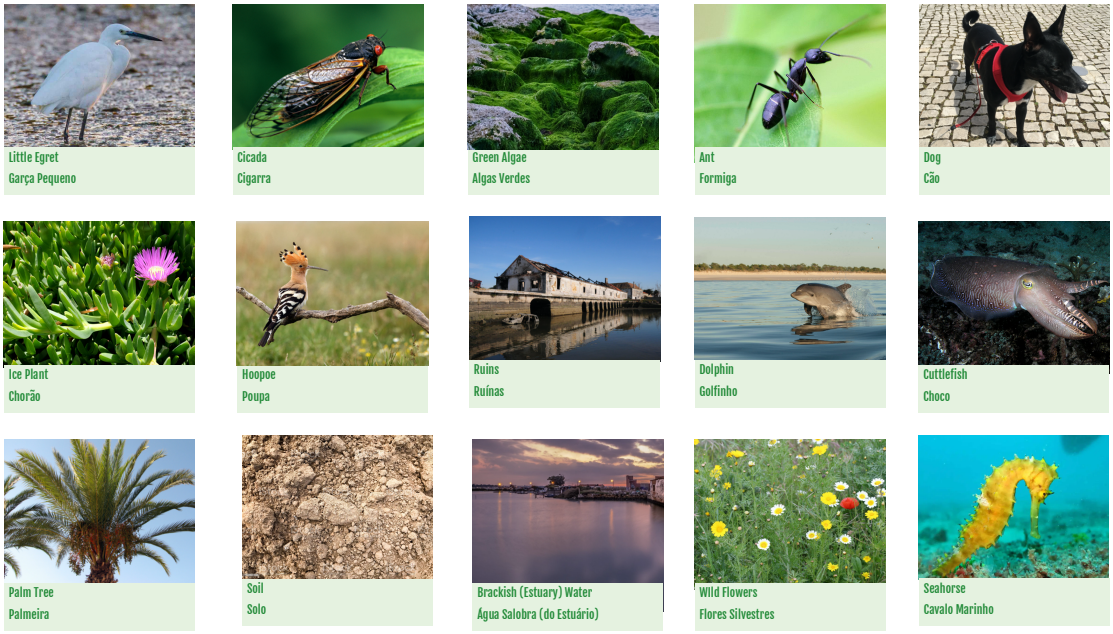


Figure 75 : Pilot Workshop : Being Cards

These cards were created during the Pilot Workshop, and participants were asked to develop personas for the beings that they were assigned.

Credit : Craig Jeffcott

7.3.3 Design Phase : First Prototype

Phase Overview

The rationale for the first prototype of the Playset was to have activities to initially orient, or "prime" the players or participants towards adopting a speculative mindset, followed by creative, design-led activities where they might speculative about possible futures.

In this first version, I focused on designing a priming activity that focused on embodying an understanding of the Strange Stranger conceptual figure by adopting the role of different beings—or Strange Strangers—through a straightforward ice-breaking game, and developing some concepts for design-led creative activities.

At this stage in the design process, I intended for the Playset to be composed of (playing-card) sized game cards that would facilitate card-based game activities.

The first iteration of the Playset was largely card-based. I designed a series of cards of different types that represented different concepts that seemed to be important to represent in the Playset: beings, speculations, principles (these three were designed to be playable card decks) and techniques (larger information cards). I also created rough prototypes of speculative strategy prompts and a speculative strategy selection spinner as part of the ice-breaker *Strange Strangers* game (See Figures 76 & 77).

Prototyping : Playset Design

Game Objects

Being Cards

Being cards are playing-card sized cards that represented a multitude of different possible beings or Strange Strangers. These were envisaged as providing a selection of different beings of various different types for use in games, which could be extended to include specific beings from a particular ecosystem or environmental context. Each card showed a photograph or drawing of the being and its name, with the word "being' on the reverse of all cards. The being cards were designed to be an eclectic mix of beings, running the gamut of humans (ruler, drag queen, activist), more-than-human organisms (frog, cactus, dolphin), objects (passport, surfboard), environmental and geographical entities (snow, galaxy, pollutant), and beings drawn from speculative fiction (vampire, alien, dragon): the choice of beings was guided both by the beings in the local environment around Lisbon (dolphin, egret) as well as the literature and ideas that informed the design framework. Being Cards were the first iteration of what would eventually become the Strange Stranger Tiles.

Icebreaker Game Cards

I designed a deck of playing-card sized cards to be used in the first iteration of the Icebreaker game. The deck contains eight cards for each of the five futuring strategies, and gives the Players instructions to follow when they draw the card. The icon for the strategy is on the back of each card, and on the front, there is a question prompt or instruction that relates to the strategy in some way: **Making**—draw five objects that relate to you, draw a vehicle that you could use, or make an origami model of yourself; **Playing**—who is your drag alter ego? represent yourself in a short dance; **Time travel**—how would you like to be remembered in 100,000 years? how do you spend your spare time?; **Mapping**—draw a map of your habitat, where do you avoid going?; **Storytelling**—what makes you sad? what is the meaning of life?

Initially these cards were sketched on paper by hand, but were then digitally designed and printed.

Speculative Strategy Selector

An artefact that allows Players to select a speculative future-making strategy at random, using icons[43] to represent each strategy: the strategies of Making (represented by a hand); Playing ad Performing (represented by theatrical masks); Time Travelling (represented by a clock); Mapping (represented by a compass); and Storytelling (represented by a speech bubble)[44].

The first iteration prototype was a paper hexagonal spinner, which was replaced by a digitally fabricated 2 cm^3 six-sided die. There is, by necessity, a rethrow side as it's not possible to make a five-sided die (geometrically, a regular pentahedron cannot exist).

Speculation Cards

Speculation Cards were designed in this first iteration to represent various pre-existing speculative fictions or designs, possibly for the purpose of inspiring the players to create their own ideas. They have a similar design to the Being Cards. The speculative idea and its author were given on one side; on the reverse, a description of the text and a bibliographic reference were given. Most of these cards represented a specific existing speculative text, artefact, or concept, such as the novels *The Left Hand of Darkness* by Ursula Le Guin (1969) and *Foundation* by Isaac Asimov (1952), the speculative design idea of *United Micro Kingdoms* by Anthony Dunne and

[43] Open-source icons are credited to *Google Material Design*, apart from the speech bubble, which is credited to "Convoy" at *The Noun Project*.

[44]
 Making (a hand)
 Mapping (a compass rose)
 Storytelling (a speech bubble)
 Time Travelling (a clockface)
 Playing and Performing (theatrical masks)

Fiona Raby (2014), and the concept of the *Carbon Liberation Front* by Mackenzie Wark (2015). This is the first iteration of what would become the Speculative Prompt Tiles.

Principles Cards

Principles Cards had the same general design as the Being and Speculation Cards, with one side displaying various principles taken from the framework and the literature, with a brief description on the reverse. I introduced these cards as I knew that I wanted to get participants to be thinking about and considering some of these ideas, which may be unfamiliar to most people; the principles included such things as *Companion Animals*, *Conservation as Theatre*, *Ethical Responsibility through Storytelling*, *Anthropocene* and *Convivial Design*. Principle Cards are not present in the current Playset; their intended role was largely superceded by the Collaborative Storytelling Game.

Location Cards

Using the same design style as the Being, Principles, and Speculation Cards, the Location cards were a deck of cards with various locations written on them, intended as settings for speculative fabulations and design. These cards are not present in the current Playset.

Technique Cards / Activity Cards

The Technique and Activity Cards were designed to be used to support the Speculative Design Challenge aspect of the Playset: to provide prompts for participants to follow a technique and carry out a speculative design activity. They were a development from the single design activity in the pilot workshop, and were based on a variety of different speculative fabulation and design techniques as well inspiration from speculative fiction.

The first iteration of this were Technique Cards. These cards are in A6 format, with one side displaying a particular speculative design tool or technique and a short instruction to the player, with a description of it on the reverse. Each card displays questions regarding how this technique might contribute to each of the three strategic goals of care, collective action, and seizing futures. I created 20 of these technique cards, but only provided descriptions for eight.

I initially imagined that there would be specific cards for each speculative strategy, but reflected that many techniques embody more than one, if not all, of the speculative futuring strategies (in particular, storytelling and fabulation being so integral to speculative practice, it's reasonable to assume that all techniques represent storytelling in some way): I sketched the speculative strategy categories onto the bottom of each card.

In a second iteration, Activity Cards replaced the Technique Cards. The Technique Cards presented design techniques in a high-level, abstract way, often using academic or 'designerly'

language, rendering them neither useful nor informative in community settings. They were replaced with single fold A6 sized four-page booklets, designed to invoke a storybook. These were titled Activity Cards, which were intended to provide a guide to design activities for participants in workshop settings or during design projects. The change of title is significant, with the cards being positioned not just as abstract techniques but as calls to (speculative design) action; specific activities to be carried out.

The front page displays the title of the activity and the speculative strategy icons (showing which strategies the activity embodies); inside the booklet, there is a description on the lefthand page, and a method which explains to the participants how to carry out the activity, on the righthand page. Many of the descriptions require the participants to select some of the other playing cards: principles, beings, and locations. These cards have been superceded by the Design Fabulation Deck in the current version of the Playset.

Games and Activities

Icebreaker

I built on the concept of the Strange Stranger personas in the pilot workshop, to create an icebreaker game that would help players get into the mindset of thinking as a Strange Stranger, and to acquaint them with the five speculative futuring strategies from the framework.

Players would have to select a card with a particular being or Strange Stranger written or drawn on it. Players would each take turns to throw a die that would give them one of the five speculative futuring strategies (making, playing, time travelling, mapping and storytelling) and then select a card from the corresponding pile, following the instructions given. Other players would try to guess their identity based on their answers.

I reflect further on the nuances of the game-play in the reflections that follow.

Principles Discussion

The Principles Discussion arose from the necessity to find an activity to bridge between the icebreaker and the design activities. This necessity formed one of the key challenges in designing the Playset: finding a way for theoretical concepts to be embodied and materialised, to open a space for speculation and to make them available in design. Eventually this led to the Storytelling Game, but in the first prototype, I designed a discussion activity, where Players would take turns to select a Principle Card and read it aloud, and the group would discuss it. It proved to be a rather dry and technical activity, and did not flow well between the other activities.

Speculative Design Challenge

Drawing on the speculative design activities from the Design Celium, this activity was intended for players/participants to carry out some speculative design activities framed around the Strange Stranger concept.



Figure 76 : Playset, First Prototype : Iteration 1a

This iteration of the playset focused on the What Strange Stranger am I? Icebreaker Game. It comprises a handmade strategy spinner and Icebreaker Game Cards, a set of design Technique Cards, and cards with examples of existing speculative fictions and important game principles.

Credit : Craig Jeffcott



Figure 77 : Playset, First Prototype : Iteration 1b

Still largely focusing on the icebreaker game, this iteration replaces the spinner with a 3D printed die, and printed Icebreaker Game Cards. There is also more emphasis on design activities, with Technique Cards replaces by Activity Cards with more detailed instructions, and Being, Speculative Scenario and Location cards for use in both activities.

Credit : Craig Jeffcott

Workshops : Play Test Workshops

The creation of the first prototype of the Playset was followed by an extended period of testing and reflection; two workshops were organised, providing the opportunity to put the Playset to use in structured workshop settings. This was followed by a period of reflecting on the outcome of these workshops and working towards a second, and somewhat different, iteration of the Playset.

The aim in these workshops was to test the games and game objects designed as part of the first prototype of the Playset as part of the process of iterative design and development. In particular, I hoped to ascertain whether the games allow participants to engage with the worldviews, goals and strategies of the speculative framework and whether the activities are structured together in an effective way, and to develop and refine the rules and other framing components of the games. This aim was met through the design, planning and running the workshop as a basis for at the time reflection-in-practice, and subsequent reflection-on-practice, supported by video and audio recordings, and extended participant feedback discussion about the effectiveness and enjoyability of the workshops. It was hoped that the participants, selected for convenience of access, would enjoy the games and activities and find them engaging, and perhaps learn something more about the research domains.

Barreiro (Portugal), November 2021

The first test workshop was organised to take place on the 6th of November 2021, with four participants selected through convenience sampling of my social circle. One of the participants was a naturalist and poet, the other three work in creative fields (filmmaking, digital art, and acting). I chose to focus on conservation and creative professionals for this workshop as I wanted to test the game mechanics and structure of the Playset rather than the potential for engagement with community biodiversity groups (See Figure 78).

Workshop Aims

The main purpose of this trial was as an initial play-test of speculative gaming elements of the Playset for the first time in a workshop with participants. In particular, I wanted to reflect on: a) how the gaming artefacts and the gameplay worked together and worked as a game, and what possible improvements could be made; b) how the structure of the workshop as a whole worked (e.g. was the flow from one game or activity to the next logical); and c) overall, how do the games, activities and the workshop format help to materialise the Conceptual Design Celium and put its concepts into practice.

Workshop Format

The workshop was organised to take place across seven hours on a Sunday, with two sessions separated by a break for a communal lunch.

The design of the workshop was such that there would be a sequence of activities that would take the participants on a particular 'journey'. The structure was inspired by the format of previous workshops I had participated in—particularly the *Ethics Committee of Dark Conservation* workshop at the *Porto Design Biennale* (Admiss, 2019)—characterised by contextualised orientation activities, followed by a deeper delve into principles and ideas, leading into speculative fabulations—and, mirroring typical design project trajectories, where design activities are preceded by contextual research.

The workshop was structured broadly into a contextual priming phase—represented in the Icebreaker game—and a speculative design phase, represented by the design Activity Cards. Participants would become acquainted with the Strange Stranger concept and begin to think from the perspective of other, more-than-human beings, as well as getting to know each other in a fun party-style game; this would hopefully prime them to engage with the design activities from such a mindset.

In designing the workshop, it became clear that some form of 'bridging' activity was needed between the ice-breaker game and design activities. A key principle of developing the Playset was to 'activate' the speculative framework in a practical way, which includes the philosophical lenses and ontological positioning of the framework; it seemed that to move directly from a playful introduction to queer and more-than-human perspectives embodied in the Strange Stranger to design activities, without delving more into these contexts, would not fulfil this aim in more than a superficial way.

Therefore, for this workshop, I included a bridging activity: a discussion session based around the Principle Cards, before breaking for lunch. In including this activity, I made a couple of assumptions: that such an activity was relevant in the context of the purpose of the workshop and the nature of the participants (and would not work in a Community Biodiversity Activism context); and that it was intended as a placeholder for the time being, to facilitate the conceptual journey of the participants. As will become clear, this decision became an important factor in the development of the second iteration, with the concept of the bridging activity acting as a seed for what would become the core of the Playset, the Collaborative Storytelling Game.

Activities

Icebreaker

This game had three purposes: 1) to socially break the ice and warm up participants; 2) to orient them to the way of thinking in terms of queer and more-than-human perspectives through the concept of the *Strange Strangers*; and 3) to introduce participants to the speculative futuring strategies. This activity used the Strategy Selector Dice, Being Cards, and Icebreaker Game Cards assigned to the five speculative strategy types.

The rules of the game were explained to the participants: each person selects a Being Card, then takes it, in turns, to throw the die and select an Icebreaker Game Card corresponding to the speculative strategy (i.e., if the player threw the die and the clock icon, representing time travel, came up, then they would have to take a time travel card). These consist of questions and activities to carry out, with the intention that each person attempts to represent their being through the activity on the card. Other players need to guess the being.

Reflections

Participants engaged readily with the game, which they seemed to find fun, if confusing at times. Some of the activities, particularly the questions about their identities, were challenging, and some made the participants laugh at the somewhat ludicrous nature of what they were asked to do, but they seemed to have lots of fun with the more "performative" tasks, such as "make a grand entrance".

The game seems to have been fun for the participants and felt like a good way to introduce these concepts, but how well it worked as a platform for delving into the concepts more deeply in subsequent activities is less clear. One possibility to strengthen the connection to the speculative framework is that the game cards should be explicitly labelled with the speculative strategy (rather than simply showing the icon representing it) if the purpose is to reinforce those strategic concepts going into a design activity.

One thing that became clear was that the lack of a 'win' condition made the gameplay confusing. Was the aim to be the first person to guess another player? If that was the case, it might make sense for the player to make their identity hard to guess, which wasn't the aim. The aim might be for each player to have as many correct guesses as possible, perhaps to accumulate the most correctly guessed cards—but if that was the case, who would want to guess correctly? Games of this type often use paired contestants to overcome this challenge: the idea is to be able to guess your partner as quickly as possible, so it behoves both players to be efficient.

Another observation was that a time constraint would be useful to make the game move along, especially with an activity without an obvious endpoint. A point was made that a time

constraint would make it easier to just commit to an activity and not overthink it, and I resolved that I would include an hourglass in a future iteration.

Finally, sometimes the Being Cards caused confusion. For example, the card for being a "Politician" was illustrated by a photograph of Apartheid campaigner, political prisoner, and president of South Africa, Nelson Mandela. It was unclear if the card specifically represented this politician, or the values associated with him, or if he was intended, as was the case, to represent the general idea of a politician. It was a good illustration of the principle of definitions being made through design and the way that specific design choices might shape those definitions: defining a politician as being like Nelson Mandela is rather different to defining a politician as being like Margaret Thatcher. A participant also pointed out that the use of inanimate objects with living beings can be confusing: since moving beyond such categorical ways of thinking is an important conceptual element in the Design Celium and Playset, perhaps this needs to be clarified.

Principles Discussion

In this activity, participants were asked to each select a Principle Card in turn, and as a group, discuss the principle covered. Around half an hour was spent on this activity, and a few different principles were discussed.

Reflections

As discussed, this activity was included as a way to bridge the introduction of the conceptual ideas and perspective of the Strange Stranger to the speculative activities by pulling in some of the theoretical principles underlying the Playset. I felt that it was an appropriate activity for these participants' backgrounds in conservation and the arts and humanities, who may have had familiarity with the sorts of concepts explored, but likely would not work in Community Biodiversity Activism settings.

Participants seemed to find it an interesting and engaging activity, though again, the lack of time constraints made it lack sufficient structure, and in general, it took the energy of the group in a more contemplative, less playful direction. It is also a rather 'dry' and almost pedagogical or didactic activity, rather than a playful one. I began to understand that an activity that is principles-oriented but less prescriptive would work better.

Lunch

This was not an activity of the workshop as such, but I drew on the ideas from Donna Haraway about the importance of eating and sharing food together (Haraway & Endy, 2019), so I prepared a meal for lunch and we spent time eating together and talking, both about the workshop

activities as well as generally getting to know one another; this collective bonding felt like an important if less formal part of the workshop.

Speculative Design Challenge

Following a break for a shared lunch, the afternoon was dedicated to a speculative design activity; a useful break-point between contextualisation and fabulation activities, and ones more oriented to design ideation.

The participants were given a series of Activity Cards, which have a name and speculative strategy icons on the front cover, and a description and instructions inside. Participants were asked to throw a die and select an activity that corresponds to the die throw. In this workshop context, I framed these activities as quick design prototyping challenges and asked them to spend 15 minutes carrying out the activity on each card. This may be artificially too constrained, as the activities may lend themselves to a two hour or more period of time or may even be something that could be elaborated into an intervention, performance or artwork.

Reflections

The participants discussed a few possible design speculation cards, but here I will note two of these in particular: *Radical Disco*, and *Meal of Care*.

The *Radical Disco* card description reads "The radical disco movement was driven by architects who designed nightclubs and discos to create new ways for people to relate to each other and to imagine different futures"; and the instructions read "SELECT A PRINCIPLE CARD. Design a disco or party that represents a future based around the chosen Principle Card. You may select any other cards for inspiration, if you wish. Imagine the location of the disco, the layout of the space, who the clientele will be, what type of music will be playing. You should design a poster for the event."

The *Meal of Care* card description reads "sharing food together can be a powerful way to engage with other beings and develop empathy for one another, with the stories around the foods being a powerful way to get others to care about things that are important to us"; and the instructions read "SELECT A PRINCIPLE CARD AND SOME BEING CARDS. Plan a meal that is designed to develop empathy for a particular principle or being. Think about who you will invite, what food you will prepare, how you all source it, how the food will be prepared, and where it will be served."

Again, there were limitations within the time constraints. I asked the participants to consider, at the end of each activity, what they would do if they had more time, or were to actually 'do' the activity concerned. This caused some confusion and a discussion about diegetic and non-diegetic realities. When I asked how they might enact a planned nightclub event set on a

spaceship, for example, someone said it wasn't possible, as they couldn't get a spaceship. I tried to clarify that I didn't mean how they might do it in a diegetic sense, such as actually building a spaceship, but how in the real world they might plan this event—how might they dress an event space as though it was a spaceship, in the way they'd advertise it, the dress code, etc.

Reflections on Workshop

On reflection, there seems to be a key mental strategy that is required of being able to slip between diegetic and non-diegetic thinking. Such a strategy is needed to perform futures, and to grasp the core principle of futures being something that you perform and create not to be true, but to be real. This led me to some deeper reflection and reading around some of the theoretical game design principles discussed in Chapter 3, in particular, the importance of the framing devices of the game in creating a space for collaborative future-making and allowing for the suspension of disbelief. I also found it interesting to think about how speculative design might facilitate passing between diegetic and non-diegetic realities, mediating a form of Diegetic Escape.

In addition, some gameplay issues arose: The die throwing felt important, as a ludic element and as part of reinforcing the five strategies, but it was not clear how it might lead to the choice of the activity. Should each player be dealt a number of Activity Cards to choose from, or is it a free choice? Is it better to have the whole group undertaking one task, or to split into separate groups? Is it better to have a free choice or a discussion of what principle or strategy to focus on?

Some of the instructions were unnecessarily complicated, e.g. some activities instructed participants to take some optional cards as well as some prescribed cards, and some activities had compulsory use of some cards while others just suggested them. In one instance, this resulted in the group trying to organise a speculative event that included every single element from the cards chosen, which became confusing. For such an activity to work, the rules should be simplified, but in some instances, the use of multiple card types might be necessary. To address this, instructions could be made more straightforward and unambiguous or could involve stepwise card use.

Glasgow (Scotland), March 2022

I organised a second workshop to play-test the first version of the Playset in Glasgow in March 2022 (See Figure 79). The workshop format was intended to be the same as in the November workshop in Barreiro, with the addition of some Glasgow environmental specific being and place cards, and I put out a call for the workshop on local Facebook groups for queer and environmental communities and groups. In the event, there were difficulties in finding a venue for the workshop that were resolved at a late stage, and only two people, alongside myself and

the co-organiser (one of the participants in the November workshop), attended the workshop, so it was rather more limited than I had hoped it would be.

Workshop Format

The situation dictated that the workshop largely focused on a simplified version of the Icebreaker Game. The way that this unfolded was a salutary lesson in the importance of context and structure both in the design of workshops and the resources that are used to facilitate them, such as this nascent Playset.

Reflections on Workshop

Of the two participants, one was familiar with and regularly plays tabletop games, but the other participant was unfamiliar with both the approach of the game and some of the ideas it was exploring: this meant, for instance, that the discussion of principles from the previous workshop wasn't likely to be successful, and was not attempted.

A slightly confusing situation unfolded, with a couple of things that stood out. One was the inclusion on one of the cards of a Silverfish (*Lepisma saccharinum)*, a small insect, a family of which appears to live in my apartment building in Portugal, and with which I am, unfortunately, quite familiar. This raised some questions—"a fish from the water?" (Workshop Participant, personal communication, 2022))—that had to be discussed, and the nature of the animal explained; this was a distraction from the gameplay, and emphasised to me the importance of considering the context of playing the game and including 'beings' that made sense within that local context.

The other challenge was with the gameplay itself, with one participant not understanding the nature of the game as being a challenge where others had to guess what was on their card, as they would often show their card to other contestants during their turn in the game.

All in all, this workshop did not go as planned—from recruiting participants and finding a suitable venue, to conducting the workshop activities—but it did provide some important insights. It highlighted the importance of recognising that workshops in community settings may involve participants from different cultural, educational and social contexts to both the designer and each other, and therefore endeavouring to make the artefacts and tasks as clear and accessible to all as possible. It also demonstrated that workshops will rarely go exactly to plan, and it is important to be flexible and responsive to change.



Figure 78 : Playtest Workshop : Barreiro

This figure shows details from the Playtest Workshop in Barreiro, Portugal.

Credit : Craig Jeffcott

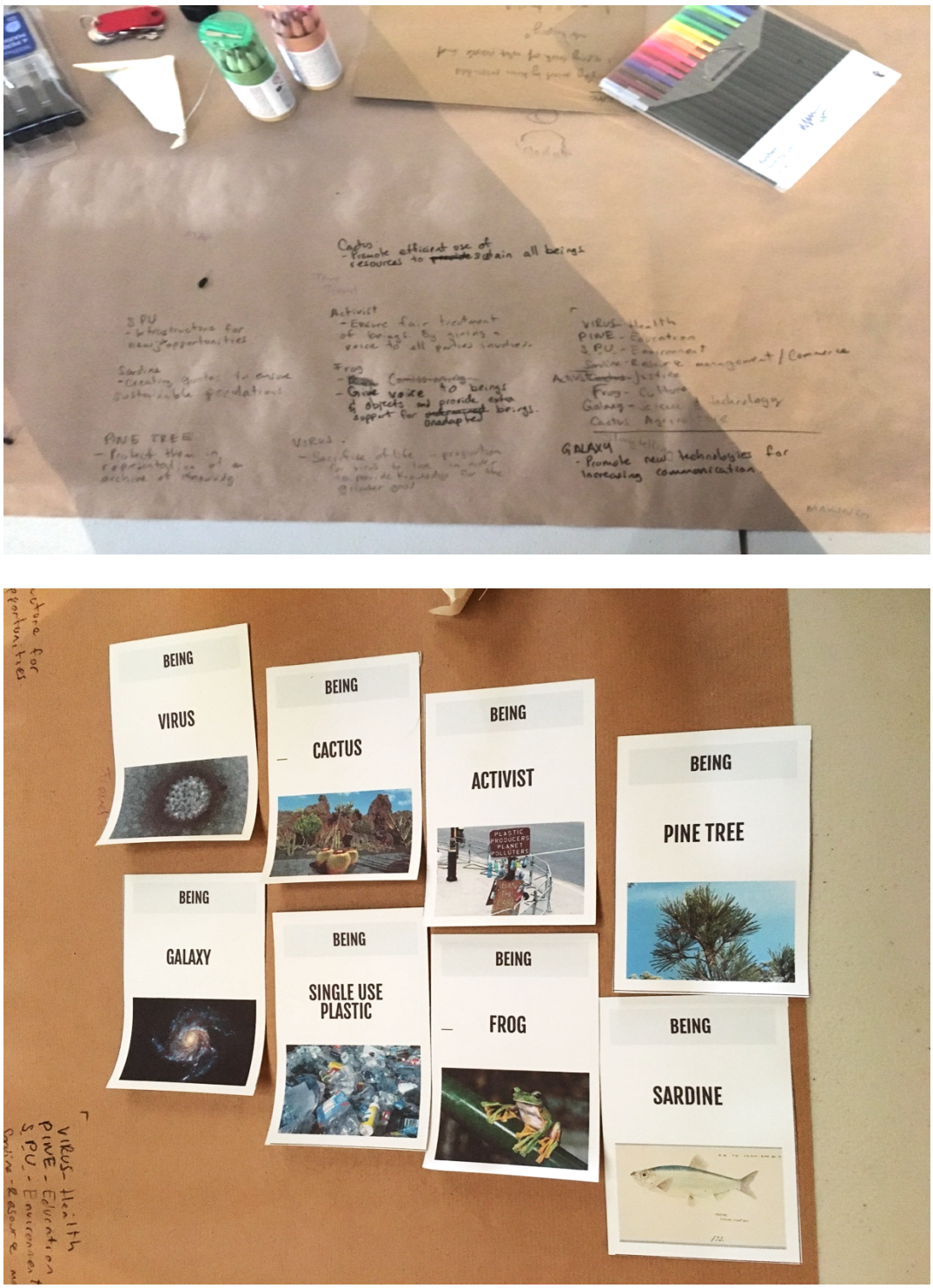


Figure 79 : Playtest Workshop : Glasgow

This figure shows details from the Playtest Workshop in Glasgow, Scotland.

Credit : Craig Jeffcott

Reflections on Design Phase

In reflecting on the first version of the design of the Playset, I identified a number of issues, which can be grouped into either issues with process, or issues with concept. Process issues, such as the structure of game activities and the design of game objects relating to how well they operate, are largely questions of refinements and modifications that can be made to improve the gameplay and workshop experience. These have already been discussed and were easily taken into account through the iterative process of Playset development.

Conceptual issues—those relating to the fundamental purpose of the Playset and the rationale behind the design of specific games and activities—are rather more complex, as well as informative, in the development of the Playset, and so these reflections will focus more on those. I have identified the following conceptual issues through the design of this first prototype: abstraction of complex ideas, creation of speculative futures, mediating the diegetic boundary, and Win Conditions. I discuss these in detail here.

Abstraction of Complex Ideas

The first aim is that the Playset should encapsulate many of the ideas and values from the design framework in an accessible way, which, referring to the theoretical aspects of game design, can be achieved through the framing devices of the game, and through abstraction in the design of the game objects. The first iteration, being as it is an early exploration of how to materialise the Celium, does not take good advantage of these aspects of game design. Its way of including many of the conceptual elements of the design framework is largely a form of "information dumping", with various cards displaying text explaining philosophical principles, design techniques, or works of speculation, and activities where participants have to read and talk about these texts; of the three workshop activities, only one was a game, and the other two were largely philosophical discussions. Very interesting, but not really what the design Playset was aiming to achieve—the Celium would itself be enough for facilitating a discussion of that nature.

Creation of Speculative Futures

The problem of the creation of speculative futures relates to the second and third aims of the Playset, the embodiment of the principles of the Celium, including the five strategies of future-making, and supporting a repertoire of speculative design practices. It became increasingly clear that the key part of supporting speculative design practices is in the creation of speculative futures, for which the strategy of storytelling is of fundamental importance, while also including the other futuring strategies, alongside some of the values and strategic goals of the Celium.

On reflecting on the first prototype of the Playset, I realised that this key process of speculative storytelling and world-creation was missing; that, in fact, there was a gap (a diegetic void, as it

were) at the centre of the Playset where this fundamental process needed to be. As discussed in the first workshop, the Icebreaker Game acted as a priming activity to orient participants to start thinking in terms of Strange Strangers and more-than-human perspectives on the environment, and the Speculative Design Challenge was designed as a way to put such perspectives to play in a variety of design activities. But to connect the two, I understood that if speculative design is a process of materialising possible futures, then approaching it without an appreciation of what those futures might resemble is difficult. In particular, I understood that a key principle of the Conceptual Design Celium was collaborating to create better futures together, as well as understanding the importance of the aim to imbue those futures with many of the ideas and values that have motivated this project and are present in the Celium. In practice, I relied on a "data-dumping" principle—of getting participants to discuss and debate the principles of the Playset ahead of doing their speculative tasks—as the "bridging" task between the orientation game and the future materialisations. However, the Playset was missing both the means to encapsulate these values and principles within the framing, mechanics and objects of the games, as well as a core Collaborative Storytelling Game that I realised must form the speculative heart of the entire Playset.

Mediating the Diegetic Boundary

Another important reflection from the first workshop was the way that the Playset should mediate the shifts from the real world to the diegesis, making clear to participants the different mental gears needed to operate in either reality. As discussed in the section on the theory of game design, games are able to shape and mediate the collaborative creation of narratives within the diegetic void through their framing devices—rules, setting, and metatext, such as game objects and in-world texts, and by providing a game space that is moderated but subject to alteration by the players. Games can engender a suspension of disbelief through emotional engagement and a sense of verisimilitude in the players. On reflection, the earlier pilot workshop also showed that an important element of framing is the situatedness that it engenders in an activity or in the players of a game: by framing the design activity in a specific location with a specific set of challenges and beings, it shifts the focus away from the general and abstract and towards the specific and concrete. Any game at the heart of this Playset needs to draw on framing in such a way to engender worlds or futures that feel real.

Win Conditions

A final, related aspect of the game play that needed to be addressed was that of the Win Conditions or endpoints of games within the Playset. People play games for the fun of playing, but they also often play them because there is an endpoint to aim for, often the possibility of "winning" the game. Such an endpoint helps players to engage and suspend their disbelief, allowing them to feel a real-world sense of achievement through experiential metaphorical

projection from the game space. However, the entire ethos of the project, the framework and the Playset is in opposition to the concept of competition, or of winning; the fundamental goal of the framework being to work together towards better futures and to collaborate. Devising a game which has an exciting endpoint, a way to win, but one which embodies the principles of collaborative future-making, is a further challenge.

These four challenges—naturally building concepts into the gameplay through framing devices and abstraction, enabling the players to generate speculative futures through play, making those futures feel real, and creating an exciting collaborative "win" condition—are complementary challenges, and all were instrumental in the development of the second prototype of the Playset.

In conclusion, these developmental workshops, whether to test out the speculative proposition or to play test some elements of the Playset, proved very useful, and allow broad conclusions to be drawn: speculative design activities can be an engaging and interesting way for groups to explore issues in biodiversity; speculative design operates on some unfamiliar premises, so it is important to structure the sequence and level of activities to the community in question; and it is particularly important to take care of the languaging of the resources, and not to use academic or technical terms where simpler descriptions might suffice. Further research and development into the gameplay elements and mechanics was necessary: this is the focus of the next design phase.

7.3.4 Design Phase : Storytelling Game Design

Phase Overview

I approached the development of a second iteration of the playset with a reflection on the insights I made through designing and testing the first iteration. I considered the balance between abstraction and concreteness on how to enfold complex ideas into the artefacts and game objects, and the power of games to allow the abstraction of complex ideas in this way; how to integrate some of the strategies and goals and ontology of the Celium within game mechanics. Also important was understanding that the first iteration lacked a "middle", an important pivot point for the Playset to bridge between priming players to think in speculative ways and the acts of speculative design, something that allowed for diving into speculative fabulation in a way that didn't need much explaining. The exercise of discussing principles was my first attempt at bridging the gap in the first test workshop, based on the understanding that there needed to be a connection between these activities. However, I came to the realisation that what was missing was not simply a bridging exercise, but the most significant, core part of the Playset.

Concept Development

To a large extent, much of the design work in the time period between the testing of the first prototype of the Playset and the design of the second—from March–December 2022—was a process of reflecting on these issues: figuring out what the core game of the Playset should be, and in particular, grappling with this balance in the game framing and game objects between the overt inclusion of the key ideas, philosophies, goals and strategies of the Celium (as in the form of data cards explaining principles, or strategies in the first iteration), and using abstraction and the structure of the games to conceal and embody those principles indirectly. I had the insight that the more overt these elements are, the more the games become inaccessible and uninteresting, but the more abstract, the more the games have the possibility to engage players with these ideas in less didactic, more fun ways.

I began to consider what those important elements were, and how they might form part of the game that I was to design. Throughout this project, there's been an emphasis on the strategies of future-making, which lie at the core of the Celium; this is what led me to design the Icebreaker Game, with the die and the five different types of action to be performed. Obviously, the strategy of play and performance is reflected in designing the Playset as a series of games, with the ideas of adopting Strange Stranger personae from the *What Am I?* Game and the pilot workshop leaning towards the performance aspect of that strategy. Making would come through design activities, and time travel is perhaps inherent in the realm of speculative future-making. Mapping remained a challenge, but I decided to focus on the strategy of storytelling. Given that this Playset is intended to engender the speculative fabulation of possible futures, I realised that at its core should be a storytelling game. This was the kernel around which answers to unresolved design questions began to take shape: how might the mapping strategy, which could refer to geography but could also refer to more conceptual maps of relationships, be included? How might the game reflect the ideas of queerness and more-than-humanity? How might it draw on the conceptual figure of the and the Strange Stranger? How could it embody the goals of care for the environment, working together for better futures, and seizing the future? How might it have an exciting win condition that embodies those values?

Development Session : Storytelling Game Concept Design

These ideas came to the forefront on a couple of evenings with friends in Edinburgh in September 2022; on the first, through a game of *Carcassone* (Wrede, 2000), and on the other, a week or so later, sitting down with some pens, paper and assorted game play objects collected from toy shops and thrift stores for a rough prototyping session.

Carcassonne is a "German Style" board game, of the sort that often has win conditions that involve some degree of collaboration (though I would not consider *Carcassonne* itself to have that

quality), the diegesis of which involves rival armies staking claim to the medieval French city of Carcassonne by claiming territories around a riverbank and defending them. The game is framed through the use of small cards with sections of a map drawn on them, which players take turns to lay on the table, in the process creating the landscape that they aim to defend, and the armies being represented by iconic wooden tokens in the shape of generic people, called Meeple. I was particularly struck by the map making gameplay, where the geography of the game was actively created through playing it, in which I saw a parallel with the concept of mapping being not just a way of recording a space but of actively making place. This insight was to be important going into the prototyping session.

During the prototyping session, I followed the thread of this geographical provocation, considering how I might adapt the existing game cards in order to embrace this sort of place making. From this, I had the insight that a grid of cards depicting various beings could, in some way, represent an ecosystem. Such a representation would need to resemble a web, biodiverse tapestry of connections in multiple directions, so the cards would need to be polygons with multiple sides. If hexagonal, the game objects could invoke the notion of a bee-hive, as well as allow for a manageable level of connections from one card to the next.

This idea started to seem promising, but the question of the game mechanics came to the forefront. Perhaps this could be a storytelling game rather like *Once Upon a Time* (Wallis et al., 1993) but about an ecosystem, where players place cards and start telling stories about them. Included in the prototyping objects were some ten-sided dice from role playing games, which perhaps could represent a year, could represent a time machine for the storytellers, so embracing the time travel strategy and the future-making goals.

But these were still just a concept, lacking framing devices—rules, win and end conditions—that would make it a playable game. We discussed the question of win conditions at length: there were small Lego tokens on the table, and I considered the possibility that these could be accumulated by players collectively in some way, but there was no obvious way for that to be included. We discussed what the point of the game was to be, the achievement within the diegetic game frame, and I realised that this resolved down beyond the strategic goals to the larger goal the Celium represented: to protect biodiversity and oppose monoculture. Someone suggested, then, that this is what the collective goal of the game should be, to increase the level of biodiversity in the system. That there should be some measure of biodiversity, which can increase or decrease, and the goal of the players is to collectively make that measure as high as possible.

As a culmination of these various reflections on what sort of game was needed, this practical game design session, conducted on a kitchen table on scraps of paper and with random game objects, gave me the insight needed to start to design the second phase of the Playset.

Prototyping: Collaborative Storytelling Game Design

The aim of this prototyping phase was to create a storytelling game to sit at the heart of the speculative Playset, mediating the creation of speculative futures in collaborative gameplay sessions.

Gameplay

The fundamentals of the Collaborative Storytelling Game mechanics came together in this phase of design: the concept of telling a collaborative story using tiles representing Strange Strangers, creating a playing board as a map of an ecosystem in the process; the use of time machine dice to decide on the setting of the story in time; Speculative Prompts to guide the emergence of the story (these were not initially tiles, but cards); and the game aims of maximising the Biodiversity Score by creating dense ecological webs and eliminating monoculture tiles; and the scoring system, with touching *Strange Stranger* edges resulting in +1 points and touching Monoculture edges resulting in -1 points (See Figure 80).

At this stage, the end condition for the game hadn't been settled on, and there was no time limit applied to the storytelling rounds.

Game Objects

This iteration was an initial version of the Collaborative Storytelling Game, using hand drawn cards, and without some of the details of gameplay worked out (See Figure 80).

Hexagonal Tiles

Hand-drawn hexagonal tiles with a variety of Strange Strangers written on them in green ink, and monocultural elements in red ink.

Speculative Prompt (Card Version)

The Speculative Prompt Cards were developed in tandem with the speculative scenarios within the Conceptual Celium; these represent eight archetypal stories drawn from speculative fiction that embody the worldview and values of the Celium (refer to *Chapter 6.3.4 Speculative Narrative Archetypes* for more information on the stories that they draw inspiration from). These were printed onto A6 sized cards (See Figure 80).

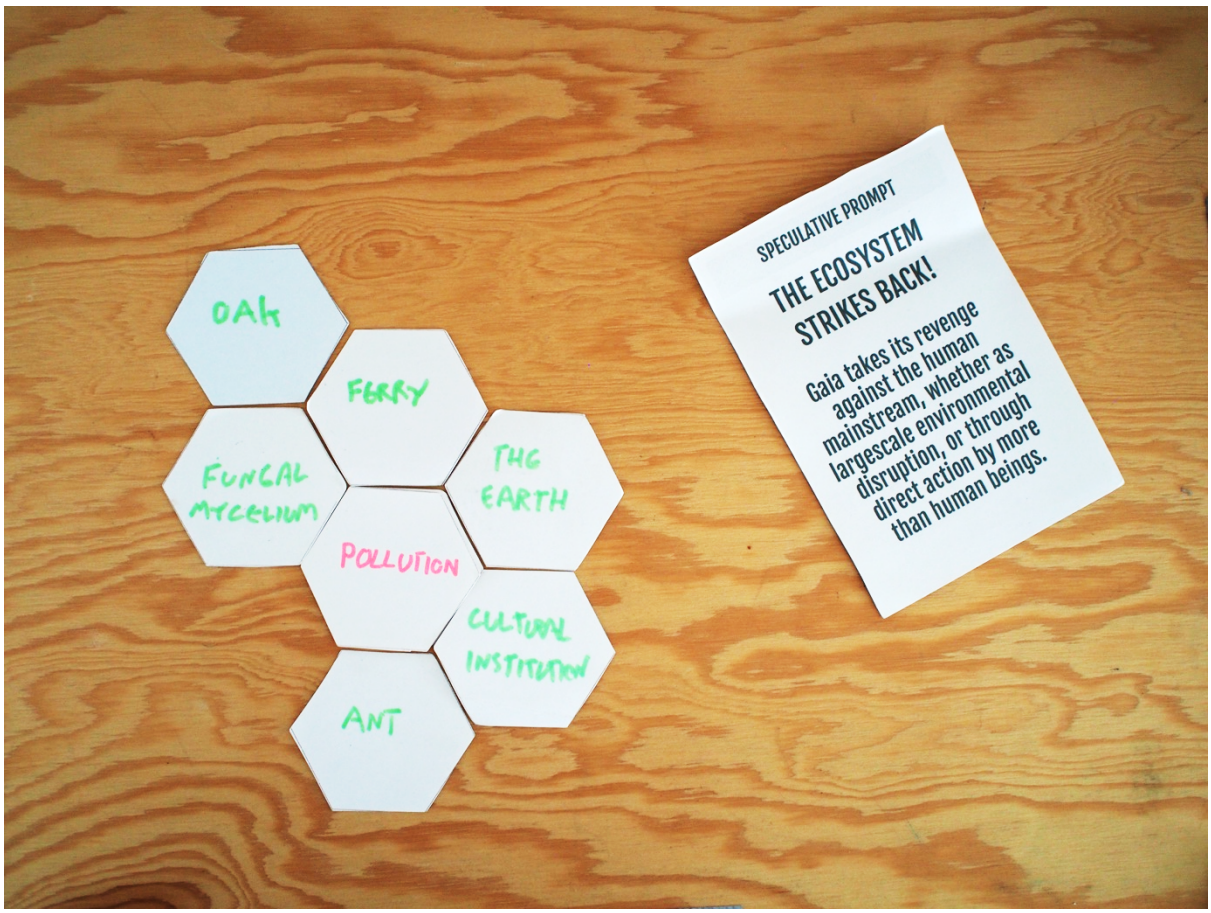


Figure 80 : Collaborative Storytelling Game Prototype

The second iteration of the playset focused on the design of the Collaborative Storytelling Game. In this game, players work to create a dense web of life, telling stories based on the speculative prompt cards. This version has hand drawn Strange Stranger cards, and rectangular printed scenarios. The cards use abstraction and framing to invoke an ecological web on which the players have to collaborate to create a strong ecosystem; the rules of the game encourage the players to create dense biodiversity networks, and to oppose the establishment of a monoculture.

Credit : Craig Jeffcott

Development Session : Storytelling Game Talk Through

Shortly after creating the gameplay concept and game objects for the storytelling game, I presented them to a friend, and talked him through the game. This was a useful exercise as it allowed me to see if the rules of the game made sense in the way I explained them, and if the gameplay seemed likely to work (See Figure 81).

One of the most useful discussion points was the issue of how to end each story within the game. At this point in the process, there was no provision in the rules or game objects that would allow the game to end, which would mean that all tiles would eventually be incorporated into a single story. This had two problems: the first being that multiple stories needed to be told, as an important part of the process of comparing and choosing between preferred futures, and the second being that the gameplay goals would be rendered somewhat futile—if all cards were played in each game, then the pressure to maximise the score before the story ends would not exist. We discussed whether each story should operate under a time restriction, but that didn't feel to be the right answer, and settled on the addition of a new type of tile: a The End Tile. This was borrowed from *Once Upon a Time* (Wallis et al., 1993): James Wallis designed the win condition of that game around each player having to play all the cards that they had been dealt and, having done so, play a The End Card to terminate the story and thus win the game. As a collaborative game, this game doesn't have this win condition, but The End Tile, when randomly selected, will end the story. I incorporated nine of these tiles into the game, allowing for the possibility in a single gameplay session of telling each of the nine stories.

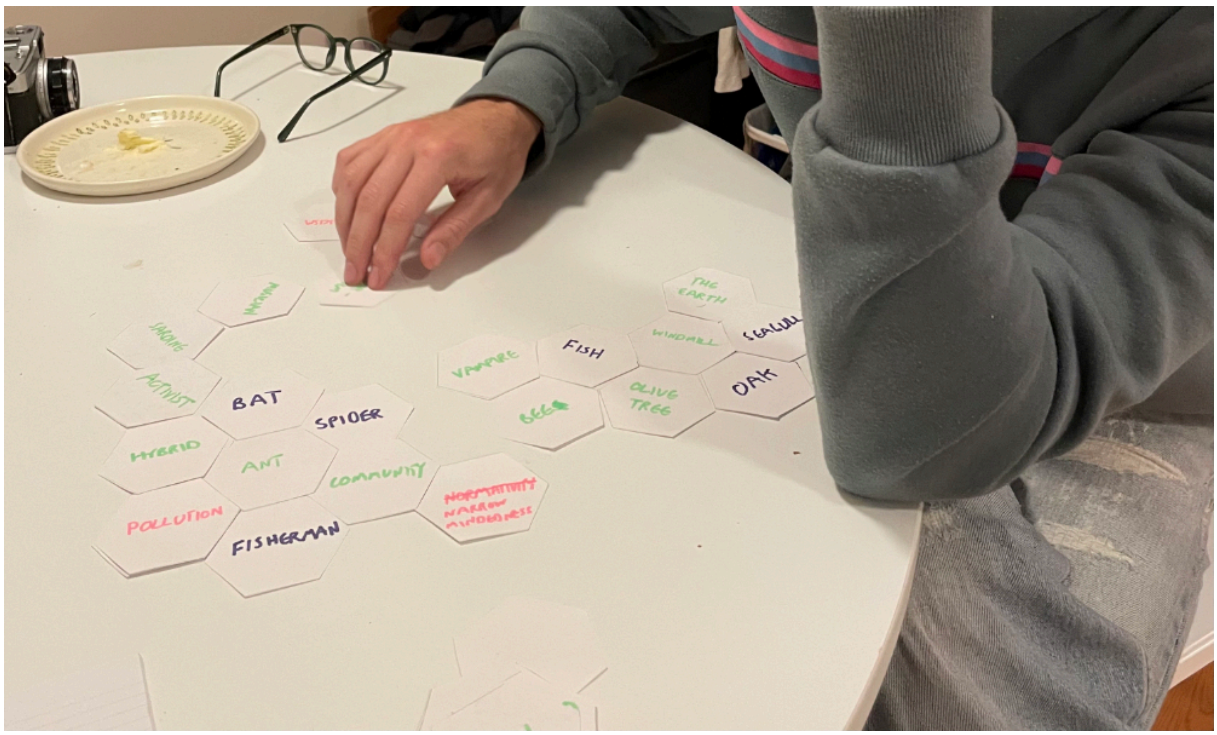


Figure 81 : Storytelling Game Talk Through

Photograph from storytelling game development session, where I demonstrated the game to a friend, and we talked through the gameplay to help to refine it.

Credit : Craig Jeffcott (Photograph)

Development Session : Storytelling Game Play Through

I arranged an initial play session with the same friend and two others some days later; in this instance, I chose to mediate the game in a Games Master role so that I could observe better how the gameplay dynamic worked. Initial impressions were positive, with players seeming engaged and enjoying the structure and dynamic of the game. Explaining the rules initially was tricky, which led to the realisation that the game works better through learning-by-doing rather than players trying to absorb all the rules from the start; in future games, I would use the first story as a walk-through of how the game should be played in subsequent rounds—once the dynamic was grasped, it seemed that players quickly embraced the concept of the game.

Two other important insights were gleaned from this gameplay session. The first was that a time limit needed to be applied to each player's story-telling round, as it was possible for participants to overthink and take too long on their answers: I realised thinking quickly and instinctively answering was a more useful approach to interesting stories than trying to be too clever or overthinking their answers, so a timer device will be added to future iterations.

The second insight was that players tended to forget about the speculative prompt for the story: after reading it, it would be put to the side, forgotten about, and didn't really influence the story in any particular way. I realised that it needed to be integrated into the game objects more effectively.

Reflection on Design Phase

Given the importance the Collaborative Storytelling Game has taken on—in being the key transitional assemblage that mediates between conceptual theory and design practice, and that mediates the collaborative creation of fictional futures and elseworlds—there was great value in taking the time to focus on developing this one element of the Playset, and designing its gameplay and objects in a reflective, iterative way. The next design phase considers how this was incorporated into the Playset as a whole.

7.3.5 Design Phase : Second Prototype

Phase Overview

This Phase involved the creation of a Second Prototype that built on the First, and incorporated the Collaborative Storytelling Game within the Playset. This prototype was tested then tested in storytelling workshops.

Prototyping : Designing the Second Prototype

The Second Prototype of the Playset aimed to pull together insights and designs from previous design iterations to create, if not a final version of the playset, at least one that would allow for a series of design and gameplay activities that could form the basis of a speculative workshop.

This iteration incorporated the Collaborative Storytelling Game into the Playset, with its game objects designed more fully, taking into account the insights from the previous iteration, as well as reworking some of the games from the first iteration to better fit with the Storytelling Game, which now lies at the core of the Playset (See Figure 82).

Games and Activities

Icebreaker Game

A simplified version of this game dispenses with the Activity Cards in favour of the Speculative Strategy Die, with a defined action for each side of the die, and the introduction of a game timer, with the aim of making the gameplay more dynamic. Defining the actions for the strategies is still in flux. Three were obvious, and were familiar from party games such as *Charades* (Cambridge University Press, 2025a) and *Pictionary* (Angel & Everson, 1985): Making required the player to sculpt or draw their *Strange Stranger*; Play and Performance to act it out; Storytelling to describe it. Mapping and Time Travel were more of a challenge, and a solution was not settled upon for those.

Storytelling Game

This game has been refined based on the previous iteration and development, with printed cardboard tiles, Speculative Prompt Tiles that can be better integrated into the emerging game board, and gameplay timers (See Figure 83).

Debating Futures

In a follow up exercise after a few rounds of storytelling—and creation of multiple futures—players critically discuss the fictional worlds they created. This exercise used a variant of the Futures Cone diagram which represents expansive pasts, as well as futures, based on a concept by Coulton, Gradinar and Burnett (2016). The diagram is used as a playing board for players to map out the fictional worlds, in terms of where they lie on the timeline, as well as where they lie on the axis of probability, deciding to position them from probable, plausible, possible and impossible futures. Following this mapping, the players are asked to decide, collectively, which of their stories represents the most preferable future. During this exercise, they will be asked to reflect on the biodiversity score of each story and how that might influence their decision.

Speculative Design Challenges

The final game or activity in the planned workshop structure remains the design activity, giving the players or participants design challenges drawn from the values and worldviews of the framework. Within this set of activities, this design challenge takes on a new purpose. Players will have spent time creating fictional worlds, discussing them, and selecting one that they prefer. They can now apply these to speculative design activities, and thus draw on one of the key advantages of speculative design as a future-making practice: it materialises part of those futures in a way that can engage and galvanise others into staking a claim for it. The cards for this activity have been simplified and made more consistent; ultimately, the aim was to make an entire deck of Design Fabulation Cards.

Game Objects

Gameplay Tiles

Hexagonal Tiles

These cards were redesigned digitally. Each Strange Stranger was represented by black capitalised text on white, Monoculture cards were grey with white text, and The End Cards were red text on white. On realising that the thin cardboard used allowed the text to be read from the reverse side, I created a reverse design for all cards, a dense block of cursive text which took a significant quote from Timothy Morton about Strange Strangers to camouflage the obverse side, as well as adding an additional metatextual framing element (See Figure 84).

Speculative Prompt Tiles

To integrate these properly into the gameplay, I decided to make the prompt cards part of the storytelling web; they were designed as irregular dodecagons formed of three regular hexagons joined together, with the story title and prompt printed in the centre. They would conceptually

and physically form the core of the story and allow for different approaches to storytelling at the start of each round. The same textual camouflage background was applied to the reverse of these cards.

This version of the Gameplay Tiles is displayed in *Appendix 3 : Gameplay Tiles (Card Version)*

Hourglasses

I purchased some hourglasses (egg timers) to introduce a time limit to each player's round of storytelling; I included a 1 minute and 30 second timer, for the discretion of the players (or the GM) depending on how fast the game is to be played.

Pluriversal Cone Worksheet

I created a modified version of the Futures or Voros Cone, following the suggestion of Coulton, Gradinar and Burnett (2016) that the Future Cone be extended to represent possible futures and pasts. I later reflected on the use of this cone with regard the comments by Cameron Tonkinwise (Tonkinwise, 2014), that the Future Cone represents a singular present. The Ontological Turn suggests there is no singular objective present, with all beings encountering the present at a nexus of a particular set of likely pasts and a particular set of likely futures. The Future Cone is therefore in opposition to the pluriversality at the heart of this approach to design, though Coulton *et al.* suggest a solution to this by depicting multiple Past and Future Cones from different subjective perspectives (2016). However, the Future Cone is a familiar entity to some people, it affords the possibility of an interesting comparative discussion of futures, and also presents a talking point to discuss the pluriversal perspective on presents, so I considered it to be a useful tool for the purposes of the Playset. It was designed digitally and printed onto A3 card. It was intended that playing tokens to represent each future would be used in a future iteration, to integrate this activity as part of the ongoing game session.

Design Activity Cards

Reflecting on the development of the Playset in its guise as a design toolkit, an important concept has been to create multi-purpose resources, or tools, for speculative design, and this led me to a simplification of the concept for these game cards. I envisaged a deck of cards, each of which will present a different design activity situated within the values and worldview of the design framework, perhaps with ten cards for each of the speculative futuring strategies. These cards could be used for a quick design prototyping activity in a one-day workshop, could form the basis of a few days of a longer workshop, or be used in longer-term design projects to create fully realised prototypes, performances and events. The intention is they could also stand alone, outside of the other games, as an inspiration deck for designers.

For this second prototype, a small deck of nine cards was created, representing the nine exemplar speculative design techniques from the Design Celium, printed on A7 card, with the Strange Stranger camouflage text on the reverse side.

Development Session : Playset Presentation

I presented the playset at a meeting of the *Speculative Futures Lisbon* meet-up, where I talked through the game play and demonstrated the game objects. In general it was well received as a complete concept, with a couple of reflections that proved useful: that a possible activity for the icebreaker game for the strategy of mapping might be to think of maps in a more conceptual way, for example, players could map out the relationships their Strange Stranger has with their environment, rather like the hexagon webs of the subsequent game; and, to conceptually replace The End Cards with To Be Continued… Cards, to emphasise the unfinished, ongoing co-creation of the world beyond the confines of the game.



Figure 82 : Playset, Second Prototype

The Second Prototype of the Playset has printed Strange Stranger, Monoculture, and The End Tiles. The Speculative Prompt Tiles have been redesigned from cards to a dodecagonal (triple hexagon) shape to better incorporate them into the game play. Four dice to use as a 'time machine' and sand timers have been added, and a deck of 9 Speculative Fabulation design activity cards has been created.

Credit : Craig Jeffcott

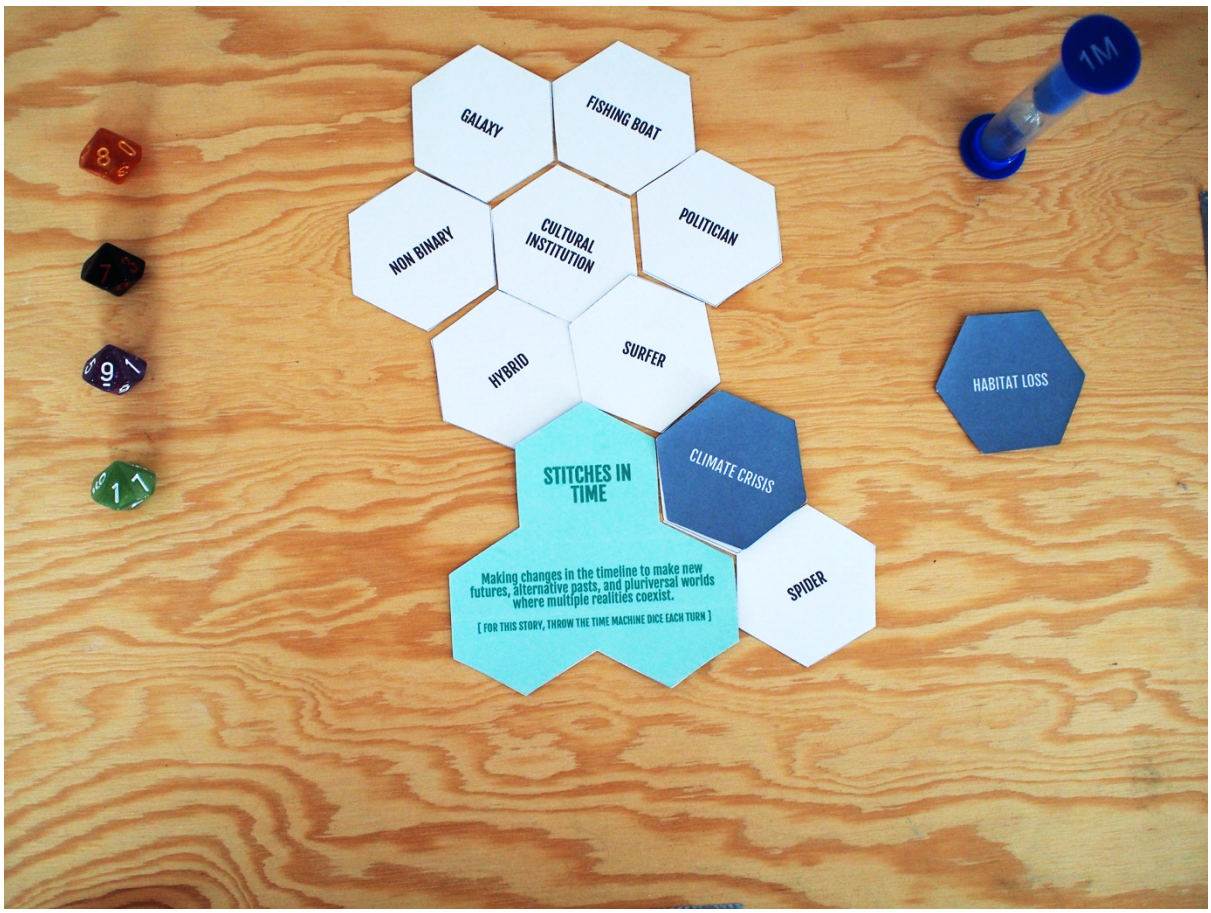


Figure 83 : Playset, Second Prototype : Storytelling Game in Progress

This image shows a game in progress. Players are telling a story set in the year 8791, based on the speculative scenario Stitches in Time.

Credit : Craig Jeffcott



Figure 84 : Playset, Second Prototype : Reverse Side of Speculative Prompts

Detail of the back of some of the times in the Second Prototype of Strange Strangers in Strange Lands Playset. This dense text was intended to obscure the obverse side of the tiles as they were printed on thin card, but also acted as a form of metatextual framing, with the text about Strange Stranger taken from Timothy Morton's Queer Ecology (Morton, 2010)

Credit : Craig Jeffcott

Workshops : Playtest Workshops

The Second Prototype of the Playset was tested in two speculative storytelling workshops. I describe the rationale for the workshop, some background context on the participants and setting for the workshops is given, and the format and structure that both workshops followed is described. I discuss each activity or game of the workshop in practice, which includes extracts from the speculative fabulations that the participants created. At the end of this chapter, I reflect in some detail on the workshops and the Playset in use, beginning with feedback given by the participants during the workshop, followed by designer reflections on practice that draw some conclusions from the process.

Workshop Rationale

The purpose of these design workshops was to test the speculative framework and speculative storytelling Playset in practice with groups of participants. The rationale for this is that this research project concerns itself with community activist engagement in biodiverse future-making, framed as a form of speculative design practice through a Queer Ecology lens, drawing on queer and more-than-human strategies for better futures. This has manifested in three moments of design.

The first moment of design was the creation of a Conceptual Design Celium grounded in accounts of lived experience reading-through-theory, and design experimentation. This frames speculative future-making practices through queer and more-than-human lenses in a particular onto-epistemological worldview, within the strategic goals of care, community action and seizing futures, and the strategies of making, play and performance, map-making, time travel, and storytelling.

The second moment of design was the creation of the Playset, an assemblage of artefacts that are designed to materialise and activate these strategies, goals and worldview in a way that makes them accessible to participants who are not necessarily speculative practitioners, intended to guide them through a speculative design process for biodiverse futures.

The third moment of design was designing and running practice-based design workshops, in which the Celium, via the medium of the Playset, is made real in the world, through performative action and artefact creation. Together, these form the abstracted structure of a Speculative Design Practice, the tangible artefacts that both further abstract as well as materialise the practice in the world, and the real-world co-creation of material speculative worlds.

Workshop Planning

Context, Settings and Participants

While the hope had been to carry out speculative fabulation and design workshops in community biodiversity contexts, I made the pragmatic decision to instead organise them in more academic, educational contexts, taking a convenience sampling approach to recruit participants. This was partly because of time constraints and logistical challenges, but also partly through the understanding that the Playset was still in a transitional and tentative form and that it might be beneficial to have participative feedback from other speculative and design professionals.

Two workshops were organised. The first took place on the 25th of March 2023, at *The Base*, a co-work space in Lisbon, with 6 participants drawn from the speculative design and design futures community in Lisbon—including one other PhD candidate from *IADE* (See Figure 85). The second workshop took place on the 17th of April at *CODE University* in Berlin, with 3 participants, all students on the BA Interaction Design Programme (See Figure 86). The workshops had the same format, with slight alterations in the timing and structure of the day: The Lisbon workshop took place from 11.30 am–6.00 pm, with a break for lunch, and the Berlin workshop took place from 2–6 pm, with a coffee break in the middle. I took the role of workshop facilitator for both workshops, and in the Lisbon workshop I also took part in the activities as a participant-player.

Workshop Aims

The aim in these workshops was less to help develop and refine the playset, as in previous workshops, but more to test it in use within the context of storytelling workshops. In particular, I hoped that insights could be drawn into how abstract framing concepts might be materialised by games, and to discover the particular ways in which the concepts framing this research might manifest through these particular games. This aim was met through the design, planning and running of the workshops as a basis for at the time reflection-in-practice, and subsequent reflection-on-practice, supported by video and audio recordings, extended participant feedback discussion about the effectiveness and enjoyability of the workshops, and an analysis of the transcripts of the speculative fiction narratives that were created. It was additionally hoped that the participants, largely those with interests in design and speculative futures, might also make interesting observations and gain insights that they might draw on in their own future-making practices.

Workshop Format

The protocol for both workshops involved four activities, divided into two broad thematic sessions: one based on speculative fabulation, and the second based on speculative design. With one exception, each activity represented a specific part of the design playset. The first activity replaced the Icebreaker Game, with a reading and brief discussion of a theoretical text. The second activity—the core activity of the workshop—was the Collaborative Storytelling Game. The third activity was a discussion of the plausibility and desirability of the various stories, and the final activity was a short design ideation session, using the Design Fabulation activity cards.

Activities

This section gives an account of the four activities that were carried out in each workshop; for each, the activity is introduced and described, followed by accounts of how they unfolded in both workshops.

The first part of the workshops focused largely on the *Storytelling* game, which is used to facilitate the creation of speculative diegetic futures and elseworlds through storytelling and playing. In particular, this storytelling is framed as speculative fabulation, which, as described previously, is an approach to storytelling in design that foregrounds bringing ways of being or interrelating that are marginal, neglected or otherwise underrepresented into fictional speculative worlds. Fabulation represents a speculative means towards "understanding, working with and making theory" (Søndergaard et al., 2023, p. 1696), with a shift away from the techno-science centric approach of design fiction and so called "Hard" Science Fiction towards a focus on more-than-human beings, social, cultural and political relations, and power dynamics as exemplified by "Soft" Science Fiction, Fantasy, and New Weird Fiction.

The second part of the workshop can be thought of as more speculative design rather than fabulation, or rather, a form of speculation through design. While the first part focused specifically on storytelling, or perhaps world-telling, an imagining of possible futures or pasts or presents, the second part brings a more intentional, material form of speculation: a making of futures, rather than a telling of them.

Text and Discussion

I made the decision to replace the Icebreaker Game with a theoretical reading as the first activity of the workshop shortly before the start of the first workshop. I made these decisions for a few reasons, some pragmatic and some more strategic. Strategically, I reasoned that for the specific participants for these workshops, on the whole people with backgrounds in design or speculative practice, it could be more interesting to contextualise the workshop activities in a theoretical perspective, and that they might less need of a 'priming' activity to put them in a

speculative mindset. Pragmatically, I had other concerns: that time constraints due to some logistical issues would make it more difficult to fit all the activities into the timescale available, and that this activity would be time-consuming; I had already tested this game in previous workshops; I wasn't entirely happy with the gameplay around the strategies of mapping and time travel; and the 3D printed gameplay die I was working with was malformed.

I chose to give the participants a short passage from Timothy Morton's paper, *Queer Ecology* (Morton, 2010) in which Morton explained the concept of the Strange Stranger. My feeling was that, as the Playset was primarily structured around the concept of the Strange Stranger, it could be an interesting starting point to introduce and discuss that concept in Morton's own words. All participants of each workshop were given a printed copy of one page of the paper, with this relevant paragraph highlighted. I asked the participants to take turns to read a paragraph out loud to the rest of the group.

Collaborative Storytelling Game

The main focus of these workshops was the Collaborative Storytelling Game, which has been described in detail, but to recap, this game involves Players using Strange Stranger Tiles to create pluriversal, more-then-human speculative narratives of possible futures or alternative worlds.

In the Lisbon workshop, four rounds of the game were played (See Figure 85). They told stories about a silver surfer who travels to a distant planet to find a missing artist (*Strange Strangers in Strange Lands*), a group of psychedelic time travellers who accidentally unleash a fascist robot in the future and have to travel to the past to promote mysticism over science to prevent that future happening (*Stitches in Time*), about fungal mycelia trying to fight the loss of frog habitats through weaponised zombie spiders and seagulls (*The Ecosystem Fights Back!*), and a group of artists who leave earth to find artistic freedom and form a new society with monkeys based on hybridised oak and banana trees (*What You See is What You Get*).

In the Berlin workshop, three rounds of the game were played. Their stories were about technological ants allied with dragons and a fairy, fighting a covert war against politicians (*What You See is What You Get*); a love filled world ruled by bees fighting against desertification (*Radical Intimacy*), and a very shaggy dog story about how various events across time led to a societal obsession with dogs and crushing global poverty (*Stitches in Time*).

I invited Erica Doo, an artist, to create some illustrations of these narratives; these allowed for the stories to take more material and persuasive form, as well as facilitating a Diegetic Escape, their entangled existence to other times, places and consciousnesses (See Figures 87–92).

Edited transcripts of these stories can be read in full in Appendix 2 : Speculative Fabulations

Comparing Futures Discussion

This exercise was based on the Futures Cone as adapted to consider plural pasts and futures (Coulton et al., 2016). It represents an important moment in the workshop, by emphasising speculative practices as an intentional form of futuring, whereby different futures are critically assessed, debated and argued over, and purposefully made a case for. The Future Cone is a visualisation of how possible futures can diverge from a present, in widening cones of possibility; a straight line from the present representing the most likely future (the Impasse of the Present, the future as just more of the now), and ever widening cones representing ever more unlikely yet possible futures; the version used here also applies the same logic to the pasts, with a straight line towards the most likely pasts that led to this present, and wider circles for the less likely pasts. As discussed previously, there are conceptual issues with this model, not least in its representation of singular presents and a linear conception of time, but it was a useful simple model for the purpose of helping workshop participants to think about futures in a more critical and analytical way.

For this exercise, I asked participants to consider the stories that they had created, map them onto the timeline, and think about how they might relate to each other in terms of being probable, plausible, possible or impossible futures. Following on from this, I asked them to assess which would be the most desirable future out of those that they generated: this future would be the subject for the subsequent design activities. The Lisbon group chose the story based on the *What You See is What You Get* prompt, about the artists on the banana oak tree planet, and the Berlin group chose the *Radical Intimacy* story of the bee planet fighting desertification.

The workshop in Lisbon allowed more time for a longer discussion, so a longer account of the Lisbon workshop is presented here. I encouraged the participants to talk through their four stories in turn, and initially to assess where they might lie on the probability axis, from probable through plausible and possible to impossible.

The first story, from the *Strange Strangers in Strange Lands* prompt, was set in 7254 and was about a partially frozen ocean planet where a silver surfer from space had arrived in search of a missing artist. One participant felt that the story lacked plausibility, simply because of how far in the future it took place: that it's difficult to really assess the possibility of something 5000 years into the future. There was a discussion about whether such forms of interplanetary travel on small spaceships seemed likely to happen in the next 5000 years, which was deemed to be possible if not particularly likely. Some elements of the story, like the water-covered planet, and the universality of art, were deemed to be more plausible. One participant interpreted the story as more figurative, being about an explorer-detective travelling to a familiar place.

In the *Stitches in Time* story, psychedelic time travellers unwittingly unleash a fascist robot and attempt to fix their mistake by encouraging medieval societies to adopt more spiritual, less technological approaches to life. This brought similar feedback; that parts of the story were much more plausible than others. The emergence of artificial intelligence with fascist tendencies exerting power through access to current technology seemed all too plausible; as did the fact that faced with such a scenario, many people might develop a prejudice against technology and embrace a more hands on and artisanal approach to life. On the other hand, the presence of time travel in the story was deemed to push it into the impossible category. There was the suggestion that if it was a story about a group travelling to a different country that didn't have robots and less technological culture, it could be perfectly plausible, simply the time travel element that was unlikely.

The third story, set in 4189, (*The Ecosystem Strikes Back!),* about an intelligent mycelial network fighting a secret war against humanity in defence of frogs by taking over the bodies of spiders and seagulls, was thought to broadly be fairly plausible. It's perhaps the most ecological, more-than-human of their stories, and seemed to involve some ecosystem cycles that seemed to make sense, of symbiosis and spread of fungal hyphae. We talked about some unusual properties of fungus and their mycelia: the way that some fungi can co-opt ants, taking over their minds and using them to spread their spores; the way that some mycelial networks are almost brain-like in their structure; the effect that psychedelic substances may have had on human evolution.

The last story (*What you See is What you Get*), where a popular leader has set up a *Subjective Museum*, where anyone can make an exhibition of their perspective on life, an idea rejected by artists who felt constrained and wanted a more individualistic way to work; they travelled to another planet inhabited by oak trees ruled by a dictatorial monkey, and attempted to ingratiate themselves through genetic art by creating all sorts of strange bananas. This caused pollution, forcing them to collaborate with the monkey to create oak-banana hybrids more in keeping with the ecosystem.

Again, this story had a lot of different elements, some of which were thought to be highly plausible, such as the museum for everyone, and the behaviour of the artists on the planet, with an artistic approach to genetic engineering that seemed to be consistent with how artists approach such things. Interestingly, there was a comment from the person who struggled with time travel that the thing that they felt most implausible was the story prompt: "the tricky part is having the multiple realities at the same time… and I think that's very far away from me, like the time travel," (Workshop Participant, personal communication, 2023). I spoke a little here about how this could be seen in a figurative way and talked a little about the Baradian idea of agential realism, where all things come into being through intra-actions between each other, leading to the idea that the world you think you perceive is the world that is real to you. In that sense, beings are living in different but parallel worlds, particularly thinking of different animals

and organisms that occupy the same place but encounter it in different, barely intersecting ways. It's perhaps the difference between thinking of it as a multiverse, in science fictional terms, and as a pluriverse, which is more of a figurative, subjective way of conceiving of multiple worlds. Someone commented that this is rather like the echo chamber effect of the media and social media, where "the news you read, the people you reach out to, the kind of images you see, are according to your own preferences… it could actually behave like we were living in parallel worlds, but at the same time," (Workshop Participant, personal communication, 2023).

Desirable futures

How desirable did these four futures seem to be to the group? The discussion moved on to considering which futures they might like to make a case for to take onto the final design activity of the workshop. This was a question less of whether they were likely to happen and whether they'd like them to happen. The story about the fascist robots was rejected fairly quickly as being wholly depressing and unwanted. The others all seemed to have elements that were viewed more favourably. The first story, which seemed to go on quite long and had a lot of plot twists, involved a lot of biodiversity, with people finding visions for the future, finding ways to express themselves, an almost messianic figure who showed them that "acknowledging the warm relationships with other beings as an important thing," (Workshop Participant, personal communication, 2023). The story about the fungus fighting back against people was deemed to be one about the earth doing its own thing, and the one with the artists on the planet with the oak trees seemed to speak of both culture and self-expression and "our relationship with nature," (Workshop Participant, personal communication, 2023). A comment across all four stories was how two of the stories were more biodiversity-oriented, but the other two were more human and culture-oriented, but it was agreed that the artists-banana story felt like a hybrid of both.

Ultimately, this was the story that they chose to make a case for in the next design exercise. It was commented that in terms of finding a way to make a case for better futures through speculative practice, this story was the ideal: it contained elements of getting things wrong, learning from them, and engaging more with the ecosystem; it was about creating community; it was a richly detailed world with culture and agriculture; and it opened up a lot of possibilities for storytelling.

Reflection on Futures Discussion

Some themes that could be seen in the discussion were the idea that the plausibility of a story could vary across the elements within it, as well as the level of suspension of disbelief and willingness to see stories in figurative ways or not. It seemed as though these elements were linked in some way to familiarity with or favourability towards speculative fiction in general. Those less well disposed to the genre found the suspension of disbelief difficult over esoteric

elements like time travel or strange forms of space travel, which made them struggle to engage with the verisimilitude of the stories, while those more comfortable with the conventions of the genre seemed to embrace the figurative nature of these stories and made an assessment of their possibility in terms of the internal or diegetic consistency of the narratives. These ways of thinking may have been prompted by the task of assessing the plausibility of the stories, but they brought up some interesting perspectives on whether speculative practices are oriented towards generating pragmatic future solutions, or imaginative provocations about values or qualities or the feeling of a future.

There was a discussion about how figurative the stories were supposed to be, where we touched on the role of speculative fiction as critical fictions that translate real world issues into speculative or fanciful ideas as a means of critiquing and commenting on those issues in an oblique way. In particular, I talked about how through *Star Trek*, Gene Roddenberry was able to tell stories about issues in the USA in the 1960s—racism, xenophobia, militarism—in a context that would have made it difficult to approach these concerns directly, but through the lens of alien species such as Vulcans and Romulans and Klingons, allowing important perspectives to be shared to a wide audience (Roddenberry et al., 1966). Participants talked about how fantasy could allow social commentary in a figurative way: that the proliferation of short-term rental apartments on holiday rental websites in cities, like Lisbon, with ongoing housing crises, could be seen as vampires, or that zombies could be referencing Covid-19 in some way.

One participant commented that even when deciding to take a story in a wild or fanciful direction, it could be rooted in something real, whether consciously or unconsciously. I explained that part of the purpose of this speculative practice is to use imagination to think about things differently, but then find ways to make those different thoughts relevant in a real-world setting.

Speculative Design Challenge

This last part of the workshop was designed to give participants the opportunity to try out some speculative design techniques, in order to explore the possibility of using design to materialise speculative future worlds, which can in turn be used as a form of activist engagement to argue for their futures. This made use of the cards in the Design Fabulation Deck: each card presents a speculative design technique or scenario and prompts the player to engage in a particular activity, framed around Strange Strangers. The Lisbon participants were divided into two groups of three people (one of which I joined), and the Berlin participants worked as a single group of three. Having chosen the speculative scenario that they would further explore during the design activity, Lisbon participants were given a card each, and asked to decide between them which activity they preferred to do; the Berlin participants were each asked to choose a card out of three given to them, and then collectively to decide between the three chosen cards.

The Lisbon groups chose the "*Parliament of Things*" and "*Throw a Party*" activities, and the Berlin group chose "*Radical Disco*".

Lisbon

Both Lisbon groups worked on speculative design outcomes related to the story about the artists on the planet with the oak trees and banana plants.

Parliament of Things

One group chose the *Parliament of Things* as their design activity; this is a thought experiment proposed by Bruno Latour, who suggested a forum for all things to have political representation (Simons, 2017).

The group chose this method as they wished to "demonstrate how little representation other living beings have in the world," (Workshop Participant, personal communication, 2023), and they likened this to the Parliament of the *Galactic Republic* as seen in the *Star Wars* (Lucas, 1977) franchise, where thousands of different worlds have their representatives in parliament.

They decided to express this idea by using an artificial intelligence (AI) Natural Language Processing system called *ChatGPT*, which they requested to generate a news story from the future reporting on the election of the parliament:

> *Yesterday, in a historic election, the world has elected a Parliament of Things based on the percentage of organisms on Earth. The Parliament of Things is composed of representatives from different categories of organisms. It was organised by a coalition of environmental groups and scientific organisations who argued that Earth's organisms resemble flies in their decisions that affect their habitats and ecosystems. To determine the composition of the Parliament, scientists conducted a global survey on Earth's organisms and estimated their relative biomass. The results of the seats were the eukaryotes, which included plants, animals, fungi and protists. They had 85% of the seats, with plants holding the largest share at 80%. Animals had 10% of the seats, fungi and other organisms had 3% and 2% respectively.*
>
> *Critics of the Parliament of Things, however, have raised concerns about the practicality of giving non-human entities a voice in human decision-making processes. Some have argued that the Parliament could become a forum for divisive debates and conflict between different organisms. Nevertheless, supporters of the Parliament of Things remain optimistic that it would provide a new avenue for promoting environmental sustainability and protecting Earth's precious ecosystems.*

Arguably, by using an AI system to generate the design outcome, the group has bypassed entirely the purpose of this design activity, which was to collaboratively concretise and materialise their abstract future scenario; in fact, the AI chatbot does not seem to have recognised the speculative setting of the story and simply has suggested an ecosystem breakdown of the components of the Earth environment. However, it does represent an effort to engage with the ideas in an efficient manner, given the limited time.

Throw A Party

The other group, which I was part of, chose the *Throw a Party* design activity. We came up with the concept of an annual festival, based around the environment and art. The festival would have a 'hipster' style, with competitions for baking banana bread from bananas and acorn flour, beer brewed from bananas, and artworks made from discarded plant matter. The festival would take place on Michaelmas (29th of September). On that date, we discovered, it is traditional for people to cut open oak galls (hard swellings on oak leaves caused by wasps) to find out if they contained a worm, a spider or a fly, which would indicate how good the following year's harvest would be.

Berlin

Radical Disco

The Berlin group decided to explore the *Radical Disco* design activity, based on their narrative on the world of radical intimacy with bees, huge flowers, surfing billionaires, aliens and chickens; the choice makes sense, as their story culminated in a rave being organised in the desert. The group enthusiastically set to their task, using LEGO bricks to build up a representation of the party that they imagined throwing (See Figure 86). They imagined that all Strange Strangers in the world would be invited ("the whole world is on pause because everyone is going to the rave, so unless you're under a rock, you're there!" (Workshop Participant, personal communication, 2023)) and that it would have a diverse crowd of attendees.

Reflection on Design Challenges

In general, I'd reflect that while none of the design outcomes were especially well-developed conceptually, possibly as a result of the short amount of time devoted to them, what was particularly interesting was the emotional and energetic engagement the participants had with the process. There was a real sense of excitement and belief in the worlds and the stories they were telling; again, this sense of having a responsibility for the worlds and the beings that they had created.

Reflection on Design Phase

This design phase was a key stage in the design of the Playset, where there was a move from the experimental prototyping, and a process of thinking with concepts and exploring how to inscribe the Strange Stranger and the conceptual lenses into designed artefacts, to play testing how well those design decisions work in practice. Following what was a rather laborious, repetitive process, with long periods spent on thinking about how to abstract the key ideas into a playable game system, this was a satisfying phase, where I was able to see my ideas brought to life. What has been up until that point a speculative object became a functional game, and one apparently capable of supporting the aim of the project, of supporting communities in imagining more biodiverse futures. It aligns with Gaver's argument that design being a cumulation of things that work, rather than a convergence on a truth; the evidence here, of the Playset's ability to work as intended, is a validation of the research process.



Figure 85 : Playtest Workshop : Lisbon

A photograph from the Lisbon Playtest Workshop, before starting to play the Storytelling Game.

Credit : Craig Jeffcott



Figure 86 : Playtest Workshop : Berlin

A photograph from the Berlin Playtest Workshop; the participants are using Lego bricks to design a Radical Disco as part of a speculative design exercise.

Credit : Craig Jeffcott

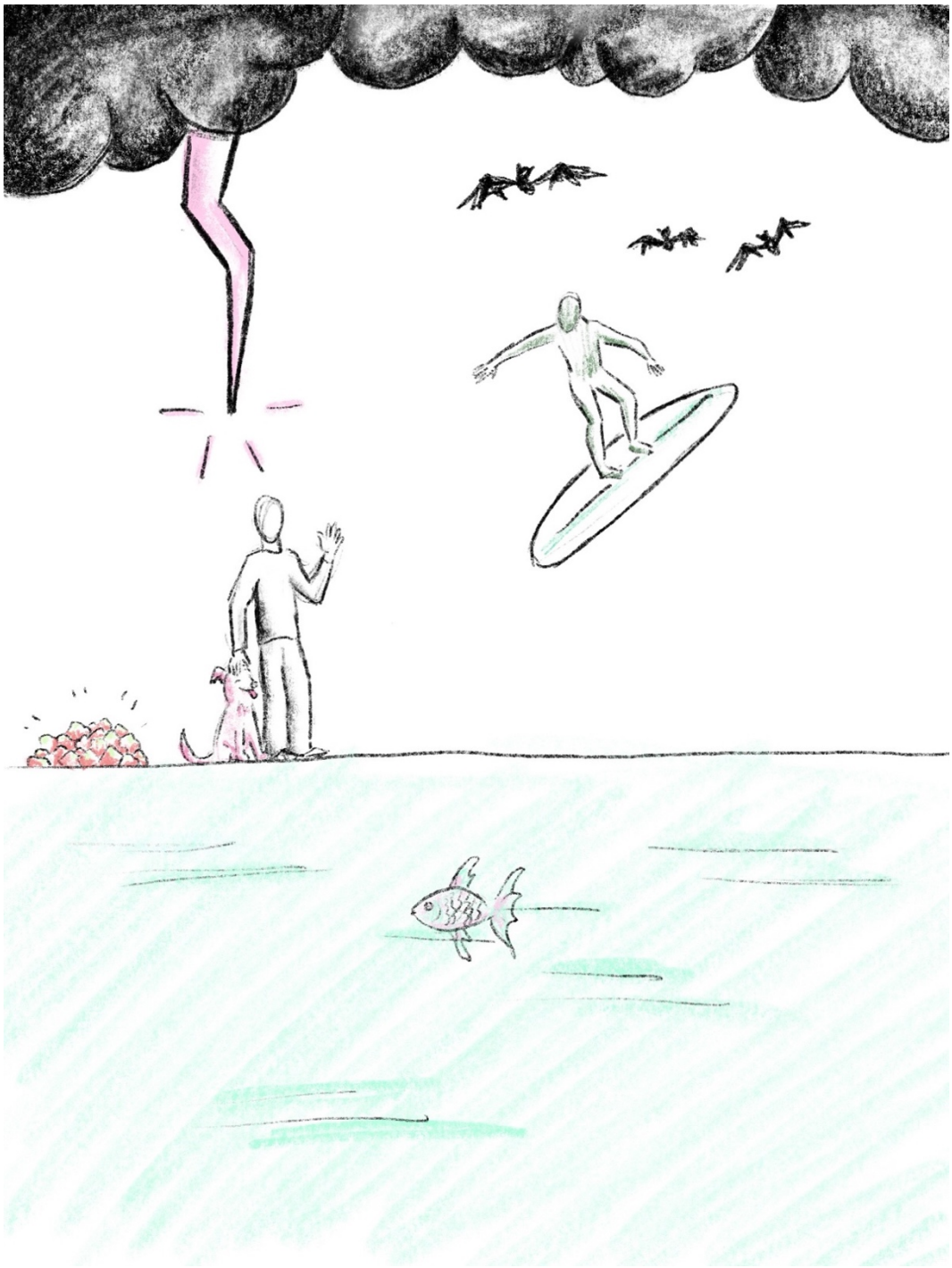


Figure 87 : Illustration : Strange Strangers in Strange Lands (Lisbon)

I invited artist Erica Doo to crate illustrations of some of the narratives created through the Collaborative Storytelling Game. This allowed for the stories to take more material and persuasive form, as well as extending their entangled existence to other times, places and consciousnesses, through a form of visual Diegetic Escape.

Credit : Erica Doo

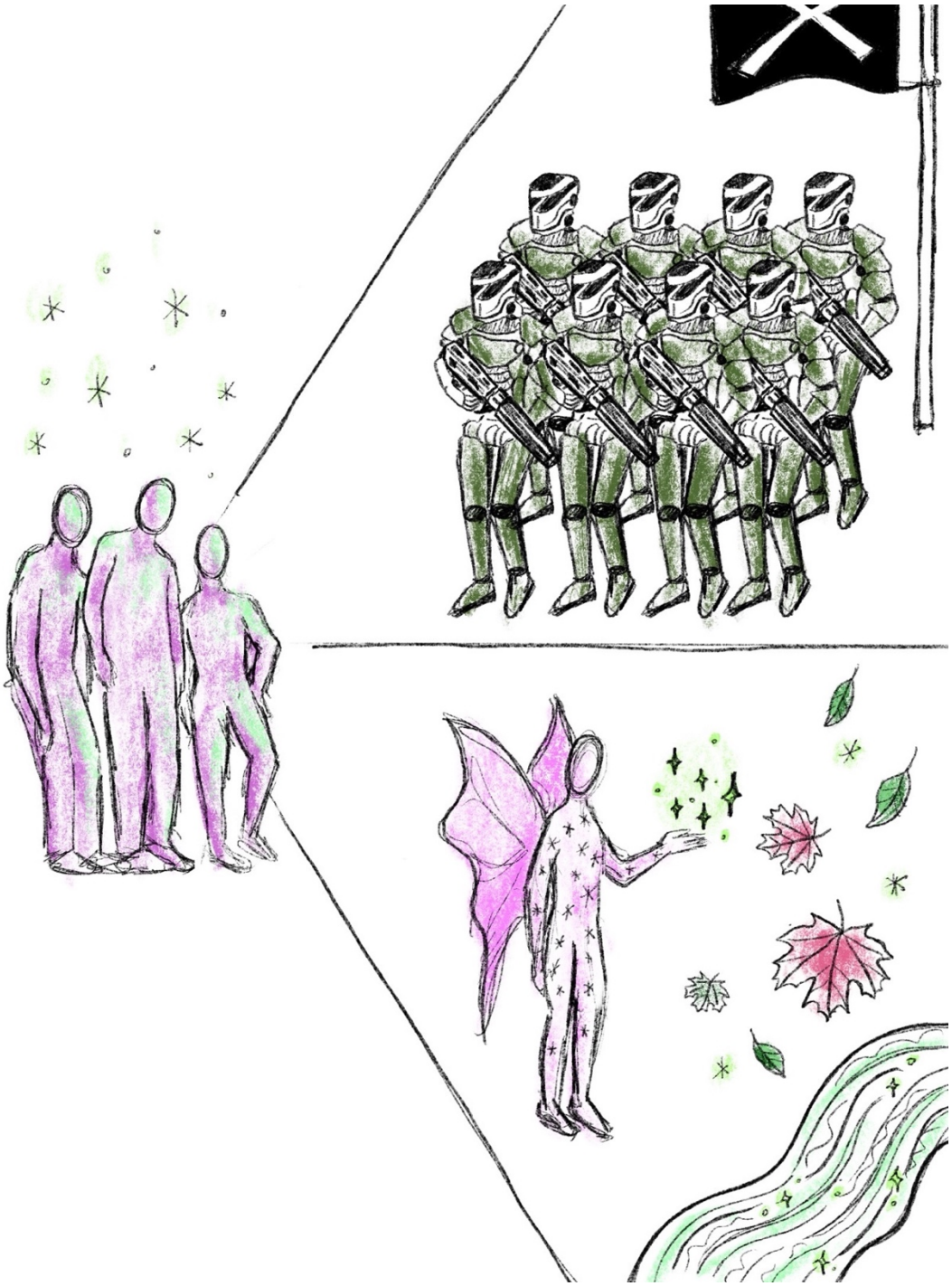


Figure 88 : Illustration : Stitches in Time (Lisbon)

An illustration of a narrative created through the Collaborative Storytelling Game.

Credit : Erica Doo

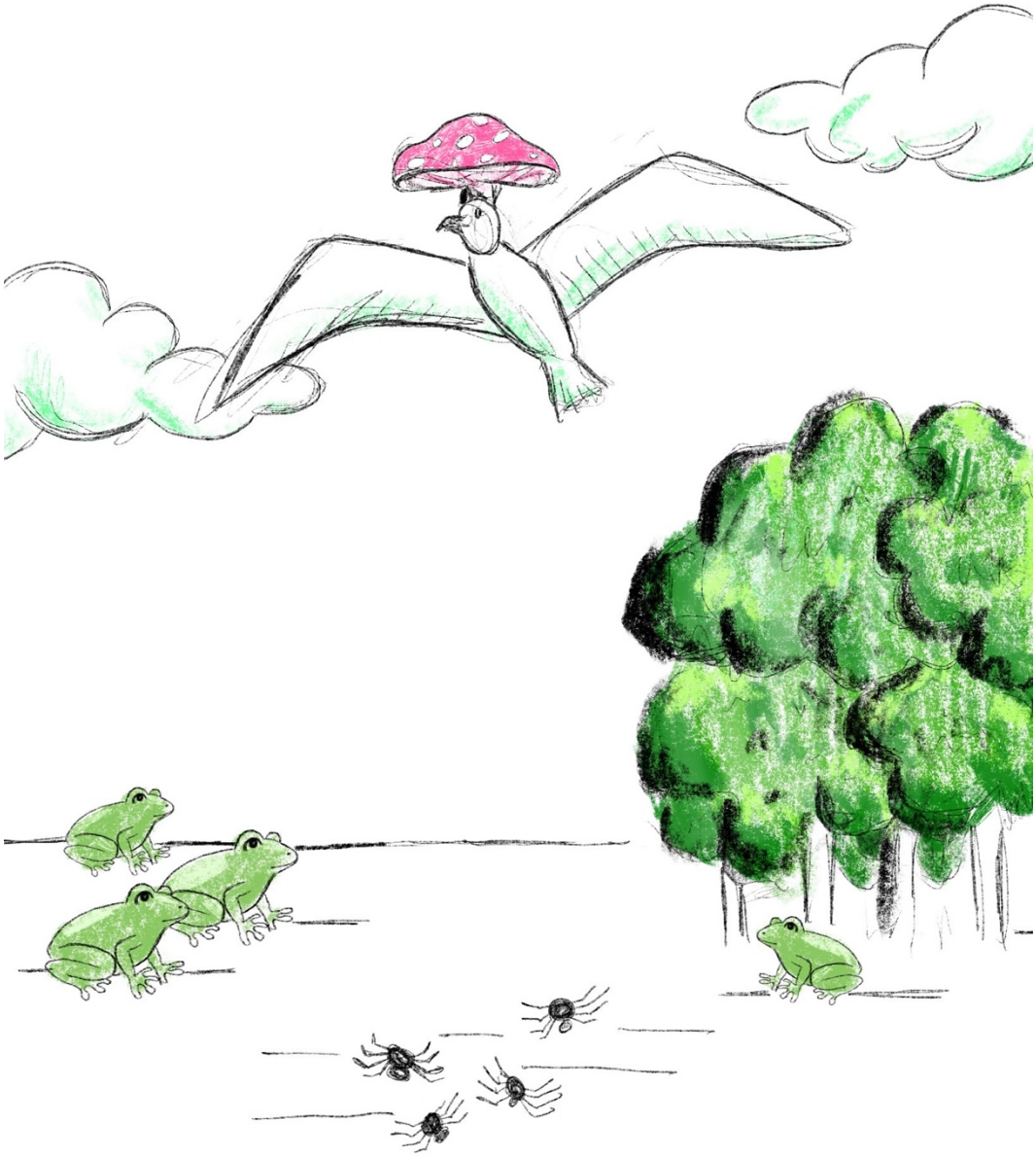


Figure 89 : Illustration : The Ecosystem Strikes Back (Lisbon)

An illustration of a narrative created through the Collaborative Storytelling Game.

Credit : Erica Doo



Figure 90 : Illustration : What You See is What You Get (Lisbon)

An illustration of a narrative created through the Collaborative Storytelling Game.

Credit : Erica Doo



Figure 91 : Illustration : What You See is What You Get (Berlin)

An illustration of a narrative created through the Collaborative Storytelling Game.

Credit : Erica Doo

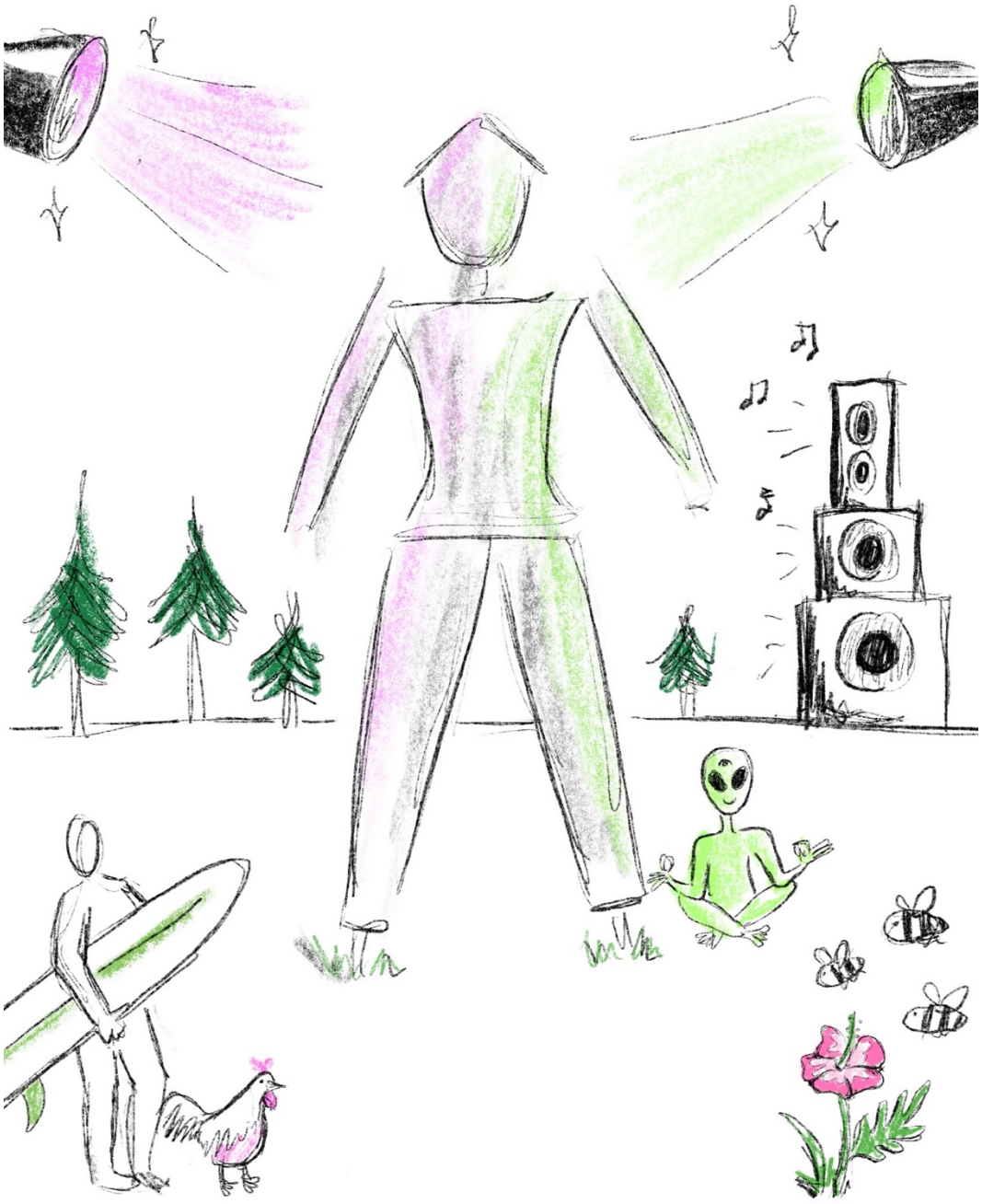


Figure 92 : Illustration : Radical Intimacy (Berlin)

An illustration of a narrative created through the Collaborative Storytelling Game.

Credit : Erica Doo

7.3.6 Design Phase : Prototype Refinement

Phase Overview

This phase, which followed the writing of the first draft of the thesis, involved further refinement of the Playset game objects, as well as presenting the Playset in a workshop at an international design conference, which afforded the possibility of testing the Situation Report activity of the Playset for the first time.

Prototyping : Higher Fidelity Prototype

This prototyping stage involved making refinements to the game objects, increasing their fidelity from cardboard prototypes to a more materially rendered game. This is an important stage in the development of this design artefact, as it is intended to work as a tabletop game outside of design research settings, and a more well rendered artefact will be more convincing in that regard than a research prototype.

The principal change made was to replace the card game tiles with laser cut and engraved game tiles made from plywood[45]. This allowed for more satisfying gameplay: as the tiles more easily aligned with each other and were less liable to be disturbed by a breeze; using wood also allowed for an invocation of natural, more-than-human worlds; and the wooden tiles were more durable, allowing the game to be reused more easily than before (See Figure 59 & 61). I also created some new Strange Stranger Tiles based on beings from the local environment in Monterrey, Mexico—such as Coyote, Hummingbird, Alebrije Hybrids—where the forthcoming workshop was to take place.

The second major change was to create an expansion of the design activity cards. In the initial prototype and in the Design Celium, only nine design activities had been defined and subsequently made into cards. However, during the research, I encountered many other speculative design approaches and decided that a complete deck of cards would allow for a wider range of techniques to be made available to players and communities; indeed, that the deck could be used as a standalone artefact for designers, researchers, and community members for initiating Design Projects. I created a deck of 45 cards, grouped into the five futuring strategies of making, playing and performing, time travelling, mapping, and storytelling—and thus acting to also reinforce these futuring strategies for players and users of the Playset (Figure 67 shows an image of some of the cards; the full deck is displayed in *Appendix 4 : Design Fabulation Deck*).

[45] I reworked the printable card prototypes into a version of the Playset that can be shared digitally and easily printed, allowing anyone to print their own copy of it: this can be seen in *Appendix 3 : Gameplay Tiles (Card Version)*

Finally, I assembled the Playset into a box with a laser engraved lid, and included additional elements such as canvas bags to store the tiles during gameplay, and a larger, laser-engraved wooden strategy die to replace the poorly fabricated 3D printed prototype. (See Figures 50-53)

Workshop : Cumulus Monterrey Workshop

The impetus for the improvements to the design was the presentation of a workshop at the *Cumulus Design Conference*—titled *Design Across Borders: United in Creativity*—in Monterrey, Mexico in October 2024. This workshop, entitled *Strange Strangers in Strange Lands : A Collaborative Storytelling Game for Community Biodiversity Activism* (Jeffcott et al., 2024) offered the possibility of presenting this research and running a workshop for an international group of designers and other creative professions, with seven delegates in attendance from across academic research, design education and commercial design fields, and from South America, North America and Europe.

The workshop followed the same genereral protocol as the previous play tests (and which is determined by the Playset structure), but with the addition of the Situation Report activity, after the Icebreaker and before the Storytelling Game. The intention with the Playset and the Collaborative Storytelling Game was that it should be adaptable to different situations, from a purely specualtive board game to a tool that could be used to address real world environmental challenges. This is the purpose of the Situation Report, to allow workshop delegates to reflect on their local environment and the challenges within it, thinking from the perspective of *Strange Strangers* and with the strategic goals of care, collaborative work, and seizing futures.

This was intended to be used in a local community setting and draw on local community knowledge: in the design conference setting, where delegates were from outside of Monterrey, a different approach was taken, and I supplied them with a number of media articles, scientific papers, and strategy documents to allow them to research the environment of the city and its surroundings, and to understand a context for design (See Figure 94).

Images from the Workshop can be seen in Figures 93-99.

Reflections on the Workshop

Delegates seemed to find the Situation Report activity interesting, and as a group, it allowed us an understanding of the wider context of Monterrey that was illuminating in the days of the conference that followed: “learning about the issues in the Santa Catarina Valley, including the fluctuations in water levels, was fascinating and gave cause for reflection as we were bussed/taxied along the river daily,” (Workshop Participant, personal communication, 2024). Another participant reflected that this activity would benefit from being more focused, such as by “assigning specific documents for each team to work on could be beneficial; pre-

assigning documents could not only streamline the process but also allow you to test and refine combinations of texts to see which work best for the activity," (Workshop Participant, personal communication, 2024).

However, in the transition to the storytelling game, I observed the connection was lost; it wasn't clear that their emergent diegeses were particuarly related to their research, although the local tiles did shift their narratives into some semblance of the surrounding ecosystem.

One partipant concurred with this insight, reflecting that there wasn't always a clear and logical flow from one activity to the next. They felt that while the Collaborative Storytelling Game is "very cleverly designed", it "did not link effectively to the issues in the Situation Report," and suggested that there might need to be an additional game element to more effectively situate the "highly fantastical (though amusing) scenarios" in the local ecosytem (Workshop Participant, personal communication, 2024). Additionally, they suggested that, possibly due to their design choices and time constraints, their design speculations were overly rhetorical and that "the design exercise could be developed to enable the results to more effectivelty invoke possible futures and more-than-human encounters," (Workshop Participant, personal communication, 2024). It is clear that more refinements of the flow of the Playset between these activities is needed.

This participant also reflected on the appropriateness of the gameplay for the target gameplayers, noticing that it "very much favoured people who are comfortable with storytelling and fabulation. Although I felt "permission' to be creative, I come from a background where that is common. Maybe some people need prepping more for this mode of interaction." They observed that some of the other participants "definitely struggled in formulating responses, though I think a language barrier also contributed here," (Workshop Participant, personal communication, 2024).

In addition to this, a participant reflected on a more granular issue of game design: "we didn't have enough "bad situation" pieces, which might have improved our world-building. Perhaps balancing number of pieces could help, or it might have just been a matter of luck during our session," (Workshop Participant, personal communication, 2024). I designed the ratio of Strange Stranger to Monoculture Tiles with the intent that the task of defeating a monoculture should be achievable, as well as reflecting that the causes of monoculture (mostly originating from human exceptionalism and capitalist greed) are much less diverse than the myriad beings that might oppose them; however, that might be perceived by some players as overly optimistic about the chances of success. This may warrant further investigation; possibly there could be a game mechanic for different difficulty modes, based on how many Monooculture tiles are added to the pool of gameplay tiles.

Overall, I fel that the workshop was a success: delegates enjoyed the Collaborative Storytelling Game and Design Challenge, the Playset overall received positive feedback, and I gained further insights for future iterations of the design.

Reflection on Design Phase

This design phase involved a refinement of the Playset and a continuation of its play testing process. It was satisfying to see the ideas of the Playset take shape in a form that resembles a game that you might see on a shelf in someone's home or office, as well as receiving positive feedback from other design professionals, and it emphasised the continuing, iterative nature of design making and design research: the insights from this phase will afford further refinements and testing workshops in order to further improve the Playset. It demonstrates that designed artefacts aren't fixed entities in time and space, but transitional assemblages, continually in the process of metamorphosis, and of shifting territories of stability.



Figure 93 : Cumulus Monterrey Workshop : Setup

The Cumulus Workshop took place at the Universidiad de Monterrey, *in the* Robert Garza Sada Centre. *Through the window, the* Cumbres de Monterrey *national park, part of the* Sierra Madre Oriental *mountain range, is visible. This is part of the ecosystem where the activities of the workshop took place. The table is set up with craft supplies for the Speculative Design Challenge activity.*

Credit : Craig Jeffcott

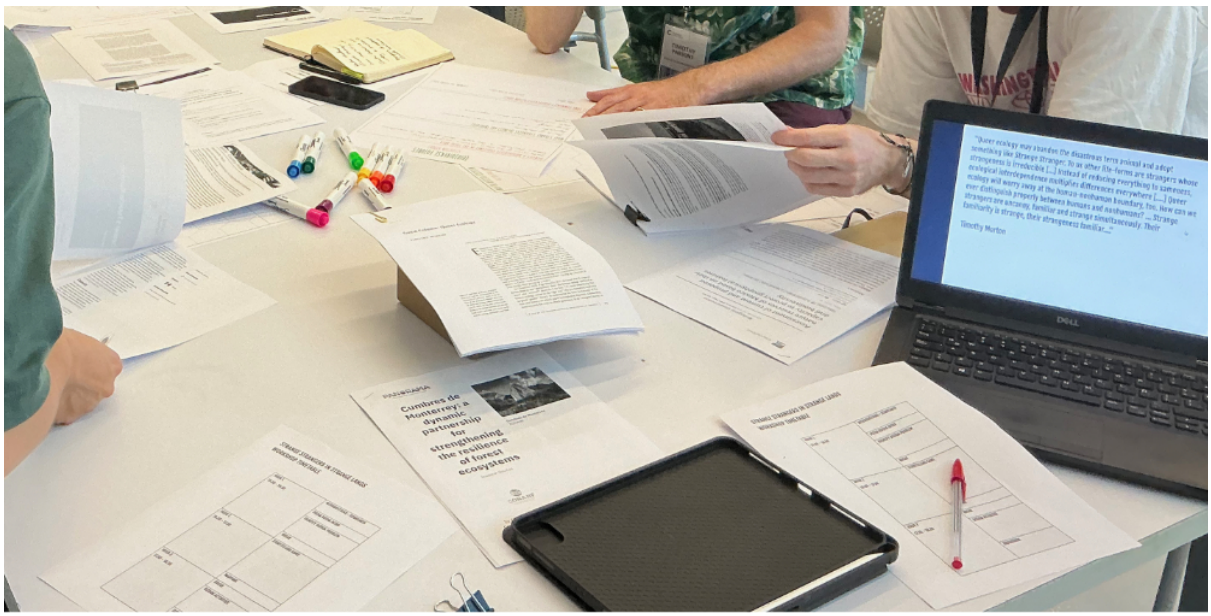


Figure 94 : Cumulus Monterrey Workshop : Situation Report Research

Workshop participants use provided reference materials to research the local ecosystem and its challenges for the Situation Report.

Credit : Craig Jeffcott



Figure 95 : Cumulus Monterrey Workshop : Collaborative Storytelling Game

This image shows the participants of the workshop beginning to play the Collaborative Storytelling Game. The person on the bottom right is the second player to add a Strange Stranger Tile, and is telling part of the unfolding story, incorporating that being into the narrative.

Credit : Craig Jeffcott

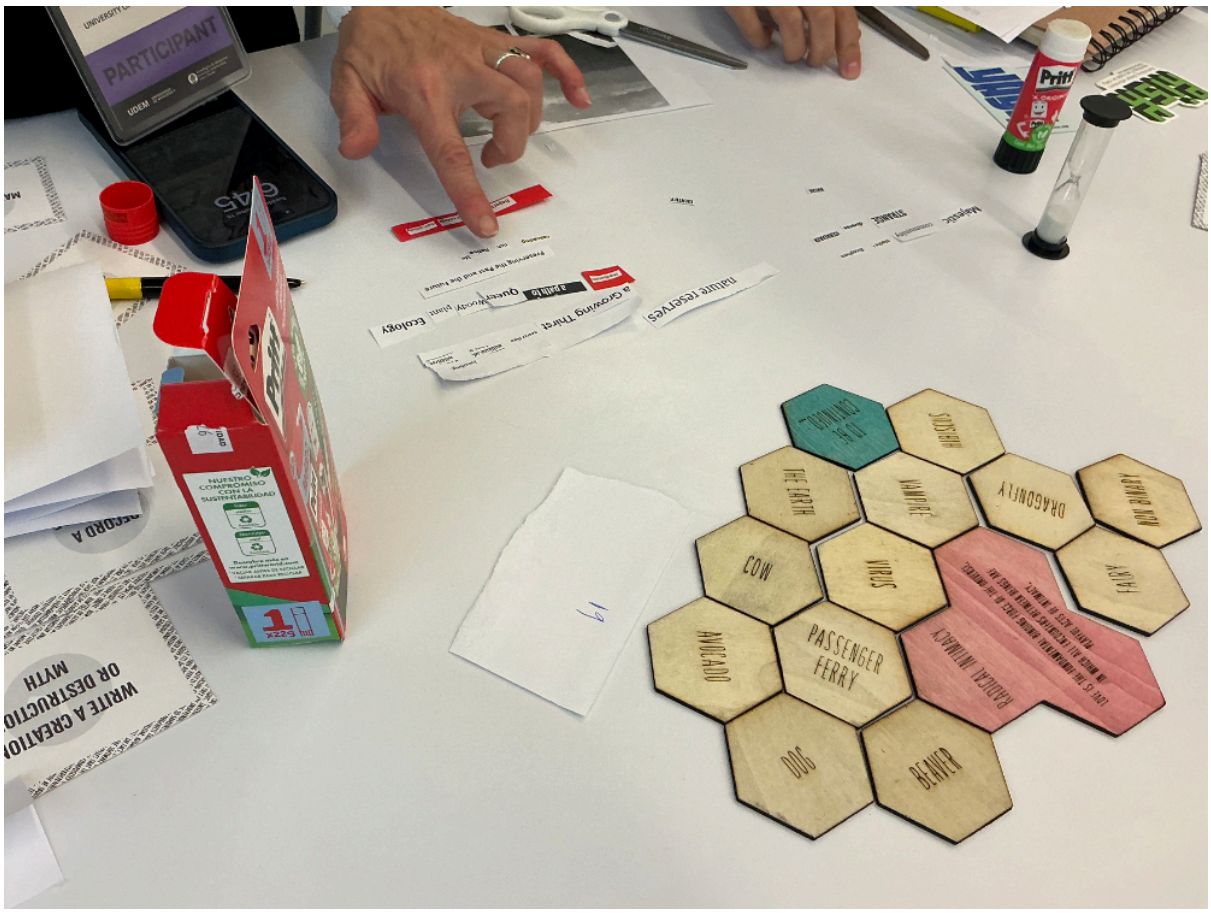


Figure 96 : Cumulus Monterrey Workshop : Speculative Narrative and Activity

This image shows the wooden tiles of the Collaborative Storytelling Game, and workshop participants completing a design activity based on the diegetic narrative they created.

Credit : Craig Jeffcott

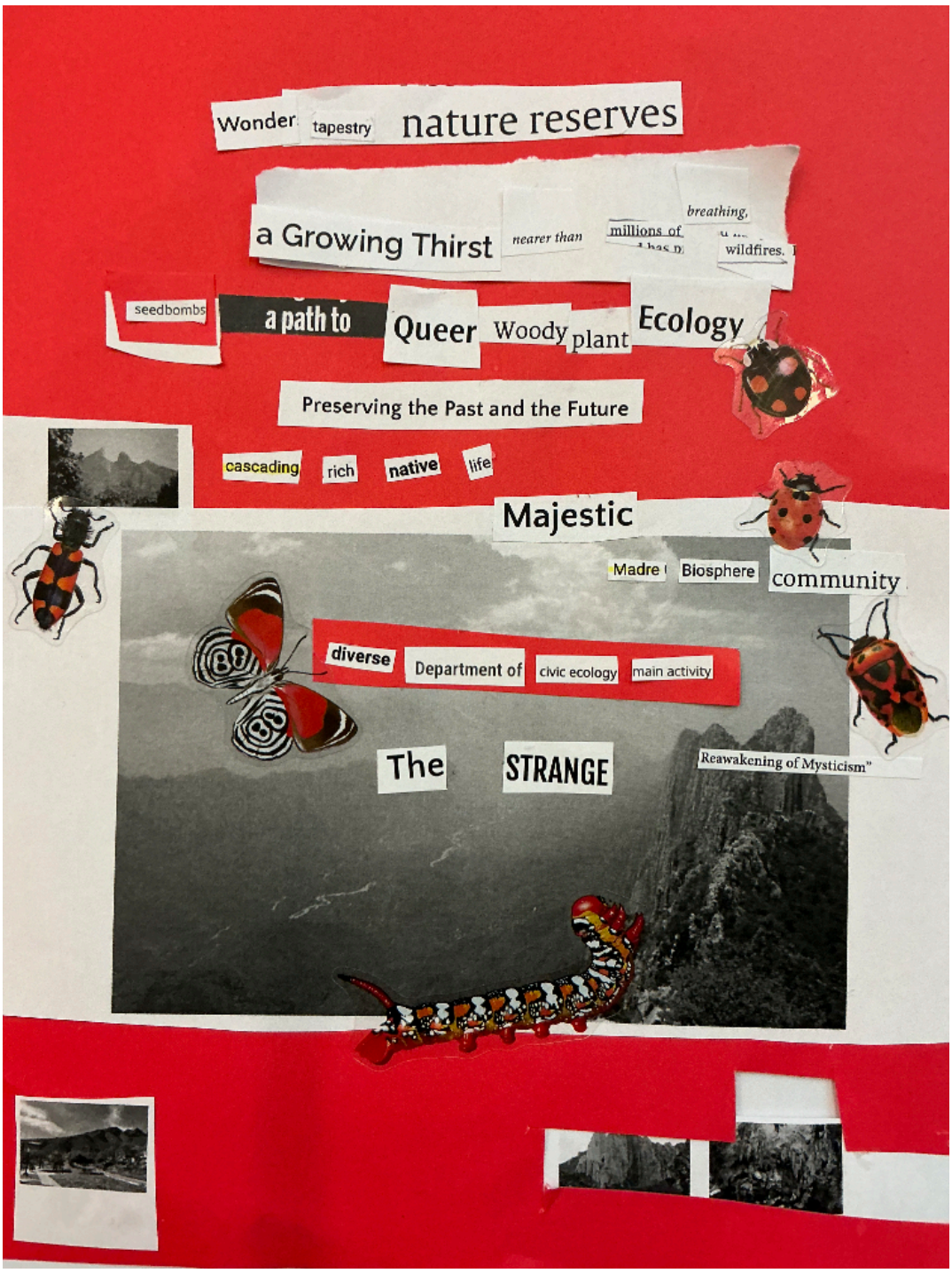


Figure 97 : Cumulus Monterrey Workshop : Design Outcome (Make Cut Up Poetry)

This poster is the artefact produced by a group in response to the Design Fabulation Card prompt: Make Cut Up Poetry. The prompt reads "Cut Up is a creative technique popularised by musicians as a way to generate emergent texts. Take some documents that interest you, and cut up the text into pieces, whatever size you prefer. Then take the pieces, mix them, and use them to construct poetry that belongs to a speculative world."

Credit : Craig Jeffcott

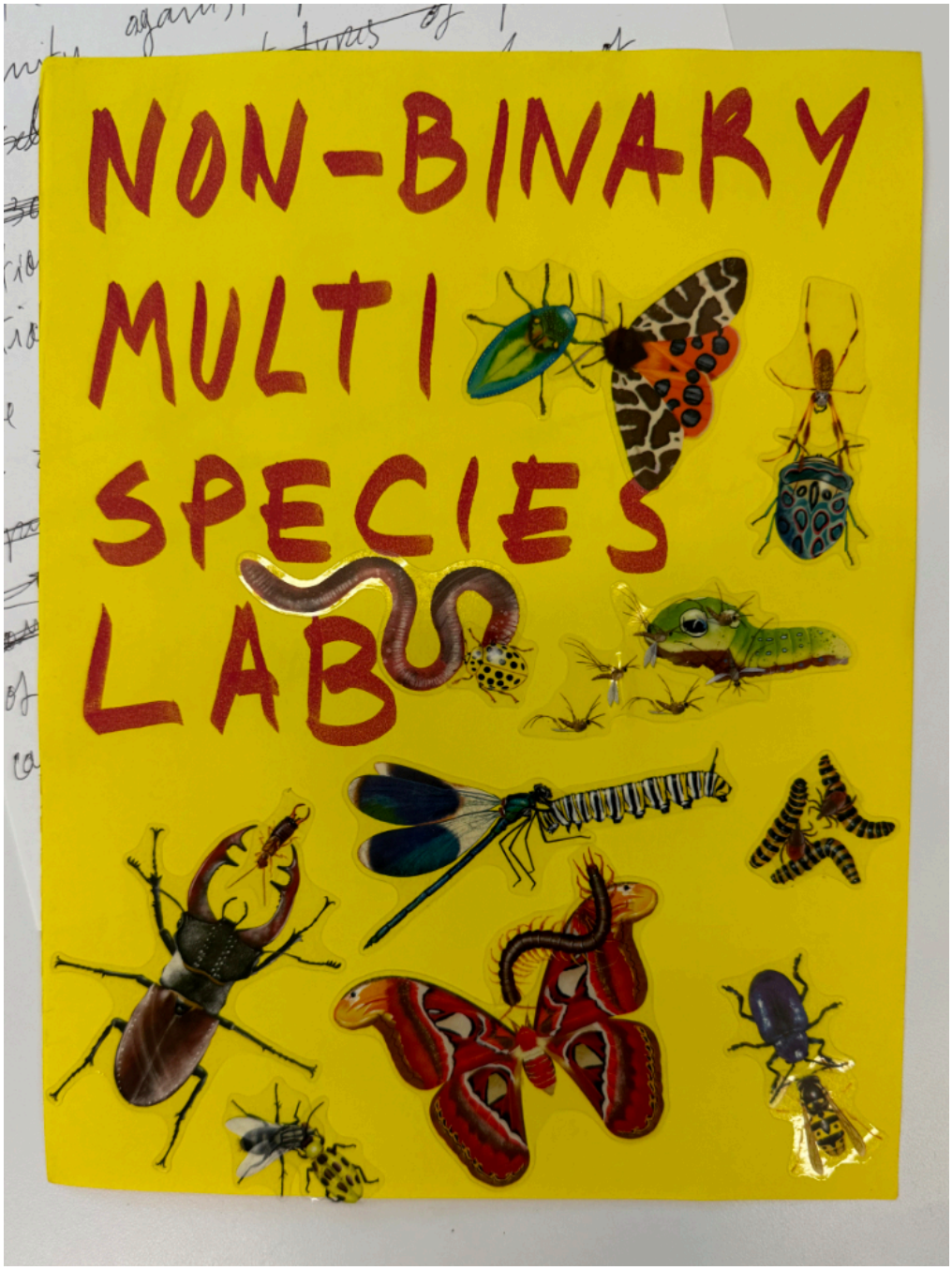


Figure 98 : Cumulus Monterrey Workshop : Design Outcome (Protest)

This poster is the artefact produced by a group in response to the Design Fabulation Card prompt: Protest. The prompt reads: "Protesting is an empowering public activity for Strange Strangers to collectively demand and stake a claim on a different future, and a creative outlet to perform what that future may be. Mount a protest for or within a speculative world: make placards, sing songs, and vocalise about an important issue.

Credit : Craig Jeffcott

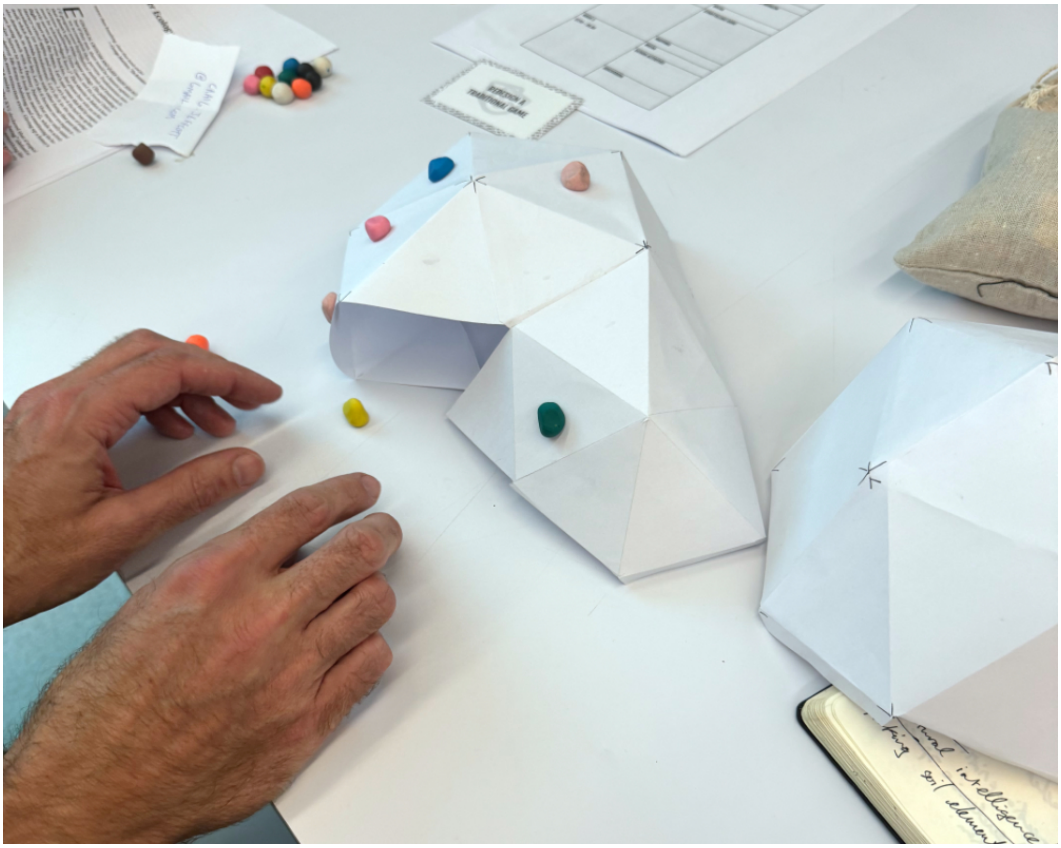


Figure 99 : Cumulus Monterrey Workshop : Design Outcome (Create a Game)

This artefact was produced by a group in response to the Design Fabulation Card prompt: Create a Game. The prompt reads: "Games are powerful artefacts that can abstract an entire world into a framework that allows people to enter into and play with that world: they are an effective representation of what the world is and what the Strange Strangers inhabiting it think is important. Create and play a game that might exist in a speculative world." This design, which was produced using the assistance of generative AI, represents a virus-inspired form of Pool or Billiards, where "instead of clearing the table every time a ball is pocketed, more balls would appear on the table," (Workshop participant, personal communication, 2024)

Credit : Craig Jeffcott

7.4 Reflections on Playset Design and Testing

An important goal of facilitating workshops with the *Strange Strangers in Strange Lands Playset* was to gain an understanding of how the Playset might work in practice: both in terms of game-play and in terms of how effectively the aims of the Playset and Celium might be achieved through these resources. This section presents some reflections on the workshops I facilitated as part of the Second Prototype design phase, in 2023 in Lisbon and Berlin. It begins with reflections by the participants, followed by my own reflections on the process.

7.4.1 Participant Reflections

At the end of both workshops, I asked the participants to reflect on their experiences of the workshop, which we discussed in some detail. The reflections of both groups have been combined and structured here according to their general themes.

Collaboration

Appreciation of the collaborative aspect of the game and the workshop came through strongly in the feedback of the participants, both in the sense that the collaborative process was creatively stimulating, allowing them to come up with quite interesting ideas, and in the meaning behind doing so: that they were working together, not in competition, and that they were collaborating together to make better stories, and to take care of the beings that emerged through storytelling.

One of the Berlin participants expressed that they particularly liked the collaborative aspect of the game:

> *"I like to do things more collaboratively. It's very important if I play a game not to play against someone but with someone. I especially liked how we kept contributing and changing things and how that gave different perspectives and gave different directions to the storytelling. One thing that kind of resonated for me was how we collaborated to save the dog [that died during the surfer story], how we tried to avoid and felt bad about these negative cards, and we [said], 'let's build around this, let's try to do something'. I think, as a device, the cards in this story kind of promoted the best of us in terms of collaborating and constructing these stories. That was really something that I took out of this today. A collaborative way to find solutions in different scenarios is really nice.*

I think that [creating really interesting future scenarios] has to do a lot with collaboration and co-working together. I think one [person] is not enough to create something that interesting. Everyone's thoughts [are] so random to create something unique.

It's so nice to get other people's perspectives and have them send you in another direction."

(Workshop Participant (Berlin), personal communication, 2023)

Worlding and Speculation

Another key theme in the participant feedback was the potential offered by the games and activities for fabulation and worlding, about how playing the game opens up the scope of speculation, to create new worlds and cultures. There was a sense of being given the freedom, even the permission, to play; to suspend hesitancy or disbelief or the need to be logical or realistic.

Another aspect of worlding that they highlighted was a richness or depth or what I might describe as a sense of verisimilitude, of not simply thinking about the environment, but about politics, and culture, to consider what it is to be and make a culture.

Related somewhat to this, some participants from Lisbon also talked about how worlding in this way was in some ways a practice of resilience, a way of imagining different worlds, and possibly catastrophic futures, in order to be ready to offer a challenge to them:

"You can dispense [with] the hesitancy that you'd otherwise have to just start sort of letting your imagination run wild [...] it just goes places."

(Workshop Participant (Lisbon), personal communication, 2023)

"Instead of getting stuck ... looking for the same solutions all the time, I think there's really a sense [that] you're off in all these wild directions [...] if you just let yourself think completely without limitations of all the possibilities. You do just get further because then you might land upon the really wild idea that actually is feasible, but you have to get there first and if you're thinking rationally and functionally all the time, then you don't get to the really wild one that actually is both rational and functional."

(Workshop Participant (Lisbon), personal communication, 2023)

"I love the idea of mixing environmental problems, different beings, [and] things that are intangible [or] not concrete, or behaviour, like being an activist. I think it's a good mix of elements when thinking about the future. Sometimes when we work with sustainable approaches, especially in speculative things, it's always about the environment [...] and biodiversity. [Here, the] starting point was biodiversity, but we ended up approaching culture, we ended up approaching politics. It made me think about crazy stuff like how can sports survive anywhere. So, I think we could touch on a lot of essential topics that we should actually think [about] when approaching future speculation.

And it made me think about crazy stuff like how can sports survive anywhere? Or alien-looking beings, [defining] things by the way we understand them [and] their aesthetics, not exactly what they are, but what they look like. Or the idea of domesticating something, but then being under the power of an animal or being that we were thinking about domesticating, but then putting ourselves in this position.

The idea behind [it], I think, is resilience. I think that's the main thing, because when we think about catastrophic scenarios and we get prepared for irrational stuff, actually we are getting stronger in our present and get our mind more elastic to get [into] different places.

How to build new cultures? I think that was a question that arose for me. What is a culture? Like, it's usually so related to our past and where we are and our roots and our heritage and so on, but how would we connect and bond with others and come up with other cultures in such different spaces? That was a great challenge to think about."

(Workshop Participant (Lisbon), personal communication, 2023)

Gameplay

Framing and Scaffolding

Some participants drew attention to the way that the design and content choices in the way the game was designed could act to constrain, 'steer' or even be limiting to the story choices. One commented that the Strange Stranger Tiles could, at times, seem rather random, which made it exciting, but confusing. They were interested in the explanations I gave them for why I made certain decisions to include certain elements and discussed whether it would be good to have these explanations near the beginning or afterwards.

"The game—the first part where we have the cards—I wonder how much [the] vocabulary [on] the cards (…) can steer the story in a way. I wonder if, at times, we were a bit limited by or steered by, for example, chicken [and if] it should be more focused. It felt like maybe we were doing it wrong sometimes.

(Workshop Participant (Berlin), personal communication, 2023)

"I'm pretty sure the terms are not random, but I really liked [how] for me it was like, "oh, a penguin?!" I was really excited to see what the next card was going to be. I really liked that. Some of them were deliberate, but other ones were pretty random. I think it was very interesting also when you mentioned where the prompts are coming from, like [in] relation to a movie or to a science fiction story. Maybe introducing this before could help a little bit too, but also it could, of course, influence the way it's going. So, I think it was also nice to hear it in the end, like, ah, this is from there, this is from there. In general, I work very well with examples. When I was looking at the cards, I [thought that] there are very many interesting examples of future scenarios. I just love abstracts, so for me, this was very fun. Like the abstract, I'm like, how far can this go?"

(Workshop Participant (Berlin), personal communication, 2023)

Structure and Confusion

Some of the feedback was more pragmatically related to the structure of the gameplay system. The Berlin participants particularly drew attention to the way that the game could become a little confusing or overwhelming, not necessarily because the game mechanics were especially complicated but because the stories that were generated became rambling and unwieldy. There were suggestions of ways that the gameplay could be made better: for the points system to count for something more and for each story to involve a set number of cards rather than a random termination card.

"It's maybe too much that we did three [stories] because, at some point, my brain just stopped working. Because I feel like this is very exhausting in an imaginative way. But other than that, I really found it interesting, and it was also easy to understand. In the beginning, I was very confused, but then when we started everything made sense."

(Workshop Participant (Berlin), personal communication, 2023)

"I think knowing how many more cards or how much more time you would have would help because I think [that] in the beginning, we were a bit shy and then we were like, okay, let's do this! But then, for me not knowing how far is the story going, it got too wild at some point. I mean, especially the last one, I really liked it with the time travelling, but I think it's very complex and my head was just like, okay... I mean, I think it's good that the end is random, but I think it would also be nice to always have the same amount of cards maybe. I really like playing games, and I didn't get the points calculation because it's also a coincidence how many cards you get. I think it's always nice to have a competition part in it to try to get more points. I don't know, I didn't feel like we really had a lot of options on where to put the cards."

(Workshop Participant (Berlin), personal communication, 2023)

7.4.2 Reflections on Design Practice

Overall thoughts

On the whole, I was very happy with the outcome of these workshops; the following are some reflections that I made during and after the process.

Participant engagement

It was gratifying to see how much the participants, across both groups, were highly engaged by the workshop activities, became invested in the stories and worlds that they created, and had a lot of fun participating.

It was interesting to hear some of the participants talk about becoming lost and confused, particularly in rounds where the story became particularly long. This gave more depth to the worlds that they created, making them more real; it emphasised how worlds are not simply about singular narratives, but rich, messy places. The Collaborative Storytelling Game created a window into lived-in worlds that could be irrational or strange.

Storytelling

Sense of Place and Culture

I was excited to see how vivid and realistic the stories and worlds created by the participants became, with one of the participants remarking that it felt less like creating stories and more like creating a culture, which aligns with the philosophy of fabulation, which has an emphasis on "social and cultural relations, political tensions, and power hierarchies," (Søndergaard et al.,

2023, pp. 1693–1694), as well as Bruce Sterling's assertion that "design fictions tell worlds, not stories," (Sterling, as cited in: Bosch, 2012, para. 3).

I was struck by how, both immediately following the workshop, and later, when transcribing and editing the stories from the workshops, the stories and their worlds had stayed with me, lingering beyond the games that created them. This aligns with Johan Huizinga's observation that a fictional or constructed world created through a game lingers on return to reality, where it "continues to shed its radiance on the ordinary world outside," (Huizinga, as cited in: Brown, 2012, p. 16), a property that I have described as *Diegetic Escape*.

Furthermore, these stories felt, to me, to invoke a distinct 'sense of place', to belong to a particular material reality, rather than an abstract concept.

Conscious Worldmaking

Related to these observations, I felt that there was something important in the way that the stories were structured by the game, but were given life by the consciousnesses, the players, creating them, drawing from their own individual and collective experiences. It recalls the Baradian notion of conscious world-making. I consider that, as Barad argues, the things in the world obtain their reality through consciousnesses interacting, rather than prefiguring those interactions; might these worlds have become more real because they were being created across consciousnesses, through collective intra-actions of worlding (Barad, 2007)? Through merging their personal universes, players of the game were able to open up pluriversal worlds.

Tangled and Oneiric Stories

All of the stories that emerged became satisfying tangled, and weird. They had an oneiric (dream-like), hallucinatory, and heightened quality to them, shifting focus from one thing to another, with the narrative suddenly meandering off in other directions. It was almost although the players were in a shared waking dream state, that was enriched by different perspectives but brought together through game-play; again, this illustrated, as Haraway and Le Guin have argued, how worlds are not singular, with one hero protagonist traversing a landscape, but multitudinous, rich, messy and lived-in (Haraway, 2016; Le Guin, 1986).

Temporality

One notable of the stories was that, despite the game mechanics including a time-machine that designated a precise calendrical year for the stories, the temporality of the stories seemed arbitrary—with no particular frame of reference, whether a story is set in 800 or 2000 or 7000 years in the future seemed somewhat meaningless—nor particularly relevant to the story narratives. The stories existed in atemporal heterotopic worlds outside of present time, but not

aligned to a linear history; rather, they exhibited a form of queer time, a flat eventful temporality, in the way that the Celium proposes that time should be encountered. This was not a deliberate design choice in the Playset, so it is interesting to see how this temporality naturally emerged through play. On reflection, the use of dice as a time-machine has a valuable role to play, as a framing device that encourages the players to think themselves into different times or worlds, setting up the conditions of the semantic blank into which their stories will be created, and giving the stories a situated quality; while it isn't important when precisely the story takes place, it is important that it takes place at some specific time, building a bridge between the real now and the speculative when, rather than as a fantastical elseworld disconnected from reality.

One aspect of temporality that was interesting was the Stitches in Time narrative prompt, which asked the participants to use the "time machine" for every play, thus moving the stories around a linear historical timeline. Again, the specific dates didn't seem to matter so much as how they related to one another and, therefore, if the story had moved to the past or the future. This mechanic greatly added to the feeling of overwhelmedness and confusion in the players, and I viewed this as a useful way of forcing them to Stay with the Trouble, to face messy, pluriversal worlds, and to contemplate the ways in which time is encountered in lived experience.

Design Theory

Scaffolding World-Making

The workshop revealed the ways in which the Playset and the games acted to frame and scaffold the gameplay and the narratives that emerged. Some of the elements of the Playset had been intended to give structure to the gameplay rather than having some important design intent, such as the scoring system and the time machine, which gave shape to the narratives and added to the suspension of disbelief.

I reflected on the Playset as a designed object which is a materialisation of the Celium, creating the conditions for a particular type of design or worlding. Through the workshop, the sense of the Playset being an embodiment of the ideas, worldviews and strategies that went into it was made clear. I considered a parallel to the design of material objects that have materiality, bearing the fingerprints of the designer, and the grain of the material, and that reflect all the influences that went into crafting it. The Playset was originally conceived as a toolkit, and there is a clear parallel to a physical toolkit, formed of materials that are designed to shape other materials. This toolkit is designed to be a shaper of meaning, to materialise something in the world in the realm of meaning.

A direct line can be understood to exist between the theoretical underpinnings and the stories that emerged, shaped by the toolkit. This can be seen in the recurrence of the same values,

concepts and ideas between the stories of one group, or between one group and another. The workshops exemplify how the design decisions made led from theory to Celium to Playset to stories and design fictions.

Reflections on Chapter 7

Chapter 7 provided an in-depth account of the development of the *Strange Strangers in Strange Lands Playset*, from initial ideas, through rounds of testing and ideation, to produce a version that, while still a prototype and in no way to be thought of as final, offers a playable experience and a fully realised design trajectory.

The Playset represents an example of how the foundations of a design programme might be materialised through design, to support speculative design as a narrative, material and performative practice that is grounded in queer and more-than-human worldviews, goals and strategies. This chapter has explored how the design of the Playset helps to achieve the intended goals of this stage of the project: 1. that it can make the complex and abstract concepts of the design framework accessible and utilisable; 2. that it should embody and facilitate the materialisation of the key principles of the design framework; and 3. that should support not a single task but a repertoire of biodiverse speculative design practices.

As has been discussed previously in this thesis, both collaborative storytelling games and design workshops establish a space for the creation of collaborative fictional futures and elseworlds (diegeses) through framings, creating space and permission to play, and facilitating collaboration. The Playset provides material artefacts and activities that scaffold speculative worldmaking, while the workshops manifest these framings through process, space, and interpersonal action: they provide a physical place for the games to be played and the stories to be told, they bring participants together for a period of time set aside from their daily lives, and they open up the magic circle by inviting participants to take (and reassuring them that they can!) a playful, speculative mindset, even if that is not their usual perspective on their lives and the world.

The Playset provides an exemplar of how a workshop might be structured (it contains games as physical objects, such as a chess set) while workshops create the conditions for the Playset to be used (it involves games as an instance of the game being played, like a game of chess between players). The workshops are an instantiation of the potential of the Playset. There is a clear trajectory by which theoretical ideas and worldviews become structured through the design Celium, activated through the games in the Playset to facilitate the opening up the creation of diegetic realities, and enacted through workshop activities into the creation of speculative fictions and futures. Since these ideas and values are oriented towards worlds that are more diverse, less categorised, and that embrace collaborative, hopeful and messy worldmaking, this represents the potential of situating a speculative design programme which may be able to play a role in community biodiversity settings to help people stake a claim on the future of their environment. This and other implications are explored in depth in the discussion which follows in Chapter 8.

Chapter 8

TRANSITIONAL DESIGN ASSEMBLAGES

The goals of the designer [are] deliberately to carry out an interpretive act in the course of producing an artefact. As Lev Manovich has publicly phrased it, 'a prototype is a theory'. One of the functions of the artefact then becomes to communicate that interpretation and to make it productively contestable.

Alan Galey and Stan Ruecker, *How a prototype argues* (Galey & Ruecker, 2010, p. 406)

Introduction to Chapter 8

This chapter takes the form of a reflective discussion of this practice-based design research project and considers the ways in which insights and new knowledge may be embodied and situated in this project as a process of design, particularly in the design artefacts that it has produced. The intention is not to generate a general theory of speculative design, but to consider, as Johan Redström might put it, what situated and transitional *design theory* of biodiverse futures this work represents (2017). This thesis argues that, as situated as a practice-based design research project, these insights are situated in the prototypical artefacts produced throughout this project, and so this account is a discussion of what can be known through these artefacts.

Chapter 8.1, *Mode of Analysis*, situates an analytical frame for this project, *Transitional Design Assemblages*, that draws on Redström's *Transitional Design Theory* (2017) and Alex Wilkie's framing of *Assemblages in Design* (Wilkie, 2010). This section explains how this framing is applied to the artefacts of this Design Project, as a way of understanding how design prototypes act to mediate transitions between situated artefacts and abstracted knowledge. The following sections explore this mode of analysis in four different ways, moving from situated design knowledge to abstracted design knowledge.

Chapter 8.2, *Prototype of a World-Telling Engine*, explores the situated Speculative Design Artefact of the *Strange Strangers in Strange Lands Playset* (focussing particularly on the Collaborative Storytelling Game) as a prototype that assembles conceptual framings into fabulated diegetic worlds.

Chapter 8.3, *Prototype of a Speculative Design Project*, frames the Playset, in an assemblage with the Celium, Design Workshops and Workshop Participant-Players, as a prototype of a Speculative Design Project that materialises the future making practices of the Strange Stranger for Community Biodiversity Activism.

Chapter 8.4, *Prototype of a Speculative Design Research Practice*, considers this project, *Biodiverse Futures*, as a prototype of a Speculative Design Practice that is shaped by the Conceptual Figure of the Strange Stranger and the conceptual lenses of the project.

Chapter 8.5, *Prototype of a Speculative Design Programme,* returns to the Playset and considers its potential as a more abstract prototype of a Speculative Design Programme, and the wider insights for Community Biodiversity Activism and design contexts.

8.1 Mode of analysis

In this section, I consider the analytical approach of this discussion. Drawing on the paradigm of Post-Qualitative Inquiry, particularly the tactics of reading through theory and research creation, both theoretical concepts and design artefacts and fabulations as taken both as theory to be read, and concepts which can be worked with (Adams St.Pierre, 2020; Mazzei, 2020; Truman, 2021). On the theoretical side, there are two conceptual systems that this focuses on particularly; *Transitional Design Theory*, as described by Johan Redström (2017) (alongside *Nascent Theory* as described by Thomas Markussen (2017)), and Design Assemblages, as described by Alex Wilkie (2010); I work with these together as a concept which I term *Transitional Design Assemblages*.

Transitional Design Theory

To reiterate, Transitional Design Theory (Redström, 2017) is a way to understand the emergence of design theory through practice, in which theory is based on definitions that are not fixed but transitional. These definitions are made through design as examples (for example, a chair provides an example of a chair, and defines sitting). Such definitions are transitional, as future acts of design redefines them; these design exemplars are *prototypes*, and so prototyping is a form of theory making. These definitions are also transitional, in a tension between the general, designing, and specific, a design. Redström offers some placeholder, general definitions for understanding this spectrum, from (general and abstract) paradigms, to practices, to programmes, to projects, to (situated and concrete) products (or artefacts) (2017). These definitions are also transitional, and make sense only relationally with each other, and are superceded by the more situated and specific definitions that design makes by example, but they are a useful orientation tool.

As has been discussed, design is situated in contexts and cumulative, therefore underspecified by general theories; framing design artefacts as exemplar prototypes is a useful theoretical construct, as they are situated material things, but are encoded with meanings and entangled with wider contexts, and thus offer some more general insights. The nature of these insights are explored in this chapter.

Design Assemblage Theory

Design Assemblage theory considers how design artefacts are brought together in an emergent and situated way, and how they are heterogeneously constituted of material entities, meanings, relationalities, actions, processes, events, affects and speculations—all of which are also assemblages. Assemblages are not settled, but in a constant state of becoming, though they have stabilities in space and time that are referred to as territories, which appear as gestalt entities,

more than the sum of their parts. Deliberate acts of design (which act to encode meaning into an assemblage) can destabilise (deterritorialise) the assemblage, leading to a reterritorialisation (new and reconfigured stabilities, or new assemblages) (Wilkie, 2010).

Transitional Design Assemblages

This analysis draws on transitional design theory and design assemblage theory in a particular synthesis, by considering prototypes and examples through design as design assemblages that mediate transitions between abstract (general) and concrete (situated) design knowledge. It considers these transitions along two axes, which I am terming an epistemological and an ontological axis. On the ontological (nature of being) axis, I consider the transitions between general theory and concepts, and material artefacts, acts, and design outcomes; on the epistemological (nature of knowledge) axis, I consider a transition between situated, concrete knowledge (what the assemblage is) and general abstract knowledge (what it can come to represent) (See Figure 100).

By considering the prototypical examples through design as assemblages, this analysis is able to attend to heterogenous design examples that are complex and transitional entities. Due to the territorialising nature of the concept of assemblage—which allows one to interrogate how design acts to destabilise an assemblage, causing it to become deteritorialised before resolving into a new territory—it offers a conceptual framework to account for how design examples mediate transitions on the two axes.

In an earlier approach to this analysis that didn't draw on the design assemblage concept, I attempted to map specific design artefacts onto specific placeholder definitions; this attempt felt forced, and counter to the transitional nature of definitions and the temporality of the placeholders. By using a design assemblage framing, it allowed for more fluidity in what is considered a design prototype, and the ways that placeholder definitions are used, to understand the different transitions.

Nested Speculative Worlds

This analysis also attends to the concept of speculative worldmaking, variously considered here as fabulations, queer spaces, heterotopias and diegesis. In particular, it considers the boundary conditions of the diegetic void, through which one can pass from levels of reality, in a recursive and meta-textual way. This draws on narratives of simulated and nested realities, such as: David Cronenberg's film *eXinstenZ* (1999), where people become trapped and disoriented in multiple levels of game fiction worlds; Christopher Nolan's film *Inception* (2010), where people can enter others' dreams, and dreams within dreams within dreams; and Simon Evan's sitcom *Staged*

(2020), which takes place in nested fictional and metatextual worlds, with real people playing multi-layered fictionalisations of themselves[46].

This analysis slips between considering the internal diegetic void (and the narratives that can be created within it) of the storytelling game, to the real-world use of the game, as well as framing it as a wider prototype, roughly in line with the move on the axis from situated to generalised knowledge. There is also a metatextual recursivity in these analyses, in that it concerns a speculative design (research) project in which artefacts were designed to support speculative design projects for Community Biodiversity Activism, but which are also situated as exemplars with implications for speculative design and design research practice more widely.

Purpose of transitional design assemblage analysis

The purpose of this analysis is to interrogate and understand how the artefacts of speculative design in this project mediate transitions between the abstract and the concrete, in order to address the concerns of the research, as expressed in the previously defined research questions:

1. What situated Paradigm of future-making is revealed by adopting the Conceptual Figure of the *Strange Stranger*?
2. How might the Conceptual Figure of the *Strange Stranger* guide a speculative Design Project that materialises these ways of future-making to support Community Biodiversity Activism?
3. How might the Conceptual Figure of the *Strange Stranger* shape a speculative Design Practice that is diverse and impactful?
4. What situated insights can be gained from this inquiry to more generally inform a Speculative Design Programme to support Community Biodiversity Activism?

The way it does this is to consider designed artefacts as transitional design assemblages that are prototypes of different things, moving along the epistemological axis of situated to general

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[46] The first series of *Staged* is a fictive narrative about the director Simon Evans and the actors David Tennant and Michael Sheen rehearsing for a play using video messaging during COVID. In the second series, the first series exists as a television series, and the 'real' Tennant, Sheen and Evans, at a higher level of reality, attempt to adapt the first series for the American market. Likewise, in the third series, at a further diegetic remove, that second series exists as a television series which the 'real' cast and crew attempt to write a sequel about. This attempt fails, leading to a fourth diegetic level, where the 'real' people have made a documentary about the failure of the third series, but this is also scripted, resulting in a final, fifth level of Diegetic Escape before this level of reality, where none of Tennant or Sheen's actions are scripted by Evans, is reached.

knowledge, and interrogating the ways in which they come together, and through de-and re-territorialisations, to mediate ontological transitions between concepts and materialisations of them.

These analytical reflections frame the:

- (Playset as a) prototype of a world-telling engine (a Speculative Design Artefact)
- (Celium, Playset and Design workshops as a) Prototype of a Speculative Design Project
- (Design Project as a) Prototype of a design research project
- (Celium / Playset / Workshop / Fabulations) as a protype of a Design Programme

Additionally, as discussed in Chapter 6, The Conceptual Design Celium, as a means of operationalising the conceptual figure of the Strange Stranger and the queer and more-than-human conceptual lenses, can be framed as an abstract and general Speculative Design Paradigm, particularly considering its more abstract components: lenses, worldviews, strategic goals and strategies.

At the most concrete level of the design epistemology spectrum, of situated design knowledge, the discussion considers the design of a game that mediates the creation of speculative diegetic realities; at an intermediate level, it considers how the artefacts act to materialise conceptual framings as a prototype of a community biodiversity oriented Speculative Design Project, and what conceptual framings can offer to speculative design (and design research) practice; and, at the most general level of design knowledge, a prototype of a Speculative Design Programme, what can extend from the game to a possible way of doing speculative design in wider institutional, social, environmental and design practice contexts.

Following the discussion of the artefacts of this project as transitional design assemblage, I present some more particular reflections that emphasise the situatedness of these theoretical reflections: this thesis is not making a statement of some general theory design, but situating some possible ways of staying with trouble in some situated acts of designing.

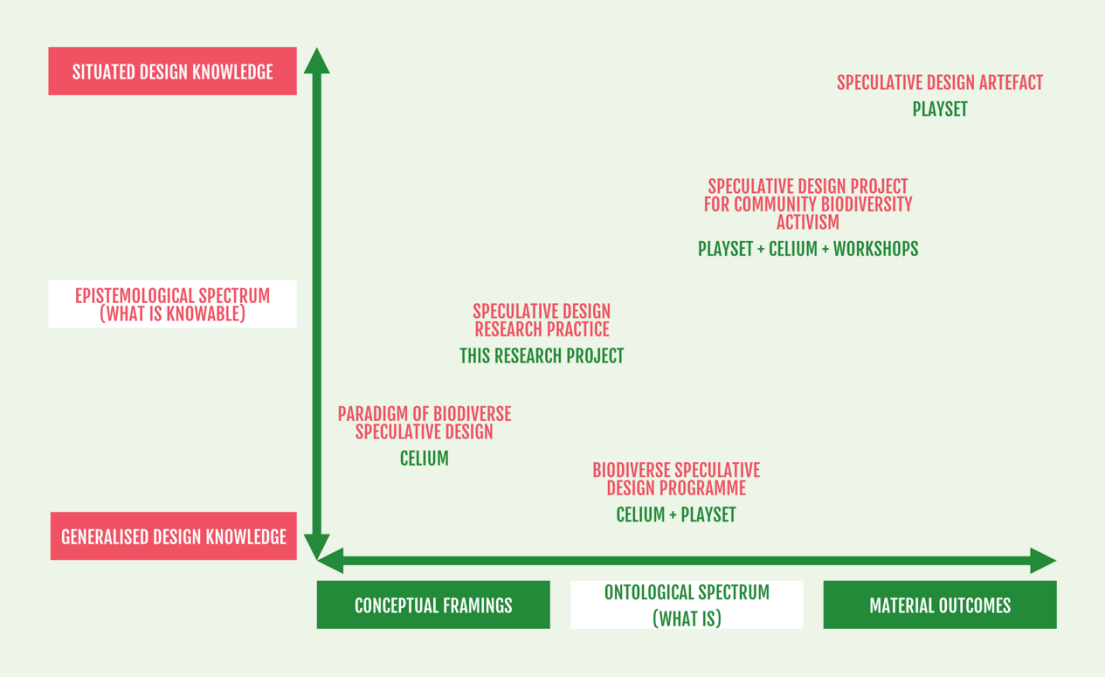


Figure 100 : Transitional Continuum Diagram

This diagram illustrates the two spectra between abstraction and concreteness: an ontological spectrum of what is, mediating between conceptual framings of design, and material artefacts and outcomes, and an epistemological spectrum of what is knowable, between design knowledge situated in designed artefacts, and generalised design knowledge. It illustrates where on each spectrum the assemblages that correspond to Redström's placeholder definitions (Paradigms, Practices, Programmes, Projects, and Products) lie.

Credit : Craig Jeffcott

8.2 Prototype of a Worldmaking System

Prototype of
System for creating fabulatory worlds, futures, or diegeses

Transitional Assemblage
Collaborative Storytelling Game

Mapping to General Design Definitions

Paradigm :	Conceptual framing lenses, Strange Stranger, Design Celium (lenses, worldview, strategic goals)
Practices :	Design Celium (strategies, speculative narrative archetypes, design techniques)
Programme :	Collaborative Storytelling Game (part of the Playset)
Project :	An instance of gameplay
Product :	Diegeses / fictional worlds

This first reflective analysis lies at the epistemological level of most situated and contextual knowledge, by taking a tight focus on the Playset, and in particular (though not exclusively) the Collaborative Storytelling Game, as the transitional design assemblage to be framed as a Speculative Design Protype. The game is situated as a prototype of a system that assembles a transition from conceptual framings (particularly queer, more-than-human and Queer Ecology lenses, and the conceptual figure of the Strange Stranger) and the future making goals, strategies and techniques of the Celium, to the collaborative creation of diegetic fictional worlds or futures.

The first reflection focuses on this as it explores in a very situated way the core purpose of the Playset and the overall aims of the project, which is to facilitate the creation of speculative futures in a collaborative way that draws on the particular framings of the project. Along with the next reflection, it aims to respond to the research question of how such framings might be made functional through speculation to support Community Biodiversity Activism.

This reflection draws particularly on the concepts of speculative design games and the theory behind how collaborative storytelling games work, to consider how the Collaborative Storytelling Game operates as a transitional assemblage to allow for the creation of these worlds and futures.

Speculative Design Games

Paul Coulton, Dan Burnett, and Adrian Gradinar have argued that there are five characteristics that an effective speculative design game should possess: allow for pluriversal realities; combine storytelling with play and performing; allow for iterative activities; avoid reductionism; and be reflective, rather than persuasive (2016). The Collaborative Storytelling Game in the *Strange Strangers in Strange Lands Playset* explicitly allows for the exploration of pluriversal realities, allowing the collaborative creation of multiple diegetic realities from the perspective of many different, more-than-human beings. The game combines diegetic acts of worldbuilding through storytelling with mimetic acts where players assume roles and performatively engage with the narratives; it is highly iterative, with multiple stories that can be told, and multiple rounds in each story where players can learn, engage, and alter their approaches to the collaborative storytelling process. The game is non-reductive, encouraging players to engage with complex, wicked problems that defy easy, simple answers, and allowing them to sit with confusion and uncertainty. Finally, it is designed to encourage reflective practices, providing sufficient framing to shape the types of stories that might emerge according to the principles of the Celium, but allowing stories to unfold as the players wish, and giving them the chance to reflect on the likelihood and desirability of such futures.

The next part of this reflection looks in more detail at the game as a collaborative storytelling game, and delves deeper into the mechanics by which it achieves these effects.

Collaborative Storytelling Games

This thesis has established that there are certain design features and gameplay mechanics that characterise collaborative storytelling games—such as tabletop roleplaying games—and allow them to create compelling fictional worlds: *Simulation*, the principle of creating fictive or diegetic realities; *Framing*, which creates a space (called variously the Diegetic Void or Simulation Gap) and a firmament for the elaboration of fictional realities; *Collaborative Worldmaking*, where fictional worlds are co-created by players; *Abstraction*, which allows for game rules and objects to simplify and represent more complex entities in the game world, and act as boundary objects between the diegesis and the bounding reality; and *Suspension of Disbelief*, which allows the player to believe and engage in the fictional reality the game establishes.

The possession of these characteristics, then, are an important set of criteria for analysis of the game; having established that it conforms to the criteria of speculative design games, I now explore in some detail how the game can facilitate collaborative speculative fabulations oriented towards the goal of promoting biodiversity (See Figure 101).

Simulation

Simulation is a key part of most games. It is a process by which an alternative reality, the gameworld, is created, and in which players' actions in the real world are transformed into the fictional reality, with its own internal "real". There is a parallel here to the queer heterotopic futures in the present that Muñoz describes (Muñoz, 2009), as well as the way that speculative practices in general are an act of future making.

In particular, collaborative storytelling games do not just present players with a pre-existing diegesis: these are created and emerge through gameplay, through an assemblage of game objects and rules, players, and narratives. The game elements prefigure a *Diegetic Void*, however, which is comparable to the Deleuzo-Guattarian Plane of Immanence from which concepts are brought forward; a situated place with a certain immanent character, shaped by the intention of the designer through the game elements and framings.

The simulation or diegetic void acts as a boundary condition between the real world and the fictional heterotopic worlds contained within the game, facilitating transitions and metamorphoses of both game elements and players that cross the boundary, existing in both in different ways: a game tile is both a hexagonal piece of wood with a being inscribed upon it, and a Strange Stranger existing inside an ecosystem; a player is both a player of the game, and the distributed agencies of various Strange Strangers. There is a parallel here with the queer concept of *passing* (Anderson et al., 2025): of transitioning into a different place (a heterotopia), and becoming or performing something other than you are—or perform—outside of that place. Of particular relevance here are the boundary conditions that allow one to enter and leave such heterotopias: what might be thought of as *passing places*. The reflections that follow consider the elements of the game and gameplay—framing, collaborative worldmaking, abstraction, suspension of disbelief—in more detail, to explore how the diegetic void is shaped and the way that passing into the fictional world is facilitated by the storytelling game.

Framing

I have discussed the role of framing devices in collaborative storytelling games as a way to make the fictional reality, diegesis or text of the game present in the real world, which in literary theory terms can be referred to as a *paratext*. The paratext in traditional fiction acts as a liminal condition that forms a "threshold" to the text; in collaborative storytelling games, the paratext precedes the emergence of the text or diegesis that is created through play (Jara, 2023). Typically, a paratext guides and prepares the reader to contextualise and understand what they are going to read—creating an assemblage of the paratexts and the reader—but in a game such as this, the paratextual framing assembles the players into player-worldteller-framing assemblages that give shape to the diegesis. As Wilkie argues, an intentionality is encoded into artefacts through

design (2010), and the design decisions I have made in developing this game are what Jara has described as a way for the author (or game designer) to give shape to the reading, or in this case, the inscription of the text—the creation of the fictional worlds within the game (Jara, 2023). The framings thus set up the conditions of the Diegetic Void or Plane of Immanence within the gameplay, and can be thought of as a transformative assemblage that acts as an enclosure separating the outside world from the inner diegetic one—rather like the way that an aquarium or Marine Protected Area create, through technical or socio-legislative means, a piece of 'ocean' separated out from the wider seas (Carver, 2021a), or that queer heterotopias form little bubbles of embodied futures outside of mainstream heteronormative time and space (Muñoz, 2009).

I reflect on game framings under three categories suggested by Jara—*rules, setting information, and meta-framing devices*—as discussed in Chapter 3 on Modes of Inquiry.

Rules

The rules of a game give structure to it, providing the player both with limitations and affordances in what actions are able to be taken within the game and the gameworld. (Jara, 2023) Rules therefore determine the nature of agency within the text, establish a sense of purpose in the players, and imbue the game with a particular set of values and end-goals. The rules are framed through the conceptual figure of the Strange Stranger and draw on the strategic goals in the Celium, explicitly state that the objective is to collaboratively protect biodiversity by building strong biodiverse networks and fighting monocultures. The rules establish a dynamic of play that emphasises collaboration, the importance of protecting the ecosystem, and a more-than-human perspective. The principal activity of the game, the collaborative telling of a story that unrolls and becomes complicated, rich with different beings, is designed to create 'weird' stories that result in defamiliarisation and estrangement in the players, creating weirded heterotopias that stand in distinct contrast to their day-to-day normality, resulting in a closer attunement to the existence of the Strange Strangers.

Setting

The setting of a game provides a frame of reference for the player, determining the tone of the game giving it a sense of place. (Jara, 2023) The Collaborative Storytelling Game doesn't necessarily establish a specific geographical setting, but does establish a certain form of temporality that encourages thinking beyond the confines of the present. Setting includes, *per* Jara, genre, theme, and mood, and these elements are well established through the framing devices. The genre is broadly established as a speculative fiction space, with the story prompts drawn from archetypal sci-fi texts and the use of a "time machine" device, but with a lean towards weird, queer and more-than-human manifestations of the genre. The choice of beings on the Strange Strangers Tiles, with their emphasis on more-than-human entities—

whether from the environment, human subcultures, and fictional metahumans, such as aliens and vampires—shift the genre more into the New Weird, allowing for both cognitive and affective estrangements, and an attendance to the unfamiliar (Garforth & Iossifidis, 2020). These also elicit weirded geographies, utopias of estrangement that might draw attention to the changed and metamorphoses landscapes of the Anthropocene era, while encouraging an ambivalence towards such changes, and a willingness to sit and work through the trouble they create (Turnbull et al., 2022).

These elements also establish a quirky, estranged, and playful mood to the game, as well as the themes of collaboration, hope, future-making, and care, which also are established by the rules and goals of the game.

Meta-Framing Devices

The meta-framing devices have been interpreted as the features of the game as a designed artefact and the way that the game objects establish framing: Jara gives examples of the physical design of the game artefacts, illustrations and embedded narratives. In terms of the design of the game, the hexagonal playing tiles are designed to establish the concept of a network of life, somewhat invoking the sense of a honeycomb. In the version of the playset printed on card, the text on the back of the tiles is a quote from Morton about Strange Strangers, subtly establishes the Queer Ecology theme (the text is repeated without spaces across all the cards, so each card only possesses disjointed fragments of the whole, and the writing is deliberately cursive and in a small point size, adding to the sense of estrangement) (See Figure 84). In the current version of the Playset, Strange Stranger Tiles are made of unstained wood, to emphasise organicity and vitality, while Monocultural Tiles are established as negative or lifeless by colouring them grey, and the To Be Continued… Tiles are sky blue, to emphasise open-ended 'blue sky' storytelling (See Figures 59 & 61). Similarly, the Speculative Prompt Tiles are coloured pink and green to emphasise the hopeful, lively queerly ecological futures they encourage players to create. Their irregular dodecagon shape hints at the possibilities of multiple directions, multiple futures that are available. The texts on the Speculative Prompt Tiles are embedded narratives, setting the scene and creating the starting point of the stories that will emerge. As discussed, these establish the tone of the emerging diegeses and situate their semantic blanks as queer and more-than-human speculative fiction worlds. The use of the ten-sided dice as a time machine (which will be discussed more as regards their abstraction) emphasises the playfulness of the storytelling, as well as invoking traditional role-playing tabletop games such as *Dungeons and Dragons* (Gygax & Arneson, 1974) that these dice are associated with, situating the gameplay for the player in this context. In the later iterations, the playset was stored in a small box, with a velvet bag for the dice, to establish a sense of a latent world in a box to be unpacked, brought into the world, and made real.

Through the framing devices of the games in the playset, the potential is afforded for "the existence of these fictional worlds, written without their stories, is an invitation for stories to happen," (Henry, as cited in: Jara, 2023, p. 52): the framings invite weird, more-than-human worlds, with a focus on entangled interactions between Strange Strangers, and working together to make better and more lively futures through collaborative worldmaking.

Collaborative Worldmaking

The collaborative nature of the storytelling game is inscribed into its core rules: the win condition of the game is not competitive but collaborative, with players working together to maximise their collective biodiversity score, which is, of course, one of the key principles of this project, working collectively towards more biodiverse futures. This draws on what Donna Haraway has described as the reciprocity of care; that by sharing stories, engendering a sense of caring about, leads to a responsibility to care for the beings whose stories you become entangled in (Haraway & Endy, 2019). This game thus facilitates a collective cultivation of care through collaborative storytelling. This shared fabulation is set in world composed of multitudinous points of view; externally, the multiple players of the game, and internally, the many Strange Stranger protagonists of the story-worlds.

The three metrics established by Devi Acharya and Noah Wardrip-Fruin for games to allow effective collaborative word-building are that they should be *player determined*, *adaptable*, and *moderated* (Acharya & Wardrip-Fruin, 2019):

The player determinability of the storytelling game is significant, with each player taking it, in turn, to decide exactly how the diegesis will unfold, determining the setting, the tone, the actions and the decisions of the *Strange Strangers* within the narrative.

The game frame is also incredibly adaptable, with players being able to take the story off in any strange direction that they might choose to solve whatever problems or events that might come up.

Through the design and framing of the game, this freedom is well moderated. The decisions on what the storytelling prompts would be and the types of being on the *Strange Strangers* cards heavily determine the tone and type of stories that can be told, and the rules establish a storytelling dynamic that passes from player to player, and some common goals to work towards; moderation is also achieved by allowing a player or workshop facilitator, to keep stories on track and to remind players of what has happened so far. Generally referred to as a Game Master, Jay Springett has recast the moderator role as a more expansive World Runner. Drawing from his experience in the Solarpunk movement, characterised as a world first, fictional genre second stance, he frames World Runner as a way of figuring out what worlds are, and how to run them: it is the "art of devising a World: by choosing its dysfunctional present,

maintaining its habitable past, aiming at its transformative future, and ultimately, letting it outlive your authorial control," (Springett, 2025b, p. 15). The World Runner description feels to be an apposite one in this context, of a Playset designed to create new and rich worlds as potential futures that can be materialised through design, so I cast the moderator role as the World Runner here.

Abstraction

As discussed, the role of abstraction in enfolding complex concepts and values into game objects was important in the development of the core approach to the design playset. From a diegetic perspective, the Collaborative Storytelling Game involved a collective effort to create a world with a strong ecosystem and a densely entangled web of life composed of a large variety of beings, or Strange Strangers. Abstraction was used both within the game objects and the game framings in order to represent this to the players.

The conceptual figure of the Strange Stranger guided the creation of the game objects. The objects used to represent the Strange Strangers themselves are small hexagonal tiles with the name of the Strange Strangers inscribed on them (See Figure 61); considered as game objects, these are highly abstract, with simple shapes and written names which are a form of symbolic signification when taken individually. However, during gameplay, these tiles are used to assemble an ecological web of life, which the hexagon shapes allow representing the ways in which organisms interrelate and entangle; considered this way, they signify in a more indexical way, representing some of the characteristics of organisms within an ecosystem (See Figure 64). Through abstraction, they allow a key quality of beings in an ecosystem—their interconnectedness and entangled assemblage—to be emphasised. In addition, they allow a representation of the key quality of Strange Strangers, where all beings are equally strange and equally familiar—all beings are reduced to the same inscrutable geometric shapes, alike in their weirdness. They also employ some culturally encoded colour symbolism: with the unstained wood of the Strange Stranger Tiles suggesting organicity and life, the grey hexagons of the Monoculture Tiles signifying a human-centric world and a lack of diversity or colour, and the blue To Be Continued… Tiles signifying a hopeful, open-endedness to the stories. As discussed above, the Speculative Prompt Tiles have an irregular dodecagonal shape, which abstractly represents the possibility for worlds to be entangled and multidimensional, not linear, by allowing the story to evolve in different directions, and are coloured green and pink, to signify queerness and organic more-than-human qualities (See Figure 59).

On the side of the gameplay, the game employs abstraction to represent the collective task of working together to build a stronger ecosystem: players take turns to place hexagonal tiles on a growing representation of a web of life, where they have to make decisions about where to place beings in relation to each other, that will allow for the most resilient ecosystems, and avoid the

dangers of monoculture. There are constraints that determine what beings they may intervene with and how much time they have available to make the decisions, and to a certain extent, all players must find a way to embrace each other's decisions and build on them constructively. Due to the random shuffling of the tiles, unexpected connections between organisms may appear, the dangers of monocultural damage lurks, capable of appearing at every turn of the game, and the story could be suddenly brought to an end before a strong ecosystem can be made: it's important to act quickly, while time remains.

Considered through a lens of the projection of structural metaphors, the game can be seen to use structures and actions that have a structural similarity to the real world challenge of Community Biodiversity Activism, and that can be perceived by the players: deciding where to place a tile on a hexagonal web having an equivalence to deciding where to intervene in a complex ecosystem, having to make the best decisions possible under time pressure and with a limit to what beings you can intervene with at a given time, trying hard to maximise healthy (or point scoring) connections and minimise unhealthy (or point removing) connections. Just as Mackenzie Wark insists that the true purpose of collective labour is to work towards a repaired ecosystem (2015), the diegesis casts the players as those shouldering the responsibility to care for this world that they are shaping.

There are other elements of abstraction in the playset, too. The use of dice as a "time machine" invokes a retro aesthetic reminiscent of the titular Time Machine from HG Well's novel (1895), and situates the future-making as random, arbitrary, and playful; the equally retro sand timers, which could represent the Cone, of multiple pasts and possible futures streaming through an ever changing present moment, as well as giving a sense of urgency, of the limited time left slipping by like ever flowing sand.

Considering the Playset more widely, The die for the Icebreaker Game represent the five strategies of future-making with simple icons: theatre masks for play and performance, a hand for making, a clock for time travel, a compass rose for mapping, and a speech bubble for storytelling: these use simple iconic and indexical signification, like hieroglyphs from some ancient language or cave painting, emphasising the universality of these ways of shaping the future, and the openness to how they might be interpreted. In the Icebreaker Game, these prescribe simple actions based on these strategies—telling a story, drawing or shaping a representation, acting something out. These aren't inaccessible design methods reserved for professionals; they are quotidian ways available to everyone to propose better futures.

The Design Fabulation Deck frames approaches to speculative design—to materialising futures —as a deck of cards, with the shuffling, the re-ordering, and the finding of new hierarchies or none at all that a card deck implies—you could even use them to build a house. It represents them as a repertoire of possibilities to be played with, not something prescriptive that tells you what you must do.

Suspension of Disbelief and Diegetic Escape

A key part of assembling the players as part of the diegetic ecosystem of the storyworld is the cognitive and affective engagements that persuade the players of the reality of the world created and their presence within it. Engaging people with worlds and contexts outside the day to day is challenging, particularly in adults; Joana Robalo talked with me about how much easier it is to engage children to care for fish in their local ecosystem, compared to adults (Robalo, personal communication, 2020). An important aspect of cultivating a sense of caring about a world is to make it feel real, and to allow players to suspend their disbelief. As discussed in previous chapters, suspending belief is to allow a form of make-believe—believing in the worlds that are made—and to bridge the simulation gap between the real-world systems of rules and objects, and the subjective experience of existing within the fiction. Springett has talked about how immersive fictional worlds allow one to occupy both simultaneously, in his experience of playing a game set in Terry Pratchett's *Discworld* (Pratchett, 1983-2015), where:

> *"coexisting with the memory of nights spent in that smoky room are very real memories of being in the cobbled streets of Ankh-Morpork. Vivid recollections of the time we escaped the Guild of Trespassers after a long chase through The Shades. So I have two memories, in the kitchen AND in the Discworld. What is this called? Two co-located realities on top of one another. A hybrid or hyper memory?"*
>
> *(Springett, 2025b, p. 14)*

How does a player suspend disbelief to exist in these collocated realities, to make it feel real? I've considered this in terms of experiential gestalts metaphors, and the affective dimension of playing a game: what does it *feel* like to play it (Begy, 2013)? Experiential gestalts are when the parts of an assemblage come together in such a way as they feel real and whole; games achieve these as a holistic assemblage, rather than through individual parts in isolation. Through such gestalts, a form of structural metaphor called an experiential metaphor is created, where the emotional response to something is similar to a feeling felt in another situation. Games then allow the suspension of disbelief through the engendering of this sense of verisimilitude, thus feeling familiar to something else and giving the fictional world an affective realness.

The Collaborative Storytelling Game in the *Strange Strangers in Strange Lands Playset* is designed to give a complication to this feeling of familiarity, as it tries to make the familiar strange and the strange familiar; by drawing on a feeling of estrangement, it aims to unsettle that familiarity, and to allow the players to sit with an unfamiliar world, and be prepared to explore it with a curious mindset, in the way that New Weird fictions engender such an experience; as discussed above, such weirding and queering estrangements are a utopian gesture that draw attention to unfamiliarity and encourage one to sit with it without judgement.

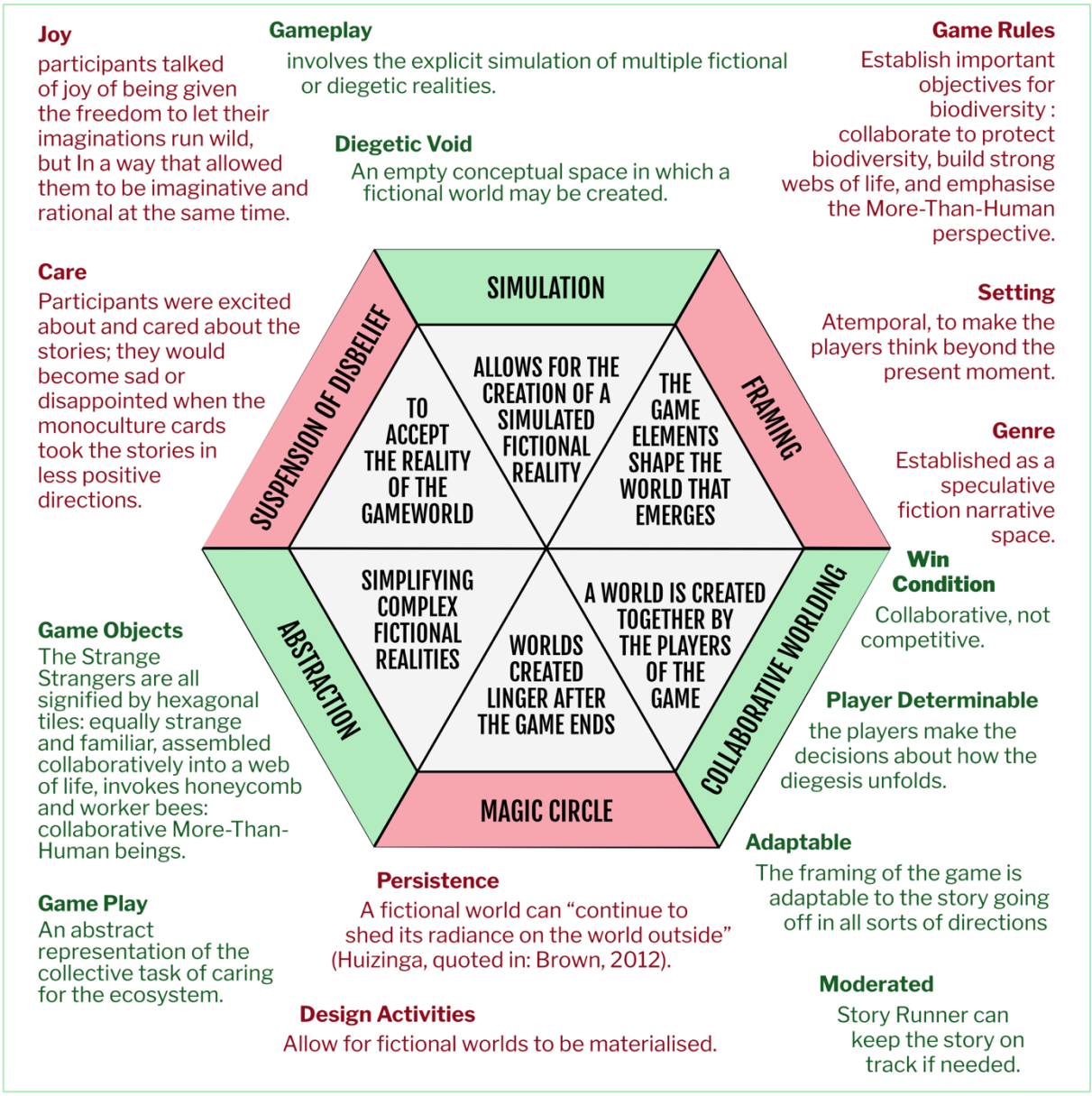


Figure 101 : Collaborative Storytelling Game Analysis

This infographic summarises how this Strange Strangers in Strange Lands Collaborative Storytelling Game meets the criteria of such games—Simulation, Framing, Collaborative Worlding, Abstraction, Suspension of Disbelief, and the Magic Circle—in order to facilitate collaborative speculative fabulations oriented towards the goal of promoting biodiversity.

8.3 Prototype of a Speculative Design Project

Prototype of
A Community Biodiversity Activism-oriented Speculative Design Project

Transitional assemblage
Celium, Playset, design workshops, fabulated worlds and designed artefacts from workshops

Mapping to general design definitions

Paradigm :	Conceptual framings, Design Celium (lenses, worldview, goals)
Practices :	Design Celium (strategies, speculative narrative archetypes, techniques)
Programme :	Playset
Project :	Design workshop
Product :	Speculative futures and artefacts

This section considers the artefacts of the project as a prototype of a Speculative Design Project for Community Biodiversity Activism. In this framing, the Celium, Playset and design workshops provide an exemplar of a Speculative Design Project: the Celium provides the framings and theoretical background, the Playset provides a structured design process, and the design workshops are a demonstration of that process in practice. To put it another way, the games and activities of the playset are designed to lead players through a series of activities that constitute a Speculative Design Project aimed at supporting Community Biodiversity Activism. The artefacts in use in the workshops are both a situated design project, as well as a more general example of how a design project might be structured in a way that is guided by the Strange Stranger, and materialises the ways of futuring that are articulated in the Celium.

This analysis therefore aims to address the research question of how biodiverse ways of futuring might be materialised through speculative design in a way that supports Community Biodiversity Activism.

8.3.1 Supporting Communities through Speculative Design

Ezio Manzini has explored the concept of 'light communities', modern, fluid communities that emerge through social innovation that facilitates community collaboration (Manzini, 2018). Manzini suggests design can support the emergence and growth of such communities by providing a *Favourable Context* for them to exist, to provide a *Stimuli for Aggregation*—a reason for them to come together around particular projects, and a *Diffuse Design Capacity*, where design skills are distributed within a community, not limited to experts (Manzini, 2015). It is important to consider, then, what form of support might be provided for Community Biodiversity Activism through design: what might be considered a successful outcome in that regard?

In simple terms, the aim of this project was to help communities take action to protect biodiversity, in opposition to the biodiversity crisis. The biodiversity crisis forms part of a wider *Polycrisis* (Cantor, 2025; Richardson, 2025), and as discussed, the polycrisis has led to a defuturing crisis of imagination (Mulgan et al., 2020; Springett, 2023); an Impasse of the Present that is hard to see beyond (Savransky et al., 2017), and to imagine futures that leave behind the normative power structures on which such an impasse depends. Speculative design has been explored as a way in which such an impasse may be breached, by offering the possibility of imagining and materialising different futures in the present. Such futures might be framed as heterotopias—other worlds—as wheres and whens that can become imbricated with the here and now. An important part of what speculative design can do is to make futures available in material ways that can be grasped, worked and engaged with (Tonkinwise, 2014). This then opens up the possibility of debate, of being literate in multiple futures, and of staking a rhetorical claim on futures that the community might want, rather than accepting the singular one that they are given.

Furthermore, bearing in mind that what is under consideration is supporting community action to preserve biodiversity, these speculated futures should be those that emphasise communal worldmaking, and diverse naturecultures. In this way the artefacts of this project could mediate transitions between abstracted concepts and material outcomes, in order to prototype how ways of futuring can be materialised through a Speculative Design Project and are able to support Community Biodiversity Activism.

What follows is a discussion of the way that the Playset is designed to support a design project trajectory, how it can be considered a microcosm of a community oriented speculative design project, and how this has been exemplified by the design workshops that were carried out.

8.3.2 Playset as a Material Assemblage

A significant concept that I have explored in this project is the materiality of design, and the way that it can be a practice that materialises futures; I have been particularly interested in how Speculative Design Practice might materialise ephemeral future-making practices situated as queer and more-than-human. I argue here that in this project, such a materialisation is both manifest and facilitated by the artefact which I have referred to as a Playset (or less precisely, a game) and, earlier, as a Toolkit.

This artefact is an assemblage of material-semiotic objects that have been assembled for the purpose of facilitating socio-material acts of collective worldbuilding, storytelling and future-making—which can result in the creation of fictions and material design expressions of those fictions—that are situated and meaningful worldviews, theories and fictions. Under the headings

of playset and toolkit, I will explore how such a material assemblage facilitates these materialisations.

Playset

The term Playset emphasises that this is a set intended for playing. I have discussed in some detail the ways in which games can facilitate the collaborative creation of diegeses (fictional worlds or futures: through the framing devices of rules, setting and meta-framing; through collective worldmaking characteristics of player determinability, adaptability, and moderatedness; through abstractions, which allow for complex ideas to be manifest in simplified game objects and framings through metaphorical projection of structural metaphors; and the suspension of disbelief by making the fictional world feel real through emotional metaphorical projection (that is, through game experiences feeling like other experiences to the player). In the previous section, I have made a detailed study of the ways in which the Strange Strangers in Strange Lands playset enables worldmaking through these means.

I consider here the material-semiotic nature of the playset as an assemblage of artefacts, or game objects that are imbued with meaning—with a particular focus on the Collaborative Storytelling Game, which is the component of the Playset where collaborative worldbuilding takes place. I would like to draw attention to two things here.

First, elements of the worldviews of Queer Ecology and the conceptual figure of the Strange Stranger are tangibly manifested (via the Design Celium as paradigm and practices of design) through the game objects and, procedurally, through the framing devices of the game. This means that players of the game are able to encounter these complex ideas not only in words, but, as physical entities through touch, and as game objects through play (an important process by which beings become-with each other). In terms of Transitional Design Theory, the Collaborative Storytelling Game materially facilitates transitions between what the game objects and framings are, and what becomes in the gameplay instances and stories that are created through play. These becomings are through design, the playing and storytelling being defined through designed artefacts, rather than simply through words.

Second, the theoretical discourse on game design touches on the idea that collaborative storytelling games can create diegetic realities (specifically, in this case, the biodiverse futures that were created in workshops) which can be thought of as real worlds within the bounds of their diegesis. These diegeses are created and influenced by the players of the game during play, which depend on the players being able to be present within and outwith the diegesis simultaneously. The game objects are the boundary conditions, the physical artefacts that allow them to pass from the 'real' world into the fictional one. The implication of this is that the game objects can allow players to perform pluriversal transitions, to create-encounter different worlds that are framed as queerly (and more-than-humanly) ecological through the conceptual figure of

the Strange Stranger. Furthermore, the Magic Circle principle suggests the reality of the diegetic futures may linger collectively in players' minds when gameplay concludes; these physical objects, laid out in a hexagonal grid representing the Strange Strangers that occupy such worlds, help to ground the diegeses in a physical reality.

Toolkit

The prior term I used for this assemblage, Toolkit, also gives a useful perspective on the functional materiality of the assemblage. In general parlance, a toolkit is a set of tools which can be used to facilitate a number of similar tasks. Consider a general construction toolkit, which might contain tools for building construction tasks: saws for cutting, drills for making holes, screwdrivers for affixing items with screws, hammers for nailing things together, and chisels for carving. These tools are designed for specific materials, such as wood, plaster, concrete, brick, and steel. They wouldn't be suitable for working with other categories of material: bread or cheese would require a set of kitchen tools; hydrochloric acid and potassium permanganate would require laboratory tools; trees and seedlings would require gardening tools.

There are two aspects of materiality that I would like to draw attention to here. The first is that, since the tools may only work with certain materials, the things that are produced will bear the material signature of the stuff from which they are made; they have a grain. Second, the tools manipulate and shape those materials; the finished item bears the marks of the maker, as well as the marks of the tools used to make it. For example, a carved olive wood bowl bears the grain of the olive tree and has a form determined by an artefact of the tool, the chisel, used to carve it. (This aligns with the way that concepts may be drawn in in Post-Qualitative Inquiry; Lisa Mazzei and Elizabeth Adams-St.Pierre have discussed how the choice of philosophical concepts shape the trajectory and outcomes of a research process (Adams St.Pierre, 2020; Mazzei, 2020))

I reflect here on the three concepts of tools (and their means of use), materials, and products. Simply, the tools are the items within the Playset/Toolkit assemblage—the gameplay cards, the dice, the timers, and their means of use are the gameplay framings. The end products, that which is produced by using these tools, are the diegeses or design fictions produced during game play, as well as design outputs based on those (as well as the gameplay instances themselves, which could be considered an assemblage of players, the game objects and framings, and acts of interpersonal communication, decision making, and storytelling). What then of the materials? What substance was used to create these stories and gameplay instances? I argue that the material worked with are the ideas, worldviews, strategies and goals, speculative fiction archetypes and design techniques situated as queer and more-than-human, guided by the conceptual figure of Queer Ecology, the Strange Stranger, and structured according to the Celium.

Similarly to the carved olivewood bowl, the futures and gameplay instances have a certain materiality, even if that materiality is more conceptual than physical; they bear the grain of the ideas in which they are situated, and they bear the marks of the creators, shaped in the way allowed by the tools, the gameplay artefacts. In this way, I'd argue that the tools given to the game players have allowed them to tangibly work with intangible materials—ephemeral future-making practices from queer and more-than-human worldviews—forming them into fictional worlds and designed artefacts.

Furthermore, this process produces futures that are materially different from those that emerge from other, more normative future-making practices: more diverse, less categorical, more fluid. The toolkit is a means of proposing futures that oppose the Impasse of the Present, and that move out of its shadow.

Therefore, what I argue here is that this experimental assemblage of playful artefacts is the powerful engine that allows the collaborative creation of biodiverse futures, futures whose figurative materiality is formed from queer and more-than-human futuring practices. These objects exist because they were produced through an experimental research-through-design process, and are arguably the most explicitly "designerly" outputs of the project; the Celium is a structure of concepts, workshops are discrete events, stories are conceptual narratives, but the Playset (or Toolkit) is an assemblage produced through explicit acts of design: graphic and communication design, gameplay design, product design. They represent a definition of Biodiverse Speculative Design Practice through design; they are an example of what such a practice could be. This is knowledge particular to practice-based design research; such material-semiotic assemblages would not emerge as a possible answer to research questions that were not explored as a form of design practice.

8.3.3 Structure of Speculative Design Projects

In this section, I consider how the sequence of gameplay and design activities of the Playset prototypes a trajectory for a Speculative Design Project. I have previously discussed the way in which design projects are structured, and their trajectory of practices and activities towards a design product or artefact. The UK Design Council's *Double Diamond* (2019) framework provides a general shape for a design project across four stages—*Discover*, *Define*, *Develop*, and *Deliver*. These stages are grouped into two diamonds: the first representing Design Research, for orientation and planning, and a second, Design Practice, for conducting design. and each diamond has a divergent thinking, "opening out" phase (Discover is learning about the context and design space; Develop is exploring possible design outcomes) and a "closing off", convergent thinking, phase (Define is settling on a specific aim or goal for the project; Deliver is choosing, finessing and finishing a particular design outcome). To some extent, the Playset is modelled on this process: The Icebreaker Game and the Situation Report might be seen as a Discover phase,

an open-ended exploration of a context (both of the figure of the Strange Stranger, and of the local biodiversity context). The Collaborative Storytelling Game sits between Discover and Define, where players are finding out how to play the game, and through telling stories, start to define what the outcomes might be. The Debating Futures Discussion activity concludes the Define stage, as the players weight up the different futures, and the Speculative Design Challenge encompasses the Develop and Deliver stages, as the players choose a design activity, explore it, and ultimately produce a design outcome (See Figure 102).

This project has also looked more specifically at the trajectory of speculative design projects; in particular, I considered the *Material Belief* project, as a good exemplar of a speculative design project oriented towards public engagement (Auger, 2012; Beaver et al., 2009; Kerridge, 2015). While I used *Material Beliefs* as a guide to structuring this design research project, it was also informative in designing the Playset and thus in shaping a prototype of a community-oriented Speculative Design Practice. *Material Beliefs* had a structure similar to the *Double Diamond*: "Scoping the Project" being the Discover phase, in which the project was oriented and contexts explored; "Engaging People" where the public became engaged through activities in the ideas of the project and the focus of the project became more clear; "Developing Designs" is the Develop phase; and "Provoking Debate" being a particularly speculative engagement-oriented approach to Deliver a design outcome, in which engagement events with the public provide an opportunity for presenting material futures as rhetorical artefacts, and in engaging people with the possibility of different futures (Beaver et al., 2009). Again, there is a mapping from these design stages and the sequential activities in the design Playset, from initial exploratory activities, fabulation and discussion, creation, and presentation of design outcomes.

The Design Project trajectory prototyped by the *Strange Strangers in Strange Lands Playset* was designed to focus particularly on two key speculative practices—fabulation and design—supported by other activities that encouraged particular framings and ways of thinking. Overall, there is a speculative design project structure of Orientation (Icebreaker Game), Contextual Research (Situation Report), Fabulation (Collaborative Storytelling Game), Deliberation (Debating Futures Discussion), and Design Making (Speculative Design Challenge).

The Icebreaker game is a priming activity to orient the players to the framing of the *Strange Stranger* conceptual figure; The Situation Report is a Discovery phase designed to allow the players to learn more about their situated environmental contexts; The Storytelling Game was designed as a fabulation engine to generate collaborative speculative fabulations; the Debating Futures Discussion was designed to engender a stance of criticality towards futures and therefore a confidence in critically assessing and choosing futures; and the Speculative Design Challenge to materialise these fabulations through design.

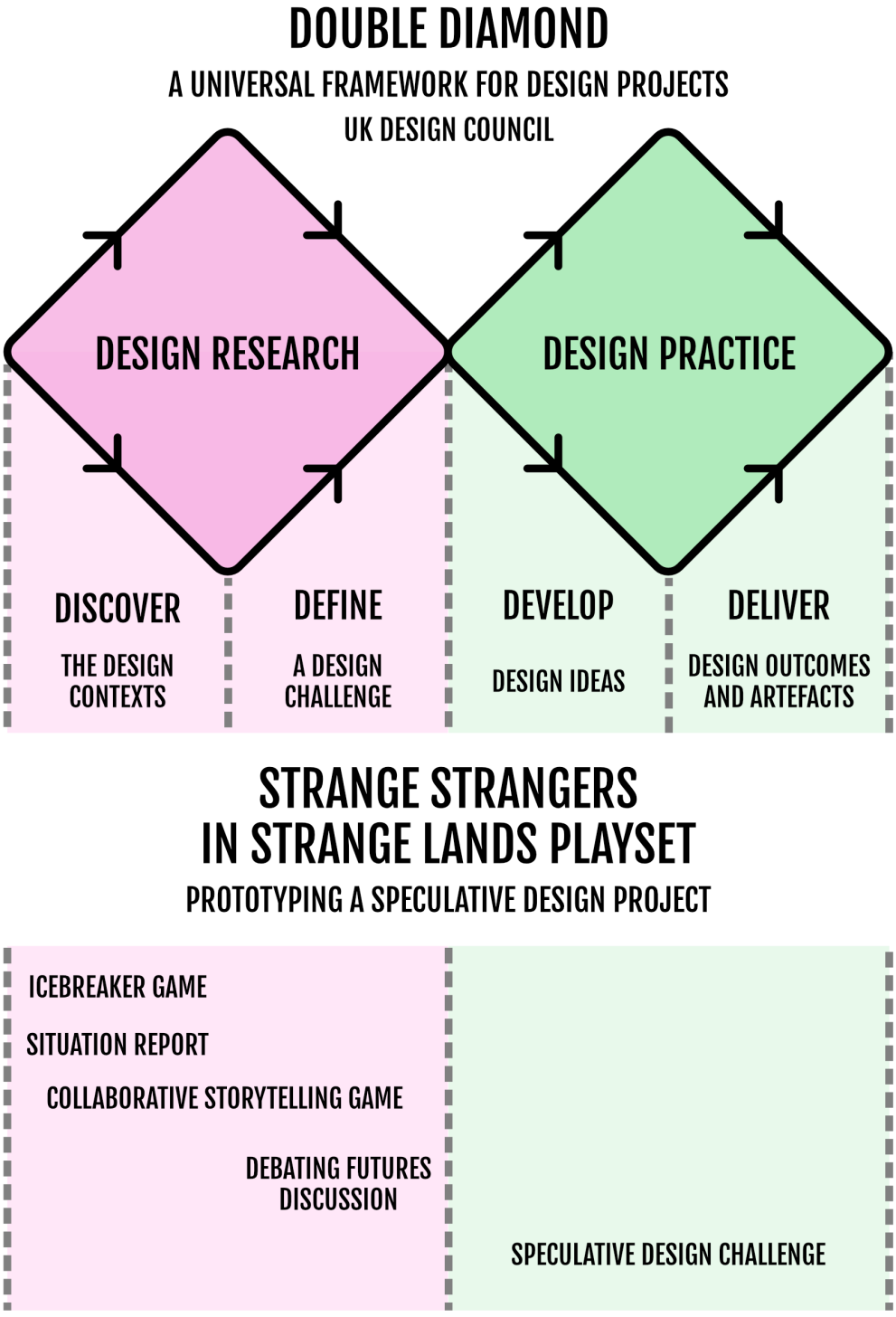


Figure 102 : Playset mapped onto the Double Diamond

The Double Diamond *is a universal framework for design projects (Design Council, 2019). This figure demonstrates how the games and activities of the* Strange Strangers in Strange Lands Playset *are a prototype of a Speculative Design Project by mapping them onto this framework.*

Credit : Craig Jeffcott

I now discuss each activity in the playset in turn, considering how the conceptual figure of the *Strange Stranger* guided the process and how the ways of futuring in the Celium are made operational and materialised through design.

Icebreaker

The Icebreaker game is the first activity in the Playset, and is designed to be a priming activity, to introduce players to the conceptual figure of the Strange Stranger and to take their first forays into exploring worlds using its tentacles. This gradual turn towards the strange or unfamiliar is a theme that has recurred across many discourses discussed in this thesis. In an exchange with Gilliam Russell regarding the design of cultural probes, she discussed with me the importance of balancing creative activities with priming activities, that would open the participants mind to a particular way of thinking about how to approach the probe tasks. (Russell, personal communication, 2020). Regarding speculative design, James Auger has discussed the need to *Craft the Speculation*: to lead the viewer or user of an artefact into the estrangements that it produces in such a way as it isn't so jarring or sudden or extreme that they disengage and struggle to suspend disbelief (Auger, 2013). In discussions of New Weird fictions and their utopian potential, the power of leading the reader into estrangement and defamiliarity in a gradual way was emphasised; the narrative of VanderMeer's Annihilation is one of a journey from familiarity, scientific objectivity, and bodily integrity to estrangement, subjective dissolution and a merging with the material world (2014). Alex Garland, the director of the film adaptation (2018), describes it as:

> *"the journey from suburbia to psychedelia. We begin very much in the world we know, and we end up in a world we don't know, and we get there like a frog sitting in increasingly boiling water; it is a description of a journey from an objective state to a subjective state."*
>
> *(Garland, cited in: Mefford, 2018, Section Refractions)*

The Icebreaker game, in its various iterations, was designed to bridge that gap from the suburban and familiar to the strange, more-than-human worlds of the Strange Stranger. It does this by taking refracting the familiar and accessible genre of party games through a Queer Ecology lens. Such games have simple rules, are usually fast paced and fun for participants, and help build friendship and community bonds between players. They also have an inherent performativity and creativity to them: in *Charades*, players have to act out the titles of particular texts (Cambridge University Press, 2025a); in the *Celebrity Heads* game, players have to guess an adopted persona (The Guardian, 2008); and in *Pictionary* and similar games players have to draw out clues for each other to guess (Angel & Everson, 1985). The context of this game genre thus provides an ideal starting point for turning from the domestic and familiar and to start to adopt queerer and more-than-human perspectives. The Strange Stranger Tiles provide players with

strange and unusual beings to become, and the five futuring strategies are embodied in the different possible tasks the players can perform.

In practice across the various workshops, the Icebreaker Game proved successful in engaging players and engendering a sense of playfulness and suspension of disbelief. In particular, playing the game engendered a sense of confusion in the players—part of the process of estrangement and defamiliarisation—but in a way that was entertaining and humorous, and thus opened up an affective space for the suspension of disbelief. As a prelude to the other games in the playset, the icebreaker led players down a path towards embracing estranged, alternative worlds, and began to give shape to the diegetic void of the approaching Collaborative Storytelling Game in which futures could be created.

Considering the Playset as a prototype of a Speculative Design Project, the Icebreaker Game demonstrates how the concept of the Strange Stranger can be introduced in a playful and familiar way, and can bring people by degrees to a new and unfamiliar worldview in which speculative fabulation can take place.

Situation Report

The Situation Report is one of the more optional tasks in the playset—and one of the least explored components in workshop settings—but it is intended to allow for design speculations to be situated in the real, material world. As discussed in this thesis, the new materialist stance of attending to the material world—and the contingencies which such an attendance creates—is a necessary part of speculative practice if it is to have relevance to the complexity of the material world and the challenges it poses.

The Playset is intended to be flexible, and allow a repertoire of speculative practices; one important part of this was that it could be used solely for speculative gaming, to imagine open-ended biodiverse futures, but also that it could be used to help communities engage with a real-world environmental challenge. The intention of the Situation Report is to help players frame that real-world context within the lens of the project; in other words, to ground the Strange Stranger and its ways of futuring in real and situated contexts. Thus, players are asked to consider their local contexts through these lenses, with a focus on the strategic futuring goals from the Celium, and sketching out an ecological web of Strange Strangers. The Situation Report is designed to be usable in local contexts in which the players might be experts, as well as to help orient players unfamiliar with the local environment—when this was tested in the Monterrey workshops at the *Cumulus* conference, design delegates from across the world were provided with environmental literature about the local area in order to complete the report.

Additionally, the use of the hexagonal grid to map out the Strange Strangers in the ecosystem (for the mapping strategy) introduces an important visual metaphor which the storytelling game is built around, so the Situation Report primes players for the game.

Considered as part of the protype of a Speculative Design Project, the Situation Report represents an information gathering, or discovery phase, and demonstrates how the figure of the Strange Stranger can frame this information gathering in a particular way. It recalls Lisa Mazzei's stance on Post-Qualitative Inquiry that the concepts used shape the way that inquiry goes and the concepts that emerge (2020); this shows how a Strange Stranger framing allows for a more-than-human and situated perspective on the local environment and the biodiversity challenges within it.

Collaborative Storytelling Game

I have discussed in some detail the mechanics of how the Collaborative Storytelling Game—through Simulation, Framing, Collaborative Worldmaking, Abstraction and Suspension of Disbelief—allows the collaborative creation of fabulated elseworlds that are shaped by the ways of futuring in the Celium and the guide of the *Strange Stranger*. I focus here on how this speculative fabulation can be situated as part of a wider speculative design workshop or project, and to consider how a Strange Stranger lens allows players or designers to fabulate about collaborative futures in a particular way.

The value of the Collaborative Storytelling Game is that it creates a framing space in which futures can happen. The diegetic void, framed by the game elements, is a heterotopic space, present within the real world but different and separated from it, but with the potential for beings and things to pass between the two (Foucault, 1967). In an environmental sense, it could be thought of as analogous to an enclosure, such as a national park or a Marine Protected Area: a part of the world separated out from the rest, in which attention is given to the various entities and beings which inhabit it. There is a problematic aspect to enclosure, in that it tends to be an anthropocentric and extractivist gesture, often with some extrinsic value being gained from maintaining a natural environment in an artificial way. (Fairbanks et al., 2018). I've discussed the challenge of stewardship (Alpert, 2001) as being a somewhat paternalistic activity—acting for, not with, the environment—and the need to avoid the danger of activating what Haraway calls the "Gardening Gene" (Haraway & Endy, 2019) and assuming human control over the ecosystem.

However, there is also the aspect of enclosures as a form of theatre, such as an aquarium, which uses emotional engagement to engender a sense of care in an ecosystem (Chermayeff et al., 2021). This could be compared to the rhetorical and persuasive nature of futures (Michael, 2000), and the way in which speculative design can engender engagement with wider publics (Kerridge, 2015); it also has a resonance with Critical Anthropomorphism, a way in which human-centric thinking can be reframed as an embrace of the human ability to reflect and creatively speculate

about more-than-human worlds, where we can "recognise shared sameness with other entities in the world or imagine what it is like to be another being," (Poikolainen Rosén et al., 2024, p. xx).

The diegetic void—the space for worlds to be told, the container for ideas—has a boundary condition created by the framings of the Collaborative Storytelling Game, through which players must pass, changed somehow, into the world of the game. This is equivalent to the boundary conditions Muñoz described in queer spaces, and the refractive estrangements caused by passing between that heterotopic space and the world outside; such a boundary condition is materialised in the film version of *Annihilation* (Garland, 2018), with a refractive barrier called the *Shimmer*—a word that invokes queer spaces and gestures—through which one must pass to enter a changed and change-inducing world. The ability to make such transitions could be described by the queer concept of passing: being able to convincingly adopt different personas or different categories of being on each side of the boundary. The storytelling game, in allowing players to adopt the role of various *Strange Strangers*, allows for such a passing into a more-than-human speculative world.

Passing, or adopting a categorical identity, is a performative act (indeed, Butler and Foucault emphasise that most categories are not innate qualities, but are products of power relations, and through performance those relations can be strengthened, or troubled, and changed (Butler, 1990; Foucault, 1976)). As the discourse around New Weird fictions and utopias argues, it requires an openness to being comfortable in in-between states, of an ambivalence to estrangement, difference and change: change in the world, and of oneself (De Freitas & Truman, 2021; Garforth & Iossifidis, 2020). It results in a depersonalisation where one accepts a changed nature, where identity is something that shifts and becomes collaborative; a making together, a becoming-with. All of these dynamics are facilitated through the Collaborative Storytelling Game, with players shifting identities from one Strange Stranger, to another, to another. The emergent stories were messy, dreamlike, and often confusing—tales of sympoetic relationships between fungi, frogs and ants who wage war on humans through mycelially-infected seagulls; or of a time travelling dog who accidentally removes cacti from existence, resulting in famine, and the time travellers who, in trying to repair the damage, follow the sound of flute music through a portal and are befriended by medieval fishermen. Despite the confusing absurdity of these stories, it was clear that during the workshop storytelling sessions, players engaged with this process of weirding and estrangement with enthusiasm, and talked of the joy of getting lost in the process of storytelling. The stories—the worlds—that they told were collective endeavours, shared diegetically across a more-than-human ecosystem, worlds without singular protagonists that embraced difference and weirdness. Through this process, the telling of story worlds, the players cultivated a sense of care: a care for the stories, and for the beings within it.

Debating Futures Discussion

The Debating Futures Discussion was intended to allow the players to become comfortable with, even literate in, the idea of pluriversal worlds and many possible futures; to be implicated actors in futures that they create, not simply victims of or subject to The Future and the Impasse of the Present. This prospectus of multiple futures is an important principle of the research lenses of the project, and this activity represents an opportunity for players to engage with it.

The activity in its current form draws on a modified version of the Futures Cone (Coulton et al., 2016), and although I have discussed some reservations about the use of this model, it is useful both in that it is familiar to many people, and is quite easy an easy concept to grasp in general. Through this Futures Cone metaphor, this activity invites players to reflect critically on the futures or story worlds that they have created, to compare and contrast them. Considering how likely they think each future is, is to allow reflection on the material reality of worlds and futures. It is easy, perhaps, to imagine different worlds, but harder to bring them to life; consider the challenge of Solarpunk imaginaries in imagining both changes to social structures as well as infrastructure in making solar fantasias a question of *what next?* rather than *what if?* (Williams, 2019). This exercise starts the process of imagining what might be needed for a particular world to exist or future to come into being, which feeds into the Speculative Design Challenge.

As a prototype of a Speculative Design Project, this activity is one of design strategising, and of defining what the world is that might be materialised through design.

Speculative Design Challenge

The Speculative Design Challenge represents the second, Design Practice diamond of the *Double Diamond* process: of developing and delivering speculative artefacts from more-than-human worlds.

The activity is framed around a deck of Design Fabulation cards. Card decks are common tools in design research and speculative design, and here they act as a bridge between gameplay and design activities. These cards have been created in such a way as to materialise many of the concepts and ways of futuring represented in the Conceptual Design Celium. In the context of the Playset and workshop trajectory, they are designed to allow players to take the fictional worlds created in the storytelling game and to materialise them through design. Across the 45 cards, there are nine activities for each of the five futuring strategies: making, playing and performing, time travelling, mapping, and storytelling. These strategies are framed ready for design practice through simple and imaginative design prompts—drawn from the conceptual

framings, from speculative design practice, and from speculative fiction—from the perspective of the Strange Strangers who inhabit speculative worlds.

8.3.4 Transitional Design Assemblage

Considered from a Transitional Design Assemblage perspective, The Playset facilitates the coming together of an assemblage of concepts and ideas (represented in the Celium and by the conceptual figure of the *Strange Stranger*), of storytelling and design activities, and of people in a particular place and time, through workshops, speculative fabulations, and material design outcomes, in the way that a design project needs to do.

To interrogate this assemblage in more detail, and inquire into the ways in which it unsettles and reforms territories, I attend in particular to the Collaborative Storytelling Game, and the way in which it creates a diegetic space for collaborative fabulation.

In the creation of a diegetic void, the game performs a deterritorialization, opening up an immanent plane for the creation of a heterotopia: this disassembles the space, creating an unstable void to be filled. This void is assembled across conceptual and material planes: it creates a shared conceptual space in and between the minds of the players, as well as a place located in normal space and in time—the time that the workshop takes place, and the physical space on the table for the game play—and, through the game framing objects, it creates a demarcation, enclosure, or boundary condition, to allow passage between the void (and the worlds that emerge within them) and the outside world. This void is a semantic blank, shaped by the Strange Stranger and the concepts that it represents. When the game is played, with the players adopting Strange Stranger personas, a reterritorialisation occurs: the heterotopia takes shape, in the minds of players, and, mediated by the game objects, on the table in front of them.

Rather like the concept of the aquarium as an enclosure, this act of worldmaking results in a microcosm of a world that can elicit interest or awe in its creators, or others who it might be shared with; and, in the concept of the Magic Circle, this world remains, once the gameplay concludes, in the minds of those who encountered it. However, there remains a boundary membrane, porous enough to allow some osmotic diffusion between the diegetic reality and the outside world, but requiring the framing devices as boundary objects to allow transportation between the inside and outside.

The subsequent Speculative Design Challenge affords the deterritorialisaton of the enclosed diegesis and the outside world, combined through a reterritorialisation into a shared convivial space. It thus allows for a Diegetic Escape—a materialisation of objects and actions out from the diegesis into the physical present.

The Playset, through its use to guide workshops, has facilitated speculative design processes, from conceptual orientation and contextual research, through collaborative fabulation and a deliberative critical reflection on possible futures, to diegetic prototyping. Through this process and the prototypes, communities are able to explore a queered and more-than-human way of thinking about futures, to imagine and fabulate about possible futures and critically assess them, and bring them to life in a way that both engages other people with their ideas, and allows them to manifest better worlds in the present.

This assemblage of the Playset, Celium and workshops is a prototype of a design process; it doesn't simply represent what a design process could be but is, in and of itself, a Speculative Design Project. It also demonstrates how particular conceptual ideas—in this instance, queer and more-than-human lenses aimed at replacing monocultures with diverse futures—can shape and be materialised through speculative design.

8.3.5 Supporting Community Biodiversity Activism

To conclude this section, I reflect on the potential for Community Biodiversity Activism to be supported through this prototype of a Design Project. Manzini discussed that designers may support the emergence and growth of socially innovative and collaborative 'light' communities by creating good conditions for community effectiveness. These conditions are: a *Favourable Context*, such as infrastructures and environments, for the community to exist; *Stimuli for Aggregation*, providing the germ of a project that gives the community purpose; and *Diffuse Design Capacity*, where designerly, collaborative and critical skills are distributed in the community, not gatekept by experts (Manzini, 2015). Here, I consider how this prototype Design Project, in the form of the *Strange Strangers in Strange Lands Playset*, draws on these three aspects to support the three biodiverse futures community goals of Care, Collective Action, and Seizing Futures.

Favourable Context

The Playset provides a favourable context for community action through the various activities and games. The Icebreaker Game primes the players to adopt a Strange Stranger mindset, the Situation Report contextualises the project in the local environment, and the Collaborative Storytelling Game uses framings and abstractions to frame a diegetic void, a space for telling stories that is shaped by conceptual queer and more-than-human lenses. It opens up a space and a time for worldmaking and storytelling that can support collaboration, careful storytelling, and imagining possible futures.

Stimuli for Aggregation

The Playset provides players with specific collaborative acts through which they might come together to stake a claim on better futures for their environment. The Collaborative Storytelling Game presents players with speculative story prompts and a collective goal: to tell a story of a dense, healthy ecosystem and to oppose the dominance of monoculture. The Debating Futures Discussion encourages players to critically appraise the possible futures they created, and decide which one to give their attention to. Lastly, the Speculative Design Challenge provides players with a range of different design activities with which to materialise their new futures in the present.

Diffuse Design Capacity

The Playset is designed to support lay people and non-designers within Communities of Biodiversity Action in making use of speculative design and fabulation to explore better futures in their environment. It therefore takes design knowledge and authority from the figure of a designer, and distributes it amongst the players through the games and activities. The game objects and activities scaffold players through an entire design project trajectory, helping them to frame their design activities both through a Strange Stranger lens and through their situated environmental contexts, to fabulate about possible futures, critically appraise them, and to materialise them through design experiments in a self-led, non-hierarchical manner.

8.4 Prototype of a Speculative Design Research Practice

Prototype of
A Speculative Design Research Practice

Transitional assemblage
This project (e.g. framings, methodological stance, tactics and techniques, research aims, design and research acts, design outcomes, reflections on practice)

Mapping to general design definitions

Paradigm :	Speculative Design, Research through Design, Post-Qualitative Inquiry
Practices :	Speculative design and design research tactics and techniques
Programme :	Emergent through the project (see next section)
Project :	This research project
Product :	Process methodology, Celium, Playset, workshop format

This assemblage reframes the project from a different, reciprocal perspective: what approach to speculative design practice is guided by the conceptual figure of the Strange Stranger, and what insights can be revealed through a Transitional Design Assemblage lens. The question is: how do the conceptual framings become assembled through design practice, not in terms of how those are materialised, but in terms of how speculative design practice might be informed by those framings?

The focus here is on this doctoral design research project, *Biodiverse Futures*, as a prototype of a Speculative Design Practice. It is an analysis of the Mode of Inquiry and Modes of Practice of this project, the project trajectory and structure, a consideration of how those have been guided by the Strange Stranger, and what insights might be drawn from this. It draws on the idea that Lisa Mazzei explores in relation to Post-Qualitative Inquiry, that the choice of a concept shapes the inquiry that follows. (Mazzei, 2020). It is a consideration of how this Biodiverse Futures Doctoral Design Project was shaped by its conceptual framing, and a framing of it as a protype, an example through design, of a Biodiverse Speculative Design Practice.

What I am interested in here is where speculative design practice has limitations (i.e. it is insufficiently impactful or diverse in approach (Jākobsone, 2017; Prado de O. Martins, 2014; Tonkinwise, 2014) to tackle complex problems of a deficit of diversity, such as the biodiversity crisis) and how an approach that borrows from queer and more-than-human future-making practices might help. Therefore, I am going to consider the way that Johan Redström argues that definitions are made through design, and that transitional, slippery definitions are more helpful in designing new things than static definitions, which tend to reiterate what already exists.

From this I draw a close parallel to the critiques by Liene Jākobsone (2017) and particularly Luisa Prado-Martins (2014) that speculative design has become mired in normative worldviews and insular practices of dissemination: the problem, viewed through a Transitional Design Theory lens, may very well be one of working with definitions that are too static, therefore tend to describe and re-iterate what has gone before, in terms of the form of the artefacts (Tonkinwise criticised the shiny, consumer product gloss of many of Dunne and Raby's projects and many other gallery-oriented speculative artefacts (Tonkinwise, 2014)) and who they are produced for (the closed loop Jākobsone described between the gallery, academy, and classroom (Jākobsone, 2017)).

What seems to be needed is a more pluriversal approach, or a different worldview, that is more able to embrace transitional, fluid thinking; I have argued already that such a worldview might be found in the non-binary, category transcending in-betweenness of queer and more-than-human thinking. What I assert here is that this reading of this position through Transitional Design Theory gives theoretical weight to the argument. Dinis Machado describes the way they experience a non-binary identity as an in-betweenness, something that is experienced bodily, viscerally; their dance practice is based on overloading the body, confusing it, forcing it into in-between states (Machado, personal communication, 2021). This parallels the approach I have taken in this project, drawing on a plethora of theoretical positions and speculative lures to confuse my practice, and to structure artefacts that embody these ideas, drawing from a multitude of other definitions of speculation that will encourage more transitional, fluid approaches to future-making.

8.4.1 Modes of Inquiry

The influence of the conceptual figure of the Strange Stranger, and the queer, more-than-human and Queer Ecology lenses, played an important role in the approach to research inquiry, and the way in which this research was framed methodologically: as Post-Qualitative Inquiry, as speculative practice, and as Research through Design. Post-Qualitative Inquiry emphasises that the temporality of any research inquiry lies outside of the bounds of the formal research project, and in fact, often begins well in advance of that. Therefore, this reflection begins by considering the context in which this research project was approached. I came to design from a background in biomedical science and science communication and cultural studies—including speculative fiction—and began my formal studies of design on the Interaction Design Programme at *Goldsmith's, University of London*. This programme drew on Science and Technology Studies to frame design as an approach to interrogate the relationship between technology and society, and therefore sat within a context of Research through Design. There was a strong emphasis on speculative design practice within the programme, and I completed my dissertation project on the subject of design for deep time, exploring a notional space programme for seeding the galaxy with (terrestrial) life. In contemplating pursuing research towards a PhD, I naturally gravitated

towards speculative practice, and Research through Design as a research approach, alongside an interest in speculative fictions and biological futures. I therefore gave consideration to identifying an aspect of speculative design that might offer the possibility for investigation, as well as considering a biological milieu in which it might meaningfully intercede. This brought me to a *Seldon Crisis* moment, a concept Isaac Asimov created in his *Foundation* series (Asimov, 1952), in which the confluence of an internal and external crisis results in the necessity to decide on a path forwards: that there was a (socio)diversity crisis within speculative design, and a (bio)diversity crisis outwith it, in the environment (Brondizio et al., 2019): in effect, a *Monocultural Polycrisis*. From this, there was a fairly clear path towards conceptual lenses of queer theory, to address sociodiversity, and the philosophy of the more-than-human, to address biodiversity. These lenses brought me to the concept of Queer Ecology, where the two combine, and thus to the guiding conceptual figure of the Strange Stranger (Morton, 2010).

To some extent, then, the choice of conceptual lenses and conceptual figure was arrived at by being situated within this context, but these then became the concepts that shaped the inquiry; to some extent, they provide a *post-hoc* validation for the suitability of taking a speculative, Research through Design approach.

Post-Qualitative Inquiry

The adoption of a post-qualitative mode of research inquiry came through a close alignment between the conceptual framings of the research project and the philosophical underpinnings of Post-Qualitative Inquiry, which could be characterised as post-structuralist and new materialist (Adams St.Pierre, 2020). Performing the role of the of the Strange Stranger is to queer ecology, to oppose binary and categorical distinctions between beings—particularly between human and more-than-human beings, and between the biological and technical worlds—and to find the familiar strange and equally, the strange familiar. Derrida frames the *arrivant*, the antecedent of the Strange Stranger, as the incomprehensible stranger to whom we should offer unconditional hospitality (Derrida, 1997). The *arrivant* represents an invitation to sit with estrangement, and a loss of a familiar settled home, in favour of becoming-together with other beings in constantly changing worlds (Garforth & Iossifidis, 2020; Morton, 2010).

The Queer Ecology framing in which the Strange Stranger is situated draws on post-structuralist queer theory, particularly Butler′s stance on gender (Butler, 1990), and Foucault's stance on sexuality (Foucault, 1976), as not being inherent biological properties but performative products and intensifiers of power relations, and therefore open to being troubled. It also draws on more-than-human perspectives that might be framed as new materialist: the importance of attending to the material world (De Freitas & Truman, 2021; Haraway, 2016) and the way in which matter and meaning is entangled (Barad, 2007), the possibility of a cosmopolitics where scientific understandings offer a way to hear the voice of ore-than-human entities (De Freitas &

Truman, 2021; Latour, 2004; Stengers, 2010), and the necessity of staying with the trouble by living together with other beings in entangled pluriversal worlds (Bellacasa, 2017; Haraway, 2016).

Collectively, these post-structuralist and new materialist stances, when considered in relation to research inquiry, are opposed to prevailing structures and structural or procedural systems of action: a problem, as Elizabeth Adams St.Pierre identified, when approached with typical qualitative research methodological and methodologies. Such methods carry ontological assumptions about pre-existing structures, and, from a post-structuralist perspective, cannot be removed from their contexts, and so will act to inscribe their structure (and their contexts of creation) onto that which they are used to study (Adams St.Pierre, 2020). She argues that it is impossible to think thoughts in a post-structuralist or new materialist way that orients towards situated and emergent concepts (thus to think thoughts as a Strange Stranger) using such methodological framings, and thus she proposed Post-Qualitative Inquiry as an alternative approach. Post-Qualitative Inquiry works with concepts, not methods, and involves a deep theoretical reading of texts—whether pre-existing texts, or the artefacts and writing that emerges through the act of inquiry, as in Sarah Truman's Research Creation (Truman, 2021): concepts lead research acts, which open the research trajectory forward, and so the methodology is emergent and descriptive, not prescriptive and defined in advance.

To reflect on this, the nature of the Strange Stranger and the more-than-human and queer conceptual lenses necessitated a post-structuralist and new materialist approach to design research, if design is to meaningfully engage with such ideas, while themselves being the concepts that were used to shape the inquiry that emerged.

Speculative Practices

Speculation is a practice of imagining and working with possible (or impossible) futures, alternative worlds, and pluriverses, in such a way that the present might be framed differently, and action might be taken towards preferable futures. Such a practice is post-structuralist in nature, aligning with the notion of the creation of the new rather than the excavation of the old or preexisting, as Deleuze and Guattari discussed (Deleuze & Guattari, 1994).There is an alignment, therefore, with the stance of the queerly ecological Strange Stranger, and thus the conceptual lenses of queer theory and new-materialist, more-than-human stances, which reject pre-existing categorical structures of human identity and material, more-than human-reality.

Some detailed consideration has been given to the speculative and utopian potential inherent in queer and more-than-human perspectives. There is an attunement to outsider status: being outside of the cultural mainstream is to be able to experience and think the world differently, and to imagine how it might be otherwise; a gesture that Muñoz describes as a utopia of hope (Muñoz, 2009). There is a queer temporality that is non-linear, haunted by those things no

longer present (Muñoz, 2009), and a weirded spatiality that is metamorphosed, inhabited by presences that seemingly shouldn't be there (Turnbull et al., 2022). There is a perspective on speculative imaginaries that can appreciate where they are reinforcing hegemonic structures and where they offer diversions and alternatives to it. And there is a stance towards utopias that is both queered—emphasising the concrete utopianism of collaborative outsider heterotopias within the present—and weirded—inviting an embrace of defamiliarity and estrangement through speculative fabulations that allow one to stay with the trouble of the changed and changing material realities of the Anthropocene or Cthulucene era (Garforth & Iossifidis, 2020).

By queering ecology, the Strange Stranger invites you to sit with the unfamiliar, the strange, the more-than-human visitor who arrives unannounced. What emerged through this project and, in particular, through the playing of the storytelling game, was the distinct weirding effects that occurred. I emphasise here that this quality of weirding—of speculative estrangement—was not present in the initial framings I made of this project: their importance was revealed through the unfolding design practice that was guided by the Strange Stranger. As has been discussed, New Weird fiction can be seen to align with a utopian perspective of defamiliarity (a departure from home), and a sense of estrangement, such an estrangement being both cognitive (thought) and affective (felt) (Garforth & Iossifidis, 2020). Both forms of estrangement were engendered through the storytelling game: the nature of the emergent stories evidences a cognitive estrangement, with oneiric and psychedelic fantasias—aligning with Alex Garland's description of the journey "from suburbia to psychedelia," (Garland, cited in: Mefford, 2018, Section Refractions). Affective estrangements were seen in the observations and discussions of the games during workshop sessions, with a sense of playful confusion being engendered, allowing for both a suspension of disbelief and a cultivation of a responsibility of care to the beings in the stories through an affective caring.

These observations led to a deeper understanding of the way that Strange Stranger framings generated weirded fictions and futures, and towards theory discussing the potential for (New) Weird fiction to facilitate utopian estrangements. Such estrangements allow for the contemplation of the material realities of the Anthropocene, Capitalocene or Cthulucene era, exploring how one might sit with and work through the troubles and metamorphoses which characterise such times and places as the here and now.

Design as Research

I have discussed at some length the way in which research through design is in alignment with the post-qualitative stances to inquiry that the post-structuralist and new materialist framings of this research lend themselves; in this, then, the appropriateness of queer and more-than-human framings for speculative design research are emphasised. As I have argued, across Post-Qualitative Inquiry, practice-based design research, Post-Structuralism, and through queer and

more-than-human lenses, there is a common goal: to set aside what already is or assumed to be, and predefined categories and structures, and instead to focus attention on what relationally comes into being, whether philosophical concepts, designed artefacts, futures, and entanglements between materials, meanings and beings. The relationality that emerges through this is dependent on the concepts that one works with to do so.

I reflect here on an interesting recursivity. The initial motivation was to situate this research as a speculative, Research through Design project as well as to explore more diverse ways of practicing speculative design; such a goal brought me to conceptual framings that emphasised an approach to inquiry for which a Research through Design approach is apposite. In recalling the discourse around Post-Qualitative Inquiry that it must be approached in a way that post-structuralist and new materialist concepts are thinkable through it, it reinforces that such a concept-led, relational and emergent approach to research is precisely what is needed for speculative design to be more diverse and impactful.

8.4.2 Modes of Practice

Such a Research through Design practice that is aligned with Post-Qualitive Inquiry (and therefore in alignment with the Strange Stranger) has particular modes of practice, which are reflected on in the literature both regarding Post-Qualitative Inquiry, and for practice-based design research. In both, it is emphasised that such inquiry is not methods-led, but led by concepts and theory. I have discussed this elsewhere in the thesis, but to reiterate, this notion of concept-led research takes on a particular emphasis in design research, in considering what is taken to be the concepts and theories which guide inquiry. It may be pre-existing concepts, such as philosophical concepts or texts, but in the framing given by Sarah Truman, Research Creation (Truman, 2021), that which emerges through research can also be taken as a concept to read and guide practice. Returning then, to Johan Redström's conception of design artefacts as prototypes and examples of theoretical definitions through design (Redström, 2017), and a framing of design artefacts as Deluzu-Guattarian emergent concepts (Deleuze & Guattari, 1994), the design artefacts created through the research process are themselves concepts and theories that reflexively inform and guide the progress of the research.

Instead of research *methods*, Research through Design draws on an emergent, rather than fixed approach, making use of Intentional Tactics and Operational Techniques (Blythe & Stamm, 2017), which have been discussed in depth in this thesis. Where methods *are* drawn on—even those that might be traditionally framed as qualitative methods for the social sciences—it is as methods of design (oriented towards a design goal) rather than as a method of research inquiry, as seen in the use of unstructured conversations and data coding in this project. Ultimately, this results in a research methodology that isn't pre-planned in advance and emerges through practice.

Again, this reiteration is to emphasise that the Strange Stranger allows for the assemblage of an approach to design research that is in alignment with its core elements: of decategorical fluidity, of encountering the world as it is, and in an acceptance of change and emergence. Such an approach is already established as a design research practice as seen in speculative design and Research through Design. This alignment, expressed in this way, is somewhat abstract: an alignment of general principles and practices, that doesn't delve into the specifics of the conceptual framings nor the specificities of design practice. What is interesting here isn't simply the way that a Research through Design project may align with the onto-epistemological values of queer and more-than-human lenses, but the ways in which the specificities of these lenses have shaped actual design practice: to look at this project not as an abstraction, but as a prototypical exemplar of situated practices.

In the following section, which traces the trajectory and structure of the project, the situatedness of the design practice and the way that the Strange Stranger guides it forward, are explored in more detail.

8.4.3 Structure of Design Research Projects

I have explored a few different ways of structuring design projects in this thesis, such as reflecting on the way that the *Strange Strangers in Strange Lands Playset* offers a prototype of a Speculative Design Project oriented towards Community Biodiversity Activism, considering the Material Beliefs project as an approach to a speculative design for public engagement with emerging science (Beaver et al., 2009), and using the UK Design Council's *Double Diamond* (2019) structure as a general framework for design projects.

In this section, I focus on the *Double Diamond* structure, as it offers a general framework for both the planning and analysis of heterogeneous design projects in a multitude of situated contexts. The intention here is to map a general and abstract framework onto a situated design practice, to demonstrate how the generic contours of a design project is shaped and situated in this instance by the conceptual queer and more-than-human lenses, and the conceptual figure of the Strange Stranger (See Figure 103).

As discussed, the *Double Diamond* consists of two diamonds, representing two distinct moments ("diamonds") of design, with each diamond being composed of two phases, representing "opening up" (divergent thinking) and a "focusing down" (convergent thinking) of Design Practice. The first diamond represents Design Research, an understanding of the design context, and the second represents Design Practice, a response to that context. In the first diamond, the opening up phase, Discover, involves researching and understanding the design context as widely as possible, and the closing phase, Define, is a focusing on what the challenge for design should be. In the second diamond, the opening up phase is Develop, where design experiments

and ideas are explored, and the closing phase is Deliver, where a particular design concept or idea is rendered into a design artefact.

From a Transitional Design Assemblage perspective, this might be framed as follows: during the Design Research diamond, the designers familiarise themselves with the situated context in which they wish to intercede through the Discover phase, and develop an understanding of the relationality between things that can resolve into a particular assemblage. In the Define phase, having framed an assemblage of interest, the designer comes to understand its territory; the spatio-materio-temporal-semantic grounds in which it is stable. The designer then defines a change they wish to make to the territories of the assemblages in question. In the second diamond, Design Practice, the designer explores ways through the Develop phase that they might act to disturb or deterritorialise the assemblages by creating new designer-assemblages, and in the Deliver phase, to make acts of de- and re-territorialisation that result in the creation of a new assemblage, a design artefact, which may achieve the intended reterritorialisations in the original situated context.

In this project, the Design Research diamond can be mapped to the development of the Design Celium, a structuring of the contexts into worldviews, goals, strategies, framing narratives and design techniques. This can be framed as Discovery, an understanding of the design context, followed by Defining the characteristics of Design Artefacts that emerged in the next 'diamond', Design Practice, onto which the design of the *Strange Strangers in Strange Lands Playset* is mapped, with the Development of the idea of design toolkit into a game-based design playset, and the Delivery of a playset prototype alongside test workshops.

In a more granular way, the phases of this project correspond to the stages of the *Double Diamond* as follows (of course, there is an incomplete mapping between a general framework and situated Design Practice: there is not a neat conformation from one to the other, nor necessarily a linear temporality in their trajectory):

Design Research Diamond

- Discover Phase : Opening Moves and Exploratory Attunement
- Define Phase : Sense Making and Assemblage

Design Practice Diamond

- Develop Phase : Initial Concept Development, First Prototype, Storytelling Game Development
- Deliver Phase : Second Prototype and Prototype Refinement

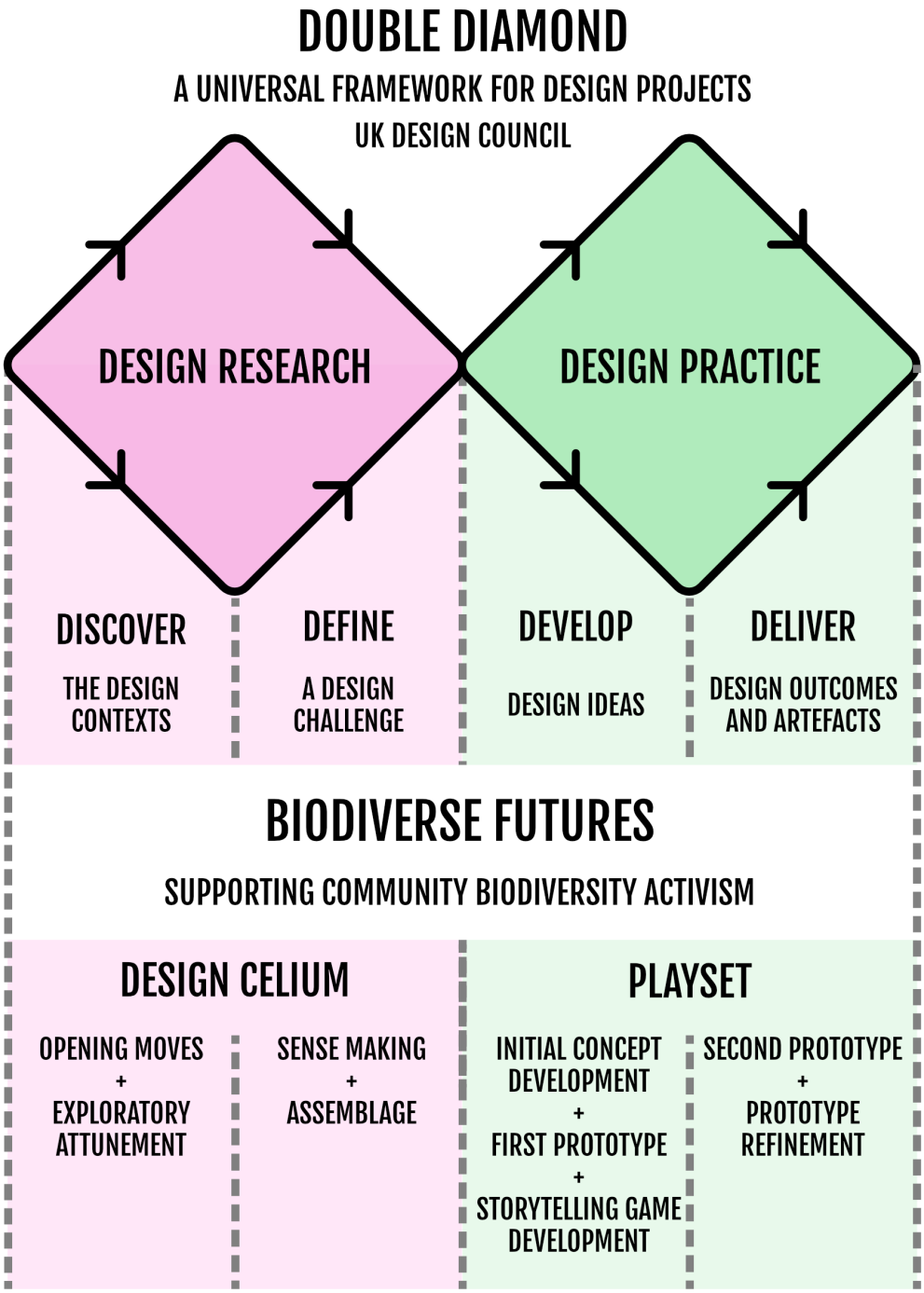


Figure 103 : Biodiverse Futures *Project mapped onto the* Double Diamond

The Double Diamond *is a universal framework for design projects (Design Council, 2019). This figure demonstrates how the phases of the Biodiverse Futures project map onto this generic framework.*

Credit : Craig Jeffcott

There follows a detailed reflection on each phase of the *Double Diamond* process alongside the phases of this project, with regards the situated design process which emerged, guided by the Strange Stranger.

Design Research Diamond

Discover Phase

The Opening Moves of the Discover phase involved deep reading of theory, alongside encounters and conversations, as a process of becoming familiar with the situated context in which my project was based. At this stage, the concept of Queer Ecology and the Strange Stranger was yet to be discovered, and the research was guided by queer and more-than-human conceptual lenses, with the exploration of queer and more-than-human futures in literature. These lenses guided my encounters too, encompassing community oriented biodiversity action and queer cultural communities, and my conversations included those with a biologist working on community biodiversity projects, a drag performer, a choreographer working with transitions, and an artist working with historical natural pigments (an emphasis on creative professionals, perhaps, but all with something to contribute to a developing understanding of queer and more-than-human perspectives and orientations to the future).

This led into Exploratory Attunement, where the concept of the Strange Stranger becomes established as a conceptual figure, and the queer and more-than-human concepts led Design Practice: exploring what possibilities for design experimentation might emerge, and taking part in design workshops which resonated with these topics. Through these workshops I developed a sense of ways of fabulation and future-making, particularly the notion of care through storytelling, community action, and attending to materiality, and some clarity towards the emerging Design Celium structure was gained. In particular, there was a move away from an early ambition to develop new design tools, to an understanding that bringing together existing ways of futuring, tools, techniques or otherwise within a Queer Ecology context may be more fruitful.

Define Phase

These reflections led into the Sense Making phase, where through Reading through Theory and through a designerly use of coding methods, a rough shape to what the Celium could be was formed, and through the Assemblage phase, many of the ideas that came out of these readings, encounters, design experiments and workshops came together into a loose assemblage that could support Design Practices, namely, the development of the Playset. This emergent Design Celium is rooted in a particular onto-epistemological milieu, framed as matter, encounters, time, place and narrative, and a set of strategic goals, and an account of speculative fictions and practices which are directly influenced by the queer and more-than-human lenses.

Design Practice Diamond

Develop and Deliver Phases

It is through the initial concept development, first prototype and the development of the Collaborative Storytelling Game that the focus on the Strange Stranger, as a queerly ecological figuration of the queer and more-than-human conceptual lenses, began to play a more prominent role. On reflection, this shift, from conceptual lenses to conceptual figures is interesting. During the design of the Celium, which is a somewhat abstract framework for Design Practice and one that could be thought as research for the design stage of the project, the more abstract or general lenses came into play to guide the research and design process.

The design of the Playset, on the other hand, is a more situated act of design, in which conceptual ideas are materialised and made tangible in the design of a physical object. This is a process in which meaning is inscribed into an assemblage (Wilkie, 2010), going from general ideas to specific things. The Conceptual Figure is a philosophical construction where philosophical ideals and concepts can be embodied, and so the philosopher (or designer) can adopt that role, essentially becoming an avatar for the concepts (Deleuze & Guattari, 1994; Tironi & Díaz Bejarano, 2024). Here, in the transition from the abstractions of the Celium to the specificities of the Playset, the embodied Strange Stranger becomes a more useful guide to action.

Drawing on this figure led to a focus on a flattened ontology of beings and an embrace of the unfamiliar, the strange, and the more-than-human. There was also a focus on the strategic goals—Care, Community Action, and Seizing Futures—and the futuring strategies of the Design Celium, but it was through the guiding figure of the *Strange Stranger* that these ideas were embodied in the emerging games and activities. This was particularly the case in the development of the storytelling game, in which a framing narrative through which players can adopt a variety of Strange Strangers in order to collaboratively create more-than-human worlds and futures.

In later project phases—of creating a usable prototype of the game, testing it, and iterating on it in the workshops—the guiding influence of the Strange Stranger can be seen in the designed artefacts and assemblages: the Playset and its games and activities, and the physical design of the game pieces, the design workshops, and the narratives and speculative design artefact outcomes. Through a process of design and assemblage, the Strange Stranger becomes inscribed into physical objects, collaborative processes, and speculative fabulations.

8.4.4 Transitional Design Assemblage

From a transitional design perspective, one might consider the way in which the Strange Stranger gives shape to the emerging Speculative Design Research Practice, through a deterritorialisation of the abstract *Double Diamond* design process and a reterritorialisation within a situated design context. The *Double Diamond* is intended as a universal design process, which can be applied in any design project or context (Design Council, 2019). In this section, I have considered how this abstract process has formed into an assemblage with conceptual lenses, speculative practices, and situated design artefacts. This has resulted in an emergent and situated Speculative Design Practice that, I have argued, might move beyond the critiques of Speculative Design as being insufficiently diverse nor impactful to address the Polycrises of the Anthropocene or Cthulucene era.

To explore what this might mean more widely for speculative design practice, is to move onto the final part of this analysis, on the most general point on the epistemological axis, and consider how this is a prototype of a design programme, and through considering design foundations and speculative projections, offering some suggestions for how future design work might proceed from what this research has revealed.

8.5 Prototype of a Design Programme

Prototype of
A Biodiverse Speculative Design Programme

Transitional assemblage
Celium, Playset, design workshops, fabulated worlds and artefacts

Mapping to general design definitions

Paradigm :	Conceptual framings, Design Celium (lenses, worldview, strategic goals)
Practices :	Speculative design and design research tactics and techniques
Programme :	Design Celium (as transitional foundations), Playset, design workshops
Project :	This analysis
Product :	Transitional foundations, fabulation of design programme

I have considered what the situatedness of the artefacts of this Design Project affords, in terms of creating a space for speculative fabulation, supporting Community Biodiversity Activism through speculative design, and transforming speculative design and research practice in a specific context. This last reflection on this project through the lens of Transitional Design Assemblage considers the Playset as a prototype of a way of doing speculative design: as a Speculative Design Programme. In this framing, I imagine projecting the playset from its situated context onto a conceptual screen of more abstracted design knowledge, and considering what such a visualisation might reveal.

Considering the ontological tension between abstract concepts and situated materiality, Redström proposed the Design Programme as a placeholder definition of an intermediary between the general and the specific of design (2017), which I am framing as a transformative creative assemblage which mediates between theoretical framings and speculative futures. A design programme is a structured system that draws on design paradigms and design practices and facilitates design projects towards the production of design products. In this analysis, the *Strange Strangers in Strange Lands Playset* can be seen as an exemplar or prototype of a Speculative Design Programme. The Playset—a material and semantic assemblage—draws on complex theoretical positions that have been structured through the Conceptual Design Celium, and encapsulates and abstracts these within material artefacts, rules and gameplay. By doing this, it makes them operational and available to hand to the players of the game, giving shape to the collaborative fictions created by the players. The Playset therefore lies, like a design programme, at the centre of the spectrum of design and designing, between materiality and abstraction, and may represent a prototypic example of what a Biodiverse Speculative Design Programme could be.

The value here of the Transitional Design Theory framing becomes clear: framing the design Playset as a Design Programme allows for these intermediaries to mediate between a specific design project and a more general framing for design in general, without becoming codified as an abstract and general theory, and thus avoiding the problems of specificity and cumulatively that makes design research often underspecified, and not well accounted for, by theory.

This analysis considers how the Playset itself represents a prototype of an emerging and transitional Biodiverse Speculative Design Programme—and how that prototype might be projected from a situated response to a particular design problem—as a guide to what a more general approach for biodiverse speculative design programmes could be. I approach this in two ways: the first was to consider Redström's argument that transitional design programmes should have transitional foundations (Redström, 2017), and to outline what foundations might made using the Celium and Playset, the conceptual figure of the Strange Stranger, and what has been revealed through the act of doing this project. The second approach is a more speculative one, drawing on Object Oriented Ontology (Harman, 2018) to fabulate about how such a design programme might appear in practice.

8.5.1 Transitional Foundations

Johan Redström offers a general definition of a programme as "the intent and structure behind something about to unfold," (2017, p. 85). He emphasises the importance of both intent and unfolding to a programme, which he situates in the ongoing design tension between a design and designing, or between what is *intended* and what becomes (through *unfolding*). A design research programme could be seen as an assemblage of worldviews, techniques, people and resources oriented towards (this is intent) particular design purposes through projects and products (this is unfolding). Typically, a design programme would have a foundational worldview, or paradigm, on which design practice might depend. Over time, that worldview becomes static, only able to describe what has gone before or create a new pattern after what already exists, even as design practice expands beyond those foundations (Redström, 2017).

Transitional Design Theory implies that through design practice, foundations can become more transient and slippery. Other worldviews can be brought into the design programme, not as additional stable foundations, but as propositions for different ways for design to unfold. This can build upon and challenge, where necessary, the core beliefs of a programme. In transitional design programmes, design practice is framed as Design Experiments; experimenting with how different worldviews might support the intended unfolding of the programme (i.e. the sorts of things that the programme is intended to make) by doing design that engages with the worldview in question (Redström, 2017). It reframes a design programme from being an affirmative practice that might state "*this is how design should be done*" to a critical one that asks, "*what would be the implications of doing design in this way?*".

Redström also proposes that as design experiments can play with unstable foundations for a design programme, it is not necessarily the case that an existing programme may precede experimental design practices, but that design experiments will form a starting point for a transitional design research programme to emerge: it is in this proposal that I situate my following argument.

I've already explored the ways in which the foundations of a notional speculative design programme are too limited to offer any useful response to the biodiversity crisis (arguably, it rests on insufficiently diverse worldviews, lacks meaningful impact, and has tended to operate within a closed academic-cultural loop (Jākobsone, 2017; Prado de O. Martins, 2014; Tonkinwise, 2014)). Conversely, I've also explored the ways in which speculative design can support and materialise more diverse worlding practices. I've also argued that in this design research project, an emerging assemblage of material-semiotic objects (the Playset) acts to bridge those two reciprocal provocations, being a powerful means by which diverse worldmaking practices can be materialised and put to use through a speculative design practice patterned on those very practices.

Therefore, I argue that this design research project can be framed as a set of design experiments to explore the emergence of a Speculative Design Research Programme intended to support Community Biodiversity Activism through the creation of biodiverse futures: such a programme transcends the limitations of speculative design and materialises a new form of speculative design practice that draws on diverse, transitional worldviews and practices.

William Gaver argues that design does not converge on truths but accumulates designs, artefacts, or objects (W. Gaver, 2012): it accumulates not facts, but, as Redström describes, *examples* (Redström, 2017). Examples through design are a reframing of the definitions that have already been made through design; designed things define the thing for which they were designed by offering an example of that thing e.g. a chair, a designed thing, offers an example of sitting, not by description but by design.

So, in considering an emerging design programme for a more biodiverse speculative design practice, what that programme might want to define is *Designing Biodiverse Futures*, to put it as a simple term comparable to sitting. That definition is made by the artefacts produced by design experimentation (this research project); in short, an example of what might such a design programme be is given by the things that have been made in this project: a Conceptual Design Celium, storytelling workshops, speculative fictions, and, at the core, the speculative Playset which provides a material-semiotic means for ephemeral queer and more-than-human futuring practices to be materialised in games, stories and design responses.

In the following section, I make a case, through illustrative examples, of what the form of such a speculative design programme might be, it's contours and values. First, though, I explore a

complementary way of considering how design programmes may be situated in practice-based design research: Thomas Markussen's *Nascent Theory* (2017).

Programmes in Nascent Theory

In Nascent Theory, Markussen (2017) argues that a programme has *kernel theories* that are foundational to the practice of design within the programme, "as well definitions, hypotheses, or core assumptions" (2017, p. 91); this is equivalent to the hard core of beliefs and foundations that Redström argues that design research programmes are built on.

Nascent Theory is, like Transitional Theory, about how these programmes expand upon their kernel theories through design research, but Markussen uses a different framing, suggesting that a programme's kernel theories can be expanded in three ways: by *extending* theories, where new theories are added to an existing knowledge base; by *scaffolding* theories, where different concepts of the same phenomena are integrated, and by *blending* theories, where concepts of different phenomena are merged. It offers a way to explain how Design Programmes might be expanded with alternative worldviews, and so is complementary to the analysis performed here.

Arguably, to some extent in this project, extending, scaffolding and blending of theory all play a role.

Extending Theories

This is the expansion of an existing knowledge base. In this project, I extend speculative design practice, situating it away from critical product design, or design for engagement with scientific research or public policy, but in the setting of a community-oriented practice for biodiversity activism. Speculative design has been put to such ends before, but there was an intention here to step beyond the typical domain of the practice, so arguably, when I or any other design practitioner has done this, it represents an expansion of what speculative design is.

Scaffolding Theories

In this, different concepts of the same phenomena are merged. For example, in this project I have been working with concepts of categorical fluidity, of transcending binaries. I have explored these from queer theory, from more-than-human worldviews, and from speculative future-making perspectives that aim to transcend a future in the shadow of the present and propose alternatives to it. Phenomenologically, these are very similar, simply coming from different perspectives, and in this project, I bring them together within design practice.

Blending Theories

Blending theories involve merging concepts of different phenomena. In this project, various phenomena are brought together—such as conservation, stewardship and care, play, storytelling, queer futures, SF, fabulation, and game-design—and contribute to the emergence of a new programme for speculative design research.

Foundations of a Biodiverse Speculative Design Programme

Through example, the artefacts of this speculative design project start to reveal the contours of a Biodiverse Speculative Design Programme: the following are some principles that might form its transient foundations. Many of these principles were discussed from the start of this thesis and have played an important role throughout this process; here, I aim to show how, through examples and prototypes of design practice, they can become definitions through design.

Making worlds together

Making better worlds together is a core theme of this project, and could be considered likewise to be core to this emerging programme of speculative design: argued for by Muñoz (2009) and Guattari (1989) and Haraway (2016) and Wark (2015), and exemplified by Community Biodiversity Activism projects such as the Community of Arran Seabed Trust (Stewart et al., 2020) and the local river protection initiatives in Cascais discussed by Joana Robalo (Robalo, personal communication, 2020). There is a strong emphasis on making worlds with, not for, other beings. It is important to eschew an anthropocentric attitude that sets humans apart from nature, which can lead to paternalistic stewardship, activating "the Gardening Gene" (Haraway & Endy, 2019), as Haraway puts it; she emphasises a view of the world that is not autopoetic, self-made, but *sympoetic*, made together (Haraway, 2016). This is at the core of the Playset; a game designed for groups to collectively bring a new, fictional world into being, populated by all sorts of beings, human and more-than. It achieves this by drawing on game design principles, of creating a player-determined but moderated space in which worlds can come into being, using game objects that mediate entry into the fictional worlds thus created, and rules that emphasise collaboration: the win condition and point scoring is collaborative, designed to encourage co-creation of strong webs of biodiversity. The gameplay insists on building on what has come before, and creating narratives that are in the form of Ursula Le Guin's bag or receptacle for a rich mix of ideas and beings (Le Guin, 1986)—rather than a heroic arrow pointing to the future of the human protagonist where all other beings are simply background details (Haraway, 2016). Many of the stories that emerge have this quality, of beings making their worlds together: fungi and spiders and seagulls finding ways to protect their environment, artists and monkeys finding a way to build a shared ecosystem through hybridising plants, surfers and aliens and bees embracing their lives together through playing in mud and throwing raves in the desert.

Another aspect of the workshop gameplay which struck me as interesting and important was the way in which the story worlds became real in a space that was shared across minds. The visual map of the ecosystem provided a structural link between the real world and the fictional ones, and the transcripts of the stories make a record of the worlds. But in their creation, in their becoming real, they existed as a shared daydream, an emerging world that for the duration of the game, multiple people were living in and experiencing together. One of the principles of games that makes them feel real—makes the worlds they create feel real—is that they operate through projection of emotional metaphors. Playing a game such as this may demonstrate—by 'feeling like'—what it might mean to make worlds together, and be a strategy people might draw on beyond the confines of a workshop, and help make better worlds together.

This touches on Karen Barad's agential realism, where consciousness is the site of entanglement of meaning and matter, the thing that makes matter matter, the thing that makes worlds worlds; shared worlds need a shared consciousness of them (2007). This power of consciousness was illustrated by something interesting that occurred during the Lisbon workshop; during the design fabulation exercise, one group asked a natural language processing "chat bot" to suggest how they might constitute a Parliament of Things in their world; the response was simply a list of the percentages of the different types of organism that exist. It felt, to me at least, lifeless, lacking in some essential quality of reality that the story it was related to had possessed. The other group (which I was part of) explored the same world through imagining a festival that might take place there, and we delved into the history and values behind it; somehow, it seemed to come to life much more, even when reading the transcripts months later. Consciously creating worlds together is what Haraway talks about when she talks of staying with the trouble (Haraway, 2016).

Story Sharing is Story Caring

Throughout this project, I have explored the importance of sharing stories as an means of cultivating a sense of care in others: as a way to promote caring *about*, which in turn encourages acts of caring *for* (Bellacasa, 2017). Donna Haraway has talked about this as the reciprocity of care through storytelling: if you care enough to listen, you care enough to care about the beings in the story, and you have an ethical responsibility to take care for them (Haraway & Endy, 2019). Joana Robalo talked about this with me in relation to using the story of a fish to get local communities involved in taking care of their river (Robalo, personal communication, 2020), and Elizabeth Langford talked about the way that she and the scientists she worked with became entangled in the story of *Chrozophora tinctoria* as they extracted *turnsole* dye from the plant (Langford, personal communication, 2020) [47]. The importance of care and stories was emphasised in the design Celium, and the Playset was designed primarily as a way to facilitate storytelling in

[47] Transcripts of these conversations are in *Appendix 1 : Conversations*

a collaborative way. During the workshops, I observed that the participants started to care deeply about the worlds that they were creating; the game allowed for a suspension of disbelief which resulted in the stories feeling like real worlds that the participants wanted to care for. This was reflected in their stories: the Lisbon group told a tale about the importance of a missing artist and the community effort mounted to rescue them, and about the creation of a museum in which anyone can present an exhibition to tell their stories; the Berlin group about ants persuading politicians to hear their story and care for them, and about the importance of looking after bees.

Strange Strangers in Strange Lands

Many of the factors that have caused the biodiversity crisis are situated in the ways that humans understand themselves in relation to nature, with a human-centric worldview that positions nature as a separate category, and either a site of pristine wilderness or as an exploitable resource. I have used Morton's Conceptual Figure of the Strange Stranger (Morton, 2010), whereby all beings are equally strange and equally familiar, and Haraway's tentacular, chthonic, earth-bound beings, with Medusa as their figure-head (Haraway, 2016), as a lure to encourage a more-than-human way of thinking about our relations to the wider world. This is also a lure towards the worlds of New Weird fiction, inhabited by Strange Strangers that mutate, metamorphose, and mutually contaminate each other, breaking down the boundaries between beings, between self and the wider world; at the same time, the world is changed, damaged, made strange and less like home (Turnbull et al., 2022). The Playset was designed to encourage this way of thinking through the choice of speculative prompts and the choice of the beings on the Strange Stranger Tiles, and through a gameplay that brought them randomly into play. This resulted in some truly otherworldly narratives and strange lands in which the strangest of Strange Strangers made their homes: fascist robots and the psychedelic time travellers trying to stop them, spiders and seagulls controlled by mycelium, monkey politicians, sand surfers, activist ants, and chicken ravers.

It may be reflected that some of these narratives or concepts frame the more-than-human in anthropocentric terms, though it is unclear whether this was created through the framings of the game (perhaps telling stories is a framing technique that leans towards protagonists with motivations that become understood from a human perspective) or from the pre-expectations of the players. In this regard, I draw on the notion of Critical Anthropomorphism (Poikolainen Rosén et al., 2024) to consider the role that humans might play in more-than-human assemblages. Our capacity to lend our voices, and to generate speculative worlds, may be a unique ability that we can contribute as part of a wider more-than-human assemblage: our "human position implies that we can imagine things otherwise, that we can, for example, recognise shared sameness with other entities in the world or imagine what it is like to be

another being—even if we can never fully know," (2024, p. xx) However, this may warrant further research, and might be directly acknowledged and discussed with workshop participants.

Playful Passing

The queer lens of this project has emphasised the importance of rejecting binaries and categories, embracing the transient and the in-between. Better futures need to break from the categories and expectations loaded on the impasse-beset present, and to find in-between spaces in which to exist. In-betweenness might be about the beings that exist and the categories that we put into, and stepping beyond those, but it's also a posture to face towards the future and an openness to change. Futures are in-between worlds, pocket dimensions that one can cross into through fabulatory making practices and return from changed.

This in-between, non-binary, transient quality is present in the ontological worldview of the Conceptual Design Celium; matter isn't fixed but fluid, energy is always in states of transition, beings arising out of interactions of these flows of energy, playfulness as a way of engaging with the world. Dinis Machado talks of the in-betweenness of their choreography practice as a way of finding ways for the body to express it's multitudinousness, to overload it and confuse it and shock it into new ways of being (Machado, personal communication, 2021)[48]; Muñoz wrote about the playful, ephemeral nature of queer futures. From a Transitional Design Theory perspective, I have discussed in detail the way in which design exists in a tension between generalities and specifics, operating in an in-between state to redefine the world and what design is, and therefore how a queer and fluid perspective on design is apt. The Collaborative Storytelling Game in the Playset uses framing devices to invoke this sense of fluidity and confusion: during workshops, players would become confused, overloaded with different characters and events that would emerge from the stories, and were forced to embrace ambiguity. These stories often had the sense of different worlds that had to be crossed through and into, and of beings in states of transition—artists crossing space to find worlds where they could be themselves appeared in the tales of both the Lisbon and Berlin groups, beings travelling through time to defeat robots or protect the environment—and playful interactions between beings, whether throwing raves with aliens, surfing on sand dunes, and werewolves embracing drag culture to spread communication joy.

Hope, Heartbreak and Trouble

Staying With the Trouble is Haraway's principle of encountering the world as you find it, in all of its complexity and richness and tragedy, embracing the tentacular, earthbound, entangled world, and putting aside grand narratives and faith in technology in favour of living and dying well together (2016). This is an important part of the future-making that this nascent

[48] A transcript of this conversation is in *Appendix 1 : Conversations*

programme of Biodiverse Speculative Design might accommodate. It isn't striving for an abstract utopia, projecting towards a better world that might someday arrive: putting your faith in some greater being, whether gods or technologies, to fix things, or else falling into grief and heartbreak at the broken down, crisis ridden present. Instead, as Muñoz also argues, it is to face the present with a sense of hope. Not blind hope in salvific externalities, but hope motivated by the sense that something is missing, that a better world is possible, and that, starting from the here and the now, and embracing the complexity of this moment and place, we might bring that world into being (Muñoz, 2009). The storytelling game in the Playset exemplified this almost by accident. The design of the game meant that story length was determined by how many Strange Stranger Tiles in relation to how many story termination tiles there were, but in a random way: in theory, it was designed for eight stories to be told, but one could end in three turns and another might go on, and on. When this happened, players could become confused and overloaded, unsure of where the story might go. They took on an oneiric, hallucinatory quality, rather like a Grimm's fairy tale that seems to slip from one narrative thread to another. They created troubled, complex and ever-changing lived-in worlds that the players were forced to stay with to find their way forward (Grimm & Grimm, 1812).

In this way, these narratives resembled those from New Weird Fiction, in which characters allow themselves to be comfortable with the change and estrangements that make the world unfamiliar and inhospitable, but to live with and in those worlds anyway; utopian theorists have suggested that such narratives allow one to come to terms with the changes and heartbreaks of the polycrisis riven, Anthropocene present (Garforth & Iossifidis, 2020).

Often, these stories had their share of heartbreak: plagues and famines, fascist robots, strange wars between factions of hybrid beings, Strange Strangers in uneasy alliances, extinctions, and climate degradation, but the gameplay mechanic was designed to make players push ahead, and to work together in tangled complexity. It encouraged players to try to make the world better by eliminating the monoculture cards and strengthening the connections between beings, re-tangling and re-knotting the web of biodiversity. "It matters what knots knot knots […] it matters what stories make worlds, what worlds make stories" (Haraway, 2016, p. 12). It matters what designs design designs; it matters what futures future futures.

Making Futures in Material Worlds

An aspect of speculative design that stands out from the other practices of speculation is that it is a material practice of future-making. Materialising futures is to make them real in the present, which emphasises an important aspect of futures in general; they are for and about the present. Most speculative fiction stories in novels and films, even when they deal with other times, are a way to present aspects of the present world in different ways, to find new perspectives on the now. queer futures, Muñoz argued (2009), are spaces carved out in the present, in between

spaces where different ways of being and relating together might be found. The Radical Disco movement also drew on this notion, of making futures that are other places, or heterotopias, in their own worlds—this is equivalent to the notion of design experiments and happenings as prototypes (Redström, 2017; Rodenbeck, 2014), examples of what might be. Futures are prototypes for making the present different; design brings those ephemeral ideas into material reality, as more insistent arguments of possibility.

Collaborative storytelling games, as has been discussed in detail elsewhere in this thesis, create a space: a diegetic void or an enclosure in which fictional worlds can be given a structure and made real, and can be accessed through framings and game objects. Stories or fabulations created through the gameplay in the workshops had an ephemeral quality to them, but something of the worlds lingered—this notion of the Magic Circle, in which new worlds are invoked during the time of the play and end when the game ends, but somehow the worlds survive for a while, continuing to exist in the minds of the players. Speculative design offers ways to make those futures less ephemeral, more present in the world, and thus harder to ignore.

In the speculative storytelling workshops, only a small amount of time was given over to design fabulation exercises, but it provided a revealing exemplar of the power of futuring through making. The Berlin group chose to focus on the story of the bee-focused world that suffered desertification, where the surfers surf on the sand, and billionaires and aliens come to realise that a love of money is less important than connection with other beings, and explored that through the design technique of "Throw a Radical Disco". Using a box of Lego bricks, they started to construct a complex model of the event, imagining how the different aspects of the party might play out. The details perhaps weren't especially noteworthy or important, but what was telling was how involved in the task they became, how much fun they had doing it, and how real the world seemed to become; they might really have been planning a party. At one point, one of my PhD supervisors (their course professor) put his head in the room as he walked past, and expressed joy and surprise at how engaged and focused the group was on their task. It stands as a good example of how practices of futuring and making can make worlds manifest and feel real, thus, start to insinuate themselves into the present and be the seeds of their own becoming, rather like the speculative artefacts in of *Tlön, Uqbar, Orbis Tertius* that bring their world into being in Jorge Luis Borges's eponymous short story, or the man who wills a human into being in *The Circular Ruins* (Both these short stories are collected in *Labyrinths* (1962)).

Into the Pluriverse

To go into the pluriverse is to embrace the possibility of multiple worlds, coexisting together. These aren't the worlds of science fiction, accessed through the means of wormholes, teleportation accidents, or seemingly magical devices; it is an acknowledgement of the multitudinous and subjective nature of reality, with all beings existing in their own universes

that are coexisting in the same spaces and times. In the pluriverse, there is no singular world, no singular possible future, despite how much hegemonic, human, capitalist, extractivist systems might insist that this is the way the world is, and that these are the ways it can be in the future (Cadena & Blaser, 2018). Such systems view the future as a danger to be managed that poses a risk to those who hold power in the present (Savransky et al., 2017), in a way that discounts and therefore invalidates (and categorises as problematically 'other') the different experiences of beings that are more-than-human and marginalised by gender, sexuality, class, race or social structure, and species.

The artefacts of this project are designed to break that way of approaching the future, which for many people becomes one of acquiescence and resignation, and to embrace a plural perspective: that futures are not fixed points in a linear time, but possibilities in a temporality created by their own becoming. The Collaborative Storytelling Game is deliberately designed to allow the creation of multiple different diegetic worlds, different stories of different places and times. These can then be explored and debated in terms of their likelihood and desirability, a process that was designed to show participants that futures are not fixed, singular, or created equally. The purpose of future-making is to learn to be free from defuturing (Springett, 2023) and the Impasse of the Present (Savransky et al., 2017) by becoming literate in futures—to treat them as definitions of what the world might be—and developing a sense of criticality towards them and thus to advocate for those that lead to better, more biodiverse worlds.



Figure 104 : Foundations of a Biodiverse Speculative Design Programme

These are the proposed transitional foundations to support a programme of biodiverse speculative design: Making Worlds Together; Story Sharing is Story Caring; Strange Strangers in Strange Lands; Playful Passing; Hope, Heartbreak & Trouble; Living in Material Worlds; and Into the Pluriverse.

Credit : Diagram by Craig Jeffcott. Heart and Heartbreak icons by Material Design. Other icons from Noun Project (thenounproject.com) under CCBY 3.0 attribution licence (Collaborate by Nithinian Tatah; Speech by Iconbunny; Medusa by Lima Studio; Archway by Kushan Prampa; Soil by Mia Elysia; Earth by IconPai).

8.5.2 A Speculation of a Design Programme

I have given some consideration in this thesis to speculative and artistic practices informed by Object Oriented Ontology, such as Metaphorism and Carpentry, which allow one to speculatively approach the inaccessible interiority of objects (Bogost, 2012; Harman, 2018). Such a fabulatory approach may also offer an interesting possibility for exploring the possibility of situating abstracted or generalised design theory in situated design artefacts; in this instance, to explore how the artefacts of this design project might represent a prototype of a more abstract Biodiverse Speculative Design Programme.

As was elaborated in the Modes of Inquiry chapter, design has an uncomfortable relationship to theory, in that situated design artefacts are underspecified by general or abstract theory, which cannot account for their context and situatedness (W. Gaver, 2012). There is therefore a problem of scalability: one cannot project from situatedness to abstraction without losing the essential qualities of the thing in question. However, the way that Harman argues for the creative gesture in accessing the interiority of things offers some possibility here (Harman, 2018).

I draw heavily on Redström's Transitional Design Theory in this thesis, where he argues that designed artefacts are theoretical definitions in design, by examples (they are prototypes), and that these definitions are both made by design, and transitional between situatedness and abstraction (2017). What might an Object-Oriented Ontology lens afford in this regard?

Imagine the example of a tangible and situated designed artefact. This artefact has phenomenal and noumenal[49] qualities: there is the real internal object and there is the surface, sensual object we perceive. Imagine further that this designed artefact is taken as an example of a definition through design. We might wish to draw abstract conclusions from this object, to project it from a situated object towards abstract theory: "what does this thing imply, or how can we apply what we learn from this object more widely?" We might use the metaphor of actual projection: we take the real object in the material situated world, and project an image of it onto a notional screen, the screen representing the plane of abstract and generalised design knowledge.

The real object, as discussed, has both phenomenal and noumenal qualities. It is a perceived object, but also an object with an internal reality. But the projected object does not. It only has a phenomenal, sensual aspect. In pushing it towards abstraction, it becomes a speculative object: it contains nothing, yet. It has the surface form of the real object, but in losing the situatedness and contextuality of the real object, those surface forms frame a diegetic void: a space which is shaped by the real, but which is yet to exist.

[49] Immanuel Kant argued that objects have a phenomenal aspect, their outward manifestation (which we can experience) and a noumenal aspect, what things are within themselves (which we cannot) (1781).

The argument that I make here is that if Object Oriented Ontology allows one to use speculative and creative acts to access the inaccessible interiority of a "real" object, the same can be applied to a speculative object that has no interiority *yet*. In such a way, then, we can encounter the interiority of the speculative object, the abstracted theoretical object, in *exactly the same way*—that is, through artistic and creative practices—that we can encounter the interiority of the real object. Which is to say we cannot truly access either, but can only obtain the sense that we have, through fabulation.

Therefore, I'd argue that any act of obtaining general theory from situated design artefacts—even in more instrumentalist methodological framings such as quantitative or qualitative design research—is always an act of speculative fabulation; that the general conclusions that may be drawn from situated practice is a form of make-believe. It isn't accessing true knowledge as such, but is an imaginative projection from the real by which one might try to understand the world.

Therefore, I conclude this discussion of a putative Biodiverse Speculative Design Programme with a final act of speculation, drawing on the transitional foundations discussed here to project from the real, the *Strange Strangers in Strange Lands Playset*, to a more abstract design programme, through fabulating what such a programme could look like in practice. This fabulation is itself a prototype of a design programme, and might act for a lure for future research towards materially manifesting such a programme in the here and now:

PRESS RELEASE

Medusa Design Institute, New Sarpedon. EMBARGOED UNTIL 1 July 2830

LAUNCH OF BIODIVERSE FUTURES SPECULATIVE DESIGN PROGRAMME

The Medusa Design Institute is pleased to announce the launch of a new biodiverse Speculative Design MA programme, aimed at providing students with a practical grounding in more-than-human speculative fabulation and design. The one-year MA programme takes a unique, game and storytelling-based approach to design education, where students will be given a unique Strange Stranger identity that they will embody throughout their studies; these may include other humans and more-than-human beings, such as animals, fungi, plants, and technical objects.

COURSE STRUCTURE

In the first term, students will explore their new Strange Stranger identity in depth through immersive design experimentation, in addition to conducting community research into local environmental contexts, culminating in an artistic happening.

In the second term, the focus will be on biodiverse worldbuilding, with students working in groups to create speculative futures and alternative worlds through fabulation and play, structured round a speculative mission to visit strange new heterotopias. These activities will be supplemented by a lecture series which will contextualise their fabulation through Post-Structuralism, New Materialism, Queer Ecology and speculative practices, alongside guest lecturers from speculative design practitioners, in order to encourage critical reflection on their emergent futures. The second term will culminate in the production of a short speculative fiction film about a chosen future.

In the final term, students will design diegetic design fictions and prototypes from their chosen biodiverse futures, alongside community members and creative professionals including artists, designers, actors, dancers, writers and curators, culminating in a group degree show: a museum exhibition of artefacts from a possible biodiverse future.

We particularly encourage applications from Strange Strangers from more-than-human backgrounds.

Conclusions

We must love what has been damaged because everything has been damaged. And to love the damage is to know you care about that world. That you're still alive. That the world is alive.

Jeff VanderMeer, *Hummingbird/Salamander* (2021, p. 99)

Drawing Conclusions

The aim of this design research project was to explore how speculative design can be used in Community Biodiversity Activism settings to help communities stake a claim for better futures. It was situated in an entanglement of speculative design practices with queer and more-than-human perspectives on future-making that decentralise the human and challenge categories and binaries.

Through exploring such an entanglement, I hoped, from one direction, that speculative design could be a means of materialising some of these perspectives and move towards tangible, different futures. From the other direction, I hoped that by being grounded in queer and more-than-human philosophies and practices, it might demonstrate how the Speculative Design Paradigm might transcend it's limitations (it has been criticised—in its tangible outputs and in the ways in which it has been practised—as lacking diversity and the inclusion of outsider voices (Prado de O. Martins, 2014), lacking a robust critique of the problematic present (Tonkinwise, 2014), and lacking a substantive impact (Jākobsone, 2017)).

Here, some final conclusions are drawn from this design research project, by revisiting the speculative hypothesis and research questions posed at the start of this thesis.

This project has considering the reciprocal questions raised by the critiques of speculative and critical design practice as having the potential to materialise different futures, but being insufficiently diverse and impactful to do so, on the one hand, and the ongoing crisis of biodiversity in the global eco-system and the necessity for futures that are inclusive of all life on earth, on the other: it aimed to address a Monocultural Polycrisis that is both sociocultural and ecological, existing within Design Practice and in the wider world where design might act.

This research was situated as an inquiry into how speculative design might support Community Biodiversity Activism, primarily through creating the right conditions (Manzini, 2018) to give communities a way to articulate and materialise better futures. Those reciprocal questions suggested that a possible response might lie in the overlap of worldviews that embraced diversity both from human culture and in the global ecosystem, and so the project was approached through two distinct but entangled research lenses: queer (representing a resistance to regimes of the normal (Warner, 1993, p. xxvi)) and more-than-human (where naturecultures meet technosciences (Bellacasa, 2017)). These lenses are united by being non-essentialist, a rejection of arbitrary binaries and categorisations between beings, and a commitment to better futures; together, they constitute a lens of Queer Ecology (Morton, 2010), from which the Conceptual Figure (Deleuze & Guattari, 1994; Tironi & Díaz Bejarano, 2024) of the Strange Stranger (Morton, 2010) acted as an embodied guide to the unfolding inquiry.

These lenses suggested a further reciprocity, between speculative design as a practice of materialising futures—but with the shortcomings of being of limited impact and lacking diverse perspectives—and the diverse future-making practices characterised as queer and more-than-human which tend to be ephemeral, transient and marginal in nature. Approaching speculative design through a Queer Ecological lens becomes in turn a way of approaching queerly ecological future-making practices through the material practice of speculative design.

Reflecting on Research Questions

What Situated Paradigm of Future-Making is Revealed by Adopting the Conceptual Figure of the Strange Stranger?

Through the development of the Conceptual Design Celium, a structured characterisation was made of how future-making is situated through the lenses of queer and more-than-human (and together, queerly ecological) theories, cultures and practices. This expanded from an inquiry into futuring strategies alone to a wider-ranging tentacular mesh in which speculative design could be refracted through those lenses. In the terms of Transitional Design Theory (Redström, 2017), this represents a move from a design (or theoretical) paradigm to one design practices; such practices could be the core or kernel theories, (Markussen, 2017) or the foundation (Redström, 2017), of a Biodiverse Speculative Design Programme. The Celium is loosely structured along a spectrum of the general (what is designing) to the specific (what is designed), encompassing Lenses, Onto-Epistemology (Worldview), Strategic Goals, Strategies, Storytelling Archetypes, and Design Techniques.

Lenses

The Celium—named in reference to fungal *mycelium*, a dense mesh of fibres (*hyphae*) which are involved in mutual and collaborative entanglements, acting to support the emergence of their own fruiting bodies, alongside symbiotically supporting the wider—emerged through the research lenses of queer (representing a "resistance to regimes of the normal" (Warner, 1993, p. xxvi)) and more-than-human (where naturecultures meet technosciences (Bellacasa, 2017, p. 1)). These lenses are united by being non-essentialist, with a rejection of arbitrary binaries and categorisations between and of beings, and a commitment to better futures; together, they constitute a lens of Queer Ecology. Central to Timothy Morton's Queer Ecology is the idea that the binaries between the natural world and humanity, or between natural and artificial, and the categories that separate beings into species, can be transcended: this is embodied in the archetypal being, the Conceptual Figure of the Strange Stranger (Morton, 2010), where all beings can be considered equally strange and equally familiar, and which, following Donna Haraway, might be represented by the snake-headed *Medusa* of Greek myth (2016).

Onto-Epistemology

Onto-epistemology—which is to say the entanglements between what the world is (ontology) and what is understood about it (epistemology) (Barad, 2007)—emerged as a very important component of the Design Celium. To understand the ways in which attitudes and actions towards the future might be revealed through these research lenses, it was essential to

understand how the world is constituted and understood within those frames. It was necessary to ask how queer and more-than-human worldviews overlap, how they orient towards the future, and how they might be applicable to design. From this inquiry, an onto-epistemological structure took shape under five headings: matter, encounters, time, space, and narrative, with narrative being the most important.

The world as constituted as queer and more-than-human is made up of **Matter** that is not fixed and immutable but fluid, always in transition, not made of solid individual bodies but of molar flows that continually separate and merge; everything is connected, nothing is essential. In this world of flows of matter, beings emerge through the **Encounters** that flows of matter have with each other—they are mutually brought into being and do not pre-exist the encounters that they have: everything is define, or made real, in relation to all other things, all of the time. **Time** itself is structured according to the same logic: it isn't a singular arrow pointed into the future, but a multitude of different, eventful temporalities. It is better thought of as a "long now" in which pasts and futures are entangled, and in which time emerges as a subjective experience for all beings. **Place**, too, is less a specific point in space, than the situated locus of encounters between beings within a wider landscape. It is **Narrative** that draws all these together, making an account of encounters between materials located through place and time: giving them meaning, giving them being.

Strategic Goals

The goal of characterising futuring strategies also required the characterisation of the goals that such strategies might aim towards. Strategies are defined as specific ways towards achieving a goal, therefore, queer and more-than-human futuring strategies are not simply strategies for making the future, but strategies that make futures that might help one achieve broader goals. Three main future-making goals were identified—**Care**, **Collective Action**, and **Seizing Futures**.

Strategies

Understanding futuring strategies was the initial core aim of the Celium, the locus where the theoretical ideas of the lenses might overlap with action in the world that could be activated through design; having understood the nature of the lenses, their worldviews and strategic goals, a synthesis of these strategies was possible. I have characterised five strategies which I mapped onto each of the onto-epistemological categories: for matter, the strategy of **Making**; for encounters, the strategy of **Playing and Performing**; for time, the strategy of **Time Travelling**; for place, the strategy of **Mapping**; and for narrative, the strategy of **Storytelling**.

Speculative Narrative Archetypes

The final two parts of the Celium emerged during the development of the design Playset, but reciprocally fed back into the Celium, as they were felt to be more towards the general than the specific of designing, though both more in the realm of the specific that the other components of the framework. Both these elements represent important aspects of the lenses, worldviews, strategic goals and futuring strategies, but situated in less general, more entangled and materialised ways: one in the realm of speculation and fabulatory practices, the other in the realm of design and material practice.

This part of the design framework draws explicitly on speculative fiction (SF) narratives, locating many of the values and principles of the framework within fictions; I have drawn out eight narrative archetypes that recur in the SF canon, and which align closely with the ideas explored in the framework, but entangled into different combinations, different hybrid forms. The aim for this component of the framework was to demonstrate how many of these complex ideas can be animated through speculative fabulation, and to provide narrative frameworks for speculative practices in fabulation and design. These fabulatory archetypes are **Strange Strangers in Strange Lands** (in which protagonists travel to strange worlds where the beings are alien to them; but from their perspective, the protagonist is the *Strange Stranger*); **The Ecosystem Strikes Back!** (in which Gaia—or the natural world—takes its revenge against the human mainstream); **Radical Intimacy** (in which love is the fundamental binding force of the universe, in which all encounters between beings are playful acts of intimacy); **What you See is What you Get** (in which all being exist in a world of their own making); **Stitches in Time** (in which making changes in the timeline can make new futures, alternative pasts, and pluriversal worlds where multiple realities coexist); **Outsider Heterotopias** (in which outsiders from the human mainstream find ways, spaces and places to create pockets of a better future within the broken down present); **More Than Human** (in which a new word emerges, outside of the human norm, of hybrid beings, cyborgs, and unthinkable aliens); and **Virtual Worlds** (in which virtual worlds, dreamscapes and imaginariums offer alternative spaces to exist within, whether as a means of self-expression and escape, or of control and imprisonment).

Design Techniques

In design techniques, the framework is brought closest to design and material practices; these techniques represent ways in which speculative design activities or projects might be situated in biodiverse worldview, strategies and narratives. I explored a selection of nine techniques in detail as an early prototype of the Playset, but the selection of techniques was not intended to be exhaustive but rather illustrative, and they have since been expanded to a full deck of 45 cards separated into five suits for each of the biodiverse futuring strategies. They have been illustrated in the thesis with these nine exemplar techniques drawn from the literature and my own design

practice and experiments: **Prepare a Meal, Put on a Drag Show, Write a Declaration of Rights, Create a Museum Display, Make Iconic Objects, Throw a Radical Disco, Devise Magic Machines, Design Passing Places, Elect a Parliament of Things.** All of these design techniques, which have been joined by many more in the Design Fabulation Deck, represent tangible, material ways in which queer and more-than-human approaches of future-making might be drawn on in speculative Design Practice.

How Might the Conceptual Figure of the Strange Stranger Guide a Speculative Design Project that Materialises these Ways of Future-Making to Support Community Biodiversity Activism?

This question has been addressed by considering an assemblage centred around the *Strange Strangers in Strange Lands Playset*—incorporating the Design Celium, design workshops, and workshop participants figured as player-worldbuilder-designers—as a prototype of a Speculative Design Project.

The Playset is a materialised design assemblage that mediates between the abstract worldviews, goals and strategies and more concrete material practices, embodying these principles in tangible, playable objects. It was designed to represent an entire Speculative Design Project trajectory, from initial framings (Icebreaker), through contextual research (Situation Report), speculative fabulation and worldbuilding (Collaborative Storytelling Game), debate and deliberation (Future Discussion), and speculative design (Speculative Design Challenge).

It had a twofold purpose: to make a Speculative Design Project accessible to members of communities of biodiversity action (who may not have former design experience), and to embody some key principles, goals and strategies of future making drawn from the conceptual framings of the project, which the conceptual guide of the Strange Stranger helped to inscribe into the game. Through the wider assemblage of the Playset with workshops—events located in a particular slice of time and space—and players, the ways in which this is manifest have become clear.

It can be concluded through the example of this prototypical project that speculative design, when shaped by such Queer Ecological lenses and guided by the Conceptual Figure of the Strange Stranger, has much to offer outside of typical design settings. It may therefore be able to play a role in helping community activist groups to argue for better, more biodiverse futures for the ecosystems that they are situated within. It was observed that while the Celium provides a conceptual structural activation of the future-making practices in a way that makes them available to ‘use’, the Playset materialises that structure through artefacts and activities, acting

as boundary conditions which, through the mechanism of Workshops, allows for the crafting of speculative fabulations and design artefacts which represent potential futures. Through these successive moments of design, these futures are patterned after queer and more-than-human ways of futuring (rather than patterned after the normative present), being formed from those concepts, and bearing their grain as well as the marks of the 'tools' designed for that purpose. It demonstrates how design research, through a continual process of creating definitions of and through design that are transitional, slipping between the generalities of theory and the specificities of practice, creates the conditions by which one is manifest as the other.

How Might the Conceptual Figure of the Strange Stranger Shape a Speculative Design Practice that is Diverse and Impactful?

The previous question considered how queer and more-than-human futuring practices can, through this design research project and the artefacts it produced (which represent definitions made through and of design, and are transitional between the general and the specific) be materialised and made specific in and through design practice; a consideration of how design research practice can mediate from the general and theoretical to the specific and material from the perspective of the theoretical lenses. Inversely, this research question considers the opposite: what is achieved for speculative design during this process. This thesis has drawn on the arguments (of, amongst others, Luisa Prado de O Martins (Prado de O. Martins, 2014), Cameron Tonkinwise (Tonkinwise, 2014), and Liene Jākobsone (Jākobsone, 2017)), that speculative design lacks impact, and lacks sufficient diversity that it is able to make meaningful contributions of possible futures that are not patterned on the present. These arguments are set in stark contrast to the promise of speculative design as a practice that is impactful and can propose more diverse futures. This dichotomy is addressed by Alexis Lothian as regards speculative fiction, arguing that speculative fiction is often motivated by "radical possibilities" (Lothian, 2018, p. 20) that fail to be realised in practice, and that a queer lens allows one to be critical of this and to propose and experiment with alternatives. It is interesting, then, to consider the following: Queer and more-than-human perspectives on the future have been established as being opposed to synthetic binaries and categorisations, rooted in outsider heterotopic performances of futures, and united by a hopeful collaborative engagement with making the future better. If these qualities can be materialised through these moments of design, what do those materialised artefacts that are the outputs of this design process exemplify that might transform or at least provide possibilities for Speculative Design Practices?

This thesis has argued for the essential complementarity of Speculative Practices in Design and elsewhere with queer and more-than-human research lenses. Both are practices and stances rooted in the understanding of an experience of time that is situated in a *Thick Present* or *Long*

Now, in which 'futures' are less predefined destinations along expected trajectories, but are instead rhetorical devices, possibilities to be experimented with and argued for; an invitation to transform the present rather than demolish it for the express train of normative futures to traverse it towards its rather final destination. What is interesting is the particularities of how futuring through those lenses is done, and how that gives particular shape to design practice. This research project itself is an example through design of the shape that a Biodiverse Speculative Design Practice might take.

What Situated Insights Can Be Gained from this Inquiry to More Generally Inform a Speculative Design Programme to Support Community Biodiversity Activism?

This thesis has discussed at length the way that design knowledge and theory is in a tension with the artefacts of design, such that the former represents the end of a spectrum towards abstraction and generalities, and the latter the other end of the spectrum towards specific, embodied knowledge. It has been noted that intermediate and transitional forms of knowledge, definitions, and theory in design may mediate this tension, and lead to academically meaningful theoretical reflections and discussions related to the designs, acts of designing and situated contexts of a design research project. Such intermediaries represent examples through design, and can include *Annotated Portfolios*, which mediate a dialectic between design objects and reflections on their creation, and *Design Programmes*, which provide a transitional setting for particular types of design to happen in.

Transitional Design (Research) Programmes, according to Redström (2017) can be seen as an assemblage of supporting foundations for design practice, which might be worldviews, techniques, people, or resources. This supporting paradigm in static design programmes would remain fixed over time even as design practice might extend, with the result that eventually, the design programme becomes disconnected from emergent design practice, ceases to be able to support the emergence of the new, and can only describe what emerges in terms of what has already been. Transitional foundations, in contrast, are slippery, and can accommodate changes of approach and worldview, and ground design practice as a form of experimentation that supports the unfolding of the design programme; such experimentation may lead not simply to refinements of an existing design programme, but to the emergence of a new programme of design, which this thesis argues is represented by this research project.

The specifics of what such an emerging Biodiverse Futures Design Programme might be has been discussed at length in Chapter 8, drawing on the principle that what design research practice provides is examples of definitions through design; these factors will be summarised here.

This putative Design Programme might have the following qualities: a *sympoetic* approach to worlding, of making better futures with, not for; drawing on storytelling as an approach to engendering caring about, and thus caring with the teller and the beings of the story; the figure of the Strange Stranger, and the necessity to embrace all beings with the same sense of familiarity and difference; the importance of intermediaries, of the states of being in-between, or in transition, and the usefulness of play as a strategy for engaging with them; the need to walk the fine line between despair and heartbreak on one hand, and an unfounded belief in external 'fixes' and saviours, whether technological or spiritual, and to embrace a hope grounded in collective action for a better future; that better worlds and futures might be made real through fabulation and play; and embracing the pluriverse, the possibility of multiple worlds existing together.

The Playset, in this framing, might stand to represent not a prototype of a design project of which it embodies an example, but as a prototype or exemplar of a more general or abstract programme of design. Scaling or extending from situated artefacts to generalised knowledge is epistemologically troublesome, as theory tends to underspecify design, with situated insights losing context and thus meaning in the process. This project, though, has attempted to Stay with the Trouble, as Donna Haraway would put it (2016), and I have therefore suggested a speculative gesture might allow a surface projection from the real to the abstract to have a speculative interiority. And so, in a last act of speculation, I proposed an artefact, a piece of text from a future Biodiverse Speculative Design Programme, open to all Strange Strangers (with the more-than-human particularly encouraged to apply). I offer this as a lure for designers and communities towards more Biodiverse Futures.

Emergent Insights

I consider here some of the key insights, findings and contributions to knowledge that emerged from this research project: those that cut across the research questions, or were assembled in the entangled processes of thinking, fabulating, making and doing.

The Role of Game Objects and Games in Mediating Speculative Worldmaking

This research project has present a number of approaches to speculative future-making, including a Design Celium, Speculative Fabulation, and an argued-for Speculative Design Programme, but, as has been discussed, the *Strange Strangers in Strange Lands Playset* plays a pivotal role in situating this speculative design in real-world, collaborative practices. This thesis has drawn a parallel between the Playset as a transitional assemblage of artefacts, lying intermediate to the more general design framework and the more specific outcomes of design workshops, such as fabulated elseworlds and speculative design responses to them, and the design programme as an intermediary between paradigms and practices on the abstract side, and projects and products, on the situated side.

Therefore, the *Stranger Strangers in Strange Lands Playset* provides an example of a design programme providing foundations for design practice: in this case, in the creation of biodiverse futures through play. The Playset arguably mediates the relationship between the ideas, worldviews, goals and strategies articulated through queer, more-than-human and decolonial lenses, and their manifestation in design practice, through materially and conceptually scaffolding and supporting their emergence.

This thesis explores at length the ways in which collaborative and speculative storytelling games create the conditions for the emergence of diegetic fictional worlds that are rooted in the lenses and worldviews that framed this project: by providing Framings that give shape to emerging fictions patterned after those lenses and worldviews (Jara, 2023); by abstracting complex concepts and ideas through game objects that mediate the boundary of the fiction (Begy, 2013); by feeling real and thus allowing for suspension of disbelief (Begy, 2013; Brown, 2012); and by guiding the emergence of collaborative, iterative, reflective fictions (Acharya & Wardrip-Fruin, 2019). Through reflections on practice and annotated portfolios, it has been demonstrated that this Playset effectively achieves those goals. Further proof comes from the storytelling workshops, in which it is clearly demonstrated both that, and how, the use of these games scaffolds the emergence of speculative fictions and diegetic elseworlds, with the creation of narratives bearing the clear fingerprints of the ideas, worldviews, lenses and values from which the Playset was formed.

This then affords the conclusion that if a Biodiverse Speculative Design Programme is to have effective foundations to scaffold, shape and afford the creation of diegetic futures of value to Community Biodiversity Activism, that a set of games is very well predisposed as a material instance of such a programme; thus, through the example provided by the *Strange Strangers in Strange Lands Playset*, it can be concluded that game activities and objects can play a significant in supporting such approaches to speculative design.

Strange Stranger as Conceptual Figure

Situating the Strange Stranger as a Conceptual Figure to guide design research was one of the key aspects of this project. This has a background context in Deleuze and Guattari's proposal of the conceptual character or persona as a way for a philosopher to embody emerging concepts (Deleuze & Guattari, 1994), and its use in personas such as The Idiot, The Poet or The Diplomat in design research practice (Wilkie et al., 2015). From a More-than-Human Design perspective, it has been proposed to reframe the concept as less anthropocentric Conceptual Figures in order to operate within a more "cosmopolitical milieu where we may engage with the more than human" (Tironi & Díaz Bejarano, 2024, p. 6), and it is in this vein that I drew on the Strange Stranger as a guide to this research, and as a way of embodying queer and more-than-human framings in the process.

Timothy Morton (2010) proposed the Strange Stranger as a title for the inhabitants of a queered ecology[50] that embrace radical difference and radical sameness, that frame the familiar as strange and, equally, the strange as familiar.

The *Strange Stranger* was used, or manifested, in this project in some different guises: it was appropriately slippery, or tentacular, coming through in different ways and with different entanglements. During the early parts of the research, while attempting to understand the research contexts, and while designing the Celium, it was a persona that I would adopt as a cognitive tool, as a way of thinking outside of the human, of following particular lines of tentacular thought. Subsequently, during design experiments and other research activities, it was more of a co-creator, guiding or advising design actions. In later stages of the project, during the design of the Playset, it became inscribed as meaning into the Playset's assemblage, and during the game play and workshops, the players were able to adopt and play with Strange Stranger identities.

The role of the Strange Stranger became more important during the playset design than the earlier parts of the research, where I focused more on the conceptual and abstract lenses of queer and more-than-human to guide the process. I reflect that this shift was due to the move

[50] Strange Stranger is derived from Derrida's *Arrivant* (Derrida, 1997), an unexpected and inexplicable guest who arrives, causes disruption to the familiar milieu, and who could be greeted with hospitality and indifference.

from a more conceptual framework towards embodied, materialised objects, and thus a Conceptual Figure, as an embodiment of concepts, is more suited to such a context. It offered a way of guiding the material design practice of the playset, and of inscribing the conceptual meanings into the game: from the game objects and rules, to the performativity of the players, to the nature of the fabulated worlds that emerged. The Strange Stranger allowed—argued for—queered, tentacular, Gorgonoid beings (Haraway, 2016) to be materially grounded in the gameworld. This was evidenced in the gameplay, where players embraced the possibility of inhabiting a multitude of more-than-human beings, and created speculative fantasias that are entangled, weirded and material otherworlds that, as Morton would put it, "show how beings exist precisely because they are nothing but relationality, deep down—for the love of matter," (2010, p. 277).

Strange Lands

One striking insight that emerged from playing the collaborative storytelling game in the *Strange Strangers in Strange Lands Playset* was less, perhaps, the Strange Strangers, but the Strange Lands that were evoked, and their strong similarity to New Weird fiction. This led to an interesting theoretical journey exploring the power of New Weird fictions to create utopias of estrangement (Garforth & Iossifidis, 2020), and encourage one to indulge in *sympoesis*, staying with the trouble of the troubled and troubling here and now (De Freitas & Truman, 2021). Weirding emphasises a geographic materiality (Turnbull et al., 2022), grounding futures in the material present: they become not other times, but altered places that resemble and cast a light on the changed and damaged Anthropocene or Cthulucene world. This is the queered and weirded ecology of the Strange Stranger, which might guide us through the narrow gap between hopelessness and blind hope (Haraway, 2016), and encourage us to work through the world together. It is interesting that by inscribing the Strange Stranger into the game as it was assembled, such worlds with a rich cultural context and theoretical potential for collaboratively working towards better ecological futures were made available to players, and thus, potentially, able to be drawn on by communities to take action to protect biodiversity.

Neologisms

Design is a process of the creation of the material new; Post-Qualitative Inquiry concerns itself with the conceptual new. I've discussed at length the framing of designed artefacts as situated and materialised concepts, but this project has also articulated some more abstract concepts, in the form of new descriptions or ideas; of definitions not in design examples, but through words. Here I briefly reiterate some of those.

Design Celium

The Conceptual Design *Celium*, developed as a supporting mesh for the emergence of biodiverse futures, was originally to be titled a *Framework*. However, conscious to the post-structuralist notion that the choice of a word or a name can bring an entire ontology along with it, the concept of a framework did not sit comfortable with the themes of this research, as a very humanistic, mechanistic structure that might insist upon a particular form to that which might be built upon its frame. The intention with this conceptual artefact was to allow the emergence of new and different ways of being, and it was not intended to be closed off and constraining. Furthermore, it was hoped to embody the Strange Stranger, a more-than-human being which weirds and queers categories and emphasises difference. Therefore, I began to explore other supportive structures that exist in the more-than-human world, that might be freighted with different, more diverse ontological implications. I came to the notion of the mycelium, which had recurred throughout the research for the project: a tentacular, multipolar entity, involved in multiple entanglements and symbioses in its environment, and a support structure not only for the fungal fruiting bodies it produces, but for entire forest ecosystems. Branching, entangled, continually opening up not closing off, tentacular, and capable of supporting multitudes, this was the sort of mesh I wanted to invoke with my choice of name. Mycelium derives from *myco*, meaning fungi, and a bracketing of epithelium, a membranous form of animal tissue: a fungal membrane. Mycelium raised a pun as a question: what might my Celium be? If mycelium is a supportive membrane for fungi, then this is a supportive membrane for design, and thus, it was named a Design Celium.

Transitional Design Assemblages

In finding a common ground between Redstrom's Transitional Design Theory (Redström, 2017) and Wilkie's Design Assemblages (Wilkie, 2010), I coined *Transitional Design Assemblages*: to frame Design Artefacts—prototypes and examples through design—as design assemblages that mediate transitions between abstraction and situatedness. I demonstrated how such transitions might be assembled on an epistemological axis, between situated and abstract design knowledge, and on an ontological axis, between conceptual framings and materialised design outcomes.

Transitional Design Assemblages offer a framing by which the ways in which design artefacts can mediate such transitions can be understood, as a process of de- and re-territorialisation as artefacts can be framed as metamorphic assemblages with shifting stabilities, resulting in transitions between abstract and situated beings and knowings.

Diegetic Escape

Diegetic Escape was coined to describe the notion of the Magic Circle created while playing a game in allowing the gameworld to persist following the game's conclusion. Diegetic Escape is therefore the act of diegetic entities, whether concepts, fabulations or objects, escaping from their diegesis into the wider world. I have argued that speculative design is a means by which Diegetic Escape can be achieved, as a process of materialising objects that are materially real and real within a diegesis, thus allowing the object to escape from simulated to material reality.

Convivial Heterotopias

> *"There was a wall. It did not look important. It was built of uncut rocks roughly mortared. An adult could look right over it, and even a child could climb it. Where it crossed the roadway, instead of having a gate it degenerated into mere geometry, a line, an idea of boundary. But the idea was real. It was important. For seven generations there had been nothing in the world more important than that wall."*
>
> *(Le Guin, 1974)*

A particular form of assemblage appeared in a variety of guises throughout this project: the concept of the box, or enclosure. Susanne Bauer and Martina Schlünder have explored how the concept of the box can be worked with to think differently about how and why things become contained, about acts of separation and why they occur, about the ways beings relate to one another, and about ways of thinking that reinforces categories and differences; they also frame it as a worldmaking device, capable of imagining different possible futures (Bauer et al., 2020). In this concluding essay, I explore way in which boxes and enclosures have emerged through this research project, framing them as Convivial Heterotopias, other worlds which we can live alongside, through, and become-with.

There is the concept of the enclosure from conservation, a portion of nature set aside by humans, generally for human use, which can include nature reserves and Marine Protected Areas (D. Vaughan & Agardy, 2020), and theatrical enclosures, such as aquaria (Rui, 2021). There are the structuralist categories of Nature and the human world, held apart in artificial separation, which are rejected by post-structuralist and Queer Ecological lenses (Morton, 2010; Wark, 2015). There are Munoz's queer utopias, spaces outside of the cultural mainstream where different ways of being, different temporalities and spatialities can exist (Muñoz, 2009). There are the fabulations of speculative fiction, boxed in by the boundaries of the screen and the book-cover and the theatre of the mind's eye. There is Ursula Le Guin's *Carrier Bag Theory of Fiction* (Le Guin, 1986), and the wall of Annares in her novel *The Dispossessed* (Le Guin, 1974), a wall that is more important as a concept than as a material reality, and for which the inside and outside depends on which side of it you are standing; there are fictions of simulated and virtual elseworlds such as in *The Matrix* (Wachowski & Wachowski, 1999), *eXistenZ* (Cronenberg, 1999) and *Surface Detail* (Banks, 2010); there are the pools containing entire realities in Lewis' *Wood Between The Worlds* (Lewis, 1955); and there are the weirded geographies of New Weird fiction (Turnbull et al., 2022). There is the genre of Solarpunk as a container of ideas (Springett, 2023). There is the diegetic void that is opened up through playing games like *Dungeons and Dragons* (Gygax & Arneson, 1974), or through the Collaborative Storytelling Game in the *Strange Strangers in Strange Lands* Playset, where "the existence of these fictional worlds, written without

their stories, is an invitation for stories to happen," (Henry, as cited in: Jara, 2023, p. 52). And there is the box that frames board games, opening up into new worlds.

All of these boxes of worlds outside the world can be considered Foucauldian heterotopias, other worlds, "places that do exist and that are something like counter sites, a kind of effectively enacted utopia in which the real sites [...] are simultaneously represented, contested and inverted," (Foucault, 1967, pp. 62–67). Such places are speculative fictions that are "absolute breaks" (1967, pp. 62–67) from the real world, separated by framings and boundary conditions—"systems of opening and closing" (1967, pp. 62–67)—which make them both isolated and penetrable. Heterotopias are fictional and transitional worlds, but reveal the 'real' world to be equally artificial and transitional: in existing, they can "seem more real than real" (1967, pp. 62–67), a perfect microcosm of a world within a messy, contingent reality.

These enclosed heterotopic boxes are speculative fictions, existing outside of normal times and spaces, and can be lures towards futures that could be, presents that coexist with the here and now, and pasts that might have been. The boundaries between the outside and inner world of these heterotopic enclosures are artificial and complex assemblages, created through human intent, and require an exertion of energy or will to prevent their entropic dissolution. This can be illustrated in a material way by considering the *Lisbon Oceanarium*, an architectural aquarium, which can only exist through material-technical assemblages: the materiality of the tanks in resisting huge amounts of water pressure; the constant application of energy in heating, pumping and filtration systems to maintain a simulacrum of the oceanic environment; the knowledge of marine scientists to maintain a balanced ecosystem within the enclosure (Chermayeff et al., 2021). Similarly, Marine Protected Areas, whose boundaries are more conceptual, must be maintained through constant application, support and enforcement of the often multi-national legislative structures that define them (Stewart et al., 2020; D. Vaughan & Agardy, 2020).

Queer spaces are kept alive by the communities that organise them and the spaces in which they can prosper, and the tolerance, if not necessarily acceptance, of the heteronormative mainstream (Muñoz, 2009). In order to exist, speculative fictions rely on authors, on publishing and film-making industries, the technologies by which they can be disseminated—printing, broadcasting, online publishing—and the means by which they can be encountered: in books, and the screens of cinemas, televisions, and computers. Similarly, the speculative worlds generated through collaborative storytelling games exist only through the boxing and framing devices of game objects and rules. They also depend on the collective suspension of disbelief that playing such a game requires in order to generate a Magic Circle that allows the worlds to persist beyond the end of the game (Acharya & Wardrip-Fruin, 2019; Begy, 2013; Brown, 2012; Jara, 2023).

In addition to requiring active effort to maintain heterotopias, they are also not impermeable or wholly separate from the wider world: nature does not respect categories. They are porous, and

beings can pass through from one side to the other through the boundary conditions and objects, and the passing places—the "systems of opening and closing" (Foucault, 1967, pp. 62–67)—they create, though not without effort. Aquaria are complex systems, with contingencies for leakages and breakages: a breach in the tank would result in a catastrophic dissolution of the world it contains, with drastic implications for any beings on either side of the boundary; more philosophically, the clear glass window allows a connection between the inhabitants and the people outside, assembled as an audience. Marine Protected Areas and nature reserves may have legally defined boundaries and, on land, physical barriers. These may deter some people (though not all) from entering, for fear of legal repercussions, and some larger or sessile organisms are likely to remain in place. But mobile and tentacular beings—fish, octopi, plankton, mycelium—recognise no such boundaries, and cross them at will. Entering and leaving queer spaces requires effort, fortitude, a fluidity of identity, and a willingness and ability to 'pass'. Depending on the location, finding such spaces requires effort: finding a certain unmarked door, or contacting a community member to facilitate their entry. For safety or for agency, when outside of queer spaces, queer beings might to mask themselves, performatively pass as something other: something more normative, less diverse. Conversely, once inside those spaces, they can experiment with fluid, unsettled forms and identities. Such passings can be unsettling, and cause cognitive and affective estrangements: Muñoz has written about the shock of leaving safe queer spaces and of being "overwhelmed by the crushing presence and always expanding forcefield" (2009, p. 39) of the (hetero)normative, mainstream world.

The boundary conditions of New Weird fiction involve a passing into estranged geographies with the loss of the boundaried self: the psychic shock of becoming an avatar of a city to the protagonists of *The City We Become* (Jemisin, 2020); Billy Harrow, the protagonist of *Kraken*, discovering the theft of the colossal squid he had preserved and being forced on the run through a numinous and confounding London underground where he is seen as the prophet of an apocalyptic tentacular god (Miéville, 2010); and the boundary of *Area X* in *Annihilation* which marks the journey "from suburbia to psychedelia," (Garland, as cited in: Mefford, 2018, Section Refractions) and the metamorphic, contaminative loss of self (VanderMeer, 2014). This boundary is represented in a visual form in the film of the novel as *The Shimmer*, a flickering, rainbow-hued bubble surrounding the weirded landscape, which threatens to grow and swallow the planet in its mutational power; having passed into it, characters may not return, or return entirely changed. (Garland, 2018)

In fictions where forests are figured as the interstices between worlds, tokens of passage are required to pass safely from one world to another. Entering the *Wood between Worlds* from CS Lewis' *Narnia* series without the correct magical rings to pass on into another world results in being trapped there in eternal forgetfulness and stupor (Lewis, 1955); attempting a similar passage through the *Anchorwood* of *Ilmar* (in Adrian Tchaikovsky's *City of Last Chances*) to distant lands without a guide and a warding bundle "of sticks and feathers, carven wood and precious

metals" is to risk certain death from the Strangest of Strangers: "mackerel things walking on lizard legs" with teeth like "the interlocking gears of a living machine." (Tchaikovsky, 2024, pp. 20–21). In both, passage between worlds requires a passport, and risks loss of self, the impossibility of returning unchanged, if at all.

The storytelling game of the *Strange Strangers in Strange Lands Playset* provides the means by which heterotopic futures are created, but it also furnishes players with a guide in the form of the Strange Stranger, and creates and mediates the boundary condition between the game world and the outer world. The game objects are tokens of passage, existing in the outer world as tangible objects and within the game as beings, ecosystems, and technical devices; the game demands a willingness to both suspend disbelief and to playfully adopt personas in order for the heterotopic future to come to life.

The porosity of these boxed heterotopias, and the effort and infrastructure required to maintain their boundaries, emphasises their artificiality: they are literally the products of artifice. Enclosures are a fiction, holding worlds in a fabulatory binary separation—natural and human-made, queer and straight, present and future. From a post-structuralist perspective, Foucault argued that they act to reveal that the outer world is also an artificial, constructed reality. Heterotopias may be more perfect abstractions of the world, but they exist as bubbles within its messily contingent materialities (1967).

Judith Rodenbeck frames art happenings—moments in time and place where spontaneous group performances are staged; themselves a form of heterotopia, or enclosure of difference—as radical prototypes of something new in the world (2014). This idea of prototypes can apply to heterotopias more widely; they aren't simply worlds outside the world, but the potentiality of what the world could become. Muñoz argued that "potentialities […] are present [but that] they do not exist in present things. Thus potentialities have a temporality that is not in the present, but more nearly, in the horizon, which we can understand as futurity." (2009, p. 99)

Treating heterotopias as prototypes allows for the exploration of different potential futures, that can be "engaged as vectors of risk and creative experimentation [that can] escape the impasses of the present, and lure our own practices of thinking, knowing and feeling to unforeseen possibilities." (Savransky et al., 2017, p. 5)

The utopias of estrangement of New Weird fictions, with their "refusal of the closure and return to home implied in the idea of the uncanny" (Garforth & Iossifidis, 2020, p. 19) are not simply fantasias but reflections of an "Anthropocene earth […] fundamentally changed by human activities and extractive capitalism." Such a "thoroughly weirded utopianism can help us to understand how our transformed reality might be survivable and how we can continue to identify and express desires for a better way of living in and through it," (2020, p. 3). Solarpunk, the practical design movement and speculative genre united through a Container of Ideas, offers

a hopeful and concrete utopia of how we might live differently and better together, grounded in the practically possible (Springett, 2023; Williams, 2019); similarly, the *Radical Disco* movement used the design of shared spaces such as nightclubs to propose new approaches to conviviality (Sword, 2015), and queer spaces allow for different intimacies and relationalities to be made possible (Muñoz, 2009). Marine Protected Areas can be framed not simply as enclosures but as possibilities of a less damaged ecosystem—the No Take Zone established by the Community of Arran Seabed Trust, represents a community-driven protype of a more convivial more-than-human reality (Stewart et al., 2020). Drawing on these and other such examples, the fictional more-than-human worlds in the Collaborative Storytelling Game can be framed as prototypes of potential futures.

Heterotopias and other enclosures might be more meaningful, then, if their boundary conditions are breached: if they bleed into reality. In theory about how games work, there is the idea of the *Magic Circle*, the suspension of belief and willingness to play that creates a heterotopic diegesis where worlds can happen, and the sense that when the game ends, the imagined world "continues to shed its radiance on the ordinary world outside," (Huizinga, as cited in: Brown, 2012, p. 16).

It is a process I've described as a *Diegetic Escape*, of parts of the fictional world coming to reside in the real. This is the potential offered by speculative design, in bringing the artefacts of fabulatory heterotopias into the here and now, where they can be held and played with, allowing you, as Cameron Tonkinwise urges, to "feel your way in that unknown dimension" (Tonkinwise, 2014, p. 186) of possible futures. This idea is explored by Jorge Luis Borges in his speculative and philosophical short story, *Tlön, Uqbar, Orbis Tertius* where he describes a fabulatory realm that begins to materially transform the real, where "the contact and the habit of Tlön have disintegrated the world." (Borges, 1962, p. 42)

Conviviality might show a way towards disintegrating these boundary conditions between the between nature and artifice, between perfected abstraction and material realities, between heterotopia and topos, and between present and future. How do other worlds, other futures, become the present, and how might we live together with them? Convivial Conservation has been proposed as an alternative to the enclosure of nature separate from the human realm, encouraging thinking more in terms of assemblage and how our lives are mutually entangled (Büscher & Fletcher, 2019), how we can get along together: what Haraway describes as staying with the trouble (Haraway, 2016)

What might be sought, then, is a form of Convivial Heterotopia: for possible, potential, even impossible worlds, words outside of the mainstream and more-than-human worlds, to break their bounds, and be lived with, and through, towards the becoming of better, pluralistic futures.

This project has explored how the Strange Stranger might lead us—as designers, or as communities of biodiversity activism—through collaborative storytelling games and in acts of speculative design, to bring more biodiverse worlds to life and force them into the world through the creation of their material reality. Towards goals of caring for the ecosystem, of working collaboratively to protect it, and of seizing better, more biodiverse futures. To draw on strategies of making, playing, mapping, time travelling and storytelling to do achieve these goals. Towards sympoesis, a becoming together and kinship with less familiar others. To embrace transitional and in-between states, and to find comfort in estrangement and difference. To find common cause and an ethics of care through sharing stories, to walk a fine line of hopefulness between blind optimism and despair, and to embrace a pluriverse of worlds.

But it might start by gathering together, unpacking a box, placing tiles on the table, and collaboratively bringing to life some *Strange Strangers in Strange Lands*.

Final Conclusions

To draw towards some final conclusions, then, is to take a wider, contextual focus over the trajectory of this project and consider the foundational motivations for it. The reflections on the emerging artefacts and Speculative Design Programme need to be considered in the context of Community Biodiversity Activism, and the aim to situate a such a design programme that could support it through queer, more-than-human and decolonial lenses.

This thesis has discussed the entanglement of matters of care between speculative design practice and biodiversity, in particular the identified need in both domains for more diversity and inclusivity, which includes the fact that the ecosystem depends on literal bio-diversity for the future of life on earth. It has explored how the research lenses might have something to say or contribute in this regard, establishing worldviews, strategic goals and strategies that may act to help and protect the ecosystem: the importance of taking care with others, of the collaborative labour of rebalancing the ecosystem, and of staking a claim for a better future; it has looked at how these goals might be approached through strategies of Making, Playing and Performing, Time-travelling, Mapping and Storytelling (particularly Storytelling), and the ways in which that might be done through examples of speculative fiction and design techniques.

On the other side, this thesis has explored how Speculative Design Practice might be transformed by these lenses, guided by the conceptual figure of the Strange Stranger. Further, it has speculated through the examples provided by the Conceptual Design Celium and *Strange Strangers in Strange Lands Playset* about a possible Biodiverse Futures Design Programme that could be situated as an intermediary between these values and the outputs of speculative practice (fabulatory narratives and design proposals). In particular, it could scaffold these in an accessible way for community members through the Playset. Therefore, taken together, it is a lure towards the speculative possibility that such a Biodiverse Speculative Design Programme may have much to offer in the domain of Community Biodiversity Activism.

This thesis explored that a significant challenge faced by community biodiversity activists is being able to imagine biodiverse futures beyond the shadows of the deep-seated paradigms and powerful hegemons of culture, legislation and economics. This design research project has aimed to find a way to help communities to see beyond the horizon of a predetermined future, predicated on the systems that have brought the ecosystem to its current parlous state; instead, to find ways to frame the future in a way that isn't human-centred, reinforcing of unhelpful paradigms of action and thought, and to help communities to imaginatively challenge the hegemonic, extended-present future that bodes extremely ill for the ecosystems on Earth.

A Note on Validation

As described in Chapter 2, validation of this research project rests on three entangled pillars: of recoverability, afforded by reflective practice; of theoretical sensitivity, afforded by a post-qualitative methodological approach of Reading through Theory (Adams St.Pierre, 2020) and Research Creation (Truman, 2021); and of design effectiveness, afforded by an informed and reflective dialectic between the technique of prototyping, reflection on design practice through Annotated Portfolios, and the effectiveness of the products of design to exemplify and define through design, based on the judgement of the designer. Through those pillars, validity can be conferred by the meeting of criteria of Design Effectiveness (which is to say, the design does the thing it was designed to do), based on the theoretically-informed and reflective judgement of the designer-researcher. The established *Effectiveness Criterion* for this design research project and the artefacts and theoretical knowledge it produces is that the designed artefacts should have the potential to support Community Biodiversity Activism through affording the collaborative creation of speculative futures or fictional worlds grounded in queer and more-than-human perspectives.

The arguments put forward in this thesis, particularly in the discussions and in this conclusion, can be considered by informed judgement to demonstrate that this Effectiveness Criterion has been met, and that there is strong evidence that the artefacts of this project do have the potential to support Community Biodiversity Activism in the intended way.

Resolution of Hypothesis

Therefore, this thesis returns to the speculative research hypothesis:

It is speculated that working with speculative design through the conceptual figure of the Strange Stranger—representing a queer and more-than-human post-structuralist conceptual lens of Queer Ecology—and working with it in a practice-based design research project, may produce interesting entanglements and symbioses: between the sociocultural and ecological; between diverse and ephemeral conceptual onto-epistemologies, and monocultural and material crises of socio and biodiversity; and between speculative design and the environment where it might try to assemble alternative futures. Such entanglements may allow the creation of new transitional assemblages that could support Community Biodiversity Activism through speculative fabulation and design, and act as prototypes of more biodiverse ways of doing speculative design.

Taking all of these reflections into account, this thesis makes a justified statement that a Biodiverse Speculative Design Practice guided by the Conceptual Figure of the Strange Stranger, as a material practice of future-making, offers tangible ways to materialise queerly ecological (so marginal, diverse and ephemeral) futures, while, reciprocally, suggesting how more diverse ways

of approaching futures can transform Speculative Design Practice. Such transformed practice offer insights for the possibility of a Biodiverse Speculative Design Programme that can support Community Biodiversity Activism towards the diverse futures demanded by queer and more-than-human beings and, ultimately, all life on earth.

Limitations and Future Work

This complex transdisciplinary design research project has some limitations, which will be discussed here, alongside recommendations for future work and further development of the ideas and artefacts herein.

Limitations

By far, the biggest limiting factor experienced during this research project was the global Covid-19 Pandemic, which led to global disruption, lockdowns, and many deaths; in comparison to these wider events, the disruption to this research was of less import, but was nonetheless significant. The intention from the beginning was that this project would involve significant engagement with the public and community groups; this trajectory began following the acceptance of the research proposal, with engagements and visits throughout the summer and autumn of 2019. Those plans, which would have involved workshops from an early stage, had to be significantly curtailed, and the research pivoted to online engagement, through conversations and design probes, but there was continuing difficulty in engaging in design experimentation during this time. There was a plan to develop a set of design strategies and tools early in the process which would have led into more extensive engagement and design workshops, if not ongoing design project, in community biodiversity settings; over time, the focus of the project pivoted towards developing a more extensive speculative design framework, from which developed the set of games in the design Playset and led in turn to storytelling workshops.

From this, another limitation can be identified. As the project plan came into clearer focus, there was an intention to demonstrate the *effectiveness* of the Playset in Community Biodiversity Activism settings as a project end-point. However, with the Covid-related delays alongside a slower than expected process of Playset design and iteration, as a project team we discussed that due to time constraints a better approach would be to demonstrate its *potential*, instead: in effect, not to demonstrate *how effectively* it worked to support future-making in community biodiversity settings, but that it *had the capacity* to do so. This led to the decision to test the Playset in workshops with other designers, design students, and speculative practitioners, rather than the more involved engagement with lay community members that had been anticipated.

Therefore, the research resolved itself into two significant contributions: a suite of artefacts situated along the spectrum from designing in general and designs in particular, and oriented towards supporting speculative biodiversity practices in communities; and a more theoretical engagement with those artefacts to explore how they might represent a contribution to design theory, in particular, how a playset of game objects, games, and design activities situated as queerly ecological could form the foundations of a Biodiverse Speculative Design Programme

oriented towards a Biodiverse Speculative Design Practice. This, then, is a worthwhile contribution in and of itself, but the programme has yet to be tested in its intended setting; we discussed that this may be work enough for another PhD research project for another student in the future.

Related to this is the fact that the playset has not been demonstrated to its expected users: members of Community Biodiversity Activism groups (such as the previously discussed Community of Arran Seabed Trust). Redström has argued that defining users based on expected use of an artefact is problematic, as it uses a fixed definition that may not account for the way in which it is used (or not used) in practice. To demonstrate the effectiveness of this prototypical Biodiverse Speculative Design Programme and associated Celium and Playset would necessitate actual, not expected, use of it by such groups, which could (and probably should) lead to further design iterations of the artefacts.

There were other limitations of a technical or processual nature with certain elements of the research, particularly in the materialisation and presentation of designed artefacts: in particular, it was not possible to develop the game beyond a testing prototype, with more complex graphic and product design, and more attention given to framing elements such as rules and illustrations, and the creation of game objects. We also discussed the possibility of the Annotated Portfolio being a separate artefact that is more of a hybrid between images and text than the more textual one presented here.

Finally, and rather more by design, this transdisciplinary project engages with many disparate domains and schools of knowledge, from design to queer theory to feminism to environmentalism to biology to game design to speculative fiction; as a design project, engagement with each of these domains in turn was necessarily lacking in either breadth or depth of coverage, largely using them as lenses or theoretical frameworks in the service of design activities. It has been suggested that the connection between existing theory, design practice and emerging theory could have been strengthened in some ways; these offer possibilities for future work.

Future Work

Considering the limitations in turn, the following future work might be done, either to continue to develop the current research project, of which this doctoral research may simply represent the end of the beginning, or as lures for other researchers to pick up threads:

Most significantly, after demonstrating the potential of the *Strange Strangers in Strange Lands Playset* and associated artefacts to scaffold speculative practices shaped by the Conceptual Desing Celium, and providing a theoretical underpinning for situating it as the core of a Biodiverse Futures Design Programme, it would be desirable to explore its use in wider

community settings, where it could be applied to existing biodiversity challenges rather than general and hypothetical ones. It would be interesting, too, to discover how community members would interact with it and potentially include it into their repertoire of practices and artefacts.

With sufficient time, it would be interesting to extend the use of the Playset beyond a one-day workshop, and explore how the storytelling and speculative fabulation games might lead to well realised and impactful design responses.

Considering the prototype of the Playset, further work could be done to develop it into a more fully realised game. This may address some of the limitations listed above, and could help to realise the potential of the Playset to be applied to a variety of settings outside of the format of the storytelling workshops; for instance, the Design Fabulation Deck might be used as a standalone resource for Design Projects, or the Collaborative Storytelling Game could be used as a casual game to be played in social settings.

Taking that idea further, then, there is the potential for the Playset not just to be used in a designer-researcher led investigation, but for it to be situated in community settings, to understand how it will be used in such contexts, and for speculations and designs to unfold according to their own processes of becoming. Situating the Playset as a community-embedded artefact might figure it as a form of design probe, that may afford the possibility of an activist-researcher conducting self-reflective action research around a community-directed speculative design project.

It is also interesting to consider how a nascent and transitional Biodiverse Speculative Design Programme with a ludic foundation in a Playset of games might translate to new avenues for design education and even for possible future design research programmes.

Finally, it has been suggested that this research might be deepened in particular aspects of its engagement with theory: that the parallels between biodiversity and sociodiversity could be further developed, and draw more on phenomenology, natural science, and metaphysics; that the contradictory use of the Strange Stranger concept in relation to certain philosophers might be explored; and that a more in-depth exploration of the onto-epistemology of design research could be fruitful. These are all possible avenues for a more in-depth study of these areas than this research project intended or allowed.

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Appendices

I held in my hands a vast methodical fragment of an unknown planet's entire history, with its architecture and its playing cards, with the dread of its mythologies and the murmur of its languages, with its emperors and its seas, with its minerals and its birds and its fish, with its algebra and its fire, with its theological and metaphysical controversy. And all of it articulated, coherent, with no visible doctrinal intent or tone of parody.

Jorge Luis Borges, *Tlön, Uqbar, Orbis Tertius* (1962, p. 31)

Appendix 1 : Conversations

Elizabeth Rose Langford

Elizabeth Rose Langford (uses she/her pronouns) is a visual artist from the United Kingdom, based in Barcelona, who has a particular interest in pigments and their history. She spent three months on an artists' residence at PADA studios in Barreiro, Portugal, working with a recently rediscovered plant that is the source of a medieval pigment.

"I came to Portugal because I heard about a recent discovery in the pigment world of the plant *Chrozophora Tinctoria*. It's a medieval pigment extracted from its fruit, a small fruit that looks very much like a weed. It was rediscovered by chemists from Nova University in Lisbon. And so, I've been working with them and they've taught me how to extract the pigment; my work here at PADA has been about the process of that and much of my work prior to now has been about working with natural materials and reworking renaissance methods of extracting pigment." The blue pigment, known as turnsole or folium, hitherto had an unknown chemical composition; through the work of the chemists at Nova University and the University of Aveiro, the compound responsible for its colour, chrozophoridin, has been discovered.

We spoke in her studio at the residency, surrounded by branches of the *Chrozophora* plant, and the artworks and experiments she was developing through working with it. She showed me some of the fruits of the plant: they are tiny, hard, dark green berries, about 3mm across, formed of three spherical lobes. "It's been funny having them in the studio, because the way that they reproduce is they pop these little seeds, they pop and then that spreads the seeds; the seeds go underground, and they don't emerge for two years. So, the plant has a one-year lifestyle, it'll flower and fruit and then it dies. And then it comes back in two years."

"It's a really strange plant. Its favourite environment is nutrient-poor soil. It loves that. It likes lots of sunlight, loads of heat, not so keen on water. It has a tap root, so I think it does want a bit of water, because that's what a tap root does, doesn't it? It goes down, down, down. And in the area that it grows in, Monsaraz in Alentejo, there's lots of inland lakes. So, I suppose somewhere in the soil there must be a bit of water. I don't know what it would do for the soil. I mean, the soil that it likes has very few nutrients. It's a really weird little plant. And the field that it's growing in in Granja, near to Monsaraz, is a set-aside field,", left to lay in fallow for a year, for crop rotation.

For Elizabeth, the plant has a certain personality. "It doesn't like growing around other plants. It likes to be on its own. It doesn't like when there's anything over it. It likes to have direct sunlight. So, in the field where it's growing its literally just earth, horse poo and a lot of forest. Which adds to it" One of the other artists on the residency, Stan, remarked that the plant has a

mean character. "This adds to its meanness, doesn't it? It doesn't want any competitors; it doesn't want any friends."

The human relationship to the berries and the plant has a visceral and emotional quality to it: Elizabeth's fingers were stained purple and roughened from extracting the pigment, the plant producing protective white grains and pollen that would often catch in her throat: "it's quite pollen-y. It goes into my throat sometimes. It's a bit easier when they're here than in the field. It's intense, very intense."

"It's a weird looking thing. Stan said, 'it looks nasty, like it has a nasty character', which I thought was sad". In contrast, the scientists who discovered it, "the way they spoke about it, they're just so in love with it."

Elizabeth visited the field where *Chrozophora* was rediscovered, in Granja, an area in the Alentejo region, close to the Portuguese border, where one of the chemists introduced her to the plant. "She took me up to the *Chrozophora* and she said, 'isn't she so beautiful?'—because in Portuguese everything is gendered, the professor was referring to *Chrozophora* as she—and at first, I was not agreeing. But then after the whole day, being with the plant the whole day, extracting and finding my own story with it and knowing their story and knowing all the stories—quite a lot of stories—you do become invested and there's certain measures that you take [to care for the plant], for example, you always leave a few fruits on each plant to allow it to spread, so you don't take everything. I think the story is very important." We discussed Donna Haraway, who has talked about the importance of stories in taking care of things—that knowing and being invested in a story implicates you in a duty or ethical responsibility of care—and the concept of Non-Extractive Utility, where you can relate to other beings not through taking from them, but by having a reciprocal relationship instead of theft, conversation.

Elizabeth explained more about the history of the plant, in the environment, and as a source of pigment. "I think that it would have been gathered, the way I'm doing now, they'd have been in the fields with clothlets, these little bits of cotton cloth. They would have been extracting the pigment onto the cloths and then use it very much like a watercolour. So, you'd just put a bit of gum arabic on it and it would become a watercolour. And then, the great thing about the clothlets, is that they're easy to transport, because they're not going to spill. It's fixed. It's not like lapis, which is really difficult to transport. Lapis is ridiculously difficult and that's why it's so expensive. When you see icon paintings, that's only because it was reserved for the royalty."

Historically, turnsole was used in illuminated medieval manuscripts, but it fell out of use, largely because "it was seen as quite a poor thing to have to gather your own colour to extract your own pigment. Because I've experienced it now, [and] it is quite hard work. You're in the field and it's really hot. So, to have to do that by yourself is seen as quite poor. As soon as people were able to buy things like indigo it fell out of favour, because indigo is also blue but it's a lot easier [

to use], you can make more much quickly; this is laborious. So, then they lost the knowledge of how to do it, and where the plant was. I think that's why the chemist has been so helpful, because I think for them it's important that it doesn't get forgotten again. One of the reasons that they stopped producing it was because they lost the knowledge about how, when it spreads the seed, it takes two years for it to come back out. It's underground for two years. One of the chemists mentioned that she tried to grow it at home. So, she threw the seeds in the garden, and nothing happened, and she was like, okay, so it doesn't work. And then two years later, suddenly [they grew], and she was like, "oh, it does work! It's just a bit slow."

"For me the weird and the funniest thing about it is that in the Renaissance manuscripts, they knew how to keep it blue, and we don't. I'm really curious about that. Because like I mentioned before, even though it's coming out blue now, it's all going to come to this colour. It all becomes a purple colour. And the chemists did mention that it's just the beginning, like this is the first in what they anticipate to be a long sequence of discoveries. Which is exciting, isn't it?

I asked what the scientists are hoping to achieve from their research, whether they are doing it purely for the pursuit of knowledge, or are they hoping to find an application for their findings. "I don't think I quite understand what motivates them. I think it's very similar to the artistic process. They're just going with each discovery and then doing a new discovery. It's curiosity. I guess also they'll want to find out about how to keep it stable. Like how to get it to stay blue. But it's funny because what I would quantify as success is very different to what they would quantify as success."

Elizabeth's Practice

We discussed in some depth how Elizabeth has become implicated in the story of *Chrozophora* Tinctoria, how her engagement with it affected the work that she was producing, and how it is situated in a wider art practice of working through deep engagement with different pigments.

"I arrived at the residency in July and the *Chrozophora* wasn't ripe yet, so that stage was a lot of information gathering, speaking to the chemists, getting excited. We actually did an extraction from the dried fruits of the previous year's harvest; we got some colour. It was not as rich as this colour, but it was a colour. There was quite a lot of build-up, it's quite a lot of anticipation. And then in August, the fruit was just about becoming ripe enough to work with, so that's when we did our first expedition there. There's just quite a lot of horse poo and earth and then the *chrozophora*. And the last time I went there, it was really nice because I went into the field with the blanket and started picking, and two quite old gentlemen came running up to me and they'd yanked out one of the plants and they were explaining that it makes colour. And so, it was nice because the chemists had been in the village and maybe the information spread."

Extraction of the pigments from the early unripe fruits was hard work, leaving Elizabeth with hardened, purple-stained fingers. “The way I’ve chosen to extract it is onto cotton, which is how they would have done it in medieval times. So, what I think it would have been cotton; the chemists said to use cotton because anything else could alter the colour.”

Elizabeth showed me some of her artwork, and experiments, with the pigment. “This work, this is the work that’s come out of it. I did some experiments on how to extract it from the cloth. And with varying success. I mean, I think, I felt like this was the most truthful way of displaying the information that I’ve gathered so far. Because any other way I might ruin the quality of the pigment because I don’t know enough about it. It’s so much about trial and error. It’s a map of the time that I’ve spent with it because I’ve also labelled when things were harvested and when I extracted it and things like that. I guess in a way this work is quite true to the stage at the moment because I feel like it has something of a chrysalis quality to it. I’m going to stay another month, for September. And September’s going to be the month: that’s when it’s ripe, finally. I’ve been watching all this time, so I’m quite excited. So, this is very much a work-in-progress process. And I don’t know what will happen to it next month when the pigment’s ripe.”

Medieval manuscripts and their recipes for pigments acted as a source of inspiration for Elizabeth’s work. “In some of these manuscripts it suggests ways of altering the colour. And one of them is suspending it over the urine of a drunk man. A drunk old man. Which I’ve not yet tried. I’ve suspended it over my own urine. And it does alter the colour. It’s quite mysterious because in the manuscript, they’ve managed to keep the colour blue—but when we’ve been using it always turns purple. This is the colour it is at the beginning of the extraction and then it just becomes that colour. So, for the purpose of the [gallery] installation, I’m going to extract some here so that I can suspend it over the urine. I’m trying to think about the best way of including it, because also it’s a bit explicit for me. You know what I mean? It’s a little bit heavy having like a jug of urine. The thing in the urine that’s making a change is the ammonia, but ammonia is also not great for health. So, I was thinking maybe putting it in a vessel where you couldn’t see it.”

This art practice has often drawn on developing a material relationship with pigments, exploring their history, how they are extracted. “I don’t know if artists continue to work with these things. I have my own issues sometimes with natural materials, because it’s very time consuming. But the thing that’s amazing about it is that you’re so connected to the whole process. [Compared to] squeezing paint out of a tube. You’ve lost quite a lot of the process there. You’ve lost the connection to the origin of the thing. Not to disparage people that work like that. The thing I think I’ve learned quite a lot about my practice from working with is that I’ve realised that I don’t really like to force an agenda on pigments. I like to try and be as much as possible led by the material and let what’s going to come out, come out.”

I talked about this in relation to Karen Barad's Agential Realism, the notion that all beings are defined through their interactions with each other, that it's only through their encounters that things become, which drew Elizabeth to recall an interview she once read with a cosmologist. "He became fascinated with space when he was four because the Comet Hale-Bopp was going through the sky. His father explained to him something like, 'this comet, you won't see it again for another however many hundred years.' And something about that understanding of where we are and where the comet was just really got into the little boy's mind, and it began an obsession. And then he became a cosmologist. I think I had a similar thing with Wendell Berry. He's a poet. And he talks about, it's a bit esoteric, but he says that if you believe in the Big Bang, he says that suggests that we're made of the same stuff as the stars and the universe and so all that we really are is conscious matter and so in that way we're the universe observing itself. Which I can't quite feel it now but when I do feel it it's like, "wow!", that's quite wonderful and in that way, we're not separate to anything." She relates it to the work of Susan Haylock. "She's an artist in a similar vein. I won't be able to describe the work, it's too much, but it's in a similar vein. I find it very interesting. She's good at liminal things."

Working with the berries of *Chrozophora*, for Elizabeth, was an experience that aligned with these ways of thinking, being led by the way she was encountering it: "Instead of having a predefined idea of where the path will take you, it's being led by the path. It's nice to talk about this. Sometimes [I think], 'oh my God, what am I doing?" Because it's a bit in the dark, and I think you have to be quite trusting of the process."

"I love painting as well, and sometimes this is quite different to painting, this process. But since reading a bit of Fernando Pessoa—you know the thing with the heteronyms"—Pessoa wrote his poems under four different personas, which he called heteronyms, with different personalities—" I'm realising that it's a little bit narrow to just be like, I'm only this, I'm only the person that extracts pigment. And it's also not truthful. It is a big part of my practice, but there are other parts of my practice. And at the moment, they're quite disparate, but I think that maybe one day they come together. But if not, then they're not. And they definitely inform each other. They're not completely separate. But at the moment, I'm not sure. This is a large part of my practice, and this is really a *Chrozophora* story."

"I did my BA in painting at City & Guild of London, which is this lovely little art school on the oldest square in London, Cleaver Square [in Kennington]. It was a really lovely three years. In the final year I started collaborating with one of the other students and his father is a professor of Renaissance materials. He taught us lots of things. He taught us how to extract pigments from earth, roots and minerals. And it was very interesting information. It was very specific, and [with] lots of rules. And when we were learning about these things, I was in that art school environment of questioning things and taking an interest in the process and not just accepting things. You know? I would say, 'but these processes, what if we do this, and what if we do that,

and what if we break the rules?' And I'm no longer collaborating with the person that I did that with."

"So now I've kind of got permission, in a way, to do all the things that I was interested to do. And it's difficult because the natural materials are very sensitive and there are rules for a reason. But we now have contemporary materials as well. And I feel like a lot of my practice is about trying to cultivate a healthy relationship with the history of art. Because I think that history is part of now, so for me it's silly to relegate it to the past and say it doesn't have any place now. I think it does have a place now. So, it's like a balancing act, trying to find the balance. In other paintings I've been trying to mix gesso with spray paint and things like that. It's often [led to] disastrous results. But obviously, you know, when you make a mistake, it's not a mistake. An accident can lead you to… Penicillin? Yeah. [Alexander Fleming] was not looking for penicillin."

During the residency at PADA, Elizabeth had an encounter, or a re-encounter, with another pigment. "Caput Mortuum, which is Latin for dead head. Or worthless remains. It's a by-product of the manufacture of sulfuric acid. And it's like a purple-y, brown-y, red-y colour"—the pigment is also known as Cardinal Purple—" I always used it, I used to buy it from Cornelissen's lovely, beautiful, apothecary-style art shop in London. We did a tour of the industrial park, and I noticed this colour was all over the floor and I thought, 'this looks like a pigment that I know'. And then we found out that the factory used to manufacture sulfuric acid. I took it to the chemist to test and its Caput Mortuum and it's fine, we can use it. It's got nothing terribly toxic in it. You know, obviously don't ingest it, but that goes for most pigments, you shouldn't ingest any of them; although apparently—to quickly go back to the *Chrozophora*, it was used medicinally. But I don't know enough about it. I mean, again, I wouldn't eat it, but I know that it was used medicinally." I later found out from the research paper about the identification of chrozophoridin that *Chrozophora* was mentioned in first century and medieval pharmacological texts, and recent research has revealed some anti-inflammatory properties that it possesses. [Reference again]

"I've also been experimenting with *Caput Mortuum*. I've been mixing it with oil, which is peanut oil. It's one of the oils that was manufactured by CUF [the company that ran the industrial park in Barreiro, currently a private health company]. And that's been nice too. I've enjoyed working with the *Caput Mortuum* as well. I haven't got as far with it as I have with the *Chrozophora*. I feel like I've got more involved in the story of *Chrozophora* is than I did with the *Caput Mortuum*. But I might… I don't know. It's definitely everywhere. But I feel like that's been kind of a theme with my work because a while ago I had a residency with *Windsor & Newton,* and it was with the chemists again. So, we were in a glass studio next to the chemists, and they were developing the paints, and we were using the paints, and it was this exchange between artists and scientists. But it's difficult sometimes to meet and to find a common language."

Rho Thomas

Rho Thomas (uses they/them pronouns) lives in London, where they perform as their drag alter ego, Taxi Rank. “I’m a few things I guess, I’m a drag queen and a musician and a teacher and a non-binary person, so they’re the labels that I end up putting on myself at the moment. But yeah, that’s pretty much it; what else do we need?”

I asked Rho to bring something that was important to them, and we started our conversation by talking about the item that they brought: an Acme Siren Whistle. They were given the whistle by their grandmother after finding it in a box together while they lived with her; it had belonged to Rho’s grandfather, who had died. “The reason my grandfather had this was he used to run summer camps with my grandmother when they were back in the UK, and he got this as a whistle to get all the kids’ attention and to let them know to come back to where they were staying.” The whistle has a distinctive, recognisable sound, like a high-pitched public warning siren, so their grandfather “figured it was a fun way of getting everyone’s attention.”

After moving to London, Rho carried it around on their keyring for a while: “I figured it might be a good way to draw attention to myself if I was ever in trouble. But it’s quite heavy and thick so it wasn’t the best thing to have on my keys.” They never had cause to use it, but consider that surprising, or lucky. “I’ve had friends of mine that have been [attacked], just even just in the afternoon, who weren’t even presenting very queer, or just in general work clothes. A friend of mine just got beaten up so badly in Bethnal Green, just because someone thought he was gay, just by looking at him. So, it does happen, and I’ve been lucky that I haven’t needed to use it.”

We discussed the experience of living in London; I recalled the occasional but not infrequent, high-profile instances of homophobic attacks, and reflected that while it could be a dangerous city, it was often a place where you’re able to be yourself. “In London, that was one of the things that I first noticed moving there, that it just felt a lot safer, especially in the more metropolitan areas. If you go further out, it starts to feel a bit more unsafe. But generally, it’s not felt too bad.”

“One of the reasons that I moved to London was because I kept hearing too frequently of things like this happening in Melbourne when I was still living there. In 2006 a friend of mine was in quite a posh cocktail bar where pretty much everyone was wearing suits, in the afternoon on a Friday. So, people started their after-work drinks quite early. His boyfriend went in and just as they were about to leave, one of them kissed the other on the cheek. And suddenly they were just surrounded by these men in suits. Who just started taunting them and beat them to shit and the bouncers threw them out for causing trouble! This was like the year I moved to Melbourne. Two years before I left, I’d mentioned to a friend, who I was studying with, that I was just about to move away from there, and he was like “oh my god how did you live there? Like I walked down the high street in the middle of the day, like not even wearing anything provocative or

anything and just had these guys screaming 'fucking faggot!' across the street."
"My exes and I would never feel safe, even on the main streets in central Melbourne, we'd never feel safe by being able to actually walk around holding hands. It was just that it was always there. So, when I got to London, and it just seemed so much more safe in that regard, and I would see queer people walking around holding hands occasionally in and around Oxford Street and Soho. Even just the way people dress. If you dress the way that any respectable man in London who has a job that can afford to wear things that are pretty nice: anyone who would dress like that, who looks like they're a guy that makes an effort, would immediately be called a faggot in Melbourne. At least that's what it was when I was still living there. But that would have been over 10 years ago, and sometimes places do change."

Despite this, Melbourne has a reputation for being the more alternative, queer friendly of Australia's cities. "Yeah, it is, it was, and it is. They call it the Paris of the South and it's very much the cultural hub of Australia, it certainly has the massive identity of being very cultural and very arts focused."

I asked whether relocating to London gave them more space to explore their identities, particularly in terms of drag, and we talked at some length about how that came into being for them and became part of their life. "My relationship with drag started off with just probably what most people would think of drag, these kinds of shows that you would see in pubs, and it wasn't really until the RuPaul's Drag Race phenomenon happened. I have to admit I was quite resistant to it at first because I trained as a classical musician and did lots of musical theatre and dance training as well, and my idea of the arts was that it's very institutionalised and very refined, especially in the classical world. At first, I was a bit dismissive of RuPaul's Drag Race, but I got hooked, and the reason I got hooked is when I realized this is all of the arts rolled into one. And when I looked at myself, I thought, that's what I've been trying to do my entire life. Like my two biggest passions were music and dance.

When I was really young, when I was six, I started tap dancing lessons and when I was four, I was singing in choirs. As soon as I heard the clarinet I fell in love with that instrument. And so, I loved doing musical theatre stuff. So, when I realised that these drag queens get to do all of it, I thought maybe this is what I should be trying to do. I had that realization while I was doing my master's degree on the clarinet, so basically throughout that period—that was 2013 to 2015—I basically went into training as well, so I started going to Cybil's house"—a drag event held monthly in East London—" and I would go to this night every month. It was really good for me because it was probably the most I felt connected to the LGBTQIA+ community since I moved to London. It became this religious thing in a way, but not religious. It was like a ritual, and I had something to work towards in terms of my aesthetics"

It was also important as it gave Rho an opportunity to develop their sewing skills. At school, they had tried to enrol in a course on Wearable Art, but the teacher insisted it was only

available to people who knew how to use a sewing machine. “They said ‘this course might be a little bit above your level.’, and equally, they were very dismissive of me because I was the only boy. So, I went home to my mum, and she said, “well that’s bullshit, it takes you like two seconds to learn how to use a sewing machine.” The difficult thing about sewing isn’t the sewing machine part. So, my mum taught me how to use a sewing machine when I was a teenager. And I didn’t do much on it apart from alterations at first. But I had that skill, and once drag became at the forefront of my mind, I bought my own sewing machine and ran with it, and made lots of guesses with that as well. Drag filled in the gaps for me and provided me with a sense of community that I didn’t really have before. And it opened my eyes to my gender identity, which it wasn’t really until I came out as non-binary that I really felt like I had the confidence to actually be myself. And, you know, drag helped me get to that point.”

We discussed whether, as a non-binary person, drag feels like a way to have or present more than one aspect of themselves; I talked about the contrast I had perceived between their more feminine Taxi Rank drag persona, and their more masculine persona as Rho. This led onto a conversation about how these identities developed for them since childhood. “Yeah, I enjoy that! That’s the thing, ever since I was a kid, I was dressing up in my mom’s clothes. When I was three there was a package delivery when I was at the front of my parents’ house, prancing around in my mum’s pleated school skirt, and I put one of those slips over my hair as long hair, and I’d probably done the full drag. I probably had her top on, and shoes, it’s probably the first time I did the whole shebang, just like parading around the front, living my best life.” Afterwards, their mother told them the man had thought he was a girl, and asked if they wanted people to think that; they weren’t sure what they felt about it. “That knocked the wind out of myself a bit and I think I stopped after that.”

“But in terms of identities. I’d always see girl-friends, when they go to parties or when they leave the house, wearing something really, really cool. I just always was so jealous of the spectrum of women’s clothes that was out there compared to men’s. And I would always picture myself and picture what I would wear presenting as a woman. And then suddenly as a drag queen it was like, ‘oh my god I can do all of this now!’ It just unlocked that part of me. I do enjoy both, I enjoy being masculine sometimes and I do enjoy being feminine sometimes. I just see myself as being in this state of flux, that I’m always somewhere in the middle. Whether it’s events, or if it’s just the way you wake up in the morning, it’s never like either ends with a binary.”

I reflected that in what they said, there is a similarity in the playfulness of performance in general and the playfulness of drag, as ways of being silly and of experiencing different ways of being. Is that something that’s important? “It’s playing around with the way you’re expressing, the way you’re feeling; it is playfulness. That’s basically what its always come back to for me. That I’ve wanted to play with everything. Like even when I was a really young kid, I loved

playing with cars and trucks. I also loved playing with dolls and My Little Pony and all of that. I just wanted to do everything."

"I used to have this Barbie doll that I just took around with me when I was seven or eight. And just because I really liked it, my grandfather couldn't stand it (although he couldn't stand kids anyway). It's so funny that he was that way in the end. We were going through my grandmother's old photos, and we found a photo of him in drag from when he was running the summer camps. He had got into full drag just to entertain the parents and the kids on the camps. It was a little complicated because he had a few strokes, before I was born and also when I was quite young. He had a really severe concussion when he was in India in the second world war which then meant that he had real problems with his temper and rage and that manifested a lot as he got older. So, it's really interesting that I have all these stories about who he was, and I was terrified of him my entire life."

"When I was a teenager, things got really difficult between me and my brother, and we had quite a psychologically abusive relationship, and that turned quite physically abusive as well. So, it got to a point where I had to get out. I would have been about 16 and my best friend was going through something similar with her dad, and so we were trying to rent a property, but no one would rent to us because they thought we were a 16-year-old couple—a straight couple—but it didn't matter what we said, about me being gay or anything like that. They just thought we were lying so that it would make them more likely to rent to us. But in any case, no one was really prepared to rent to two 16-year-olds in Canberra."

"So, in the end, I gave up and I don't know who suggested it, but because my grandmother had moved to Canberra to be closer to my parents, that was then suggested. So, I moved in with her for, I think it was three to six months, and then I got really close with her. I think my biggest inspiration has always been my grandmother, and actually she's the reason why I am currently at the moment in Australia, because she's 94 now, and because she took me in when I was a teenager, and she accepted me immediately. Like I think I'd only been there for maybe a week or two, and she confronted me one day and said, 'do you mind if I ask you a personal question?' I said, 'not at all.' She said, 'are you gay?' And I said, 'yes.' She said, 'I thought so.' And then just said, 'that's absolutely fine with me. I'm gonna be here for you and love you anyway.' So, she was the first person in my family to actually say that and to accept me. Because my parents didn't accept it at first, although they're fine now. So that was just part of why, but even before that, when I was quite little, I heard the stories of her life, but also just the way she is very playful and just does what she wants."

"Because she never just accepted being treated like how women were treated when she was growing up. She had one sister and three brothers, and she always said, 'why should I be a girl when I could be a boy?' That was her natural reaction, like, 'I don't want to behave like girls behave. I have much more fun doing what the boys do.' So, she was absolutely the tomboy. And

because of that she was very rebellious. She was very, very, very smart, and got a scholarship to the richest private girl's school in North London."

"She was from a very poor family, and so she only got the scholarship because of her grades. And she immediately felt classism straight away and would rebel against that. So, you know, you see all these parents picking up their kids all wearing furs. It's just ridiculous. But yeah, she was fighting the system from there and always did. She was in the WRENS as well at the end of the Second World War. And they were trying to get her to wear skirts all the time. She was like, 'fuck that, I don't want to wear skirts. The work I'm doing, I need to wear trousers.' So, she fought and fought and fought with her boss until finally she said that she could wear a skirt only when she did these particular duties, and she had to change into it just before and change out and that kind of thing. She was proud of herself for winning that battle. So, I think from her I get that idea of playfulness and not accepting things as society presents it to you. I absolutely get that from her."

We discussed how this refusal to accept the boundaries imposed on oneself is an important strategy of resilience, to reject the fixed and rigid and defined in favour of flows and transitions; I talked about the COVID pandemic, and how it acted to uproot and disrupt social structures, allowing people to enact different sorts of futures, where people with power might resist change, but those without may see the potential for more positive outcomes.

"In terms of like resilience, I have to think in those terms. I was at a staff conference (on Zoom) earlier in the week where we had an incredible person who presented, and they were talking a lot about what you would normally expect people to talk about in a crisis in terms of trying to help people. So, mindfulness and psychological processes that you use to get yourself out of a state of anxiety, and halfway through it I realized, well, I've been through therapy so many times now, this isn't quite so new, but one thing that he mentioned was about resilience."

And it just got me thinking that I think I'm at a point where it doesn't really matter what happens anymore. Like, I'm just still gonna get through it. Which is crazy, because last week my aunt died—not from Covid but from cancer—and while I was in quarantine my mom told me that my cousin who's back in the UK, in Reading, he's just been given weeks to live. The reason why I'm here in Australia is because my grandmother had a stroke, like a very mild stroke. She's fully recovered, mostly recovered. In terms of mental faculty, she has dementia, and now she has been deemed as needing full-time care. So, I was really hoping that I would have got to see her, you know, back in April when she was still living with my parents and I would have had no time restraints, but now I've had to only see her for an hour at a time in full PPE (Personal Protective Equipment).

"On top of that, she's just been absolutely beside herself because she has dementia but that's not a fixed thing. And when she's completely lucid and with it, she knows what's happening. And

she's absolutely devastated that she's now living in a home, and she never wanted this. She's always been the person who's like, "I can still look after myself", and now she's coming to terms with that, and it's just been absolutely heartbreaking. So, I love this. And I just lost my job last week, you know, well my main job, so yeah, it's just like, "what else can you throw at me?" So, it was again this idea of resilience, you know, what can you do?"

I talked about the idea that marginal, outsider communities or beings often need to be more resilient because they're more vulnerable, but can be more capable of resisting sudden shocks than more powerful entities, that never had to develop those capabilities—I gave the example of a little plant (I had in mind the *Chrozophora* plant that Elizabeth Langford talked about, a dry, spiky, mean looking plant, alone in a dry field, with a big tap root) needing to be more resilient than a tree in a forest.

"Yea, exactly, the more it encounters hardship the stronger it becomes. I think that's interesting. You've reminded me of a thought that I had a few years ago which was something on the lines of… I want to call it, well this isn't the thought I had, but this is now what I call it, I'm just a Flesh Prison. Basically, whatever happens to the outside of this, there is still something inside of me that is being protected by whatever it is that is this exterior. And so, you know, I could see the hardships and the things that I've been through, but that hadn't extinguished what was inside. So, you know, it's a good parallel, I think, with what you said with the little plant."

Drag Culture

We returned to the topic of drag, and their drag practice that combines classical music and drag performance. *Ru Paul's Drag Race* seems to have some well-defined 'types' of drag queen: beauty pageant, funny, scare… Has there ever been a classical musician drag queen?

"There has. Georgie Thor is a violinist, and she was on *Drag Race*. She now does regular concerts across the US. I can't actually find any whole recordings of numbers that she does with the violin, so it's difficult for me to know what exactly she is doing with it, but from what I can see from the programming and from how it's been advertised, I think it's like a variety show. So, it's not just the violin, but it's there's some lip-syncing, there's some maybe some singing, some collaborations with other musicians, and you know performing as soloist with a that virtuoso sense right in front of an orchestra, I think those kinds of things. So that's been explored as a soloist, but you're right, in terms of *Ru Paul's Drag Race* format, that is only one aspect of drag."

"It's based in pageantry, and because it's a competition, they try to get people who can compete on a set playing field. They have very specific parameters, some of which I really do not agree with in terms of the identities that they allow on the show. Because since then there have been other shows like *Dragula* which have been much more diverse in having lots of other gender identities. But also, in terms of the prevalence of high fashion, that's been borrowed from TV

shows like *America's Next Top Model* and *Project Runway*, who have also recently come under a lot of fire for not being diverse enough and for having concepts that are putting forward an idealized [identity] that is so systemically racist; *Drag Race* really suffers from that as well."

I think it's alright to acknowledge that there are parts of drag that aren't represented in that show. Because I don't feel like a performer that does the kind of things that I want to do fit into a show like that. I'm still in two minds about that because, like I said earlier, I do enjoy the playfulness of being able to do anything. I am exploring all genres of music, not just classical, with drag. I was forced into this classical world because I play the clarinet. But I never actually decided, hang on, I want to be a classical clarinettist. I just wanted to do everything that you could possibly do on the clarinet, [but] you have to do it at a classical college. You can't do a jazz course on the clarinet, you can only do saxophone, which is just like, "what? They're basically the same instrument, they're variations on a very similar instrument."

"Probably [now] we've got more degrees available and more schools available, and more and more demand. I think you can probably get away with doing it, but certainly when I did my undergrad in Australia that wasn't an option. I wanted to do more jazz, so I took up saxophone as well, but everyone was telling me you have to specialize—and it was the same with dance. I wanted to study both, I wanted to do a double degree of dance and music, and no one would let me do it."

"And on top of that I wanted to do clarinet and saxophone, but no one would let me do it. And now I feel like I've wasted a lot of time doing all this classical stuff which has got me nowhere. Unless I can play clarinet concertos and orchestral music and chamber music to a professional level, that's not making any money. Whereas drag, there's more of an audience for drag, so actually if I was allowed to do my art form the way I wanted from the beginning…"

"To go back to the idea of performance, yeah, there are some incredible performers that do push the boundaries and do amazing things that aren't represented on shows like *Drag Race*."

I recalled that the British drag community had concerns that the UK version of *Drag Race* made by the BBC was importing a US model of drag that wasn't a good fit with the British approach; in particular, performers on the US *Drag Race* seem to take themselves very seriously, but British drag tends to be sillier and more rebellious. There's a tradition of performative silliness, particularly involving forms of drag, like the pantomime.

"Yeah, there's this tradition the sarcastic middle-aged drag queen sitting in a stool just insulting people in the bar. I've seen a few shows like that in central London, but also, my best friend lives in Kent and they have a monthly drag night, I think it's at the Prince of Orange pub. Anyway, that's been quite interesting because you would get these very regional drag queens who are exactly like you say, the driest wit, just insulting everyone in the room. And some of them do it

incredibly well, where you're in on the joke and it's all fine, but there was once it was just so awkward because all they did was just insult people, and yeah, it's just offensive. I can't focus on that line, it can be a dangerous thing to get right, that balance, I can say."

The British version of *Drag Race* seemed to be a version of Britishness packaged for the American audience: the Queen, *Downton Abbey*, cultural references that people have for Britain that British people don't necessarily identify with.

"Yeah, it was very much, 'oh, let's just make every British stereotype we possibly can with this.' It was just a bit tiresome. And all it really did was highlight how overly produced the whole conversation really was."

"There were people who were getting really bad comments for stuff that really shouldn't have got bad comments. And after a while, you start to see the way that the feedback is given to them by the judges is tailored in a way because they want certain people to be viewed as doing well and others as not. And that was the most dramatic example of that because you could see people who were really rubbish just being given free passes, while other people, who had actually done incredibly well, were edited in such a way that it looked not so good and then they just found one detail and then slated them for it in the judgment and then they get sent home and it's like 'what? What's happening here? Are you seeing what I'm seeing?',"

"So yeah, all it really did was just show how it's just not real and it just made me wonder what the actual agenda was underneath all of that. Like as you say it was just to find a version of British drag that we can show to the American market; who of these drag queens has the most American aesthetic that we can justify as being a good winner? I mean, I'm not saying that's what happened, but it just felt really weird. The whole thing just felt really weird. My flatmate, who's also a drag queen, and I would watch it and afterwards we'd just look at each other in horror and be like, 'what are they singing? Are we watching the same show as the judges?' Like, yeah, it was just so strange. It was so bizarre and really awkward."

Is it strange, if you think of drag as a way to escape categorisation and binaries and as a way of playing with identity, that it's framed as a competition? What does it mean to win at drag?

"I think Drag Race originally, when it started, it felt like there was equal value put forward in the fact that you just got on the show and were able to compete in such a way that really highlighted the best that you could possibly be. And then, so long as everyone was doing that, it didn't really matter in the end who won. So, that's been the mantra they were selling to us in the earlier seasons. You still get reminded of that every now and then. I think what they've been trying to show is like some parallel with life, because at the end of the day, there are these comparative situations where there can only be one person to do something. And so, a decision has to be made, and sometimes it's going to feel like the right decision, and sometimes it's not.

And that's life. So, I think that's my takeaway from it anyway. So, I'm never really that insulted by who wins, because it's also subjective as well." It ultimately it boils down to Ru Paul's vision of what drag is. "It's one person's idea".

It is very impressive and admirable that they've managed to take something as marginal and queer as drag and bring it into the mainstream, and the fact that it draws on the ballroom culture of New York in the 1980s that provided community and solidarity for queer and trans people, in the face of the HIV epidemic and widespread prejudice.

"I was going to say in a time when homosexuality was less accepted, but actually even now there's been major backpedalling in the US and I wanted to say it's somewhat accepted, but that comes from me being in a very privileged position. It was a time when people were more frequently thrown out of homes for being gay—but I actually know people who have just been thrown out of homes for being gay in London. So, the purpose of these ballrooms was to provide family for people who suddenly didn't have it."

"And also, for the trans community to find somewhere to be accepted, especially trans people because they were and still are the most targeted people for abuse. If we're talking about a sense of providing for resilience and for providing people like that somewhere to flourish is so important. And, yeah, they have to be the most resilient people that there are, to be able to keep going when so much of that is thrown at you."

Joana Robalo

Joana Robalo (uses she/her pronouns) is a conservation biologist at MARE (Marine and Environmental Science Centre) in Lisbon, whose work focuses on endangered freshwater fishes in Portugal and Spain, particularly related to their evolution, taxonomy, and genetic geographical distribution; in addition, she teaches students at ISPA (University Institute of Psychological, Social and Life Sciences) on biology and psychology degree programmes, where she is the director of the biology degree and teaches biology and neuroscience to psychologists.

She describes herself as a "problem-focused researcher" who doesn't focus on studying specific species, but is more concerned with problems related to fisheries, conservation or taxonomy. Working mainly in molecular genetics, she uses genetic techniques to understand species, whether related to "population biology, speciation, or the genealogical relationships between the species". Traditionally, zoologists focus their attention on specific species groups, but her approach involves "working with different species and learning a bit more about them and integrating all the information that we can get through molecular tools, with ecology, life history, and bio-configurations".

Joana explains that there are also many strategies by which biodiversity can be assessed through these molecular genetic methods, for example, often genetic analysis enables the identification of separate species that are often cryptic because, while being genetically distinct, they don't differ much in morphology or behaviour. These analyses can lead to other ways to identify them in the wild. More recently, techniques involving Environmental DNA (eDNA) have been developed, where the DNA present in the environment can be used to check which species are in the area.

"We have all these biodiversity indices and genetic tools that are proving to be—at least in the freshwater realm—are proving to be very effective in detecting new species and also not new species, detecting species that are not very abundant and that you do not catch as frequently as others, and also to detect newcomers like invaders. So that is becoming a very important tool to detect bio-invasions in the marine areas due to the specific characteristics of the marine environment."

Public Engagement with Biodiversity

There are many ways to approach studying biodiversity, but one of the most important and difficult challenges is communicating it to the general public. Joana explains that this isn't easy, as it is necessary to find a way for people to care about it, and to publicise it well. "Because people don't care if a small fish is endangered. I think it's also a question of credibility because people sometimes don't understand the scientific process and methods".

Joana discovered a new fish in small rivers in Portugal, which had been considered to be the same species as another fish elsewhere in the country, but it was discovered to be a different species. "I got letters from people where the fish occurs telling me that, 'no, it's not a new species, it has always been here'. People should be happy because they have a special thing around their houses, but they said 'no, this is not new, we eat this, it isn't new' ". In effect, people didn't want to acknowledge the new species, perhaps because they'd feel obliged to care more for it, rather than eat it.

"I think we have an obligation to learn to communicate better. But the problem is that it's difficult to communicate just based on species and numbers. You can tell people that we are losing so many species per year, but they somehow seem to not to relate to them."

Some of her colleagues are trying to change this through two research projects to promote biodiversity in young children. These interactive initiatives involve talks, games, river visits, diving lessons, and classroom activities about the importance of healthy rivers, and marine biodiversity. Their focus is more on young children, rather than teenagers or adults, as young children tend to have more open minds on these topics.

Ethical Responsibility through Storytelling

I introduces Donna Haraway's proposition that storytelling is a way to engender an ethical responsibility in the listener: the idea that if you engage with someone's story, and care about it, then you're implicated to take care of it, too. I suggested that this was what the projects with the schoolchildren aimed to do, by engaging them in the story of their local ecosystem.

Joana agreed that this is a reality that needs to be considered in biodiversity studies. She mentioned initiatives such as adopting a stretch of a river, or adopting a shark as ways that are used to connect people to nature and get involved, "but somehow, I think we're not doing enough. Because I think people in general are disconnected with nature." Often when people do go into nature, there's an artificiality to it, such as the practice of "glamping"—glamorous camping, usually in luxury tents, which aims to recreate the experience of staying in a luxury hotel, but in the wild. "So you go to nature, but you do not touch it; you go and see it, but behind your rules"

"For most people nature is just like an abstract entity; they like the concept, they like seeing it "over there" but they do not want to confront themselves with that. And if you start saying that species are disappearing and that everything is collapsing, it's like when you see that an earthquake has caused so many deaths in a foreign country." You care in a detached, generalised way, not personally, not as though it is really important."

Hyperlocal Community Engagement

Joana discussed the story of the small fish in detail, providing a good illustration of the complex networks of events, beings, organisations and projects that can be involved in biodiversity projects, and the ways in which the local community became engaged with the issue.

It started with work with local landowners to re-naturalise small, coastal independent rivers that were heavily polluted with agricultural runoff chemicals, and to help improve people's relationship to rivers, alongside a native fish project, and working with Non-governmental organisations to do activities with children in the rivers. At the same time, they carried out natural engineering projects to change the course of the rivers, to create calmer pools away from strong currents in which fish would be safe, planting native trees, and generally improving the river ecosystem. The discovery of the fish was a small part of this project, and local people were initially disinterested.

"So, we started developing their interest in that specific fish, and now almost all municipalities along the stretches of those small rivers are involved with the conservation projects about that fish."

Was this change partly due to involving more people in the project? “Yes, and because the rivers started being a good place to go”. She described “a chain of good things” that happened, a developing sense of “goodwill around the rivers, and I think it started with a small fish; it was the seed that was needed”: people began to take their children to the rivers due to the work being done to improve their margins, through the local government involvement the schools got involved, and people were being taught how to maintain the rivers, and manage them properly”.

She emphasises that this initiative worked specifically due to its small, hyperlocal scale, working on small rivers. “Because here we can go to the local government and then the people over there, they know that the owner of this specific land and then the people of the local non-governmental organizations get involved and then you can do a chain of good deeds, and the children are involved: the children take their parents to the river, and then it all turns out good.” It wouldn’t be possible to do this in a larger river that crosses many different localities.

It is a similar situation in marine protected areas (MPAs): the diving projects with children focused on specific marine protected tidal areas in Cascais and Sintra, and involved the local municipalities who wanted to know what organisms are on the beach, and again, “it is due to the scale that we can do this.”

How do these activities relate to more traditional scientific research, are they equally important in terms of the impact of your work?

Joana argues that her work has very little immediate impact, as she doesn’t work in an applied field, researching a specific disease, like cancer or Parkinson’s, but that working with children to make them think about biodiversity and how humans relate to the ecosystem, has the potential to have a great impact. “I think that with some concepts, some seeds must be planted in early ages. Because you can teach an adult to recycle but it is not the same thing. Children are open to these things. So, I would say that to make a difference, yes. I think these actions are even more important than the other science that we do”

There is still a great deal of work to be done with the general public in communicating science. “Children get enthusiastic about many different things”, but adults are more pragmatic. “To get an adult happy or excited about some scientific discovery, it should be something that they really relate to, like a cure for something”.

For example, if you told children about fish being shipped for thousands of kilometres on a truck, they might care about the ecological impact, but adults “just pay attention to how much does it cost. You can think if it has more chemicals or less chemicals, but more or less, the question will always be around the price”. This is why she believes focusing engagement efforts on young children is of prime importance, whatever the subject: “if you want to talk about

cultural diversity or gender-related issues, as it was with recycling, as it was with everything, you should plant the seeds in an early phase."

Why is engagement with biodiversity important?

Pragmatically, "nature has lots of solutions for present and future problems: you can go and look for inspiration in nature foe everything—architecture, engineering, arts—so nature is a source of inspiration and of ideas. Sometimes nature finds solutions for many different problems and many different solutions for the same problem. You can find that if you look at evolution, you can have non-related species with the same solutions or you can find related species with different solutions to the same problem. So, it's a source of ideas. That's the utilitarian response."

But there's also an ethical aspect to it, too. "We have a responsibility to keep as many species and diversity as we find. It's not possible because lots of species have already been lost. But I think we should try not to ruin anything. So, we should also try to adapt to a lower exploitation price. But this I think is a political question, because capitalism does not prepare us to live with less, only to want more. To have more, to increase."

She sees many ecological "trends" as fake: there is the argument that everyone should have electrical cars, but "where do the minerals for the batteries come from? What are the benefits and what are the problems this causes? My idea is that we should use only the resources that we need. That is my idea of keeping biodiversity. Try to ruin as little as we can."

She acknowledges that this is utopian, "because everything that we touch, everything that we do, ruins some things. I'm not saying that we should go wild again, and we should go live in caves or something like that." It is important to be a responsible consumer, though. Do you need to buy a new phone when you have one that does everything you need, or a new car when the one you have still moves? "But I think that people are not prepared to do this turnover"

During the coronavirus pandemic, which was in its early stages at the time of the interview, people argued that the pandemic would make people re-evaluate the way we live, and to realise what is really important. "I don't think so! Give them 15 days and we will all be the same." People adapt to changes in situation quickly: "now we cannot even remember almost some things that we did pre-COVID. I think that when it ends, we will always remember the year that we stayed at home. But I think we will resume consuming at the same rate very shortly—maybe accelerated, because people will feel that they deserve it. I think that will happen.". Considering where the world is at in 2023, two years out from the end of the pandemic, I'd say that she was right.

We discussed more about the complexities of the responsibilities of humans towards the ecosystem, particularly regarding changes in species distribution due to invasion, and human involvement in that. Should we be trying to stop invasive species, or is this just a natural process? We discussed a paper she had published regarding an invasive fish that affected the level of aggression in other fish in the area.

“Yes, I think we should prevent the invasive species because they cause lots of problems in the ecosystem as a whole.” She distinguishes between two mechanisms of invasion; by fish naturally expanding their natural distribution areas, often due to ocean warming, and by being directly transported by human activity: from the water discharged from fishing board, or by people discarding exotic pet species in rivers.

If they arrive on their own, because the water is warmer through human activity, “that is a problem, but it is a global problem that we”—as individuals—”cannot address easily.” But the arrivals that are transported by humans are a big problem that can be addressed: marine transplantations can compete with other species, even commercially important ones, for food and shelter, they can eat the local fish, and sometimes they will hybridise with them. “That is also a problem, because it’s normal that species are changing through time, but not hybridizing with species that were not there before”

I talked about some of Maria Puig de Bellacasa’s ideas about care and neglect, where choosing to take care of some things implies neglect of others: in a way, are we not neglecting these invasive species, by putting them in places they shouldn’t be, then abandoning them? I gave the example of the forest management measures in Mata de Machada, a local woodland park in Barreiro, Portugal, where invasive plants such as chorão (ice plant) and acacia, which had been planted for land management purposes, are being systematically removed using volunteers. “The problem with the chorão and with the acacia is that they don’t let any native plants grow. In Sintra we have a huge problem with acacia because the seeds that are on the ground all grow so fast, the plants grow so fast that they make a huge cover and there is nothing that can grow over there. And that is a problem.”

Regarding chorão, she told an interesting story that highlights how complex and delicately balances ecosystems are, and how human actions can have unintended and large consequences on them.

There is a group of small islands off the coast of central Portugal called the Berlengas, which had two problems caused by human decisions. The first was that chorão has the ability to retain soil. Many of the native plants on the island had died, and the soil was washed out to sea, so planting chorão seemed to be a good idea to retain the land. “The problem is that it is not the native plant, so it was not a good long-term solution.” The other problem is that the islands were overpopulated by seagulls. In the past, people collected seagull eggs to use for food, but the

seagulls ate a lot of garbage, and it made people sick, so they were banned from eating seagull eggs. However, this caused a population explosion of seagulls, resulting in around 42,000 breeding couples, who became really aggressive during breeding season. So now there was too many seagulls, and too much chorão, both caused by human action, and nobody could manage the chorão because the seagulls were too aggressive. To solve the seagull problem, they tried to remove their eggs, but they simply laid more, so they had to deactivate the eggs and replace them in the nests, and this started to reduce the seagull numbers, and eventually the chorão could be removed and replaced by native plants.

It's not always possible to restore an ecosystem in such a direct way. "if you go back to a river, you cannot put the river in a pristine way. You cannot do that. So, what you can do is that if you recover the [area] around the river with the natural vegetation, then you will have to let the river re-naturalize itself. Trees and the bushes, the amphibians will come, the birds will come."

Often, this may not be due to a specific act of care, but through natural changes in human activity. Compared to twenty years ago, there are more birds around fields and rivers, because, similar to the seagulls, children used to catch little birds, or steal their eggs. But many small villages have been abandoned, and children lost interest in chasing birds, so the bird populations began to recover. "So, not everything is bad. Sometimes nature has a really good resilience. So, if you don't attack, sometimes it will get better by itself"

Dinis Machado

Dinis Machado (uses they/them pronouns) is a Portuguese choreographer living in Stockholm, Sweden, who identifies as gender non-binary and trans-feminine. Their choreography practice is situated at the intersection of theatre and visual arts, and explores the ways bodies are constructed in space, how the construction transforms the body, and how these constructed bodies move: the labour of construction.

This informs their choreography practice and process. They think of bodies and movements in a multi-dimensional way, with movement thought of not just as physical displacement, but others sorts of change: of time, of intensity, of emotion, of paradigms. They work with their own body, and other queer performers, particularly where queerness is intersectional with disability, migration, cultural background and race. "These identity questions, they produce experiences in the body. It's different to grow up and to live with these kinds of issues. I choreograph these bodies with this luggage; because I also choreograph narratives, they are present both through the way that these experiences kind of shape these bodies, but also through the kind of narratives that this body is with them."

They approach their work with dancers in a collaborative way, with their approach based not on prescribed movements, but on posing problems and working through their solutions: "I usually

produce problems for a dancer, and they will resolve it into a movement, or transform it". In one project, they walked in the park with dancers and asked them to re-enact the experience with eyes closed in the studio; in another, they asked dancers to manipulate each others' bodies and to "reconstitute the sensations that this experience produced in their body and to produce movement out of it" and then transform them, changing speed or intensity or building a narrative. "Its shape, its intensity, the experience of it is really very important". They describe this as a process of creating different grammars of movement, taking parts from different prescribed collections (such as in classical ballet) of grammars and combining them into something else "as a way of experimenting and thinking a multidimensional body".

This is situated in a queer perspective of experiencing the body and its emotional landscapes in different ways, "almost like different bodies, with very different textures and with very different mechanisms": digital bodies, sexual bodies, working bodies, our bodies in public. They're interested in how to navigate these different bodies, "to activate some and to deactivate others and to alternate in-between". They have a strong interest in rituals, how the body is transformed by hours of sleep, or hiking, or dancing at a club, becoming different bodies in the process.

"As a non-binary and trans-feminine person, I'm always leaving several bodies that are not only my body: there are all my bodies and then there are also all the bodies that people project on me". They aren't motivated by responding to the perceptions of other people, but on "enabling certain fields and experiences and potentials" that were forbidden to them through being assigned male. For them, performance isn't motivated by queer visibility, but of how to think about transness and queerness through performance as a way of occupying space, of the body as performance.

They think of their movement work as a form of non-religious spirituality situated in a "sensorial relationship with the body", much like the spirituality of observing or being in nature, where the complexity of the body can be contemplated and allowed. "Because, traditionally, the way that we build identity is so much about reducing the possibilities of the body so that you build this coherent image of yourself, and sometimes it's more about unbuilding that and allowing the body to be able to be more things at the same time. It's useful to put aside this coherent image of self and be more expansive."

A queer and ecological reading of bodies is as sites of transition, not from one thing to another, but as continual processes of mutation. Dinis works a lot with the idea of decomposition, where things grow, decompose, and become other bodies, other organisms. "You understand that body is really a movement more than a thing. The body is the different organisations of this matter, rather than the matter itself. So, then the body becomes something almost intangible." Many people face questions of multiplicity, mutation, and gender ambiguity, but "in a lot of places in our society we are not really allowed to listen to these transitions. You are programmed to

establish a life in your 20s or 30s and then be coherent for the rest of your life with that choice". It is something that people can struggle to talk about or express, and Dinis sees the role of art as a way to make visible many of the things people experience in silence.

Dinis explores notions of identity "through the way the body relates with others" and asks "what politics does our body enact in a space? How does it position itself?" Discussing the notion that one's identity can be shaped by our meetings with others, they emphasise the importance of solitude and being alone for queer people. They consider this in relation to having to stay at home during the COVID pandemic, creating a safe space where they can be with themselves, and how that changes to a more calculated approach in relation to others when leaving home.

Consider the example of the different experience of wearing a skirt in public, in the city, versus wearing it alone, in the woods. "I think that when you're a queer person in the city, the experience of the gaze of the others is much more prevalent. The encounters that you're having affect the body that you're inhabiting: wearing a skirt in Stockholm versus in the woods is configuring you to be a different sort of being. If I wear a skirt and I go to the street, the presence of people looking at me is so strong, but if I wear a skirt and I go for a walk in the forest, what this produces is an experience of this garment, it's the way that this skirt transforms my body, it's the way that it flows in the wind and how do I walk with it."

There is also the queer experience of being alone in busy places, such as the space that is afforded in a nightclub or a rave, "where you can be alone and are surrounded with people but you don't need to interact with them so much and it's dark so they will not look so much at you. So, you suddenly can fantasize about your body, or you can experiment with your body in a way that is also collective and alone"

This process of fabulation and imagination, of thinking of different ways to be in the world, is important to performativity, because "the way we think our bodies transforms what our bodies are. One of the strongest way of norms is the way that we are taught to imagine our bodies. It is very difficult for us to imagine ourselves in a different way. This relates with this question of multiple bodies: how can we learn to navigate; how can we practice making our minds navigate more bodies than the ones that we imagine we have? And I think that's really… that's choreography for me."

For Dinis, transitional states are important, and in their work, they are "mostly busy with in-betweenness". Often movements are thought of as linear things, measured by where they begin and end, but we think less about the transition, what happens in between. But movements can be something else, a quality or a landscape, of things going somewhere even when they don't look like they are. "In the mainstream imaginarium, when people think of dance or movement, they think of a body moving from a clear position to another clear position. And that's what we

also call beauty is when we can recognize a shape. But I'm very interested in producing and working with shapes of in-betweenness, shapes of definition, shapes of weirdness."

"And I think that's relating with queerness on a structural way. Because that's what it means. That's the experience that queer bodies have, the experience of not having a name, of being a kind of nothingness, something that hegemonic society doesn't have a place for. I am interested in bodies and movements that are in a space of in-betweenness, that are unnamed by society, but also by ourselves"

Through their practice, Dinis is able to "work with these spaces of in-betweenness, working with them as a something that has a right on its own" to exist. These are places that are difficult to get to directly "because if we try to do a movement of in-betweenness without a name, no one can do that, because we only can do what we can imagine". They use "scores and scripts and instructions to allow us to arrive at places we can't get to directly". To arrive at new relationships with our bodies, they work on confusing the body, overloading it with information and forcing it into a new space. Performance has an important task "to reinvent imaginariums to produce images that can make our spectators imagine other bodies, other ways to exist within a body."

We discussed one of their performances, which I had seen, in more detail, Consubstantiation (2020), which was presented in Lisbon, Covilha and Bilbao. In this solo work, Dinis explored, from a queer perspective, the somatic, bodily experience of pregnancy. Starting from interviews with a woman during her pregnancy, where she was asked to describe (in subjective, non-medical terms) the transformations in her body, Dinis worked with this as a score for their own bodily movements, finding ways to experience it as real. "This is a very big obsession for me, that if you imagine things a lot or if you imagine things the right way, they become a reality." In another work, he told a group of dancers the details of the day in a life of people living on an island, and they worked for months on re-enacting that day from memory, day after day, until they had a sensorial, lived memory of life on the island, producing echoes of it in their bodies.

With their Catholic upbringing, birth was emphasised as something sacred and violent, as well as a way to disregard queer bodies as in-valid: if queer relationships do not reproduce, do not facilitate the sacredness of birth, then they are wrong: "you're a machine that doesn't work". They considered what questions society projects onto them, as someone assigned to be male at birth but displaced from there; the fact that their family members wouldn't ask them about having kids, as they assume it's an experience their body can't have. They wanted to ask "what it means to drag through a somatic experience this event that is such a keystone of heterosexuality"

Dinis was interested in the ritualistic nature of the process, of what is born of something that produces intense sensations and emotions in the body, but no baby, and how that resonates with the history of rituals. They saw it as a puzzle for the body, that causes it to be de-

anthropomorphised: “you start twisting the body, little by little, and each one of these little twists is tangible, you have a contraction here but then at the same time you have this other thing that is going there, and all of a sudden your body finds itself in a very complex state. A state that is crossing a lot of events and different kinds of movements.” It’s a way to “build altered states of mind through tangible realities”, grabbing the body “piece by piece until you find your body taken by all these procedures that you start enacting and these procedures allow you to abandon yourself”.

For Dinis, this raises a lot of questions about ideas of freedom. Often, historically, freedom is thought of as a liberation from everything, but as a queer person, it’s “very difficult to just go and be free. Like you have so many rules about your body. I think we can only build freedom through criteria. If we think about BDSM sexualities, for example, it’s exactly the same thing. In heterosexual normative sexuality there is this imaginary of freedom, that you just find your monogamic mirror soul and you just lose [yourself] in a kind of evident freedom; that’s so obviously a lie, and that’s why we have such a horrible relationship with sexuality. It’s why so many people kind of stop having sexuality because there is this idea that sexuality is something that you don’t talk about, that you don’t negotiate, that is something that should happen through this magical force that comes and takes you. And I think that’s exactly what BDSM, and other ways of negotiating sexuality are, is that you talk with the other people that you’re having sex with, and you say, “hey, let’s try to do this in this other different way.”

“Even if you are aware that there’s all the things you are not aware of, there are ways of doing things. But even the ones that you are aware, when you decide ‘I do this always like this, so I will not do it.’ But for not doing it, you have to invent another way. Like you can’t just not do it, you have to invent another way of doing it. You have to create another procedure to erase that one. Because there is no not doing it, like there is no point zero. So, the way to change a way of doing something is to decide another way of doing that same thing.”

“As a queer person and within all these things that I was already saying about how I think of identities as mutable places and as places of transition, I think I’m very interested in substituting these dogmatic ways that we learn to do things by provisional things. I have a very hard time thinking on the right way to do it now, and then we’ll see tomorrow if I’ll do it differently or not.”

“Because we are prisoners of the things that we can imagine, it requires twisting, it requires proposing ourselves to other ways to find new spaces, otherwise we’ll just be reproducing these imaginariums that we already have in our heads.”

Do new ways of being exist in the shadow of things that already exist?

“I have a hard time with the idea of new. Like, all these things that I am, they are new, they are new iterations. Like, there are marks of our times, but all these things, we are relating also with practices and forces that have been there all forever.”

“I’m relating with a trans-like experience, that I’m rewriting within my contingencies and the contingencies of my time. Outside of time. Of historical time, but also of our life narrative. Our lifeline. I’m very interested by these ways of thinking time non-linearly like as if our body already contains everything that we will do, these things are just manifesting certain points. There are all these expectations and structures in society that say things should be this and things should be that, but it’s not really about trying to find new experiences so much as stepping outside of those expectations, stepping outside of the future that we’re sort of locked into and being able to find different things that the future could be that may also be things that are from the past perhaps.”

Dinis believes it’s not about connecting with our desires so much as “it’s connecting with the bodies that we desire for ourselves with the sexualities that we desire for ourselves with the sensations that we desire for ourselves. How to develop tools to materialize those things.”

Andrew Gardner

Andrew Gardner (uses he/him pronouns) is an archaeologist based at UCL in London, who specialises in Roman Britain. In 2016, I interviewed him to talk about temporality, materiality, and designing for the far future.

Interest in time and temporality

My interest in time and temporality come from… well, I’m an archaeologist, so obviously time is my business, as it were! Specifically, I’m interested in Roman archaeology, and we know quite a bit about Roman time concepts, so I have an interest in those, both in kind of everyday time, calendrical time, but also perceptions of change and continuity. That then relates to a bigger issue I’m interested in, which is how time concepts affect action, affect people’s choices in how they live their lives, which relates to broader issues both of cosmology, and the politics of time: if you like, why people think about the future in particular ways and how that relates to the past—in the past, and now in the present, and I suppose potentially in the future. Now the past is often used to legitimise the present in terms of political agendas, but then also to give a shape to the future in terms of whether we’re going to progress—as a species, or as individual cultural groups—or are expecting problems. All these kinds of issues are framed in relation to the past and how we think humans have dealt with things in the past, or not. Have we learned lessons from the past, or not?

Tangentially, I also have a personal interest in science fiction and fantasy fiction, I guess all of which involve often temporal phenomena, like lost civilisations. Whether it's in a fantasy medieval setting, where there's often echoes of the remnants of Roman high civilisation, or in the future where there's often an idea of society becoming more kind of dystopian, and more of an echo of previous civilisations. In that realm I'm interested in how time, or temporal transformation, is a big part of how we create the particular character of a particular context, and a particular present.

The difference between the ways that people think about times outside of their own that are close in contrast to far distant

Thinking about the differences between scales of time, in terms of everyday perception, it would be easy to say that people find it pretty difficult to think about big timescales, and arguably there's the particular political problem with that right now in terms of climate change. One of the issues there is how do you get people to do something on a short-term timescale, i.e. recycle more, or whatever, which is at the everyday scale, in order to influence something which is, for most people, quite difficult to imagine future scale—although it may actually be getting closer all the time. The point is the articulation of the small and the large scale; the daily events are difficult to leverage into the large-scale events of a future which may be at least a generation distant.

In terms of the past, I think it does vary quite a bit, sometimes people can feel quite strong connections to relatively deep antiquity, but usually that has been crafted through the way particular national ideologies are framed. I'm often interested in how people speak of people of the past, whether they identify them as 'us' or as 'them'. It can be quite telling when people talk of the Britons in the Roman period, for example, as 'us' or 'we', so there's clearly a sense of continuity there going back two thousand years, which in reality is pretty questionable, but people have that kind of feeling of affinity.

But certainly, I think that in terms of how people come to learn about antiquity, one of the challenges one faces in educating young people about the past is this temporal gulf, and it is quite difficult to build up the visualisation of that depth of antiquity. Obviously as people get older that becomes more familiar, but there are still these moments which people kind of are drawn to in deeper antiquity. I guess they are things we tend to know something about, but maybe not everything, and so often people are drawn to points in time where there's sort of more of a mystery, but there's enough to go on. Then there are deeper periods of prehistory where we know quite a lot but nothing like as much as we know about more recent times. Those are perhaps less widely appreciated. So, I think people certainly can readily develop an affinity for points in time beyond their lifespan or their immediate ancestors, but there are certain kinds of temporal horizon that draw people's attention more than others.

And often, I suppose, these are things which are marked by particular material signatures as well. That serve as icons of that particular moment in time. Whether it's hand axes or pyramids or Samian pottery for the Romans or something like that, there are Iconic Material Objects which mark those moments.

The value of material objects and artefacts in mediating a relationship with other times

The value of objects in mediating the relationship between the present and the past is pretty profound. It is said by almost every person I've come across who's interested in archaeology or becomes an archaeologist that the tangibility of the past is in touching objects that you excavate and have not been seen or handled for however long an interval. That is the kind of attraction of doing it. And I think I'd say the same for myself actually, having been interested in history, I became an archaeologist because it was about the tangibility and the immediacy, and obviously that relates to a human engagement with the material world in a more profound way.

Artefacts are pretty important to the way human consciousness interacts with the world, and particularly we have a strong sense of the temporality of artefacts. They're an important benchmark I suppose for change, and continuity, and aside from the aging of our own bodies, they're the things that keep us located in time, that allow us to imagine both past and future times, and we have to do that in order to be able to operate in a daily basis. We're always oriented both towards where we've come from and where we're going, and obviously different cultures construct those points of reference in different ways but that seems to be a pretty fundamental part of being human.

And of course, artefacts can often be not only important in themselves, but speaking of archaeological artefacts, they can be inspiring of contemporary artefacts which evoke a different time. So, a lot of the design repertoire of the contemporary world is all framed in points of reference in material culture that come from either previous times or are in Modernism a direct reaction to or rejection of that kind of aesthetic. But there's always that kind of relationship. You're either doing something deliberately new or you're doing something deliberately old, and that's in reference to the materiality of the past, which is all we have of the past: the past doesn't exist in itself, but it exists through the things that still exist.

Value of objects in providing a connection to a future time rather than the past.

So, the connection between the present and the future through material culture is, I think, a really interesting question. Because at this moment in time, we probably think about this more than anybody ever has. Absolutely, different cultures in the past oriented themselves to a future, and that future was imagined rather differently to how we would imagine it now. But I think, and it's an often-repeated axiom in archaeology, when we're talking about cultures in the past, we generally operate on the assumption that they were not doing what they did because they

thought somebody would be digging it up two thousand years later and speculating on its purpose. They were acting in the present for relatively short term goals, and obviously weren't anticipating the actions of archaeologists or historians now; in contrast we now actually do anticipate the actions of archaeologists in the future, or historians in the future, and a lot of the things that we do 'for posterity', that whole concept of posterity, the idea of a future that cares about the past, I think is a fairly modern phenomenon. But of course, its resting on certain assumptions about continuity, of about communicability, the notion that the records we keep now will somehow be meaningful in the future, but of course, actually, whilst humans generally seem to care about the past, that can be manifest in quite different ways, and so may not be the same kind of relationship to the future past as we have with our present past.

In other words, we want to preserve and learn from aspects of the past. It may not be how people in the future think about the past. So, on the one hand at the moment, we're in a period of incredibly fast technological change, which is interesting in comparison to most periods of human history. Things are changing now more quickly in terms of technology than they have in pretty much any other moment you could point to, and maybe that's relevant to why we also think now about the long-term future of humanity and how that's going to play out. That's even more of a problem with reference to particular things like climate change, but also simply in terms of: can we expect the pace of change we have now to continue, is it going to get thrown off whack completely, will things slow down, will there be a collapse of civilisation, or will things somehow keep getting more intense? Because the future in many ways seems more unknown, we're also trying to control it by projecting ourselves into the future in terms of designing for the future, in terms of thinking about how we might preserve things for the future. Whether it might be managing nuclear waste, whether it be making sure that records we have right now in digital form are future proof in terms of what technologies might be available to read certain file types—given that we know that we have already been through several forms of data storage in the last forty years! So, what's going to happen in the future? That's obviously a big problem so we're anticipating those problems, but precisely because those things are changing so quickly right now, that it's actually hard to imagine what will be mediating the relationship between future people and us. And I suppose by extension, even further back in time.

The other aspect is the sheer materiality of contemporary life. Again, different periods in the past are more or less sort of materialistic: for example, in British archaeology the Roman period stands out because it's a relatively materialistic period, not necessarily in the sense that it's consumerist or anything like that, but it has a large material imprint, a lot of stuff around that happens to be the stuff that survives quite well in archaeological deposits: lots of pottery, lots of metalwork. The population density is still relatively low compared to today, but it stands out. But obviously in the last 150 years the amount of things in the world has grown pretty significantly, and it's becoming quite hard to imagine future people not having a clue what's going on in the year 2016 because there's just so much stuff that presents itself or will present

itself. It seems very difficult to imagine future archaeologists having some of the problems that even contemporary archaeologists have with a reasonably evidenced period like the Roman period. But again, we don't know what's going to happen. Again, we have a problem that humans have not really had before is that there are some technologies which we have developed quite recently which it's easy to imagine being completely inoperable in the future. And so that introduces new levels of unpredictability, that didn't really pertain in the past.

Value in designing for the distant future

Is there value in designing for the distant future? I think the value in designing for the far future obviously is contingent on a certain sense of ethical responsibility. That even if things don't affect anything much in your own lifetime, or even a few lifetimes hence, the fact that the scale and nature of certain aspects of the way humans have interacted with the physical world will have consequences for the distant future, which means that there's got to be value in taking responsibility for that—but of course the value in a way is nonetheless manifesting itself in the present.

We're imagining a future that we can never know; it's in our present that we are imagining it. We only have the power to influence things in the present, they will have consequences in the future, so what's the value directly for us? Anything one does ethically, is selfless, but it also makes one feel that one is doing the right thing. One does it in different domains for distant others, spatially distant others. You might do things that will not affect you directly but will affect people far away from you at the present horizon, so it's really just an inversion or a rotation of that process: that you can do things for a distant other on a temporal plane rather than a spatial plane. It boils down to your ethical responsibilities to other people.

So, I don't think there is a question that designing for the future has value. Clearly the impact of humans is now so significant that there's no question that there are going to be consequences and if we don't do anything one can predict what these consequences are; if we do something, in a way its more unpredictable, but at least there's more of a sense of ethical responsibility being fulfilled.

Do we only have an ethical responsibility to humanity, or to other life on earth and elsewhere?

Do we have an ethical responsibility to life in the rest the universe, to other life on the planet? I'd say we do. Obviously, this is an area of current debate, certainly on a terrestrial scale. I don't need to go into all the ethical dimensions to the green movement or other forms of ethical philosophy pertaining to what we might call the natural world, but clearly, we're in a time when people are thinking about new ways of configuring these ethical relationships to the planet and other animal species, to natural environments, so that's an area of ongoing debate. Fairly obviously, if we don't resolve some of those things in a way that does acknowledge ethical

relationships of some sort with other parts of the terrestrial biome then we're going to be in trouble. So even from a selfish perspective there's a reason for figuring out some of these issues.

But in the interplanetary scale, I think personally I'd advocate an ethical responsibility, though I can see that that might not be a universal response to life elsewhere in the universe. One of the interesting questions is going to be to what extent, if and when confronted by those kinds of direct situations, human actors learn from experience on Earth and the lessons there of not taking an ethical responsibility seriously are pretty clear in terms of how that usually pans out. Which is: not well. But by the same token much as we study the past in order to learn from it, it seems to be pretty commonplace that we don't learn from it, so who knows what will happen?

Appendix 2 : Speculative Fabulations

This Appendix contains the speculative fabulations from the design workshops that were generated during the *Strange Strangers* storytelling game.

These have been transcribed and edited for narrative flow from recordings of the workshop

The list at the top of each story is the *Strange Stranger* cards that were played during the game. Those underlined are the monoculture cards, and those with strikethroughs are the beings that were eliminated by the actions of the monoculture cards.

Lisbon

STORY 1

Strange Strangers
Surfer – artist – snow – worm – alien – bat – ~~dog~~ – pine tree – neurodiversity – <u>extinction event</u> – fish – fishing boat – thunderstorm

Year
7245 CE

Prompt
Strange Strangers in a Strange Land

In the year 7254, a silver surfer rides through space on their silver surfboard, arriving on a faraway ocean where strange beings look at them suspiciously. They struggle to relate, and experience a mutual sense of disengagement, but the surfer needs to engage them, as they have come from Earth on a special investigation. They are investigating the disappearance of an artist. This artist, who is neither male nor female—this place doesn't have the same approach to gender as the Earth the surfer comes from—has gone missing, and the community is worried that without art, their strange land of creativity is going to fade away.

The surfer becomes curious about some of the oceans on this planet that have become frozen and covered in snow—places where he wouldn't be able to surf—and he thinks the artist could be there. The artist had been working on an artwork, coincidentally about surfing, where he's been trying to get worms to surf in the snow on tiny surfboards.

All the beings of the sea join the surfer in his search for the artist, and they have an intense discussion about what it means to be an alien- is the surfer an alien, or the artist, or the other

beings on the planet? All they have to go on is a 5000-year-old book that the surfer has, written in the early 2000 by bad science fiction writers, with this persistent idea of the alien other. The surfer realizes that by defining the artist as an alien, it is othering them, unfairly setting them apart. They start to look at the other beings around him. They sees that they're surrounded by bat-like creatures, who, to their eyes, he is the alien. Then they realise that having travelled from the twenty first century, it's now the seventy third century, and that they've travelled through a wormhole— the wormhole transported them to the future, not through time, and they've actually been on Earth all along. The bat-like creatures are the descendants of the bats from their own time, and the snow is composed of a lot of chemical pollution from the twenty first century.

The artist was the only person who could try to unfreeze the oceans and give any chance for the future on Earth. They had taken a dog with them on their trip to the frozen oceans, because they believed in the importance of love and companionship, in taking care of each other, and the dog represented that goal to them. Their art practice is a form of radical activism, rethinking the ways that beings relate to each other, and they hoped to find something in the frozen wastes that would help.

In the frozen oceans, the artist had discovered amber, the petrified sap of ancient pine trees, and they were creating artworks from it. In these regions, it was also being used as a source of energy and currency... it was a key resource.

Of course, the surfer was on a mission, as they saw it, to rescue the artist from these frozen oceans where they had become lost. But when they encountered each other, it became clear that the artist had made themselves comfortable in this place, and it was where they wanted to be. The artist explained that they are neurodiverse, and see the world in a unique way. To share their special perspective, surfer started doing some therapy with the artist, and they found their brain and way of thinking was changing, and they felt free and renewed. Together, they worked with the other beings towards building a beehive mind to increase the connections between all beings on the world.

Sadly, during this time, the dog somehow ate a lot of the amber, and subsequently was poisoned and died. This was the last dog on earth, so dogs are now extinct. So, in the therapy sessions they tried to understand how to build different connections with different beings following the death of this dog that had symbolized love and care. While dealing with these thoughts and emotions, the artist wet on long walks in the snow, and encountered a lake that was not frozen, and in this lake, there was a fish, which the artist decided to domesticate and care for.

However, that old sci fi book from the 2000s had a story in it about fishing boats, and so despite the artist forming a close bond with a fish, there was a decision to start fishing again, as it was seen as a beautiful historical tradition, of trawling the seabed with massive nets! But it was

realized that as well as eating fish, they could be friends, and they could be altered to walk on land and breathe in the air. But, of course, the whole planet is covered in water, so what would be the point?! This was the debate that this sparked off.

In those days, there were many thunderstorms. One night, there was a particularly energetic storm, with a lot of lightning, and in the morning, the dog was found to have been revived by the lightning. So, the artist had an idea, they took to the sea in the fishing boat, and created new machines that could unfreeze the oceans and revive the beings that had died in the ice. All the snows melted, and many other plants and animals and people came back to life, and all the beings united together, collectively embracing their differences and collaborating towards a better future

TO BE CONTINUED...

STORY 2

Strange Strangers

~~Psychedelic~~ (2919) – Poverty (3841) – ~~Robot~~ (3879) – Prejudice (6913) – Fairy (1552) – The End (4803)

Years

2919 – 3841 – 3879 – 6913 – 1552 - 4804

Prompt

Stitches in time

In the year 2919, a psychedelic means of time travel was devised, which allowed people to travel into the past. A group of friends would get together regularly, and their thing was that they would travel back to pay witness important events, to see that they turned out the way that history recorded them. Over time, they became disappointed, as very little happened in the way they had been told that it had.

The friends lived in a period of relative poverty, and so one of the ingredients they needed for psychedelic projecting into the past was hard to find. They realized there was a substitute ingredient that they could use, but this had the effect of transporting them, not to the past, but almost 900 years into the future, to the year 3841. Here, they made a shocking discovery: they realized that people had lost the ability to communicate, and they had to rethink their purpose, since their aim for time travelling was to connect with people and see the events of the past. Instead, they made it their mission to help people to be able to communicate properly again. For thirty years, they had little success, until one day, in 3879, while exploring an abandoned building, they accidentally found and activated a robot. They realized that this robot had the ability to allow them to communicate with other people again, so they started travelling everywhere with the robot.

Unfortunately, they hadn't realized that this robot was a fascist, and that around 500 years before, in 3358, it had destroyed all of the other robots. The world had moved to a period of collectivist thinking, almost a hive mind, helped by the robots and other technologies. But this robot was controlled by an artificial intelligence that craved power and control of all things, and was happy to embrace poverty and racism. It would easily have dominated the hyper-connected society, but in that time, a final effort by the dying robots forced the fascist robot into a dormant state, but, since people were so reliant on technology to communicate now, they had lost the ability to do so. And now these unwitting time travellers had reactivated it!

Almost 3000 years later, in 6913, the world is dominated by fascist robots. It is a time of great poverty, as the robots have taken all the resources for themselves, and there is extreme prejudice

towards all robots and computer technology generally. There is a sect, descended from the psychedelic time travellers, who come up with a plan. They realise that in stockpiling all the resources, the robots have unwittingly gathered a significant amount of the lost psychedelic ingredient needed to travel to the past. They succeeds in stealing the ingredient, and travel back to the past to try to prevent the robots ever being created.

They arrive in the year 1552, well in the pre-industrial past. Given their great antipathy towards robots, AI and technology generally, they encourage a different approach to science, that embraces magic and fairies and alchemy. They used these magical techniques to build ships to travel to other worlds, and encounter shamans and other indigenous ways of doing things.

They decided to travel to the future again to see if they had been successful in changing the timeline. They arrived in the year 4804, which was over 1500 years after the fascist robot would have been unleashed, and discovered the world was quite different. People had embraced rituals and magic and the power of their imaginations, and so robots and computers had never been invented. People embraced being part of nature and the other beings they shared the world with, and so never lost the ability to communicate with all things, and never became dependent on robots or enslaved by fascism.

STORY 3

Strange Strangers

Fungal mycelium – ~~frog~~ – habitat loss - spider – ~~seagull~~ – virus – climate crisis

Year

4889

Prompt

The Ecosystem Strikes Back

In the year 4889, fungal mycelia have formed an intelligent network, capable of communicating well in a way other organisms can't. They form a symbiotic relationship with frogs, who have become more intelligent, creating a frog civilisation.

However, due to human activity, the frogs begin to suffer extreme habitat loss, which angers the mycelial network. The fungi start to recruit spiders as mobile portions of their mycelial network; certain types of fungi can take over the brains of arachnids and insects. So, they have co-opted all of the world's spiders into a global mind that allows the mycelial network to move faster and more aggressively to fight back against human caused habitat loss.

At some point the mycelia realised that much of their war against the humans and habitat loss was taking place in their environment, in the soil and the land; if they were able to fly somehow, they could expand into other regions of the biosphere. They learned how to communicate with and control seagulls, using their bodies and senses to find new lands that they could spread into. But by infecting the seagulls with their hyphae, they began to change the seagull biochemistry, and they transformed into a different type of animal.

These new fungal-seagull hybrids carried a new virus, which proved to be fatal to spiders, and within a short time, all the spiders in the world had been killed, and the world begins to be dominated by the fungal-seagull hybrids. These seagulls keep eating the fish in the ocean, and in time, the loss of spiders and the overfishing by the seagulls throws the ecosystem into disbalance.

This resulted in a climate crisis, which wiped out the hybrid seagulls. Now the frog-mycelium alliance needs to find another strategy to protect the environment. The mycelial network processed all that it learned from working with the frogs, spiders and gulls, and applied that to its relationship with trees and their roots. They find a way to move trees and forests in a much faster way, actively fighting back against humans by destroying their cities and replacing them with acres of woodland, creating a new beginning for all living things.

STORY 4

Strange Strangers
Leader – cultural institution- abandoned building – galaxy – ~~oak tree~~ – passenger ferry – politician – community - pollution

Year
7789

Story Prompt
What you see is what you get

In the year 7789, there was a great and well-loved leader, who valued the importance of everyone's own subjective reality. They set up a cultural institution called the Subjective Museum. This museum was in a huge building that would give a space to anyone who wanted one. In this space, they're allowed to make a display of the world that they live in and their perspectives on it, with any artefacts that they choose. They have access to all of the museum's resources and they're able to tell their stories in whatever way they want to.

Of course, there are always going to be people who are going to rebel against the rules. And even though the leader and his museum was well loved, and there was space for everybody, some rebel artists wanted to do different things, and show their art in different places, because they didn't want to belong to that community or identify with its dynamics.

These rebels understood that a way to make something different was changing the actual space for the museum. The Subjective Museum was very well structured and had many buildings and rooms and artefacts, but the rebels felt constrained but the institutionality of the space. Instead, they wanted to create something in less formal spaces, in destroyed environments that seemed to have little to offer, and they started creating art in abandoned buildings.

They wanted nothing less than to challenge the leader, to use their individuality to provoke reactions and to challenge their place in the galaxy. So, in time, they realized the planet was too small for all of these different things. They wanted to find a place where the physical reality was more in line with their inner reality. So, they created amazing spaceships, in all sizes and colours, and set off on their own into the galaxy, to take their views to new places.

They left earth and travelled in all directions. One ship came upon a planet that had a lot of water and was covered in forests of trees very similar to oak trees, but there seemed to be no people living there. This ship wasn't one of the individual crafts, but a passenger ferry, carrying a group of rebel artists. When the artists landed on the planet, each of them perceived the reality

of this new world quite differently, and went off and encountered the planet in very different ways.

Some of them start to discover there are many other creatures living in the planet, but they didn't resemble anything they recognised. They started to suspect that the oak pollen was making them hallucinate, when they encountered what seemed to be a monkey who had set himself up as a politician on this planet. He seemed to be a mean and dictatorial leader, with control over the other creatures, and the artists were at risk of being enslaved because of their rebellious attitudes. They started to miss the benevolent leader from Earth.

But some of the other artists saw it in a different way. They realised that the monkey being was actually really hungry, which is why they had become a dictator. So, the artists give them some of the bananas that they had brought with them. And together, they realized that the planet had a monoculture of oak trees, and that they could plant some banana plants. So, they created an agricultural community of artists and monkeys based around banana farming. Of course, the artists, being rebellious and single minded, all had different ideas of what the banana was or could be. Many of them had skills in genetic artistry, so they started creating weird and wild looking bananas, of all sorts of shapes and colours and sizes, some weren't even recognizable as bananas anymore.

Unfortunately, all of these new and different banana trees had not been designed for the ecosystem of the planet, and started to cause widespread pollution.

Eventually, the artists realised that it was important for them to work together and not just go off making all lots of random banana trees, which had ended up damaging their community because of the pollution that they caused. They realised that they could make hybrids of the alien oak trees and the banana trees from earth, that would result in a healthier ecosystem.

Berlin

STORY 1

Strange Strangers
ANT / POLITICIAN / ACTIVIST / DRAGON / FAIRY / THUNDERSTORM / SARDINE / VIRUS / NEURODIVERSITY / NON-BINARY / WAR (COVERS FAIRY) / SNOW

Year

4755

Prompt
What you see is what you get

In the year 4755, ants appear much as they always have, but secretly, they have made technological advancements, including discovering how to achieve invisibility. As a result, they have become invisible, and politicians don't know or care about their existence. But there are ant activists who are desperate for a better civilisation, and see that they must fight against humans to achieve this, and want to persuade the politicians that a better world can be achieved through technology. Because the ant activists can't directly communicate with humans and politicians, the split into two factions. One faction makes a deal with some dragons, who are able to speak to both ants and humans, but the dragons want to start a war. The other faction allies with The Fairy (there is only one in this world), who comes to the ants entreating them to find a compromise for the good of the planet. At this moment, a huge global thunderstorm erupts, the lightning having a bad effect on the dragons, who go into hiding. The fairy sees this as an opportunity to introduce the politicians to the ants. In the following discussions, it is decided to invite to sardines to take part, as they have the strange ability to live under water. It soon becomes clear that the thunderstorm has had even wider effects than realised. It caused a global outbreak of a virus carried by the ants, which the fairy has made themselves vulnerable to, and there is a common goal to help save the fairy. One effect of the virus is to cause neurodivergency, and some newly neurodiverse politicians find a different way to look at the problem, and they figure out how to combine their knowledge with the ants to save the fairy.

This leads to a breakthrough between ant kind and humankind, during which everyone realises there are no binary categories and so there's an acknowledgement that there is something beyond the idea that species are fixed and immutable, and there is the free ability to cross from one species to another.

Unfortunately, the sardines were horrified by this turn of events, and felt they had been sidelined in the discussions. So, they sided with the surviving dragons and launched a terrible

war. In the aftermath of the war, the climate was irreparably damaged, snow fell and fell and fell, affecting ants and politicians and sardines alike. The world entered a new ice age, and everything died. The fairy was the last being left, looking out across a frozen landscape, and succumbed to heartbreak.

STORY 2

Strange Strangers
Bees – ~~Mud~~ – Desertification – Pine Tree – ~~Surfboard~~ – Billionaire – Alien – Chicken – Rave – Artist

Year
6608

Prompt
Radical Intimacy

In the year 6608, the world has embraced radical intimacy, understanding that love is the most important thing, and this is represented most by the bees, who are spreading the love between the beautiful, colourful enormous flowers that are everywhere in this era, bringing honey to everyone, binding everything together. The bees are the most important connection to everything else that lives in the universe. The world has changed quite a lot in this time when bees are powerful and ruling the planet. Everyone has been taking loving care of nature, appreciating the rain, and it has been raining a lot more. So, there is a lot of mud everywhere, and the bees enjoy swimming in it every day. Unfortunately, by this year, the rain had stopped falling so much, because not enough care was being taken over farming practices, and the mud started to dry up as many areas became desertified.

Then it was discovered that the pine tree could be a solution to the desertification problem, as it was able to grow in desert conditions. But this was a problem for the bees, because they were used to the big flowers, not trees, and they didn't know how to make honey from pine trees. But they let the trees make their way in the world, to see what kind of connections they could make.

In the past, surfing had been really popular on earth, but in a world with more flowers than trees, it was something that people had forgotten to pursue. But with all the pine forests, someone started to make surfboards, and now people go sand surfing in the deserts. But unfortunately, capitalism apparently exists everywhere, and because surfing quickly became popular, it created this society's first billionaires, and they made it really uncool to ride surfboards. But this reminded people why radical intimacy is so important, and drew everyone together.

During this time, aliens arrived, and they added a new element to the relationship between capitalism and radical intimacy; the aliens lived in a radically intimate way with money. The aliens tried to tell the people and the bees and the pine trees how to find this intimacy and love for money, but only the billionaires understood them, because they loved money too. But in thinking about it, they reflected on the way they were living and saw how disconnected from the

values of their society they had become. They made this realization because of chickens. The aliens really liked eating chicken, they loved spicy chicken wings. But the billionaires explained to them that they're vegan, that people on earth stopped eating other animal species. The aliens were puzzled, and thought about why this had happened, but came to the realization that of course, they should be vegan, because they loved everyone, not just money!

The aliens and the chickens threw the rave of the century to celebrate, and people came from all over the land and from other planets too, to spread their love and radical intimacy for others, and to remember the bees and all the hard times they got them through, and generally have a great party. But it was more than just a party, it was a time for species to bond together, and to reflect and have revelations of how they could move forward.

As part of these reflections, an artist emerged. Their practice was to challenge everything, question everything, get people to think about how things happened and if anything makes sense. They encouraged everyone to think about all of their connections in a more mindful way, not because they rejected radical intimacy, but because they wanted everyone to be more aware of everything that they do.

In the end, people learned to accept that there were now deserts in the world, and they resurrected an old rave party in the desert called Burning Man, where they had exhibitions that they used to help them explain everything. The aliens made their first exhibitions on Planet Earth there, and they began to think how the rave and the exhibition connect together, and about how things will work out in the future, so they organize a panel discussion about it, and work everything out.

STORY 3

Strange Strangers

Poverty – ~~Dog~~ – Galaxy – ~~Cactus~~ – Extinction event – Habitat loss – Community – Flute - Fisherman – Pandemic – Werewolf – Drag Queen – Squid – Robot

Years

8504 - 6702 – 3812 – 5559 – 5653 – 7629 – 5160 – 485 – 303 – 1222 – 1010 – 2553 – 601 – 7944

Prompt

Stitches in Time

[8504]

In the year 8504, the planet is in a dreadful state. Everyone on the planet lives in extreme poverty: unlike during the early 21st century, there are no rich minorities, and everyone is equally poor. Poverty has sadly killed lots of people, but at least there's equality, in a way, because nobody has anything. This is the story of how it happened, which starts with an event from 2000 years in the past, in the year 6207.

[6207]

6207 became known as the Year of the Dog. During this year, people had become intensely interested and invested in dogs and making sure that they had comfortable lives. So, in this time, all dogs are very happy, getting everything they want and having all their dreams and wishes fulfilled. Humans aren't exactly slaves but essentially spend all their time working for the dogs, who are now the most important power and civilisation on the planet. Over the course of two millennia, dogs had taken everything from their owners and left humans with no money, which played one part in leading to the state of extreme poverty in the 86th century.

[3812]

Almost 3000 years before The Year of the Dog, a galaxy-level incident happened, which is of great importance to this story. An anomaly appeared in space, somewhere close to the solar system. In this anomaly, on odd numbered years (for reasons that couldn't be explained), a portal opened up that is a gateway to other, random times.

[5559 / 5653 / 6207]

In 5559, these incidents became connected. The time portal opened up to a dog, a rich and wise dog, and he travelled to the year 6207, the Year of the Dog. Things were underdeveloped in this time, and this dog, being very smart, took advantage of this to persuade everyone to be obsessed with dogs. However, the dog had a secret, a terrible mistake that it had made. The dog had had a

small cactus in a clay pot that it was very fond of, and had tried to take that through the portal with it. But unfortunately, it struggled to hold the pot in its mouth, and about 90 years into the portal transit, while passing the year 5653, the cactus fell into the vortex! Somehow, this created a genetic temporal shockwave that caused all cactuses to be erased from the timeline. So, cactuses are now extinct… in fact, they never even existed, and only the dog remembers they ever did.

[7629]

So, on the path to the extreme poverty of the 86th century, the obsession with dogs and the loss of all cacti led, in 7629, to terrible habitat loss, and the extinction of the dogs. The dogs were obsessed with eating only beef and pork, so vast amounts of the land, much of it where cactuses once might have grown (had they ever existed) were given over to farming cows and pigs. They were farmed so intensively that eventually, no land was left for these animals to graze, so they went extinct, and the dogs subsequently all starved.

[5160]

Before all this dark stuff happened, about 1500 years after the portal opened a time traveller community had formed around it. They were trying to learn about the portal and figure out how they could use it to make the world a better place, and had sent various beings through the portal over the years—the dog and the cactus would be sent by them in 5559. But unfortunately, they weren't able to find out what happened to them, because they were being sent to random, unknown times.

[485]

Thousands of years before, in the time of the Byzantine Empire, a new type of flute was made, and there was a particular song, a special melody, that everyone became obsessed with. This flute music was such a hypnotic, mystic sound, that it was able to affect the time portal, and to travel through time

[303]

About 180 years earlier, the Roman empire was in decline, and was facing an inflation crisis, which caused widespread panic. In communities along the coasts of the empire, fishing was the main source of income, so the fishing people would go out fishing whatever the conditions, to be able to provide for their families. One day, in the year 303, a fishing boat has sailed out into a storm, when they hear this weird, ethereal flute music drifting out of the rain. Curious, they sailed towards the sound, when they saw a huge flash in the sky, and people fell from out of the sky into the ocean. The fishermen went to rescue these people, who were wearing big, heavy

protective suits. They were in fact space suits, as these people were some of the future time travellers who went through the space portal.

[1220]

These travellers were taken in by the fishing families, who befriended them and even started families with them, and for over 1000 years, the stories of the people who claimed to be from the future were part of the local legends in that area. Unfortunately, when they travelled to the past, some of them carried a bacterial infection, which would periodically affect one village or another for some months and then die down. But in the year 1220, an outbreak erupted that caused a huge sickness and killed a lot of the people from the fishing and time traveller community. In time, the bacteria came to infect the fleas carried by rats, and then it spread and spread, and about 150 years later, it caused a Europe wide pandemic that came to be known as the Bubonic Plague, killing millions.

[1010]

210 years before the plague hit the fishing communities, there was a strange occurrence in Egypt, which caused the Nile river to freeze over. During this time, the strange ethereal flute music could be heard, which would suggest that the time portal had somehow caused a strange weather event in Egypt. The music had another odd effect, in that it caused werewolves to be drawn to Egypt, following the sound of the strange music.

[2553]

The werewolves somehow got caught up in the time vortex, and were transported to the year 2553. As beings of transformation, they were drawn towards the drag culture of the third millennium. Nobody really knew where these mysterious drag were-queens came from, but they spread a lot of joy in the community (as well as the ability to transform into a wolf at full moon) and so from that time on, werewolf and drag culture became one and the same.

[601]

The final effect that the time vortex had in this story, was that the flute music affected the squid of the oceans in the year 601, causing them to evolve into much more colourful squid, producing clouds of multicoloured inks, which made humanity curious to learn more about colours and colour theory. People embraced vibrant colours in a whole new way, a legacy that drag queens were able to take inspiration from.

[7944]

As this story comes to a close, there are some important events in 7944, about 300 years after the dogs went extinct, and 560 years before the time of extreme poverty when this story began. The

drag queen werewolves have been great changemakers in society, and were heartbroken when their cousins, the dogs, went extinct. Therefore, they worked with the time traveller community, and constructed robotic dog replacements, in all sorts of vibrant colours, to replace all the dogs that had died. Whether these rainbow robot dogs contributed to the extreme poverty half a millennium later, or held the seeds of the planet's recovery, is a story for another day.

Appendix 3 : Gameplay Tiles (Card Version)

This appendix displays the gameplay tiles from a version of the *Strange Strangers in Strange Lands Playset* that is designed to be printed onto card. It includes Strange Stranger Tiles, Monoculture Tiles, To Be Continued… Tiles, and Speculative Prompt Tiles, in addition to a Futuring Strategy Selector Spinner (replacing the 3D Printed Futuring Strategy Die).

It also includes a quote about Strange Strangers from Timothy Morton's Queer Ecology (2010), intended as a 'baffle' to print on the reverse of the tiles to obscure the text on the obverse when printed on thin card.

This version of the Playset is intended to be able to be shared digitally, allowing anyone to print and cut-out their own copy of it without needing access to laser cutting and 3D printing facilities.

OAK TREE

THE EARTH

PASSENGER FERRY

OLIVE TREE

LEADER

WEREWOLF

POLITICIAN

SPIDER

NEURO-DIVERGENCY

SURFBOARD

WASTELAND

HYBRID

FISHING BOAT

CACTUS

MUD

DRAG QUEEN

ANT

PSYCHEDELIC

SQUID

BAT

FAIRY

PENGUIN

DRAGON

MEAL

VIRUS

BEES

FISHERMAN

SNOW

THUNDER STORM

ROBOT

FLUTE

NON BINARY

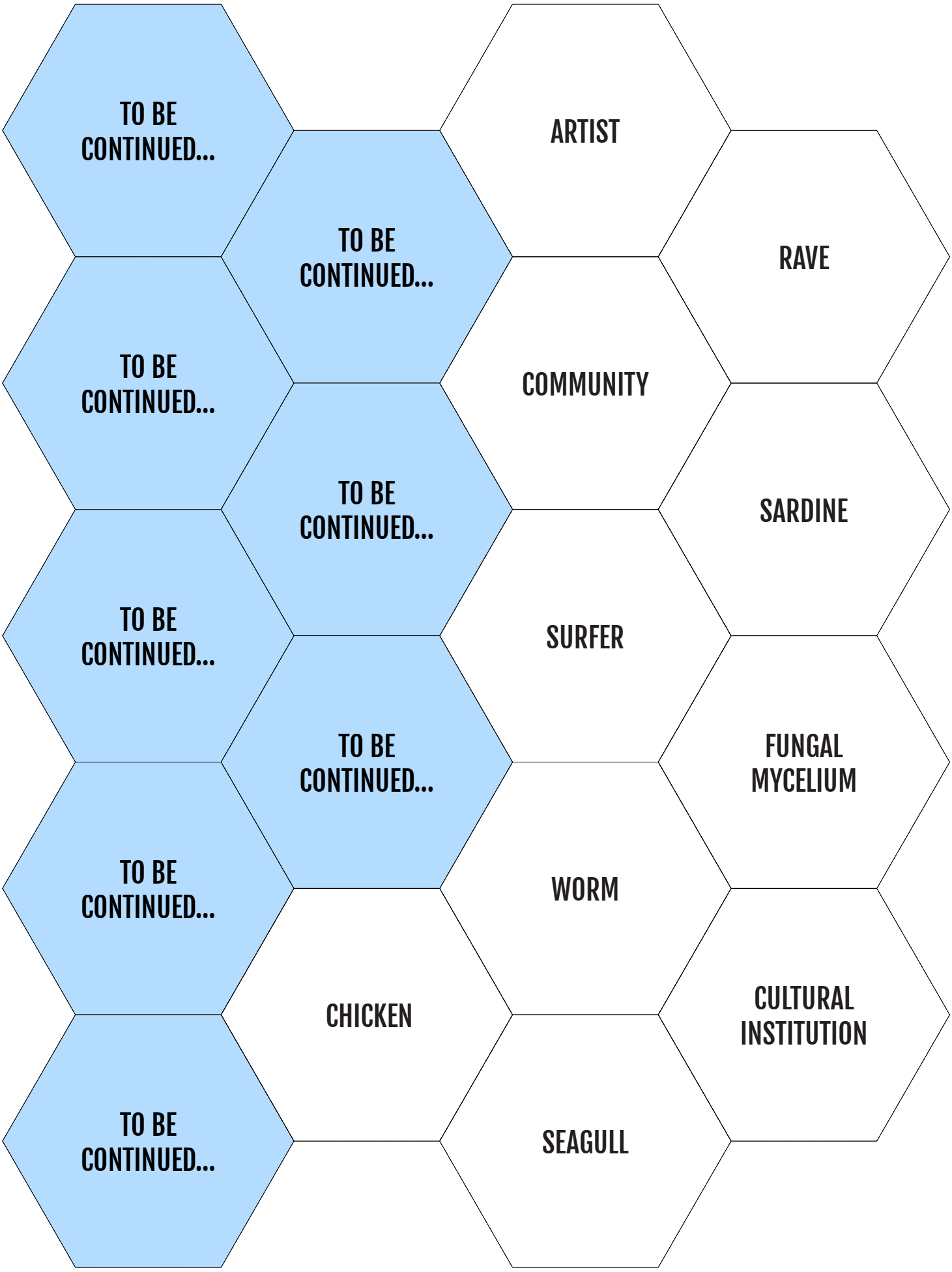
ABANDONED BUILDING

ACTIVIST

GALAXY

FROG


ALIEN
EXTINCTION EVENT
VAMPIRE
POLLUTION
PASSPORT
BILLIONAIRE
PANDEMIC
NARROW-MINDEDNESS
FISH
POVERTY
DESERT-IFICATION
FASCISM
DOG
HABITAT LOSS
CLIMATE CRISIS
WAR
PINE TREE
PREJUDICE


TO BE CONTINUED...
TO BE CONTINUED...
ARTIST
RAVE
TO BE CONTINUED...
COMMUNITY
TO BE CONTINUED...
SARDINE
TO BE CONTINUED...
SURFER
TO BE CONTINUED...
FUNGAL MYCELIUM
TO BE CONTINUED...
WORM
CHICKEN
CULTURAL INSTITUTION
TO BE CONTINUED...
SEAGULL

STITCHES IN TIME

Making changes in the timeline to make new futures, alternative pasts, and pluriversal worlds where multiple realities coexist.

[FOR THIS STORY, THROW THE TIME MACHINE DICE EACH TURN]

THE ECOSYSTEM STRIKES BACK!

Gaia takes its revenge against the human mainstream, whether as largescale environmental disruption, or through direct action by more than human beings.

WHAT YOU SEE IS WHAT YOU GET

What the world and the beings in it is, is determined by the encounters that these beings have with it and each other. The world you believe you see is the world that is real for you.

VIRTUAL WORLDS

Virtual worlds, dream spaces and imaginariums offer alternative spaces to exist within, whether as a means of self expression and escape, or of control and imprisonment.

STRANGE STRANGERS IN A STRANGE LAND

You have travelled to a strange world where the beings there are alien to you; but from their pespective, you are the strange stranger.

MORE THAN HUMAN

In this world of hybrid beings, cyborgs and unthinkable aliens existing outside the human norm, a new world emerges.

RADICAL INTIMACY

Love is the fundamental binding force of the universe, in which all encounters between beings are playful acts of intimacy.

OUTSIDER UTOPIAS

Outsiders from the human mainstream find ways, spaces and places to create pockets of a better future within the broken down present.



Appendix 4 : Design Fabulation Deck

This appendix presents the cards from the Design Fabulation Deck. These cards are speculative design techniques and activities, which can be used as part of the *Strange Strangers in Strange Lands Playset* to materialise fictional worlds and narratives created through the Collaborative Storytelling Game, or as a standalone resource for designers, design students and community members to inspire speculative design projects.

There are nine cards for each of the five futuring strategies from the Conceptual Design Celium, as indicated by the icon on the obverse side of the cards: Making (hand); Playing and Performing (theatre masks); Mapping (compass rose); Time Travelling (clock); and Storytelling (speech bubble).

Futuring Strategies Key

 Making (a hand)

 Playing and Performing (theatrical masks)

 Time Travelling (a clockface)

 Mapping (a compass rose)

 Storytelling (a speech bubble)



Iconic objects from particular worlds give a strong sense of where they come from and what their world is like: think of the smartphone, Roman pottery, Japanese katana swords. Create some iconic objects that might represent a speculative world. Then imagine how they might be used, and what they could tell about the culture they come from.



The author Arthur C Clarke's Third Law states that "any sufficiently advanced technology is indistinguishable from magic". So, design some machines that could exist in a speculative world and imagine (magically!) what they might do, and how Strange Strangers could interact with them.



Preparing food and eating together is a fundamental part of most cultures and societies. Imagine what the food culture of a speculative world could be, and plan a meal that the Strange Strangers who inhabit it could share together.



A key principle of speculative design is to allow for tangible and material engagements with speculative elseworlds, making them more real in the here and now. Find your way to a speculative world through engaging and making with a particular material, such as sand, or clay, or another relevant material that is to hand.



Sketching is a quick technique for visualising speculative ideas, making them more real in the here and now. Visualise and illustrate a speculative world through sketching and drawing; perhaps you could create a notional drawing class, or a field trip to make some urban or wildlife sketches.



A challenge that will be faced in more-than-human worlds is that of enabling communication between different beings that may have vastly different sense impressions of the world they share, and different interpretations of what their world is. Consider the Strange Strangers in a speculative world, and design some devices to allow them to communicate with each other.



Muralling transforms a bare wall into a portal to another world that can be collectively brought into being. Plan, design, and–if possible–paint a mural to represent some aspect of a speculative world and the beings that inhabit it.



Quilting can be a powerful and materialised act of community activism, bringing together a wide group of beings in a common task of artistic expression, often to draw attention to an issue of importance to the wider community. For a speculative world, decide on an important issue and collaborate on creating a quilt to represent it.



A Diorama is a three dimensional representation of a scene from a world, designed to be seen from a fixed viewpoint. Used in museums to illustrate historical or ecological scenes and to contextualise artefacts, Dioramas are constructed like a theatrical set of a moment in time. Design and build a diorama of a speculative world and the Strange Strangers that occupy it.



Drag is a subversive art form where performers adopt heightened, ironic personas that are often extreme exaggerations of gender stereotypes, but the heightened gaze of drag could be used to explore more than human identities of Strange Strangers. Create a drag show that represents an aspect of a speculative world.



The radical disco movement was driven by architects in Italy who designed discotheques to create spaces for people to relate to each other in new ways. Plan a disco or party that might take place in a speculative world. Think of all the details: the location of the disco, the layout of the space, what Strange Strangers will attend, and what type of music will be playing.



A Happening is a spontaneous, collective performance in a public area, similar to a Flashmob, that can be considered both a piece of performance art and a prototype of a different world. Enact a happening to represent a speculative world and the Strange Strangers that inhabit it, in public if possible.



Games are powerful artefacts that can abstract an entire world into a framework that allows people to enter into and play with that world: they are an effective representation of what the world is and what the Strange Strangers inhabiting it think is important. Create and play a game that might exist in a speculative world.



Dance is an expressive art form that allows the exploration of emotions, ideas and philosophies through body movement, and it is an effective way to the explore transitional and in-between states between one world and another. Choreograph a form of dance that represents or exists within a speculative world and the beings within it, and perform it.



Theatre is a liminal space, much like this game, that allows one to make-believe a speculative world is real, and perform as or even become, however temporary, a Strange Stranger that inhabits it. Write, workshop or improvise a stage play that represents or exists with this world, and perform it.



The games that exist within a world are shaped by that world's philosophies, ethics, ecological character, and the Strange Strangers inhabiting it. Explore the differences between this world and a speculative one by taking a traditional, real-world game and redesigning a version of it from that elseworld. Consider how the rules and the objects of the game might change.



Protesting is an empowering public activity for Strange Strangers to collectively demand and stake a claim on a different future, and a creative outlet to perform what that future may be. Mount a protest for or within a speculative world: make placards, sing songs, and vocalise about an important issue.



Marginal futures and elseworlds already exist in the present, on the edges of things, but are so ephemeral that they may be found only in a gesture or a glance; through movement, speech, a look, an orientation, or a work of art. Explore how a speculative world and its Strange Strangers can be accessed through ephemerality and gesture.



Passing is the concept of being able to 'pass' as a member of another category of being, particularly one that has more power or influence. It can often be mediated by objects, such as passports, and passageways through boundaries, whether physical or conceptual. Imagine and design places for Strange Strangers to pass from one category to another in a speculative world.



Living Labs are grassroots hubs for innovation and idea generation installed within a particular territory, such as a city or an ecosystem. Living Labs allow for the collective emergence, sharing and testing of new ideas. Create a Living Lab within a territory to engage the communities with a speculative world.



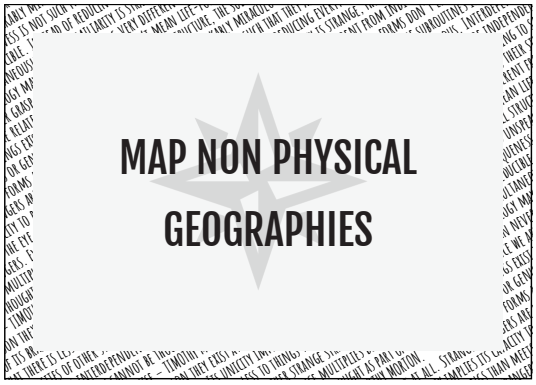
Mapping is not simply an objective process of representing the world as it is; it is also a subjective process of making the world anew. Performative mapping frames map-making as a performative and embodied process of world making. Use map-making to perform and embody a speculative world and the Strange Strangers that inhabit it.



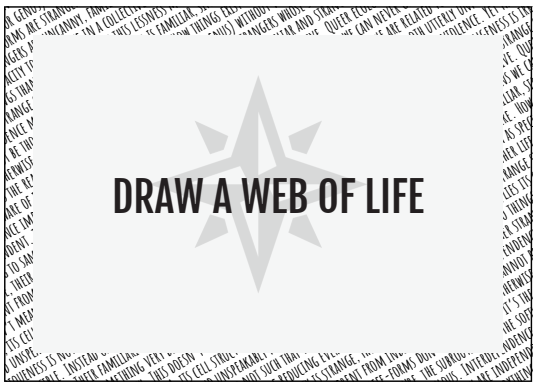
Speculative worlds and possible futures, once imagined, can insinuate themselves into the here and now, through objects, gestures, moments, and other ephemera. Go on a scavenger hunt in this area to find evidence of the existence of an elseworld and the Strange Strangers inhabiting it. Collect it through physical objects, photographs, recordings, and art.



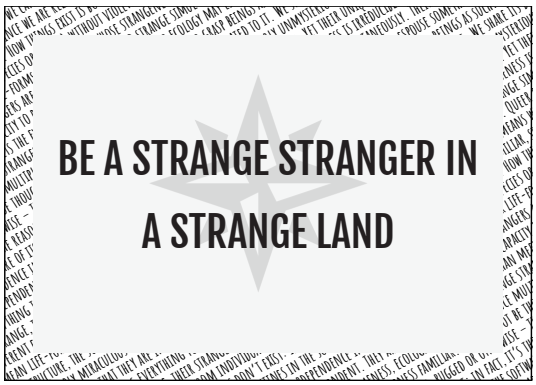
A framing object often found in speculative fiction, particularly fantasy, is a world map that represents the world in which the story will take place; presented at the front of the book, it is often the first boundary object that allows access to the fictional world. Design a map for a speculative world that you have created, to show its geography, landscape, cities, or cosmopolitical layout.



Artists have used the physical metaphor of the map of a landscape or city to map or represent non-physical geographies; personal identities, or mental states, or power relationships. Explore a conceptual element of a speculative world or the Strange Strangers inhabiting it by creating a map of it.



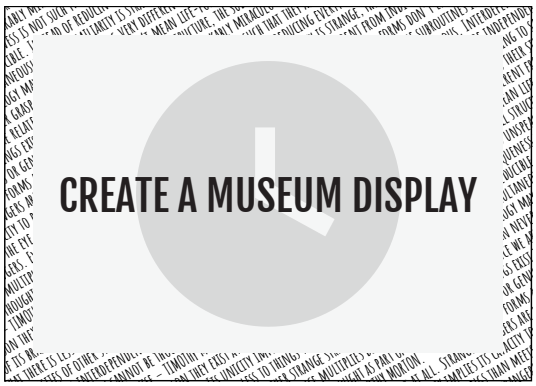
All the Strange Strangers within a world are exquisitely interconnected and implicated within each other's lives and existences. Map out the web of life that exists within a speculative world; it can be a flowchart, a tree of life, a hexagon grid, or any other form of your choosing.



Crossing from one world to another is to find yourself to be the Strange Stranger in a Strange Land. Imagine you have somehow arrived in this world from a speculative elseworld. How strange and unfamiliar this world must seem to you! Go and explore with these new eyes, and record, report or react to what you find.



Use photography as a mapping tool to visualise a speculative world. Decide on a list of 10-15 photograph prompts related to a speculative world you want to explore and the Strange Strangers that inhabit it, and use that to guide a photo safari in the here and now.



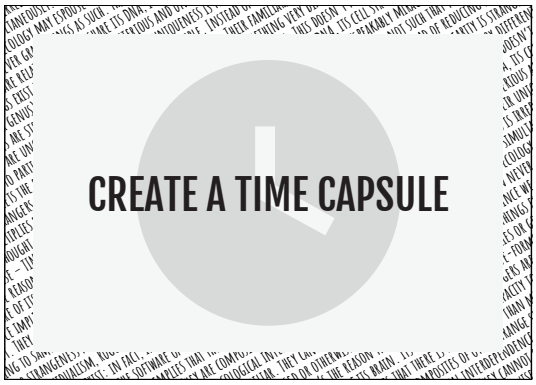
Museums are spaces where the artefacts from particular places and cultures are curated, displayed and contextualised, to tell a story about their world. Design a museum display that would represent a speculative world and the Strange Strangers within it. Decide what artefacts will be displayed, and how these will be contextualised by texts and the museum design.



To arrive at a speculative world different from the here and now, whether in the past, future or alternative present, the recorded history must surely be different. Write an alternative history for a speculative world; consider the beings and the events that caused it to come into being.



There are many ways to visualise time beyond time's ever forward going arrow, many which are not linear; what if time was a crumpled sheet, an infinite forest, a seething whirlpool? Visualise non-linear time in a speculative world in a way that makes sense to the Strange Strangers within it.



The ground is atemporal, beyond the cares of the linear times that governs the human world. As a medium for a buried time capsule, it allows artefacts of a particular moment in time to achieve atemporality, to be uncovered by other beings in other times. Create a time capsule of artefacts that represent a speculative world, to be buried and found in some distant time.



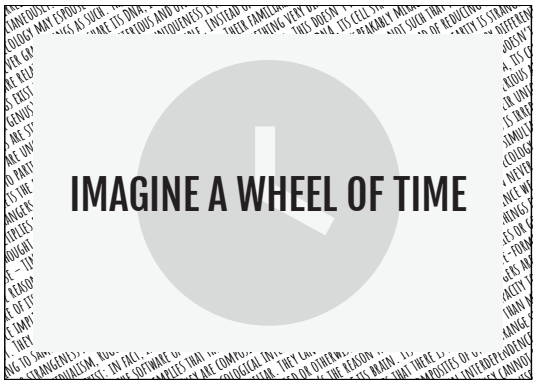
The Soundscape of a world represents a evocative fragment of a particular moment in time; audio recordings can invoke a rich, complex world in the mind's eye of the listener. Create an audio soundscape that could have been recorded in a speculative world, that provides a vivid evocation of that place and the Strange Strangers who live there.



Many cultures understand their temporality through stories of the original creation and possible destruction of the world; such myths and stories give shape and rhythm to a culture. Fabulate about a myth of creation or destruction of a speculative world that makes sense to the Strange Strangers within it.



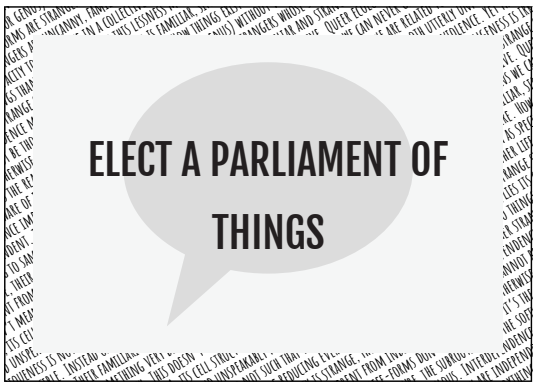
Speculative Fiction has explored the possibility of the diegetic escape of speculative worlds, where they intrude into the real world. Intrusions, or bubbles, of possible futures can exist in the present; Foucault calls such worlds heterotopias, other worlds. Create an incursion of a speculative world into the here and now; this could be through a single object, or a larger area of space.



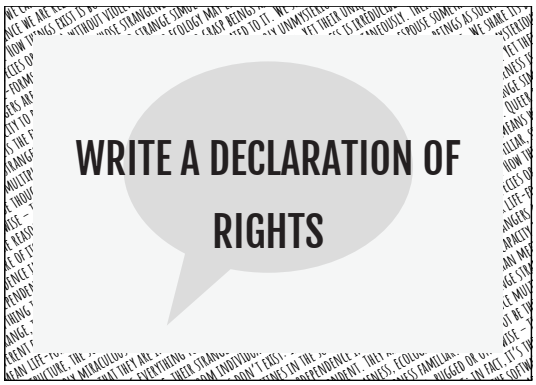
Imagine time is circular; the past becomes the future and the future becomes the past. In a seven generational timescale, time repeat every seven generations, and actions in the present should consider the impact in seven generations. Fabulate about a speculative world with a seven generational wheel of time.



Festivals are important moments in the calendars of many worlds, where beings gather to celebrate history, culture, and faith through shared meals, rituals, and performances. Celebrate a significant festival for Strange Strangers of a speculative world; consider how it came about, what it represents, and explore it's rituals, iconography and food culture.



A parliament of things is a thought experiment to consider that all things, human and more than, need political representation. Imagine what Strange Strangers could be elected to a parliament of things in a speculative world, and what their roles in the parliament would be.



The Universal Declaration of Human Rights is a landmark document that sets out all of the rights a human should be entitled to in an ethical society. But it is limited to the human perspective. What might a more than human declaration of rights be in a speculative world? What rights should all Strange Strangers be entitled to?



A 'zine is a form of anarchic, self-published magazine, often produced in the pre-desktop publishing era by marginal individuals and sub-cultures through lo-tech means, such as cutting and pasting text and images and photocopying them. Create a 'zine for the Strange Strangers of a speculative world



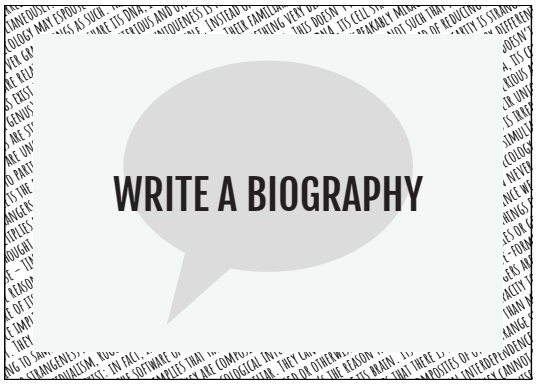
The things neglected by a culture are as significant as those it cares for, neglect being the dark reciprocal of care; such things deserve to be archived and remembered. Decide what things might be neglected in a speculative world, and consigned to a notional Archive of neglected things. How will they be archived, and how might their admission to the archive be recorded?



A Living Library is a system by which beings can learn about each other lives by consulting a library not of books or of multimedia, but of other living beings, giving a rich insight into what it might be like to encounter the world through another Strange Strangers' lived experience. Create a Living Library for a speculative world, that other beings may consult to learn more about it.



Gathering round a fire for warmth and safety, and telling stories to entertain, to warn, and to make sense of the world around, is an ancient tradition: sharing stories is a powerful way to make others care. Gather together round a fire, real or fabulated, and tell each other tales of Strange Strangers and the speculative world they inhabit.



The story of the life of one Strange Stranger, famous or not, can be an encapsulation of the world in which they existed; the places, the beings, the culture and the ecosystem, and the history. Fabulate about the life of a Strange Stranger in a speculative world, and write their biography.



Cut Up is a creative technique popularised by musicians as a way to generate emergent texts. Take some documents that interest you, and cut up the text into pieces, whatever size you prefer. Then take the pieces, mix them, and use them to construct poetry that belongs to a speculative world.



Languages allow Strange Strangers to communicate with and encounter each other within their world. Authors of Speculative Fiction create languages to bring their worlds to life, or worlds as places for created languages to exist within histories and cultures. Create a language–spoken, written, gestural, sensorial–that exists within and represents a speculative world.

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Oriente Green Campus . Jardim António Augusto Simenta Mordido, 2 - 1885 Moscavide | Portugal
Tel: (+351) 213 936 600 . iade@iade.pt

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