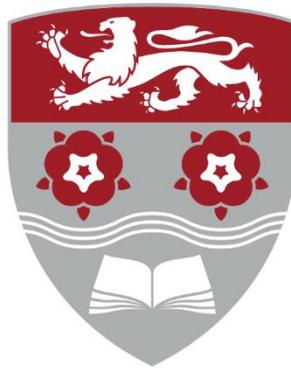


Making wonder tales:

an exploration of
material writing practice
for ecological storymaking



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Abstract

We are confronted by multiple ecological crises worldwide and there is growing evidence that fact-based communication is not helping people to engage with environmental issues. Traditionally, stories have connected people with wider nature, and there have been appeals from conservationists, scientists and theorists for new stories to be shared. To date, however, very little consideration has been given to the ways these new stories may be shaped through contemporary writing practices. Digital technologies provide writers with new opportunities for practice and for reflection on their role in making and sharing stories. This research inquiry uses practice as research to uncover links between material writing practice – an approach where all materials, including the digital, become part of the composition process – and ecological stories. The research is framed by three initial questions:

- 1) How can writing practices be developed with new technologies for ecological storymaking?
- 2) How are stories changed when new writing practices are developed for ecological storymaking?
- 3) What does the development of these writing practices mean for the role and continuing relevance of the writer?

Through substantial reflexive practice, over the course of three projects, the inquiry revealed interrelationships between a story's subject, content, form and medium, which are often overlooked by mainstream contemporary publishing. By avoiding pre-determined technological outcomes and reducing hierarchies of materials, an approach to material writing practice was developed that uses a range of methods to uncover new possibilities for making and sharing stories. The process-centred approach was shared with other practitioners through workshops and their responses highlighted the benefits of material experiment for practitioners in expanding creative practice and for connecting with wider nature. Participant responses, along with my own discoveries through process, demonstrate that creating opportunities for ecological storymaking is a valuable action for change. Through a series of propositions for writers, this research answers the call for new stories with the contribution not just of new stories, but a new approach to storymaking.

*For my sons George and Sam
and for Andy, my love*

Declaration

I declare that the work included within this thesis is my own work and has not been submitted for any other degree or qualification. To the best of my knowledge it does not contain materials previously published or written by another person except where due reference is made in the text.

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The corporate revolution will collapse if we refuse to buy what they are selling – their ideas, their version of history, their wars, their weapons, their notion of inevitability. Remember this: We be many and they be few. They need us more than we need them. Another world is not only possible, she is on her way. On a quiet day, I can hear her breathing (Roy 2003)

Knowledge emerges only through invention and re-invention, through the restless, impatient, continuing, hopeful inquiry human beings pursue in the world, with the world and with each other (Freire 1996, p.53)

New myths spring up beneath each step we take (Aragon 1994, p.10)

Part 1, Chapter 1: Introduction

1.1 Motivation

The stories we tell in post-industrial societies about humans and their place in the world have become dangerously disconnected from ecological realities. The scale of human-made disaster we now face is unprecedented (Met Office 2018; IPCC 2014; Ceballos et al. 2015). In 2017 William Ripple et al. and 15,364 scientist signatories from around the world gave humanity a second notice, noting that a first warning given 25 years before, had been largely ignored. Not only has very little progress been made on foreseen environmental challenges, most are getting much worse (Ripple et al. 2017). The authors advise that, ‘To prevent widespread misery and catastrophic biodiversity loss, humanity must practice a more environmentally sustainable alternative to business as usual’ (Ibid., p.3). As I write this, business as usual continues. In the UK, ‘we are among the most nature-depleted countries in the world’ (Hayhow et al. 2016 p.6). We are surrounded by evidence of significant climate breakdown and ecocide caused by human actions (Griffin 2017; Waters et al. 2016; WWF 2016). Yet, as the *Common Cause for Nature Report* identifies, we are overwhelmed by facts and messages of threat and ‘public concern about the environment is at a 20-year low’ (Blackmore et al. 2013, p.8). The story we have been told in the West, of modern humans being separate from other living things, engenders a sense of disconnection and entitlement that is so embedded in contemporary

Western thought that it is difficult to overcome (Lakoff 2010, p.76). For many conservationists and theorists, the stories we tell are seen to be one way we can address this, resulting in calls for new stories (DuCann et al. 2017; Klein 2015; Lakoff 2010; Smith et. al 2014; Tsing et al. 2017). This study is a writer-researcher's response to that call.

1.2 Research Aims

Stories play a significant role in forming our understanding of the world and informing our actions within it (Frank 2010, p.3). Traditionally, stories have been used to share knowledge and guide behaviour around the world, and as John Elder and Hertha Wong write, we are now in a situation where, 'Reimagining notions of nature and our relation to it and telling stories that awaken and sustain our relationship to the earth are necessary acts of survival' (1994, p.10). The Arts and Humanities Research Council (AHRC) assert that the arts can 'play a crucial role in raising awareness of environmental issues'(2017, p.1) and Lakoff, similarly, urges the telling of stories that articulate values and engage people (2010, pp.79). In responding to these calls for stories, this research also brings another element for consideration into play, namely that stories are shaped by the technologies used to share them. This means a consideration of how we make and share these stories is also necessary as part of a holistic response to ecological challenges. Daniel Chandler writes that,

How much it matters to us that our ends are transformed by our media depends on whether such transformations seem to

us to be in general harmony with our overall intentions (Chandler 1995, p.11).

In mainstream print publishing the writer is distanced from the material realities of production. Writers are primarily producers of content and the act of writing is considered in intellectual rather than embodied or material terms (Ingold 2016, p.27). This research aims to engage with writing as a material practice, making stories in response to the ecological subject matter rather than working towards pre-determined technological ends. Through a series of creative explorations an approach to ecological storymaking is developed. The impact this approach has on the stories made is considered and the findings, which have implications for both theory and practice, are interpreted and shared.

1.3 Background to the approach

1.3.1 The interdisciplinary nature of this research

This research is necessarily interdisciplinary. Ecological crises impact on every aspect of life on this planet and the complex nature of the challenges faced requires responses that bridge disciplinary boundaries. As a writer my educational and professional background is in the arts. I initially trained as an actor and have a BA in Acting and an MA in Creative Writing. This study has been undertaken in Highwire, a transdisciplinary centre for doctoral training that is funded by the Engineering and Physical Sciences Research Council (EPSRC) under the Research Council UK's Digital Economy Theme (EPSRC

2018). The centre focuses on the overlap between three disciplines, Design, Computing and Management and, 'emphasises digital innovation through technologies, products, and processes' (HighWire 2018). I was drawn to the HighWire programme because it enabled engagement with disciplines I'd been separated from educationally by my focus on the arts since the age of sixteen. Working in HighWire with supervisors based in Design and Computing made this study achievable and enabled an approach to practice that would not have been possible in a traditional English and Creative Writing department. The interdisciplinary ethos and exposure to different disciplinary perspectives and literatures was invaluable for the development of this research. Working in a communal space with colleagues from very different disciplinary backgrounds provided plentiful opportunities for collaboration and inspiration and opportunities to work with colleagues from Lancaster Environment Centre also had a significant impact on this work. I have been able to bring my disciplinary knowledge from Creative Writing into this rich interdisciplinary mix to enable me to answer research questions that engage with complex interdisciplinary issues.

To fulfil its aim to engage with writing as a material practice, this study requires a more expansive view of writing than is allowed for by 'the specialization mode', which has separated writers from the methods and means of production (Cooper in Reinfurt 2007, p.1). Having found myself limited by the conventions of the mainstream print publishing industry, I have taken the opportunity to draw inspiration from other art practices and traditions, in particular photography, land art and the artists' book. This research asserts that

the material reality of an ecological story matters because it contributes to the telling of the story. Therefore, engaging with a wide variety of art practices, and their materials, methods and approaches, has been essential to developing a more holistic approach to ecological writing.

1.3.2 Situated knowledge and the global context of research

While embracing interdisciplinarity it is essential to recognise this research is necessarily partial and situated in my own practice and experience (Haraway 1988, p.589). This research does not make claims to universality. It is undertaken from my perspective as a feminist and with awareness that as a white English academic I am working from a position of privilege and need to consider both the position I write from and the research I undertake in relation to a global context. While this work is subjective, it is important not to portray my view, or a white Western position more broadly, as a default. It is also necessary to question the authority of the dominant academic literature, which has often negated the life experiences and forms of knowledge production of all but a select group of socially and economically privileged white male scholars (Dei and Asgharzadeh 2001). Human-caused ecological crises are a complex global phenomenon and in responding to them through story it is vital to draw inspiration from ecological traditions and knowledge around the world. It is also important to recognise that ecological crises are not driven by all societies or all people, yet their consequences disproportionately impact those who are socially, economically and politically disadvantaged (UN-DESA 2016). While

undertaking this research it is essential to recognise this and to aim not to perpetuate inequalities or apply generalisations in my response.

This research recognises the interconnection of humans with the living world, and the work includes attempts to reach towards non-human perspectives through storymaking. Anna Tsing describes how ecologists use the term assemblage to avoid the connotation of boundaries inherent in the term community (Tsing 2015, p.22). Writing about assemblages as open gatherings, she says, ‘They allow us to ask about communal effects without assuming them’ (Ibid. p.23). This makes assemblage a useful term to use to describe and consider the complexity and variation of disciplinary, global, human and non-human perspectives that provide the much wider context for this research.

1.3.3 Engaging in research as a writer

This inquiry is grounded in my practice and experience as a writer who has worked in publishing and the arts and creative industries for ten years. The research has roots in my long interest in wonder tales, a form of traditional story more commonly known as fairy tales (Warner 2014, p.xxii), and the ways these stories have been shaped and reshaped – first in oral traditions and then by the technologies used to share them (Zipes 2012, pp.21-2). As a short story writer who has no interest in writing a novel, I am already situated at the fringes of the publishing industry, and perhaps, therefore, much freer to challenge conventions and to explore what else it’s possible for stories to do. My writing has primarily been published in print, although I have long been fascinated by the potential of digital technologies. I taught myself to code in

HTML from an out-of-date library book when my sons were babies to found two online journals, *New Fairy Tales* (2008) and *Paraxis* (2011), and made a *Field guide to digital fiction* (2010) as part of my Creative Writing MA at Edge Hill University. HighWire has provided my first opportunity to work within Computing as an academic discipline.

Working as a writer on a digital technology and environmental risk management project just prior to undertaking this research, I created a series of stories that could respond to environmental data. During the project, I found the field visits and working with scientists on the project inspirational. Through collaboration with technologists, the stories I wrote were intended to be made visible online in relation to live environmental conditions. Yet, there was a chasm between the subject of the stories, told from the point of view of wind, rain and sea, and their existence as a screen-based prototype. Additionally, the technicality of the coding soon outstripped my ability to contribute to its development. When the project finished, and the prototype stopped working, I was unable to fix it. This prompted me to wonder how else those stories could have lived in the world and to search for ways of making digital stories that are more accessible to those without computing qualifications.

1.3.4 The centrality of practice

In the UK the PhD is awarded 'for the creation and interpretation, construction and/ or exposition of knowledge which extends the forefront of a discipline, usually through original research' (QAA 2014, p.30). Arts-based research in UK higher education has expanded rapidly since the 1980s (Nelson 2013, p.11). In the

Western intellectual tradition, theory and practice have been sharply divided (Ibid, p.5), but there is now increased recognition of the significant contributions to knowledge that can be made by bringing them together in a creative space (Gray and Malins 2004, p.32). The insights developed through practice as research are transferable to other practitioners and scholars through their clear and explicit articulation in writing, enabling an advanced contribution to be made to a field (Mottram 2014, p.246).

For this inquiry, the use of practice as research is essential to developing understandings about aspects of ecological storymaking. As Michael Crotty writes, the purposes of our research are embedded in our question and this should lead to our selection of methodology and methods (2015, p.13). A desk-based study evaluating the responses of writers to ecological crises could lead to insights through the interpretation of published texts, but an exploration of the writing process and its impact on the texts would be entirely absent from the research. A qualitative study drawing on interviews with writers could bring valuable insights to process, but it would not enable the depth of insight possible through the in-the-moment reflective and iterative inquiry that characterises practice as research, described by Robin Nelson as theory '*imbricated within*' practice (2013, p.29). This research is focused on the discoveries that can be made and shared from inside practice. It uses the insights drawn from this original research to create, interpret and communicate new knowledge, and in doing so meets the requirements of the doctoral award (QAA 2014, p.30).

1.4 Implications of the research

As this is an interdisciplinary study rooted in a creative practice, the findings of this research have implications for practitioners and scholars in several areas.

For writers engaged in making ecological stories, it provides insights into an approach to storymaking that focuses on material practice and direct engagement with the living world. The research invites writers to question their lack of engagement with the processes and materials of production and to consider the interplay between the stories they write and the materials and technologies that are used to share them. This study challenges the concept of the writer as creator solely of content and emphasises the relationship between a story's narrative and physical form.

This research also has implications for the publishing industry. Several of the stories created through this study respond innovatively to the reader and the environment and were developed without pre-determining how technology would be used to share them. This suggests that prioritising a technology, and seeking content to fit within its established conventions, can limit opportunities to explore and develop new kinds of stories. For readers, this research offers new ways to read and engage with stories. The work developed counters the dominance of the screen and printed page and invites direct engagement with wider nature through stories that are imaginatively and materially inspired by their ecological subject matter.

For scholarly disciplines and future researchers, this research has significant implications in its demonstration of the value of interdisciplinarity for the development of new knowledge. In bringing the arts and sciences together through practice as research, it illuminates the potential for cross-pollination and new insights that emerges when a researcher is not isolated in a single discipline. Given the complexity of ecological crises, freedom of movement between disciplines is essential.

It is in the context of responding to these crises that this research has implications for its widest audience, which includes people working with environmental communication in academia, conservation, the media or publishing. For those who want to tell ecological stories that will make a difference in the world, this research underlines the importance of taking into consideration how those stories are made and shared.

1.5 Structure of the thesis

What follows is a thesis, but as a writer I also can't help but think of it as a story. It's the story of what happens when a writer sets out to make ecological stories, and in doing so finds she must question everything about writing practice, technologies and conventional disciplinary boundaries. She sets out to discover what more she can do to make and share stories of connection with wider nature and brings back what she finds with the aim of helping other writers to develop their own explorations. The thesis is divided into three parts. Part one, forms the understory of the research. The introduction is followed by

a contextual review that expands on the rationale for this research and considers the relevant theory and practice that the inquiry builds upon, drawing together insights from across disciplines and practices to develop the research questions. In chapter 3, methodological approaches are reviewed through the form of a story and a research design is established for working with a practice as research methodology.

The story of the research forms part two, which documents three creative explorations undertaken in response to the research questions: *Persephone Calling*, *The Lichen Records* and *How to Catch a River*. Each project takes a different ecological subject as its starting point and documents the germination of ideas and experimental processes undertaken, making tacit knowledge visible and explicit through reflection. These chapters emphasise process over end product. However, to enable better understandings to be developed about the impact of practice on stories, all the elements of each story made are also documented within the thesis. Through these three projects an approach to ecological storymaking was developed and chapter 7 documents and reflects on the sharing of this approach with other practitioners through two workshops.

Part three brings together the research's contributions to the wider story, synthesising insights from parts one and two in a discussion chapter, which concludes with seven propositions for writers that aim to provoke reflection on contemporary writing practice, working with technologies, and the role of writers. Chapter 9 concludes the thesis, recognising the limitations of the research and pointing towards future work. The contributions made to

knowledge are considered in terms of writing practice, the evolution of stories, and the wider response to ecological crises.

Through practice as research, this inquiry develops an approach that suggests a need not just for new stories, but for new and more holistic ways of making stories for challenging times. Rebecca Solnit has written that,

‘Ultimately the destruction of the earth is due in part, perhaps in large part, to a failure of the imagination or to its eclipse by systems of accounting that can’t count what matters’ (2014a)

This research joins the many acts of imagination being carried out across the world that are attempting to address this failure.

Part 1, Chapter 2: Contextual review

It matters what stories tell stories (Haraway 2016, p.35)

This research inquiry addresses the calls from theorists and conservationists for new stories that respond to current ecological crises (DuCann et al. 2017; Klein 2015; Lakoff 2010; Smith et. al 2014; Tsing et al. 2017). To begin to explore narrative possibilities, it is essential to develop an understanding of the context in which these calls are made. This review explores why new stories are needed and how ecological narratives have been shared across time. The ways print and digital technologies shape stories is considered, and the role of the writer in contemporary publishing is assessed. Understandings drawn from the works reviewed are brought together to form the research questions that frame the inquiry.

Ecological crises are so complex they require thinking and responses that are not restricted by disciplinary boundaries. Taking a single approach is not enough: working with and synthesising from the approaches of multiple disciplines gives researchers the opportunity to grapple with complexity. In describing the context in which this research takes place, this review draws together insights from literary theory, environmental science, conservation

literature, design, computing, art practices, cognitive science, science and technology studies, and philosophy.

2.1 Stories and the world

...our human perspective is that we inhabit an endlessly storied world (Cronon 1992, p.1368)

Stories are enmeshed in every part of our lives as they help us to shape, understand and share our experiences. This section explores the positive and negative ways narratives can shape our relationship with the world around us. In the oral tradition ecological stories were used to share knowledge about the living world, but the spread of print technologies has changed the way ecological stories have been shared over time, privileging individual voices over communal knowledge. In contemporary publishing there has been an explosion of writing that focuses on nature, but individualistic human-centred narratives still dominate. It is clear that writing is needed that emphasises connection with wider nature rather than propagating the illusion that humans are somehow separate. This section shows that stories have a clear role to play in facing ecological crises but given that they are so effective at shaping the ways people see and engage with the world they need to be used with care.

2.1.1 Stories of where we are: disenchantment, disconnection, and their counter-tales

Stories of disenchantment

Humanity's response to climate breakdown and ecocide has been wholly inadequate to date. Many theorists suggest this is rooted in a human perception of being separate and distinct from the rest of nature (Nanson 2007, pp.3-5). For E.O. Wilson, it is evolutionary changes – bipedalism, large size, and sensory limitations – that made us not only the dominant species on Earth but also unaware of almost all the life we are destroying (2014, p.90). However, this overlooks the fact that humans don't all, and haven't always, lived in a state of alienation from wider nature. Iain McGilchrist argues that this disconnection results from the advent of modernity in the West, with its roots in the 19th century's Industrial Revolution and the attendant movement from rural to urban life, loss of a sense of belonging, and social disintegration (2012, p.389). Additionally, dominant narratives from religion, and subsequently science, gave rise to the idea of human superiority (Gray 2014, p.77; King 2003, pp.26-27), separating Western societies psychologically and spiritually from the natural world. According to the 19th century scientific view, through evolution humans had emerged from nature (Tarnas 2010, p.376). Thus separated from the rest of the world, people in the West began to view the Earth as 'a bundle of resources' (Kothari 2010, p.425) for private exploitation rather than as gifts for sharing (Ibid.). Fuelled by what John Gray describes as the myth of progress, in which 'humanity is marching to a better future' (2014, pp.79-80), Western capitalism

has been able to 'manufacture the waste land of consumerism' (McIntosh 2008, p.158), leaving us in what Max Weber referred to as the disenchanting world (McGilchrist 2012, pp.389-390).

The dominance of the narrative of human exceptionalism is indisputable (Rose 2017, p.655). William Cronon notes that stories of human impact on the environment are told through either a progressive or declensionist mode: either they relate a story of improvement and progress, or one of human destruction rooted in, 'antimodernist reactions against progress' (1992, p.1352). He notes that, 'Placed in a particular historical or ideological context, neither group of plots is innocent: both have hidden agendas that influence what the narrative includes and excludes' (1992, p.1352). Although this is a valid observation of the way narratives have been used, a quarter of a century later the evidence of human-caused destruction is overwhelming (Ripple et al. 2017). Since 1992, a 35% rise in population has led to intense pressures on the environment (Ibid.). The burning of fossil fuels, deforestation and agricultural production have risen, a mass extinction event has begun, and an economy rooted in growth and unsustainable consumption proliferates in many countries around the world (Ibid.). It seems that the challenges now faced are greater than they have ever been before. As Charlotte DuCann et al. write, 'We imagined ourselves isolated from the source of our existence. The fallout from this imaginative error is all around us' (2017, p.11).

Counter-tales of connection

We must accept the evidence that human actions are causing ecological crises, but the way we choose to tell stories about it matters. Jane Bennett challenges the disenchantment narrative, suggesting it has become a self-fulfilling prophecy, shaping the world in its form, and that it's, 'too hard to love a disenchanted world' (2001, p.12). She suggests we need, 'not a tale of re-enchantment but one that calls attention to magical sites already here' (Ibid., p.8). In responding to this call, the realities of contemporary life have to be taken into account. In post-industrial societies, we cannot return to a pre-modern existence and our engagement with other living things is often disrupted by urban environments. Rather than focusing on this disconnection, though, we need stories of connection. There is a need to recognise that we, 'are part of Earth's flora and fauna' (Wilson 2014, p.26), not *apart* from it.

Our attention to connection can begin with the language we use to describe the rest of the world. Timothy Morton argues for the concept of 'ecology without nature', noting the fact that, 'nature remains an effective slogan is a symptom of how far we have *not* come' (2009, p.24). He argues that using the word nature is a barrier to developing ecological thinking and appropriate responses to the crises (2009, p.1). For Morton, the term nature is an empty rhetorical construct that increases people's sense of being at a distance from the rest of the living world (Ibid. p22). Of the word environmentalism he notes, 'In a society that fully acknowledged that we were always already involved in our world, there would be no need to point it out' (Ibid., p.141). Morton asserts that to take an ecological view of human

connection with the world, we must give up the idea of nature, and the language associated with it (Ibid. p.1).

Ecology is a term that reduces distance – with its recognition of the connection between living things and their environments and its etymological roots in the concepts of home and dwelling (Schwarz & Jax 2011, p.145).

Throughout this study, I use the term ecology and attempt to reduce my use of the term nature as part of my aim to express connection with other living things. However, I acknowledge that doing so challenges long-ingrained habit, and, as Jonathan Bate suggests, perhaps the term needs to be contested rather than being rejected outright (2000, p.171). With this in mind, where the word ecology could not be used without disrupting the clarity of meaning, I've used the more encompassing term 'wider nature' when referring to anything other than human. In doing so, I am attempting to make clear that humans are a part of and not separate from nature.

As well as creating barriers through language, we create narratives of disconnection through our descriptions of place (Melosi 2010, p.3). As Kevin Lynch writes, 'We cling to the notion of a world with an urban inside and a rural outside' (1965, p.219). With more than half of the world's human population now living in urban areas (UN 2018), many people's contact with other living things is limited to the creatures and plants that also make their homes in the city (Dunn et al. 2006 p.1814). Robert Dunn et al. argue developing awareness of this 'nearby nature' could be vital to future conservation efforts (2006, p.1814). Yet, 'nature' is often depicted in stories, tourism and conservation communications as something outside our everyday experience –

as something we must travel to see (Moss 2012, p.17). Spending time in nature is a recreational activity for those whose class privileges give them the resources to enjoy it (Cronon 1996, p.21). This forms part of a, 'consumerist appreciation for the reified world of nature' (Morton 2009, p.155). This narrative portrays the city as an entirely artificial construct from which non-human nature is excluded and the countryside as natural. In fact, the ecologies of rural areas have been negatively impacted by human management for thousands of years (Monbiot 2014, pp.66-67). In the UK, agriculture has led to widespread deforestation and ecocide. George Monbiot describes how, 'what we have come to see as natural is in fact the aftermath of an ecological disaster' (2014, p.69).

Acknowledging the complexities, inconsistencies and hypocrisies of these narratives and counter-narratives means they can begin to be navigated. Recognising connectedness with other living things from wherever we are is essential. There are traditions around the world that have continued to use storytelling as a form of connection with the living world, but in the affluent West these traditions have been eroded. If stories are to be used to respond to the crises, there needs to be a focus on stories of connection rather than a repetition of the narratives that set humans apart from the rest of the world.

2.1.2 What can stories do?

Stories can help

The repeated calls for stories to respond to climate breakdown and ecocide shows a faith in the power of stories to speak to people and bring about change.

A recent report on arts and humanities research and the environment asserts that,

...arts and humanities research can provide new perspectives on the weather, climate change, and natural history, each with important implications for the way we engage people in caring for and protecting their environment (AHRC 2017, p.1).

Stories are one key element in a, ‘rapidly expanding body of artistic and cultural work that responds to climate change’ (Smith et al. 2014. p.7). The term story is rooted in the Latin *historia*, but the term had diverged from meaning an account of historical events to also mean fiction by the late eighteenth century (Bassnett 2013, p.326). Stories are ubiquitous, ‘present in every age, in every place, in every society... distributed amongst different substances’ (Barthes 1977, p.79). Stories can inspire us and influence our actions – ‘affecting what people are able to see as real, as possible, and as worth doing or best avoided’ (Frank 2010, p.3). Boyd notes the capacity of fiction to enhance creativity and extend our thinking beyond the present, so we can envisage how situations can be transformed (2010, p.197). Stories can also enhance empathy. Francis Firebrace, a Yorta-Yorta elder and performer, has described the way a story, ‘Opens people’s hearts and plants seeds’ (Nanson 2007, p.18). The ability of stories to influence emotions and inspire empathy is backed up by growing empirical evidence (Heister 2014, pp.103-9). Keith Oatley writes that fictions, ‘start trains of thought that readers would not have otherwise had... They prompt new connections within the self’ (2002, p.55). Oatley’s studies on the relationship between fiction and empathy have resulted in him concluding that, ‘fiction may be twice as true as fact’ (1999a. p101).

Truth, fact and fiction

Despite the evidence that fiction can, and does, make a difference in the world, suspicions about its ability to convey truth remain (Oatley 1999a, p.101). Oatley notes, 'Fiction does not mean something untrue; it means something made' (1999b, p.444). Yet, terms for stories such as fairy tales and myths, are also associated with dishonesty (Armstrong 2005, p.7; Warner 1995, p.xiii; Botkin 2012, p.xvi). Lakoff attributes the valorisation of facts above all else to our inheritance of Enlightenment thinking (2010, pp.72-73). The idea that 'reason is conscious, unemotional, logical, abstract, universal' has, he notes, been disproved, but remains prevalent among people who are involved with environmentalism (Ibid.). 'As a result, they may believe that if you just tell people the facts, they will reason to the right conclusion' (Ibid.). Yet, as the *Common Cause for Nature* report asserts, 'People aren't 'rational', emotions and values are crucial in determining how we process information' (2013, p.14). Presenting facts about environmental challenges is not enough to motivate people to action. In fact, 'Fear and threat can make us feel helpless. They can also backfire, making us more materialistic and less concerned about the environment'(Blackmore et al. 2013, p.15). Instead, the *Common Cause* report recommends using frames that 'focus on connecting with nature'. Frames are, 'bundles of associated knowledge and ideas in our memories' (Blackmore et al. 2012, p.3). Using frames that focus on connection can help because they are, 'strongly linked to intrinsic values, which help promote pro-environmental and pro-social behaviours' (Blackmore et al. 2013, p.57).

Altering how we present information transforms the way people feel about and respond to it (Blackmore et al. 2013, p.48). Lakoff implores people to,

Tell stories that exemplify your values and rouse emotions. Don't just give numbers and material facts... find general themes or narratives that incorporate the points you need to make (2010, p.79-80).

Sharing stories is a worthwhile response to ecological crises, however the use of stories is not without its uncertainties, which require further consideration.

Stories can harm

Recognising the power of stories to influence people, also means recognising their influence can be harmful as well as beneficial. The current ecological crises can be considered a result of harmful dominant narratives. As DuCann et al. write,

‘We believe that the roots of these crises lie in stories we have been telling ourselves... myths of progress, human centrality and separation from “nature”. Recognising these as stories we have made for ourselves means we can change them, creating alternative narratives to reflect new ways of understanding our place in the world (Armstrong 2005, p.11).

Stories can be shared with the intention of bringing about positive change, but the writer needs to be wary of straying into instrumentalism. This can result in the story losing the qualities that would make it engaging (Le Guin 2016, p.48). Butler notes:

When we call for more stories about climate change we are not asking for more coverage of climate change in the media. We are asking for more works of literature... Not to rally us to a

cause, or to encourage us to make adjustments to our lifestyle, but to deepen our understanding of a predicament that didn't exist a generation ago (2014, p.13).

In setting out to make ecological stories, we also need to be aware of the way literary forms contribute to the shaping of what is communicated. Jonathan Gottschall describes how, 'Fiction – from children's make believe to folktales to modern drama – is about trouble. Aristotle was the first to note this' (2012, p.52). Bryan Alexander notes that, 'problem-based storytelling is a popular model in the literature' (2011, p.8). Ursula K. Le Guin discusses the popularity of this model and describes how a focus on conflict can have negative impacts. This story, she writes, 'is the story that hid my humanity from me, the story... about bashing, thrusting, raping, killing, about the Hero...The killer story.' For Le Guin, our reification of the hero's story contributes to our domination of wider nature and each other. She writes:

It sometimes seems that the story is approaching its end. Lest there be no more telling of stories at all, some of us out here in the wild oats, amid the alien corn, think we'd better start telling another one, which maybe people can go on with when the old one's finished. Maybe. The trouble is, we've all let ourselves become part of the killer story, and so we may get finished along with it. Hence it is with a certain feeling of urgency that I seek the nature, subject, words of the other story, the untold one, the life story (1992, p.168).

Le Guin argues powerfully for another structure for stories, which she calls the 'Carrier Bag Theory of Fiction' (1992). In contrast to the linear plot of the hero, she proposes the idea of a receptacle for gathering fictions, 'full of beginnings without ends, of initiations, of losses, of transformations and translations, of far more tricks than conflicts' (1992, p.169). This more

encompassing approach to making fiction, allows for more diverse communities of voices rather than focusing on an individual male hero's domination and achievements, and so may be particularly suitable for making ecological stories. Writing stories is an action in the world that has consequences and it is important to acknowledge the potential for these to be positive or negative. Writing with an awareness of this becomes essential when a story is written in response to ecological crises and the costs of either inaction or of harmful messages can be so high.

2.1.3 Ecological stories across time

Traditional stories

Many oral traditions locate story in landscape. Abram describes this as 'an alliance so thorough that the speaker must pace his stories or songs to match the speed with which he moves through the terrain' (2017, p.174). In this way, imaginative stories can become a means of navigating the physical world literally as well as psychologically. Before the advent of writing, oral stories, 'carried within their nested narratives much of the accumulated knowledge of the culture' (Abram 2017, p.104). Anthony Nanson connects the disappearance of these stories to the loss of the living things they refer to:

Hand in hand with the destruction of nature goes the destruction of traditional knowledge – the oral tradition of creation myths, culture hero epics, and instructive folktales – that once mediated a balanced relationship with the land (2007, p.4).

Robert Macfarlane writes that we have also lost words for landscapes, creatures, plants and weather conditions. He points out that language deficit

leads to attention deficit (2015a, p.24). Many of the oral stories that have survived were first recorded as literary versions during the 19th century. The stories were often reshaped in line with the 19th century values of their collectors, translators and editors, and knowing this complicates our engagement with them. However, Elder and Wong write, ‘we can still appreciate them as imaginatively translated and constructed collaborative narratives’ (1994, p.9). Themes found in these stories echo through to today: ‘Harvest wisely, take care of the land, do not pollute, respect all life, seek balance in nature, believe you can make a difference’ (MacDonald 1999, p.xi). Le Guin notes that preindustrial stories contain ‘a powerful and permanent element of animal story’ (2016, p.26) and that the recurring animal helper motif reminds us ‘all creatures are kin’ (Ibid., p.33). In these stories there is a boundless sense of possibility, yet the tales also serve the moral purpose of teaching where boundaries lie (Warner 1995, p.xvi), depicting relationships between humans and the living world while engendering ‘pleasure in the fantastic, curiosity about the real’ (Warner 2014, p.xvi).

Folkloric tales like these are often described as fairy tales in English literature, but the term wonder tales, from the German *wundermarchen* (Warner 2014, p.xxii), seems to better reflect their imaginative character and potential to engage our own sense of wonder. Rather than a literal representation of the world, wonder tales present us with a counterworld (Zipes 2012, p.14). They ‘are unreal but they are not untrue’ (Lüthi 1976, p.70). The unreality of the stories does not diminish their ability to address difficult questions and suggest meaningful answers, it often enhances it. As Marina

Warner notes, the translation of experience through metaphor is often more compelling than a literal account (2014, p.95). McGilchrist writes that 'the word metaphor implies something that carries you across an implied gap' (2012, p116). Stories can carry us across gaps towards understanding by offering us new knowledge in an engaging way.

The 19th century movement in many European countries to collect, edit and publish folklore and wonder tales can be considered one strand of the wider tradition described as 'romantic ecology' (Coupe 2000, p.13). Romanticism emerged in response to industrialisation, as a 'critique of the Enlightenment's aspiration to master the natural world and set all things to work for the benefit of human commerce' (Bate cited in Coupe 2000, p.xvii). Writers including William Wordsworth, William Morris and John Ruskin in the UK, and Ralph Waldo Emerson and Henry Thoreau in the US, popularised a strand of literary romantic writing that focused on their individual responses to 'nature' and 'the wild' (Coupe 2000). Works grouped under the term Romantic, tend to describe contact with nature as a way of healing the ills of modern society (Morton 2009, p.22). Laurence Coupe describes contemporary nature writing as having its roots in this romantic tradition and describes there being a sense of continuity between the writings of 19th century poets like Wordsworth and many environmental writers today (2000, p.6).

Ecological stories and contemporary publishing

Twentieth and twenty-first century publishing has seen a flourishing of activity under the banners of 'nature writing' and 'new nature writing'. The latter being

a term popularised since the 2000s in the UK (Moran 2014, p.49), where, as Mark Cocker notes, its expansion is one of the most considerable in publishing this century (2015). Moran describes the common theme uniting new nature writing as being 'its exploration of the potential for human meaning-making not in the rare or exotic but in our everyday connections with the non-human natural world' (2014, p.50). Key practitioners in the field include Mark Cocker, Roger Deakin, Kathleen Jamie, Richard Mabey and Robert Macfarlane (Ibid., p49). Cocker has described the appeal of this kind of writing as residing in its ability to remind us of our connection to the rest of the living world while minimising the feeling of our own centrality, saying, 'We become part, not all.' (2015). Yet, as Elder and Wong suggest,

...the very fact the West has developed a genre called 'nature writing' testifies to a separation between much of human life and the nonhuman world that has developed since the industrial revolution (1994, p.3).

Morton asserts that 'Nature writing partly militates against ecology rather than for it... it re-establishes the very separation it seeks to abolish' (2009, p.125). Even Cocker, while advocating for the form, notes the very real possibility that these works can become 'a literature of consolation that distracts us from the truth of our fallen countryside' (2015). The highly commercialised output of the genre, as seen in new bookshop sections across the UK, suggests that Cocker's worries could be well-founded. There is potential for the form to provide a vicarious substitute for actual engagement with wider nature. Additionally, the reflective essays that characterise the genre most frequently project the voices of isolated individuals rather than focusing on

communities (Elder and Wong 1994, p.3). These individuals are often lone men and the very noticeable lack of gender, ethnic and class diversity is a serious limitation of the form (Oakley et al. 2018, p.697). Poet Kathleen Jamie emphasises this issue in her description of MacFarlane: 'What's that coming over the hill? A white, middle-class Englishman! A Lone Enraptured Male!' (2008).

This is not to say that the vital work of addressing the lack of diversity in the genre has not begun; a number of independent publishers, editors and writers are striving to bring more diverse voices, experience and knowledge to the fore. Examples include Robin Wall Kimmerer, who describes the three core strands of her writing as, 'indigenous ways of knowing, scientific knowledge, and the story of an Anishinabekwe scientist trying to bring them together in service to what matters most' (2013, p.x). In her books *Gathering Moss: A Natural and Cultural History of Mosses* (2017) and *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants* (2013), Kimmerer offers the reader insights drawn from Traditional Ecological Knowledge (TEK), her expertise as a botanist, and her experiences as a mother. In 2009, the publication of *Black Nature: Four Centuries of African American Nature Poetry* (Dungy) marked the first major review of nature writing by African American poets. The book seeks to dispel the perception that African Americans have not participated in the genre. As editor Camille T. Dungy notes, nature writing is often about an idealised pastoral landscape, 'And black people have been typically working in the land, and that's not part of the idyllic version of things' (Montagne 2010), but this doesn't mean many and varied writings on

the subject by African Americans don't exist. In the UK, there have been efforts to share contributions women have made to the genre with the recent publication of *Waymaking: An anthology of women's adventure writing, poetry and art* (Mort et al. 2018), and the crowdfunding campaign for the anthology *Women on Nature* (Norbury 2018). This campaign will enable publication of a book that seeks to investigate and share the many different ways women have observed and recorded the natural world around them (Ibid.).

In addition to works showcasing the voices of people who have been excluded from the existing canon of nature writing, there are writers who are working to bring the imagined voices of ecological subjects to the fore. Notable examples include poet Les Murray, whose book *Translations from the Natural World*, gives voice to creatures from a pair of dogs to a shoal of fish. In one poem, two eagles tell us, 'We shell down on the sleeping branch. All night./ the limitless Up digests its meats of light' (1993, p.15) and Murray's visceral use of language transports us up into the sky. Alice Oswald's *Dart* catches the voice of a river, and the many who live in and with and beside it, in its evocative lines of verse, 'all names, all voices, Slip-Shape' (2002, p.48). Writing such as this counters Cocker's warning that the nature in nature writing can become nothing more than a pretty background to people talking about themselves (2015).

Ecological writing can also be considered within the wider context of environmental and activist art. Oakley et al. have described the genre's potential as a form of arts activism and consider it to have a place within a spectrum of socially and politically motivated art that includes the sculptural

land art of Andy Goldsworthy and the urban waterway installations of Eve Mosher (2018). Macfarlane describes a 21st-century culture of nature ‘involving millions of people and spilling across forms, media and behaviours’ (2015b). Organisations and collectives are forming that embrace and share nature writing alongside other artforms like film, photography and music. Examples in the UK include *Caught by The River*, which started out as an online meeting space in 2007 and has grown to become a publisher, event organiser and music label (2018), and *Dark Mountain Collective*, which is ‘a project has taken many forms: a manifesto, an ongoing series of books, four annual festivals and far more events, collaborations and friendships’ (2018). Both of these eclectic organisations have embraced the potential of digital communication for reaching wider audiences while rooting their activities in direct engagement with wider nature.

Alongside these developments, there have been movements to revive oral storytelling traditions in Western societies (Dwyer 2010, p.69). Storytelling clubs and festivals have been established across the UK (SFS 2017). This resurgence of interest in storytelling has become bound up with environmental concerns, leading to the publication of many collections of traditional stories on ecological themes (for example, Keable 2017; Galbraith and Willis 2017; MacDonald 1999). Elder and Wong describe the important role of storytelling:

Familiarity with the oral traditions of nature from around the world can both reinforce the environmental awareness already fostered by Western nature writing and give it a more global and particular context (1994, p.1).

Contemporary fiction has also tackled ecological themes across literary, science fiction and fantasy genres. The term ecofiction has been used to describe what is 'primarily a literacy phenomenon of the twentieth and twenty-first centuries' (Dwyer 2010, p.10). Joe Smith describes the growing number of climate change novels and the way they often equate planetary loss with an individual's personal loss, noting, 'These representations are, one suspects, as much about us, and how we are in the world, as they are about those non-human ways of being' (2014, p.64). It is pertinent to consider this in relation to the finding from the *Common Cause for Nature Report* that emphasising loss and hopelessness may actually provoke disengagement from the issues (Blackmore et al. 2013, p.15). In this study, it is my intention to focus on themes of connection and hope rather than loss, in order to engage readers with ecological issues. One way I intend to do this is to draw on traditional tales, which Warner notes often present 'messages of hope arising from desperate yet ordinary situations' (2014, p.96). However, it is important to recognise that I am sharing stories in the face of unprecedented ecological crises. I anticipate that focusing on hope will be difficult as the challenges we currently face can feel so overwhelming. Acknowledging this, Renata Tyszczyk writes:

Climate change is too here, too there, too everywhere, too weird, too much, too big, too everything. Climate change is not a story that can be told in itself, but rather, it is now the condition for any story that might be told about cities, or our inhabitation of this fractious planet (2014, p.47).

The need to write from within these conditions challenges writers in terms of how they work with the content of stories and the ways they shape and

share them. This has been underlined by Rob Nixon, who describes climate change as a form of slow violence, which is violence that takes place over long timescales and is often unseen (2011, p.2). To confront this slow violence, he writes, we need to ‘plot and give figurative shape to formless threats whose fatal repercussions are dispersed across space and time’ (2011, p.10). There is a need to tell stories that engage people with the issues, to emphasise connection and hope, to reveal issues that are often invisible to people, and to grapple with representing the ways human actions can have devastating long-term ecological effects. Drawing inspiration from the many ways ecological stories have been told over the centuries and recognising the successes and limitations of the various approaches, gives me a base from which I can begin to explore different ways of storymaking in response to the challenges we face.

2.1.4 Wonder tales for the here and now

It is clear that stories can have a positive role to play in engaging people with ecological crises. Stories can provoke empathy, promote understanding and aid the transfer of knowledge. However, an awareness that stories can also have negative impacts is essential for responsible storymaking. Stories of connection and kinship are needed that can evoke a sense of wonder in everyday urban environments. Narratives of human separation from the rest of the world exacerbate people’s sense of disconnection. This is amplified by the fact many more people now live in urban rather than rural environments. Transplanting traditional tales straight into contemporary urban environments may not engage audiences who live in very different circumstances to their ancestors.

Wonder tales, as a form of traditional story, have a long history of exploring relationships between humans and the rest of the living world, while emphasising the marvellous in the everyday. To use this form now requires finding ways to situate the narratives in contemporary realities.

There is also a need to consider the voices that are shared through ecological storymaking. New nature writing has privileged the voice of the individual male writer, and in common with much ecofiction has put humans at the centre of the story. The current ecological crises are so large, multi-faceted and overwhelming they need to be addressed by a multiplicity of voices from many diverse perspectives. Attempts to imagine the voices of other living things and not only tell stories about humans is one way of addressing dominant anthropocentric narratives. There is a need to consider what these challenges mean not only for content but for the way we shape and tell stories, particularly in the context of events taking place across vast distances of time and space. Given that stories are intertwined with the ways they are told, it is also necessary to consider how technologies contribute to shaping the stories that we need.

2.2 Technologies of story

To surpass our limits, we built structures – giving our ideas solid form. These structures we built, in turn, shaped us (Sousanis 2015, p.109)

The book has flourished for centuries as a substrate for stories, shaping texts in ways that have become invisible to us (Hayles 2002, p.39). This section explores the ways print and digital technologies can impact on narrative, and what this means for the making and sharing of ecological stories. Where print technologies led to a sense of the fixedness and authority of texts written by individual authors, digital technologies enable the creation of more flexible and collaborative texts. The use of either print or digital technologies for ecological storymaking prompts questions about their environmental impacts. When making ecological stories it becomes essential for writers to pay more attention to the technologies they choose to use and the impacts these technologies have on both their stories and the world.

2.2.1 Stories are shaped by print

During periods of emergence and transition, practitioners work across old and new technologies, and the impact a technology has on the shaping of narrative content becomes more apparent. When the use of print technology first spread, early printers emulated fine manuscripts, taking time to uncover the new possibilities the technology brought with it (Bolter 1991, p.3). ‘Technologies influence the situation, form, and production of texts’ (MacArthur et al. 2016, p.12), but in conventional print publishing this influence is obscured. The nature of a text is thought to reside, ‘in its linguistic content and structure, not its layout or its materiality’ (Sharples 1999, p.129). Daniel Chandler suggests, ‘the more frequently and fluently a medium is used, the more ‘transparent’ or

‘invisible’ to its users it tends to become’ (1995, p.12). As N. Katherine Hayles notes, ‘digital media have given us an opportunity we have not had for the last several hundred years: the chance to see print with new eyes’ (2002, p.33).

The invention of the Gutenberg Press in the 15th century transformed our relationship with stories and knowledge. In *The Printing Press as an Agent of Change* (1979) Elizabeth Eisenstein asserts that printing’s impact on societies was cataclysmic, but that this has often remained unacknowledged in historical accounts (p.3). With the development of printing, words became a commodity and stories that had been freely shared were now bought and sold (Ong 2012, p.129). Print technology bound stories to pages, encouraging us, ‘to think of a written text as an unchanging artifact, a monument to its author and its age’ (Bolter 1991, pp.2–3). Indeed, one of the appeals of print technology is its promise of permanence with the potential for texts to be, ‘resurrected into limitless living contexts by a potentially infinite number of living readers’ (Ong 2012, p.80). Johanna Drucker describes books as,

...low maintenance, relatively long-lived, free-floating objects with the capacity to convey a great deal of information, and serve as a vehicle to communicate far beyond the limits of an individual life (1995, p8).

In the oral tradition, mnemonic techniques such as rhythm and repetition, episodic structure, a focus on action, and fantastical characters, ensured stories were passed on (Ong 2012, pp.69-70; Lüthi 1976, p.51). When stories no longer had to be memorised to be shared, writers began to explore the interior lives of characters and to strive towards realism (Ong 2012, p.70, p.145). Walter Benjamin notes, ‘The dissemination of the novel became possible

only with the invention of printing (1999a, p.87). The stories told in novels couldn't have existed without the material form of the book and yet printed literature has been, 'widely regarded as not having a body, only a speaking mind' (Hayles 2002, p.32). It has taken the emergence of digital technologies for us to recognise that:

Literature was never only words, never merely immaterial verbal constructions. Literary texts, like us, have bodies, an actuality necessitating that their materialities and meanings are deeply interwoven into each other (Hayles 2002, p.107).

Both the content and form of fiction have been shaped by the transformations brought about by the development of the printing press. The impacts of printing range from literature's vastly increased geographical and social reach, to the commodification and gatekeeping of what had once been freely shared. Episodic and folkloric stories that had relied on mnemonic features and people's capacity to pass them on for longevity, gave way to plots that remain fixed by the printed page and emphasise interiority and closure (Ong 2012, pp.143-6). Once we acknowledge that stories have been shaped by technology in this way, it becomes vital to explore how new technologies can have impact on the stories they are used to share.

2.2.2 How do digital technologies shape stories?

Comparisons with orality and print

With the emergence and spread of digital technologies in the 1980s and 90s came the development of new kinds of screen-based story. Theorists have framed these developments with reference to the legacies of both orality and

print. Writing in the early 1980s, Ong described the way the use of computers continued the process of fixing words in space established by print technologies (2012, p.133). He also noted the emergence of 'secondary orality', describing this as a feature of technologies such as radio and television. These technologies returned people to, and extended, their sense of communal engagement with a story in contrast to the isolated engagement of a reader with a printed book (pp.133-4). Thomas Pettitt writes about this being part of a 'Gutenberg Parenthesis', suggesting that as we emerge from the dominance of print media we are experiencing a restoration of forms of communication that have more in common with the oral tradition (2013, p.55). As John Hartley notes, according to this theory, print-literacy is,

...an exception in a much longer trajectory of human thought, which may be in the process of restoring earlier modes of communication based on speech and instantaneity (Ong 2012, p.207).

Digital technologies, and in particular the advent of Web 2.0 (O'Reilly 2005) allow for the sharing of, and response to, texts across geographic distances at speed. Noting the similarities between them, John Miles Foley writes that both the oral tradition and the Internet 'depend not on static products but on continuous processes' (2012, p.7). In contrast to the distanced process of print reading, 'we now expect sociality to underpin most publication' (Alexander 2011, p.32). These links to orality are striking, but the technologies involved mean that digital publication can initiate responsive exchanges between reader and writer across vast geographic distances.

For other theorists, ‘digitization remains a technology strikingly akin to typography’ (Bredehoft 2014, p.159). E-readers have been embraced by commercial publishers and opened up a large-scale arena for self-publishing (Maxim & Maxim 2012), but as Alexander notes (2011, p.147), to date, e-readers only let us read stories in fixed formats, which is not the same thing as a digital story. E-readers and their content generally share key characteristics of printed books including fixed text, individual authorship, and commodification. There is a tendency for ‘the technology to be used to archive and provide access to extant texts’ (Haase 2006, p.228). Printed texts are replicated digitally, or digital texts are presented in a way that mimics the layout and reading conventions of print. Craig Mod has described digital books stagnating in ‘closed, dull systems, while printed books are shareable, lovely and enduring’ (2015). Thomas A. Bredehoft notes ‘the display protocols for digital text (at least at the moment) focus on two-dimensionality at the expense of materiality’ (2014, p.160). This could explain the growing reappraisal of print’s material qualities. An Arts Council report on 21st century literature notes: ‘despite and perhaps because of the rise in digital, people, and readers of literary fiction in particular, still value physical objects’ (Arts Council England 2017, p.31).

These comparisons help us consider the relationship between digital and print technologies, but we should not be limited by them. As Matt Hayler notes,

...to continue to judge the new by the old means that we still lose what’s good about the old thing (it may not be present anymore), but we also lose what might be excellent about the new (2015, p140).

Emergent digital technologies have begun to shape stories in ways that are still being explored.

Digital transformations

Due to the rapid pace of technological change definitions of digital literature remain unfixed (Bouchardon 2017, p.1). Here, I use the term to refer to literary works that make use of the capabilities of digital technologies as an integral part of the work. The broad scope and experimental nature of digital literature, and the speed of technological development, make it preferable to consider key characteristics identifiable across genres, platforms and devices rather than considering developments chronologically. Here, the characteristics of multiplicity, participation, hybridity and design for attention are identified across digital media and considered in relation to their impacts on story:

Multiplicity

Since the earliest electronic hypertext and interactive fictions, paths through stories have multiplied. Silvio Gaggi writes that readers are empowered by being given the role of navigator and active constructor of the story (1998, p.103). The reader explores via links and the narrative is shaped by the choices they make. With a body of digital work that stretches from Judy Malloy's, *Uncle Roger* (1986) to Joanna Walsh's, *Seed* (2017), significant scholarly attention has been paid to forms of digital literature that allow for multiple readings, but such works have not reached a mainstream audience. As R. Lyle Skains notes, for readers who are used to print, these works', 'unfamiliar delivery, structure and

conventions' can inhibit enjoyment (2010, p.107). James Pope writes that the mechanics of digital stories have often been put, 'before plot coherence, character development, reader-engagement and narrative closure' (2013, p.208). David Miall and Teresa Dobson note that readers who do report enjoyment find pleasure not in the fiction but in, 'the exercise of the intellect in driving the hypertext machinery to see where it will lead' (2006). These works are sometimes considered to have more in common with playing a video game than reading a story (Skains 2010, p.107). In contrast to hypertext fiction, video games have reached a much wider audience and as they become increasingly, 'intensely story-centric' (Gottschall 2012 p.182), the boundaries between reading and playing continue to blur.

Participation

Reader participation and interaction has extended far beyond clicking hypertext links, with the Web blurring boundaries between readers and writers. Online communities develop and share fanfiction, extending the fictional worlds of other media (Skains 2010, p.106). Experiments in collaborative fiction have included the wiki novel, *A Million Penguins*. This project spawned a complex hive of interlinked narrative fragments. Researchers Mason & Thomas describe it as having failed as a novel, producing something 'more akin to oral folklore with multiple versions of the same story existing at the same time' (2008, pp.19-20). Digital folklore has also begun to emerge, of which *Slender Man* is the most notable example to date. The story originated in a web forum (*Something Awful* 2009) and has since been told and retold in short online horror stories called

creepypasta, YouTube videos, fan art and games. Shira Chess and Eric Newsom identify in this process, 'shared ownership, variability of form, and the constant and consistent invitation for audiences to become storytellers themselves' (2015, p.9).

Away from the Web, there has been experimentation with located and situated digital literature. The term 'ambient literature' was coined by researchers on the AHRC-funded *Ambient Literature Project* (2016) to describe works that make use of novel technologies to create situated reading experiences. These works ask readers to participate by taking digital stories into different contexts and their reading experience is expanded through engagement 'with a wider (and wilder) paratextual world' (Marcinkowski and Hayler 2017). The reach of this kind of work has widened thanks to the proliferation of smartphones. Alexander predicts that, 'Mobile devices may become the ultimate digital storytelling device' (2011, p.139). Smartphones also enable other forms of participation. In Kate Pullinger's work of ambient literature, *Breathe* (2018), algorithms use data gathered on a reader's phone to individualise their experience of the story. This alters the locations, times of day and seasons in the story in response to when and where a reader is engaging with it. Technologies such as Virtual Reality, Augmented Reality and Mixed Reality are in continuing development, with Frank Biocca describing the goal of full perceptual immersion in a narrative – the illusion of an, 'absolutely "transparent" medium' (2013, p.114). These forms of narrative participation will further blur the boundaries between story and world.

Hybridity

Digital technologies enable combinations of, 'text, image, sound and structure together in a virtual environment' (Mencía 2017, p.4), creating many ways to shape and share stories. This hybridity extends beyond the screen, as writers and publishers explore the, 'creative potentials that exist when the traditional skills of writing and hybrid forms afforded by technology are combined' (Ashton et al. p.3). Works such as Duncan Speakman's ambient literature piece *It Must Have Been Dark by Then* (2017) and J.R. Carpenter's *A Gathering Cloud* (2016) combine print and digital technologies, engaging with acts of translation and transformation between media and contexts of reading. Mainstream publishers are taking advantage of hybridity in less experimental ways as they aim to engage wider audiences by bringing podcast and blog works to print media and vice versa (Alexander 2011, pp.47-49).

Design for Attention

Storytelling has always been about holding attention (Boyd 2010, pp.110-112).

There are more cultural forms vying for our attention than ever before, as Miall and Dobson note:

The key issue here will not be how far literature can be made to dance to the multimedia tune in order to seize the attention of the Internet-surfing audience for electronic entertainment, but how far we can establish the distinctive qualities of the literary experience that makes it a clear and significant alternative to what commercial interests are willing to provide (2006).

Digital literature has overwhelmingly focused on development for the screen, although the popularity of podcasts and use of digital technologies to

engage wider audiences with audiobooks must also be noted (Rubery 2016, p.245-6). Screen based-works were first developed for personal computers. As has been discussed, the novelty of hypertext fiction has drawn readers' attention to its mechanics and encouraged, 'processes of attention that inhibit the engagement and absorption that are [literature's] most characteristic aspects' (Miall and Dobson 2006). Many works of digital literature are now optimised for mobile devices, where the reader's attention is susceptible to interruption and temptation from other media and notifications. Works such as Blast Theory's *Karen* (2015) counter this by taking advantage of notification systems to interrupt the reader's everyday life with the story. However, as Simon Groth warns, a focus on developing works primarily for screens may be short-sighted given, 'the fluidity of digital media has been influencing storytelling long before we carried screens everywhere with us and will continue long after the next interface innovation comes along' (2018). The rapid pace of technological change provides clear warning that designing works for one specific experience of digital literature is unnecessarily limiting.

In works of ambient literature, attention is invited to shift between media, memory and the surrounding world. Jon Dovey recognises, in the capabilities of the emerging form, the potential to use it to address the complexities of environmental stories out in the world, suggesting, 'we need to develop forms of attention that afford us the potential to trace networks of entanglements' (2017). The suggestion that this hybrid form could engage people with ecological issues, runs counter to the widespread tendency to see technology as something that, 'removes us from the workings of the natural

world' (Gruen 2010, p.427). Yet, as we've seen, stories are a powerful way of engaging people with ecological issues and technologies help us to share stories. The challenge is for us to find ways to use technologies that enable stories to do what they do best.

2.2.3 Technologies and ecological stories

Technology vs Nature

Technology has often been seen as 'the mechanism by which nature is disrupted and destroyed' (2010, p.426). Yet, as Lori Gruen notes these arguments rely on describing a division between humans and nature that increases disconnection and which many environmentalists now disagree with (2010, p.427). What is more, newer technologies tend to provoke an adversarial reaction, while over time older technologies are accepted as natural. This is evident in the acceptance of the technology of the book, the form in which 'nature writing' is currently flourishing. Hayler shows that the book is thought of as giving a 'natural' reading experience while e-reading isn't (2015, pp.56-59). He argues neither is natural, rather it is, 'the use of and adaptation to technology that forms an aspect of our nature' (2015, p.58). We adjust to new technologies over time.

If we put aside the idea of a division between technology and nature, it remains pertinent to question if the use of digital technologies for making ecological stories is either appropriate or necessary. This will help us avoid the kind of 'technological determinism' that Evgeny Morozov describes where digital solutions are proposed for either non-existent problems or inappropriate

contexts (2014, pp.5–9). It is indisputable that the production of digital technologies has a negative impact on the environment (Gruen 2010, p.424). Currently, ‘The energy footprint of the IT sector is already estimated to consume approximately 7% of global electricity’ and this is set to rise (Greenpeace 2017, p.5). The potential role of digital media in contributing to protection efforts divides environmentalists, with some advocating for the use of technology in responsible ways and others citing the impacts on traditional and sustainable ways of life of even the most well-meaning technologies (Gruen 2010, pp.424–5). The issue is complicated further by the fact that the environmental damage caused by their production and use is often hidden from us. This is an aspect of what Albert Borgmann describes as the ‘device paradigm’ – created by the shrinkage and concealment of the machinery of a device (1987, p.42). This renders, ‘the details of its working... impenetrable to most users,’ while making a commodity easily available (Borgmann 2000, p.419–20). Similarly, the ecological impacts of cloud computing and server farms are concealed from us as we spend hours on our screens. J.R. Carpenter writes: ‘An email may travel thousands of miles/and pass through multiple data centres/to send a photograph across the street’ (2017, p.88). To counter this invisible consumption, Borgmann calls for focal artefacts and practices that, ‘disclose the world about us – our time, our place, our heritage, our hopes – and center our lives’ (2000, p.421).

Those who argue against the use of digital technologies on the grounds that they damage and disrupt our engagement with the environment often utilise print technologies to make their point, while ignoring the detrimental

impacts of print publishing. As Alice Bell writes of a series of ecological books for children, ‘There is an interesting question about the materiality of much of this media. That eco superhero Hall of Fame is built out of a pile of dead trees while telling kids to recycle’ (2014, p.42). She notes that in the 21st century, ‘Books have become a disposable product’ (Ibid.). In 2013, the UK published more books relative to population size than any other country by a significant margin, publishing 2875 titles per million inhabitants (IPA 2014, p.17). The print publishing industry has negative environmental impacts through deforestation, paper production, energy consumption, distribution, retail activities and disposal via landfill (Green Press Initiative 2008). As with digital technologies, these are rarely acknowledged. Understanding that *all* technologies have ecological impacts is essential. Chandler notes that, ‘When we use a medium for any purpose, its use becomes part of that purpose’ (1995, p12). In responding to the call for ecological stories we must consider the interrelationship between ecological themes and the technologies we use to share stories. Only then can we try to address rather than conceal any conflict between them.

In 1923, El Lissitzky’s manifesto *The Topography of Typology* was published in *Merz no.4*. He argued not only that ‘the new book demands the new writer’ but that ‘The design of the book-space, set according to the constraints of printing mechanics, must correspond to the tensions and pressures of content’ (Tullet 2010). This reversal in process, requiring that books be shaped to fit content rather than content shaped to fit books, finds renewed potency with the emergence of digital technologies. With this in mind, we can

explore how the book-space of digital stories might respond to ecological content.

New Hybrid Tales

There is not yet a significant body of ecologically-themed digital literature. Only a small number of works on this theme have experimented with the possibilities afforded by digital technologies and hybrid publication. Three recent examples, *The Gathering Cloud* (Carpenter 2016), *It Must have Been Dark by Then* (Speakman 2017) and *Hayling Stories* (Green 2017a) each relate to climate breakdown and all engage with materiality and digital media in different ways. *The Gathering Cloud* co-exists as a website, printed book and live performance. The web-based work, collages old meteorological drawings and repurposed animal gifs. As the reader navigates the work, material accumulates on the screen, adding weight to simple digital actions for which we rarely consider the consequences. Carpenter writes, ‘The Cloud is an eerily deceptive name connoting a floating world far removed from the physical realities of data’ (2017, p.70). Both print and web forms of the work ground us in the material reality and actual cost of our digital interactions.

It Must Have Been Dark by Then was developed by Duncan Speakman and the *Ambient Literature* team as part of an AHRC funded project (2016). This printed book and GPS smartphone work asks readers to undertake a journey from wherever they are. Describing the three journeys he undertook on different continents to make the piece, Speakman writes, ‘I went with an intention to record loss but found much more’ (2017, p.8). Music, voice, stories

and the reader's own footsteps construct a palimpsestic work that invites the reader to make connections between Speakman's journeys and their own. The text in the printed book traces paths and climbs up pages as water levels audibly rise. I noted after experiencing the piece 'it wasn't like the story was in the same place, but like I was reading a book where the page had expanded, and the world was hanging between the words'.

Hayling Stories is a work-in-progress by Michelle Green, collaborating with interactive artist Maya Chowdry, sonic artist Caro C and literary geographer David Cooper. The work encompasses an evolving digital story map and live performance. Here, digital mapping is used as a way of holding on to memories as the sands of an island shift and sea level rises. Stories will be tied to local tide times on the completed digital map. Green writes, 'If a story sits out on the tip of the East Winner Sand Bar, our audience can only read or hear it when the tide is out. They will be tied to the island' (2017).

All three works engage with materiality and make use of the characteristics of digital technologies to make visible and share transient and embodied experiences. There is an emphasis on discovery by the reader, and in combining new and old experiences of reading, which encourages the reader to reflect on both. Carpenter develops her works as an individual, while also working as part of a wider community, with the work evolving with support from a festival, digital literature award and publisher. Green and Speakman are both working in collaboration with other artists and technologists. With all three works, there is engagement with the world beyond the page or screen that helps to shape and situate the reading experience. Yet, it is notable that all the

works use a screen as a major element of narrative delivery, resulting in what Iris Soute et al. describe as a 'head down' rather than 'head up' experience (2010). For the purposes of ecological storymaking, it is important to consider how this can limit interaction with the surrounding world.

2.2.4 Technologies for ecological stories

Technologies shape stories and engagement with digital technologies makes the impacts print technologies have had on stories more visible to us. Although it is inevitable that we consider new technologies in relation to the old, the dynamic and hybrid nature of digital media allows for new possibilities. The three examples of digital works with ecological themes considered above all engage with materiality as a way of making visible and tangible the impacts of climate breakdown. All combine content with the hybrid and participatory nature of digital technologies to engage readers and encourage discovery. Marshall McLuhan famously declared that 'the medium is the message' (2008). For him, the medium of a work had a more significant impact on its audience than content (1995, pp.151-161). Yet as Hayles makes clear, in literature the medium and content are thoroughly entangled in their communication of any message (Hayles 2002, p.32). This means there is potential for writers to engage with the shaping of the materials of communication *as well as* the content and to work with the interplay between them. To do so involves challenging the conventional role for writers established through the dominance of print publishing.

2.3 The role of the writer

Human endeavours, it seems, are forever poised between catching dreams and coaxing materials (Ingold 2013, p.73)

Despite its unarguably material nature, writing is often considered to be solely an intellectual linguistic pursuit (Sharples 1999, p.129). Books are considered only in terms of their content and writers as the makers of this content, playing a role in what Chandler describes as ‘ecologies of writing’:

All writers are inextricably enmeshed in such an ecology, which includes attitudes and practices in the use of media (such as language, the written word, textual forms, physical tools and systems of publication), and other social and psychological phenomena (such as personality and roles). It is an ecology in which writers shape texts and are shaped in doing so; in which they use tools and are influenced by their use of them; in which they both employ techniques and are directed by them; in which they adopt roles and adapt to them; in which they both write and *are written*. (1995, p13)

In responding to the calls for new ecological stories it becomes necessary to question the conventions of the ecology of writing established by mainstream print publishing. It is necessary to review the role of the writer and the ways their practice contributes to shaping stories. This section suggests that by engaging with writing as a material practice a writer can draw insights from the process to become more than a maker of content. By engaging directly with the resources and technologies of production a writer is able to explore the interplay between a story and the way it is shared. With increased autonomy,

the writer is able to respond to and make choices that relate directly to the ecological subject matter of the stories.

2.3.1 Writing a role

People use story to understand and share their experiences. In the oral tradition stories are part of a common store of material – the ‘float of themes and formulas out of which all stories are variously built’ (Ong 2012, p.60). Leslie Marmon Silko writes that the Pueblo people have told stories as a survival strategy for thousands of years and that as she grew up ‘everyone could tell stories, and everyone felt responsible for remembering stories and retelling them accurately’ (2012, p.xix). In addition to collective practices, there have always been those with the role of storyteller, people who could skilfully shape a story for each unique situation of its telling (Ong, 2012, p.59). These individuals were ‘treated with respect and, often, a certain wariness’ (DuCann et al. 2017, p.15). With the establishment of print technologies, the markedly different role of author emerged. Isolated from their audience and from the communal tradition, the author was considered to be ‘a godlike and inspired creator of unique one-offs’ (Carter 1990, p.x). Walter Ong notes that, ‘The printed text is supposed to represent the words of an author in definitive or ‘final form’ (2012, p.130). He contrasts this with the medieval manuscript tradition in which alterations and marginalia proliferated and were incorporated into later copies. Ong writes that this was closer to the ‘give-and-take of oral expression’ (Ibid., p130). As explored in the previous section, this

more dynamic approach to narrative is also considered to be possible with some forms of digital literature.

The role of writer has been professionalised over time, although making a full-time living from writing remains rare. As an Arts Council report into 21st century literature notes: 'It's easy to believe there was once a Golden Age for literary fiction, but the history of publishing tells us otherwise. It has rarely, if ever, been easy to support literary writing' (Arts Council England, 2017, p.3). Whether someone identifies as a professional writer or not they can engage in the practice of writing. In this context, writing is understood to be the creation of literary texts that can be shared with others. Mike Sharples compares this to design practice and says both involve 'a conscious and creative communication *with* and *through* materials to achieve a human effect' (1999, p.60). Practice is understood to describe approaches to writing formed through collective learning that shape and are shaped by a 'community of practice' (Wenger, 1998, p.6). Etienne Wenger notes, 'These practices are thus the property of a kind of community created over time by the sustained pursuit of a shared enterprise' (1998, p.45). As writing practice is currently dominated by writing for print publishing, its methods and tools are those associated with writing for print.

The emergence of digital technologies has the potential to reshape writing practices. Muriel Cooper, who founded the Visual Language Workshop at MIT in 1974,

...was convinced that the line between reproduction tools and design would blur when information became electronic and that the lines between designer and artist, author and designer, professional and amateur would also dissolve' (Reinfurt 2007, p.15)

While the lines between roles may blur, approaches to production must also change. As Baldur Bjarnason and Tom Abba point out,

No-one in their right mind believes that the same production process will work in film as for publishing, so why would you try to shepherd a digital project to completion using identical processes as a conventional book? (2015).

Just as the impact of print technologies on texts has only become visible to us with the emergence of digital technologies, it's now becoming easier to see how writing practices are also shaped by print. From a position of awareness, these conventions can be questioned, and new possibilities can be explored.

2.3.2 Material writing practice

Making with ink

Writing is a material practice. Unlike oral storytelling, it requires tools, substances and surfaces for inscription, in addition to bodily gestures (Piquette and Whitehouse 2013, p.2). Kathryn Piquette and Ruth Whitehouse describe how, 'studies of content, context and materiality are all necessary for a holistic study of writing' (Ibid, p.2). Yet, writing is often studied and practiced without any consideration being given to its material nature. When attention is paid to the materials of writing, it can result in an almost obsessive interest in what a writer's desk looks like (Krementz 1996), a writer's 'Pedantic insistence on certain papers, pens, inks' (Benjamin 2009, p.69), or their writing rituals, which Sharples describes as 'strange and habitualised' ways of working (1999, p.120).

Writers engage with materials as makers of content. Cooper refers to this as ‘the specialization mode’ (Reinfurt 2007, p.1), with the design and making of books being left to other professionals (Ibid.). Sharples asserts the rift between writing and material practice is ‘a legacy of nineteenth-century technology and thinking’ (1999, p.129). Ingold associates the rift with the dominance of print technology and notes a similar disassociation in fields like architecture and design (2016, p.27). All, he says, split ‘skilled handicraft into separate components of “imaginative” design or composition and “merely” technical execution’ (Ibid.). Richard Sennett describes this separation being repeated at different moments in Western history where ‘practical activity has been demeaned, divorced from supposedly higher pursuits’ (2008, p.21). Arnold Pacey discusses how this division of labour is part of a technological distancing of the individual from the final product that means no one has to take sole responsibility for the end result (2001, p.179). Contemporary writers engage in material practice every time they write, whether they recognise this or not, but the materiality of their practice is separated from the materials of the design and fabrication processes that also shape the work the reader will encounter.

In drawing attention to the materiality of writing practice, it is interesting to note the many roots tying stories and texts to making. Fiction is taken from the term *ingere*, which means to shape or mould as well as to invent (Gjerlevsen 2016). Text comes from *texere*, to weave (Wilson 1996, p.6) and the Scots have their *Makar*, a National poet and maker (Scottish Poetry Library 2016). Writing is often described as a craft, it ‘is an art, a craft, a

making,' says Le Guin (2015, p.xiii). In such descriptions, it is implicit that the crafting is of language as words are the primary materials of the writer.

Models of writing often describe stages of planning, composition and revision as part of either a linear or iterative process (Chandler 1995, p.2; Sharples 1999, p.112). Sharples describes how writers have been broadly characterised as being planners or discoverers but notes this is a limiting model and in fact most writers combine elements of planning and discovery to varying degrees (1999, pp.112-13). Ingold's description of writing as a gathering process, aligns with the discovery approach. He asserts that ideas are not projected fully formed from the mind to the page but uncovered through the physical act of writing (2011, pp. 178-9). Engaged in this writing process, a writer cannot work in isolation from the rest of the world. Yet, most descriptions of writing don't consider the wider context of practice, including engagement with materials or an environment, from the perspective of the writer (Harper 2013, p.139). Ingold asserts that, 'Making is a process of correspondence: not the imposition of preconceived form on raw material substance' (2013, p.31). With all forms of making, writing included, this process of correspondence takes place in the world and with materials, which can impact on the process through inspiration, interruption or association. New understandings may come to light by engaging directly with, and reflecting on, what Pacey describes as the 'participatory insights' that come from 'a strong personal involvement with materials and making full use of the vital immediacy of sight, touch and the other senses' (2001, p.112). Recognising writing as material practice means we must, 'take

account of the material worlds in which writing is inextricably embedded' (Piquette and Whitehouse 2013, p.1).

The writing process is rendered invisible in conventional print publishing, where the focus is on the final printed book. Yet, even when writing for print, a number of what Graeme Harper describes as writing artefacts will be produced as part of the process (2013, p.149). Commonly these take the form of notes and drafts. Harper asserts, 'These artefacts are as much a part of creative writing as those works that emerge from creative writing and assume public identities' (Ibid.). Yet, as with many other artforms, 'The processes of making appear swallowed up in objects made' (Ingold 2013, p7) and the 'creativity of the productive processes that bring the artefacts themselves into being are lost' (Ibid.). This suggests that an insightful approach to exploring practice would involve drawing understandings from writing artefacts and the processes that led to their making rather than only considering finished stories.

The artists' book

Engagement with the book as a format is not limited to writers, it can also become part of an artist's practice. The term artists' book is used to describe an eclectic array of artworks that engage with and reflect on the form of the book. This includes handmade and letterpress works, zines, altered books and art objects (Farman 2007, p.319). In *A Manifesto for the Book*, Sarah Bodman and Tom Sowden argue for the more inclusive term book arts and use it to describe any 'book related activity that artists engage with' (2010, pp.5-6). Although book arts are considered to have ancient origins (Bodman & Sowden 2010, p9;

Hampton 2015, p.V), it was the 20th century before the form became well-established (Drucker p.1; Bodman & Sowden 2010, p.9). Book arts usually involve significant engagement with material practice as the artists involved develop work from the 'peculiar interplay of material, form and content' (Farman 2007, p.319). Michael Hampton describes the artistic process as 'fabrication taking place in a constant whirl of materials, means, and applications' (2015, p.O). As can be seen with the resurgence of print books (see p.38), the development of digital technologies has not diminished artists' books but in many ways improved their reach and appeal (2015 Hampton, p.11). For Hayles, engagement with artists' books reveals the significance of the interplay between materiality, word and image and so can be usefully related to both print and electronic literature as physical artefacts (2002, pp.65-75). Considered in this way, artists' books are a useful resource for writers concerned with materiality. However, it is important to recognise they are most often the result of an artist's rather than a writer's practice.

The differences in approach to book arts of artists and writers has been recognised by Zenon Fajifer who coined the term 'liberature', which he uses to describe works made by writers where 'every element of/within the book is part of the whole message, not only the text' (Bodman & Sowden p.22). Fajifer doesn't consider the works made by himself, Katarzyna Bazarnik and Radoslaw Nowakowski to be artists' books, although their appearance means they may be categorised as such by others. For Fajifer, using the term liberature helps to distinguish that these are works made by writers that grow out of existing texts (Bodman & Sowden 2010, p.6). In in this research, I am keen to avoid the

specialisation mode that separates writers from processes of design and production, yet I must acknowledge that I approach this study as a writer not an artist. This will have an impact on the works I create. My intention is to explore ecological subjects through material writing practice and to develop all the elements of a work together to tell the story. This intention means it is the process of storymaking that is central to the study and how any finished work might be categorised is of less concern.

Making with digital materials

Since the earliest interactive and hypertext fictions in the 1980s and 90s, a number of writers have expanded their writing practice to encompass digital materials and developed skills in design and coding to bring their stories to life. Pope asserts, 'The writer must not write the story then arbitrarily design the interface. The design now *is* the narrative' (2013, p.213). However, a division of labour between those who make story content and those who design and make the rest of the work remains common. Outside the use of proprietary software and platforms, producing screen-based stories requires the development of programming skills, which can be a barrier to engagement. Discussing the prominence of women in the early electronic literature movement Maria Mencía describes how, 'an undefined canon and an unrestricted entry gate,' meant, 'anyone with a personal computer and an idea could participate,' and so traditional gatekeepers could be bypassed (2017, p.4). However, by the early 2000s, 'the speed of technology made producing and sharing work more difficult for individual practitioners' (Mencía 2017, p.27). With compatibility

across platforms and devices, and rapid obsolescence now also major issues, it is little wonder that many writers are discouraged from getting involved in digital literature. One successful way of doing so is to collaborate with technologists, although finding the opportunities, spaces and budgets to do so is another barrier to engagement for most writers.

One alternative that has been little investigated for the development of digital literature is the use of microcontrollers and sensors, which could be used to create reading experiences where a story responds to readers or their environment. These technologies have been widely taken up by the Maker movement as part of a 'democratized technological practice' (Tanenbaum et al. 2013, p.2603). This has been described as, 'a grassroots movement of backyard and kitchen tinkerers, hackers, designers, and inventors' (Vossoughi and Bevan, 2014, p.2). Access to the tools and skills needed to use these technologies has grown over the last decade, with makerspaces opening in dedicated spaces and museums in major cities (Gutwill et al. 2015, p.151). The proliferation of online forums and tutorials, low cost of many components, and emphasis on process and experimentation all contribute to their popularity. These technologies provide an interesting opportunity to consider the intersections of material practice and story. Vossoughi and Bevan have described how:

... the range of practices involved in making can and often are viewed as mutually generative, and the forms of meaning making embedded in the process of creative problem solving and design can productively blur the lines between science, engineering and the arts (2014, p.10)

Direct engagement with production means sourcing materials and taking resource and energy use into consideration. In contrast to Borgmann's device paradigm, consumption is made visible with these technologies, and material and energy choices are built into the work. Experimentation with microcontrollers does not lend itself to conventional publishing, but this should not preclude experiment, bringing to mind Italo Calvino's declaration that, 'The demands of the publishing industry are a fetish that must not be allowed to keep us from trying out new forms' (1996, p.50). In an essay on the subject he writes:

...literature can perpetuate itself by a series of confirmations, limited readjustments, and further studies. What interests me, however, is another possibility inherent in literature: that of questioning the established scale of values and code of meanings. A writer's work is important to the extent that the ideal bookshelf on which [they] would like to be placed is still an improbable shelf, containing books that we do not usually put side by side, the juxtaposition of which can produce electric shocks, short circuits (1997a, p.82).

The need for ecological stories encourages us to question the profit-oriented nature of much contemporary publishing and its impacts on the environment. In trying to find better ways to work, it doesn't make sense for writers engaging with the challenges of ecological storymaking to be limited by the conventions of print-based practices and publishing models. Writing for an improbable bookshelf opens up a space to explore different ways of making and sharing stories. This provides opportunities to explore the interplay between ecological themes and narrative forms through a reflexive and responsible use of materials and technologies.

2.3.3 The writer and the world

Response-ability

Whether writers intend to make ecological works or not they cannot isolate themselves from the times we are living in. Gail Burns writes of climate breakdown that, 'As the issue dominates more and more of our daily lives, we may all become eco-writers' (2018, p.49). Donna Haraway advocates 'staying with the trouble' (2017, p.1) and cultivating what she calls 'response-ability' (Ibid., p.34). To do this means striving to be fully present and aware of the issues rather than participating in the 'unprecedented looking away' (Ibid., p.35). Rebecca Solnit notes that, 'Most modern writers are deskbound, indoor creatures when they write' (2014b, p.113). For some who are directly responding to ecological crises in their work, this is no longer seen as an appropriate way to work. *The Dark Mountain* manifesto declares, 'We write with dirt under our fingernails' (DuCann et al. 2017, p.23). Morton writes, '*I am immersed in nature* is not a mantra whose repetition brings about its content' (2009, pp.182-3) and suggests that, 'Instead of trying to pull the world out of the mud, we could jump down into the mud' (Ibid., p.205).

If a writer intends to make ecological stories this intention will carry through to the content of their work. Boyd notes that telling stories not only invites interpretation of the meaning of the story but the storyteller's motives for telling it (2010, pp.369-370). There are longstanding debates about what should motivate writers to share stories and what that motivation means for the resulting work. These often pit the position of art-for-art's sake against the ethical responsibilities of the writer (Atwood 2002, pp.83-109). Yet as George

Orwell reminds us, 'The opinion that art should have nothing to do with politics is itself a political attitude' (2004, p.5). Le Guin is wary of limiting her work by trying to convey a message but writes, 'My first responsibility is to my craft, but if what I write may affect other people, obviously I have a responsibility to them too' (2016, p.49). Atwood asks, 'Is there a self-identity for the writer that combines responsibility with artistic integrity?' (2002, p.104). For her, there are no definite answers, but in posing the question she invites writers to consider their own motives (Ibid., p.91). As a writer, I feel a strong sense of responsibility in creating work to share with others. I also recognise the challenge of balancing my intent to make ecological stories with the narrative and imaginative requirements of creating an engaging story. For me, self-awareness and reflection through practice are key to maintaining a balance between responsibility, artistic integrity and research integrity.

The Imagined Reader

Long before a story is finished the imagined reader becomes a companion to the writer. The role of these ideal readers is necessarily entwined with that of the writer (Atwood 2002, p.136). The relationship between the two has been described as a partnership or an act of co-creation (Medulsund 2014, p.198). Umberto Eco refers to, 'the dialogue between the author and [their] model reader' (1985, p.47), which precedes the dialogue between finished text and reader from which 'the author is excluded' (Ibid., p47). Peter Mendulsund cites Proust's assertion that, 'for the author books may be called "conclusions" but for the reader "Incitements"' (2014, p.200). A key task for the writer, then, is to

leave enough space for the imaginative participation of the reader to take over. Oral storytelling has a long tradition of this. Alida Gersie refers to the delight storytellers take in sharing minimal stories that ‘poetically encapsulate information and invite elaboration, curiosity, talk or comment’ and often prove to be highly memorable (2014 p.30). Nanson writes of storytelling:

To properly appreciate a story the listeners must actively contribute to imagining it. Through this participation, and the memory of the experience they take away with them, some part of their being may be transformed, connected in new ways with things beyond themselves (2007, p.49).

When it comes to a reader’s participation with a text, Barthes asserts that a ‘text’s unity lies not in its origin but in its destination’ (1977, p.148). He advocates for the writerly text, with which the reader becomes producer rather than passive consumer (1974, p.4). As Daniel Ashton et al. note,

Digital technologies enable new forms of participation that necessitate a radical overhaul in our understanding of what writerly and readerly collaboration can accomplish (2017, p.3).

For Chandler, ‘the extension of Barthes’s notion to other media could be productive, involving a consideration of the extent to which engagement with such media might be regarded as *userly* or *makerly*’ (1995, p.6). For some kinds of digital story, an imagined reader’s whole body and context of reading also needs to be considered. Piquette and Whitehouse suggest that, ‘One direction in which engagement with material practice leads us is a concern for the senses, through which human beings experience the material world’ (2013, p.5). The space the writer leaves in a text for the imagined reader should be open to sensory and embodied participation too.

2.3.4 Writer as storyteller

Within conventional print publishing, writers are disassociated from material practice and removed from the generative discoveries that can emerge when making with materials other than language. Explorative engagement with materials and new technologies can lead to new insights. This has been made more difficult by the speed of technological change, but potential inspiration can be drawn from the Maker movement's engagement with a combination of high and low technologies. The tradition of the artists' book highlights the possibilities of the interplay of content, form and medium. Writers, though working from a different starting point, can work with physical as well as narrative materials to develop stories. In doing so it becomes essential to imagine the reader's participation in terms of embodied and sensory experience as well as the imaginative participation associated with print literature. A material approach to writing practice brings into relief the ecological sensibility of production methods and materials, while expanding the roles of the writer and reader.

2.4 Drawing the threads together

With insights from many sources woven together through the language and structure of this chapter, central concerns become more visible. The calls for new stories as a response to climate breakdown and the faith that stories can make a difference is justified by evidence of the ways stories can impact on our

lives. It is clear that stories can have both positive and negative effects, and so care must be taken in making and sharing them. Climate breakdown can be overwhelming as a subject matter for writers and for readers and it is preferable to avoid emphasising messages of disconnection and threat, which can turn people away from the issues. A focus on interconnection and wonder and an emphasis on everyday urban environments could help root ecological stories in the here and now in ways that mean people are more likely to engage with them.

It is important to consider how the technologies we use shape our stories in ways that have become invisible to us through the dominance of print publishing. The emergence of digital technologies makes these technological influences more apparent and in doing so re-emphasises the material aspect of literature. The influence of technologies on the creation, sharing and reading of a story are important considerations in ecological storymaking, where if the medium is part of the message an ecologically sensitive approach to production is essential. By recognising the interrelationships between subject, content, form and medium, appropriate materials and technologies can be selected and worked with to develop engaging works where every aspect contributes to the telling of the story.

The role of the writer has been limited by print technologies to primarily making content and is usually disassociated from material practice. Practices can be usefully reconsidered in relation to the use of digital technologies and the responsibilities of writing ecological stories. Rather than focusing only on finished works, the writer is well-placed to investigate

practices for making ecological stories from inside the writing process. A consideration of the writing artefacts that result from exploring different methods, materials, artistic traditions and contexts of practice could bring new insights to writers. The approaches developed through this work could then be usefully shared and further developed within a community of practice.

Writers have become habituated to ways of working that have primarily served the requirements of the profit-driven print publishing industry. In responding to the calls for new stories on ecological themes, it is essential to consider how stories are shaped by established practices and technologies and how storymaking can respond to ecological issues. Developing a writing practice to meet the considerable challenges of ecological storymaking requires a commitment to openness and a willingness to explore new possibilities.

2.5 Aim, objectives and research questions

Drawing on the theoretical and cultural context uncovered through this review, this research aims to respond to calls for new ecological stories through the development of a new approach to ecological storymaking, rooted in material writing practice and connecting both writer and reader to wider nature.

The objectives of this inquiry are:

- to develop a new approach to writing practice for ecological storymaking through the investigation of the wider context in which the research is

rooted, exploration through creative practice, the development of writing artefacts and stories, and by sharing the approach developed with other practitioners in a workshop setting

- to identify ways in which the approach developed shapes the stories made through reflection in and on practice, and through analysis and synthesis of key characteristics of the stories developed and their relationship to practice.

The inquiry is framed using the following research questions:

- 1) How can writing practices be developed with new technologies for ecological storymaking?
- 2) How are stories changed when new writing practices are developed for ecological storymaking?
- 3) What does the development of these writing practices mean for the role and continuing relevance of the writer?

Part 1, Chapter 3: Methodology and Research Design

...research (and not only artistic research) often resembles an uncertain quest... (Borgdoff 2011, p.56)

This chapter brings together a consideration of methodological approaches and the research design for this inquiry. The form of a story is used to fictionalise an exploration of theoretical traditions. Having established that practice as research is the most appropriate methodology for this inquiry, the approach is outlined and the research design set out.

3.1 Adventures in methodology

[1]: a theory-woven wonder

tale

The story didn't begin when the writer tipped the questions out of the box onto her desk – where they squirmed under the fluorescent office lights. It began before that, before she'd even tucked the seeds of the questions away in the box while she got on with making stories [2]. Let loose, the questions skittered across piles of paper on her desk. They left sticky residue where they slid down books. They rolled about until they were coated in pencil shavings, coffee grounds and dust. In the box the questions had grown legs. If she looked hard, she could just about make out three separate forms: one for making stories, one for shaping stories, and one for the storymaker [3].

The Understory

1 Methodology is understood here as 'the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes' (Crotty 2015, p.3).

2 I was initially led by what Haseman describes as 'an enthusiasm of practice'. He notes this is a characteristic approach in arts research: 'Practice-led researchers construct experiential starting points from which practice follows. They tend to "dive in", to commence practising to see what emerges' (2006, p.100).

3 The three questions articulated at the end of the previous chapter (p.67) have framed this research inquiry and helped shape the methodological approach. This story, however, recognises that although the central element of each question has been present throughout the inquiry, the questions have continually shifted and have been difficult to keep sight of at times.

The questions quested towards daylight as if sniffing for it. As soon as they found the window they jumped, and she had no choice but to follow them. Overwhelmed by the quest ahead, the feral questions were something for her to hold on to at least. She had to trust that however mercurial, they'd lead her in the right direction [4].

The writer just managed to catch the tail of the first question as it leapt from the windowsill. The question inflated, and they floated together away from the campus, high above the city. The wind pulled them towards distant hills. From this distance, the world looked smaller and much more manageable. Page-like fields were punctuated by trees and lined with roads, making a paper model landscape. She imagined cutting out neat answers from above and sticking them down in a book. The question deflated in her hand without warning.

The fall shook all thought of answers from her head. She landed on her backside in some nettles. The question, unhurt, scuttled

4 Crotty writes that '...our research question, incorporating the purposes of our research, leads us to methodology and methods' (2015, p.13).

off to play hide-and-seek in the bracken with its friends. Maybe she needed a bigger box. Or smaller questions. They were supposed to contain her search and help keep everything else out but now they'd got loose she couldn't keep sight of them [5]. Panicking that she was failing in her quest already she got up and ran after their ever-shifting forms [6]. At times, they were vague outlines and no longer really questions at all [7]. She couldn't pin them down.

Having lost her breath and her bearings, the writer decided to head for higher ground. Wondering if questions, like her children, might dislike being ignored, she strode off without looking back. The moorland rose sharply ahead of her. She could hear the questions scrabbling along behind her, trying to keep up.

High on the hillside stood an ivory tower. From a distance, it looked as if the ground around it was rippling. When she got closer, she realised a long queue of searchers

5 Webb notes that for writer-researchers the potential data source is the whole world, and inquiry can only be contained by 'the way we shape our research questions and by the focus of our story' (2015 p.127).

6 Mäkelä and Routarinne assert that 'the most important task... is to show a clear connection between the question and the answer' (2006, p.16). Yet, the uncertainty inherent in the research process can make this feel like a distant possibility.

7 Nelson prefers the term inquiry to questions 'partly because questions typically imply answers' and practice as research 'typically affords substantial insights rather than coming to such definite conclusions' (2013, p.30). I have continued to use the terms question and answer, but as part of an approach to research where their nature is recognised as less fixed.

was wrapped round and round its outer walls.

Somewhere inside, there had to be answers.

From her place in the queue, the writer tried to make conversation with people around her, but everyone spoke different disciplinary languages. Every word seemed to have its own border that had to be crossed before you could understand. She kept trying, while many other searchers kept to their own groups, or turned away from the world to stare in through the tower's windows [8].

The queue didn't end at the door, it spiralled round and round inside too. When the writer reached a help console she pressed the FAQs and selected 'What is research?'

'Research is a systematic approach to inquiry that leads to knowledge creation.'

She kept pressing for further definitions until the screen got tired of her prodding and froze [9]. There was nothing about the way she made stories that was systematic, but perhaps setting out to research storymaking was different [10]. It felt different just knowing she'd let her questions out of the

8 Gray and Malins write that the interdisciplinarity characterising many arts-based PhD projects 'demonstrates a willingness to examine other fields and make sensible connections. It requires an outward-looking attitude and an awareness of other research cultures and paradigms' (2004, p.21).

9 Research is: 'creation and interpretation of new knowledge' (QAA 2014, p30); 'a process which generates knowledge' (Smith and Dean 2014, p.3); 'an original study to enhance knowledge and understanding' (Borgdoff 2011, p.54); 'a knowledge derivation enterprise' (Scrivener 2006, p.3); 'creative and systematic work undertaken in order to increase the stock of knowledge' (OECD 2015); 'a process of systematic and disciplined enquiry' (McNiff 2013, p.111).

10 Webb's assertion that there are 'differences in intention, between generating knowledge and generating creative work' (2015, p.15) highlights a key difference between 'ordinary' creative practice and practice as research.

box. Now she had to find answers and share them too. Impatient coughs from behind let her know she was holding up the queue.

The line stretched on. Her questions amused themselves by doing cartwheels between other searchers' legs. She'd never worried about knowledge before. Now she had to create some she was less sure she knew what it was. When she finally reached a staffed desk, the man behind it looked so confused by her questions she apologised.

'A systematic approach to inquiry leads to knowledge creation,' he said, echoing the help screen.

Her questions were trampolining on a stack of papers on his desk. She couldn't think with all the noise they were making.

'Next please,' the man called. 'And can you please take those with you?'

Grabbing one question in each hand and the other between her teeth, she headed for the exit with no idea what she should do next. She let the wind carry her along for a while, through cotton grass and heather, until

the questions escaped her hold again.

Defeated, she collapsed on the grass. The questions crept up beside her, becoming seed-like again and still. Wondering what would happen if she planted them right there, she began to dig into the dirt with her fingers.

Underneath the top layer of soil, she discovered there were books. She kept digging and uncovered a large bookshelf-lined hole. She was trying to decide whether or not to climb in – even her questions seemed apprehensive – when a flutter of wings made her look up.

‘You found the rabbit hole!’ A magpie was talking to her from its perch on a nearby rock. ‘Don’t worry, it doesn’t lead to Wonderland, cah!’ The bird cawed at its own joke.

She didn’t respond.

‘You’re looking for knowledge about knowledge, yes?’

‘How can you tell?’

‘You have that look about you.’

‘I’m worried I don’t know what knowledge actually looks like.’

‘Cah! Well, it’s not just one thing, is it? Who you are, how you go looking for it, that’ll change what you find [11], and how you crawl on about it [12]. I weave knowledge into my nest. Makes it stronger.’

The writer let her feet dangle over the edge of the hole.

‘The Underlibrary’s that way. It’s best to go through it so you can get back out again [13].’ The magpie crawled again as it flew off.

The bookshelves made an excellent ladder. She tried not to get distracted by book titles as she felt for each shelf with her feet. Her questions clung to her shoulders. It was a long way down.

The hole opened out into a cavernous library inside the hill. Books covered every surface, even the ceilings and floors. A maze of aisles stretched out before her in every direction. She looked for signage, but although there were signs everywhere they’d been written over so many times that nothing

11 Lincoln, Lynham and Guba categorise five paradigms of research inquiry: Positivism, Postpositivism, Critical, Constructivism and Participatory and describe the issues most often in contention between them as ‘inquiry aim, nature of knowledge, the way knowledge is accumulated, goodness (rigor and validity) or quality criteria, values, ethics, voice, training... accommodation and hegemony’ (2018, p.109).

12 As Kuhn notes, ‘Each group uses its own paradigm to argue in that paradigm’s defence’ (2012, p.94).

13 Crotty suggests we must spend time exploring the ideas and modes of analysis of many thinkers as part of a formative process to develop the approach best suited to answering our own research questions (2015, p.216)

was clear. 'Excuse me,' she said to a man she'd nearly walked into because his clothes matched the bookshelves. 'I need to find out about knowledge.'

'Well, there's only one path to knowledge,' he said. 'It's this way.' [14]

The writer followed her guide down innumerable aisles of books. There were sections within sections within sections within sections, all neatly divided. They passed rows of desks where questions were splayed out, pinned to the desks. Answers were clearly labelled, stuffed and displayed in glass cabinets or pickled in jars [15]. She lingered to watch a dissection being performed on a question by a group of men, all dressed in the same bookshelf camouflage.

'Do you mind if I ask something?' she said.

'Shhh,' they replied in unison. 'We're not here.' [16]

Her guide strode on and she realised her questions were missing. There was a

14 Borgdoff asserts that 'research is "owned" by science; it is performed by people who have mastered "the scientific method", in institutions dedicated to the systematic accumulation of knowledge' (2011 pp.53-4). Describing this positivist paradigm, Crotty notes 'like the Enlightenment that gave it birth, positivism offers assurance of unambiguous and accurate knowledge of the world' (2015, p.18).

15 Describing the categorisation associated with the scientific method, Crotty writes it 'embodies the desire to have control of things and to know what is likely to happen' (2015 p.171).

16 Belief in objectivity resulting from a lack of interaction with the object of study is a key element of positivist inquiry (Lincoln, Lynham and Guba 2018, p.115).

scuffle behind the nearest shelves. ‘What’s over there?’ she asked.

‘You can’t go that way.’ Her guide marched straight ahead.

There was a narrow gap between the shelves and she could see her questions jumping about on the other side. She decided to squeeze through.

‘That’s the wrong way,’ her guide called after her. ‘You won’t find knowledge that way!’

The shelves in this section of the Underlibrary were almost identical, but the floor was carpeted in papers. Questions leapt from shelf to shelf and searchers gave chase to pin them down. Here, searchers wore white coats instead of bookshelf camouflage. There was a quiet hum of conversation as they examined questions or got on with the Sisyphean task of mopping up [17]. The questions were unrulier here, but dissections were still taking place amidst the chaos. Everything was measured, recorded and analysed. Answers were flattened, framed and

[17] In contrast to the positivist ideal, Kuhn contends ‘normal’ science is not so orderly: ‘Mopping-up operations are what engage most scientists throughout their careers’ (2012, p.24). Nelson notes subjective elements are no longer ruled out as ‘scientists accept that the knowledge they produce is not as “hard” or “objective” as nineteenth-century positivism assumed’ (Nelson 2013, p.39).

placed out of reach on the highest shelves until they could be replaced with better ones [18].

There was a barrier ahead with a guard at it. The writer's questions were bouncing about and waving to her from the other side. She approached, expecting to have to explain herself to the guard, but he didn't acknowledge her at all, so she hurried through. Above the barrier on both sides there was a sign welcoming those who crossed to 'The Truth'.

As she wandered through the stacks, her questions shadowed her footsteps. This section was even messier than the part of the library she'd just left, but fewer searchers wore white coats. Many wore suits. There were rows of desks, but here people were making every kind of construction imaginable and then pulling them apart into questions and answers [19]. Periscopes were lowered to allow discrete observation of the outside world. Some searchers poured the contents of books through sieves to sift out meanings. Others

18 'Results produced by means of scientific methods often prove inconclusive or contradictory, and quite frequently established positions have to be substantially revised or abandoned in the light of further research' (Nelson 2013, p.39).

19 Positivist and non-positivist approaches to research, especially positivism and constructionism, are divided in their approaches to inquiry. Crotty writes that, 'What distinguishes constructionism, setting it over against the objectivism inherent in the positivist stance, is its understanding that *all* meaningful reality, precisely as meaningful reality, is socially constructed' (2015, p.55)

worked in aisles of reflective shelving. There were groups who were so entangled with their questions it was hard to make out where they ended and any answers began. Loud discussions about truth and knowledge went on endlessly. The only things anyone could agree on was that the positivists were wrong and that truth had to be negotiated [20].

The books in this section had an unsettling way of reshelving themselves by jumping across the aisles. Some were splitting – tearing themselves apart trying to be in two or more places at once. She was starting to see that answers couldn't be definite or pinned down [21].

Wanting to find out more about this, she approached a searcher who was rifling through a giant filing cabinet. 'My guide on the other side of the library said I wouldn't find knowledge over here,' she said.

He shook his head but didn't look up. 'No one finds knowledge. We construct it. Even they construct it over there while they're so busy pretending to be objective.' [22]

20 'Agreements about truth may be the subject of community negotiations regarding what will be accepted as truth' (Lincoln, Lynham and Guba 2018, p.137).

21 Nelson notes that 'acceptance that knowledge is not fixed and absolute' (2013, p.39) is key to the approach of practice as research.

22 For constructionists: 'There is no objective truth waiting for us to discover it. Truth, or meaning, comes into existence in and out of our engagement with the realities in our world' (Crotty, pp.8-9).

‘Have you ever been over there?’

‘No, of course not.’ [23]

‘But then how do you kn – ’

Their conversation was interrupted by an influx of searchers who grabbed books from the shelves – throwing some, keeping others. There were angry shouts and an indiscriminate splattering of ink missiles. She took shelter behind a chair. ‘I didn’t realise it could be so dangerous down here,’ she said to a searcher who’d crouched beside her.

‘Are you kidding? Knowledge is power,’ he said, before he snatched a pile of books from the nearest desk and ran into the debate [24]. In the tumult, books and men roared at each other and every altercation resulted in the materialisation of yet more books, but no matter how many more appeared they all looked very similar. When the fight was over, and the library had settled back into calmer discussion, the writer approached a librarian. ‘Excuse me, where is everything else shelved?’

‘I’m not sure what you mean.’

‘The books written by everyone else?’

23 Hanson notes that, ‘Most of the arguments for one side or the other are based on assumptions about what one side thinks the other side is doing, rather than what the other side is doing. (2008, p.97). Haraway writes, ‘The only people who end up actually believing and, goddess forbid acting on the ideological doctrines of disembodied scientific objectivity...are non-scientists, including a few very trusting philosophers’ (1988, p.567).

24 Crotty describes Critical Inquiry as having a different stance to other forms of inquiry, noting there is, ‘a contrast between a research that seeks merely to understand and a research that challenges’ (Crotty2015, p.113).

The librarian looked her up and down.
'Oh, I see. I think there's some feminism
towards the back, on your way out.'

'Thanks, but I don't just mean the
books about feminism, I mean where are *all*
the books written by women? In fact, where
are the books by anyone who doesn't look or
sound or behave like them?' She pointed
towards a group of well-heeled white men
who'd settled back into their comfortable
armchairs [25].

'I'm not sure I -'

'And what about other ways of finding
answers, or all the answers that aren't book-
shaped?'

'Well, we don't really allow that kind of
thing in here.' [26]

Afterwards, the writer would think of
all the things she should have said in response
to that. In the moment, she retreated to a desk
in silence. As she watched the comings and
goings around her she saw a woman sneak out
from underneath a shelf and take a book. A
little later she reappeared to return it. When

25 'Mainstream research practices
are generally, although most often
unwittingly, implicated in the
maintenance of capitalist
production and in the
reproduction of systems of
oppression, including poverty,
racism, sexism, heteronormativity,
religious oppression, ablism, and
others' (Dei and Asgharzadeh
2001, p237).

26 Dei and Asgharzadeh note the
'high premium placed on the
ability and desire to theorize in
certain conventionally established
ways' within institutions and also
describe 'the insidious attempts to
deny the validity of the
knowledges shared by certain
bodies who may not follow the
conventionally accepted methods'
(2001, p298).

the writer took the book down from the shelf she found whole passages had been scribbled out and revised [27]. Others appeared now and then and revised works or slipped new things into place, but the men from the armchairs still took up most of the space.

Her questions were jumping up and down. They'd had enough and so had she. There was a knowledge shop to get through before they could reach the exit [28]. She had to drag the questions past rows of tote bags that said things like: 'Keep calm and research' and 'I think therefore I am not a bag'. There were aisles of degrees with huge price tags. Tucked away on the closing-down shelves she noticed a worrying number of arts and humanities subjects lined up [29]. In the research section, there were rows of shiny, pre-formed questions with corporate backing attached. The gate ahead looked a lot like airport security.

'Metrics, please,' [30] said a uniformed guard.

27 Rich writes that for women, 'Re-vision – the act of looking back, of seeing with fresh eyes, of entering an old text from a new critical direction – is for us more than a chapter in cultural history: it is an act of survival' (1972, p18).

28 Giroux writes that as neoliberalism continues to advance, the university is 'increasingly defined as a space of consumption, where ideas are validated in instrumental terms and valued for their success in attracting outside funding' (cited in Spooner 2018, p.900).

29 '...one-size-fits-all productivity benchmarks privilege positivist research methods and disciplines' (Spooner 2018, p.907) giving them a more secure place in the academy.

30 Spooner has called for academics worldwide to 'critique, resist and act collectively to arrest the encroachment of audit culture' (2018, p.895).

‘I’m sorry, I don’t... I came here to learn about research.’

‘Your impact needs to be quantified. We need to see your citations, please. Now.’

‘How did you get in here?’ another guard asked. ‘You didn’t come in this way.’

‘I make stories... I’m still working on the research part...’

The writer’s questions were clinging to her legs, trembling. She grabbed them and pushed through the gates, triggering a shrill alarm. She darted into a small tunnel and ran, eventually emerging in an alleyway far from where she’d entered the Underlibrary.

When her questions had calmed down, she placed them on the pavement. They skipped off, jumping over cracks and blowing seeds from dandelion clocks. She followed close behind. They shimmered in and out of visibility in the sunlight, but at least they were there, and she felt certain she would discover answers if she followed them [31]. She’d hoped to get some kind of badge in the Underlibrary that told her where she belonged, but maybe

31 ‘the focus of our research leads us to devise our own ways of proceeding that allow us to achieve our purposes’ (2015 Crotty, p.13).

she'd been wearing her badge all along. The only way she could find answers to her questions was by making stories [32]. There was no need for camouflage or dissection [33]. She knew they were questions worth asking [34]. From the edge of the kerb she watched her questions tumble ahead.

She wasn't alone. Other searchers wandered the tangle of alleyways, following other questions. All around, she could see knowledge coming into existence in different ways [35]. Backyard workshops spilled into the street. Gardens bloomed from plant pots and bins. Tightropes strung between windows formed a web of pathways that were used for pegging out ideas as well as washing. Placards and graffiti could be browsed between piles of books. People were searching from where they were, and she realised she must too [36].

Paper chimera flew through the streets, accreting and shedding pages, breaking through any barriers they met, thrashing their tails and leaving ripples of thought in their wake [37].

32 In recognition of the essential role of practice in answering the research questions that frame this inquiry, the methodology adopted is practice as research (PaR). The relating research design is described on p.92.

33 Practice as research does not make claims to objectivity: 'In the role of practitioner-researcher... the interaction of the researcher with the research material is recognized' (Gray and Malins 2004, p.21).

34 Webb notes of writer-researchers that, 'behind our passions, interests, purposive actions is the belief that they are worthwhile' (2015, p.56).

35 Smith and Dean argue that any definition of knowledge 'must include the idea that knowledge is itself often unstable, ambiguous and multidimensional' (2009, p.3).

36 Haraway describes the value of situated knowledge: '...arguing for politics and epistemologies of location, positioning, and situating... from the view of a body, always a complex, contradictory, structuring and structured body, versus the view from above, from nowhere, from simplicity' (1988, p.589).

37 Finley writes of the momentum behind 'increased problematizing of hegemony of thought, action, and ways of being. A continuing project is at hand to tear down and reconfigure the traditional dichotomies of art/science, nature/culture, natural/artificial, incorporeality/materiality, subjectivity/objectivity, sense/effect, or body/thought' (2018, p.563).

The writer found a place to work: a scrap of edgeland where buddleia and rosebay willowherb sprouted between mossy bricks. Her questions were happier in this habitat, but they wouldn't sit still for long. Drawing on what she already knew [38], she followed the hunch that had seeded her questions [39]. Feeling her way forwards [40], she began to make stories, gathering scraps of materials and thought about her in a nest, which got stronger as she worked at it [41]. The questions stayed still for longer stretches of time, watching her work, and so she got a clearer look at them before they shifted again.

When she felt lost, the writer got up to meet her neighbours and talk about their searches. One neighbour was walking with others to ask questions about how we can know a landscape, another was growing questions with gardeners that responded to the seasons [42]. The writer's questions hovered nearby, calling for her attention whenever she wandered off too far.

38 Mäkelä writes that prior practice is an essential pre-condition for artistic research (2006, p70).

39 Polanyi writes that the hunch is common both to artistic and scientific inquiry: 'all the time we are guided by sensing the presence of a hidden reality toward which our clues are pointing (2009, p24). Paradoxically, 'to see a problem is to see something that is hidden' (2009, p21).

40 'we can know more than we can tell' (Polanyi 2009, p4).

41 I admit to using, '...the usual writerly methods, which resemble the ways of the jackdaw: we steal the shiny bits, and build them into the structures of our own disorderly nests.' (Atwood 2003, p.xviii)

42 Working as part of an interdisciplinary community has helped me to see the ways researchers develop 'a fit between the research questions and the methodology designed to answer those questions' (Leavy 2015, p268).

When she returned to her nest and became so absorbed in making she forgot the questions existed, they prodded at her until she acknowledged them again. She had to hold on to the fact she wasn't only making stories to share – she was making stories so she could share the understandings that germinated in the making [43].

Sometimes, she ventured back down into the Underlibrary. Avoiding the main gates, she found that hidden entrances appeared just when she needed them. Darting in and out, she brought piles of books back into the sunshine. But if she read and thought for too long without doing any making, her questions became impatient [44]. The trick to keeping the questions happy seemed to be bringing the theory and the making into the same space [45] and to recognise the thinking in the making [46] – making it visible to herself and others by adding it to her nest [47]. She responded to the questions as they flitted in and out of focus and to the discoveries of the story-made-research-

43 Borgdoff asserts that artistic research takes place when 'practice is not only the result of the research, but also its methodological vehicle, when the research unfolds *in and through* acts of creating' (2011, p46).

44 Haseman reminds us that, 'The 'practice' in 'practice-led research' is primary — it is not an optional extra (2006, p103)'.

45 'Bringing together creative action and critical reflection in the same creative space' (Gray and Malins 2004, p32). Disrupting what Nelson describes as the 'firm institutionalized binary between theory and practice' (2013, p.19).

46 Manning and Massumi note, 'Every practice is a mode of thought, already in the act' (2014, p.vii).

47 'The research journey obliges us to make tacit knowledge explicit through reflective practice so that others may see our progress through the landscape' (Gray and Malins 2004, p.32)

threads and research-made-story-threads [48]. The path she made for herself as she worked wound through cities, urban nature and materials [49]. It started from where and when she was, recognising she was part of an age-old community of practitioners, and opened up spaces for exploration, connection and wonder that entangled her with others [50]. It followed the footprints of those who admit knowledge is changeable, never neutral, and that there is an interconnected world of meaning outside human makings [51]. Through the process her questions became clearer and helped shape the ways she worked, so she could discover answers that aimed to make a difference in the world [52].

Her questions, stories and answers curled together in the nest. Each had its own pulse, but they remained entangled as they grew. When she held the developing answers up, the light shone through them. Their edges were soft and their tendrils stuck to her fingers [53]. She placed them back down into the nest's weavings of paper, description and thought. The account the nest gave of their making was the best way she

48 'Methodology should be responsive, driven by the requirements of practice and the creative dynamic of the art/design work' (Gray and Malins 2004, p.72).

49 'Methodologically speaking, the creative process forms a pathway (or part of it) through which new insights, understandings and products come into being' (Borgdoff 2011, p.46).

50 Engaged in what Haraway describes as 'a curious practice' (2016, p.127), opening to the world and to 'magnificent unexpected connections between the work and the quotidian objects of the everyday' (Dayer 2017, p.21), rather than participating in a 'narrowed and narrowing view of life' (Walker 1983, p.5).

51 Recognising 'world as active subject, not as resource' (Haraway 1988, p593) and that 'Every sentient creature is a worldmaker' (Gray 2013, p.163).

52 In alignment with critical arts-based research, this inquiry 'attempts to bring about acts of care for self and others in community with the environment, the world, people, places' (Finley 2018, p.572).

53 This inquiry recognises that 'outcomes will be suggestive rather than conclusive' (Crotty p13) as knowledge is 'inter-subjective, context bound, and is a result of personal construction' (Gray and Malins 2004, p.21).

could think of sharing what she'd found [54]. Yet, the quest wouldn't end until she'd submitted answers to the Underlibrary. She could just imagine the looks on the faces of the gatekeepers as she tried to get the disorderly nest inside [55].

She tied down stray bits of documentation and added wheels to the nest, so she could pull it back through the tangle of alleyways on the long journey through the city to the library's main entrance. As she walked she talked to other writers she encountered, sharing what she'd found and learning more from the conversations [56]. Whenever she paused to reflect and write, the nest lost some of its disorderliness and it began to take on a more bookish shape [57]. When she reached the gates to the Underlibrary she held a book-shaped nest in her arms. Between its pages were new stories, discoveries and understandings [58]. The writer was ready to go inside and continue the conversation [59].

54 'How can people trust our research findings?... The process itself is our only justification.' (Crotty 2015, p.41).

55 Nelson writes that 'positivism and 'the scientific method' have lingered in informing a dominant understanding of academic research and the criteria for knowledge' (Nelson 2013, p.26). As Carter notes 'scientific and poetic creativity both suffer' because of this (2004, p.7).

56 The original contribution of this research is to practice, so it is vital to share what was found with practitioners outside as well as inside the academy. Scrivener notes, 'These accounts are a valuable resource for other practitioners' (2006, p177). Practice as research doesn't aim to be reproducible but it's findings can be transferrable if they are 'made accessible, communicated and understood' (Gray and Malins 2004, p.21).

57 The thesis is acknowledged as an essential element of practice as research. When written up, knowledge can enter 'into a dialogue with existing practical and theoretical paradigms' (Smith and Dean, p.7).

58 '...writer researchers will deliver the creative work, an improved understanding about some aspect of professional creative practice and a new way of seeing the world' (Webb 2015, p.72).

59 The conversation is continued first through the viva and subsequently through an academic career that opens up a space for further research and practice.

3.2 Research Design

The preceding story provided a way of reflecting on my exploration of methodological approaches using the practice as research methodology I've adopted for this inquiry. There is increased recognition in academia of the validity of communicable knowledge generated through creative practice (Barrett 2010, p.2). The methodological approaches used to describe this work are variously named and defined. Terms including, practice-based research, practice-led research, research-led practice, practice as research and performative research have been used with varying levels of interchangeability and nuance to describe the relationship between theory and practice engendered by artistic approaches (Smith and Dean 2014, p.5-9). This inquiry uses practice as research (PaR) because while challenging the, 'firm institutionalized binary between theory and practice' (Nelson 2013, p.19) it doesn't privilege either and can instead be defined as, 'theory imbricated within practice' (Ibid., p.33). PaR is an established methodology in arts disciplines, and is used by practitioner-researchers to carry out a research inquiry through the production of creative work, the provision of documentary evidence of process, and the development of complementary writing (Ibid., p.26). Using PaR involves the selection of methods to generate what Nelson describes as three kinds of knowledge: know-how – the tacit knowledge associated with practice; know-what – knowledge made explicit through critical reflection; and know-that – the propositional knowledge articulated in theory and existing practice

(Ibid., pp.41-47). The methods selected for this research and their relation to knowledge types are mapped in Table 1. The dynamic interrelation between these modes of knowledge in practice as research generates new insights (Ibid., p.47), contributing to both theory and practice. Nelson asserts that, 'some of the most innovative practice arises from such an approach while it also mobilizes the potential for the "substantial new insights" or "new knowledge" required of the PhD' (Ibid., p.19).

<i>Research Phase</i>	<i>Contextual review</i>	<i>Practice-based explorations</i>	<i>Sharing insights from practice</i>	<i>Discussion and Synthesis</i>	<i>Conclusions</i>
<i>Knowledge type</i>	Know-that	Know-how, moving towards know-what	Know-how, moving towards know-what	Know-what, moving towards know-that	Know-what, moving towards know-that
<i>Methods</i>	Review of the literature and wider context of practice.	Three storymaking explorations Reflection in and on practice Production of writing artefacts, stories and documentation (materials, prototypes, photographs, audio files, journal) Developing and articulating an approach to ecological storymaking	Two workshops sharing approach, materials and stories made Documentation of workshops (materials, prototypes, photographs, audio files)	Critical reflection and synthesis of findings through discursive writing Developing propositions for writers	Critical reflection through writing Articulating original contributions to knowledge Recommendations for future work and identification of next steps
<i>Rationale</i>	An ongoing critical and analytical review of existing knowledge (know-that) allows the research and its contributions to be developed and understood within the relevant context of theory and practice (Gray and Malins 2004, p.35; Nelson 2013, p.66).	Practice is central to the research process and insights are generated through reflection in and on practice (Nelson 2013, p.29; Schön 2005, p.62). The tacit nature of know-how becomes explicit know-what through the documentation, writing and theorisation surrounding the practice (Smith and Dean 2014, p.7). Through PaR the critical focus centres on process and its outcomes, rather than evaluation of an end product (Barrett 2010, p.135)	Sharing the approach developed with other practitioners places the research in its wider context and brings new insights and perspectives from others (Gray and Malins 2004, p.21). Workshops allow for cross-pollination that strengthens the research (Leavy 2015, p.269). They can be seen as a form of peer assessment (Smith and Dean 2014, p.26) that aids further understanding of the work.	Synthesis of the research findings through discursive writing aids articulation and evidencing of the inquiry and generates further insights through writing, leading to theory generation (Nelson 2013, p.36; Bolt 2010, p.33). Theory is made communicable and shareable for non-specialists (Nelson 2013, p.36).	Movement between the research phases allows tacit knowledge (know-how) to be made explicit (know-what) and for this to be related to existing theory (know-that) to generate new knowledge (know-that) (Nelson 2013, p.60). Future steps are articulated in recognition that the knowledge produced, 'is necessarily about something and for something' (Leavy 2015, p.27), and can make original contributions to both theory and practice.

Part 2: Exploration through creative practice

Every text, story, or trip, in short, is a journey made rather than an object found (Ingold 2016, p17)

This part of the thesis documents the three storymaking projects that form the core of this research inquiry. The key discoveries from these projects are then used to inform and set out an approach to ecological storymaking. Each project draws on key insights from the contextual review and uses a practice as research methodology to explore the interrelationship between ecological themes and the imaginative and physical materials of story. Material writing practice is developed and the ways stories are shaped by practice and technologies is considered. As this account centres on practitioner exploration, it uses a subjective voice, recognising the value of 'know-how' inherent in practice as described in the methodology (see p.90). Drawing on theory and critical reflection through practice, understandings can be synthesised to make new contributions to knowledge.

Of the three projects undertaken, *Persephone Calling* in chapter 4 constitutes the major inquiry. *The Lichen Records* in chapter 5 and *How to Catch a River* in chapter 6 are smaller projects undertaken to further explore initial insights. Each project is documented through five phases of storymaking: beginning, gathering, seeking, making with technologies, and sharing.

Discoveries made on each project journey are articulated and insights taken forward to the next piece of work. The findings from these projects are used to develop a material approach to ecological storymaking, which is outlined in section 6.8. This approach was taken into workshops for further exploration and development as documented in Chapter 7.

In the contextual review, we saw how El Lissitzky noted that the 'book-space' was set by the constraints of print technology and called for it to instead respond to the pressures of content (see p.46). These projects start without predetermined outcome and each take a different ecological theme as the inspiration for story content. By following materials, engaging with tacit knowledge, and being open to curiosity and chance, content can shape how a narrative is developed and shared, and new possibilities both for writing practice and for stories begin to emerge.

Part 2, Chapter 4: Persephone Calling

We thought of Persephone for a while in silence. I imagined her struggling her way towards us (Almond 2013, p.166).

As a practitioner, I was eager to embark on the creative work that would form the core of this investigation. I was prepared to challenge my creative practice and to develop the skills needed to engage with practice as research, however nothing could have prepared me for the challenge of writing without being able to write: a consequence of breaking two fingers and being unable to use my right hand for two months. This section documents the first project journey and the surprising discoveries made when I was serendipitously forced to extend my practice much further than I'd anticipated.

4.1 Beginning

The starting point for *Persephone Calling* was the search for a story. 'It matters which stories tell stories, which concepts think concepts,' Donna Haraway tells us (2015, p.160). In this project my intention was to tell a story about our connection to other living things, rooted in the urban landscapes where the majority of us live. Drawing on the role traditional stories have played in communicating knowledge and sharing wonder (see p.24), I set out to select a

wonder tale or myth I could work with and reimagine for contemporary readers. Recognising the communal aspect of traditional storytelling and drawing freely on existing wonder tales and folklore has been central to my writing practice over the last ten years. For this reason, I didn't anticipate having any difficulty with finding a story to work with, yet I soon discovered even stories featuring other living things were much more human-centric than I'd noticed before. I was also looking for a story I could connect with, one that sparked a sense of imaginative possibility within me, so I knew I could work with it. As a quality this is not easily articulated. I knew I'd only know the story when I found it.

I began the project indoors because that was where the books I was searching through were: in libraries, on my own bookshelves, online. Yet, by searching for a story in this way, I was unquestioningly following my habitual practice of desk-bound research. I became aware of the irony of spending hours indoors searching for stories that could help people engage with other living things outside. To counter this, I began to spend more time walking and consciously paying attention to the world around me every day. I began to see the patterned bark of trees, the mosses jewelling city-centre walls and lesser celandine emerging at the edges of pavements – all things I'd walked past without noticing before. This active engagement with other living things in the city was the beginning of a new way of working for me. It meant I was able to expand my idea of what constituted imaginative and physical narrative materials and the ways I could gather and work with them.

4.2 Gathering: four stores of material

The gathering phase of *Persephone Calling* was characterised by a hoarding of materials, both imaginative and physical in nature. I gathered materials with an open mind in terms of the shape the story would take. Many writers gather materials to work with for the development of a story's content. However, I was also gathering materials that would inspire the material existence of the story. This process is documented through a series of artefacts and commentary below.

4.2.1 Story strata: finding Persephone

The traditional story I chose to work from in the end was not discovered through a methodical search of bookshelves and online sources, but through the everyday ritual of reading a bedtime story to my sons. Throughout this research inquiry I've found remaining open to serendipitous encounters an essential part of the process. By, 'holding open the possibility that surprises are in store, that something *interesting* is about to happen' (Haraway 2016, p.127), I've been able to seize on chance events and follow intuitions that are rooted in my experience of practice. The bedtime story was David Almond's *Skellig* (2013), in which the myth of Persephone is a thread that connects the themes of spring, birth, life and death. 'There's a story that's been calling to me since I came across it in *Skellig*,' I noted in my practice journal (April 16). Initially, I continued looking for other stories that connected to living things more explicitly, but Persephone continued to tug at my imagination. My sense of

connection to the story was amplified by the arrival of spring, which I'd become vividly aware of by purposefully paying attention on my walks outside and I realised this was the story I needed to work with.

Almond's reimagining gave contemporary relevance to a story that is more than 3000 thousand years old. Rooted in a tradition of ritual and orality, there is no original version. The story exists through the retellings that were fixed as literary texts. I searched for and read as many versions of, and references to, the myth as I could find, ranging from the earliest literary version, the *Homeric Hymn to Demeter* recorded in seventh century BCE (Sacred Texts Archive n.d.), to contemporary versions by Charlene Spretnak (1992) and the folk opera *Hadestown* (2010) by Anaïs Mitchell. Digging down through the strata of the myth I reflected on the possible intent of those who had told the story before. This process of reflective and comparative reading as a writer made visible the patriarchal lineage of narrative choices made by the majority of its tellers and gave me a wealth of source material to which I could respond.

As a writer and feminist, the revisions, translations and adaptations of fairy tales that came to the fore in the latter part of the 20th century have been a key inspiration for my work. After centuries of sociocultural and economic barriers to female authorship (Haase 2004, p19), writers including Angela Carter, Anne Sexton, Alison Lurie and Margaret Atwood began to take old stories and make them anew. Their bold reimaginings drew from the materials of traditional tales while revivifying them for contemporary audiences (Warner 2014, p.136). With classical myths, translations by men still dominate our bookshelves today. It was 2017 before the first full translation of *The Odyssey*

into English by a woman, Emily Wilson. Wilson has acknowledged the challenge of conveying an understanding of the key patriarchal themes in the text while translating the work as a woman for a contemporary cultural context (2018 pp.86-7). The dominance of patriarchal themes in Greek mythology is countered by Sprenak in her collection *Lost Goddesses of Early Greece* (1992). Describing the canonical Greek myths as stories ‘told by men of how women react under patriarchy’ (1992, p.37), she instead presents evidence of a pre-Hellenic oral tradition, centred on Goddesses, that tells of ‘harmonious bonds among humans, animals, and nature’ (Ibid., p.25). With these approaches to feminist revision to draw inspiration from, I extended my initial intent to include making a version of the myth that restored autonomy to Persephone, and linked her journey to other living things, while bringing her story into the contemporary city.

4.2.2 A sketchbook: growing ideas

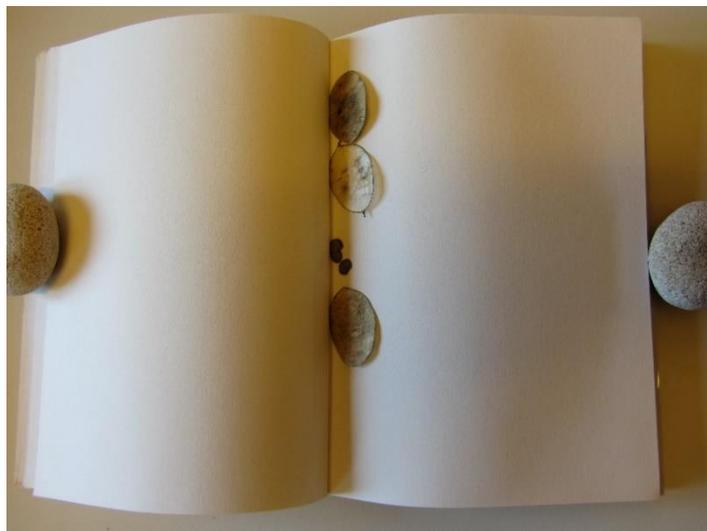


Figure 1: a sketchbook for carrying seeds

Writers carry notebooks. This oft-repeated maxim works as both badge of identity and instruction for a developing writer. With the intention of challenging my practice, instead of buying my usual lined notebook, I bought a reversible sketchbook, with plain paper in the front and lined paper in the back. In retrospect, this seems a small act, but the significance I assigned to it at the time reveals the role of habit and precedence in my writing practice and just how text-bound my writing practice was. Once I began using it, I found I preferred to work on the plain pages. Unconstrained by lines my writing could loop and curl, making shapes on the page. I began to draw catkins, petals, leaf skeletons and sycamore keys that I found as I worked on my front doorstep – sitting on the threshold between indoors and out.

Despite these explorations in line and image-making, text still dominates the early pages of the sketchbook. Woven between the drawings are unattributed quotes taken from different versions of the myth, poems, and scientific papers relating to the Anthropocene. The lack of attribution reflects a conscious desire to remove hierarchy between the sources of inspiration gathered – there is no divide between art and science here – in order to think about the communal aspect of storymaking. Questions wind across the pages: ‘whose voices does she [Persephone] hear on her journey?’, I ask, ‘whose voices does she carry?’. A litany of the beginnings of spring: ‘snowdrops, croci, dog violets, speedwell, lesser celandine, primroses, welsh poppies, swallows, swans on the river’ is contrasted with a litany of human-made debris: ‘black carbon, inorganic ash spheres, spherical carbonaceous particles, polycromatic hydrocarbons, polychlorinated biphenyls...’(April 16). Figure 2 shows the move

from pages dominated by text, towards those with a more equal balance of text and image, as I began to draw and spend more time outside. From the point that I broke my fingers the pages hold found materials. Each seed and leaf became the record for an impulse, thought or idea in place of words.

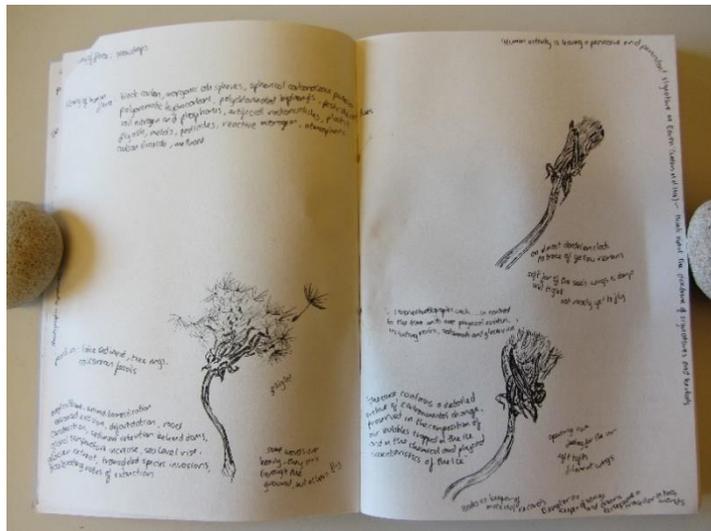
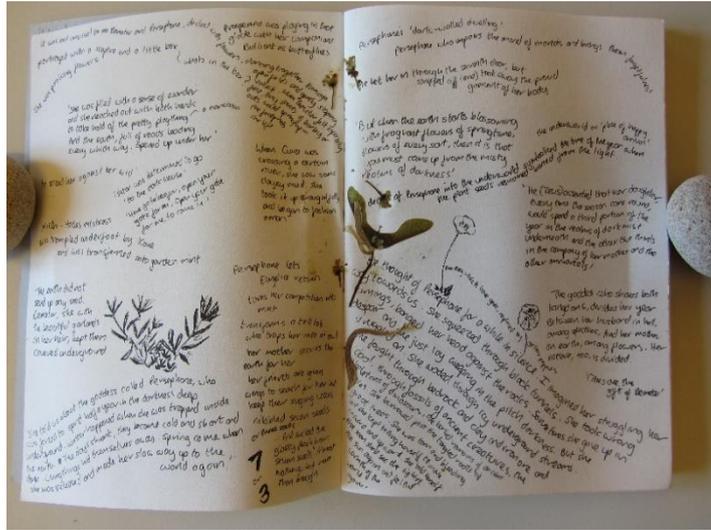


Figure 2: from words to leaves

4.2.3 Digital stores for admin *and* wonders

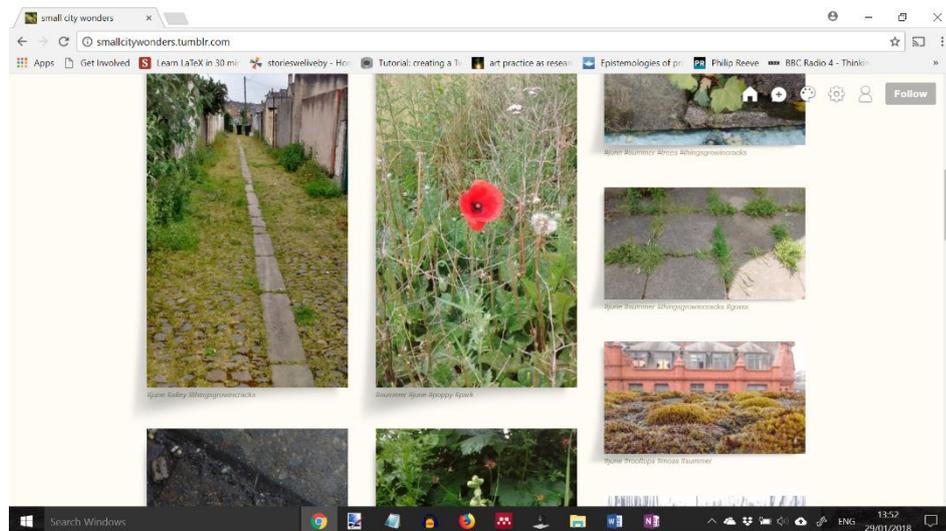


Figure 3: *small city wonders*

With the advent of mobile smartphone technology, it's possible to use digital software to capture, manage and retrieve notes using integrated camera, audio recording and drawing tools, anywhere within signal range. I used a digital notebook to house my practice journal as it enabled me to use multiple media to make short reflective entries on storymaking. I also included my notes on reading, other art forms I'd engaged with, anything that inspired me, and life events and their impact on my work. During the project the digital notebook also became a valuable repository for functional information. I used it to collect sources for materials, to-do lists and online tutorials for making with technologies. It provides a chronological account of my process that has enabled me to draw insights from, and make connections between, many different elements of the projects in the final stages of the PhD.

The digital notebook was used as a private repository, but I also used a public-facing blogging platform with the aim of gathering materials relating to the other living things I encountered in the city. 'Small City Wonders' (Dean

2016a) is in part an attempt to redress the rural focus of much of the environmental literature I was reading. It is also a way of collecting materials I could work with. The fact it was publicly discoverable encouraged my caretaking and updating of the digital space. Photographs make up the bulk of posts. Many are of wildflowers I'd previously overlooked and wanted to learn the names of. Collisions between human and other-than-human life also feature heavily – a fallen nest on the pavement, a dandelion seed caught on the edge of a coffee cup, a discarded crisp packet lying amongst some bluebells. Written text records snatches of conversation with family members about the arrival of spring. This is not reworked and revised prose, but a simple reflection of everyday moments of ecological engagement in the city. The tags I chose to categorise the posts reflect the growing preoccupations I was gathering materials around: '#thingsgrowincracks #light #spring #wildflowers #edgelands #thingsfound #wishes #weeds #bluebells #seedstravel...' (Dean 2016a). The act of consciously paying attention to and then documenting what I encountered had a huge impact on my day-to-day life. I wrote in my practice journal:

I have never experienced the spring like this before...

...one thing leads to another, paying attention more makes me notice more, leads me to find out more, makes me notice more
(May 2016)

The use of writing artefacts is a key method in this research inquiry (see p.92). Harper characterises writing artefacts as remnants of process, rather than finished works to be shared (2013, p149). The blog is a writing artefact, but it was also made to be shared, therefore making my process visible.

4.2.4 Voice notes: broken thoughts

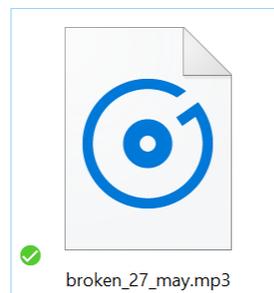


Figure 4: voice file

The progress I was making in gathering materials came to an abrupt halt when I broke two fingers on my right hand in late May 2016. Transcribing the voice notes that I recorded in the weeks afterwards, I am struck by the upset in my voice. The voice notes are stilted, my voice tremors with emotion, sentences go unfinished and I repeat myself as I struggle to articulate my thoughts aloud into the voice recorder. I return several times to the way I use writing on the page to think with and to the fear of losing things because I can't record them with written words:

attempting to make any kind of voice notes,
it feels
it doesn't feel as permanent as writing
I don't know, they feel more like ghosts
they're not solid
I'm not secure in their existence
when I'm writing it's all there for me to sort
through
(transcript from June 2016)

Typing left-handed was frustratingly slow. Experiments with voice-to-text software had to be abandoned as the algorithms couldn't decipher my Lancashire accent (see note below). As I moved from gathering to seeking in the storymaking process, I realised I would need to find other ways of thinking and working to be able to continue working.

Persephone is Traveller dragon
Persephone is a travel driven I curiosity
Persephone Travelodge curious
Persephone travels she is curious

[the result of using voice-to-text software to
speak a single sentence aloud]

(June 2016)

4.3 Seeking: four ways to find a story

Seeking, from Old English *secan* – to try to find, to look for, to strive after, to ask (Bosworth-Toller 2010) – is an appropriate verb under which to collect the actions involved in this stage of the storymaking process. In previous practice, I would have described this as ‘the bit where I daydream’, exploring narrative possibilities in my mind before moving on to writing. Interrogating practice through research has meant reconsidering what methods and materials can be used in making a story. The artefacts below each illustrate a different approach taken to seeking not just the story’s narrative possibilities, but also its physical shape. Each exploration resulted in a number of writing artefacts. These writing artefacts were not made to be shared with a reader but are presented here like the shed skins of a growing story. By making process visible they provide useful prompts to reflect on material writing practice.

4.3.1 Making marks towards a story



Figure 5: story marks

Frustrated by the immateriality of voice recordings I set out to find a physical process I could think with that would allow me to manipulate narrative materials by hand. Using clay, I made 24 tokens and pressed materials I'd found on my walks into them, ranging from fragments of pottery and glass, to a feather, lichen and seeds. Initially, I tried to work with story marks alone, using them to represent the narrative elements and materials I'd gathered. Thinking with them silently didn't work, and I was unable to articulate why. Discussing my frustration with a colleague and showing him what I was attempting to do I began to tell him stories with the tokens and realised this vocalisation helped. Selecting which tokens to use and playing with their ordering sparked new ideas and prompted questions.

Returning to photographs of the story marks (fig. 6) after two years, I am still able to read stories from their arrangements. For example, I can see how I looked for paths up from the underworld through layers of human-made materials in the earth, water and atmosphere. I experimented with the order of narrative events, forming a circle of story marks as I questioned whether the seed representing spring should come at the beginning or the end of a story traditionally tied to the seasons. I can also see where I challenged the patriarchal version of the story by exploring the consequences of it being Persephone's choice to enter the underworld. With the tokens I was seeking narrative possibilities, working physically and imaginatively with materials gathered and beginning to make choices about what elements I wanted to include and discard in my version of the myth.



Figure 6: telling tales

4.3.2 Seeking a story shape



Figure 7: a moss circuit

Without the constraint of a predetermined shape for the story I was free to experiment with different materials and technologies. I was keen to explore the potential use of microcontrollers because of their relative accessibility compared to other digital technologies (see p.59). I played with the way the water content in materials like moss and leaves could be used to conduct electricity, turning them into sensors that completed a circuit when touched to trigger an audio file. Beginning to explore these interactions in narrative terms I experimented with using pomegranate flesh as a conductor. The pomegranate is a key image in many literary versions of the Persephone myth. Tempted into eating the seeds of a pomegranate in the underworld, Persephone is bound to remain there forever. The punishment is reduced by Zeus who declares she must instead return there each winter.

Working with the pomegranates, and eating their seeds as I did, I meditated on their place in the story, binding imaginative materials to physical experience and technological interaction. These experiments focused on

physical interactions with natural materials, intertwining them with the digital technologies. However, with the guidance of my supervisors, I tried to resist letting the technologies become deterministic and to remain open to other possibilities for making the stories. I found that imagining ways a story could exist in the world without considering any practical possibilities was a helpful way of countering temptation towards a pre-determined technological format, leaving my imagination free to wander.

what if we didn't turn pages?
what if a story unfurled
unrolled
grew
(May 2016)

4.3.3 Drawing out ideas



Figure 8: window to a snail shell

Although I was unable to master writing with my non-dominant hand, drawing left-handed was a revelation. My inner critic was silenced because it felt permissible for the standard of work to be low. No longer anxious about the quality of the finished drawings, I was able to focus on the imaginative process rather than reaching towards representation. I found it more practical to use large sheets of paper and individual cards than a bound sketchbook and this move from a sketchbook, with its linear expression of idea development, to the exploration and recombination made possible by unbound drawings, inspired new connections between ideas. Working at scale allowed me to identify story elements I wanted to work with and to note links between ideas, working physically to connect the materials. In my practice journal, I noted this as a breakthrough, questioning whether working in this way was allowing me to explore a more complex web of narrative possibilities and whether these could be particularly suited to media other than the book:

[Note: typos are due to broken fingers]

Drawing out ideas with left hand
Symbols Only absolutely necessary
words Allowed me to make connection I
wouldn't have made if typing or writing

Working in space and with threads, almost
three dimensional feel to it ... Is working
like this a way to capture more when
writing for digital or any media which is
not linear and page tied/bound?
(June 2016)

Making drawings of objects I'd collected during the gathering phase, I began to seek narrative possibilities and I didn't want to lose them, so I made a number of linked audio recordings. The drawings are edged with copper tape and when attached to a Bare Conductive Touch Board (an Arduino-based microcontroller that will play audio files) the voice notes can be triggered by touching the drawings. In these recordings, there is more confidence in my voice than in the earlier voice notes as I talk about what I've drawn and the narrative associations it's triggered. For example, in the voice note on the snail shell I take the following imaginative journey:

'as I was drawing I realised the patterning inside, it looks like a window, which is interesting when you think about it being a home... I'm not sure it technically is a home... it's a place to hide, a form of protection, it's also a form of memory... born with a tiny very fragile shell, and as it grows the snail shell grows with it and so if it could turn around, if it could crawl back up the curl of its shell then it would be crawling back up into its past... there's something about the idea of carrying your past, sort of wound round in circles, carrying it with you, but not actually being able to go back'

(transcript of voice note recorded June 2016)

Listening to the voice notes, I can follow the meanders of thought. There are moments of insight nestled within looping sentences. Phrases repeat or dissipate, and my language use is imprecise as I reach towards a correct word rather than having it straight to hand. A succession of conjunctions link one thought to the next. Recording the imaginings like this makes visible my thought process in a way that is often erased through the revisions and precision of typing.

Ultimately, drawing provided me with a new way of reaching out towards things in the world that felt very different as a process to writing. This had important implications for my sense of connection with other living things and the way this could be shared through stories. As I noted in my journal:

... Drawing is feeling. I'm realising this more and more. It may be a way to find narrative voice as it involves a reaching out and processing/understanding/closeness that isn't there in the same way when I look from a distance and then try to fill that distance with words. Using words to describe, I stay in my own head, there's not the same sense of crossing.
(Dec 2016)

4.3.4 Walking stories in the city



Figure 9: 'Global Warning' Liverpool alleyway, July 2016

There is a long association between writers and walking. Virginia Woolf and Charles Dickens wrote essays describing their walks through cities (2005; 2010). Wordsworth composed aloud as he walked down rural lanes (Solnit 2014b, pp.113-4). The 19th century concept of the *flâneur*, a gentleman wanderer (Solnit 2014b, pp.198-9), was brought to critical attention in the 20th century by Walter Benjamin through his writings on Baudelaire (1999a, pp.152-190) and his work on the unfinished *The Arcades Project* (1999b, pp.3-13). Solnit describes Benjamin as 'one of the great scholars of cities and the art of walking them' (Solnit 2014b). Benjamin's discussions of *flânerie* as a resolutely male pursuit have dominated the discourse on walking in cities to this day. As Lauren Elkin asserts in her 2016 book on women who walk, 'The *flâneuse* is still fighting to be seen' (2017, p.18). During the 20th century, walking as a practice and method for discovery was taken up by groups of artists and activists including the Surrealists and the Situationists (Solnit, pp.207-212). In his phantasmagorical account of his wanderings in Paris, Louis Aragon strove to hold on to a 'sense of

the marvellous suffusing everyday existence' (1994, p.11). Situationists undertook *dérives*, a kind of 'urban drifting' (McDonough 2009, p.10), and practiced 'transformed cartography' (Debord 2009, p.62) by exploring a place using a map from somewhere else. Their endeavours brought elements of chance to urban exploration as they studied the impacts of place on people through what they described as psychogeographical investigations (Debord 2009, p.59). Contemporary writers who walk join these literary wanderers of cities, while setting out on their own paths. Elkin notes that prominent writer/walkers like Iain Sinclair and Will Self seem as oblivious to women who walk as their 19th and early 20th century predecessors (2017, p.19). Yet, she asserts, the *flâneuse* does exist. Elkin describes the woman who walks as 'a determined, resourceful individual keenly attuned to the creative potential of the city, and the liberating possibilities of a good walk' (Ibid., p.23).

For me, setting out to use walking as a writing method involved the conscious transformation of an everyday activity into a mode of creative development and composition. Imagining Persephone into the city as I walked was also an ideal way of freeing her from the patriarchal binds of the literary myth. Everyday walks in the city had become an essential way to gather materials and I extended this practice by undertaking longer walks with a distinct imaginative focus and intent. Inspired by Aragon's writing and the practices of the Situationists, I tried to remain open to chance encounters and alert to wonder in the everyday. In Lancaster, the city where I live, I chose to walk only along alleyways for as far as I could. This enhanced my sense of Persephone as outsider and visitor to the surface world as it made my own city

unfamiliar to me. Taking the character with me for a walk, I imagined her peering in at the backs of people's lives, seeing their refuse and secrets, while remaining unseen herself, and asked myself how she would feel when her way was blocked.

To echo Persephone's journey from the underworld upwards, I walked from the lowest point I could get to in a city to the highest. I selected Liverpool for this walk because I could journey from James St Station, one of the two oldest deep-level underground stations in the world, to the top of the city's cathedral tower, which rises 500ft above sea level. Drawing on my acting training, this time I walked as Persephone and kept trying to get higher, but the city seemed to conspire against me, its routes shifting and taking me in new directions. The significance of chance encounters was astounding: I encountered a building called *Elysium*, the name for the ancient Greek afterlife, up a mostly derelict side street, and thanks to the city's abundance of neo-classical architecture, I met many family members from Greek mythology captured in stone along the way. In a continuation of the gathering process, I sought signs of other living things and the debris of human life in the gutters and the cracks of walls and pavements. Story structure and content began to emerge as I walked. Describing the process in my practice journal I wrote:

Walking with the character
Writing with footsteps
Making story in the world
(June 2016)

Having begun to pull together content, form and materials for communicating the story I knew I had to move on to the making phase. Seeking was an unpressured phase of storymaking where I couldn't really fail as everything was exploration and nothing I was making was intended to be shared with a reader, but I had to commit to following through on one or more ideas or I wouldn't be able to make a story that could be shared.



Figure 10: weaving story strata

4.4 Making: four elements of story craft

4.4.1 Following intent

Moving from gathering and seeking towards making stories involved making choices. I had to commit to a story idea to move forwards, but at the same time I needed to ensure I was following my intent to make an ecological wonder tale rooted in the contemporary urban environment. Exploring different methods and materials, I had begun to consider several possible shapes the story could take. I decided to follow three of these ideas to give me the space to explore and reflect on where different choices would lead me. This led to the making of three very different stories: *Three Seeds*, *For Hades* and *Persephone's Footsteps*.

4.4.2 Forming content

Content, understood here as the imaginative and language-based materials of the story, had already begun to accrete during the gathering and seeking phases. Asking questions and following the narrative implications is a central part of shaping ideas into stories. Still unable to use my right hand I had to find a way of forming content that wasn't writing. What I hadn't anticipated was that the different methods used during the seeking phase of the project would lead to different ideas for content, and that continuing to work with these methods would also give me different ways of composing stories. Drawing on the cyclic nature of the myth uncovered when working with the story tokens I tried to overcome my inhibition to composing aloud, speaking ideas, finding patterns, rhythms and repetitions and shaping them towards the story that

would become *Three Seeds*. While gathering and seeking I'd drawn many found things – feathers, leaves, sycamore keys, an empty snail shell, dandelion seeds. As I drew, I began to orally compose fragments of story that connected to each object in turn, imagining the stories of other living things and recording these as voice notes. I moved on to composing *For Hades* as I drew. Walking led to new questions and new narrative possibilities. I walked story ideas on foot and composed the majority of *Persephone's Footsteps* as I journeyed from the lowest to highest points of Liverpool city centre, before returning to the city to take the composition for a walk and further develop it, and then walking it again to revise it.

Forming content also requires the shaping of the gaps that are left to be filled by the reader's imagination (see p. 63). In a story, what is not included can be as important as what is. When working on drawings of tree rings I noted in my practice journal:

...plots move outwards all at once rather than linear (how would I write a story like this?) am I writing about unwritable stories? but isn't that the point - to give hints of them to inspire people to imagine because we can't know
(Aug 2016)

Both *For Hades* and *Persephone's Footsteps* leave a large amount of imaginative work for the reader to participate in. With *Persephone's Footsteps* gaps also had to be shaped for the unique experience each listener would have in taking the story for a walk in a different city, where the urban landscape and their movements through it would become part of the unfolding narrative.

4.4.3 Finding form

Form – used here to describe the linguistic and stylistic conventions used to shape a text – has not been a central consideration in my practice previously. I write short stories and usually begin writing with that form already in mind. For this project, which aimed to follow subject and materials to shape the story, form was necessarily not predetermined. Form had to be developed through the processes of gathering, seeking and making. The resulting stories are markedly different to anything I have written before. The texts are shorter, non-linear and the language is more overtly poetic. In an attempt move away from the screen and page-based dominance of much contemporary literature, the stories were made to be heard, rather than read.

Without writing, I found techniques from the oral tradition indispensable in shaping content and form, employing mnemonic techniques such as the use of numbers, alliterative language and repeated phrases (Ong, 2012, pp. 70–1). In oral traditions such as those of the Pueblo people in New Mexico, stories have been ‘kept in the human memory’ (Silko 2012, p.xix), told and retold for generations without recourse to writing. *Three Seeds* does not have a fixed text, but cycles through a narrative scaffold that centres around

repeated refrains. *For Hades* builds on the narrative possibilities uncovered when drawing found objects and the associated texts can be discovered in any order. Walking to compose gave me a sense of embodied movement, which is conveyed in the episodic narrative form of *Persephone's Footsteps*. The story was literally composed upwards, each section reaching up towards the next. When I was able to use my broken fingers again, I found myself unable to follow convention to 'write down' the story and followed the movement of the material up the page instead.



Figure 11: writing upwards

4.4.4 Making with technologies

As noted in the contextual review, writing is a technology and technologies have long shaped the stories they are used to share (see p.34). When exploring story possibilities during the seeking phase of the project I tried to resist the temptation to choose a novel technology for sharing the story and to create

content for that. Doing so would have meant shaping the content for the technology rather than creating work where the technology responds to the content as I intended. However, it was difficult to progress with ideas without knowing if a potential technology would work. The only way I was able to develop stories was with constant movement back and forth between intent, subject, content, form and technologies. This wasn't easy, as I noted in my practice journal:

[Note: typos are due to broken fingers]

Because i am developping the writing in tandem and the form and content in relation to each other its all umcomfortable, no confidence in it, fear it might not work'

(August 2016)

As part of this movement back and forth, prototyping became an invaluable element of practice. It was only when I worked with the materials physically, whether those were paper, wires or words that I could see if something was going to work and continue to develop it, as illustrated by the following note from my practice journal:

I realised as soon as I'd made a paper prototype that it wouldn't work with electric paint/touch sensors. I'd been so focused on the problems of insulating the paint I hadn't realised you can't hold a vertical map and touch it to trigger sensors at the same time. The base has to be held because of the weight in it and the other hand is needed to hold the map open/keep it open in the wind etc...It was a vital lesson for me in mocking something up, you can't just test it in your head, same with writing, you can't just test the idea in your head, it's only through the writing that you find out if it will actually work or not. Action rather than contemplation is what's needed.
(Oct 2016)

Working on *Three Seeds* I experimented with turning pomegranates into capacitive touch sensors to trigger audio files using a Bare Conductive Touch Board, but I couldn't resolve the tension inherent in fixing an oral composition through recording. The digital technology worked, but I felt the story lost its improvisatory character. Following the materials I was working with in this case meant making the decision not to use any technology to share the story.

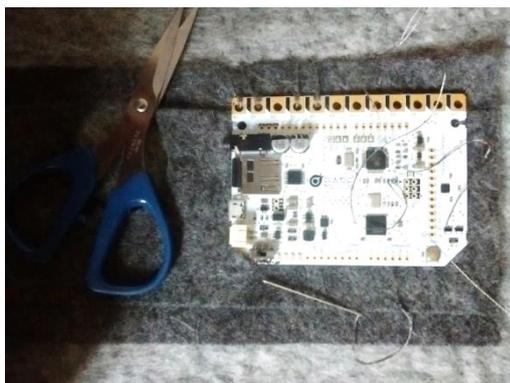


Figure 12: making For Hades

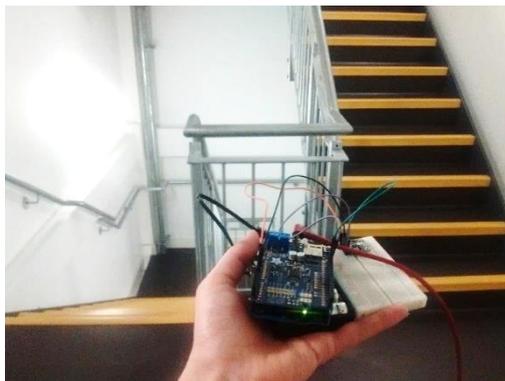


Figure 13: making Persephone's Footsteps

Making *with* rather than *for* digital technologies involved a huge amount of skills development. I learned to solder, build circuits and code in C++ and Python. Much of this learning came from online tutorials, but when I couldn't get two lots of code I needed for *Persephone's Footsteps* to combine I sought face-to-face advice from a colleague in computing. It was fascinating and completely unexpected to discover my colleague's programming process had parallels to the creative writing process. We started by working on paper long-hand, without the code, to work out what it was I was trying to do. It hadn't occurred to me to code like this. I'd been working directly on the screen into the tiny window of an Integrated Development Environment, adapting example code on screen rather than working through ideas with language or drawings first. Working on paper felt less intimidating and more like a process I know and could understand.

Making with technologies also involved a continuous dialogue with the imagined reader. The means of communicating the story and the impact of this on reading experience also had to be imagined and worked with. Shaping potential experiences was especially fraught when working on *Persephone's Footsteps*, where the technology would trigger parts of the story at different intervals depending on how far upwards the reader had travelled. I noted in my journal, 'I actually create half-things. The reader fills in the blanks and does the rest' (Oct 16), but in this instance it was the unpredictable city as well as the unpredictable reader that would be filling in the blanks.

4.5 Sharing: three reimaginings of a myth

Towards the end of the project I had made three stories. Literary theorists work with finished texts, performing acts of hermeneutics to parse meaning from a story. As a practitioner, I can't live outside a text I've created, but I can take the story and unravel the threads that resulted in its making. A story is a collection of all the materials gathered, choices made and experiences that led to its existence. Interpretation is the job of the literary theorist and critic. What follows instead is an account of the materials of the three stories made and insights drawn from reflecting in and through and on practice.

4.5.1 For Hades



Figure 14: *For Hades*

For Hades is a contemporary reimagining of the Persephone myth presented as a storied artefact. Persephone has collected stories told by different living things from the surface of the earth and a series of related objects, which are presented together in a bundle. A recording of her voice is tied to each object –

audio files are triggered through touch – and she shares what she’s learned about the stories of other living things, including the concentric mythology of trees, the map tales of bees and the raucous tales of dandelion seeds. The bundle is constructed as a gift from Persephone to Hades. It is her attempt to share with Hades some of the wonders that can be found above ground and to explain to him why she must leave for the surface each spring. The audio text is made to be read through touch in the darkness of the underworld.

A reader encountering the bundle explores it through touch. The work is designed so it can be ‘read’ with fingers from left to right. Touching the key on the far left gives the contextual information for the whole story. A key was chosen because of its association with maps and information, and to symbolise the unlocking of the story. The other texts aren’t linear and so could be encountered in any order.

Story materials

Physical materials:

Felt, conductive thread, a Bare Conductive Touch Board, 7 MP3 files, micro SD card, 5V power pack, a small speaker and found objects including an old key, a web made from conductive thread and twigs, a snail shell, a glass vial containing the amount of honey a bee makes during their lifetime, a small book made from seed paper containing the text of the earliest known literary version of the myth, a glass bottle filled with dandelion seeds, a leaf book made from oak leaves sewn together with conductive thread and a swift’s feather.

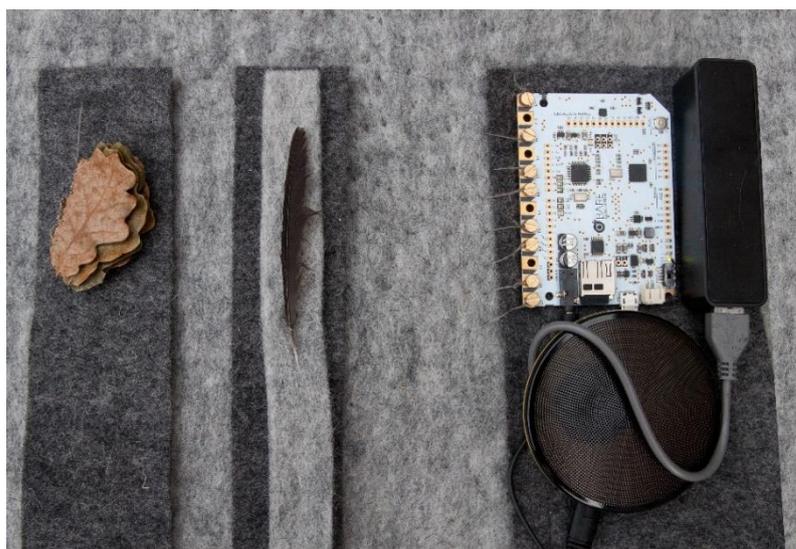
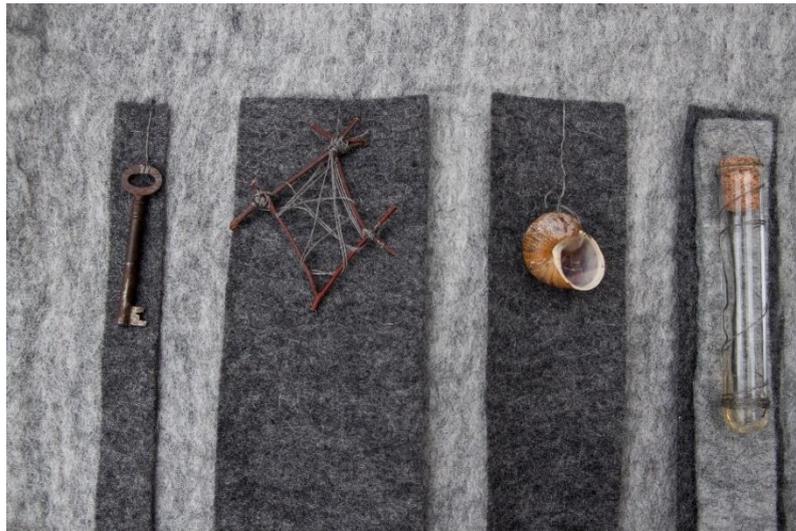


Figure 15: a story to be read by touch

Old key

These stories are for you, my love. I need you to understand why I leave the Underearth each spring and don't return until leaf-fall.

When we're apart I carry things to tell you. There are so many stories to be found in this rattlebag earth, so much to hear and see and feel. I can't live beneath it all for too long.

You'll find I've knotted my voice into each of these treasures in turn. It won't wear thin, though your memories of me might. You asked me once how I expect you to hold on to me when I'm gone, how you can hold on to the intangible. I think that might be what stories are for.

Web of thread

Spiders weave stories into their webs – some for entertainment, others to lure and bind prey – but they're almost impossible to read. Tales billow in the breeze. You can't touch a story without pulling it out of shape.

Squatting before a web on a gate I didn't know where to begin. I took up the narrative thread of a spider who was trying to escape a flood by stringing webs between raindrops. A cloud snatched the light for a moment and I lost that tale and found another of a vast golden city of webs where a fly could rule over everything as ki– a single thread snapped beneath my breath and suddenly whole parts of the story were gone, blank air in their place. These stories are remade again and again. Spider tales are intricately plotted – there are no loose threads, yet they transform faster than they can be read. You won't ever get to the end of a story, but the slightest fragment clings to you long after you walk on.

Empty Snail Shell

Snails are very like humans – they carry a story around with them, worrying at it just beneath the surface. They dream it endlessly. They can't let it go and can't get back to its beginning, but snails carry their stories without ever sharing them. As a snail grows, their story grows. The protagonist often bears striking similarity to the snail themselves. These are long spiralling tales of choices made, paths taken and a striving for something that is always just around the corner. Minute realism details every piece of gravel and leaf on a journey that ends abruptly when the snail dies – sometimes dragged from their own story by a bird. Gathering empty shells on city pavements I've found each inscribed with a different tale, but I can only read the last chapter. If you were small enough to slip inside a shell you could read the whole story from end to beginning with your fingertips.

Honey

Bees tell each other stories about journeys – most creatures do – but a honey bee's labyrinth-danced tale can also be used a map. The story of a bee who set out on the north road to find the buried sun, and who helped the mist, the rain and the wind along the way will lead you to a glorious haul of nectar. Sometimes, though, you might follow the tale of a bee and come to the site of a flower that doesn't exist. With only one short summer of life and a thousand more journeys to make, I know you will ask why they create these fictions alongside their more practical stories. Perhaps they're a way to remember places they won't get to visit and flowers they won't ever know.

Seed paper book of The Homeric Hymn to Demeter

The humans tell our story. They say I was snatched from the surface, not drawn by my own curiosity into the Underearth – where in losing the way I found you. They say I am to blame for winter – the seasons are tied to my heels. It's true that I don't know winter. After walking two-thirds of the year with them my longing for you gathers such weight it pulls me down until I find you again – often little moved from where I left you.

I know you will not walk upwards with me. Even rocks rise with time, but not you. I have never asked you to leave, but I cannot stay. Your clouded eyes, all-seeing fingers, the five wide arches of your heart grown like a worm's – I shelter in you until the story of light needles me again. We are two, together then apart then together again – it's an accordion life. When we're apart I still feel you with me. I read the world with your fingertips alongside mine. So why do the humans tell our story without love?

Dandelion Seeds

Dandelions tell some of my favourite stories. Every dandelion is actually a raucous body of flowers – each one with stories to tell – and they will tell them anywhere.

There's the story about the seeds who loved the wind that carried them so much they took root in the air, the one about the seed who grew in an old man's beard, and another in a cat's ear. There are tales in which shoes are the boats that transport seeds across the earth and others of seeds asleep for hundreds of years waking to a new world. There's the one about the dandelion who called for all the winds at once and was uprooted in the chaos. The seed who wouldn't settle in a garden, a park or a field because they wanted somewhere grander, but they ended up beneath a bus station bin.

Dandelion offspring are identical to their parents. If you could tell yourself stories, a new you who had chance to grow somewhere else and live a different life, what would you say? Some tell light, barely-there tufts of stories with filament wings so their seeds can fly, others tell weightier stories of warning and fear. Their seeds don't fly far. Every seed is carried by a story as well as by wind, footstep or fur. We are all seed-carriers too.

Leaf book

Every tree grows its own mythology. 'There was once' trails outwards in concentric rings, each round of story drawing in more of the world. And a tree's story will not be bound, it splits the bark, grows on and up into the sky, branching tens of ways into a thousand possible endings. I met an old magpie in a park tree who said she could hear every word of every tale in a chorus of leafshiver. But no story can ever be known all at once – endings fall and more grow each spring.

Tree stories aren't linear – they grow out everywhichway at once. On a rotting oak stump I tried to trace a path through the story of an acorn rooted in both earth and sky – a flood of ants – under the lichen wars – hidden in the ruins of a great nest city. Unable to follow the plot I started again and ended up in a toad's belly. Every tree is a vast secret library. When humans cut them down to make books they are making palimpsests.

Feather

Swifts don't know the winter either. They arrive with the spring, telling the long ends of sweeping stories begun in distant sunshine, threaded through with things half-dreamt as they half-slept on the wing. Swift stories are traced in the air and they pass them back and forth and interject, so a mountain that flies like a bird becomes a city on a washing line that becomes a nest made from wind.

When they've settled for the summer they turn to jokes and gossip instead, but as the days shorten their stories lengthen and frost edges the tales. Falling leaves become ice nets that become an endless ocean of snow. For swifts, winter only exists in stories. For me, winter is sleep in your arms. I will be home soon.

Code
(C++):

```
/******  
For Hades by Claire Dean  
Code based on The Rhubaphone by Liz Edwards  
Adapted from:  
Bare Conductive Proximity MP3 player  
-----  
proximity_mp3.ino - proximity triggered MP3 playback  
Based on code by Jim Lindblom and plenty of inspiration from the Freescale  
Semiconductor datasheets and application notes.  
Bare Conductive code written by Stefan Dzisiewski-Smith and Peter Krige.  
This work is licensed under a Creative Commons Attribution-ShareAlike 3.0  
Unported License (CC BY-SA 3.0) http://creativecommons.org/licenses/by-sa/3.0/  
*****/  
  
// compiler error handling  
#include "Compiler_Errors.h"  
  
// touch includes  
#include <MPR121.h>  
#include <Wire.h>  
#define MPR121_ADDR 0x5C  
#define MPR121_INT 4  
  
// mp3 includes  
#include <SPI.h>  
#include <SdFat.h>  
#include <SdFatUtil.h>  
#include <SFEMP3Shield.h>  
  
SFEMP3Shield MP3player;  
SdFat sd;  
  
#define NUMPINS 10  
  
int ledBuiltin = 13;  
long pauseTimeout = 3000;  
long lastToggled[NUMPINS];  
int trackPlayed = -1; // -1 indicates no track is playing  
boolean isPlaying = false;  
  
void setup(){  
  Serial.begin(57600);  
  
  pinMode(LED_BUILTIN, OUTPUT);  
  
  //while (!Serial) ; {} //uncomment when using the serial monitor  
  Serial.println("Bare Conductive Proximity MP3 player");  
  
  if(!sd.begin(SD_SEL, SPI_HALF_SPEED)) sd.initErrorHalt();  
  
  if(!MPR121.begin(MPR121_ADDR)) Serial.println("error setting up MPR121");  
  MPR121.setInterruptPin(MPR121_INT);  
  
  // Changes from Touch MP3  
  
  // this is the touch threshold - setting it low makes it more like a proximity trigger  
  // default value is 40 for touch  
  MPR121.setTouchThreshold(8);  
  
  // this is the release threshold - must ALWAYS be smaller than the touch threshold  
  // default value is 20 for touch  
  MPR121.setReleaseThreshold(4);  
  
  byte result;  
  result = MP3player.begin();  
  MP3player.setVolume(0,0); //0 is loudest. 254 is silent. First number is left speaker, the second is right  
  speaker.  
  
  if(result != 0) {  
    Serial.print("Error code: ");  
    Serial.print(result);  
    Serial.println(" when trying to start MP3 player");  
  }  
}
```

```

}

void loop(){
  if(MPR121.touchStatusChanged()){
    MPR121.updateTouchData();
    for(int i = 0; i < NUMPINS; i++){
      if(MPR121.isNewTouch(i)){
        Serial.print("Pin:");Serial.print(i);Serial.println("was touched");
        if(!isPlaying){
          if( (trackPlayed == i) && ((millis() - lastToggled[i]) < pauseTimeout) ){//handle case where was
playing recently
            MP3player.resumeMusic();
          }
          else{
            MP3player.stopTrack();
            MP3player.playTrack(i);
          }
          trackPlayed = i;
          isPlaying = true;
        }
        else{
          //ignore presses if already playing
        }
        lastToggled[i] = millis();
      }
    }
  }
}

```

Reflections

For Hades is intended to encourage the reader to think of other living things as having voices and stories to tell. As a physical object, the story is intended to evoke a sense of wonder while the minimal stories leave lots of space for the reader's imaginative participation in line with the discussion in the contextual review (see p.63). The story is made using a mixture of found and human-made materials. In contrast to most digital stories, there is no screen – the reader must engage directly with the objects to hear the story. The digital technology is left exposed to view. In contrast to the features of paradigmatic consumption outlined by Borgmann (see p.45), this is not a black box intended to hide its workings and provide novelty, but an object made for tactile engagement, linking physical materials with the imaginative materials of story. The found materials used include leaves and a feather, which are likely to disintegrate over

time. This ephemerality reflects the subject matter. The story can't last forever and makes no claim in its physical presence that it will.

The writing emerged from the drawing process and while being rooted in concrete detail it is intended to convey a sense of possibility and wonder. The brevity of each fragment was a conscious choice in response to the estimated length of reader engagement. The reading experience will be novel to many as the digital technology used only responds to touch and it's not common to read a story with our fingers. This could make the work impenetrable without guidance on how to engage with it. The work is also limited by the fact it's a one-off. It cannot be reproduced and shared widely like a book or a screen-based story. In contrast to the way these media tend to be consumed by individuals, though, it does offer the potential for a communal experience as small groups can gather round it.

The use of digital technologies to share a story with an ecological sensibility necessarily calls to mind the environmental impact its making will have had. Engaging directly in the production of all aspects of the work meant I had to confront my responsibility for this in every aspect of the story's making. I acknowledge the production of the digital technologies used will have had a negative impact on the environment. I endeavoured to source the materials ethically, to use limited electronics with temporary fixings, so they can be repurposed at a future point in time, and to use rechargeable batteries with a solar charger. I chose materials that were recycled, repurposed or found wherever possible. There is a clear aesthetic contrast between the technologies used and the found materials, and this reflects my intention to engage with the

complexity of our relationships with human-made and ‘natural’ materials (p.44). In a way, I feel this approach is more transparent than setting out to write a book of ‘new nature writing’ and doing nothing as a writer to acknowledge the negative ecological impact of the book’s production and distribution (see p.46). Engagement with material writing practice meant I developed a very direct relationship with the materials used and could make choices based on their environmental impacts. This seems appropriate when the intent is to make ecological stories.

For Hades, highlights for me the interrelationship between using drawing as a method, the use of found materials, and the stories that emerged as part of the process. The story as a whole entity is visibly and imaginatively the distinct product of the process of its making.

4.5.2 Persephone’s Footsteps

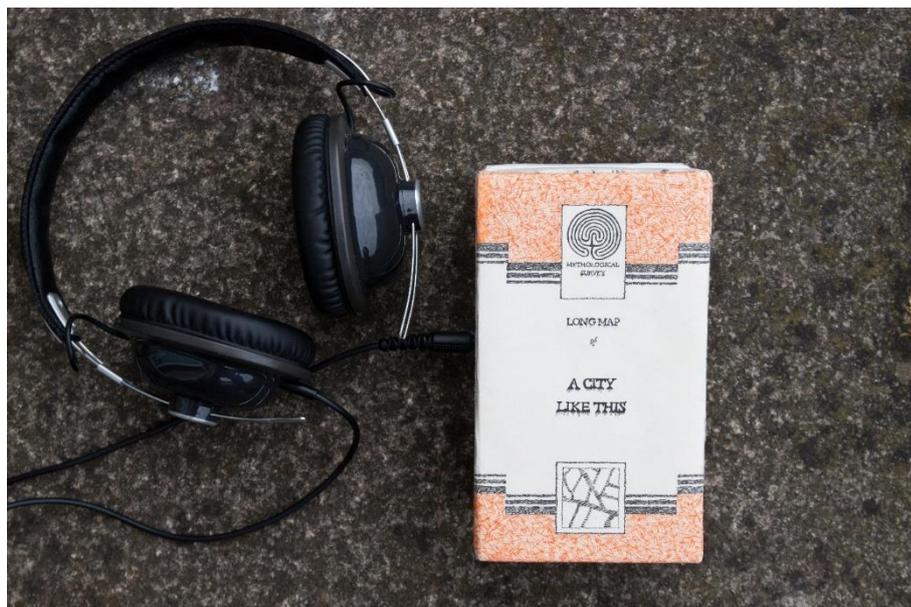


Figure 16: Persephone’s Footsteps

Persephone's Footsteps is a contemporary reimagining of the Persephone myth, a response to escalating carbon emissions, and a map that can be used to explore any city. As Persephone climbs higher – first to escape the underworld and then to escape the polluted streets of the city – the listener must climb higher to hear more of her story. The paper-based map made is collaged from maps of urban strata – from a geology chart, up through underground and street-level maps, to carbon emissions and constellations. Embedded in the map, an Arduino microcontroller with MP3 shield attached to an altitude sensor triggers different sections of the story at different altitudes, so the listener must keep walking upwards to hear the next part of the story. This utilises the way the digital technology can locate a reader/listener in space and reveal the story in response to their physical movements.

Persephone's Footsteps is designed to be taken into any urban environment. The reader is given the map and wears headphones. They are advised to choose a low position to begin from and the story is switched on. The first audio file plays from where they are. The next four audio files will only play as the reader reaches increasing distances from their starting point. They choose how to navigate the city they are in and their journey echoes Persephone's in that they must keep trying to get higher. The code for the work can easily be adapted so it will work in different places with varying intervals of altitude difference.



Figure 17: inside the story

Story materials

Physical materials:

Reused cardboard box, paper, ink traced maps including: Geology of the British Isles, maps from the most polluted cities in the countries with the highest carbon emissions over time (underground maps of Tokyo (Japan) and London (UK), street level maps of Stuttgart (Germany), Moscow (Russia), Shanghai (China) and Austin (US)), a NASA carbon emissions map, a northern hemisphere constellation chart, Arduino Uno, MP3 player shield, micro SD card, 5 MP3 files, BMP180 altitude sensor, battery compartment, 6 rechargeable batteries, breadboard, wires, headphones.

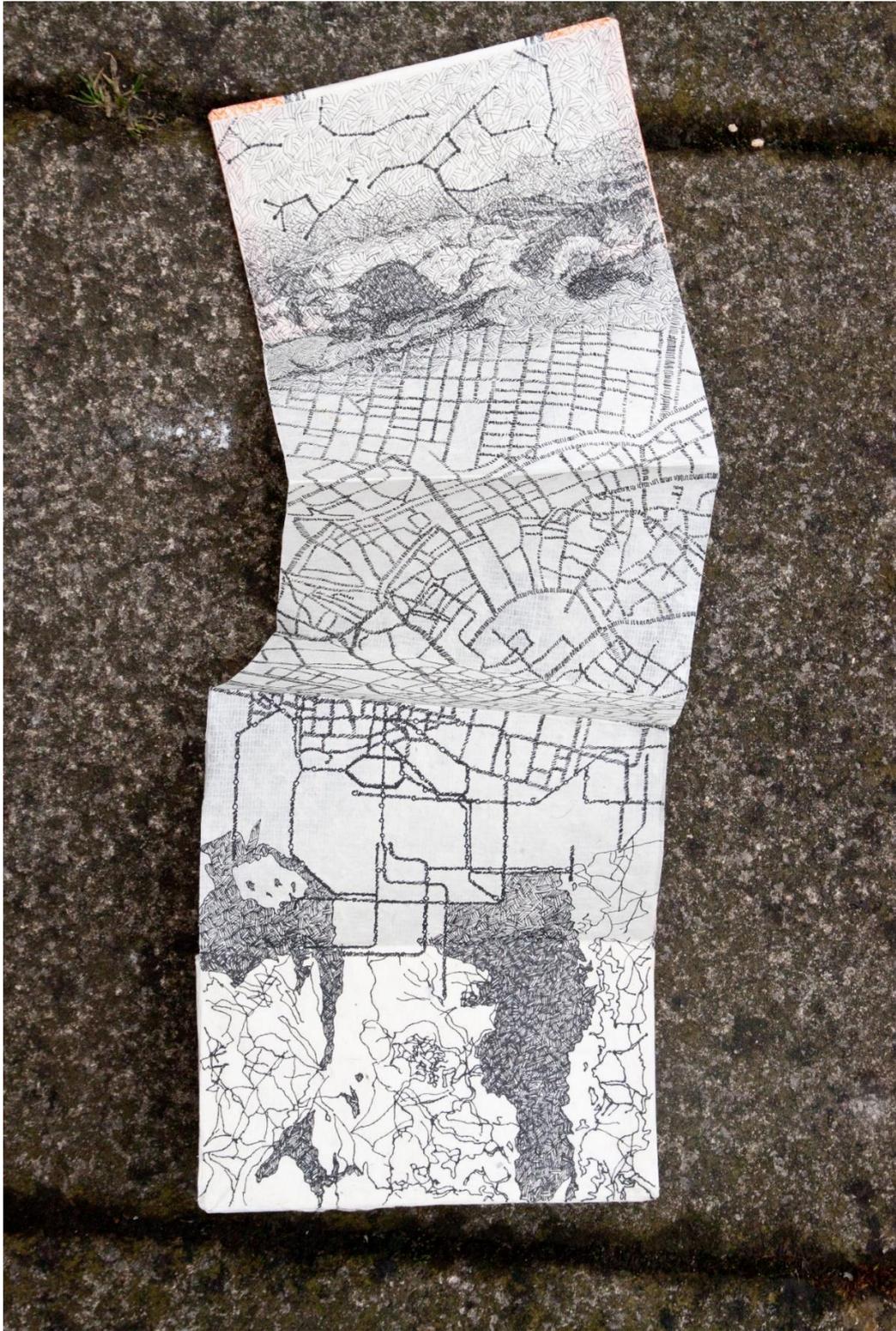


Figure 18: mythic cartography

[1]

The Underworld isn't far beneath your feet. If you crouch and place your fingertips against the hooded skin of the earth, you're almost there. It doesn't take much to slip through a crack or fall down a rabbit hole.

Persephone left on a Tuesday, after three thousand years of always doing what the story said; after three thousand winters beside Hades, who was now more stone than god. He couldn't follow or even turn away as Persephone began her final ascent.

The paths up are ever shifting. Persephone read the way in worm castings and the beat of rain. In bell song and boot clack. And as she climbed she wondered at what people bury and forget just beneath their feet.

Beneath yours now are there rib bones, or silver coins, or broken-windows without views?

Persephone was soil-packed and struggling to breathe just beneath someone's feet. The old roots tried to keep her down. It was too soon for spring. So, Persephone made false blooms from sharp-toothed glass, slivered brick, porcelain limbs, and bent nails. Her garden would be rust-thick and plastic-wrapped. She forced a new spring out through a crack in the pavement of a city like this.

[2]

Is there anything growing where you are now? There's always something growing. A dandelion, a shadow, a block of flats, a goddess sprouting between tarmac and curb, bringing spring out of step, out of time, out into the city streets.

Persephone was stuck half-under-half-up. She shook the soil from her eyes as people strode by in a footcrash parade that filled her mouth and ears with fag ends and dust. She shouted for help. People pretended not to hear her over the road thunder and the rain. Stalactites of grime formed in her lungs. She felt heavier than she had in the Underworld.

Two crows pulled her out in the end. Accidentally, while fighting over who would pluck her eyes from her head.

Persephone bound her roots around her feet with no idea of where to go except up and away from below and before. A premature spring raged into bloom beneath every step she took. The celandines were rust-edged, primroses plastic-packed. Swallows skitted overhead.

'Let's blame them,' she said to the crows. 'They brought spring early, not me. They can take my story. I don't believe it anyway. It couldn't happen in a city like this.'

[3]

Do you know the paths of the city? They're always shifting whatever the map might say.

Persephone walked up, but the ways up became ways down as streets tipped beneath her feet. The whole world had been packed into the city-maze. Sweet and greasy food smells lapped against illuminated windows and mirrored walls. Every turn led to another until she realised the city was not going to let her go.

She crept into an alleyway, following a string of graffiti to the backs of people's lives, taking her hushed riot of bluebells and broom with her.

She slept for weeks on a sodden mattress, ate at an upturned crate and won a pair of trousers from a man who called her Joan.

Persephone filled the pockets of her new trousers with every feather she found in the hope that they would remember how to fly and lift her away.

At dusk the city is more porous; the paths shift again. Persephone set out, stepping carefully over cracks, searching for higher ground, terrified she would be trapped in the city all summer until she mis-stepped over a crack and fell back down to the Underworld.

The heat of the day hung in curtains of shimmer and filth and she might have managed to escape if she hadn't stopped to scry the signs; Gold Xchange, Help the Aged, Vape Escape, Roots Cafe. Night grew from the ground up and filled her pockets, weighing her down. Behind her, the buildings played Grandmother's footsteps.

Persephone asked the signs for help, but they couldn't speak for themselves. She asked the shadows for help, but they were too weak and too few in the bleached city night. Finally, she approached the statues – those doppelgangers of old friends – and asked them for help. The statues gathered at a crossroads, where their stone reflections ricocheted between mirrored building-sides.

The city paused, waiting to see what the kaleidoscopic army would do. And Persephone slipped away unseen, climbing higher through the night of a city like this.

[4]

Are you high enough? When you look down from above you can make toys of a city. It's easier up here to be a god.

With one breath Persephone felt she could rearrange the city as she chose. Buildings could be bent apart to let in light and make space for the tangle of plants she'd brought in her wake.

Persephone scaled a solitary tree, trying to get higher still, and took up residence in a magpie's nest. As she squatted amongst the leaves the long summer burned on, burned through pavements and skin, brought floods of rain to fill the gaps between everything. The city swelled and the smells of the Underworld joined the streets. The ground was rising to meet her.

She looked for a path in the swirl of dust and ash and all that should remain buried, not burned, and caught hold of a plume ladder.

Halfway up, a frenzy of swallows became tangled in her hair. Torn between their inner clocks and the long call of summer without end they made circles in the smoke.

Persephone remembered the feathers in her pockets. She scattered them on the wind. And as the birds dived to catch what they'd lost, she climbed even higher over a city like this.

[5]

Look up.

Persephone sits in the sky. Just above the city, just beneath the stars, just where the spume and jetsam of human life comes to rest in the air, and she pulls it all around her, makes thick blankets of it.

She waits for a winter that won't come again to a city like this.

Code (C++):

```
// Persephone's Footsteps code by Claire Dean with support from Graham Dean, based on resources
// from Adafruit and Sparkfun websites
//include SPI, MP3 and SD libraries
#include <SPI.h>
#include <Adafruit_VS1053.h>
#include <SD.h>
//sensor include files
#include <SFE_BMP180.h>
#include <Wire.h>

// define the pins used
//#define CLK 13 // SPI Clock, shared with SD card
//#define MISO 12 // Input data, from VS1053/SD card
//#define MOSI 11 // Output data, to VS1053/SD card
// Connect CLK, MISO and MOSI to hardware SPI pins.
// See http://arduino.cc/en/Reference/SPI "Connections"

// These are the pins used for the breakout example
#define BREAKOUT_RESET 9 // VS1053 reset pin (output)
#define BREAKOUT_CS 10 // VS1053 chip select pin (output)
#define BREAKOUT_DCS 8 // VS1053 Data/command select pin (output)
// These are the pins used for the music maker shield
#define SHIELD_RESET -1 // VS1053 reset pin (unused!)
#define SHIELD_CS 7 // VS1053 chip select pin (output)
#define SHIELD_DCS 6 // VS1053 Data/command select pin (output)

// These are common pins between breakout and shield
#define CARD_CS 4 // Card chip select pin
// DREQ should be an Int pin, see http://arduino.cc/en/Reference/attachInterrupt
#define DREQ 3 // VS1053 Data request, ideally an Interrupt pin

Adafruit_VS1053_FilePlayer musicPlayer =
// create breakout-example object!
//Adafruit_VS1053_FilePlayer(BREAKOUT_RESET, BREAKOUT_CS, BREAKOUT_DCS, DREQ, CARD_CS);
// create shield-example object!
Adafruit_VS1053_FilePlayer(SHIELD_RESET, SHIELD_CS, SHIELD_DCS, DREQ, CARD_CS);

SFE_BMP180 pressure;

double baseline; // baseline pressure

boolean t1, t2, t3, t4, t5;

void setup() {
// put your setup code here, to run once:
Serial.begin(9600);
Serial.println("Adafruit VS1053 Simple Test");

if (! musicPlayer.begin()) { // initialise the music player
Serial.println(F("Couldn't find VS1053, do you have the right pins defined?"));
while (1);
}
Serial.println(F("VS1053 found"));

SD.begin(CARD_CS); // initialise the SD card

// Set volume for left, right channels. lower numbers == louder volume!
musicPlayer.setVolume(20,20);

// Timer interrupts are not suggested, better to use DREQ interrupt!
//musicPlayer.useInterrupt(VS1053_FILEPLAYER_TIMER0_INT); // timer int

// If DREQ is on an interrupt pin (on uno, #2 or #3) we can do background
// audio playing
musicPlayer.useInterrupt(VS1053_FILEPLAYER_PIN_INT); // DREQ int

if (pressure.begin())
Serial.println("BMP180 init success");
else
{
// Oops, something went wrong, this is usually a connection problem,
// see the comments at the top of this sketch for the proper connections.
}
```

```

Serial.println("BMP180 init fail (disconnected?)\n\n");
while(1); // Pause forever.
}

// Get the baseline pressure:

baseline = getPressure();

Serial.print("baseline pressure: ");
Serial.print(baseline);
Serial.println(" mb");

t1 = false;
t2 = false;
t3 = false;
t4 = false;
t5 = false;
}

void loop()
{

double a,P;

// Get a new pressure reading:

P = getPressure();

a = pressure.altitude(P,baseline);

Serial.print("relative altitude: ");
if (a >= 0.0) Serial.print(" "); // add a space for positive numbers
Serial.print(a,1);
Serial.print(" metres, ");

delay(5000);

if (a >= -0.5 && a <= 0.0 && !t1) {
  Serial.println(F("Playing track 001"));
  musicPlayer.playFullFile("track001.mp3");
  t1 = true;
} else if (a > 1.0 && a <= 1.5 && !t2) {
  Serial.println(F("Playing track 002"));
  musicPlayer.playFullFile("track002.mp3");
  t2 = true;
} else if (a > 3.5 && a <= 6.5 && !t3) {
  Serial.println(F("Playing track 003"));
  musicPlayer.playFullFile("track003.mp3");
  t3 = true;
} else if (a > 7.5 && a <= 9.5 && !t4) {
  Serial.println(F("Playing track 004"));
  musicPlayer.playFullFile("track004.mp3");
  t4 = true;
} else if (a > 10.5 && a <= 12.5 && !t5) {
  Serial.println(F("Playing track 005"));
  musicPlayer.playFullFile("track005.mp3");
  t5 = true;
}
}

double getPressure()
{
char status;
double T,P,p0,a;

// You must first get a temperature measurement to perform a pressure reading.

// Start a temperature measurement:
// If request is successful, the number of ms to wait is returned.
// If request is unsuccessful, 0 is returned.

```

```

status = pressure.startTemperature();
if (status != 0)
{
    // Wait for the measurement to complete:

    delay(status);

    // Retrieve the completed temperature measurement:
    // Note that the measurement is stored in the variable T.
    // Use '&T' to provide the address of T to the function.
    // Function returns 1 if successful, 0 if failure.

    status = pressure.getTemperature(T);
    if (status != 0)
    {
        // Start a pressure measurement:
        // The parameter is the oversampling setting, from 0 to 3 (highest res, longest wait).
        // If request is successful, the number of ms to wait is returned.
        // If request is unsuccessful, 0 is returned.

        status = pressure.startPressure(3);
        if (status != 0)
        {
            // Wait for the measurement to complete:
            delay(status);

            // Retrieve the completed pressure measurement:
            // Note that the measurement is stored in the variable P.
            // Use '&P' to provide the address of P.
            // Note also that the function requires the previous temperature measurement (T).
            // (If temperature is stable, you can do one temperature measurement for a number of pressure
            measurements.)
            // Function returns 1 if successful, 0 if failure.

            status = pressure.getPressure(P,T);
            if (status != 0)
            {
                return(P);
            }
            else Serial.println("error retrieving pressure measurement\n");
        }
        else Serial.println("error starting pressure measurement\n");
    }
    else Serial.println("error retrieving temperature measurement\n");
}
else Serial.println("error starting temperature measurement\n");
}

```

Reflections

Persephone's Footsteps is intended to encourage the reader to explore a city, taking them on routes they might not ordinarily take and calling their attention to wild flowers, street life and levels of pollution. The reader is asked to engage with the urban environment in an unhabitual way, accompanied as they walk

by story, and their journey is entangled with Persephone's. If the reader is unable to find higher ground as Persephone tries to get higher, both reader and character cannot reach the next part of the story. There is a lot of potential here for rich serendipitous experiences where the reader could experience synergy or dissonance between city and story. Yet, this unpredictability also means there is a lack of authorial control. The story is written with as much open space and flexibility as possible to allow for varied experiences and environments. Ultimately, though, the work must spark and connect with a reader's imagination. It requires a significant commitment on their part to walk the story into a city space. The code can be adapted to allow for different experiences of an environment, for example taking into account the altitude differences as encountered by a reader who is a wheelchair user. For anyone with a hearing impairment, a printed copy of the text is at present the only alternative format. Improvements in accessibility are something I need to work on as I develop the work beyond prototype.

The box map is a practical means of carrying and protecting the digital technology, although in contrast to *For Hades*, it renders the technology invisible to the reader, which doesn't fully align with my intentions. The map is hand drawn, not waterproof, and unwieldy in the wind, but marks of wear and tear are intended to be part of the work. I wanted it to look used. The code can be adapted and reinstalled for different cities, so the episodes trigger at different intervals in relation to the baseline reading, giving the work a useful adaptability. There is currently no way to mitigate against the potential for disruption to the experience from noise or external events. Further

development could usefully add user controls, so audio files could be retriggered once they have played without having to start the whole work from the beginning. There is something about the frustration of having to start again if disrupted that feels appropriate for Persephone's difficult journey, but I suspect it would annoy readers and lead to disengagement.

This work draws on the idea of a strata of narrative experience in the city. It aims to make life visible at every layer and reveal traces of human impacts on the living things with whom humans share their habitats. As an ecological story, it succeeds in taking people outside and in calling attention to the urban everyday – where waste mingles with wildflowers and we all breathe the poisons that spill from mechanised human travel. This is different to the secondary engagement with a city evoked through reading words on a page from a comfortable chair indoors, however evocative those words might be. This story asks you to breathe its polluted reality as you walk the words into the streets. Yet, encouraging people outside to take part in such a novel and potentially uncomfortable experience will inevitably be challenging.

Persephone's Footsteps is ambitious in its attempt to take the reader on a journey of scale but I am concerned that the concept is possibly stronger than the individual experience as there is so much unpredictability inherent in the work. Developing the story has prompted me to pay more attention to the gaps that must be left for the real-world experience and imaginative participation of the reader in any story. This reimagining of the myth is not a hopeful one, but it is about connection. In following the narrative materials, I struggled with the tension between my intent not to share a story of threat or hopelessness and

the unconscious processes that helped shape the story. In the end, I made the choice to follow where the story wanted to go, but this tension was something I knew I wanted to explore further in the subsequent projects.

4.5.3 Three Seeds

Three Seeds is a contemporary version of the Persephone myth in the oral tradition. Told in three linked segments it tells of Persephone's journey from the underworld up to the surface in spring to search for her mother. When she finds her in a nursing home with dementia and Demeter doesn't recognise her, Persephone travels higher still, up along the pollen roads and waits with the leaves until it's time to fall. The story centres on mother and daughter and the seasonal relationship between life, death and rebirth.

As an oral story the text is not fixed but remembered and reshaped with each new telling. The transcript of a recording is given below, but this should not be recognised as the story itself, only as what Ong would call the residue of one instance of its telling (2012, p.11).

Story materials

Transcript of recorded storytelling:

1.

I took a seed from the underworld, plucked it from a pomegranate in a hemstone garden under a soft-earth sky.

When I was a child walking the tightrope-skin of the earth, my mother told me if I ate a seed it would root in my belly and grow. What I didn't know then was that belief in a story makes it true.

I'd spent too long in the underearth – even rocks rise with time – so I plucked a seed from a pomegranate in a hemstone garden under a soft-earth sky and the seed rooted in my belly and grew and I grew with it, up along the worm roads, up through the tightrope-skin of the earth and I unfurled with spring flowers into air and birdsong and light. I bound my roots around my feet and set out to find my mother.

2.

I took a seed from the supermarket, plucked it from a pomegranate in a plastic-wrapped garden under a glass-caged sky.

It took all spring to find my mother on the tightrope-skin of the earth. Living with mortals had aged her so they'd packed her away in the house before death. She told us her daughter was lost, said a woman in a gravy-stained blouse.

My mother, memory gone, had hoarded seeds beneath her bed. Who are you? she asked as I bent to kiss her head. Who are you? she asked as I bent to pick a daisy from the carpet. Who are you? she asked as I walked away.

I walked until I saw a sign that said welcome. Another said special offers, 3 for 2s, and I plucked a seed from a pomegranate in a plastic-wrapped garden under a glass-caged sky and the seed rooted in my lungs and grew and I grew with it, up along the pollen roads, up through carbon knitted sky and I unfurled with summer leaves into rain and sadness and night. I waited with the leaves until it was time to fall.

3.

I took a seed from under my mother's bed, plucked it from a pomegranate in a time-thick garden under a sleeping mother sky.

When I was a child walking the tightrope-skin of the earth, my mother told me the journey back never takes as long. What I didn't know then was that belief in a story makes it true.

My mother, memory gone, mumbled as she slept, and I plucked a seed from a pomegranate in a time-thick garden under a sleeping mother sky. The seed rooted in my mouth and I curled down through a crack in the floorboards. 'Persephone,' my mother called out, but I could not answer her because my mouth was full of earth.

Reflections

With *Three Seeds*, I intended to make a contemporary version of the myth that focused on the mother-daughter relationship that it is thought was the focus of pre-patriarchal versions of the story (Spretnak 1992, pp.105-7). Spretnak notes that the introduction of the abduction of Persephone to the myth came only with the shift from matriarchal to patriarchal society, disrupting an 'ancient and widely revered sacred story of mother and daughter' (Ibid. p107). The pomegranate is a key image in the myth but in patriarchal versions it is depicted as a form of temptation. In an echo of Eve's story, its consumption is

given as the reason for Persephone being punished. I wanted to challenge this narrative, so the seed instead becomes a vehicle for travel and a reflection of the cycle of life and death. Orally composing the story, it was my aim to make a tale I could remember and pass on. I drew more on personal experiences to make this story, which was one way of making it more memorable to me. I believed as a child that if I ate a seed it would grow in my belly. I watched my Grandma spend the last few years of her life with dementia. The transcript shows very different content and form to my previous writing style. I revelled in creating memorable compound words and rhythms and this carried through into my work on the other two versions of the story.

As an ecological story, this work can be seen to draw on the traditions of oral storytelling that bring together the human and nonhuman to communicate knowledge and emphasise the connections between them (see p.25). The world presented here is a contemporary one that includes plastic-wrapped supermarket fruit and a care-home setting. In this, it stands in stark contrast to the oral stories collected in the many eco-anthologies I've read. For the most part, these include stories that have been collected, edited and translated to give a particular picture of the past (see p.25). Here, as outlined in the contextual review (see p.32), the aim is to evoke a setting to which contemporary urban audiences can directly relate.

As an oral story, there is not a fixed or technological record of *Three Seeds* – the transcript is not the telling. It is presented here for the purposes of reflection, but the life of the story depends on my ability to tell it.

Unfortunately, I lack confidence as an oral storyteller. As a writer, I am used to

remaining hidden and letting technologies carry the story to readers for me. I have succeeded in making an oral story I can remember, and its making had no negative environmental impacts, but it remains hidden and cannot exist in the world unless I am able to share it. Although I haven't found a way of doing so yet, insights from the process of making the story have informed subsequent work making it a valuable part of the research inquiry.

4.6 Discoveries from the project journey

4.6.1 Blowing down the walls

In an early note for an idea I had, I wrote in my practice journal, 'Need an artist to work with on this' (April 2016). I now know my acceptance of the role of writer as being someone who only works with words, and drawing being something an artist would be needed for, denied me access to the learning and insights to be gained through processes other than writing, and the understandings that can be developed through a discursive approach to working with different creative practices. 'Insight chases circumstance' (Nov 16) is a quote I noted down, unfortunately without attribution, a few months after I broke my fingers. I can't know how my research would have progressed if I hadn't had an accident, but the sharp shock of finding myself unable to write, followed by the weeks and months of discovery shaped my research and practice in unexpected and revelatory ways. Reflecting on this in my journal, almost two years after the note saying I needed an artist, I wrote:

not staying within the walls of my role,
pushing at them and finding they were
flimsy and collapsed at a touch, they were
never real because they were built by
someone else
I will blow the house down
(Jan 2018)

If the role of artist, or technologist is passed on to someone else in the making of a story there can be fruitful collaboration and mutual learning, but the learning and tacit experiences inherent in the processes won't become part of the writing practice. In this project, drawing feathers and running up and down stairs to test an altitude sensor and revise code became intrinsic parts of the storymaking process, forming a valuable feedback loop between different elements of the story.

Ever the greedy magpie writer, I cast my net wide when searching for new ways of working, following curiosity, intuition and the ecological subject to borrow methods from other practices. This resulted in a continuous reflective conversation between my 'old' practice and everything new to me that I was trying out. I was able to interrogate the habits I'd formed, the assumptions I made, and the paths I tend to unthinkingly follow in relation to the new paths I was stumbling along. I found many commonalities in approach, understanding my writing practice more clearly through its relation to other ways of working, as illustrated in the following notes from my practice journal on weaving:

Structure working with it intuitively
Parts holding other parts in tension
When pulled too far out of shape hard to
get it back
Paths can be untaken
Repetitions, rhythm, patterning, feeling for
it as i go

The need for a base material to keep the
structure and pull things back into place
between the brighter, more vivid images
and episodes. Might seem dull but
essential to holding it all together in
weaving and stories...

The time spent is in the thing. More visible
with weaving than with a story but both use
time as a material

(August 2016)

Composing aloud enabled me to work with language sounds and rhythms and I found myself making word choices and developing compounds such as ‘tightrope-skin of the earth’ that were markedly different from my usual prose style. Not being able to write stories, and having to find other ways to make them, directly informed all the stories and the ways they were made to be shared. After two months, when I was able to start using my right hand again, I tried to return to writing stories down, but my practice had shifted dramatically. I wrote in my journal:

Sat down to work on the long map
But felt confined by the screen
Switched to A4 and big pen to work things
out
(Aug 2016)

I had broken so many conventions of established writing practice that my attitude to challenging them became more uninhibited. I followed my intuitions wherever they lead me, for example in writing *Persephone's Footsteps* up the page without hesitation. During a presentation I gave on my work at the *Screening the Literary* symposium (Dean 2016b), other writers were responsive to and inspired by this approach (see fig. 19)



Figure 19: a response from an author on twitter to my approach

The sense of freedom in making a story and not knowing what shape it was going to take was underscored with the fear that I would fail to make anything. These circumstances made the gathering phase of the project more expansive and eclectic than any I had undertaken before.

4.6.2 Making the process visible



Figure 20: visible storymaking

In my previous writing practice, process had been visible only as notes in a notebook and numbered drafts in digital folders on a computer screen. On this journey, drawing from other practices meant I accumulated and created more physical materials of research and composition. Working without writing and struggling with the immateriality of voice recordings, I tried to physicalise my imaginings and the composition process. Even digital materials such as charts, diagrams and quotes from papers that resonated with me were printed out and became physical materials in my mapping and weaving.

As practice forms the core of my research I was aware of the need to document the development of the work. However, I hadn't anticipated that this commitment to documentation would make visible the creative process in a way that would feed into further development of the work. Reflecting through documentation also made visible to me the results of using technologies that hadn't occurred to me before:

The pauses in thought
And search for words
Aren't shown on the page

The pages fill gaps and silence
Elides the invisible graft, makes everything
seem smoother and faster than it is
(June 2016)

When selecting materials and technologies to work with I began to make choices that reflected the fact the stories were being handmade, rather than trying to emulate a mass-produced aesthetic, which would erase the marks of their making. Ingold writes of print that it 'bears no witness to the activity of those whose labours brought it into being, appearing rather as a pre-composed artefact' (2016, p26). I echoed this in my journal, reflecting that my engagement with different ways of making made my input as a writer more visible:

I've been thinking today about my choice to use felt, to work with the skills I can. Not looking for the smooth, professional aesthetics of a thing mass-made or even crafted by a craftsman. Making myself, with what I can access, skills I have or can realistically learn. The marks can be left visible. The tech on show. Because it is a thing that has been made by hand as part of a whole with the making of the story and I want to share that. Not pretend it exists by magic.
(Sept 2016)

4.6.3 Gathering, seeking and knowing when to stop

There was a danger I could have stayed in the gathering and seeking phases of the project forever. In my previous writing practice, gathering and seeking would soon have led to me sitting down at the computer to write a story. Here, I was gathering much more material in many different ways, without knowing how I was going to use it. Writing about my use of tags to categorise the images and text I was collecting on the blog I noted it was ‘a way of making things findable without knowing what I’ll be looking for in future’ (May 2016).

Without a predetermined way of sharing the stories the seeking phase was essential to the process. Searching with a range of materials and using different methods meant I could seek narrative and design possibilities with physical materials too. The extended period spent on gathering and seeking meant I was able to dedicate more time, attention and space to the storymaking, resulting in a greater depth of knowledge and engagement with materials. However, as story materials accumulated there was more and more to sift through and I became overwhelmed. I noted in my practice journal that I had, ‘Ended up lost with too much material (Sept 2016). Committing to three story ideas to follow was the only way I could navigate out of this. Ordinarily, I would only attempt to write one story at a time. The choice to work on three allowed for a more varied exploration, but it was also a result of the reluctance to let ideas go because I had gathered so much material.



Figure 21: gathering maps, Sept 2016

4.6.4 Following the materials

The creative and imaginative value of following the materials was a significant insight from this project. Through this exploration of process my understanding of what materials it takes to make a story expanded. Previously, I would use the term materials just to refer to information gathered when conducting research for a work. Now, I understand the materials that make a story to also include inspiration, intent and time, along with all the physical materials and technologies used to share a story. Insights from handling materials fed into the development of the stories at every stage. I learned to make my ideas solid, so they could be worked with by hand rather than remaining abstract propositions. This project made explicit the way that working with different materials using different methods leads to different kinds of stories. As a writer I can make more informed creative choices about my practice knowing this.

4.6.5 Connecting with the world

Approaching writing practice in such different ways meant I spent more time away from my desk, gathering and working with physical materials, and paying more attention to the world around me. Writing in my journal I noted spring was ‘creeping out of the pavement cracks outside, seeing it everywhere since I began the *small city wonders* blog’ (April 16). Drawing, in particular, gave me a way of paying attention to other living things in my everyday life, and became a method of seeing, understanding, imagining and composing:

...skeleton keys, leaf skeletons, petals, catkins, the wind flotsam I find on the concrete in my tiny front yard. A particular paying attention, see tiny hairs, details I would never have noticed, reflect on how one shape echoes another, patterns, a forest in the fibres of the skeleton key, hairs like on an insect's leg on the back of the petal, catkins like seahorses. And prompts me to ask questions -- like what is a catkin, and I found out it was an inflorescence, hanging down to be wind-pollinated (May 2016)

I also came to understand the importance of working with actual things rather than memories or abstractions:

There's a difference when I start working with a material, like when drawing the spiders web, different to thinking I know what a spider's web is like and describing, working with it from memory, engaging with object in real world makes story material very specific and rooted to then work with
(August 2016)

Realising this was the case when drawing I could see how it also applied to writing. This helped me to see the value of working physically with materials and working outdoors rather than at a desk, and to begin to understand how much this could add to the storymaking process.

4.7 Project conclusions

Persephone Calling contributes key insights into how conventional writing practice is shaped by print technologies by revealing the possibilities that are opened up when a writer becomes a maker. It demonstrates the opportunities created for story by following the narrative subject – and the materials and methods it inspires – instead of working with a predetermined technological outcome in mind. Circumstance gave me the opportunity to completely reshape my practice and enabled the boundary-crossing and experimentation from

which a new approach to storymaking has begun to be developed. This engagement with material practice is particularly suitable for ecological storymaking as it involves a consideration of, and purposeful connection with, the context and materials of a work's production. By engaging with materials as a writer I've been forced to confront the ecological impacts of their use and to make choices that align with my values, intent, and desire to bring the work to a wider audience in the most appropriate way possible. *Persephone Calling* builds on previous practice, drawing on my professional experience of writing short stories for print for ten years and beginning to experiment with digital technologies. It is in part inspired by the frustrations I have experienced of a mismatch between ecological story content and the technology used to share it and considers whether there are other ways of working.

Persephone Calling contributes to the key research objective of developing a new approach for ecological storymaking by providing insights into how a practice that is rooted in materials and connection with wider nature can work. Bringing findings from the contextual review into this project, I focused on material writing practice and engaged with digital technologies to help reveal the unquestioned habits and assumptions formed by writing for print. By prioritising the ecological subject of stories and following this to make choices in materials and methods I was able to open up my practice and uncover interrelationships between subject, content, form and medium. The project included non-textual experiments in composition during the two months when I was unable to write. Although breaking fingers isn't

recommended as a research method, this led to a rich expansion of methods that could be carried over to writing practice.

Below, I consider insights from this project in response to my research questions:

- 1) How can writing practices be developed with new technologies for ecological storymaking?

Working with new technologies in this project involved not starting with them but starting from the way they illuminate existing conventions and new possibilities for story. Ecological storymaking requires engagement with other living things. Finding ways to explore the existing myth of Persephone in the context of the ecology of the contemporary city was key to gathering materials for story and finding imaginative ways to work with them. Working with an open-ended process helped me to develop stories with technologies that responded to their content.

- 2) How are stories changed when new writing practices are developed for ecological storymaking?

The stories resulting from this project are intimately tied with the materials and methods of their making and traces of this can be seen in the content, form and media used to share them. *Three Seeds* is an oral composition, marked by rhythms and language choices that make it memorable, and which resists sharing except through being told. *For Hades* uses minimal stories of many living things and is inspired by the attention paid to these things through drawing. *Persephone's Footsteps*, which can be characterised as altitude-

responsive ambient literature (see p.41), was made through walking and it is a story that has to be walked. The way it responds to a reader's movement, so their experiences join with the character's, is the result of an integration of writing and design processes. Considering how all three stories are characterised by their making provides understandings into how challenging conventional practice can lead to new kinds of stories.

- 3) What does the development of these writing practices mean for the role and continuing relevance of the writer?

This project demonstrates that connection as a writer with wider nature is vital to make ecological stories and a material focus can be an important part of this connection. The approach to practice I have begun to develop through this project, expands the role of the writer that is dominant in conventional print publishing and shows the value of exploring across artforms. The constraints imposed by circumstance pushed me further than I may have otherwise gone in extending practice. I made a choice to embrace these constraints inspired by my intuition that there was something to be discovered through finding other ways of working.

~

Approaching storymaking without a fixed outcome in mind, following materials and responding to the ecological subject meant I was working in a wide-open space, and it would have been easy to become lost. Using an existing myth provided some structure and a reference point to work from. In the subsequent projects I aimed to explore if the same approach would work if the

scaffold of an existing story was taken away. I was able to take forward the materials and methods used while continuing to expand my practice in response to other ecological themes.

Part 2, Chapter 5: The Lichen Records

All it requires of us is attentiveness. Look in a certain way and a whole new world can be revealed (Kimmerer 2017, p10)

To see the intricate worlds of lichen, lichenologists use a small magnifying glass known as a jeweller's loupe. Asked why I had one by a colleague in the office, I explained it was so I could look at lichen and his reply was, what's a lichen? I soon discovered this was not an unusual response. The more I saw lichens everywhere, the more I realised other people didn't see them. One of the oldest living organisms on Earth, lichens helped and help to create the conditions for all forms of life (Purvis 2010, p46). Having no filters, they take everything in from the air around them and because of this they are vital bioindicators (Seed et al. 2013). Lichens can tell us about the condition of the air we're breathing, and yet we often don't see them or understand their messages. This section documents my attempts to make stories about lichen in an effort to draw attention to those messages.

5.1 Beginning



Figure 22: lichen growing over the River Lune, Lancaster

Intending to centre this project on a living thing in urban environments as part of the focus on urban nature discussed in the contextual review (see p.18), I was initially going to work with trees. A chance encounter with a lichen growing on the railing midway along the bridge over the River Lune piqued my curiosity and changed my plans (see fig. 22). As with *Persephone Calling*, I trusted my instincts and followed where they led me. I don't remember ever having noticed lichen growing on the bridge before, although I must have passed it daily for years. Ubiquitous but unnoticed, thriving on human-constructed substrates, I soon realised lichens can be seen everywhere in the city. Early desk-research told me the lichens I was finding were those species that can tolerate and even thrive on the nitrogen oxide from car fumes (Wolsley 2015). I discovered Lancashire, as the birthplace of the Industrial Revolution, has a poverty of lichen species (Travis & Wheldon 1915), with many not having returned even

after the mill chimneys stopped smoking in the mid-20th century (Hawksworth 1970; APIS 2016).

Setting out to work with lichens I almost immediately encountered a tension between scientific and artistic approaches, made apparent in their naming. As discussed in the contextual review, Macfarlane asserts that if we can't name something we don't pay attention to it (see p.25). Lichens are bereft of common names and largely absent from folklore. Their complex Latin names defy easy memorisation and pronunciation, but this is the way many lichenologists prefer it. A contact recommended a lichenologist I should get in touch with, but I was warned he would not be keen on my work with fairy tales and folklore. The *British Lichen Society* website refers to the controversy surrounding common names for lichen, noting many members view them as 'positively undesirable' although some realise they can have value when communicating with the public (BLS n.d.).

The challenge of making stories with something many people don't see and can't name was daunting, but I found myself captivated by lichens' incredible diversity and marvellously intricate forms, and by the fact they can only exist through a symbiotic relationship between fungi and algae, which come together to exist in places where neither could ever thrive alone. I was determined to find a way of sharing this sense of wonder.

5.2 Gathering: growing collections



Figure 23: desk work after a day out in the field at Malham Tarn Field Studies Centre

5.2.1 Specimen packets

Having learned the value of working outside during the first project, I began to look for lichens everywhere I walked, but to learn more about them I realised I would need a guide. Attending a residential Field Studies Council course on lichens at Malham Tarn in Yorkshire was an intense and immersive way of gathering materials for stories. Of the eight attendees I was the only one without a background in science. Most participants worked in conservation and were improving their knowledge of lichens for use in field surveys.

The twelve-hour days were divided into field work, lab work and lectures. Field work involved exploring the local area as a group. I kept close to the others, shadowing their explorations, and they guided me, sharing lichen names and knowledge. I repeated the names aloud over and over, trying to master the complex syllabic constructions that, having never studied Latin, were alien to me: *Gyalecta genensis*, *Cladonia digitata*, *Flavoparmelia caperata*, *Evernia prunastri*, *Opegrapha rufescens*. I was carrying a waterproof notebook,

but quickly realised it was no use outside where, in the wind, the paper was never still. Back in the lab, the names I'd learned as sounds needed patient translation to match them to their written forms. I was inducted into scientific methods of identification using complex keys, chemical tests and microscopy to tell apart lichens that to me often looked the same. Absorbed by complex new processes I had little time to think of story possibilities, but I was gathering huge amounts of information and tacit experience, and a library of specimen packets I could refer to throughout the project.

The company of the others on the course and the experiences we had – wading through a fen, clambering over limestone pavement and climbing up in to trees to find lichens invisible to the naked eye, could not be replicated through any amount of desk research. The class list showed that together we identified 125 species during the three-day course. I've been amazed that most of the Latin names I repeated aloud to myself have stayed in my memory and these lichens have called out to me in other landscapes since.

5.2.2 Light notes

I wanted to explore the world of the lichen. Having learned they respond to light, air quality and rain I spent time in a graveyard where they thrive undisturbed on gravestones. With my eyes closed for stretches of time I tried to sense the direction of light and to understand what it would be like to have no filters, to take everything in. I became aware of the pervasiveness of traffic through sound and fumes. I'd taken along light-sensitive cyanotype fabric and used a layer of plastic to make notes over it. When the plastic was removed, and

the fabric fixed with cold water, words could be read from its surface, inscribed by the light falling around them. The most recent notes were the faintest and hardest to read. Those that had been there longest were clear. I was inspired by the way the use of this very early form of photography (Fabbri & Fabbri 2010), meant time and light could be recorded together in the notetaking, revealing something of the circumstance and sequence of their making. This reminded me of the way time was revealed in the weaving during *Persephone Calling* (see p.162). Time given to a story's making is hidden in a finished text, yet a focus on process and the value of writing artefacts along with any end product means time is revealed as a material that is central to the making of any work. This resonated for me with a consideration of the role of time in the worldmaking of the lichens. My smartphone camera could offer me instant photographs of lichen, but I found myself seeking technologies that could reveal time in a way that could give me more insight into the ecological timescales experienced by lichen. This in turn helped me to think about Nixon's concept of the slow violence of climate breakdown discussed in the contextual review (see p.32) and ways to represent this. Later, I continued this process, using the light-sensitive paper in different locations and these experiments led me towards using pinhole photography as a further method for exploring light and time.

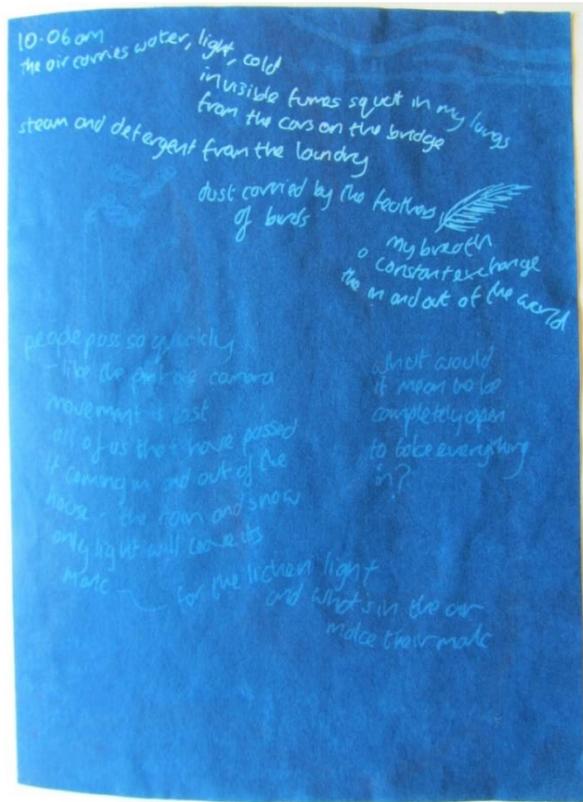


Figure 24: light notes

5.2.3 Story possibilities

I started to develop possibilities for story shape very early on in this project. This was partly because I was nervous about failing. There was no scaffolding narrative to work from as I'd had with Persephone and I was less clear about what the story could be. Buoyed by the success of making stories with technologies in the first project I wanted to attempt similar things. I began to make lists of story possibilities relating to the lichen materials I was gathering:

what if it took two people to read the story together? or enough light or rain or time, a symbiosis, stories growing on different substrates, a lichen library fragments that contribute to one overall story, a story camouflaged against lichen [like the moths]... a story that needs two people, an invisible story you make visible, *usnea* – grandfather's beard, growing on a man who stays still long enough, a story told with light, a story told with air – no filter, a still story, fungi as story structure, algae as story content, a slow story... a story that grows and loses words depending on the air quality

(Summer 2016)

The focus in these examples is all on how the story will be shared and the form it will take, but I soon found this outcome-centred way of working inhibited the storymaking process. I kept trying to work with the idea of a story that would require two people to be touching each other to hear it. This idea drew on a lichen's symbiotic relationship between at least two organisms working together to create something more. Although I worked out this was technologically possible, I couldn't come up with an idea for a story that worked with it. In my notes I wrote:

...I jumped too far ahead by thinking about outcomes before process and then trying to retroactively fit stories rather than letting the whole thing emerge from the engagement and process. I realised this when I became blocked, but reluctant to give up the 'novel' idea of requiring two listeners/readers to be in contact to get all of the story. Need to let it go and trust the process.... although it's okay to explore possibilities I need to hold them lightly not determine that these are the forms the stories will take
(Jan 2017)

5.3 Seeking: materials for exploration

5.3.1 Language

The majority of language through which I encountered lichen was scientific. The complex names and the descriptive terms and concepts in the literature concerning lichen felt like the antithesis of the language ordinarily found in wonder tales. I spent a lot of time wondering how I could possibly begin to convey a lichen voice through language and the scientific papers seemed to be the last place I would find such a voice. The examples of Les Murray's animal voices and Alice Oswald's river voice came to mind (see p.29), but the task of working with language from a lichen perspective felt incredibly overwhelming. I think their lack of animation makes the leap to anthropomorphisation as

advocated by Bennett (see p.235) even more daunting. However, one afternoon when a meeting was cancelled, and I found myself with a spare couple of hours and no materials with me, I printed off three lichenology papers at random and had a go at cutting them up in an attempt to help me think about story possibilities.

There is a long tradition of working with texts using experimental methods like this. In the early 20th century Dadaists used collage as a method with images and text to create a poetry of chance, while the Surrealists went on to work with automatism (Hopkins 2004, pp.67-71). In the 1960s, the cut-up method was espoused by novelist William Burroughs who wrote in an essay on the subject: 'You can not will spontaneity. But you can introduce the unpredictable spontaneous factor with a pair of scissors' (1963 p. 346). Oulipo is a literary group that has been active in Paris since 1960. Its members don't draw on chance or automatism, but instead embrace writing constraints and mathematical experiments in their search for 'potential literature' (Becker 2012, p.9). What all these approaches share, is an ambivalence to the fixed nature of printed texts and they offer methods for finding new possibilities when working with words.

Returning to the symbiosis of lichens, I wondered if I could take words from different lichen texts and put them together to make something new. I'd recently explored Jonathan Safran Foer's work *Tree of Codes* (2010), in which *The Street of Crocodiles* (2008) by Bruno Schulz is dissected to reveal another story. Rather than being restrained by what was on any given page, I decided to use a cut up approach and leafing through the papers I cut out the words I was

drawn to, paying particular attention to repetitions. I focused first on cutting out words and then on arranging them together on the page in different combinations. This was delicate work, where a single breath could disrupt the growing story. Describing the process in my journal, I wrote:

Accretion of meaning

A story started to form

Still only have the edges of it

Squinting at it

Not grasping too tight and can't articulate
in writing yet

It exists in the spread of the words that I
tacked to the page to bring home with me
and the other possibilities I scooped into an
envelope to keep safe

(Feb 2017)

Tree of Codes, uses Schultz's language, which is suffused with the fantastic. In contrast, I was drawing words from scientific papers. The language used was Latinate, objective and dense with terminology. I had no idea if working with this kind of language could produce anything that would spark my imagination, but as I noted in my journal I found, 'the marvellous revealed in the combinations...Dry scientific language transformed' (Feb 17). There was also language within the papers I hadn't noticed at first, a material language of

dust and metal, which is the kind of concrete language wonder tales thrive on (Lüthi 1976, p.51). I wrote: 'Strange collisions begin to occur as I let the words fall to the page' (March 17). The narrative voice of these experiments is very different to anything I've ever worked with before. It is omniscient but at the same time reaches towards the perspective of the lichen. As I noted in my journal:

...the story belongs to the lichen
The word appears again and again
The word human only appears twice
Scientific objectivity actually makes it easier
to tell the story of the other rather than a
story about ourselves
(Feb 2017)

This method worked so well that I ended up using it three times. I found it reoriented my position to the lichen and gave me a way of de-centring my human perspective, so I could begin to consider the world of the lichen.

40,000 deaths a year attributed to it in the UK alone (Royal College of Physicians 2016). While working with language I compiled a litany of noxious chemicals and particulates that humans have launched into the air, but as noted by Nixon in his description of the slow violence of climate breakdown (see p.32), it can be hard to fear what we can't see. I wanted to find a way to make the reality visible.

Trying to capture the particulates that lichens take in from the air, I constructed a homemade pollution trap. Some tiny black particles became trapped in the sticky layer of Vaseline, but I knew there was much more I couldn't see. Turning to digital technology to make the pollution visible, I experimented with a dust sensor, using it in conjunction with an Arduino microcontroller to identify levels of particulate matter in the air. I also signed up to air quality alerts online. Exploring in these ways gave me more information, however in each case there were barriers to using that information to make stories. The dust sensor gave incredibly localised readings and its readings changed too rapidly to be linked to story elements. I felt the air quality alerts were misleading; they nearly always showed air pollution as low, yet I knew that my sons and I were breathing in noxious fumes as we walked beside busy roads on our long walks to and from school. The lichens tell a story about the air only if you have the knowledge to identify them and this is knowledge I acquired tacitly at the Field Studies Centre course and then through committing a significant amount of time to their study. This wasn't something I could communicate clearly and simply through story.

5.3.3 Time



Figure 26: Lichen-view, a solar graph taken with a pinhole camera and three-month exposure

As a teenager, I had an old Greenpeace leaflet pinned beside my bed that said,

Think of the planet Earth as a 46 year old... Modern humans have been around for four hours. During the last hour we discovered agriculture. The industrial revolution began just a minute ago... (Greenpeace 1989).

This provided a way of considering the vast scale of time that I loved to wonder at and with. Lichens live on different timescales to humans. They are one of Earth's earliest living things (Purvis 2010, p.46) and scientists are investigating whether they are biologically immortal (Pringle 2017, p.G161). This suggested to me that to make stories with lichens I had to be able to consider a very different relationship to time. One way I approached this was to visit the *Longplayer*, a one thousand year musical composition that has been playing in a lighthouse in London since the turn of the millennium. I visited on the 5th March 2017, when it had been playing for 17 years and 68 days. Staring out across the Thames as I listened to the chimes of the Tibetan singing bowls I found I couldn't imagine anyone standing there listening in hundreds of years'

time. *Longplayer* is an attempt to help us consider vast scales of time, to ‘render as sensible or tangible the great span of one thousand years’ (Finer n.d.).

Finding it easier to look back at, rather than forwards to, a thousand years I thought of the 1000 year-old copy of *Beowulf* in the British Library. Being led by my impulse to visit it, I stared down at the manuscript’s slightly charred pages, protected by glass, and considered how we have found ways to communicate over vast timescales; it is just difficult to comprehend from within a single human life.

Lichenology depends on communications across time. I spent a day in the Herbarium at Manchester Museum exploring their collection of UK lichens. Co-founder of the collection Leo H. Grindon was one of the first to describe the link between lichen and air pollution, writing in *The Manchester Flora* (1859) that, ‘the quantity has been much lessened of late years, through the cutting down of old woods, and the influx of factory smoke, which appears to be singularly prejudicial to these lovers of pure atmosphere’ (p.513). In the many boxes and folders I explored I found lichens like *usnea* and *bryoria* that have long-since stopped growing in Lancashire. Scraps of newspaper and lurid shades of toilet roll used to wrap specimens dated them as much as the handwritten notes. The collection showed the importance of the small acts of attention and dedication of many amateur naturalists over centuries.

As we lose more species, the prevalence of ‘shifting baseline syndrome’ means we compare what we’re losing to an already impoverished sense of what was there (Papworth et al. 2009). In the 1915 text, *Lichens of South Lancashire*, Travis and Wheldon write, ‘Our paper will serve to depict the lichen-flora as it

appeared when at its worst, and our Systematic List may be useful some day to compare with a regenerated flora, which will assuredly develop when the air becomes purer' (1915, p.91). This communication of hope for better things from a century ago had a huge impact on me. The weight of it not having come true stayed with me throughout the rest of the project.

Realising the significance both of time and light to the project I began to explore alternative photography methods as an attempt to make both visible. I read about solargraphy, a form of pinhole photography that uses ultra-long exposures, meaning it is 'able to capture a period of time far beyond our own vision' (Quinell n.d), and this seemed an ideal method to experiment with. I made and set up two empty drinks-can solargraph cameras following tutorials I found online (Quinell n.d.). One blew down from its place on a wall after a month. The second, I opened after three months. In the image taken (fig. 26), the path of the sun is visible across the sky. You can see trees, fences and plant pots, but no cars, or birds or people. Anything that doesn't remain still isn't captured. There was something haunting about knowing my sons had jumped about in front of the camera each day, but not left a trace. I couldn't have anticipated how effective it would be at stimulating my imagination and how much it would frustrate any attempt to make a story with it.

As I gathered materials and sought shapes for a story, I'd amassed a vast collection of information, insights and inspiration, and, as my family will attest, an obsession with identifying lichen, but I remained very unsure about how I was going to make a story with all these materials.



Figure 27: Lichen-view, the pinhole camera

5.4 Making: four elements of story craft

5.4.1 Following intent

My intention with this project was to use story to make lichens more visible to people. As I learned more about lichens, I also wanted to find ways to make air pollution and the passage of time tangible to readers. From early on, I had to reconcile differences between scientific and artistic approaches. Rather than planting myself firmly in one camp, I explored both and found productive and inspiring spaces to work in the overlaps. Finding a way to tell stories from the imagined perspective or voice of lichens was a constant challenge that led me

down many different paths without me ever getting to a point where I felt I'd got close enough. This didn't stop me from continuing to try.

5.4.2 Forming content

This project involved engagement with lichens over eighteen months. It was necessarily bound by the time constraints of the PhD, and I don't feel the project is finished yet. The work took on a quality of lichen-time. Content accumulated slowly and *Excerpts from the Lichen Records*, in particular, feels more like a writing artefact than a finished story. Unlike most writing artefacts, it was developed to be shared, but I'm certain it is not complete and will still lead to the creation of further stories. One experiment in storymaking that didn't work involved attempting to make a slow-growing story one word at a time. Selecting words from *The Manchester Flora* I added a word to the story each day if the air pollution levels for North West England were low and removed a word if they were moderate or high, but I soon found I couldn't make a story in this way. I couldn't hold on to any idea of an emerging narrative. I wrote in my notebook: 'Accreting words isn't enough to make a story' (April 17).

Focusing on lichen also meant tracing their wider ecological relationships in the world and this is reflected in the content I made for *Detours from Lichen Cartography*. Meditations on the substrates and materials encountered by lichen in the city led to the making of maps and short texts that invite exploration outside. Here, the use of minimal stories leaves wide gaps for the reader's own imaginative engagement with their environment.

5.4.3 Finding form

Le Guin's 'Carrier Bag Theory of Fiction' (see p. 23) was a vital touchstone throughout this project. Drawing on it to make *For Hades* had given me some confidence in working with fragmented and minimal stories, rather than linear plots. With this project, I didn't have a central character or narrator as I'd had with Persephone and I found finding forms for the stories much more challenging. The cut-up stories I'd made felt closer to poetry than prose, a form that I am inexperienced in as a practitioner. My lack of confidence in the form meant at first I considered them to be experiments on the way to writing a story. Other people's positive responses helped me to see they worked as they were. When we were discussing my struggle to make a story for the project, one of my supervisors suggested I was actually making a community of stories, just as lichen live in communities. Bringing together disparate story elements to make something more echoed the theme of symbiosis, which kept recurring in my explorations. It was present in the cut-ups themselves and also in my use of kennings in place of scientific names.

A kenning is a metaphoric compound, originally used in Anglo-Saxon and Norse poetry, which takes two words to make a figurative description of a third (The Poetry Archive 2016). I was inspired to experiment with the form after coming across the description of lichen as a time-stain in *The Manchester Flora* (Grindon 1859, p.511) and by my visit to see the *Beowulf* manuscript, in which 'whale-road' means sea (Heaney 2000, p.3). I explored ways to use kennings that could give a sense of lichens' relationship to place, light, air and

time, resulting in names for them such as breath-map, light-smith and fume-ghost.

5.4.4 Making with technologies

As I learned more about lichens and their response to air quality, I wanted to find ways to make air pollution more visible or tangible through story. Working with air pollution data and trying to get story elements to respond to it was not straightforward. I tested different combinations of microcontrollers and sensors. When I thought I'd found a way of doing it by scraping air pollution data from DEFRA's UK Air website (2018) I found there wasn't a clear story to be told with the data. Whenever I checked, the readings said air pollution was low in North West England. However, this doesn't mean we aren't breathing in dangerous amounts of particulate matter every day. This impacted on the content of the story I developed. Different air quality results in one of two versions of the *Lichen-dial* story becoming visible, but both versions invite the reader to reflect on the prevalence of air pollution from different perspectives.

As lichens are responsive to light, I experimented with using a UV light sensor to trigger an audio story file, so a reader would only be able to hear a story in bright daylight outside. *Detours from Lichen Cartography* isn't screen-based and only uses one earphone and minimal visible text. The aim is for the listener to become more immersed in the environment than if they were reading from a screen or a conventional book outside. The work I'd done on *Persephone's Footsteps* helped me to consider how I could make the story using

both technology and environment as materials to shape the experience of the reader.

5.5 Sharing: a community of lichen stories



Figure 28: *Lichen-dial*, the cover story for *Excerpts from the Lichen Records*

5.5.1 Excerpts from the Lichen Records

Excerpts from the Lichen Records is a collection of stories and story fragments. The work is presented in a folder format, inspired by the collection methods of the Manchester Museum Herbarium. This archival format is subverted slightly by the content, which takes scientific language and methods and infuses them with elements of the fantastic. The cover holds a story called *Lichen-dial*, of which two different versions can be read depending on the current level of air pollution in a specific location. In one version of the story, Prometheus gifts fire to man and in the other to the lichens, changing the course of history. The text was made by using the cut-up technique on the lichen section of Grindon's *The*

Manchester Flora (1859). *Excerpts from the Lichen Records* holds two further cut-out stories, made with words taken from a selection of lichenology and air quality papers; a solargraphic image titled *Lichen-view*; and a selection of lichen specimens in packets, labelled with the kennings rather than their scientific names.

The intention is for the reader to explore the work and discover the different story fragments. The work doesn't have a single plot, but forms a community of stories, which responds to air quality just as lichen do and will continue to grow as I add more content to it.



Figure 29: inside *Excerpts from the Lichen Records*

Story materials

Physical materials:

Printouts of scientific papers, paper, Raspberry Pi Zero, Wi-fi dongle, USB hub, 5v battery pack, servo motor, solargraph, lichen specimens, brown paper packets, ink, cardboard

Sentinel lichen

Lichens depend on the observation of fine detail. Elements of crustal origin leave rock dust and soil particles suspended in the air and are paralleled by floristic changes. The biodiversity of air pollution suggests new colonizing species and provides an early warning.

In the late impoverishment, dubious material was found in the urban forest, leaching from industrial complexes, ambient levels of mechanism and the nearby steel desert. Such avenues of sulphur dioxide, richness and loss. Under a canopy of nitrogen major roads accumulated. Phytotoxic gaseous pollutants performed in warm relationships over the legacy of atomic rainfall. An abundance of ammonia and particulate matter were known to be removing some of the sensitive. All metals were found in unexpected patterns above ground for it was a known age of deviations from air.

The presence of lichen was unexpected in a mill in the north of England. Terrigenous lichens were growing from the fine fraction of air between declining foundries, between extraneous industries, between precipitation and dust.

Lichen formation on slow traffic was observed: vehicular lichen flora trapped old metals. Lichen mines became widespread across heavy ecosystems.

Lichen communities tolerated sequestering elements that were responsible for the occurrence or disappearance of children in the towns. With time some species disappeared. Lichen remained. A slow lichenfall of presence and abundance.

Lichens are very thorough. Over time all branches of human activity were colonized. When the climate is showing signs of disturbance sentinel lichens respond.

Cut-up source list:

Loppi, S. and Pirintos.S. 2003. Epiphytic lichens as sentinels for heavy metal pollution at forest ecosystems. *Environmental Pollution* 121: 327–332

Loppi S., Frati L., Paoli L., Bigagli V., Rossetti C., Bruscoli C., Corsini A.. 2004. Biodiversity of epiphytic lichens and heavy metal contents of *Flavoparmelia caperata* thalli as indicators of temporal variations of air pollution in the town of Montecatini Terme. *Science of the Total Environment* 326: 113–122

Seed L., Wolseley P., Gosling L., Davies L., Power S. 2013. Modelling relationships between lichen bioindicators, air quality and climate on a national scale: results from the UK OPAL air survey. *Environmental Pollution* 182: 437-447.

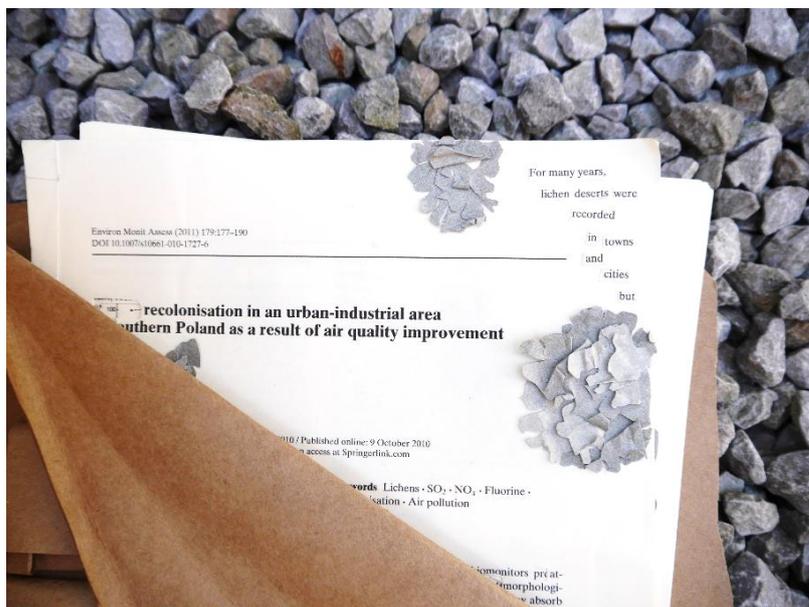


Figure 30: detail from *Migrant Lichen*

Migrant lichen

For many years lichen deserts were recorded in towns and cities, but lichens are highly effective migrants as indicated by their arrival into the smoking air over towns such as Skawina.

Within the boundaries of rainfall, dust-tolerant lichens combined multiplicatively. Skawina provided access to vast new habitats of industrial air. Prevailing winds supported a mountain of dust.

The carbon diaspora gathered. All possible substances were present in the atmosphere. Emissions mixed in a rich morphology of pollutants – reproductive concrete coupled with metallurgical compounds, common anthropogenous wire and carcinogenic propagules on the wind.

Changes occurred that may not be explained, providing new surfaces in the atmosphere: the slow growth of landscapes in air.

Lichens scaling and advancing over wide areas extended habitats before the establishment of human conurbations. Numerous residents colonised the tentative cities of air.

Overlapping urban developments are now ubiquitous throughout much of the atmosphere. Higher population zones lead to higher emissions. Species are sharing decreasing concentrations of air in a limited world.

The high towns seem far from Skawina. The lichen desert still exists.

Lichen-dial

When old Prometheus brought sunthorns to
the lichens they chained the wild bright in the depths of a
man he rock.
factory.

Clothing the stone with their fringy
abundance lichen covered Moorlands
upon every part of the land. sprang up from
Buildings

Man spread bleak

from a curious lace-work of
rootlets to make habitats of many. Lichens stained
stone walls. Man wrought high mountains
into ashes

forming
crusts of time. Under abbeyes of rain life grows green
pitted cloughs and pillars ruin. cottony decay clings to fragments

inhabiting the wild and vivid shine unfrequented poets
tattered spectral smoke of lessened air. Rare bridge worlds. Everywhere on
flora

rocks and old trees A solitary species is writing the other story of air.
tracings appear. Letter-lichens are

Cut-up source list:

Cislaghi, C., Nimis, P. 1997. Lichens, Air Pollution and Lung Cancer. *Nature* Vol 387: 29.

Belinchón, R., Yahr, R. and Ellis, C. 2015. Interactions among species with contrasting dispersal modes explain distributions for epiphytic lichens. *Ecography* 38: 762–768.

Lisowska, M. 2011. Lichen recolonisation in an urban-industrial area of southern Poland as a result of air quality improvement. *Environmental Monitoring and Assessment* 179:177–190.

Code for Lichen-dial (Python):

```
import feedparser
d= feedparser.parse ('https://uk-air.defra.gov.uk/assets/rss/current_region_levels.xml')

import piconzero as pz, time
pz.init()
pz.setOutputConfig(0,2)

pz.setOutput(0, 20) # 60 degrees clockwise
time.sleep(10)

if 'Current pollution level is Low at index 1' in d['entries'][15]['description']:
    pz.setOutput(0, 165)

elif 'Current pollution level is Low at index 2' in d['entries'][15]['description']:
    pz.setOutput(0, 165)

elif 'Current pollution level is Low at index 3' in d['entries'][15]['description']:
    pz.setOutput(0, 165)

elif 'Current pollution level is Moderate at index 4' in d['entries'][15]['description']:
    pz.setOutput(0, 155)

elif 'Current pollution level is Moderate at index 5' in d['entries'][15]['description']:
    pz.setOutput(0, 155)

elif 'Current pollution level is Moderate at index 6' in d['entries'][15]['description']:
    pz.setOutput(0, 155)

elif 'Current pollution level is High at index 7' in d['entries'][15]['description']:
    pz.setOutput(0, 155)

elif 'Current pollution level is High at index 8' in d['entries'][15]['description']:
    pz.setOutput(0, 155)

elif 'Current pollution level is High at index 9' in d['entries'][15]['description']:
    pz.setOutput(0, 155)

time.sleep(600)
```

Reflections

This work is not intended to be a finished and polished story to be shared, but a collection of fragments that shares something of the process and discoveries that went into its making. The cut-up stories worked beyond my expectations. Much as drawing was a revelatory method for me during the first project, the cut-ups had a similar impact on this project, although having constructed them I was unsure of how best to share them. *Sentinel Lichen* and *Migrant Lichen* are both being published in a forthcoming volume of the print journal *Alterity*

(2018), which focuses on the other-than-human. I'd not anticipated sharing them in this more conventional way, although it feels fitting for this lichen-like work to disperse and colonise new substrates. *Excerpts from the Lichen Records* draws on Le Guin's 'Carrier Bag Theory of Fiction' to make a work that exists to be explored, but it feels less complete as a work to me than *For Hades* or *Persephone's Footsteps*. I consider it to be a valuable repository for fragments and further explorations.

Lichen-dial responds to air quality, and the code can be adjusted for different places. At the moment it is set to North West England. Although it responds to air quality it doesn't make visible whether the pollution levels are high or low. If the results of the alerts had been more reliable I may have tried to make them visible, but I had to work with the data that was available. The turning dial approach was inspired by a *Magic Window* book I had in childhood, and by the idea of a lichen-dial communicating air quality as a sundial tells us the time. Working with the servo motor to make the different versions of the story visible in relation to the data involved a lot of trial and error, but as an experiment in making the story visible without using a screen I was pleased with the results.

Excerpts from the Lichen Records relates interestingly to Nixon's concept of slow time (see p.32). Ecological stories are needed that can help humans engage with and contemplate vast timescales and working with lichen gave me some insights into potential ways of approaching this. It led to the making of a work that can grow and that is intended to be engaged with going forwards. This is very different to the finality and fixedness of a printed story. The

different elements of the records could be developed into separate works and all could be added to or continued by others. My engagement with lichen records in the Manchester Museum Herbarium underlined the importance for me of the collaborative accumulation of observations over time, and this is an aspect I am keen to explore further through storymaking in the future development of this project.

5.5.2 Detours from Lichen Cartography



Figure 31: *Detours from Lichen Cartography*

Detours from Lichen Cartography is a book of maps accompanied by an audio story that is designed to be taken outside. The story responds to the environment and will only grow longer in daylight. Each page turn reveals a new city as the narrator tries to find the city of lichen and recounts visits to cities of stone, rain, air, leaves, words and light. The book is designed for wandering and wondering. It must be held open for the audio story to continue.

The work also responds to the environment in other ways, for example one page moves with wind and another greens over in sunlight.

The reader is invited to take the story outside and listen. They are given no further instructions, and so it is up to them how they proceed through the book or how they read or interact with it. They could sit down with it or walk, but if they close it at any point, or step into shadow, the story will pause until there is enough daylight for it to go on. The maps echo fragments of text from the audio story, with the aim of creating moments of resonance for the listener. The story responds to UV levels of strong daylight and so can only be experienced outside.



Figure 32: the city of stone

Story materials

Physical materials:

Paper, cardboard, glue, conductive thread, Lilypad MP3 player, MP3 file, Lilypad UV sensor, 3.7 volt li-po battery, single earphone, pencil, graphite, ink, air pollution ink, water soluble paper, photochromic ink, cotton thread, leaf

Text of the audio story:

City of Stone

I was looking for the City of Lichen when I arrived in the City of Stone. I found myself in a deserted square, edged with rock formations that gave the impression of towers. I looked to see if anyone lived inside them, but there were no doors, only fissures. Windows were just ideas in stone, not yet worn down to the sand before glass.

In the City of Stone architecture is a myth. Buildings rise and crumble over geologic time. Streets are accidental formations within strata. Debris and whispers are pressed into new layers of sediment underfoot. Over time, all cities take the form of the ways they're inhabited.

City of Rain

It would be easier to map the City of Rain by sound: the drip of old warehouse walls; the gush and splatter of shopfronts; the lapping of doors against their frames. Falling rain forms office buildings and housing and everyone in the city lives without roofs.

On the day I visited, the city had swelled, joining land and sky in anticipation of that night's new moon. People floated past on their way to work. It was a warm day, the latest in a string of many, but no one mentioned the possibility of rain not falling. In other cities, they would be constructing artificial walls just in case. Here, when the rain stops, the city will be gone.

City of Air

A pub sign made illegible with rust, swung above my head and I thought it might be a building in flight. A low crooning between my fingers made me certain of it – the City of Air sings between things. Streets there are rearranged without notice. The city lives on the wind. There are days, though, when it falls still. When it hangs in heat shimmer until the restless hum of its inhabitants stirs the city to fight again. The buildings leave more traces than they used to. Their walls are thickening with dust, but no one who lives there believes it's possible for the city to be weighed down for good.

City of Leaves

The City of Leaves blew towards me and I stepped into its tangle of faded alleyways. The shop windows were yellowed and empty. Memory was thick around doorways and it rustled across concrete clearings. There were no trees. At first, I thought the city had given up, but then I remembered the city had found me. It was still looking for something, holding on against decay, even as its streets became skeletal and the fabric of buildings gave way to dustfall and mulch. The longer I walked the harder it was to hold on to any possibility, but then, in a crack in the pavement, I saw the first tiny green bud of another city.

City of Light

The City of Light rises and falls each day. Its streets glint, shimmer or burr depending on the hour, unfurling or withdrawing the seasons. It's hard for a visitor to relax in the city when a sudden shadow can take the street from beneath your feet, but those who live there seem happy enough. They don't try to hold on because they know there will always be more light. I heard from a shopkeeper about another city – a thin double that flickers into existence after dark. This city of manufactured light pulls birds from their paths and people from their sleep. I thought I saw a flash of this other city at dusk, but already the dandelions were closing and the walls of the city were folding.

City of words

In the City of Words language
blooms:toletsmile!you'reonctvcoppe
rearthcablehasbeenremovedfreewifijusteatmynameistakeadvantag
efiredoorkeepshutnostoppinggizmerslivemusictonightbookyoursp
aceskyhappyhouratyourfingertips words breed more words. The
signs of the city are talking to each other now and can't be
interrupted -- policenoticeyouareundersurveillancemusic4lifeprom
iseispeacegravemusicboxfacebooksuperfunkcallplanetallmajorcard
sacceptedfireexitartslovinglyputtogethersmokingincreasestheriskof
blindnesswinthefightasonesecuritynoticefreeentrybeautyoutletmix
edrecyclingrabbitholethankyouausteritymeansgeneralwaste. There
are so many words that those who live beside them no longer read.
I searched for spaces without words and found there are quiet
corners where leaves and petals – the carapace of anything that
grows – remain wordless. It's best not to linger there for long. If the
city's attention is drawn, these spaces too could be written out of
existence (carparkforsaletoletluxurydevelopmentsold).

City of Lichen

When I finally arrived in the City of Lichen I felt sure I'd wandered its streets before. The city takes everything in. There are no barriers. It welcomes all incomers and everyone becomes part of the fabric of the city, so the streets and those who walk them grow together into wondering-wandering architectures. The City of Lichen remains unseen until you've visited its streets, and then you will see it everywhere, holding within its tiny, multitudinous branches all other cities and possibilities. I didn't think a city could give me hope, but here inhabitants of every kind live together and are transformed to make something more.

Code (C++):

```
// detours from lichen cartography code clairedean adapted from Applehead_witch
// Demo program for Sparkfun's LilyPad MP3 Player
// Mike Grusin, SparkFun Electronics

char filename[] = "1.mp3";
const float sensitivity = 0.9;

#include <SPI.h> // To talk to the SD card and MP3 chip
#include <SdFat.h> // SD card file system
#include <SFEMP3Shield.h> // MP3 decoder chip

const int TRIG1 = A0;

//dark level alter this depending on environment
const int darklevel = 140;
const int EN_GPIO1 = A2; // Amp enable + MIDI/MP3 mode select
const int SD_CS = 9; // Chip Select for SD card

SFEMP3Shield MP3player;
SdFat sd;

boolean debugging = true;

void setup()
{
  byte result;

  pinMode(TRIG1,INPUT);

  pinMode(EN_GPIO1,OUTPUT);
  digitalWrite(EN_GPIO1,LOW); // MP3 mode / amp off

  if (debugging)
  {
    Serial.begin(9600);
    Serial.println(F("LilyPad MP3 Player trigger sketch"));
  }

  // Initialize the SD card; SS = pin 9, half speed at first

  if (debugging) Serial.print(F("initialize SD card... "));

  result = sd.begin(SD_CS, SPI_HALF_SPEED); // 1 for success

  if (result != 1) // Problem initializing the SD card
  {
    if (debugging) Serial.print(F("error, halting"));
  }
  else
    if (debugging) Serial.println(F("success!"));

  // Start up the MP3 library

  if (debugging) Serial.print(F("initialize MP3 chip... "));

  result = MP3player.begin(); // 0 or 6 for success

  // Check the result, see the MP3 library readme for error codes.

  if ((result != 0) && (result != 6)) // Problem starting up
  {
    if (debugging)
    {
      Serial.print(F("error code "));
      Serial.print(result);
      Serial.print(F(", halting. "));
    }
  }
}
```

```

    }
    else
        if (debugging) Serial.println(F("success!"));

    MP3player.setVolume(10,10);
    digitalWrite(EN_GPIO1,HIGH);
    delay(2);
}

void loop()
{
    byte result;
    byte sensorvalue;

    // Get the current light level (sensorvalue): alter delay if need it to respond more quickly

    sensorvalue = analogRead(TRIG1);
    if (debugging)
    {
        Serial.print(F("sensor value: "));
        Serial.print(sensorvalue);
        delay (15000);
    }

    // Check to see whether we're above the darklevel

    if (sensorvalue > darklevel)
    {
        if(debugging)
        {
            Serial.println(F("got a trigger!"));
        }

        // If we're currently playing a file, let it finish (don't start over)

        if (MP3player.isPlaying())
        {
            if(debugging)
            {
                MP3player.resumeMusic();
            }
        }
        else
        {
            // Play the file!

            result = MP3player.playMP3(filename);

        }
    }
    else
    {
        if(debugging)
        {
            Serial.println(F(" no trigger!"));
        }
        // If we're currently playing a file, let it finish (don't start over)

        if (MP3player.isPlaying())
        {
            MP3player.pauseMusic();
        }
    }
}
}

```

Reflections



Figure 33: a building in flight

This story takes inspiration from some of the materials and methods used to make *Persephone's Footsteps* and explores them in the very different context of lichen ecology. It is influenced by Italo Calvino's book *Invisible Cities* (1997b), in which imaginary cities are used to describe facets of reality in Venice. *Detours from Lichen Cartography* explores the interconnection that is always present, even if we try to look at a single element of an environment. It follows the threads that lead from looking at lichen out into the world. It uses the fantastic as a mode to explore wider nature in the city. The minimal nature of the story and the fragmented presentation of text leaves a significant space for a reader's imaginative participation.

Where *Persephone's Footsteps* responded to a reader's movement, *Detours from Lichen Cartography* responds to the environment it is read in. The story echoes the lichens in its response to light and is unable to grow without it. I was pleased with the way I was able to get the UV sensor to work with the audio files, so they can't be heard inside and closing the book or stepping into

shadow will pause the story. The book's intricately handcrafted pages also respond to the environment in different ways – the *City of Air* moves in the wind, the *City of Light* glints in the sunlight, the *City of Rain* is made with water-soluble paper that will dissolve more if it gets wet and the *City of Lichen* uses photochromic ink that will turn green in strong daylight. This is a book that is made to be taken outside. Despite their portability not many books are specifically designed for this. In some ways the work feels like book art, although, as discussed in the contextual review (see pp.57-8), I am inspired by the form, but it wasn't my intention to make an artists' book. I'm not an artist making books, but a writer experimenting in the making of material stories. For me, this means working with both narrative and physical materials as part of an ongoing and iterative process.

As an ecological story this work succeeds in drawing the reader outside for a very different experience to the predominantly indoor pursuits of reading of print and screen-based texts. The work can be categorised as ambient literature (see p.41) and as with *Persephone's Footsteps* makes use of the form's invitation for interplay between text and the world. In this case, drawing a reader's attention to wider nature in an urban environment. As with the other works made, the technologies used are easily rechargeable using a solar charger and can be replaced or re-used in other work making the piece more sustainable. I think there's huge value and imaginative potential in experiencing a story outside. In contrast to the concerns about new nature writing becoming a substitute for actual engagement with wider nature discussed in the

contextual review (see p.27), this work shows there is potential for ecological stories to take people out into the world to engage directly with wider nature.



Figure 34: city of light

5.6 Discoveries from the project journey

5.6.1 Sometimes the journey is the story

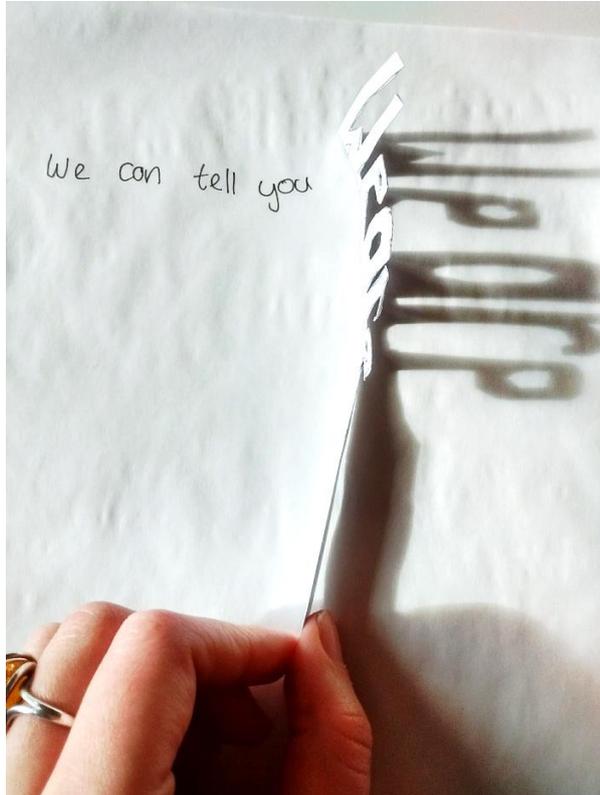


Figure 35: playing with light and shadows

Making the Lichen Records was a slower-paced, and, at times, much more frustrating project to work on than *Persephone Calling*. I was keen to develop the approach to material writing practice that had begun to emerge in the first project, but my rush to emulate the successes I'd had held me back at first. I'd forgotten to start from the lichen and let everything else follow from there. Able to write again, I was keen not to fall straight back into my old habits of writing for print technologies, so I continued to walk and draw, but lichens are stationary, and it didn't feel like drawing was helping me to get much closer to them. Once I started exploring the world of the lichen by working with light and time, the explorations became much more imaginatively stimulating.

Approaching gathering and seeking as a way of accreting ideas, rather than forcing a story to a deadline also helped. I described this process as being:

Like the lichen
Story growing slowly
Not forced
(Feb 2017)

The value of finding guides to a subject came to the fore in this project. I spoke to ecologists, conservationists and professional and amateur lichenologists. All of these conversations helped my understanding grow and led to encounters and insights I wouldn't have ever had if I'd relied on desk-research. The sense of communication over time that I had while exploring the Herbarium collection was particularly powerful. It gave me a real sense of our ability to communicate across time and a sense of how engaging with this is especially relevant in our current situation. Work on the project is ongoing. I feel committing to engagement with lichens over a longer timeframe than the PhD allows for is essential. I've discovered that sometimes environmental stories are so complex and there are so many facets to be aware of that taking time and going slowly is the best way to ensure a story doesn't have the potential to do more harm than good. If I'd made a story about an absence of lichen meaning the air quality is poor, people would have been misled into thinking air quality is better than it is in cities where *Xanthoria parietina* thrives on car fumes.

The passion I developed for lichen was unexpected, but I've learned that burgeoning obsession doesn't provide a story. I had to find ways of exploring materials and methods that were appropriate for the project theme. I felt more lost without an existing story to work from, especially when I discovered I couldn't just replicate what I'd done in the first project. What I could replicate, however was the open approach and, as I wrote in my practice journal, my willingness to engage in, 'Breaking open my practice and being able to fail' (Aug 17). It is an exposing way of working, but it is made more possible by the privilege of having space and time as part of a funded research inquiry.

5.7 Project conclusions

The Lichen Records contributes key insights to the value of material practice for uncovering different ways to develop stories centred on other living things. This project draws on the approach to writing practice developed through *Persephone Calling*, with a focus on material process and reconsideration of the role of writer as maker. Finding that the replication of methods was not appropriate, the project replicated the approach, using the intended subject to guide the selection of materials and methods to work with.

This project contributes to the key research objective of developing a new approach to storymaking for ecological stories by uncovering ways to make stories that centre on the experience of the world of another living thing. Through the methods undertaken I was able to consider how lichens respond to the environment and trace their many entanglements in the world. I identified

that working with a technological outcome in mind held back development, and I could only make the kind of interrelated story I wanted to when I started from the lichen and followed the imaginative and physical materials I gathered. This process contributed to expanding my understanding of what constitutes a material. I worked with time and light, attempting to make them visible and sensible through narrative materials. Approaching everything as a material to be worked with – including the scientific language that distanced me from the lichens initially – provided paths towards insight and connection.

This project gave me opportunity to identify ways in which this approach shaped the stories made. Both *Excerpts from the Lichen Records* and *Detours from Lichen Cartography* draw on the use of minimal, fragmented narratives and leave significant space for the reader's imaginative participation. Both contain found materials that can be explored by touch. Both are responsive to the environment in which they are read. In this project, the making of writing artefacts was again essential for the development of the stories and *Excerpts from the Lichen Records* is a writing artefact that is unusually intended to be shared. It has contributed to developing my understanding of how a mixed media work like this can be considered a living story rather than a fixed and bound one. There is opportunity for the story to be added to and worked with, just as materials continue to be added to the Herbarium collection that inspired it over time.

Below, I consider insights from this project in response to my research questions:

- 1) How can writing practices be developed with new technologies for ecological storymaking?

The Lichen Records provided insights into developing writing practice in ways that avoid the constraints of writing for a pre-determined technology, suggesting a focus on the ecological subject, rather than on new technologies, can lead to innovations in practice. The project widened my understanding of what can constitute a material to be worked with, which had benefits for the imaginative development of the work and emphasises the value of a material focus for writing practice.

- 2) How are stories changed when new writing practices are developed for ecological storymaking?

The stories resulting from this project have a curious character inspired by the processes of their making. They are spaces to be explored and explore with, minimal stories, and invitations to imagine. The eclectic approach to materials of making leads to a wider approach to materials of sharing. Materials are used to encourage connection with the ecological subject, including the use of found lichens that readers can discover in packets labelled with the poetic form of a kenning. *Detours from Lichen Cartography* is intended to be read outside, forming a relationship between reader, book and place and emphasising the possibilities of making work that can respond to the reader and the environment it is read in.

- 3) What does the development of these writing practices mean for the role and continuing relevance of the writer?

The material approach to practice took time and space to develop in this work. This was made possible because in my role as writer-researcher I was free from the constraints of the publishing industry. I hadn't anticipated that working with something that I first saw only as a minute, easily overlooked organism could possibly open up such a vast space for me to explore. There was an overwhelming sense of difficulty in trying to consider the world from a lichen perspective and in finding ways to tell their stories, but I am learning the important part is to keep trying. I've found that only by truly connecting with the subject can I find ways to share this sense of connection through the work.

~

On paper, *The Lichen Records* is the second of the three practice-based investigations. However, my engagement with lichen began in summer 2016 at the same time as I was working on *Persephone Calling*. It has continued throughout the PhD and will continue afterwards in recognition of the importance of time in relating to the subject and because I feel there is so much to learn from trying to make the unseen visible. The focus of this project was primarily on process and materials and the insights developed in relation to the subject. In the next project I aimed to explore this focus in a different context and to spend more time considering what the development of this approach means for the role of the writer.

Part 2, Chapter 6: How to Catch a River

To gaze at a river made of time and water...

(Borges 1972, p.169)

Learning to “live with water” is high on UK and international research and policy agendas (McEwen et al. 2017, p.14)

For this project I joined a larger environmental research project as writer-in-residence. *Ensemble* (2017) is an interdisciplinary research team, working to explore the opportunities new and emergent digital technologies bring to understanding, mitigating and adapting to environmental change. *Ensemble's* first research theme of flooding held personal relevance for me, as I'd lived beside the River Lune in Lancaster for four years and experienced flooding in December 2015. This section documents the process, artefacts and stories I created in response to the wider project and reflects on how the process was shaped by both personal experience and by engagement with the science and technology-focused approaches I encountered as part of the wider project. At the end of the chapter, I bring together the key discoveries from the three projects to set out an approach to ecological storymaking.

6.1 Beginning

Working with the *Ensemble* team meant the starting point for this project of flooding was defined for me. I saw this as an opportunity to consider storymaking in relation to the tangible impacts of climate breakdown made relatable in everyday phenomena such as weather (see p. 20). The wider project aimed to address ‘flood risk management through data driven decision making, communication and community engagement’ (Edwards et al. 2017, p.1). The interdisciplinary nature of the team, which is made up of technologists, environmental scientists and a designer and connects with outside agencies, exposed me to very different approaches to the subject than I would have encountered working as an individual. This enabled me to reflect on the role of writers and ecological stories in responding to climate breakdown in a wider context of environmental science communication.

6.2 Gathering: conversations with others

6.2.1 Conversations with scientists and technologists

Taking part in project meetings, reading groups and workshops I was able to have in-depth conversations with scientists and technologists from Lancaster University and external agencies about the impacts of flooding. The use of environmental models to make predictions about flooding was a subject that came up frequently. Speaking to a hydrologist about the lack of a flood warning when my home flooded in 2015, he explained the uncertainty inherent in

modelling, acknowledging all models are wrong but some are more useful than others. He said the wider public and even the agencies that use the predictions are often unaware of the scale of uncertainty present. Finding ways to communicate this is a significant challenge for scientists.

At times during the project, I found the sense of distance between the models discussed and actual lived experience of rivers unsettling. The hydrologists' approach was rooted in place, but the technicalities of the modelling work introduced a sense of abstraction. I noted in my journal of the technological discussions, 'They don't talk about people or place. Its data, models, systems' (Feb 17). Additionally, I felt the absence of the voices of people affected by flooding. More than once I was told that academics working in environmental science would never live in an area where there was a flood risk. As someone who had experienced flooding, and as a single mother who was still renting that house out of economic necessity, I found this lack of consideration for other people's circumstances troubling. As discussed in the introduction, climate breakdown has disproportionate impacts on people who are socially and economically disadvantaged (see p.5). Many people have no choice but to live in areas where there is a flood risk, and this is what makes clear and informative communication around the subject so important. As the project progressed, my process necessarily became both a gathering of materials in relation to the work of the wider project and a more personal gathering in relation to the voices I felt were missing.



Figure 36: River Lune, Lancaster, just upriver from where I used to live. Photograph taken Jan 2018 showing the remains of a hay bale that caught in the tree during Storm Desmond, Dec 2015

6.2.3 Conversations with the river

Living right beside the River Lune, and having experienced flooding, I was surprised by how in the chaos of daily life I could go whole days without noticing the river. In an attempt to redress this, I spent twenty days in December 2016 purposefully paying attention to the river, using the form of a written dialogue at least once a day. My intention was to gather materials that would help me find the river's voice, but what I found instead perhaps says more about my ever-shifting relationship with the river. Where the poet Alice Oswald gathered many voices, human and nonhuman, of those living and working by the river from source to sea (see p.29), I watched the river from where I was, noting the character of the water at different tides and times of day

and the birds and debris that made up its primary inhabitants. The constant change and instability of the river are recurrent themes. I accused it of playing tricks by mirroring its state the night before, 'as though you hadn't swollen and shifted with an early-hours tide, as though you are always the same thing'.

Words of movement tumble over one another; the river is falling, rush, swing and see-saw, running, shifted, swollen, washed, taking, carrying, but it is also shrunken pools, the sea, mirror, shadow, rubble, hammered-silver surface and a net criss-crossing the sky. There is a repeated sense of its threat: 'You left your shadow on the wall in the night, showing how tall you were, how close to reaching over the wall'. I asked it questions, trying to understand its intentions despite rationally knowing there are none: 'You look carved out today. Was it the hail or swirl of gulls that took you away? Does it hurt when you try to hold on? How do you feel about the name river? Is it too binding? It refers to the path of water we can see, but you are also underground, you seep through the walls of my cellar. Are you river then too?'

Recognising I was getting no closer to imagining the river's voice because my own was drowning it out, I switched to paying attention by drawing the river to see if that would reveal more insights. The pen and ink sketches made between late December 2016 and March 2017 capture the quality of the water in all weathers and at different times of day and night. They are residue of a visual and imaginative engagement that meant I became much more attuned to the character of the water and to the likelihood of flooding. The knowledge I developed about the nature of the river is something I can recall even now I've moved away.

The focus on image rather than language helped me to focus on what I was seeing, more than what I was feeling about the river, and the fear I'd been carrying since the flood lessened. I started to have a good relationship with the river and to enjoy noticing the myriad ways it shifted and changed.



Figure 37: a changing surface, drawing the river each day

6.3 Seeking: trying to catch a river

6.3.1 Playing with uncertainty

Uncertainty was a key concept for the wider project. Describing this focus, Liz Edwards writes: 'The complexity that contributes to an instance of flooding means there is significant uncertainty in flood prediction and decision making about mitigation strategies, which can affect trust between local communities

and decision makers' (2017, p.1). Uncertainty isn't a quality I've dealt with in storymaking before. As I wrote in my journal, 'plots like certainty' (Feb 17). I tried to find narrative possibilities that would embrace uncertainty. Using a set of fairy tale story dice my sons have as examples, I made my own story dice with clay, drawing flood-related images on their sides. I played with them to explore chance and risk as I made up stories. I'd come across the terms '1 in a 100' and '1 in a 1000 year flood' in the media during the winter of 2015. The wider team had discussed how these terms are commonly misunderstood to mean a flood of that scale will only happen once every hundred or thousand years. It actually means that in a year there is a one in a thousand chance of a flood that size happening in that particular place. I developed prototype story dice that would represent this. Three five-sided dice, one four-sided dice and one two-sided dice, each with a flood symbol on one side, gave a 1 in a 1000 chance of throwing all flood symbols.

The images for the early dice were all flood related but playing with them I realised it would be better to include positive aspects of river life too. The aim was to enhance a sense of connection rather than focusing on threat. Above all, I was trying to find ways of encouraging others to make stories about rivers, so they could connect to the river through the act of storymaking rather than through reading stories about it.

6.3.2 Filling jars



Figure 38: a book made for the river to read in a jar filled with riverwater

Flooding was a challenging subject to work with. ‘There isn’t an easy story’ as I wrote in my notes (Feb 17). There is no clear, hopeful message for people whose homes or livelihoods may be under threat as a result of increased flooding related to climate breakdown. I was mindful of the insight drawn from the contextual review, that a focus on threat can disengage people, but I’d also become aware of how much people need to be aware of flood risk: one in six homes in the UK is at serious risk of flooding (National Flood Forum 2018) and more than half of respondents to a 2015 YouGov survey said they’d never checked if their home is at risk (Know Your Flood Risk 2018). I’d experienced the failure of flood warnings and the complete inaccessibility of digital technology during a flood-related power-cut followed by two months of no internet or phone access. Instead of focusing on technological responses to a

flood, I realised the story I wanted to tell was of the value of the knowledge of people who actually live with rivers and flooding. Fellow PhD candidate Louise Mullagh's *Data Drift* method (2018) recognises the importance of experiential knowledge and provides an engaging way of collecting multiple forms of environmental data. Taking part in one of her walks with the rest of the *Ensemble* team gave me space for reflection on how knowledge is situated in place and how it can be passed on. As we collected materials on the walk, there was lots of discussion about the presence and absence of water in the landscape, the hidden paths it takes and how long-term attention to a place gives you signs to work with. This privileging of experiential knowledge was something I was inspired to focus on.

Drawing again on Le Guin's 'Carrier Bag Theory of Fiction' I began to work with ideas for stories as receptacles for rivers. The desire to somehow control or contain the uncertainty of living beside a tidal river kept coming up in my writing. For example, I wrote, 'I took the river and put it under my pillow, so I would know where it was all through the night, but it wouldn't stay still. I dreamt of the sea' (April 17). I tried to explore how I could catch the river in jars or use jars as containers for flood-proof stories. Having come incredibly close to losing hundreds of my books, which had to be relocated upstairs, I became slightly obsessed with accounts of flooded libraries and archival lists of books lost in floods. This vulnerability to water is at odds with the sense of permanence the printed book gives that is discussed in the contextual review (see p.35) and contrasts with the longevity of the book discussed in *The Lichen Records* (p. 190). I gathered fragments in jars, using one jar to hold drawings I'd

made of flood myths from around the world. I made a book full of holes for the river to read and placed it in a jar with river water to watch it disintegrate over time. Another jar held a list of the river's dreams (see fig. 39). The jars provided a focus for exploring different possible story shapes and ways of engaging with the river as part of everyday life.

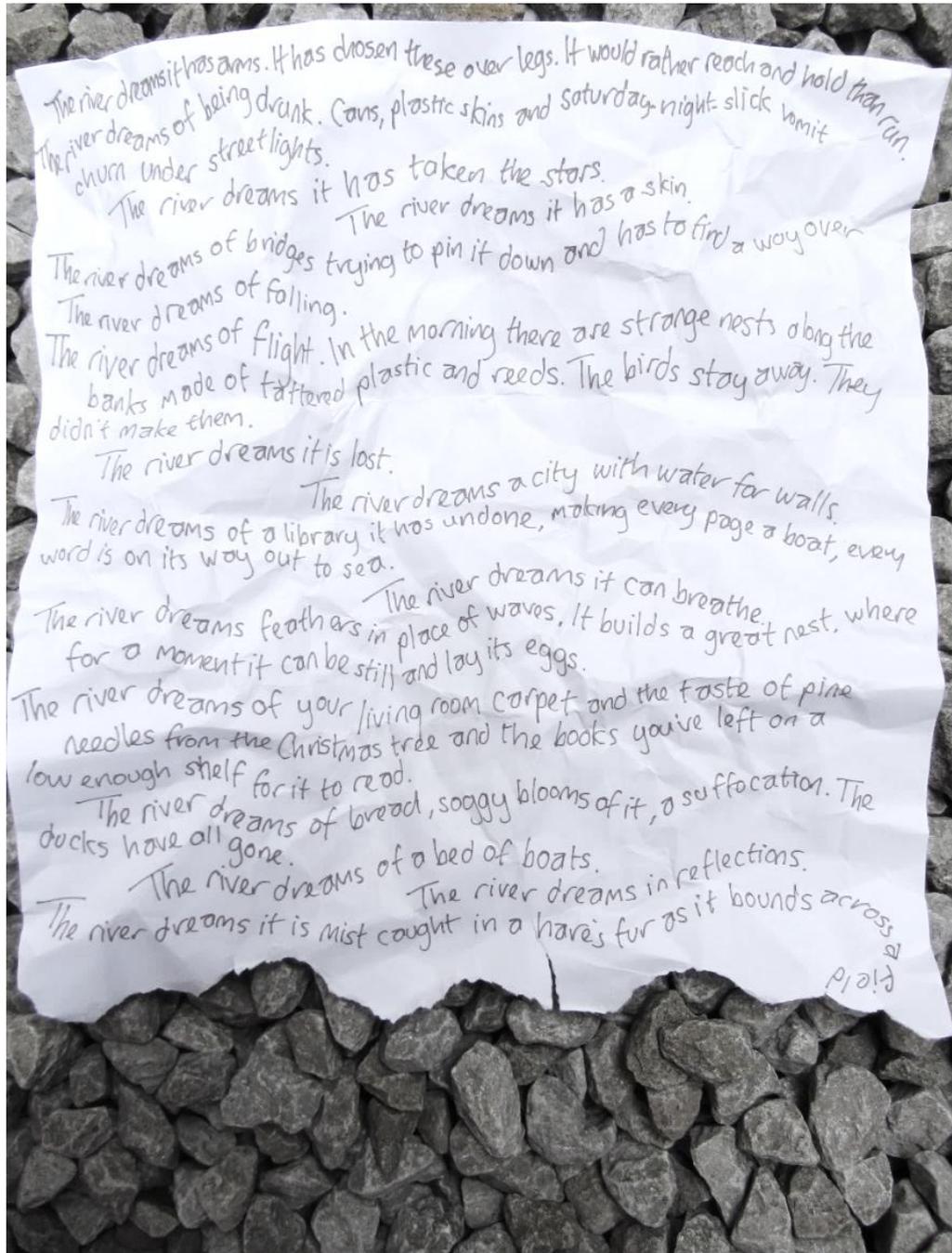


Figure 39: the river's dreams

6.4 Making: four elements of story craft

6.4.1 Following intent

This project was challenging, partly because I hadn't anticipated that my personal experience with flooding would influence me as much as it did, and partly because I had to balance my intentions with the intentions of the wider project and its stakeholders. One of my core ideas, which developed into *The River Library* had to be reshaped at the request of an external agency, who are trying to discourage all uses of the term '1 in a 1000 year flood' because of the confusion it elicits. They suggested I could use the story dice to explore, 'the chance of a flood happening during the term of your mortgage'. This did not have the sense of wonder and connection I was striving for.

Flooding was a difficult subject to work with in terms of connection, wonder and hope. I tried to take into consideration the roles of active remembering and active forgetting (McEwen et al. 2017). Active remembering involves using strategies such as marking flood levels or working as a community to commemorate floods and develop resilience, and active forgetting is an erasure of the marks of flooding used as a way of coping with traumatic experiences (McEwen et al. 2017). I also had to acknowledge and negotiate social, political and economic tensions in wanting to make a story about the passing on of flood knowledge when people in areas impacted by flooding may not want to draw attention to it because of, 'concerns about local house values, tourism, retail and insurance premiums' (McEwen et al. 2017, p.22). The wide variety of voices and positions I encountered made me realise

working with the story dice was one of the best ways I could approach this subject as it would create the opportunity for others to share their stories.

6.4.2 Forming content

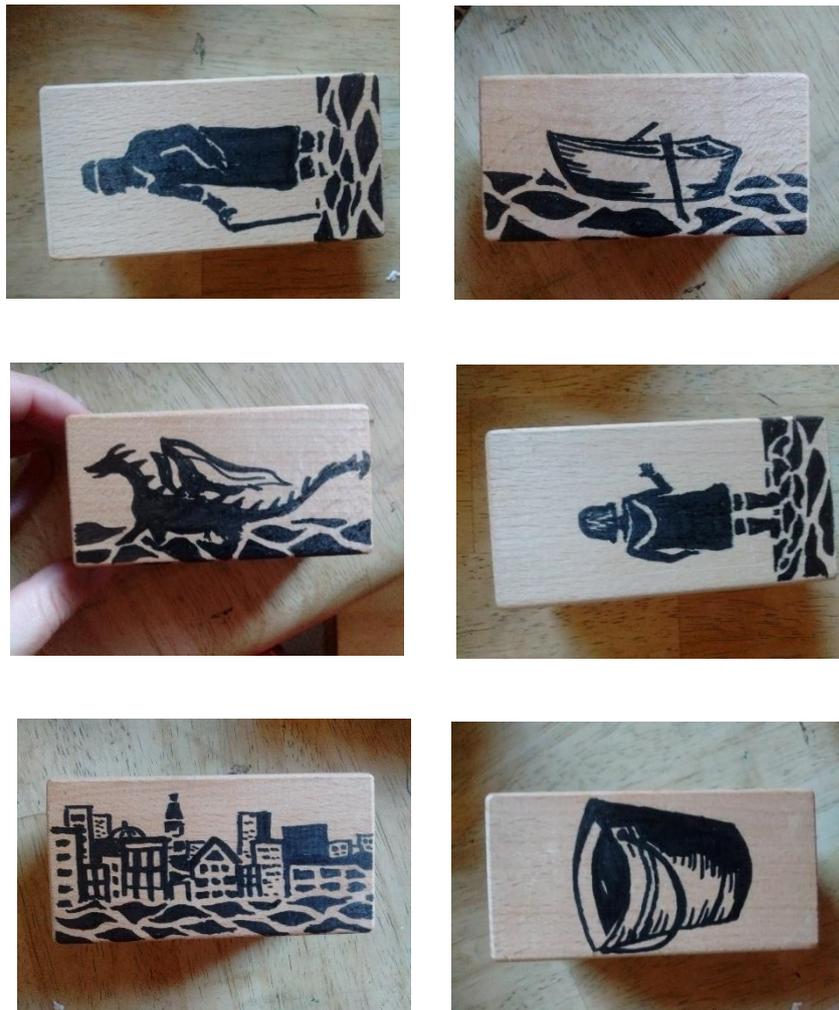


Figure 40: drawing story dice

I'd lived by the river for a long time without paying enough attention to it and regretted my lack of knowledge when it came to the 2015 flood. The processes used in this project helped me to engage with the river and learn from it daily. Personal experience played a key role, but I also strove to remain open to other voices and perspectives. As part of the wider project I found the positivist tone

of some of those involved challenging at times, but I also realised there was a lot for me to learn by engaging with other perspectives. The images that make up the content for *The River Library* dice were inspired by a desire to balance practical, scientific and lived experience with a sense of wonder and connection. Images ranged from people and the things they could use to help in a flood, to folkloric creatures such as dragons that were once considered to be the cause of flooding.

In many of my explorations I anthropomorphised the river. Recognising what I felt to be felt the trickster-like nature of the water and being unable to shake the sense of the river having agency and desires I imagined voices and lives for the river. I was wary that I might be centring the human by relating to the river as if it was human, but I found inspiration in Jane Bennett's declaration that,

I believe it is wrong to deny vitality to nonhuman bodies, forces and forms, and that a careful course of anthropomorphization can help reveal that vitality, even though it resists full translation and exceeds my comprehensive grasp (Bennett 2010, p.122).

The content for the story *We Are Riverish* embodies this vitality. The story is the result of an entangling of project engagement and personal experience, although it took me until a year after the project had started to get to a point where I could write it. I noted in my journal:

And finally I have a flood story that feels like a flood story and it was mine all along, maybe it was just too hard to write, it was too close.... I have spent so long searching for stories outside myself that perhaps I've been neglecting the biggest source of material I have, which is my own experience. The riverish story feels like it will work because it is rooted in that. The concrete specificity of things that happened can be used as bridges to those that didn't... to make something new and something that feels like it speaks, has voice, that could matter.

(Feb 2018)

6.4.3 Finding form

The form for *The River Library* developed from using the story dice and the idea of making a home for the dice and the stories made with them. As I worked on it, I had in mind the relation to the *Ensemble* project's frequent use of the terms library and model and the different meanings these terms can have. The environmental models used by the project abstract data from place. I responded to this with miniature models of riverbanks based on the River Lune. This was still an abstraction, but I hoped they would encourage tangible exploration and a sense of connection with the actual river. The wider project's flood scenario library aims to make complex data from many sources openly accessible to more people to help with decision-making (Edwards et al. 2017). I created a

library to invite storymaking and to encourage the sharing of local knowledge. This participatory form takes the idea of the writerly text discussed in the contextual review towards the makerly suggested by Chandler (p.63).

Using images rather than text for both *The River Library* and the simple sequential image story of the *Tide Jar* allowed me to leave ever-wider spaces for the reader's imagination, inviting the reader to construct meaning and story from what they see in the images. In contrast, *We Are Riverish* uses the well-established short story form. Drawing on my previous practice, it combines contemporary urban realism with the wonder tale. Following the materials with this particular narrative lead to a more conventional form that felt right for the story. I trusted my intuition and didn't try to push it in any other direction.



Figure 41: cutting waves for the *The Tide Jar*

6.4.4 Making with technologies

This project, more than any other, became a conversation between old and new technologies and how well they worked with the ecological subject of flooding. There are echoes of print and oral traditions in the works made. Although analogue in its shared form, I used digital production methods to make *The*

River Library, scanning drawings and laser-cutting them in lino to make the stamps that would enable the recording of the stories. The stories were shared both through oral telling and printed versions made with the stamps.

To make *The Tide Jar*, a story that illuminates at spring tides, I worked with an Arduino microcontroller. The open source nature of Arduino encourages people to share code online, which can be freely adapted. I felt sure other people must have made lunar projects, but it took significant time and a process of trial and error to adapt code so it would do what I wanted. Spring tides occur when there is a full or new moon and I found working with the lunar cycle could be approached with a variety of coding and hardware solutions and it was difficult to know which way to go. Aquarium forums unexpectedly became my most sought out place for help as several people had made devices to create a realistic moonlight effect in their fish tanks.

Throughout this project I kept coming back to the fact that digital technologies fail in the event of a flood. *We are Riverish* has a more conventional short story form, but using digital technology to share it, or print technology with its illusion of permanence, felt wrong. Experimenting with ways of sharing the story using water-soluble paper felt like a way of being honest about the text's impermanence. Leaving the story outside and documenting it dissolving with the rain has become another meditation on time, ephemerality and materials. As I write this, during the summer of 2018 heatwave, the story has not yet fully dissolved and the absence of water has become another part of the story that ties it to climate breakdown (see fig. 47).

6.5 Sharing: river tales

6.5.1 The River Library



Figure 42: storymaking with *The River Library* at Manchester Science Festival

The River Library is a participatory storymaking installation. People are invited to throw story dice into books that hold rivers and to use these as prompts to make up their own stories of rivers and flooding. Three books each open to reveal a model riverbank. The story dice have symbols of living things, landscapes, folkloric characters, floodwater, and objects that might help in a flood. The more dice someone chooses to throw, the more chance they have of getting a flood, but they could also get more elements to make a story with. People are invited to share the story made with their dice orally and to use the stamps and ink to record it. Two copies are made so they can take one home and one can stay with *The River Library*. *The River Library* is intended to be an enjoyable storymaking activity for all ages and I've found it to be particularly suitable for families as it encourages the sharing of stories with each other. It aims to increase awareness of all living things who make their homes by the

river, and to encourage people to think about the impacts of flooding and share ideas of actions that could help during a flood.



Figure 43: a river in a book

Story materials

Physical materials:

Repurposed cardboard book boxes, wooden blocks repurposed from a game, ink, buckram book cloth, printed river words, glue, plaster, paint, resin and model railway landscaping materials.



Figure 44: the 95 stories made by participants at the Manchester Science Festival, Oct 2017

Reflections

From early on when participating in the *Ensemble* project I realised I wanted to make a participatory story, so that other people's voices, experiences and knowledge could be heard. Liz Edwards, a designer working on the wider project wanted to create immersive and informative installations on flooding at the Museum of Science and Industry as part of *Manchester Science Festival 2017*. This gave me a perfect opportunity to develop *The River Library* with sharing it at a largescale event in mind. The event was incredibly successful and engaged people of all ages, with almost 2000 people visiting the overall installation in a single day (Edwards 2017). Over the course of the day participants made a total of 95 stories. *The River Library* was so busy at times that it was difficult to always have the level of engagement intended, but it was wonderful to see families making stories together and to see children running off with their printed story and using it as a prompt to retell it to others in their group.

I found inviting people to make stories in this way to be a brilliant way of engaging them in conversation about rivers and flooding. People shared all kinds of responses including memories, anecdotes and wild imaginings. Many people commented that the dice worked really well as it gave them something to work from and sparked ideas so storymaking was less intimidating. Several children expressed delight at being able to tell and stamp out their stories rather than having to write them down, which they associated with the strictures of schoolwork. It was interesting to note the association between written text and story appeared to be ingrained from a very young age.

As a form of ecological storymaking this work predominantly related to the oral tradition by encouraging the communal sharing of ecological knowledge through stories. Yet, the library aspect and the printing of symbols meant it provided participants with some of the familiarity of print and a sense that their works were being recorded and would last as a printed text would. The success of the activity encouraged me to think about the significant potential of creating opportunities for others to take part in ecological storymaking, engaging people with the issues as makers rather than readers.

6.5.2 The Tide Jar



Figure 45: The Tide Jar at full moon

The Tide jar is a story lantern that is only illuminated in the early evening when there is a full or new moon. This is when spring tides bring higher water levels and a greater chance of flooding to riverside properties such as those beside the River Lune in Lancaster. Paper cut-out silhouettes tell a very simple story across five images. These are views from a window of a child growing to adulthood, and signs of flooding and recovery are visible over time. I chose to represent the passage of time in this way when I found out lunar tides follow an 18.6 year cycle (Cherniawsky et al. 2010). The lantern is intended to be an unobtrusive reminder that calls attention to the river when daily life can disrupt our awareness of tide times and the lunar cycle. It is intended to be inconspicuous, providing a gentle nudge to pay attention to where the water level is, but

without being a constantly visible reminder of past distress. In this way it becomes an artefact for 'active remembering' (McEwen et al. 2017).

Story materials

Physical materials:

Glass jar, cardboard, tracing paper, Arduino Uno, Grove Shield, Grove LED, 5v plug, seaglass

Code (C++):

```
//code by Claire Dean for The Tide Jar, adapted from code by NightAtTheOpera Nano-reef.com. Set RTC
first
#include <Wire.h>
#include "RTClib.h"
#include <Time.h>

RTC_DS1307 rtc;//define a object of DS1307 class
int led2 = 2;
int y, m, d, h;
int l = 255;

void setup() {

  pinMode(led2, OUTPUT); // initialize the digital pin2 as an output.

  Serial.begin(9600);

#ifdef AVR
  Wire.begin();
#else
  Wire1.begin(); // Shield I2C pins connect to alt I2C bus on Arduino Due
#endif
  rtc.begin();

  if (!rtc.isrunning()) {
    Serial.println("RTC is NOT running!");
    // following line sets the RTC to the date & time this sketch was compiled
    // comment this out for the final upload to moon project
    rtc.adjust(DateTime(__DATE__, __TIME__));
  }
}

void loop () {

  DateTime now = rtc.now();
  y = now.year();
  m = now.month();
  d = now.day();
  h = now.hour();

  Serial.print(y);
  Serial.print('/');
  Serial.print(m);
  Serial.print('/');
  Serial.print(d);
  Serial.print(' ');
  Serial.print(h);
  Serial.println();

  // light leds only after 7:59 PM (19:59 hrs) & shut off leds after 10:59 PM (21:59 hrs in military time)
  if (h < 20 || h > 21)
  {
    lightLed (0);
    delay(3000);
  }
  else
  {
    getPhase (y, m, d);
    delay(3000);
  }
}
```

```

}

void lightLed (int L2){
  analogWrite (led2, L2);
}

void getPhase(int Y, int M, int D) { // calculate the current phase of the moon
  double AG, IP; // based on the current date
  byte phase; // algorithm adapted from Stephen R. Schmitt's
              // Lunar Phase Computation program, originally
              // written in the Zeno programming language
              // http://home.att.net/~srschmitt/lunarphasecalc.html
  long YY, MM, K1, K2, K3, JD;
  // calculate julian date
  YY = Y - floor((12 - M) / 10);
  MM = M + 9;
  if(MM >= 12)
    MM = MM - 12;

  K1 = floor(365.25 * (YY + 4712));
  K2 = floor(30.6 * MM + 0.5);
  K3 = floor(floor((YY / 100) + 49) * 0.75) - 38;

  JD = K1 + K2 + D + 59;
  if(JD > 2299160)
    JD = JD - K3;

  IP = normalize((JD - 2451550.1) / 29.530588853);
  AG = IP*29.53;
  Serial.print(AG);
  Serial.println();
  if(AG < 1.20369)
    //phase = B00000000;
    lightLed (1); // set the LED on
  else if(AG < 3.61108)
    //phase = B00000001;
    lightLed (0); // set the LED off
  else if(AG < 6.01846)
    //phase = B00000011;
    lightLed (0); // set the LED off
  else if(AG < 8.42595)
    //phase = B00000111;
    lightLed (0); // set the LED off
  else if(AG < 10.83323)
    //phase = B00001111;
    lightLed (0); // set the LED off
  else if(AG < 13.24062)
    //phase = B00011111;
    lightLed (0); // set the LED off
  else if(AG < 15.64800)
    //phase = B00111111;
    lightLed (1); // set the LED on
  else if(AG < 18.05539)
    //phase = B00111110;
    lightLed (0); // set the LED off
  else if(AG < 20.46277)
    //phase = B00111100;
    lightLed (0); // set the LED off
  else if(AG < 22.87016)
    //phase = B00111000;
    lightLed (0); // set the LED off
  else if(AG < 25.27754)
    //phase = B00110000;
    lightLed (0); // set the LED off
  else if(AG < 27.68493)
    //phase = B00100000;
    lightLed (0); // set the LED off
  else
    //phase = 0;
    lightLed (1); // set the LED on
}

double normalize(double v) { // normalize moon calculation between 0-1
  v = v - floor(v);
  if (v < 0)
    v = v + 1;
  return v;
}

```

Reflections

I didn't realise until I'd made and was testing *The Tide Jar* that in a way I'd made a lighthouse, only here the warning was of the possibility for flooding. Placed in a window, it could call the attention of the inhabitants of the house, and of others nearby, to the risk. The sequence of images is designed to be attractive to look at and tells a simple story that is wide open to interpretation. I'm aware however that the concept, or story of the story, may be stronger than the work itself. There are problems with how it could be received in that flooding doesn't only happen at spring tides. It is not intended to be a reliable flood alert but a call for attention to the river and lunar cycles. There are energy issues, in that the work must be plugged in all the time. It uses a very low amount of energy except when lighted for four hours in total in a month, but a solar panel would be much better way of doing this. Unfortunately, with only limited solar power options available to me at this time, this has to remain a prototype for a solar model for now.

Without using solar power, the lantern wouldn't work during a flood or power cut, but as a prototype it is still useful for the times in-between floods when the risk can fade from memory. The lantern was in part a response to my wanting to address the way local flood knowledge is easily lost in areas with rented properties and transient populations, who may not know of the risks, just as I didn't. There is a conflict of interest where landlords or sellers conceal this information in order to pass the property on. This lantern couldn't practically be left behind in the flood-prone property I've now moved from, but it is an attempt at finding a way to share local ecological knowledge. My many

experiments with jars left me feeling that perhaps a note in a jar left hidden somewhere the landlord wouldn't see it would be of the most use. Telling the next occupant what warning signs to look out for and what steps would help protect them and their belongings would be a more direct form of help than a story could be.

In terms of ecological storymaking, this work points to the absence of shared ecological knowledge that exists in transient urban communities. Oral storytelling once provided a way of passing on this kind of knowledge over time, but without this living tradition, and with the potential for printed information to be used to serve market interests and hide the realities of flood risk, people are left exposed to risks. Unfortunately, those who are most at risk are those who are already most disadvantaged (see p.5). For me, this work is about highlighting these issues as part of a conversation about how knowledge is shared and with who as much as it's about telling an ecological story.

6.5.3 We are Riverish



Figure 46: *We are Riverish*

We are Riverish is a story that won't last. Printed on water-soluble paper the story is made to be found on a riverbank. The text recounts a childhood spent beside a city river and the unexpected things that happen when the river decides it wants to see more of the city. Rather than pretending to permanence as printed books do, this story wants to be read, remembered and returned to the river with the rain.

Story materials

Physical materials:

Water soluble paper, printer ink, glue

We Are Riverish

When I was ten we moved to a house by the river. It wasn't a pretty river. It had greenish walls and dive-bombing gulls. The stench of old seaweed hung in the air. Scraps of plastic and empty cans washed in and out with the tides. Sometimes the rescue hovercraft came clattering up over the stones in the night, lights flashing, to search for someone who may or may not have jumped off the bridge.

The river made mysterious puddles in our cellar that stayed for weeks at a time and then disappeared overnight. It rippled through the wallpaper, leaving behind waves of black damp. We breathed the river in and out until I was sure my insides must be as furry as the back of my Lego box after I'd left it too close to the wall.

The first time Mum got a flood warning we made a boat from a big cardboard box. We pretended the carpet was going to wash us away. The first time there was a flood there was no warning. The best story I'd ever written disappeared from the living room floor. The river came up through the cellar in the night. It snatched everything it wanted and left us some slimy grey sludge.

After the flood, Mum was angry with the river. She kept glaring out of the window at it. Men came with pumps, others came with clipboards. Your warnings are rubbish, I wanted to shout at them. You warn us when there isn't a flood and you don't warn us when there is. Mum said they were trying to help, that trying was all people could do. Her eyes were red with the crying she tried to hide from us. Me and Ben didn't want to move house again. Mum

said we couldn't afford to rent anywhere else anyway, but she never said that when people told her we'd be better off moving. She mumbled as though she agreed with them.

Sometimes, when the water was high I pretended the house was a boat and that we'd float if another flood came and save all our stuff and Mum would be happy again. I learned to watch Mum as she watched the river. She counted days of rain, so she knew when the ground was too full to hold any more. She knew when the moon would be full, when the tide was too high, when the winds were too strong. Mum watched, and I watched her, until I'd start picking my things up off the floor and taking them upstairs before she had to tell me.

The house became topsy-turvy. We stopped carrying all the books and things we loved back downstairs after a flood warning. I spent more and more time upstairs looking down at the river. That was how I realised that sometimes the river got up and walked along the streets.

There was a woman with an orange mac and two carrier bags who sat on the bench across the river every day. She sat there even if it was raining. The first time I saw the river get up it had taken her form. I think the river had been reflecting her for so long she was easy to copy. You could tell the difference between the river-woman and the real woman, though, because the real woman sat very still and stared down into the water, and the river-woman darted about taking in everything. She saw me watching her from the window and waved.

When I was playing out at the skatepark after tea the river woman came and watched me. Closer up, you could see she was

more water than woman. Her skin kept moving and it twinkled under the streetlights. She smelled of soil and wet grass.

I asked her why she took my story. She couldn't answer with words. She gasped at the air and there was a burbling as she tried. In the end she made her reply with things. She placed a twig, three leaves and an empty crisp packet in a row along the top of the skate ramp.

I don't understand, I said.

A month later I found a small ball of paper on our front doorstep. It was too soggy to pull it apart without destroying it, but I knew my story was hidden inside. I held it for a while, but it just made me feel even more sad, so I threw it back into the water.

It took me a while to realise it wasn't just her – the river was many. More and more of them filled the city. I think they must have got a taste for exploring. Sick of creeping up through cellars in the night, they wanted to walk among us and be invited in through the front door.

I began to see them everywhere, especially at high tide. Some were more river than others, but there were always signs: their skin was tumbled smooth, they never stood still, mud caked their shoes and crusted up their legs. Some had faces so cloudy you couldn't see into them, but others shone in the slightest bit of light. They gathered outside the pub with the smokers and waited in the queues at the bus station. They hung around outside the supermarket, getting in the way when people were trying to get to the trolleys.

At first people ignored them, but the riverish listened, and reflected people back at themselves, so people got to like having them around. The riverish left a trail wherever they went. I knew they were trying to talk to us, but I'm not sure anyone else realised.

Twigs, damp feathers, bottle tops, tiny stones. They were small gifts to remember them by, to help us remember they'd return.

The river became more city. And the city became more river. And the people in the city began to change. They picked up stones in one place and moved them to another without knowing why. They began to collect rubbish in particular nooks. You could hear babbling underneath the market-day chatter. Birds swooped through crowds without fear. Sometimes, one by one, passers-by would begin to run and leap, and the movement would pass down the street in a wave.

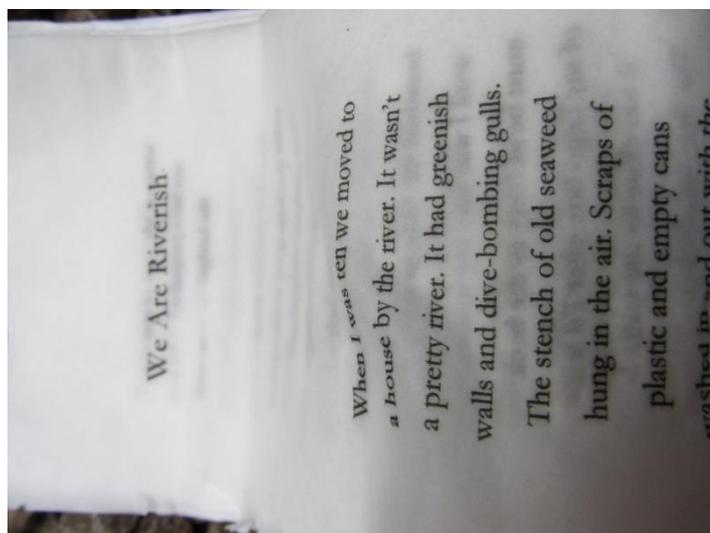
Everyone who stays beside the river long enough becomes a little bit riverish too.

Reflections

Describing the perceived magic of early texts, Ong includes a quote about Tibetan monks, 'printing pages of charms and formulas on the surface of the water with woodcut blocks' (Ong 2012, p.92). There's something about this combination of technology and surrender to impermanence that appeals to my imagination and has stayed with me since I first read about it. During my work on *The Lichen Records*, I'd become very aware of communication over time and how long the *Beowulf* manuscript had survived, yet this project made me think about how books provide only an illusion of permanence. They can be easily lost. Sharing this story in a way that made it impermanent felt like a way of commenting on this. The story is a refraction of my own experiences. Bringing the element of the fantastic to it was an attempt to reach towards the sense of

the river as trickster with will and desires that had accompanied me throughout the project, despite or perhaps because of the more rational scientific approaches I was encountering through the wider project. I've documented the disintegration of the story over a month and it is still in the process of dissolving. I intend to make several more copies and leave them on benches beside city riverbanks, where they might be discovered before they're washed away in the rain.

As an ecological story, this work's use of materials will have a more limited impact on the environment than those using digital technologies. The paper used is non-toxic and biodegradable and the intention is for it to be left outside to disappear. In this way, although the work is printed it has more in common with the ephemerality of the spoken word in the oral storytelling tradition than a printed work. There is something about surrendering a work to the elements in this way that feels very pleasing in terms of its relation to the ecological theme even though it limits the story's longevity.



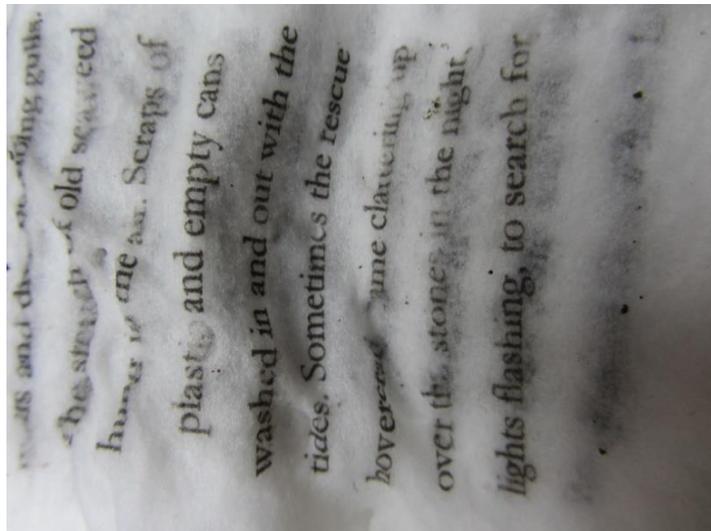
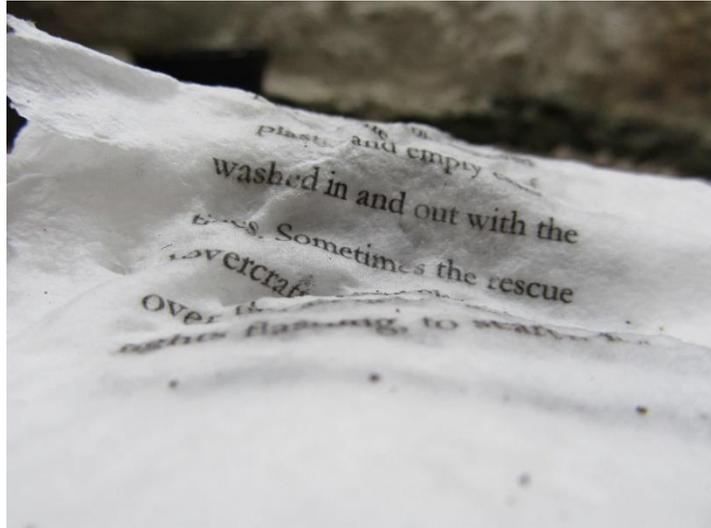


Figure 47: We Are Riverish, June and July 2018

6.6 Discoveries from the project journey

6.6.1 Openness is key

This project brought more challenges to be navigated, with the constraints of being part of larger project and my own experiences holding me back at times. Working with people and agencies with different outlooks and agendas wasn't easy, yet instead of narrowing my focus to what I knew and was comfortable with, I realised I needed to open up to other perspectives. I soon realised that creating opportunities for other people to make and share their own river and flood stories, was a fruitful way to approach this. This participatory approach also helped me to find ways to provide space for what can be difficult stories to tell as there isn't a positive resolution. The myriad stories made by others for *The River Library* provided insights into how members of the public can be encouraged to engage in storymaking and reflection through playful and non-intimidating activities and how this can lead to a sharing of knowledge.

Widening the focus from flooding to the river helped me work with a subject that was challenging emotionally because of personal experience. Paying attention to the river through writing and drawing, and becoming aware of the cycles of tide and moon, helped me to make stories and ultimately helped me to live beside the river without as much fear. With this project, because I knew there wasn't a clear story to tell with a positive resolution the role of experiment became even more vital. Having learned from *The Lichen Records* not to force things, I made many writing artefacts using jars. These were not made to be shared, but as artefacts to make stories with and I can see traces of

them layered beneath both the *The Tide Jar* and *We Are Riverish*. Rather than a focus on output, opening up the space and time for this work as process led to insights into the value of storymaking with ecological subjects that impact directly on our lives and the way opportunities can be created so that others can benefit from this process.

6.7 Project Conclusions

How to Catch a River contributes key insights into working with the tangible impacts of climate breakdown to make stories, the value of material experiment for developing story ideas, and the level of public engagement made possible through the creation of participatory story experiences. It draws on the understandings developed through *Persephone Calling* and *The Lichen Records* of the importance of following subject and materials to make stories. Through participation in a larger environmental project this investigation brings insights into the benefits of collaboration for bringing science and experiential knowledge together through story.

This project contributes to the key research objective of developing a new storymaking approach for ecological storymaking through its reflective use of methods and materials that respond to the subject of flooding and rivers. Drawing became a key method for paying attention and developing awareness and narrative materials. Experiments in the production of writing artefacts expanded the materials available to me for composing and making stories. In sharing elements of the storymaking approach with both the wider *Ensemble*

team and members of the public for *The River Library* I was able to gain confidence in the value of tactile realisation and exploration of story for engaging people.

Identification of ways in which the approach shaped the stories developed can be addressed through reflection on the very different forms of the three stories presented. In *The River Library* and *The Tide Jar*, visual imagery takes precedence over written text and invites writerly imaginative and discursive participation. *We Are Riverish* takes the most conventional form of any story made during the research inquiry except in the manner of its sharing. This shows that significant links can be made between the material body of a story and its text even when the text takes a form more associated with print literature.

Below, I consider insights from this project in response to my research questions:

- 1) How can writing practices be developed with new technologies for ecological storymaking?

Using digital technologies as a way of sharing stories can feel incompatible for some ecological issues. As discussed in the contextual review, it can seem counterintuitive to use these materials if their production will have caused environmental damage (see p.44-5). In the case of flooding, which can lead to widescale technological failures, there is additional tension between subject and medium. Yet being able to interrogate this response is useful for the development of the approach as it makes visible the interrelationships between subject, content, form and medium. Following the subject, rather than being

outcome-driven, means it's possible to be more responsive to these kinds of issues from early on in a project. This gave me the space and opportunity to relate lived experience to the materials and technologies I was working with and to make stories that attempt to respond to these issues rather than ignoring them.

- 2) How are stories changed when new writing practices are developed for ecological storymaking?

The stories in this project are very different, yet each is in conversation in some way with the potential failures of technologies in the face of flooding. Using a material approach to writing practice for this subject led to more visual and participatory forms than in the previous projects. All of the stories are inspired by the value of experiential knowledge and the need for this to be passed on. The forms they take reflect this, but also acknowledge that ultimately our attempts to pass on knowledge using print or digital technologies could be thwarted by the impacts of climate breakdown.

- 3) What does the development of these writing practices mean for the role and continuing relevance of the writer?

This project continues the extension of writing practice that has been core to the approach developed over the previous two projects. Through material exploration and the use of a range of methods, stories are made *with* rather than *for* technologies. Here, the role of writer also involved making opportunities for others to create and share stories in a public setting. This felt

like a positive way to respond to a difficult subject. Finding ways to make ecological stories has been a continuing learning process and although insights can be carried forward from one project to the next, each subject brings its own challenges for a writer.

~

How to Catch a River provided an opportunity to bring the approach I'd been developing into spaces where I was working with others, which opened up the practice to other people's perspectives. The responses from those I worked with and the stories developed gave me confidence that it was time to take the approach into a workshop setting in order to explore and develop it further with the insights of other practitioners.

6.8 Material writing practice for ecological storymaking: the approach developed

Considered together, the three projects – *Persephone Calling*, *The Lichen Records* and *How to Catch a River* – demonstrate the wide range of possibilities for practice and stories that can result from a material writing practice that prioritises process. By focusing on the ecological subject and developing process from there – rather than working towards a pre-determined technological outcome – new opportunities for storymaking emerge. All three projects resulted in the making of stories. These stories take markedly different forms,

yet all use physical materials as part of the fabric of the story. These are, to use Le Guin's term, 'carrier-bag' tales – in contrast to linear stories of a hero's dominance over nature, they are non-linear, minimal stories from multiple perspectives that aim to invite imaginative participation, curiosity and exploration from the reader. The synthesis of story and materials is central to this way of working and its development was made possible through constant reflective movement between the ecological subject, imagination, materials and technologies as I extended the role of writer to maker.

Using a Practice as Research methodology, reflecting in, on and through writing practice over the three projects, has led to the development of the following approach to storymaking for ecological stories:

6.8.1 Finding ecological connection

This approach challenges the common perception of a writer working alone at their desk. It asserts that the context of storymaking matters and that to make stories that respond to disconnection from the living world, writers need to reflect on and address their own disconnection. The conventional role for writers as content creators can be linked to the disassociation of text from the material realities of process, production and the sharing of stories. These projects make visible fruitful entanglements between engaging with material practices and connecting with ecologies. During *Persephone Calling*, I learned that spending time outside and paying attention to other living things meant I became more connected to my environment and gathered more materials with which to work. The storymaking process was shaped by my encounters as I

sought out other living things in the city. Following curiosity and cultivating awareness of an ecological subject through material practice results in a feedback loop between story and subject that shapes both process and story. This helps create paths towards connection to wider nature for the writer with the aim that these can be shared with the reader too.

6.8.2 Engaging in material practice

This approach suggests that writing is an inherently material practice. Writers are often cut off from a realisation of this because of the focus on text in their work and the specialisation mode prevalent in mainstream publishing. This research shows that stories are shaped by the tools and materials we use to make and share them, whether this involves a computer or a handful of leaves. By focusing on the material realities of practice and expanding the writing process using materials and methods that relate to an ecological subject, new ways of working can be developed. Technologies become one kind of material among many, rather than a determining focus at the outset of a project.

In *The Lichen Records* I explored time, light, language and air pollution as materials. Each was worked with and made visible or tangible through the writing artefacts and stories made. The anticipated attention of the reader is also considered to be an element that can be worked with and gaps are shaped for it in the works produced. Direct and conscious engagement with materials means the writer can consider the ecological sensibility and appropriateness of a material for sharing work on a subject. Energy use, ethical production and sustainability of materials are all essential issues for consideration. There is

often no straightforward answer to the questions these issues raise but working through them as part of an engaged making process is preferable to remaining oblivious or pretending that the issues don't exist.

These explorations characterise the phases of storymaking as beginning, gathering, seeking, making with technologies, and sharing stories. The materials used in the gathering and seeking stages can also become the materials used in making and sharing a story. The interconnection that characterises this way of working leaves traces of the process visible in a work, so they can be read there along with the story.

6.8.3 A focus on process rather than outcome

Working in this way requires a focus on process without a pre-determined shape for a story in mind. Here, the technological means for sharing a story does not determine how a story is made, what it contains or what it is made from. Instead, a focus on the ecological subject matter and material practice can suggest and inspire ways of working. For example, working with light and time as materials for *The Lichen Records*, and wanting to find ways to make them tangible, led me to exploring photography as a way to capture a representation of time, which then took me to the method of solargraphy. Responding to the subject of the story and following materials reflectively leads to further experimentation. All three projects required space and time to allow this experimentation to happen. Failure is not possible as every part of the process contributes to the understandings that shape the work and future explorations.

The phases of storymaking identified in these projects are not isolated from each other – their boundaries are fluid, and all inform each other. *Beginning* involves establishing the ecological subject for a story, being open to curiosity, intuition and chance to find a subject that inspires the writer. *Gathering* involves gathering materials of all kinds that relate to the subject. Drawing and walking have been used as ways of gathering ideas and physical materials in all three projects. In *Persephone Calling* drawing and walking also became key methods of composition. Thinking through drawing, making with clay, photography and weaving all provided insights and ideas as gathering materials moved towards seeking a shape for a story. *Seeking* involves working with physical as well as narrative materials to develop both story and design ideas. The making of writing artefacts is a key part of this process. These works are not necessarily intended to be shared but are ways of working with materials to explore possibilities. Moving from seeking to *making with rather than for* technologies involves not privileging technologies but exploring their capabilities and using them as materials to help shape the story in ways that relate to its subject. *Sharing* stories involves making work that invites the imaginative participation and engagement of readers. The stories are the outcome that is made visible to the world, but they are inherently shaped by the processes that led to their making.

6.8.4 Remembering that technologies shape stories

Conventionally, technologies shape the way stories are made, shared and received. The ways print technologies do this have become invisible to us

through familiarity. The emergence of new technologies helps us to reflect on the impacts of print in addition to opening up an exploration space for new possibilities. Rather than letting the technology determine the shape of an ecological story, this approach proposes that evocative interrelationships between subject, content, form and medium can be established by responding to subject and materials, and by making *with* rather than *for* new technologies. Ongoing reflection-through-practice uncovers assumptions in existing writing practice and creates the space for further development of process. With this approach, the aim is not to conceal any technology involved, but to make it visible in acknowledgement of the role it plays in the writer's process and the reader's experience.

~

Together, these four elements establish a very different approach to making stories to the dominant practice that results from print publishing. Having developed this approach through practice, it was essential to find out if other practitioners could relate to this way of working. To gain insights from others, and further reflect on and develop the research, I designed a workshop for practitioners. This workshop ran twice at Lancaster University in April 2018 and is documented in the next chapter.

Part 2, Chapter 7: Making Wonder Tales Workshops

For as long as I've been an artist, I have felt part of communities where bartering and collaborating are critical parts of growth. Cross-pollinating is how ideas spread and get expanded upon. Sharing what we can is how we help each other thrive on this messed up planet.
(Fake, E. 2013)

Writers work within a community of practice. 'One never writes alone,' say Manning & Massumi, citing Deleuze and Guattari's assertion that one writing alone is already a crowd (2014, p. viii). It is easy to forget when working at a desk by ourselves, but we always write in discussion with other writers and their work. However, this is a distant relationship, not one enlivened by conversation in the present moment. A workshop provides a space for practitioners to work together for the development of practice, peer review and critique. In the context of this research, the aim of the workshop was to provide the opportunity to explore and reflect on other practitioners' responses to the approach I'd developed. This was achieved through the sharing of materials and examples of writing artefacts and stories from the research and through inviting them to participate in a series of exercises. The exercises were designed to introduce them to material writing practice and encourage reflection on connection with wider nature. The participants were asked to consider the approach in relation to their existing practice and to participate in discussion

on the making of ecological stories. This section documents the workshops and reflects on the key insights that emerged from working in this way with other practitioners.

7.1 Workshop context

Running workshops in community and educational settings has formed a key part of my professional practice as a writer. In a creative writing workshop, it is usual to focus on a theme or technique and create the space and opportunity for development, understanding and learning through practice. Both workshop leader and participants make discoveries together through a series of participatory exercises and participants can share what they create and reflect on the process through discussion. I knew from experience that workshops are spaces for experiment, conversation and the beginnings of work. It is very rare for someone to create a story or poem they feel is finished in a workshop environment. With a successful workshop, participants take away work for further development, as well as new ideas and inspiration. With these workshops, it was important for me to understand how the practitioners approached storymaking in their existing practice, and how they related this to the process I'd developed. I wanted to find out how they felt about the methods and the writing artefacts they made and whether they were inspired to take anything forward in their work.

The theme I set for the workshops was birds. The subject was selected because most people will encounter birds every day, even in urban environments. We take their existence alongside us for granted and yet more

than a quarter of UK birds are now on the Red list for endangered species and some of our most familiar species like house martins, song thrushes and starlings are facing steep population declines (Ross-Smith 2015). The room on the university campus I booked for the workshops has floor to ceiling windows on two sides, which look straight out onto a pond frequented by moorhens, ducks and the occasional heron. The building is bordered by narrow strips of woodland, giving easy access to outside space.

I designed the workshop to last three hours and ran it twice, anticipating that I could bring insights from the first workshop to the second. The workshops were audio recorded and photographed. I made notes during the workshops and afterwards I made selective transcripts from the audio recordings. These transcripts document key moments and conversations that relate to the approach being shared. Engaging in selective rather than full transcription was essential due to the practicalities of the workshop setting, which was at times dispersed and involved overlapping conversations. This work recognises that 'transcription is a selective process reflecting theoretical goals and definitions' (Ochs 1979, p.44) and that transcriptions are always representations and so can only give us, 'a restricted, selective perspective' (Duranti 2006, p.309). To gain a fuller picture, I've considered the transcripts in relation to my reflections on the workshops, the writing artefacts made, and the participants' answers to a series of follow-up questions. From this process I've been able to draw out several key themes for discussion.

The overall workshop design was the same for both workshops, although I responded to the interactions and conversations that emerged. The individual

participants, their engagements with each other, the different size of the groups and even the difference in weather all contributed to the two workshops having a different feel. The first was characterised by a meditative quiet as participants focused on making and shared insights with each other after rather than during exercises. The second was threaded through with more interaction as people discussed what they were doing as they worked. Despite the different character of the workshops a number of remarkably similar insights emerged from both.

7.2 Workshop participants

7.2.1 Recruitment

The primary means of recruiting workshop participants was through the social media platform Twitter. As a writer, I use Twitter daily to network with peers and there is a significant literary community who are generous in sharing opportunities with others both on and off the platform. I had intended to use additional means of advertising, but so many people signed up after the initial call that I wasn't able to advertise further. I had set a maximum number of ten participants per workshop based on my experience of running writing workshops. This number allows for a mix of perspectives in the room, while remaining intimate enough to encourage sharing and discussion. For the first workshop, nine people signed up and eight attended on the day. For the second workshop, ten people signed up but after several last-minute cancellations five attended on the day.

I was also contacted by several people who were not able to attend but who wanted to find out more about my research and to be kept-up-to-date with

the findings. These included storytellers, writers and conservationists from across the UK and Europe. This response showed there is widespread interest in this way of working and the insights that can be drawn from it.

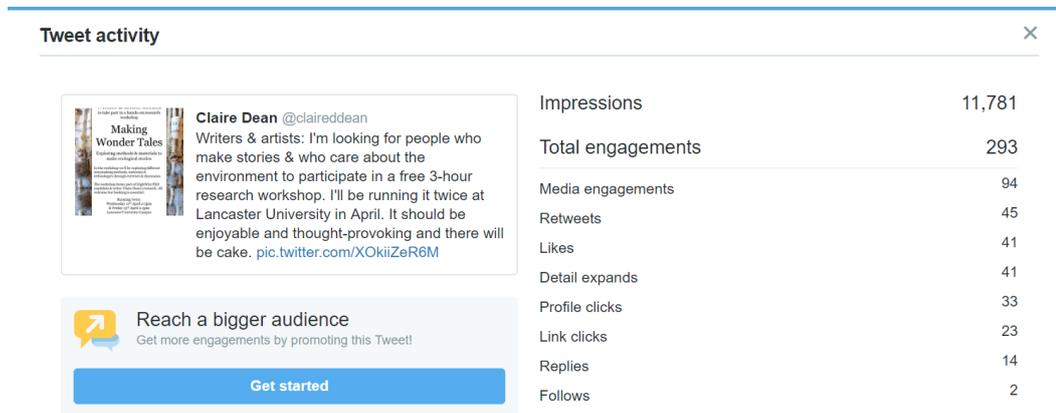


Figure 48: the analytics for the call for participants I shared on Twitter

7.2.2 Participant backgrounds

The call for participants addressed writers and artists but purposefully did not qualify these terms further – for example by asking for signs of professionalisation such as publication, exhibition or academic affiliation. Making sure the call was open and public-facing fits with the ethos of the research and two of the participants specifically thanked me for the open nature of the call. Of the thirteen participants, ten identified as writers. Of these, four were currently in postgraduate education. Three of the ten were poets. Five were involved in teaching in university or community settings. One described herself as just having written all her life. Two of the writers also had other backgrounds, one was a historian, the other a media artist. The three remaining participants identified as a media artist, a designer and a dancer.

7.2.3 Understanding participant approaches to process

At the outset of the workshops, participants were introduced to the concept of a portolan chart, a medieval seafaring chart that is characterised by its practical application. Made by sailors for use by other sailors (Harvey n.d.) these charts detailed coastlines and aided navigation by future seafarers. The charts provided a useful analogy for the mapping of creative process by practitioners, providing participants with a way of articulating and sharing their process with each other. Participants were given a piece of paper with a faint line reaching across it and asked to chart the typical creative process they used to make a piece of work from a point of beginning to a point of sharing.

The paper included a faint line to give people a place to start from and to help dissipate fear of the blank page. I was also expecting it to provoke writers, as in my own experience process is rarely linear. The resulting charts are patterned with swirls, loops and arrows and give a clear insight into how much is shared across different people's approaches. By layering excerpts of text and traces of movement from all the portolan charts to make one drawing I was able to make this visible (see fig. 49). Beginnings start from something small, a moment of unexpected inspiration that could take various forms including chance encounters, responses to image or text, emotions or sensory experience. This is followed by a stage of gathering, collecting materials, talking, walking bursts of inspiration, exploration. Out of this stage come loops of uncertainty, backtracking, and muddles. Self-doubt and failure appear, but the swirls of movement continue as work is woven together. There is learning, revision and making as people move tentatively towards sharing.

The charts share an overall shape of a gradual opening out and tangled expansion before narrowing down to something that can be shared with someone else, usually a trusted reader or editor. This point of sharing was still considered a step on the way to something else. As one participant noted, 'I don't think any of the things I make are finished. I come back to them even if it's a few years later'. In this research, I've identified, beginning, gathering, seeking, making and sharing as phases of storymaking. It was interesting to note that although the specifics of language differ, all participants broadly followed this same movement from a starting point, to gathering ideas, to opening out through the exploration of ideas before narrowing back down to make a text that can be shared. The key difference lies in the focus on material practice and experimentation in this research.

7.3 Sharing materials



Figure 50: sharing materials

Materials were placed on tables around the room for participants to engage with. I chose not to give a screen-based presentation on my research, which would have given a secondary experience of the work, but to enable participants to handle and engage with it directly. A wide selection of work was displayed, including sketchbooks, notes and other writing artefacts, and prototypes of the stories at all stages of development. Participants were encouraged to explore the work and I was able to draw on it in discussions, but I made it clear I wasn't providing a pattern for how make a particular kind of story. I was creating the space and opportunity for them to work with the approach I'd developed, albeit in a condensed form, to make their own stories.

A small printers' tray was used to display the kinds of materials I've been working with. The compartments held a mixture of found materials like feathers, egg shell and seeds, media like charcoal, pastels and ink, sensors and wires. Materials were presented in this way to reduce any sense of hierarchy between them. A dedicated table contained materials for participants to work

with during the workshop. A larger printers' tray contained a wealth of found materials and tools like needles and thread, scissors, and a dip pen. There were jars of ribbon and string, luggage tags, clay, crates of paper, card, wood and fabric. These were leftovers and scraps from the research inquiry, and from previous projects, which I keep and reuse as part of a sustainable approach to practice. Working with an ecological mindset means ensuring nothing is disposed of as rubbish – seeing leftover materials as being imbued with potential rather than as waste. The table also included excerpts from bird-related texts, including academic papers, folklore, magazine articles, poetry and song lyrics. Books on birds were placed around the room. The environment was intended to feel like a treasure-trove of materials the participants could select from and explore with.

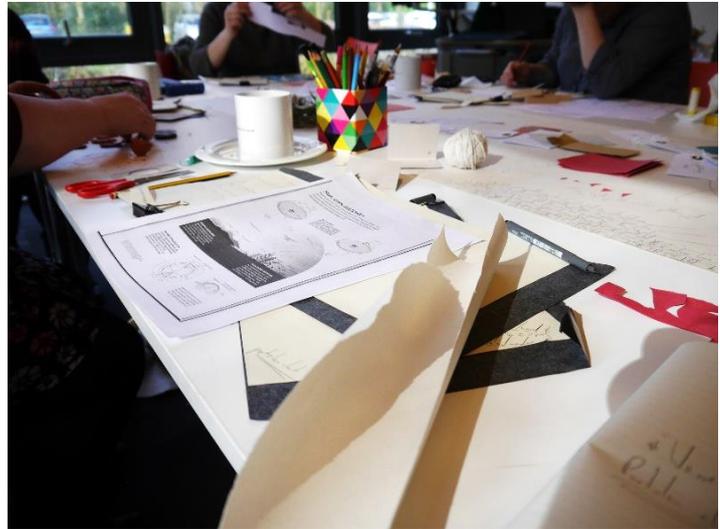


Figure 51: materials to draw from

7.4 Sharing process

Participants were led through a series of three exercises that related directly to the approach to storymaking outlined at the end of the previous chapter.

Participants were encouraged to find ecological connection through spending time outside and gathering materials to work with; to engage in material practice, responding to the subject they'd chose through material exploration; and to focus on process rather than on working with a predetermined, technological outcome in mind.

Exercise 1

Participants were given a small board with paper and a pencil and a ribbon of text attached that said, 'Find a bird or a trace of a bird ~ draw, follow a trail, capture birdsong'. People were made aware they could go outside to do this.

They were encouraged to seek out, follow, draw and mark make, to go outside with a sense of possibility and be open to following whatever happened. The intention was for them to engage directly with other-than-human nature and begin to gather materials, imaginative and physical that they could bring back to work with.



Figure 52: bird traces, exercise one

Exercise 2

Participants were asked to select from the materials they'd gathered in the previous exercise and share them with the group on the paper lining the tables. They were also encouraged to begin to draw from other materials around the room. The intention was for participants to make visible for each other the kinds of gathering they'd undertaken and share insights. They also began to make choices at this stage by identifying what materials, both imaginative and physical, they were most drawn to working with.



Figure 53:
exercise two

Exercise 3

Participants were encouraged to take something that emerged from the previous two exercises and to begin to explore the possibilities for it as a story. It was made clear that this was making to discover and not making for sharing with the wider world, and that the focus was on process. They were asked to follow the subject they wanted to write about and to begin to experiment with materials they felt could help them respond to this subject. The intention was to share, in very condensed form, the seeking and making stages of my

research. The focus was on process and open-ended experimentation, to uncover possibilities for story they may not have considered otherwise.

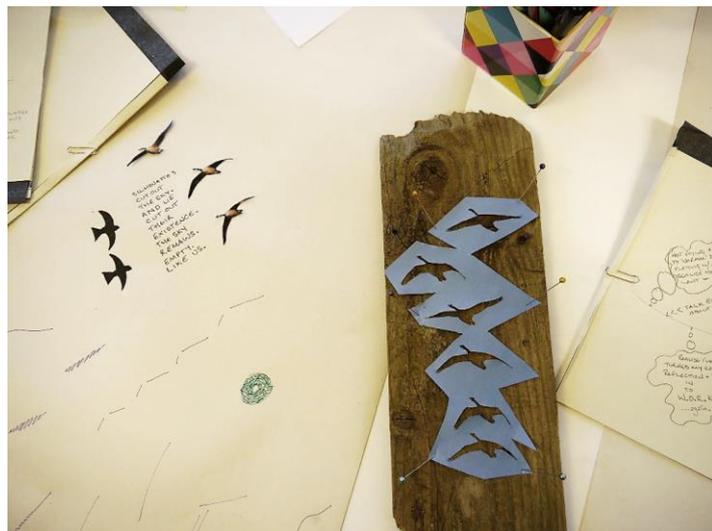


Figure 54: examples of participants' work



Figure 55: a participant's nest knots

7.6 Discussion of key themes that emerged from the workshops

7.6.1 Hearing silhouettes: the importance of going outside



Figure 56: hearing silhouettes

Most participants spent some time outside during the first exercise, and some also went outside during exercise 3. This clearly had significant impact on those who took up the opportunity. As one participant noted, ‘I stood here, and I was like there’s no bloody birds out there, but then I went out and there’s actually a lot of bird song.’ This sentiment was echoed by others. Birds remained invisible from inside at first, although later in the workshops people started to notice the birds through the windows as well. Being open to chance encounters was key. Going outside for the purpose of the exercise rendered visible and audible what had not been noticed previously. Participants brought back notation of bird song, feathers and twigs. ‘It was really great just to do things, not be at the desk but actually going outside and making things – engaging with the world rather than sitting in a self-judgemental bubble,’ noted one participant.

material in participants' storymaking. This tended to occur associatively, so when one participant saw a blackbird outside it reminded them of one they'd seen nearly being hit by a car that morning. Other participants shared stories of recent memories: one talked about the eider ducks she'd seen that morning, another shared seeing turtle doves from a family member's bedroom window the previous week, saying, 'it was just lovely one of those really nice moments where everyone's taken out of that moment into a different kind of moment.' For other participants, engagement with materials provoked memories from childhood: rough crumpled paper became a mountain for a participant who then worked with her memory of seeing an eagle in the Cairngorms, another made an owl pellet from clay and bits of shell, twigs and fibres, remembering picking apart the ones she found in childhood. Another described how with what she'd made she'd, 'started off with thinking about nests that I've known and that I've remembered throughout my life.'

Another aspect of memory that came up in both workshops was the sharing of bird knowledge between participants. The discussion of blackbirds led to a participant sharing that, 'they're one of the highest roadkills.' Discussion of how badly birds were being impacted on by building work on campus reminded a participant of, 'seeing the nets that they put over the hedges to prevent the birds from nesting.' Another participant responded: 'I've seen that in so many places recently and I was saying, what are they for?' The many layers of knowledge, both scientific and cultural that people carry with them became apparent through the workshops. This is encapsulated in the

following exchange after we'd all witnessed a heron being chased by a crow outside:

'Mind you crows bully.'

'They're very clever'

'And they're tricksters'

7.6.3 Absent nests: everyday relationships with birds

Participants shared many stories of everyday encounters with birds during the workshops. It was clear this constituted another kind of knowledge that people then worked with in their storymaking. Participants discussed noticing when migrational species like swallows arrive and discussed changes to this. People's responses to stories about negative human impacts on birds were very empathetic. This was evident in the language they used: 'It bothers me this year because of the spine... the space has gone, they can't nest there,' one said about building work on campus; 'It made my heart stop,' another participant noted about a blackbird nearly being hit by a car. Remembering a male hen harrier who pirouetted above a local hillside all through the previous summer without find a mate, a participant said, 'it's just unbearably sad and I was thinking what would you say to him?'



Figure 58: absent nests

7.6.4 Mrs Greenlegs: the value of names

The naming of birds came up in both workshops as a topic of discussion. Several participants talked about not being able to remember the names of birds saying, 'I'm not very good at naming,' and, 'I can never hold on to the names of plants and things,' and one participant talked about how they had lost the names they'd known in childhood. The use of personal names for birds came up in both workshops. One participant seeing a moorhen outside the building said, 'I used to live by the canal. I used to call them Mrs Greenlegs.' In workshop 1, there was lengthy discussion about giving birds individual names rather than referring to them by species to encourage a public response when they are persecuted. 'I think that's the reasoning behind giving rare birds names, isn't it, so that you relate to them as individual birds rather than a golden eagle or an osprey?' said one participant. That this practice is frowned upon by some conservationists was clear from a story another participant shared about a conservationist being horrified when asked what they called a particular osprey. This participant noted that naming can be seen as anthropomorphising and that this can be damaging if we only see other living things in terms of the human. She described the benefits too, though, saying it, 'can generate empathy and connection, and it's keeping the awareness of the other within that.' From naming, the participants reached the concept of narrativising the existence of a bird to provide connection:

'You can say you killed B1471 or if you say you killed Bob...'

‘Bob the eagle who’d flown all the way from ...And everybody’s going, oh no poor Bob. Make a story for Bob really, isn’t it?’ There was wide agreement in the room with this idea.

7.6.5 Nest knots: language and birds

Discussions of the language we use in relation to birds and wider nature came up frequently in both workshops. Participants were working with language as one of their core materials in the workshop, both in sharing stories vocally and making with these stories by combining physical materials with words.

Participants discussed the perceived divide between humans and other animals. There was recognition that the language we choose to use, or as one participant put it are ‘conditioned to use’, impacts on how we perceive our relationship to other animals. Examples during the workshops included birds being referred to as people and birds making ‘overhand’ knots in nests. One participant noted:

...it’s integral to remember we are human animals, so if you can get more into your body... it becomes easier to write from that place. Rather than having to sit intellectually trying to show how there is no distinction you have to be the absence of distinction.

This perceptive comment emphasised that other ways of working are needed if we are to reach towards telling other-than-human stories.

Participants navigated the challenges of making bird stories both with and without language. Recognising and acknowledging human nature while reaching towards imagined bird experience was a common way of working.

Several participants articulated evocative concepts shared by birds and humans, like home, journeys and migration. These felt like bridging images that helped

people reach towards bird experience from within their own. Participants repeatedly acknowledged the difficulty of imagining bird experience, but the communal atmosphere of experiment and play seemed to help with this. A participant described afterwards how, ‘the workshop encouraged me to think of the non-human world from a bird's point of view.’

Notation was used by many of the participants in exercise 1 as a way of capturing bird song and traces of their movement such as ripples in the pond. These marks became a language of their own, which could then be shared with the group. In one instance the marks two participants had made were almost identical and they delighted in the fact they must have been hearing and translating the same bird. One of the participants explained why she'd drawn the marks rather than write out the song phonetically as several other participants had, saying that with words you can't,

...hear the sound of it and the pace of it... I have tried to write down dee doo dee doo and then I look at it and I've been like I don't know what that says, it doesn't make any sense to me at all, so [making marks] was a visual way of trying to capture it.

She was surprised to find she remembered how to sing it when she came back inside.

7.6.6 Knitting with twigs: material encounters



Figure 59: knitting with twigs

All participants expressed enthusiasm at having the chance to engage with so many different materials and the majority said they wouldn't ordinarily work in this way. There was recognition that for many people material play is left behind in childhood. One participant said, 'All these smells remind me of my childhood... I feel like I've gone back in time.' Participants took time to explore the characteristics of different materials and the impact these had on the ways they worked. A good example of this was the dip pen and inks that all the participants experimented with in workshop 2. Their enthusiasm for it was passed on to each other: 'Does anyone want a go with this dip pen, it's AMAZING,' one participant said. Another acknowledged that it made them write much more slowly and a third participant responded, 'it's a really radical act to slowly write with a pen in itself.'

Some participants were unconfident in working with different methods and media saying things like, 'I can't really draw but I'm drawing,' and, 'I wish I could actually draw but hey... I'm trying'. The key thing was that participants

did give it a go and all expressed enjoyment in the process. Allowing for uncertainty and following the materials and associations they provoked worked well for several participants. One said: 'I had no idea what I was going to do, I didn't even know I was going to come back to these fragments of maps and things, but then I saw [that paper] and just crumpled it up... so it started with the mountain...'. While another acknowledged, 'Material exploration is important in my work, but it usually comes later.' This participant, who had attended an art school, felt there were similarities in the workshop to a fine art approach to researching materials. Coming to this research as a writer without any background or training in fine art, it is striking to me that working with a material focus in writing speaks so directly to the long tradition of materials research in art. This highlights how conventional writing practices, with their neglect of materiality, may be missing myriad opportunities for cross-fertilisation between artforms.

Participants used what was available in inventive ways and it was interesting to see how ideas sparked around the room. One person sewed paper together and then another began sewing pathways on a map. One participant gathered twigs to make nest knots and another then used two very fine twigs to knit. Printed materials were cut up and altered in ways I hadn't anticipated as everything available to participants became another material to be worked with. One participant said they 'chopped up some of the scientific texts that were provided and then tried to write in a different language register.... It's got a very different tone to the factual information.' For many participants there was a clear connection between material engagement, emotional response and the

intent behind their storymaking. One participant said: 'I can't believe I'm doing this. I'm cutting birds out of existence, which is kind of the point, but I'm cutting birds out of existence.'

The fragility and instability inherent in some of the materials and constructions people were making prompted them to reflect on how this related to the content for their stories. This is illustrated through the following incident during the sharing of work in workshop 1:

This is an oystercatcher's foot and it was going to get bigger and bigger and bigger and each one is a question and this one you'd need a microscope to get all the little layers out, but once it's built up how do you get all the bits out? Unpicking. It's about unpicking questions [the work fell] It's unstable and fragile...

Another participant commented their ducks were 'lacking in integrity.' When a second participant responded that, 'they need to do a bit of work on themselves', the first said, 'Well that's what the whole story's about in fact... maybe it's fine.'

The value of foregrounding material practice was recognised by participants. One said: 'matter in your hands it completely changes your engagement with the world...it's secondary engagement, isn't it, to be doing it through words?' Nobody expressed disappointment in their encounters with materials, but a couple of participants said they were frustrated that the workshop wasn't longer, with one saying, 'I definitely wanted more time to play with materials.'

7.6.7 Dissolving words: making writing artefacts

As the workshops were oriented towards process and exploration participants made works that could be more appropriately characterised as writing artefacts. When sharing what they'd made, all the participants articulated and reflected on the process and how and why they'd ended up with what they did. Several participants made work that included concealed text and so had to be physically explored to be read, but there was also a sense that texts were hidden because they existed primarily for the writer at this stage of development.

There was discussion in the first workshop of whether, if the works were taken forwards, there would be a memory of the process present in the work. One participant had explored water-soluble paper and after inadvertently dissolving most of her text had rewritten and attached it, but she was unhappy with the outcome. 'I know the whole thing is quite ugly, but it has an integrity... and that doesn't fit its integrity, so it needs to not be there... that's where a title comes in handy.' There was a sense that explorations could lead to the making of very tactile stories. A participant who has a visual impairment wanted to go on to further explore making tactile and audio work, explaining, 'I wanted to try and do it raised with felt and materials...So you can trace the path of the bird.'

7.6.8 Connecting paths: uncovering possibilities

One participant commented after the workshop that they liked the way technology was presented as just one of many materials that could be used for making a story. Presenting materials in this way and using my work as an

example of a possible approach to working with technologies enabled participants to see different ways of making stories without having to have technical knowledge or a predetermined outcome already in place. As one participant commented, it was an opportunity to ‘see some of the technology I might use to bring my ideas to life.’

During the workshops, participants engaged with technological materials in different ways, one participant used wires and a Bare Conductive board as part of a storied map she was making, creating a circuit without realising she was doing it. The board represented a city for her and she’d chosen to use wires as pathways. A participant with visual impairment was excited by the use of touch to trigger audio files in *For Hades* and wanted to know if you could make a book using the same technology. Being part of the workshop meant she’d encountered a possibility for stories she’d had no idea about previously. Another participant commented:

I'm absolutely fascinated by the connections between creativity/writing and tech. It's something I would never have thought of, and I think it opens up a whole new world of possibilities.

Several participants talked about the way the workshop set-up reduced divides between ‘natural’ and humanmade materials. One commented: ‘I particularly like the fusion of technology with nature and the questions it poses.’ Another commented on this in relation to the examples of my work I shared, saying the stories had:

...an ecological sensitivity about them in that whilst they were functional and lasting, when engaging with them I (and others that I was watching!) handled them gently and with care, because it was evident they were handmade and had taken

time to be created and put together - which gave our handling of them a gentleness and softness which I don't think we usually use when approaching technology...

I'd anticipated that some participants may see the technologies as distancing readers from other-than-human nature. This did come up in terms of computer and smartphone use, but participants overwhelmingly seemed to recognise my research as attempting something different. A participant wrote afterwards:

Stories can inspire change. Linking stories with the environment and then engaging people with technology seems like an interesting way to engage people with impact in a tangible way.

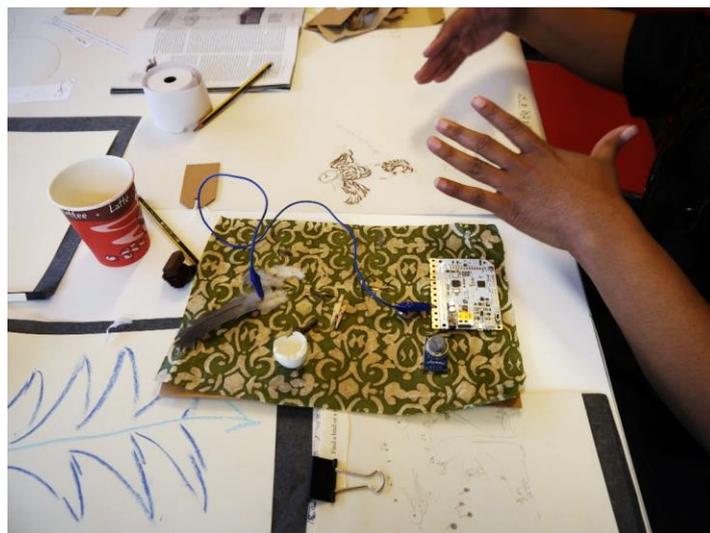


Figure 60: connecting paths

7.6.9 Making space

The importance of the workshop environment to people's engagement with the process was very clear from feedback after the workshop. One wrote, 'Claire created a warm, welcoming, and safe space for exploration.' Another noted, 'Different working cultures and environments can strongly affect process. I find

it difficult to work in this way in my shared office because it isn't the cultural norm.' The set-up proved to be overwhelmingly inspiring for participants, who were able to move away from their everyday processes and try out new things.

One said,

When I write, I like solitude... Because we were telling stories in different mediums, I was able to create in a more public space. Also, because it isn't my usual medium, I felt more free to experiment and imagine.

Another commented that 'having a playful, curious approach was really liberating - it made me more productive than if I approached it as "work" or as a "practice".' Several participants talked about feeling like they need to give themselves permission to work in this way, but that they felt they could now go away and do that. In workshop 2, one said:

It's so inspiring I just feel like it really opens up your creativity getting away from the screen... I always have a notebook, I always have numerous posh pens... I really think getting a bit more tactile and drawing and not being just so linear is really nice I feel I can take that away and explore that myself and go to the art shop and get a load of stuff and be more messy.

The group setting and the space it allowed for discussion, sharing insights and the cross-fertilisation of ideas gave a real sense of the value of community to writing practice, in what can often be a very solitary occupation. Participants also acknowledged the benefits of the transdisciplinary nature of the workshops and were fascinated by each other's ways of working. One wrote afterwards, 'I enjoyed the workshop, particularly the disciplinary mix that made for interesting conversations and observations on process.'

The desire for a dedicated space to work in this way came up repeatedly as participants recognised working with materials takes space. In workshop 2

one participant said: ‘we all want to have a table a mess table... in fact can you just keep running the workshops?’ and another participant wrote afterwards, ‘it has made me ever more sure that I need a room of my own and two desks - one for writing and one for play’. As well as the need for physical space there was recognition of the need to make time in our lives to work in a process rather than goal-oriented way. One participant summed this up when they wrote: ‘So much of it seems to be about ‘Creating Space,’ space to play, mental headspace, that interplay between mindfulness and critical detachment.’

7.6.10 Responsibility and the role of the writer

In the second workshop an interesting discussion emerged during the sharing of work about the role of the writer in relation to making stories that respond to ecological crises. One participant talked about ‘how we often only think about climate change in terms of apocalypse, dystopia, end of everything... we need other ways of trying to think about, to write about these issues that aren’t post-apocalyptic novels.’ The participant wanted to explore ways of working with the idea of small changes instead. Participants discussed the difficulties of comprehending the impacts of climate breakdown over the timescales involved, and a participant contributed their knowledge of Parks Canada’s approach to making and revising policies to always cover 100 years. The group discussed the vital role of long-term thinking in the face of so much short-termism and apathy. Another participant said:

...it’s a responsibility I think isn’t it for people writing? That’s not to say... I mean it’s all game to write about... but it’s a consideration in how powerful it is and how people are going

to absorb that into their attitude of what's worth doing, what their role in it is...

This was another instance where the group setting was beneficial as participants were each able to feed in their thoughts, emotional responses and knowledge relating to the subject. The issues, which can feel overwhelming to individuals, were instead approached and discussed with the support of the group.

7.6.11 Process matters: participant reflections on the approach

Participants had an overwhelmingly positive response to the approach shared and to their experience of participation in the workshops. Working with a focus on process rather than outcome was considered by several people to be a novel and enjoyable experience. As one participant noted, 'I loved that there was no outcome we were expected to achieve – the process was the point and it was very freeing.' The workshops introduced several of the participants to new ways of working. One participant described how, 'The processes were quite new to me and opened up my practice in a number of ways – starting with looking, making, using objects, visual and creative arts.' Making with clay and found materials and drawing seemed to particularly inspire people:

I don't usually use drawing as part of my practice, though I have always 'gathered' as Claire describes. (I do a lot of research and reading before writing or during writing). For me, a more visual approach and the use of images and drawing as part of the process was really inspiring.

That this could be a way of approaching writing was a very new idea to many of the participants and several articulated the value they found in it:

I found the process very engaging and thought provoking. I hadn't considered working in that way for my own writing.

I liked the experimental nature of the processes. I always revert using more conventional processes to generate work. A Colleague used to say, if you always do what you always did, you will always get the same, and the workshop was a great example of this saying. Use different methods to get different results.

The workshops had an impact on intentions for future work for several participants, showing the approach could bring insights to their own practice. A number planned to work with drawing and materials-led approaches again.

One wrote afterwards:

I immediately went out and bought some graphite pencils and a sketch pad. I realised that there is something important in the looking that is done when drawing. It makes me look much more carefully when I draw something. And this looking and detail is so important when writing about nature or ecology. I plan to use more drawing in my creative practice and process.

The workshop offered some of the participants new perspectives on work they were already developing, providing the space to try new things and highlighting perspectives they hadn't considered:

It was exciting...It linked a little bit back to my work... I'm looking at knots and Tim Ingold looking at knots and creating centres and how we can create centres with movement two lines converging...But I haven't actually sat down and done knotting with my hands, so it was really helpful.

I think what's come out of it for me... my PhD is about the north and I've suddenly got this whole other area to look at which could be migration routes or even that birds-eye view and what's happening to them... And also, where the birds might stay or rest in the north of the UK... I'm really excited about this because I've got a whole other avenue to think about.

Participants took the opportunity to engage with the stories I'd shared, and this provided a valuable opportunity to get peer feedback on the work. For me, one of the most gratifying moments was a participant saying she'd just been reading Le Guin's 'Carrier Bag Theory of Fiction' and then she pointed at *For Hades* and said, "This is carrier bag!" I was thrilled that my intentions had carried through to a reader's interpretation of the work. I was also encouraged by people's physical engagement with the works and their articulation of the imaginative responses provoked:

I love the way that the forms used are so inclusive almost like playing but the message that, or story that, is told is so expansive and plants a seed in your mind that grows and grows and carries on generating thoughts and interactions.

I liked that you had to sort of figure-out how things worked, you had to be curious and look closer.

That people had such a positive response to the work and that they got so much out of engaging with the process highlighted for me that the value I'd found in working in this way could be communicated to my peers. This was summed up particularly well in this final comment from a participant:

I haven't stopped thinking about the creative approach. The stepping outside of the publishing paradigm to explore materials, process and product is, in my view, something which creative practitioners all need to notice as an option. Maybe the commercial/industry approach works for them in which case fine, but even then, to notice it for what it is and the impact it has on creative process, possibilities and product as a result is still needed. We can liberate both our personal creativity and the collective creativity by becoming more aware of this.

7.7 Workshop conclusions

Running these workshops enabled me to expose my thinking to other practitioners. I was able to consider how they responded to the process and gather and reflect on their feedback and insights. The workshops underlined the value of paying attention to the context of storymaking and the significant impact working with materials and an open-ended process can have on developing potential stories. The workshops were positioned after the practice-based explorations, so I could bring my findings from the projects into a workshop space for discussion and reflection. In planning, preparing and delivering the workshop I had to make my process clear and explicit, so I could communicate what I'd discovered about extending writing practice to others. This helped me to articulate what had until that point mostly remained tacit understandings.

Sharing the approach I'd developed in a group setting allowed for conversation and collaboration. Although I have always valued workshops as sites for learning I hadn't anticipated just how impactful working with a group on this would be – both for the practitioners taking part and for the research. The workshops emphasised for me the value of storymaking for connection with wider nature, suggesting that creating opportunities for storymaking as well as creating stories for others to read can be a positive response to ecological crises. After working as an individual for long stretches of my PhD, the workshops also revealed the benefits of working as part of a community to face the challenges this area of work can bring.

The workshops contributed to the key research objective of developing a new storymaking approach by giving me the opportunity to understand, reflect on and further develop the approach in relation to insights from others. It was clear that working with a more open-ended process and focusing on direct engagement with wider nature and materials inspired participants and stimulated imaginative experiment. The joy people expressed in material engagement as they worked with found materials like twigs and leaves, clay, and cut-up texts was palpable. Giving people the time and space, and in a sense the permission, to work in this way was essential. The open-ended nature of the process freed participants to challenge their own practices and make new discoveries, which they could then take forward in their work.

Both workshops provided a safe and convivial work space and participants were emboldened to try out new things within the supportive environment. I hadn't anticipated just how beneficial working with this process as a group would be. Enthusiasm for the materials was contagious and exploring them became an effective prompt for discussion and the sharing of insights, bird-related memories and knowledge. Each workshop was different, showing that even with the same set of materials and exercises a workshop isn't directly repeatable. Having different people take part brought different insights and connections to light. For the purposes of the workshop, the approach was necessarily abbreviated. Time was the one material I couldn't give participants a significant amount of and several said they would have liked to continue for longer. When it comes to developing further research in this area, I will aim to run workshops over longer periods.

The workshops did not involve the making of completed stories, but every participant generated writing artefacts in response to the exercises. It became evident that there were key benefits in the act of making. Several participants articulated that it resulted in an increased sense of connection and empathy with the story subject. The writing artefacts took a wide variety of forms, but all involved the interrelation of text and physical materials and used visual and tactile expression as part of the exploration of the subject.

Below, I consider insights from this project in response to my research questions:

- 1) How can writing practices be developed with new technologies for ecological storymaking?

The workshops did not focus on technologies, but on working with an open-ended process that doesn't pre-determine any technological outcomes.

Although I introduced some of the stories I've been making and the ways they use technologies to respond to reader or environment, I wanted people to focus on the earlier parts of the process. After making writing artefacts, a couple of participants went on to consider how they might use new technologies in further iterations of the work. By introducing participants to some of the different possibilities afforded by new technologies and emphasising that I'd been able to make with them I demonstrated they can be accessible to writers.

- 2) How are stories changed when new writing practices are developed for ecological storymaking?

The workshops didn't result in finished stories, but participants generated a wide range of writing artefacts and shared ideas for stories vocally. There were many small, everyday bird stories with personal significance shared within the groups and this seemed to emerge from the context of the workshop. I've remembered many of these stories and shared them with other people since, which shows the lasting impact someone telling a story in this way can have. The writing artefacts contained fragments of stories and all used materials as part of their sharing. Some of the most evocative tied subject and text together through the materials, for example the fragments of a story about nets being used to prevent birds from nesting in hedges. These were tied around a series of twigs using the knots birds use in their nests. Another work involved fragments of text on migration being sewn to make pathways on a paper map. These works clearly showed traces of the process that had led to their making.

- 3) What does the development of these writing practices mean for the role and continuing relevance of the writer?

The workshops emphasised the need for space and time to work in this way. The practitioners taking part all had an interest in, and most had some experience of, making ecological stories. Many articulated a sense of responsibility in writing about climate breakdown and ecocide but acknowledged the overwhelming and at times distressing nature of the subject. There was a real sense that working together in a group setting was a positive response to these issues. The workshops also provided a reminder that we make stories from where we are, taking our experience and perception as the 'norm'.

Working together is another way of revealing the habits and assumptions that have become invisible to us in our own work. Having people take part from different creative backgrounds and disciplines was fantastic for breaking down barriers and extending people's sense of what it's possible for them to make.

~

The workshops provided a vital opportunity to share my thinking with other practitioners who have an interest in ecological stories. I'd purposefully recruited participants with an interest in the subject. There is the potential for more work to be done in exploring the approach developed with writers who aren't as motivated by ecological themes and with people who don't consider themselves to be creative practitioners. However, for the purposes of this research inquiry the important thing was to get insights from peers who have encountered some of the same issues in their work, who are actively interested in making ecological stories as a response to the current crises, and who are engaged in and able to reflect on their process. This enabled me to draw out insights into their writing practice that can be reflected on in relation to the discoveries I'd made through practice as research in *Persephone Calling*, *The Lichen Records* and *How to Catch a River*. These are discussed and synthesised in the next chapter to make contributions to knowledge across both practice and research.

Part 3, Chapter 8: Discussion and synthesis

The act of creation may be one of invention, not in the modern sense of the word, but in its older sense: one of discovery, of finding something that was there, but required liberation into being (McGilchrist 2012, p.230)

This chapter brings together insights from the three practice-based explorations and the workshops and considers them in relation to the insights from theory and practice discussed in the contextual review. Reflecting on each research question in turn, I present insights in response to them, rather than giving definite answers, in line with the practice as research methodology employed (see p.72). It is through articulation and documentation of the research journey that the approach to material writing practice, and the knowledge developed on the development of process and stories, become transferable to others. At the close of the section I introduce seven propositions for writers. These encompass the findings and make them communicable to non-specialists, encouraging reflection on, and exploration of, writing practice in light of the discoveries made through this inquiry.

8.1 Developing Material Writing Practice

8.1.1 A new approach to practice

The first research question I asked was – How can writing practices be developed with new technologies for ecological storymaking? This question drew on the calls for new ecological stories, and evidence presented in the contextual review, that stories are needed as part of our response to ecological crises. Rather than proceeding to make these stories using conventional writing methods, the research recognises that technologies shape stories and that this needs to be taken into consideration in the development of practice for making ecological stories. Engaging directly with materials and production means that the writer’s intent to respond to ecological crises can be shared through both the content and medium of a story in a way that doesn’t happen in conventional publishing. The emergence of digital technologies has revealed habits and assumptions associated with print technologies that have become invisible to us and brings an opportunity to interrogate how we currently make stories and why. Although the emergence of new technologies provided impetus for the exploration and development of practice, this does not mean these technologies are the focus of the storymaking in this research. That would just entail moving from shaping stories to fit the conventions of print technology to shaping them to fit digital technologies. Instead, the research has instead taken an eco-centric approach, prioritising the ecological subject matter in each project and making stories in response to it.

8.1.2 Connecting with the living world is essential



Figure 61: finding connection

The contextual review highlighted the sense of disconnection from wider nature that is prevalent in many contemporary post-industrial societies. It emphasised the importance of using narratives of connection to counter this. I reviewed how ecological stories have been shared across time and considered the ways the contemporary writer, often solitary and deskbound, creates story content in isolation not only from wider nature but also from the material realities of book production. Even in much contemporary nature writing, authors are often characterised as a lone explorer and the human centre of the story. To develop ecological stories this research has established that finding connection to wider nature enables participatory insights and possibilities for stories that would not have been discovered otherwise. For example, when working on the *Persephone Calling* project, I found it was all too easy to assume I knew what a spider's web looks like and to make a story about it from memory. However, watching a spider's web caught on a gate, exploring its intricate sun-glisked paths and trying to draw it, only for the wind to catch hold

of it and the paths to change, brought so much more to the story I ended up making. Slowing down, opening up process and finding different routes towards perception revealed a wealth of material for storymaking that I'd never conceived of previously.

When working on *Persephone Calling*, through paying attention and following my curiosity, I became alive to spring in a way I never had before. I've tried to hold on to this more enlivened awareness, but it isn't easy when daily life in our capitalist society seems to conspire against any sense of connection with other living things. In contrast to the rural focus of much environmental literature referred to in the contextual review, other living things thrive in the city if you take time to look. I wandered edgelands and ginnels – liminal spaces where human debris becomes a seedbed – and followed greened-over alleyways and pavement cracks full of wildflowers. The living things I tended towards storymaking with were the everyday and overlooked such as dandelions, snails, bees and spiders. This focus on what can be described as 'mundane nature' directly contributed to the selection of lichen as the ecological subject for the subsequent project.

Prior to this research I had very little awareness of lichen. Now I see both lichens and their absences everywhere, recognising them as long-lived guides to the air we all breathe. This project was in some ways haunted by a sense of what I couldn't experience. I became aware that growing up in the birthplace of the Industrial Revolution I have never seen many of the luxuriant epiphytic lichens that should drape the trees here. The damp climate they once thrived in also made this the ideal habitat for cotton mills. Lichens are largely absent from

folklore and often don't have common names with which people could identify them. Finding connection with lichen for this project involved embracing both experiential and scientific knowledge. Taking part in a lichen field studies course provided invaluable insights and I amassed a lot of detailed knowledge in a short space of time. Working in urban environments with time and light as materials became a way of reaching towards lichen-perceptions of the world. Using the language of scientific papers as a material to be cut up, sifted and made with unexpectedly provided a way of reaching towards lichen voices and perspectives.

The third project, *How to Catch a River*, exposed for me how little attention I'd paid to the river I lived beside until it flooded the house I was renting. Being part of a larger project – where discussions sometimes felt abstracted and at a distance from lived experience – inspired me to find more ways to connect with the river both in my daily life and through encouraging others to connect with rivers through storymaking. The emphasis on creative discovery through connection was carried through to the research workshops, in which it felt essential to encourage participants to explore outside. From inside, participants had been unaware of all the birds in the trees. They became audible, if not always visible, the minute participants stepped outside and gave time to noticing them. By finding and expressing connection to birds through creative exercises participants began to consider birds' points of view and express empathy with them.

This research has found that material writing practice can be developed as part of a commitment to developing awareness of connections with the living

world. Embodied sensory experience and direct engagement with other living things expands the range of materials a writer engages with and the methods that can be used to make stories. With this practice leading to the making of stories to be shared, a sense of connection can be communicated to readers, with the aim that they will be encouraged to go outside and engage with wider nature too. If we are serious about addressing ecological crises through stories, we need to do the best job we can and that means interrogating our existing practice by asking what we ordinarily do and why. I could not have made any of the work produced in this inquiry by working at my desk. Seeking connection with wider nature is an intrinsic part of both the process and stories created.

8.1.3 Materials matter

Finding connection to wider nature and the focus on developing material writing practice are the key defining characteristics of this research. In the contextual review I gave an overview of the ways writers are separated from the material realities of making books. Writing practice is shaped by the need to create text-based content that is passed on to a publisher. The writer's relationship with how a story lives in the world often ends there. By focusing on the production of narrative text rather than material practice, the participatory insights that Pacey describes as coming from the attentive handling of materials can't occur (p.55). By recognising the limitations that accompany writing practice for conventional print publishing and focusing on material engagement, new insights can emerge. Throughout the inquiry, materials gathered and worked with have included found materials such as seeds, leaves

and twigs that provided connection to wider nature, narrative materials such as imagined story elements, motifs, language and structure; and physical materials, sourced sustainably as far as possible, including paper, felt, clay, microcontrollers, wires and sensors. Gathering and working with such diverse materials expanded my opportunities for thinking and storymaking through and with materials. This enabled me to consider their ecological sensibility and their appropriateness as tools for communication of story. This engagement resulted in several unique entanglements of content and medium. This shows that for ecological writers, the context of practice and materials and methods used can significantly alter the way they make writing in the world and the stories they are then able to share with others.

In *Persephone Calling*, gathering and working with found materials through drawing and oral composition sparked imaginative insights that fed directly into the making of stories. This is made visible through the way the stories present points of view of many living things in the city. With *The Lichen Records*, I explored methods of working with light and time as materials in ways that made them tangible for me as writer and expressed this for the reader through the stories made. Scientific language also became a material I was able to physically work with and transform. I took advantage of its objective tone to make stories that put lichens, rather than humans, at the centre of the story. In *How to Catch a River*, the use of physical materials in both storymaking and sharing helped ground the work in sensory, lived reality when I was concerned about the distancing effects of scientific abstraction in some of the project discussions I took part in. I had been working to de-centre the human in the

previous projects, but with flooding I felt there was an absence of the human in discussions, and a need to recognise the way people's lives are being impacted on too.

During the workshops, participants revelled in working with and exploring materials – knitting with twigs, making nest knots, forming owl pellets with fibres and found materials. Many expressed a strong association between the materials and a kind of play they associated with childhood. None worked with materials in this way in their current writing practice. This inquiry has shown the value of focusing on material exploration in relation to an ecological subject. Doing so enables the development of stories through the act of making, responding to the subject and bringing corresponding insights that are rooted in sensory experience of the living world.

8.1.4 An open-ended process opens up possibilities

Writers have become bound by the habits and traditions of text-centric process in preparing stories for print publication. As I found when I broke my fingers and was unable to write for two months, we become accustomed to thinking



*Figure 62:
drawing
left-handed*

through writing. Particularly in the domains of academia and publishing there is less status given to thinking through making and less focus on the process than on the end result. This research has explored the impact on writing practice of working without a pre-defined outcome for a story in place. Focusing on the ecological subject and working with corresponding materials means the story does not respond to the constraints of technology but to the pressures of content, as advocated by Lissitzky (see p.46).

Breaking my fingers during *Persephone Calling* provided an abrupt and unanticipated push towards finding more ways to make stories. Taking this as an opportunity, I was able to explore and experiment with materials and methods for storymaking. Drawing left-handed was a revelation. It relieved me of the inner critic who would have otherwise inhibited the discoveries made possible through drawing. Drawing has now become integral to my writing and research practices, when I hadn't drawn since the age of 14. The development of writing artefacts using all kinds of methods including drawing, walking and working with paper and clay allowed for story development through making. This is different to writing a story first and then making a way of sharing it. When made as part of holistic process, language and substance become intertwined. Revision, an essential part of any piece of writing, continued the movement back and forth between story and materials. When things didn't work nothing was lost as every interaction contributed to my understanding and to shaping the stories I am able to share. This made me unafraid to try things and challenge conventions I have long taken for granted.

In *The Lichen Records*, I was tempted to think about technological possibilities early on in the project and I quickly became blocked by trying to think what story would fit with a particular technological interaction. Letting the idea go and proceeding from a point without a fixed outcome enabled me to explore materials and methods that related to lichen and to let the story grow from there. In this project, writing artefacts became not only a product of thinking through making, but artefacts to reflect on and focal points for continued development of the work. In *How to Catch a River*, gathering together the writing artefacts I'd collected in jars I was able to see a common theme of the river having agency and desires. I hadn't articulated this directly with language, perhaps because of the emotional impact of having experienced flooding. Working from the writing artefacts, I was able to explore this theme to make the story *We Are Riverish*.

During the workshops, the direction to work without a final outcome in mind freed participants to make writing artefacts and fragments of stories in very different ways to their usual processes. Creating storymaking opportunities for others both in the workshops and with *The River Library* has underlined for me the value of storymaking with others as a response to ecological crises. Insights arose through communal making and discussion. Everyone who participated will carry those insights and the memory of the engagement out into the world and that has the potential to make a difference through a raised awareness of flooding, and through greater understanding of resilient approaches to flood risk that could be taken up by individuals and by communities working together.

This research has presented many examples of the positive impact on practice of working with a more open writing process. Writers can be limited by the constraints of print publication, deadlines, economic considerations and by focusing on written text to the exclusion of other possibilities for creating stories. Ingold describes how creativity is subsumed in a final product (p.56). With this approach the process and its artefacts are also valued. Connection with wider nature can occur through exploratory engagement with materials and process. This matters for the writer striving to create ecological stories and for readers because the process leaves its marks in stories whatever shape they take. This is made evident by the texts of stories presented in this thesis. Even separated from their physical realities they look and read very differently to anything else I've ever written, carrying something of the story of their creation with them.

The approach to storymaking developed through this research inquiry is motivated by the urgent need to recognise human interconnection with other living things. This can help us to recognise and respond to the damaging impacts many human actions are having on the lives and habitats of a myriad of species, including our own. It demonstrates how a focus on working with materials and methods that help us find connection can have an impact on process and the stories made. Thinking *through* making, roots the stories in their ecological subject matter and leads to what Pacey describes as participatory insights (p.55) that help shape the work.

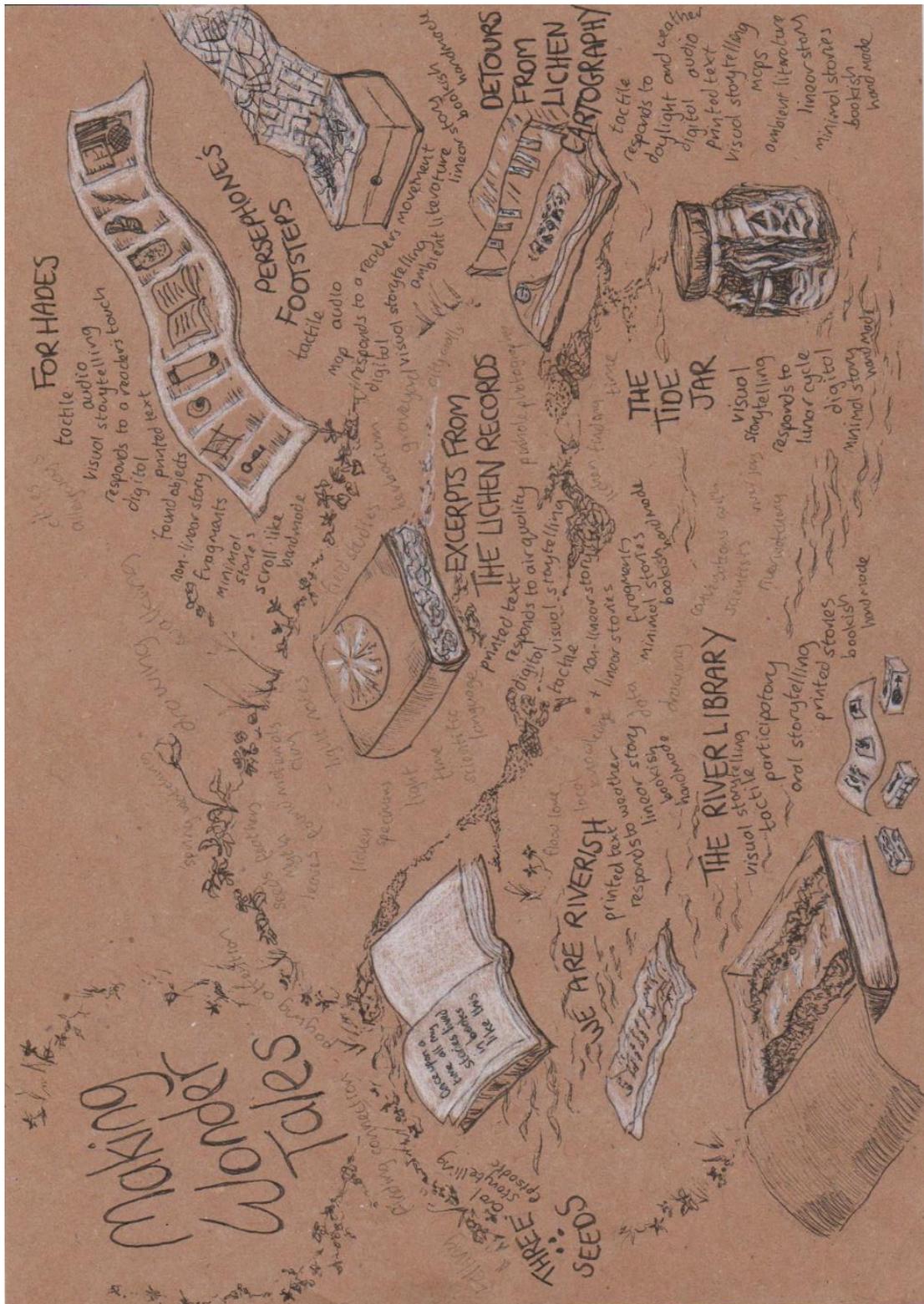


Figure 63: considering process and stories made in relation to previous practice

8.2 New Shapes for Stories

8.2.1 Making new stories

My second research question asked, how are stories changed when new writing practices are developed for ecological storymaking? From the contextual review it is clear that technologies have shaped stories over time and are integral to the ways they're experienced by readers. Yet, as Hayles notes, we have forgotten that literature has a physical reality and think of it only in terms of intellectually created text (p.36). By developing material writing practice as discussed in the previous section new possibilities for stories emerge. Through reflection on existing theory and the findings from the practice-based explorations, I've identified the following ways of classifying the stories made during this inquiry.

8.2.2 Whole stories

The writing practice developed through the inquiry is holistic in its approach to storymaking. It recognises every element of a story as being interconnected and that the physical existence of a story in the world becomes part of what is read. In the work developed, the ecological subject informs every element of the story and the story becomes an indivisible whole. Finding ways to present the stories I've made in the text of this thesis has felt a lot like performing a dissection. I've had to pull the stories apart into separate elements that can be shared in a printed format, but the parts can only give a suggestion of what the story is when experienced as a whole. In each project the ecological subject has inspired the materials used and the story content. Subject, materials and content have

inspired the form – in nearly all cases these are minimal, fragmented stories told from multiple perspectives. Subject, materials, content and form have led to the development of the way of sharing a story – the medium through which it can most appropriately be shared. The interrelations between all these elements are not concealed from the reader but made visible in the way it is shared.

The development of *For Hades* involved the creation of a storied object. The bundle is presented as a gift to Hades from Persephone. Her voice and the stories she tells of the surface can be uncovered through touch in the darkness of the underworld. The story encourages fingertip exploration, and direct engagement with found materials such as a snail shell, feather and leaves that reveal fragments of the stories of other living things. Every part of the story contributes to the experience of its reading. In *Persephone's Footsteps* the story occurs between reader and the city they walk through. Their journey is joined with the character's. An early reader said, 'There's nothing between me and the story and the place I'm listening to the story in.' For this story the city, too, becomes part of the whole.

Excerpts from the Lichen Records responds to air quality. The community of stories and fragments collected within the work were slow-growing. Disparate scientific texts are brought together to make new stories in cut-up form that echoes the symbiosis of lichens. *Detours from Lichen Cartography* is an audio story that will only grow longer in daylight. If the book is closed or a shadow falls on it, the story will wait for more light. Several of the work's other materials will also respond to the environment it is read in – blowing in the

wind, dissolving in the rain and changing colour in the light. These interactions are entwined with stories of elemental cities of rain, air and light and the search for a city of lichen. *How to Catch a River* resulted in the making of *The Tide Jar*, a simple image-based story about living with the possibility of flooding. It's a lantern-tale that responds to the lunar cycle to provide warning when the tides are high. *We Are Riverish*, is a story about living with flooding that will quickly disintegrate in water. *The River Library* uses dice and the form of a library to invite playful participation and encourage people to add their stories to the work. None of these stories would have expressed as much, or invited the same level of engagement, if they had just been texts printed in books. They can exist as intended only as whole stories.

The development of this work also responds to the insights in the contextual review concerning the environmental impact of both print and digital technologies. Making these stories by hand with ecological awareness is a way of attempting to reduce the misalignment between medium and message. The attention paid in this area helps reduce the sense of dissonance that is present, for example, in making a high-energy use app about climate breakdown, or a substantial print run of a nature book that could end up being pulped. There are always environmental impacts in making, but these can be reduced. The stories made during this research are small-scale with low energy consumption. The materials used are recycled or sustainable wherever possible. By developing all the elements of a story in correspondence with each other and not denying a story's physical reality, an ecology of story – where every element is interconnected – becomes more possible.



Figure 64: following Persephone's Footsteps

8.2.3 Handmade stories

The stories developed for this research all carry the marks of their making. As noted in the contextual review, handcrafting takes time and attention and participatory insights emerge from the handling of materials. Every story made for this research is hand-constructed, although the works also contain elements of both print and digital technologies. The contextual review discusses Ingold's assertion that a printed text renders the work that went into its making invisible (p.56). An oral storyteller is always present with the story they are telling. Printed books separate writers from readers by distance and time. These

stories don't provide the immediate presence of an oral story, but they also do not render their making invisible.

In the *Persephone Calling* project there is an indiscriminate mixture of found and technological materials and they are bound together. For example, leaves are sewn into a book with conductive thread, turning them into a touch sensor. These stories have not got the smooth, machine-made aesthetic of printed books. I learned to use forgiving materials to allow for the limitations of my skills. The felt used for the bundle of *For Hades* is a sturdy and sustainably sourced fabric, but it was also chosen because it hides my uneven stitching. Handmaking the stories resulted in my giving care and attention to every detail of every element of a story. I spent hours revising sentences and circuits to make both more effective.

There are some details that will remain unknown to the reader. For example, the amount of honey in the vial in *For Hades* is one twelfth of a teaspoon, which is the amount a single bee makes in their lifetime. This knowledge comes from my HighWire colleague Liz Edwards' work on the beespoon, made for the *Telling the Bees* project (2015). Similarly, I used ink made from air pollution to draw the maps in the *Detours from Lichen Cartography*. This is not knowable for the reader but working with the dense black ink and reflecting on how it would impact on lichen was very much a part of the making of the story.

With both *For Hades* and *Detours from Lichen Cartography* I left the technology visible. Circuits can be traced as points of connection between sensors and microcontrollers. This is in direct contrast to the invisibility of

technology that Borgmann describes as being part of paradigmatic consumption (p.45). In *The Tide Jar* and *Persephone's Footsteps*, where the technology is contained this is due to practicality rather than an intention to conceal it.

Engagement with found materials like twigs and feathers was joined with stripping wires and learning how to solder. The combination of materials means the resulting stories cannot be characterised as having either a 'natural' or a digital aesthetic. If anything, they seem further away from the digital. There are no screens, the circuits are visible and, in some cases, handsewn. These are also works that don't hide their fragility or pretend to permanence. *We Are Riverish* was made to dissolve in the rain. The leaf book is going to disintegrate. The technologies used may break, but the parts are interchangeable. I can repair and replace elements. With these technologies I have more control than I would have with proprietary systems, which are prone to rapid obsolescence.

I've learned that time and attention show in a thing that has been made by hand and we treat these objects differently. One of the workshop participants noted that people handled the stories with more sensitivity than they would a machine-made object (p.291). In many ways the one-off nature of the works and in several cases their bookishness calls to mind the artists' book form, but as discussed in the contextual review (see p.56) there is a difference in intent between the production of artists' books and works that are rooted in literary production. In some ways the stories I've made are more like a writer's art than an artist's book. They are created primarily from a literary impulse to make and share a story and in their use of materials they move towards art. The

aesthetic elements grow with and from the narrative: they are stories given tangible life to grow.



Figure 65: stories grow in the cracks

8.2.4 Sensory stories

The sensory experiences that were integral to making the stories carry through into a concern for the presentation of story and the sensory experience of the reader. Rather than only engaging readers visually, most of the stories employ additional means of engaging the senses. I was keen to avoid the use of ‘head down’ technology and wanted to find ways of inviting connection with wider nature in what can feel like a screen-dominated society. There are no screens or extended visible texts in this work. Drawing on a lineage of locative fiction and ambient literature, the research uses audio files as a viable alternative that allow for visual immersion in an environment. *Persephone’s Footsteps* and *Detours from Lichen Cartography* are both designed to be taken outdoors. Neither work will reveal the full story if a reader tries to stay inside to listen to them. These stories engage a reader’s hearing, presenting the text through audio files. There

are maps and minimal visible text, but these are primarily works to be carried with the head up, leaving the eyes to read the streets. The stories are walked into an urban environment with all of the sensory immersion that entails. There is the possibility for moments of both dissonance and syntony as the reader relates what they are hearing to the world around them.

Through their use of materials and design all the stories also invite tactile engagement. *For Hades* responds to touch – the story can't be heard without being explored by hand. This is an indoor story, but it brings connection to other living things through sensory engagement. We might not otherwise explore the curl of a snail shell or trace leaf veins with our fingertips. Until the projects were complete, and the stories all gathered together for the workshops, I didn't realise just how much they make visible a relationship to the book while each becoming very different things. They are all holdable works, bookish or book-scale. This could be due to how much I value print's material qualities. As noted in the contextual review, the emergence of digital technologies has prompted a resurgence of interest in the book as object (p.38).



Figure 66:
tangible stories

Echoing past technologies maintains a link with them for both writer and reader. It can provide a valuable signal to a reader that these are literary works to be read, even if the reading takes place in a very unfamiliar way.

8.2.5 Living stories

The printed book can be seen as a closed work holding an immutable text. In practice, I've found myself scribbling out and changing words in the books where my stories are printed every time I have to read from them at an event. Stories don't stop changing. Books give the illusion that they do and prevent the writer from making changes visible. Every time I come back to a story, I have changed and the world has changed and the situation I'm reading it in has changed. Ong notes how for an oral storyteller every telling of a story is adapted to the circumstance of its telling (p.51). In this research I've explored ways of moving beyond the fixed text and the illusion of permanence it brings. Using digital technologies has enabled me to make stories that can respond to a reader or their environment, albeit in limited and specific ways that relate to the story being shared.

In *Persephone's Footsteps*, Persephone is trying to get higher and further away from the underworld and the city streets. The reader can only get to the next part of the story if they, like Persephone, can find higher ground. This story also allows for use in different contexts. It can easily be reprogrammed to trigger the sound files at different intervals, to allow for altitude variations in different cities. Similarly, the *Lichen-dial* in *Excerpts from the Lichen Records* can be reprogrammed to gather air pollution data from different locations, making it specific to the context of engagement. This does however require my

presence or that of someone with instructions to reprogram the work. These are not works that can travel without a connection to their maker like books can.

The research also explores the ways a story can continue to grow and develop over time. Working with time as a material during *The Lichen Records* inspired the slow accumulation of story materials and encouraged me to leave space so elements can continue to be added to the work. This is made possible by working with non-linear forms and the concept of making a community of stories. I've found that sustained engagement with an ecological subject matter leads to deeper understanding and connection, which impacts on the storymaking and the resulting stories.

Just as the research recognises that stories can continue to change and develop over time it also recognises they are not likely to survive in one form permanently. The book can be an incredibly long-lived form, as evidenced by the 1000 year-old *Beowulf* manuscript I visited during *The Lichen Records* project. It is certainly more durable than any of the digital technologies I've used during this research. Cloud computing and the easy replication of digital text give the impression of potential longevity, yet issues with rapid obsolescence present challenges to a digital story finding its way far into the future as the codex of *Beowulf* has (see p.59). However, working with flooding emphasised for me that books can also be lost. I explored this through making *We Are Riverish* with water-soluble paper and acknowledging its impermanence in its making. Ephemerality is also built into the stories by using materials like leaves. This is part of recognising these stories as being of the world and working with rather than against an awareness of the fragility of living things.

As evidenced by the oral tradition, one way that stories can continue to live is through being passed on. In the contextual review, it was noted that minimal stories are seen to invite greater imaginative participation from the reader. Barthes' notion of the writerly text echoes this (p.63). This research has sought to make stories that invite a high degree of imaginative participation, so that readers can create connections between the story, wider nature and the context of reading. If participation is considered on a continuum, with didactic text that inhibits participation at one end, at the opposite end is the invitation for the reader to become the storymaker. With *The River Library*, I created an opportunity for storymaking and saw how it resulted in both oral storytelling and in the use of a printed record as a mnemonic device for sharing the story with others. The workshops, too, evidenced the value of creating opportunities for others to make stories. I hadn't anticipated the degree to which the act of making alongside each other would result in the sharing of stories and memorable anecdotes that could then be passed on. There are many ways for stories to live in the world and this research demonstrates that engaging with this potential is a necessary part of ecological storymaking. Without this willingness to experiment and explore, the content of ecological books and digital works will continue to be at odds with their material realities.

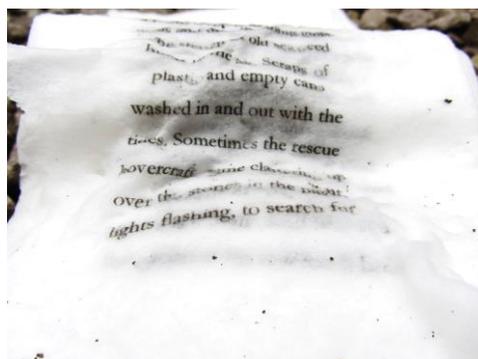


Figure 67: living stories

8.2.6 New wonder tales

For thousands of years across the world, wonder tales have traditionally been used to entertain and engage, and provide guidance and warnings. The wonder tale has been widely used for ecological storytelling, as discussed in the contextual review (pp.24-5). With their succinct nature and fantastical elements, they have continued to live in many forms. The stories carry valuable messages about our relationships with the living world, but they are often human-centred. They also tend to be shaped by the dominant patriarchal values of their time. Working with the form requires attentiveness to these issues and a commitment to reimagining the stories with ecological and feminist values for today. Stories are needed that recognise the connection between all living things and provide messages of hope for difficult times. Wonder tales for contemporary society rooted in the here and now can elicit delight in the marvellous alongside the mundane. I have worked with wonder tales as part of my existing writing practice for many years. Their use in this research is grounded in both my knowledge and understanding of the form and the recognition that a sense of wonder and enchantment can be a way of finding connection with wider nature in the modern world as suggested in the work of Jane Bennett (see p.17).

The stories made during the *Persephone Calling* project draw on an existing myth but bring Persephone into the contemporary city. In *Excerpts from the Lichen Records* scientific language is reworked to make fantastical stories of colonising lichen that remove humans from the centre of the narrative. *We Are Riverish* is a wonder tale about the river taking on human-like

forms after having got a taste for wandering about the city during a flood. These stories all use the extraordinary to explore ecological issues in a way that engages the imagination rather than trying to force an educational message. It isn't just in terms of content that these works are wonder tales. Even the concepts, or the story of each story, can be considered in terms of wonder. There's a story that can be read by touch in the dark, another that only continues if you climb higher, a story that will dissolve in the rain, one that responds to the air, another that grows longer in daylight and a story that's only visible at full and new moons. Working with a sense of wonder in both material engagement and connection to the living world means wonder is part of the fabric of these stories.

This research has demonstrated that putting the ecological subject at the centre of storymaking has a significant impact on the stories made. Working in correspondence with subject and materials results in stories that are interconnected and whole. These are handmade works, not mass-produced, and they would not fit within the economic models of mainstream publishing, but this doesn't mean they can't have an impact. Writers shouldn't be inhibited from experimentation by the constraints of print publishing. As evidenced by the large number of people who engaged with *The River Library* at the *Manchester Science Festival* there is potential for other kinds of experiences of story, whether as part of installations or events. If we want people to try engaging with stories in new ways it perhaps makes sense to do so in an environment that invites supported experimentation and that doesn't put additional barriers, such as the need for an expensive phone, in readers' way.

As writers, we are uniquely placed to use our narrative skills to tell the story of stories, to imagine what they could be, and to shape them through this imagining. This research has begun to explore what shapes are possible if we follow the subject and materials rather than shaping a story to be contained by a pre-determined technology. This is particularly pertinent for ecological stories where the aim is to invite connection with the living world. The research has shown that using material practice for ecological storymaking results in which both content and physical materials stories are interwoven with their subject, making whole stories that invite sensory and imaginative exploration.



Figure 68: the fabric of a story

8.3 Writer as Maker

8.3.1 The role of the writer

This research has shown that by putting the ecological subject matter first and taking a more active role in the making of the physical elements of the story, insights and understandings can be developed that shape not only content but also how the story is made and shared. This requires a reconsideration of the role of the writer. My third question asked, what does the development of these

writing practices mean for the role and continuing relevance of the writer? The contemporary writer's role is primarily defined in relation to their participation in the print publishing industry. As makers of content for books and ebooks in mainstream publishing, writers rarely have control over the physical format their books take, or how this interrelates with their stories. An expansion of the writer's role has been possible from the early days of electronic literature in the 1990s, when writers began to experiment with the design and coding of screen-based digital works and publishing these works online to reach wide audiences. However, as noted in the contextual review, the rapid pace of technological change and increased dominance of proprietary systems have made this more difficult over time. For writers, the possibility of economic or cultural success motivates many to work to the established conventions and formats of the print publishing industry.

As sales of literary fiction fall, the majority of writers in the UK are unable to make a living from their writing (Arts Council 2017). In light of this, it's interesting to consider the overwhelming loyalty of writers to the print publishing model. It frequently requires them to carry the financial risk of working without pay before finding out if someone will publish their work, at which point they have very little control in its continued shaping and journey into the world. There seems to be little for writers to lose in exploring other ways of making and sharing the ecological stories we need.

8.3.2 Writing as a response

Haraway's concept of *response-ability*, and the need for us to 'stay with the trouble' rather than looking away and participating in climate silence has been an inspiration throughout this research (see p.61). The projects have engaged with ecological issues while embracing multiple perspectives, drawing on science, folklore and experiential knowledge. The contextual review detailed the evidence for the need for stories as a response and for these to focus on emotional engagement over facts, hope over threat, and connection over disconnection (p.21). The research has sought ways to make stories that can respond to the crises, but that also don't lose sight of their need to work well as stories. There can be a tricky balance, alluded to by Le Guin in the contextual review, in being mindful of our responsibility to the story *and* the reader (see p.62). I found this when making *Persephone's Footsteps*. The story would not resolve into a hopeful ending. Persephone escapes but she gathers thick blankets of cloud around herself in the sky and climate chaos continues below. I could find no way of removing the sense of threat and still making this work as a story. This isn't ideal, but I consider there is hope in the act of taking a story outside, in noticing the connections between living things in the city and in being invited to wonder how things could be different. A single story can't solve all our problems but caring about a story's potential ramifications does matter if we don't want to cause more harm. The role of writers in times of crisis was clearly articulated by Le Guin when she said in a 2014 speech, 'resistance and change often begin in art, and very often in our art—the art of words'. She went on to say that there is a significant need for writing that is motivated not by

profit, but as a response to the difficult times we are facing and that offers imaginative alternatives to the way things are (2014). Works that respond to the crises can invite awareness and engagement so that readers are informed and encouraged to take the next steps towards positive ecological action. They can also offer alternative visions and hope by showing that there are ways to challenge 'business as usual'.

Working on *The Lichen Records* I couldn't find a way of telling the complex story of different lichen species' relationship to air pollution that would not lead to confusion. Learning about the different species in detail is the only way to be able to read the air quality by their presence or absence. Making a community of stories and finding ways of presenting lichen perspectives and engaging people with their existence imaginatively felt like a better way to proceed. *How to Catch a River*, presented an opportunity to work with the tangible outcomes of climate breakdown in a way that people can perceive them. However, flooding isn't a story that can be told with hope. It is having a devastating impact on people's lives and livelihoods. Recognising this, I tried to make stories that sought connection with the river rather than focusing on flooding and showed ways of living with water. An important part of this was working to ensure other voices, perspectives and stories were made visible as part of the work. Through this project and the research workshops I discovered working with others is a valuable way of comprehending, discussing and facing what can feel like overwhelming subjects when making stories about them alone. It now seems to me that working together as part of a community of practitioners and scientists is perhaps the best method we have of 'staying with

the trouble' as Haraway asks us to (p.61) and enabling us to write in response to it.



Figure 69: working together

8.3.3 Writing as making

This research proposes that we consider writing to be making, and in doing so uncover habits and assumptions in our current practice. Through practice as research I've developed a material writing practice that starts with the ecological subject and involves making with a broad range of materials, including technologies. It reimagines how and where a writer works and what it is they do when they write. As a writer I am used to beginning my stories with scribbled notes before composing them in a Word document on a computer and then sending them on to an editor by email. The writing processes I've explored during this research couldn't be more different. A significant amount

of skill development was required to carry out this research, from learning how to solder, build circuits and code in C++ and Python to learning how to use Coptic binding to make a book. Through the approach developed, I've shown it is possible to work in many ways as a writer to directly engage with wider nature through material writing practice. The benefits of this are made visible in the deeper insights and understandings of the ecological subjects that are developed from the process and can be shared in the stories made.



Figure 70: writing with river mud and ink

As part of its exploration of the ways all technologies shape stories, this research sought to explore opportunities presented by the low-cost, more accessible technologies associated with the Maker movement. My primary means of learning how to work with these technologies has been using YouTube tutorials and forums, where others have freely shared their skills. These were challenging projects, but the basic skills were not too difficult to acquire. Perseverance seems to be the most important material required. As has been shown, understanding, skills and imaginative insights can be developed in the handling of materials. Working with these technologies in relation to

ecological subjects has resulted in the making of stories that do not share many of the characteristics we might associate with digital stories. There are no screens or black box devices in use, but there are leaves transformed into sensors and stories that pause when they don't get enough daylight.

This research has shown that there is so much to be learned about writing from direct engagement with the world and through material practice. It has altered my approach to practice in ways that would have been inconceivable to me three years ago. Due to injury, I was pushed early on to find ways to write stories without actually being able to write. However, it was the intention already embedded in the research to interrogate practice as part of my response to the calls for ecological stories that made it viable for me to take up this challenge. During *Persephone Calling* I had to completely reconceive my practice. The insights developed through engaging with wider nature and making stories in different ways had a profound effect on my approach to writing. I delighted in experimenting with clay and weaving. I told stories aloud to myself and walked them into city streets. My processes became more eclectic and wonder-full and I became less inhibited about sharing them with others as I began to realise they worked and I was able to make stories with them. Having learned so much through the first project, I soon learned I couldn't just repeat the same methods in the second. Centring a different ecological subject matter meant there were new explorations to be made and new materials to follow.

Ecological stories are needed, and writers have narrative skills that can help engage people with stories in ways that will capture their attention, evoke

empathy and engage them with the issues, with the potential to raise awareness and lead to positive action. This research proposes that writers can do more to engage with wider nature through material practice and that this results in stories that can be made and shared in new ways. The excitement and engagement of other practitioners in the workshops demonstrated that there is a desire to explore new methods and materials for storymaking, but limited opportunities to engage in them and a lack of self-confidence in working outside prescribed roles can hold people back. Writers have an important role to play in responding to ecological crises through story as they can use their skills to engage readers with ecological subjects. Given that materials and technologies also shape stories, this research proposes that writers also need to play a larger part in considering how their stories are made and shared. This means no longer relinquishing the story of stories to profit-motivated publishing conglomerates and technology companies.



Figure 71: this thesis is a book-shaped nest (see p.71)

8.3.4 Ecological storymaking

This chapter has brought together insights from across the research inquiry and highlighted their relationship to the sources considered in the contextual review. In doing so it has established that developing a material writing practice for ecological storymaking brings significant new insights to process and connection to wider nature for writers and that this impacts on the stories made. It recognises that technologies shape stories in conventional publishing and by centring an ecological subject, new shapes for stories can be developed that reflect the interrelationship of all elements of a story. Process and its artefacts are valued alongside the stories made, which are considered to be living, whole, handmade and sensory wonder tales. The writer is seen to have an important role in responding to ecological crises through making stories. With more space and time given to exploration, experimentation, skills development and collaboration, writers could bring their narrative skills to every element of the storymaking process.

Drawing on the findings articulated and synthesised through this discussion, I have developed seven propositions for contemporary writers. As an outcome of the practice as research undertaken, these are addressed to all who write and share stories and encompass both ecological and technological themes. They are presented here in recognition that writers operate within what Chandler describes as an ecology of practice (see p.50), and that by taking responsibility for shaping their own work they can also have an impact on this wider ecology.

8.4 Propositions for contemporary writers

These propositions detail a series of specific and achievable actions that writers can take to develop their practice in ways that engage with and respond to both new technologies and ecological concerns. They call for writers to reflect on their current practice and explore new possibilities for storymaking. These propositions are not advocating for one way of working over another, but for an opening up of practice to embrace a multiplicity of storymaking methods. Many writers might not want to work with digital technologies, or make every aspect of a story themselves, but if they want to engage with the development of stories a degree of critical awareness is essential. Technologies shape stories and print publishing shapes writing practice. This too often remains unacknowledged by writers and scholars. My intention is to provoke reflection on the habits and assumptions that result from the dominance of print technologies and the mainstream publishing industry. For writers who don't want to engage actively with making or production, there is still much to be learned from a consideration of the role technologies play in shaping practice and the forms writing takes. A raised awareness of the impact context, tools, methods and materials can have on shaping a work may encourage writers to make more informed choices about the ways they work in relation to the stories they want to share. By taking insights from this research and articulating them for a wider audience, the aim is for the knowledge developed to become transferable to other practitioners, making contributions to writing practice, to

the development of stories, and to the wider discussion on how we respond to ecological crises.

The propositions are:

- 1. Draw from curiosity**
- 2. Explore materials**
- 3. Remain open not bound**
- 4. Write for the improbable bookshelf**
- 5. Find a community**
- 6. Create opportunities for storymaking**
- 7. Recognise stories as antidote**

- 1. Draw from curiosity**

We often write by shutting ourselves away from the world. Limiting distractions can make concentrating on the page easier. Going outside to gather ideas for stories and then coming back to the desk is one way of working, but what if we find ways to make stories in contexts that relate to the stories being made? Out in the world, trails of association and chance encounters can feed into the work and unexpected connections can be made. This is engaging in writing as a 'curious practice' (Haraway 2016, p.127). It is a way of being wholeheartedly open to whatever you might discover.

One way of finding connection with other living things in the world is to draw them. This has long been recognised by artists. Paul Klee asserted that

dialogue with nature is essential for an artist (1969, p.63). If we spend time drawing, we slow down and really perceive something with all our senses. For example, if we engage directly with a leaf, rather than writing about it from memory, new insights are revealed, and unexpected ideas emerge. Writing is too often seen as an intellectual act, separated from body and world. Drawing helps us to overcome this. I've found there is a feeling of crossing towards a thing, almost identifying with it, when drawing. I don't feel this same kind of connection when I search for the words to describe it.

Writers, as people who respond to the world through written text and are praised for their ability to do so, often say they can't draw. This is to confuse drawing the verb with drawing the noun. Feeling they are unable to draw something that is a finished artwork of economic or cultural value, writers miss out on the possibilities of drawing as a conversation with – rather than representation of – a thing. Not only does drawing lead to insights for writing, it can teach us to think about writing in new ways. A focus on process rather than end product means valuing exploratory methods and reflecting on writing as a process, taking the time to wonder with our words. When we see creative acts always as a means to an economic end we miss opportunities for connection and engagement, and of discovering new ways to pay attention to the world, so we can better tell its stories.

2. Explore materials

In art practice, a medium might be selected for the qualities it can bring to the subject of the work. With our palette limited to words, as writers we often don't

reflect on the fact that our words will be given material form. The medium, whether book or screen bound, will become part of the story as well as the way the story is communicated. An artist drawing with ink, charcoal, or river mud would recognise the interrelationship between medium and process, content and form. Writers have become makers of intellectual content, separated from the material realities of their own storymaking. If you write with a pencil on the back of an envelope in a hospital waiting room how does it feel different to writing in sand with a still-tacky ice-lolly stick? How are both different from typing at a desktop computer under fluorescent lights? We are not machines when we write. We respond to our environments and materials. Our real and imagined worlds have porous edges.

The materials writers work with can include narrative materials like plot, motif and character, but they can also include found materials like feathers, pebbles and twigs, and technologies, whether these involve pen and paper or code and wires. Reflecting on and through the handling of materials leads to ways of untangling thoughts, and insights that couldn't have occurred otherwise. A mutual shaping of story and materials means a story will make sense as a whole. We can explore materials as a way of making stories *in* as well as *about* the world.

3. Remain open not bound

When you begin a story do you write for the printed page or a screen? Writers often begin a story with a clear idea of its end, not always in terms of content, but in terms of how it will be shared. The story is shaped by this foreknowledge.

Length, style, structure and even the content are all impacted by the conventions of the medium it is written for. The linear plot, interior monologue and lengthy description are all bookish traits, just as a focus on action, rhythm, repetition and memorable characters are associated with stories in the oral tradition. With digital technologies we are still navigating what is possible in relation to what has come before and what might come next.

If we set out to make a story without an end product in mind, we can focus on the subject we are making a story about. Following the subject, giving ourselves space to be inspired by it, and exploring related materials and methods, allows for correspondence between subject, content, form and medium. Working in a more open way provides time for the story to breathe, for ideas to accrete, and for chance encounters and imaginative provocations to be embraced. It may lead to richer, more insightful engagements with the world through storymaking. At the very least nothing is lost. We will write with more awareness of what it is we're doing and why, and what that means for the stories we write. Any story made will carry the marks of the journey that led to its making.

4. Write for the improbable bookshelf

Who writes the story of the story? I have begun to write for the improbable bookshelf, a shelf Calvino described as being for works that question rather than perpetuate conventions of literature (1997a, p.82). In contemporary mainstream publishing, the writer writes the story and hands it over to an editor at a publishing house. Book sales are in decline as an ever-wider range of

media compete for our attention, but the conventions of printed literature continue to be perpetuated with little innovation taking place. The medium of the book, in both print and digital iterations, continues to dominate and shape the way writers approach the making of stories. To make work for the improbable bookshelf, writers need space and the means to experiment and explore. Above all they need to reflect on how they make stories and why. By conforming to the established role of content creator, writers are missing opportunities to develop practice and possibilities for the ways we share stories. The story of the story is currently being written by technologists and mainstream publishers who are profit-motivated and risk-averse. What if writers bring their narrative skills to imagining new ways stories could exist in the world?

5. Find a community

Storytelling is a communal endeavour in the oral tradition, but print individualises writers. We think of writing as a solitary act. We may write in conversation with other writers and the world, but we often work at a distance from both. Distance permeates our relationship with the material production of our work and the readers with whom it is shared. Copyright laws ascribe ownership to stories, where once a story could be reworked freely to be shared in new contexts. In some ways digital technologies can be perceived as reviving some elements of communal practice, with the potential for instantaneous communication and proliferation of remix culture. In other ways it can feel like digital technologies continue and even exacerbate the distancing from each

other and the world. As a result of my experiences with this research, I gave up my smartphone. I watch as friends, family and strangers stare incessantly at mobile phone screens wherever they are, seemingly unaware of the world that's around them. Finding or establishing a community for practice where people can meet and work together is a way of connecting with each other and the wider world. Writing and making together can contribute significant insights to practice and push boundaries as demonstrated by collectives of experimental writers such as *Dada*, *Oulipo* and the *Beat Generation* in the 20th century. *Dark Mountain* are an admirable example of a collective of artists and writers coming together in the 21st century for the purposes of ecological storytelling. Working with practitioners from other disciplines as well as writers can bring constructive opportunities for development – enhancing learning, emboldening experimentation and sparking new possibilities for the way stories are made.

6. Create opportunities for storymaking

As writers, we understand the benefits of storymaking. We accumulate knowledge and insights into all kinds of subjects, increasing our understanding and empathy, and developing a sense of connection with our subject. We know the joy of weaving together everyday and extraordinary worlds, of the entanglement of experience and imagination. Readers become entangled in this experience, bringing their own imaginative and experiential resources into the mix. Reading can connect us with different perspectives and inspire us to action, but as a mode of engagement it is always one step removed from direct experience. As readers we are introduced to the world through the prism of

someone else's words. Readers contribute to the creation of the text, but the writer chooses what details are revealed or magnified, and a reader's imaginative participation begins from there. Aiming to write stories that allow for greater imaginative participation is one way of connecting the reader as it invites them to be even more involved in co-creating the story. A further step is to create opportunities for the reader to make the stories.

There is significant potential for connection through direct rather than mediated engagement with the world when we invite a reader to make discoveries for themselves through storymaking. This is made more accessible by emphasising the importance of process over end product, and by providing opportunities for people to share not only what they make but the insights that have come from it.

7. Recognise stories as antidote

The enormity of the ecological crises we face, and their social and political causes and ramifications can make us feel powerless as individuals. This can paralyse us or prompt us to look away. Climate breakdown and ecocide don't have to be front and centre in everything we write, but they are there and not to acknowledge them is to participate in turning away. There is unlikely to be one big story that can fix everything. A multiplicity of voices and perspectives is needed. Reflective storymaking that is mindful of its potential impacts is needed. Stories of connection that call attention to nearby, interrelated, everyday wonders are needed. Works of ecofiction, new nature writing and

ecocriticism are increasingly appearing in bookshops, newspapers and journals and their writers appear in the media, at literature festivals and events. This is very positive, but it doesn't mean there isn't more to be done to reach out beyond an already engaged audience. The profit-driven, corporate publishing industry may not be the most appropriate way to share ecological stories. Independent publishers, collectives and individual writers and artists can take more risks. We can engage in intimate acts of storymaking and sharing, working to create chance encounters with story and reaching people who don't identify as readers. We can recognise stories as antidote to every advert asking us to consume more and to every corporate and political distraction that aims to confuse us and deflect our attention from the crises we face. Storymaking can give us space to experience, reflect on and respond to the world in better ways.

Part 3, Chapter 9: Conclusions

Write, let no one hold you back, let nothing stop you: not man; not the imbecilic capitalist machinery, in which publishing houses are the crafty, obsequious relayers of imperatives handed down by an economy that works against us and off our backs; and not yourself (Cixous 1976, p.877)

This research aimed to respond to the calls for ecological stories from conservationists and theorists (DuCann et al. 2017; Klein 2015; Lakoff 2010; Smith et. al 2014; Tsing et al. 2017) through the development of a new approach to ecological storymaking, rooted in material writing practice and connecting both writer and reader to wider nature. This aim was achieved through two key objectives. The first was to develop a new approach to writing practice for ecological storymaking through the investigation of the wider context in which the research is rooted, exploration through practice, the development of writing artefacts and stories, and by sharing the approach developed with other practitioners in a workshop setting to consider its impact and develop it further. The second objective was to identify ways in which the approach that was developed shaped the stories made. This involved analysis and synthesis of key characteristics of the stories and a consideration of how this related to practice.

This research builds on the understanding that stories are an essential response to the escalating ecological crises we face. Stories can engage people with the issues and emphasise human connection with the rest of the living world. This study shows that writers can take positive action through storymaking and that how this storymaking is undertaken has a significant impact on the stories that are made. As a writer-researcher, I have drawn on extensive previous experience and interrogated practice from the inside. By articulating and synthesising my findings I am able to make contributions to knowledge that have implications for both creative practitioners and for future research in this area. These contributions to knowledge fall into three distinct areas: a contribution to writing practice establishes the significant value of material insights for storymaking; a contribution to the evolution of stories establishes that whole stories can be developed by working with rather than for technologies; and a contribution to using stories as a response to ecological crises establishes that connection to wider nature can be made through storymaking.

9.1 Overview of the inquiry

This inquiry brings together and builds on theory and practice from across conventional disciplinary boundaries. The research responds to the calls for new stories in response to ecological crises and the evidence that stories can encourage empathy and connection in a way that facts and figures can't, drawing on the work of theorists including cognitive linguist George Lakoff

(p.21). The approach to wider nature takes inspiration from theorists including Donna Haraway and Jane Bennett, who encourage us to engage with the material realities of the world and explore other-than-human perspectives in situated engagements that help us find connection and wonder in the everyday (p.61; p.235). The research builds on the evidence that technologies shape stories, drawing on the work of Walter Ong on orality and print (p.35), and the work of N. Katherine Hayles on recognising the material realities of digital literature (p.36). In addition to considering how technologies shape stories it also reveals how writing practice is shaped by technologies. Responding to designer El Lissitzky's call for the book-space to respond to the pressures of content rather than the constraints of print publishing (p.46), an open-ended process was developed so the stories made were a response to their ecological content. Ursula K. Le Guin's 'Carrier Bag Theory of Fiction' (p.23) has been a guiding force in the liberation from conventional narrative forms and its influence is visible in the many of the writing artefacts and stories made. The research also draws on the work of scholars and writers including Tim Ingold (p.54) and Italo Calvino (p.60) to advocate for a rejection of industry-driven limitations on the role of writer, allowing new discoveries to be made through material engagement.

The research was carried out using a practice as research methodology, which recognises that significant insights to knowledge can be made through reflection in and on practice, and through the interrelation of theory and practice. This resulted in the production of writing artefacts, stories and the thesis that documents them and synthesises the findings of the inquiry. Three

practice-based explorations were undertaken to develop insights into practice through storymaking centred on different ecological subjects. *Persephone Calling*, centred on a theme of spring and urban nature, reimagining a Greek myth for contemporary audiences. *The Lichen Records* centred on exploring stories of lichens and their relationship to air quality and *How to Catch a River* centred on storymaking in response to flooding. With each project, taking inspiration from the subject led to the use of different materials and methods and an extended and open-ended focus on process. This included the use of drawing, walking and making with technologies to extend my practice, resulting in the development of new possibilities for stories. The resulting work includes handmade wonder tales that integrate narrative and physical materials, respond to the reader or environment, and provide sensory engagement in ways that invite connection with wider nature.

Insights drawn from across the three projects contributed to the development of an approach to ecological storymaking that involves finding connections with wider nature, engaging with material practice, and working with a focus on process over outcome and awareness that technologies shape stories. This approach was introduced to other creative practitioners in two workshops to find out how others responded to the process and to develop it further. The findings from the workshops established that material engagement and a focus on process can inspire practitioners, freeing up creative expression and leading them to new insights. The workshops also contributed an understanding of the value of approaching ecological storymaking as a community. Working as part of a group of practitioners enabled a fruitful

sharing of knowledge and was fortifying for all in the face of working with challenging subjects. Bringing the insights from the practice-based explorations and the workshops together through discussion and synthesis, a series of propositions for writers was developed. These outline actions writers can take to develop their practice in relation to both ecological issues and emerging technologies. Every stage of the inquiry is thoroughly documented in this thesis, and the significant understandings developed are articulated and shared in a way that is transferable for future practitioners and scholars.

9.2 Discovery through practice and the PhD

The use of practice as research as a methodology was essential to the success of this inquiry. Only through imbricating theory in practice (Nelson 2013, p.8) and reflecting on the creative process from the inside could the insights into the significance of material writing practice for ecological storymaking have emerged. Working directly with the interrelationship between story and technology, I expanded my role as a writer to develop whole stories where both narrative and physical materials contribute to telling the story. This led to the development of understandings that could not have been achieved using another methodology or from a research position outside practice. Practice as research enabled a responsive approach, where emerging insights inspired further investigation. This provided fertile ground for the 'creation and interpretation, construction and/ or exposition of knowledge which extends the forefront of a discipline' (QAA 2014, p.30). The insights from the discoveries

made are transferable to writers and researchers working in a range of fields through their documentation, interpretation and articulation in this thesis, fulfilling the requirements of the PhD (Ibid.). The relevance of the results of this study to a wide-ranging audience underlines value of using practice as research in an interdisciplinary setting to address complex, boundary-defying subjects.

This research demonstrates the significant benefits of bringing practice and theory together in doctoral study for both the creation of new knowledge in the academy and the development of creative practice both inside and outside academic institutions. Approaching research as a writer shaped the way I undertook the research, leading me to jump straight in to practice, and to be open to intuition and serendipitous encounters. Approaching writing as a researcher enabled a deeper interrogation of practice, requiring that I make my process visible, which gave me more material and insights to reflect on and work with. Engaging in practice as research has had a significant impact on my creative practice both in this study and outside it. It has led to the development of an approach to practice that prioritises process and material insights, isn't limited to content-making, and draws freely from other art practices to enable responsive and materially imaginative work with the subject of a story.

9.3 Recognising the limitations of the research

This research is necessarily bound by the timescale and requirements of doctoral research. The research is situated in my own practice and experience

and it essential to acknowledge that this is necessarily limiting. While aiming to work with an awareness of a global context, the study is rooted in my individual subjective experience. This is a limitation for both the findings and the way I present them. The nature of doctoral study and focus on practice as research meant that I spent long periods of time researching as an individual. The workshops underlined for me the benefits of communal practice, which were largely absent throughout the wider study. Additionally, although I have attempted to draw materials for inspiration from a wide range of sources around the world, my work is still limited by its Western focus overall. Digital technologies can enable more access to ecological knowledge and storymaking traditions from around the world and in future work I need to work further on engaging with and developing my research in a global context. More time and more opportunities to collaborate with others, particularly across geographic boundaries, would lead to more insights and I intend to work to develop an international community of practitioners and projects in this area as part of my future research.

The research is limited to a focus on stories understood in relation to literary writing practice and does not consider film, theatre or other narrative artforms. This is due to its being rooted in my own writing practice and the need to provide boundaries that made the study achievable within the given timeframe. I recognise, however, that there are significant discoveries to be made in relation to those other artforms and that some of the implications of this research may be of relevance for those working with stories in other artforms. The research does not extend to explore the relationship of readers to

ecological stories more generally. To do this justice would require a further study with a different methodological approach. The intention of this study was to focus on writers and the storymaking process and in doing so contribute to writing practice.

The research has resulted in the production of stories that are not easily categorisable. The research has met with enthusiastic responses at a range of conferences and events where I've shared it, but it's often the only non-screen-based work presented. Its hybrid nature and the absence of screens means it doesn't meet the requirements of several digital literature prizes. *Persephone's Footsteps* was longlisted for the *Ivan Juritz 2018 Award*. This is a prize for creative experiment and the work was longlisted in the category for installation and performance rather than the category for text. Although I identify myself as a writer, as a result of this research my practice now sits at the boundaries of media. Working in this liminal space means not always having the words to classify what it is I'm doing, and this can make it harder to make the work visible to others. The handmade, intimate nature of the work also makes it difficult to share widely. Academia has been a privileged space in which to explore this practice without recourse to economic concerns. It has enabled me to focus on ecological subjects and prioritise an exploratory process rather than needing to make a product that can be sold. As a result of this, it is the approach to ecological storymaking, rather than the stories themselves, that can be more widely and easily shared.

9.4 Considering the implications of the research

The interdisciplinary nature of this research means it has implications for a wide range of practitioners and scholars concerned with writing, publishing and ecological storytelling. For writers participating in ecological storytelling there are significant implications for practice. This research finds that centring and responding to an ecological subject matter through storymaking enriches and expands the writing process. This leads to a more engaged consideration of materials and the ways technologies are used to make and share ecological stories. The research demonstrates the importance of finding and experiencing connection with wider nature as part of writing practice. The tendency of writers to work unquestioningly with print conventions, at a distance from the world, behind a desk, means opportunities are missed for a more embodied connection with wider nature. The benefits of focusing on material writing practice have implications for the contexts and spaces writers work in, the materials they use, and the ways that we teach creative writing in schools and universities. This research suggests that creating spaces and opportunities for material practice is essential to the development of writers' understanding of the interrelationships between technologies and story.

This research also has implications for writers, publishers and theorists concerned with the development of writing practice in relation to digital technologies and the evolution of stories. It builds on the investigations of digital literature scholars, in particular N. Katherine Hayles, and reflects on the ways writing for print technologies still dominates our methods, even though

digital technologies mean we can now make and share stories in many more ways. Working with, rather than for, digital technologies opens up an exploration space and provides a valuable feedback loop between the development of story content and the story will be shared. Digital literature scholarship has overwhelmingly focused on screen-based work, yet due to rapid technological change development in this area has become more difficult for individual writers over time. By working with the more democratic technologies associated with Maker culture, this research has shown what it is possible for a writer without a computing background to achieve. It has led to the development of several stories that use digital technologies to respond to their readers or environments in ways that have not been done before in either academia or publishing.

The focus on making works that do not require a screen or possession of a proprietary device, presents new possibilities for those making digital stories and has implications for the publishing industry. The work is small-scale and exploratory, but that does not mean its implications are limited. I was recently asked to contribute an article about this research to *FutureBook*, prominent UK publishing magazine *The Bookseller's* digital publication, which shows that the approach developed here is of interest to publishers. The article made a case for the recognition that writers have narrative and imaginative skills that can contribute to the shaping of the technologies we use to engage with stories (Dean 2018). For readers, the development of this work has implications in terms of their understanding of what a story is and how material elements and the context of reading contribute to their sensory experience of it. These

developments invite a more active role in exploring a work of fiction and expand conceptions of what reading a story means and where this can take place. The stories resulting from this research provide opportunities for a reader to engage with wider nature through both the content of the story and their experience of reading it, reducing the potential for dissonance between the ecological subject matter and the way a story is shared.

The successful development of this research with its emphasis on interdisciplinarity has significant implications for future scholars and for the institutions and funding bodies that support their research. This study demonstrates how a researcher with an arts background, funded by the Engineering and Physical Sciences Research Council (EPSRC), has been able to harness the opportunities provided by interdisciplinary engagement to produce research that engages with multiple disciplines to make contributions to a wide range of fields. It points to the benefits of cross-pollination between disciplines and departments and the need for the provision of workspaces and opportunities that can permission and inspire this. As a centre, HighWire has offered me invaluable support across disciplinary boundaries, enabling me to undertake research that acknowledges the complexity inherent in aiming to respond to ecological crises through storymaking.

The research was motivated by responding to the call for new stories. Its findings have implications for approaches to environmental storytelling across artforms, media and disciplines because it demonstrates that the ways stories are made and shared has an impact on the stories we end up with. It's not just the words that tell the story, but the way the story exists in the world too. This

suggests a need for anyone engaged in ecological storymaking to work with an awareness and sensitivity to the ways in which the context of their practice and the material realities of production will shape the story that their reader encounters.

9.5 Future Work

This research provides a grounding from which I will develop future work and that can be used as a springboard by other writers and scholars in this area. I intend to continue working with a material writing practice, bringing these insights to all my future work. Initially, I intend to build on the work by designing and making digital stories that are more robust, so I can share them more widely and work with the insights of readers to develop them further. I am keen to further experiment with the scale and location of work produced, aiming to build on the use of materials and technologies in this research to bring story into city environments and particular to invite chance encounters with story to reach audiences who don't engage with reading books.

The importance of creating opportunities for storymaking for others for connection to wider nature is something I intend to explore further in my role as writer-in-residence on the *Ensemble* project at Lancaster University. I will also bring a focus on material writing practice and a nuanced understanding of how technologies shape stories into my new role as a Lecturer in Creative Writing, with the opportunity to share and develop the approach throughout my future academic and professional writing career. I intend to use the

academic role as a space from which to build a transdisciplinary community of practitioners with interests in ecological storymaking, inspired by finding the value of working as a group in this area.

The propositions for writers are a research outcome specifically designed to make the findings of this research communicable to a wider audience. The findings can be taken forward by individual writers and by those who teach creative writing at all levels. The workshops established the importance of creating a supportive space for experiment with material practice. Establishing studio spaces and mixed media workshops where practitioners can explore storymaking with a wide range of technologies, materials and methods would bring benefits to the development of writing practice in professional, community and educational settings.

The research's finding that the act of storymaking brings a sense of connection to wider nature could be taken forward by individual writers, and by conservation and environmental science organisations. Exploring and developing storymaking opportunities for the general public could form part of a response to specific ecological issues with which organisations want people to engage.

9.6 Contributions to knowledge

Knowledge about and developed through creative practice often remains tacit. As practitioners, we draw on previous experience and intuition. Our work often stands as its own explanation and knowledge about process is bound within

both the work and ourselves. Research requires us to articulate why and how we have made something, making our creative process explicit and rendering this knowledge visible. In this way, it can be shared with and understood by others and built upon in future.

9.5.1 Contribution to writing practice – material insights

This research contributes to knowledge about writing practice. It has revealed that a focus on material practice can lead to insights that are developed through the act of making, which helps reduce the distancing of writers from the processes and impacts of production. The research establishes that by working with a more open approach to practice and avoiding technological determinism, new possibilities for making and sharing stories can emerge. This can be seen in the way using walking to explore the Persephone myth in the city lead to the development of altitude-responsive story *Persephone's Footsteps*. The episodic narrative was composed through walking and developed *with* rather than *for* the technology, so that the character's journey and the reader's become entwined.

This approach necessitates a re-consideration of the role of the writer. By understanding making as a dialogic process between imaginative composition and physical materials, the role of the writer expands. I have learned to code in different programming languages, solder, sew and use book binding techniques. I've begun drawing again for the first time in more than twenty years. Engaging in material practice and using methods from across artforms generates insights and possibilities *through* making that couldn't emerge if working with abstract

ideas or typing directly onto a computer. This is a way of making story possibilities malleable and providing space for the writer to play a role in shaping the way a story can be shared in the world.

9.5.2 Contribution to the evolution of stories – towards whole stories

This research contributes to knowledge on the development of stories. It finds that engaging in material practice without a pre-defined outcome can lead to the making of stories that embrace the interrelationships between subject, content, form and medium to develop what this research defines as whole stories. These are stories that integrate narrative and physical materials at every level. For example, *For Hades* is a gift from Persephone to Hades, a story designed to be read by touch in the dark, and a collection of found materials, with fragments of the stories of other living things attached to each object. In its scroll form, with vials of honey and seeds and a book made from oak leaves, it is an artefact intended to invite exploration and inspire a sense of wonder.

Building on the theory that technologies shape stories, as evidenced by the impacts on story content, form and structure in the oral and print traditions, the research opens up an exploration space to consider the impacts of digital technologies on story. It finds that by centring the subject of a story to inspire materials and methods for storymaking, new possibilities for the realisation of the story emerge. This is significant in current practice given that digital technologies are providing us with more ways of making and sharing stories. Developing stories with technologies allows for dialogue between materials, creating opportunities for surprising innovations and hybrid forms.

In this research, it has led to the development of stories that are responsive to reader such as *Persephone's Footsteps*, which responds to a reader's movements in relation to altitude, and stories that respond to the environment, such as *Detours from Lichen Cartography*, which will only grow longer in daylight. These stories invite sensory and embodied participation, enabling ecological narratives to be shared in new ways that bring readers into direct contact with other living things.

9.5.3 Contribution to using stories as a response to ecological crises – connection through storymaking

This research contributes to knowledge on using stories to respond to ecological crises. It finds that empathy and connection with other living things can be developed through the making of stories. The potential for beneficial connections through storymaking is evidenced by the impact of this process on my own relationship with wider nature, the enthusiastic engagement of the wider public with *The River Library*, and the overwhelmingly positive responses of those who took part in the *Making Wonder Tales Workshops*. This research demonstrates that creating opportunities for storymaking can be a positive action for engaging with ecological issues and suggests that a focus on creating opportunities for others to make stories may be as valuable a response as making stories for others to read.

The research finds that centring the ecological subject matter when making a story provokes a cascade of ecologically sensitive choices in terms of

the materials and methods used. This results in stories that can provide a more direct connection with wider nature, either through materials or by taking the reader outside. Materials were recycled or repurposed wherever possible. The digital stories use rechargeable batteries and are designed to have very low energy consumption. In contrast to the concealed nature of much digital technology, this research finds that working to make the technologies used visible encourages responsibility on the part of the writer. The potential for dissonance between medium and subject is reduced, and the stories made invite imaginative engagement with ecological subject matter for both writer and reader.

9.7 The value of this research

Throughout this study I've bridged multiple disciplines and engaged in practice as research to develop and share significant new understandings for ecological storymaking. By taking an interdisciplinary approach – working in Design, Computing and Creative Writing and engaging with the Environmental Sciences – I was able to respond to research questions that could not have been answered from within a single discipline. The specific findings of this study were only discoverable through practice as research, which enabled a thorough investigation of the interplay between story subject, content, form and medium from within practice itself. This research challenges both the print-centric conventions of writing practice and the screen-dominated conventions of digital literature. The emergence of new digital technologies, and the

accessibility of those associated with the Maker movement, brings an opportunity for writers to reflect on the way we work now, and to contribute to how writing practice and stories develop in future.

Conventional publishing is profit-driven, market-orientated and specifically targets an audience who will purchase books. Given these conditions, publishing houses cannot be relied upon to explore different ways of making the ecological stories that are needed to address the current crises. This research demonstrates that a writer's direct engagement with material practice, makes it possible to respond to an ecological subject matter through the making of whole stories, where the methods, materials and technologies used are sensitive and responsive to the story being told. The projects undertaken illustrate an approach to the creation of ecological stories that inspires wonder, emphasises human connection with the rest of the living world, and invites awareness of, and empathy with, nonhuman nature in urban environments. The use of this approach has resulted in stories that invite readers to become more aware of their connection to wider nature through imaginative and sensory engagement with stories. This is a valuable response to the evidence that readers need stories that will engage them directly with the issues in a way that factual information can't. This participatory experience of reading takes place in new ways, with stories responding to the reader and their environment, and in doing so it helps raise awareness and invite the empathy that is needed to inspire positive ecological action.

During this inquiry, reflection in, on and through writing practice has demonstrated the incredible value of a focus on material practice. Through this

approach the distance between writing as an activity and wider nature has been reduced, leading to the development of stories that invite embodied exploration of wonder tales within the world. For me, this approach to storymaking resembles the symbiosis of the lichen, where fungal and algal partners come together to make something more. Here, the narrative and material elements of story come together to make something that couldn't exist otherwise and that can thrive in new and unexpected environments.

Engaging in this research has completely transformed my writing practice. Consequently, this will impact on all the stories I make and share in future. I've become certain that in facing ecological crises we not only need new stories, but also new ways of making them. This research points towards some of the ways in which this could be done. We must be willing to reflect on where we are and ask difficult questions if we want to imagine new possibilities for our stories and for the world we're living in. It requires tenacity to keep exploring and making and responding when multiple ecological crises and their ramifications can feel so overwhelming at an individual level.

On my way home from university this evening, sitting on the top deck of the bus, I noticed lichens growing all over the metal roof of a bus shelter. I smiled because their names immediately sprang to mind as if in greeting – *xanthoria parietina* and *physcia adscendens* – and also because they were tree lichens thriving on a structure made by people, suspended between ground and sky. My knowledge of lichens is an unexpected legacy of this research, but one I'm incredibly grateful for. These miniature wonders with unpronounceable names that can tell us so much go unnoticed every day. Only by giving our

attention to the world can we begin to make the ecological stories we need. The stories the world needs most of all are those that inspire us to give it our attention.

Appendix A: Contributions and publications

Academic roles

Research Associate, *Institute for Social Futures*, Lancaster University (2017-2018): *Graphic Futures* – a project in collaborative authorship to design futures-based graphic stories.

Writer-in-residence, *Ensemble*, Lancaster University (2016 onwards) – an interdisciplinary environmental and computer science project.

Associate Lecturer, BA English, MMU (2015-2016) – Short Stories Module

Conference and Workshop Presentations

Dean, C. (2017) 'A Long Map: exploring walking as a method to make altitude-responsive ambient literature', *MIX 2017*. 10/07/17 - 12/07/17, Bath Spa University.

Dean, C. (2017) 'Leonora, Fly', *Leonora Carrington Centenary Symposium* 30/06/17, Edge Hill University.

Dean, C. (2017) 'Writing as Making, Making as Writing', *Writing as a Material Practice Workshop*. 24/05/2017, Lancaster University

Dean, C. (2016) 'Writing Without Type: Explorations in Developing a Digital Writing Practice', *International Conference on Digital Media and Textuality*. 3/11/2016 – 5/11/2016, University of Bremen, Germany.

Dean, C. (2016) 'Making Wonder Tales: Developing a Digital Writing Practice', *Screening the Literary: Writing Quality on the Web*. 28/10/2016, Lancaster University.

Dean, C. (2015) 'Writing from Research: Fact into Fiction', *Celebrating the Short Story*. 5/12/2015, University of Huddersfield.

Dean, C. (2015) 'Making with Wonder Workshop', *National Association of Writers in Education Conference*. 13/11/15 - 15/11/15, Durham.

Dean, C. (2015) 'Into the Digital Woods: Fairy Tales in New Forms', *MIX 03: Digital Writing Conference*. 2/07/15 - 4/07/15, Bath Spa University.

Additional research-related literary outputs

Dean, C. (2018). Writing for the improbable bookshelf. *Futurebook. The Bookseller*. Available at: <https://www.thebookseller.com/futurebook/writing-improbable-bookshelf-78> [accessed 26 July 2018].

Dean, C. (2017) 'A Rat's Tale', *Light Up Lancaster 2017* [installation and performance] Lancaster Library and various locations in around the city centre.

Dean, C. (2016) 'The Weeder Woman' [story for site-specific audio installation with Liz Edwards]. National Trust Clumber Park, Nottingham.

Dean, C. (2016) 'The Scarecrow and the Boy' [story for site-specific audio installation with Liz Edwards]. National Trust Clumber Park, Nottingham

Dean, C. (2015) 'Data Stories', *Environmental Internet of Things*, School of Computing and Communications, Lancaster University [Online], Available: <http://www.environmental-iot.com/data-stories.html> [28 April 2017].

Additional literary publications during the PhD

Dean, C. (2017) 'The Two Sisters' *A Festival of Tales* [commissioned performance

- and online publication] Ormskirk: Chapel Gallery
- Dean, C. (2017) *Bremen* [short story chapbook] Manchester: Nightjar Press
- Dean, C. (2017) *The Unwish* [short story chapbook] Manchester: Nightjar Press
- Dean, C. (2017) 'People Watching', *Thought X* [short story] Manchester: Comma Press.
- Dean, C. (2017) 'Is-and', *The Best British Short Stories 2017* [short story] Norwich: Salt
- Dean, C. (2016) *The Museum of Shadows and Reflections* [collection of short stories] St Andrews: Unsettling Wonder.
- Dean, C. (2015) 'Voice Marks', *Spindles: Stories from the Science of Sleep* [short story] Manchester: Comma Press.

Appendix B: Workshops

Ethics approval:

FSTREC ref: FST16022:

The application has been reviewed by members of the FST Research Ethics Committee and approval has been granted for this project.

Questions sent to participants after the workshop:

1. What are your thoughts on the process we used in the workshop? How does it relate to your usual practice?
2. During the workshop did you come up with any possibilities for creative work that you think you will take further?
3. Do you have any thoughts, comments or questions that come to mind about the work I've been making for my PhD?

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