DESIGN FROM DECOMPOSITION:

CONNECTING TO A CYCLE OF MATERIAL AFTERLIFE

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RESEARCH ABSTRACT

Textile making as a practice has historically prioritized human-based need (Colchester, 1991; Geijer, 1979), however, the era of climate emergency compels revisiting design and production traditions within the textile industry and reconnecting with cycles of a more-than-human world. A term first proposed by philosopher and ecologist David Abram (1996), the more-than-human world, has come to describe the interconnected matrix of relationships beyond isolated human understanding to include the wisdom of nature and served as the focus of many research studies ranging from Participatory Design (PD) to Ethics (Noorani & Bridgestocke, 2018; de La Bellacasa, 2017). Yet, how such approaches inform textile making practice remains an open question. This research enquired how encountering more-than-human forces might shape designer relationships to their materials of practice, by reconnecting to a material life cycle phase typically considered destructive from a human perspective and regenerative for non-human forces—decomposition. Using hentilagets, a word from the dialect of Shetland for small tufts of wool picked up and gathered from fences and fields in Scotland, and waste wool this enquiry sought to understand if decomposition was a meaningful grounding to inform textile making through engagement with design practitioners who worked with wool in Scotland and the more-than-human matter found in Scotland's soil.

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DECLARATION

I, Lindsey Stewart Sherrod, declare that this submission of full thesis for the degree of Master of Research meets the regulations as stated in the course handbook.

I declare that this submission is my own work and has not been submitted for any other academic award.

[redacted]

Lindsey Stewart Sherrod
The Glasgow School of Art, December 2021

PREFACE

This enquiry began with reading the honest account of a former vegetarian becoming a shepherd. In an essay, the author described their complex and often-emotional process of accompanying the lambs that they raise from birth to harvest each year to understand their own connections to natures' life cycles (Dunn, 2014).

"I am part of nature, not above it."

The author's words (not mine) became a mental refrain I returned to over the last two years. At the time of reading, I was in the middle of a demanding season of production and marketing of my work. When the studio was quiet, and I was surrounded by "things" that I had initiated into the world through making I became increasing curious about their ending. In a world where what is new and exciting gains prime attention and economic focus, this sharp departure to "the end" felt like something that I was not supposed to bring up in conversation and most assuredly not in my practice. It felt dark and unknown. It seemed like a space that someone with a different expertise would address. Having spent my formative years on a farm where foggy light rises off mountain vegetation each morning, however, I found that questioning the matter did not bother me. Nature has its own rhythms and I acknowledge that I am part of them. So, again, I returned to considering, "What does it mean to be admittedly, imperfectly, a part of nature and its cycles, and in my case as a designer, how does this shape what I create?"

A few years before reading the essay, my own practice began after working as part of a creative agency team in Chicago. I observed clients in urban environments who brilliantly navigated the realities of modern production. I supported their efforts through design, however, I also often wondered if there were alternative paths to sourcing and production. In 2014, the opportunity arrived, and I began my own practice of designing accessories as informed by the farming practices that I observed in my youth. My mother and father built our first home with their own hands, on land near an ecologically protected mountain range that is 209,000 hectares wide at the base and home to more than 3,500 plant species. Through our experiences living in a curve dipped between two mountains, caring for the land and animals, my parents taught me that nothing is wasted, and everyone is connected to everything. My first designs were made as a reflection of this philosophy. I decided to study alongside mountain farmers and saddle makers to understand how durability and form could take shape as accessories and occasionally garments. In the process, I also gained first-hand experience of materials and often under-utilized resources that are available to designers when we are open to possibility. As a result, the first few accessories were aesthetically different than what I expected, but I was intrigued by the way that they were produced. This led me down a path of wanting to re-examine what it could mean to utilize co-products of "healthy farming" and land management practices in design.

I was informed many times by contacts within the textile industry that this approach was most likely not viable, due to the factors defining modern supply chains. My own challenge, despite deterrents and admittedly many setbacks, became finding a way to reshape my own linear supply chain thinking into a regenerative circle representing care and respect for land and animals. I believe that the immersion of working alongside farmers at the beginning of my design process led to design principles that continue to guide my practice, such as sourcing traceable leather from sources who engage in healthier land and labour practices. I also believe that this path to making would not have emerged if I had initiated my practice solely from my studio environment.

Upon acceptance to the Master of Research programme at The Glasgow School of Art (GSA), I thought that my research would reflect principles from my practice, but I also expected that it would push me beyond my own thinking as I learned from my supervisors and instructors. Initially, I thought that I would work alongside farmers to learn from them, which would then result in the making of an artefact. However, during the course of reading and interactions with my supervisors and leaders in my field, the project began to reshape itself. In an early supervisor interaction, we discussed the return of a traditional practice in agriculture where farmers bury cotton textiles in their fields to test soil resiliency and how the technique had become the focus of several sustained research studies (Knox and Osanai, 2021; Middleton, *et al.*, 2021; Taylor, 2021). This led to the evaluation and decomposition of garments from my own closet. Around this time, I began to observe increasing public awareness towards the value and purpose of wool in relation to the work of shepherds in Scotland. Due to decreasing prices for wool, many shepherds were seeking new purpose for their fleece, burning this year's wool yield, or regretfully considering leaving it behind to rot in their fields. Combined with my closet decomposition, which was in progress, a new direction began to emerge for this research that situated my thinking securely on "the end". Like the shepherd in the initial essay, I sought to more fully understand my connection to the cycle of material afterlife.

VOLUME 1

This research occured over two cycles—one that represented the study of literature, methodology, and work with participants (Volume 1) and one cycle that reflected work as reflective practitioner (Volume 2). Therefore, included with each volume is a table of contents, lists of figures and terms, and instructions for reading each volume.

GLOSSARY OF TERMS

DECOMPOSITION: For the purpose of this research, decomposition refers to a cycle of material afterlife where artefacts interact with the liveliness of microorganisms found in soil.

DESIGN FROM DECOMPOSITION (DfD): A design approach in which materials of practice are first examined and tested through soil burial in order to determine how the decomposition process shapes form.

DECOMPOSITION-LED: For the purpose of this research, decomposition-led described the design process in textile making where decomposition is considered in ideation phases and material selections, but the actual decomposition is not experienced.

HENTILAGET: A word from the dialect of the Shetland archipelago referring to tufts of fleece left behind, often in pastures or intertwined with barbed wire fences. 'Hent' means to grasp or gather, and, 'laget' refers to wisps of a material such as wool or straw.

MATERIAL AFTERLIFE: For the purpose of this research, a cycle of material use requiring human and more-than-human intervention.

MATERIALS OF PRACTICE: Matter that is shaped, molded, or constructed into a form through a practice or discipline. For the purpose of this research, Materials of Practice refers to fibres used for textile making by designers within their mode of practice.

MORE-THAN-HUMAN: Recognition of a matrix of relationships experienced through sensation and perception beyond isolated human understanding to include the wisdom of nature. In this research more-than-human includes the liveliness of the microorganisms found in soil.

RELATIONSHIP: A reciprocal connection between two entities.

TEXTILE MAKING: The process of designing, creating, and producing textiles for human use.

WOOL DECOMPOSITION: For the purpose of this research, wool decomposition is a site of interrogation for material afterlife.

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CHAPTER 1:
INTRODUCTION

1.1 INTRODUCTION

The decomposition of material objects is typically not the desired outcome of design. In textile making, this is particularly evident in the establishment of the standardised Cotton Strip Assay test—a low-intervention, low-tech method utilised in scientific practice to measure the microbial activity in soil through the burying of undyed, calico cotton strips (Harrison, Latter, and Walton, 1988; French & Howson, 1982; Latter and Howson, 1977). The development of the Assay, was not intentional, however, but an unexpected conclusion of textile research for fungicides to prevent cloth decay (Barr, 1988; Harrison, Latter, and Walton, 1988; Schmidt & Ruschmeyer, 1958; Wade, 1947). Rather than establishing a barrier between textile and the soil, the Assay experiments unearthed a new method for investigating the activity of microorganisms living in soil (Harrison, Latter, and Walton, 1988; Sagar 1988; Latter & Howson, 1977; Heal *et al.* 1974) **(Figure 1)**.

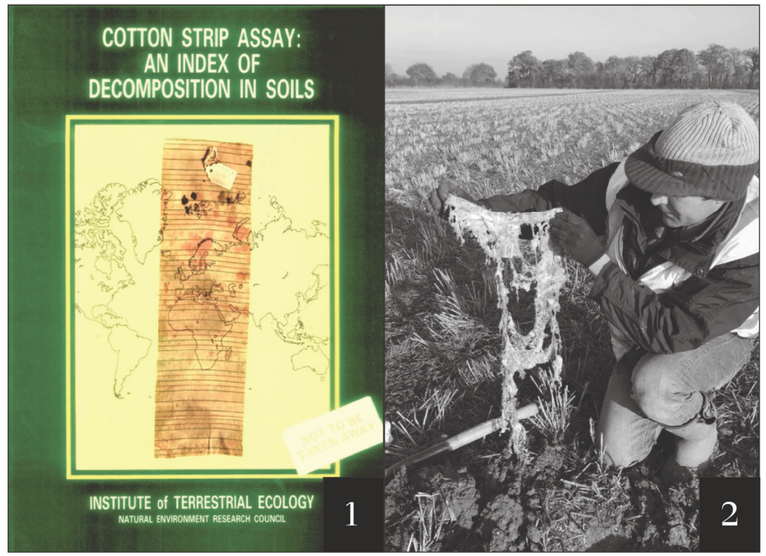


FIGURE 1: 1. Cotton Strip Assay, Harrison Latter and Walton (1988). 2. Assay Field Testing in agriculture, The Herald, 13 May 2017.

Over the last forty years, the Assay has evolved into an adaptive research field method, as well as tool to assess soil health. Revisiting textile decomposition, however, in the current climate era presented an opportunity to reconnect with textile decomposition as a pathway to renewal, rather than a point of resistance for designers. It is in this context that this research surrounding wool decomposition occurred, and in the following sections the research aims, objectives, and questions that guided the research are described (Section 1.2, 1.3), along with information regarding the role of practice (1.4) and instruction for reading the thesis (Section 1.5).

1.2 AIMS AND OBJECTIVES

In pursuit of the research enquiry to understand connections between textile decomposition and material afterlife in relationship to designers and their work, the following aims and objectives served as a framework:

Aim: To study the relationship between designers and textile afterlife, through wool decomposition in soil.

Objective 1: Create an experience where designers who work and make with wool in Scotland physically experience and interact with wool decomposition in soil.

Objective 2: Understand how the experience of wool decomposition in soil influences meaning and decision-making for designers working and making with wool in Scotland.

Objective 3: Consider how the experience of wool decomposition relates to the designer's perception of their own connection to the more-than-human.

1.3 RESEARCH QUESTIONS

Using the aims and objectives as guides, this enquiry therefore asks a main research question and one sub-question:

Main Research Question: What meaning do designers who work and make with wool find in wool decomposition?

Sub-Question: Does the experience of wool decomposition influence the relationship between designers, their material of practice, and the more-than-human world?

1.4 THE ROLE OF PRACTICE

In addition to research of the topic and work with participants, this research engaged the researcher's practice of working and making with textiles in accessory form. Firstly, by not removing the researcher as practitioner from the decomposition or "end" process, this practically engaged both material afterlife theory and practice in a hands-on manner. Similarly, to how the working alongside farmers in the context of the researcher's previous work led to deeper

understandings of material sourcing. Secondly, this research required directly sourcing textile materials in raw form, specifically wool, to learn how the fibres could safely return the soil. Finally, studying decomposition as a reflective practitioner drew upon interdisciplinary knowledge of soil health and composting to reveal insights for the creation of an embodied symbol through experimentation.

1.5 READING THE THESIS

Each of the steps outlined in the section above (The Role of Practice) required reflecting-in-action (Schön, 1983), where as a practitioner, work is shaped through emerging knowledge or activity as it is unfolding. Therefore, the thesis text and reflective work of practice for this research are bound together in one document consisting of two volumes to reflect how research and practice interacted throughout the year-long study. The first volume describes research preparation, as supported by literature and methodology, as well as fieldwork and findings that resulted from work with participants in the study. The second volume portrays the ideation and assembly of the symbol that occurred after participant work concluded and documents how research findings shaped the artefact form. It is recommended that Volume 1 is read first, followed by Volume 2. Concluding remarks and future research opportunities can be found at the end of Volume 2 in the Epilogue.

CHAPTER 2:
SCOPE OF CONTEXT

2.1 INTRODUCTION

Wool decomposition in soil was revisited in this enquiry to investigate the relationship between designers and textile afterlife. Within the Scope of Context (Chapter 2), decomposition as an approach to understand textile afterlife will be mapped (Section 2.2) to literature that suggests the future of textile afterlife resides in technical cycles of continual use. Next, decomposition-led approaches, where textile afterlife is "designed in" but not experienced, are examined (Section 2.3) and how this approach to decomposition limits understanding of the more-than-human world. Finally, wool is evaluated (Section 2.4) as a contextual and practical material to undertake the research.

2.2 MAPPING TEXTILE DECOMPOSITION

Decomposition as a reference term is complex, utilised in varying fields, and therefore must be defined in the context of this study. While decomposition can conjure associations of decay, deterioration, corrosion, and death, there are studies that reveal how embracing the idea of decomposition in material objects can provide new design insights and open pathways to regeneration (Liu, Bardzell, & Bardzell, 2019; DeSilvey, 2006). Applications of the term in fields such as microbiology, physiology, and zoology (Swift, 1979), as well as statistics (Kitagawa, 1955) and computer science (DeMarco, 1979) suggest decomposition can open up insightful activity rather than views of a stagnant, unavoidable path to decline. Conceptually, decomposition offers two paths to renewal that can appear interchangeable from consumer perspectives (Napper, 2019) but offer different applications in this research context—biodegradable and compostable. Biodegradability theoretically applies to all organic matter (Chandra, 1988); however, the term biodegradable can be applied to such items as petroleum-free alternatives to synthetic fibres which are biological or biologically derived polymers (BioPolymers), and, as such may require industrial facilities to enable the transitional process into simpler compounds (Fletcher, 2014; EcoTextile News, 2007). Textile BioPolymers can also include Polylactic (PLA) fibres, such as corn, derived from waste streams and materials associated with, large-scale, intensive agriculture (Fletcher, 2014). Some studies assert that the industrial processing of post-use textiles feeds into a new era of material use based upon principles of the Circular Economy (CE) where all materials loop within continual cycles of use (Ellen MacArthur Foundation, 2017). It has been argued that this is an Age of Recovery (Goldsworthy, 2021) in which the key is designers actively preparing proactively for the end of a material life cycle:

> *Today, it has never felt more important to stop our precious resources ending up in landfill or leaking fibres into our environment and oceans. It has flipped the practice of materials design*

and recycling from a reactive approach based on upcycling to a more proactive one based on recovery and regeneration. The essential aim is to start with the end at the beginning and prepare materials for recycling in the future (Goldsworthy, 2021 pp. 140).

While this approach addresses the continual need to "close the loop" in order that all materials and design components feed into systems of renewal (Braungart and McDonough, 2002), the technology to implement industrial solutions for textile recycling and biodegrading to scale remain emergent (Payne, 2015; Innovations in Textiles, 2020). For example, currently less than one percent of post-use garments are recycled into new clothes and only 13 percent of garments are recycled into other products (Ellen MacArthur Foundation, 2017). However, adopting the mentality of the Age of Recovery to proactively prepare for textile afterlife presents an opportunity to re-visit textile composting as a decomposition technique **(Figure 2)**. If designers in this emergent age are tasked with preparing for the afterlife of materials, it may alter the traditional relationship that designers hold with their materials of practice, where emphasis and value has traditionally been placed upon creative, economic, and commercial outputs. In the following section, examples of artists, designers, and researchers who embrace decomposition-led work are examined in the context of frameworks for encountering the more-than-human world.

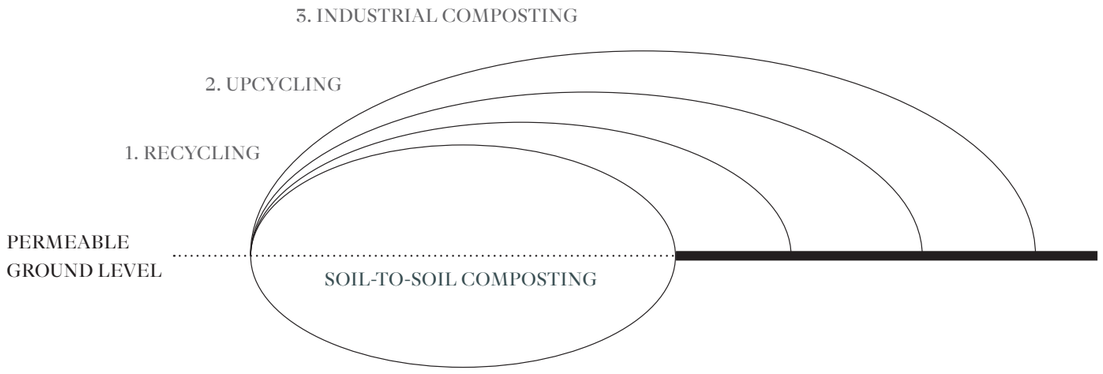


FIGURE 2: Techniques for textile afterlife (Researcher's own, 2021).

2.3 SOIL-TO-SOIL

Composting as a decomposition technique returns natural fibres to soil as nutrient-based materials through existing biological cycles (Fletcher, 2014) and allows soil to become an accessible, interactive place where meaning can be examined in the context of this research. This "soil-to-soil" approach of composting natural textile fibres also mirrors emerging themes within local food cultures (Burgess, 2019), where priority has transferred from industrial agriculture preservation to soil fertility and agroecological practices. Soil as a place for active interrogation between two worlds, rather than medium, has also extensively been examined within research where soil is invited into practice through active interplay and further binds researcher within their surroundings. Artist-researchers from Aalto University, Helsinki collaborated with the Finnish Environment Institute to investigate the interrelations of human and environment through soil, using craft as an embodied way to engage with the local environment (Latva-Somppi and Mäkelä, 2020). Wendy Teo Atelier and Eliza Collin's Narratives of Soil bound practitioners across disciplines and place through soil (Teo and Collin, 2021). Within a textile making context, Hussein Chalayan's The Tangent Flows collection, Central Saint Martins (1993), intentionally interacted with the transformational qualities of microorganisms in soil by burying textile-based garments at his home and unearthing the designs in their decomposed states immediately prior to presentation. While each of these studies **(Figure 3)** encountered aspects of soil's liveliness, in

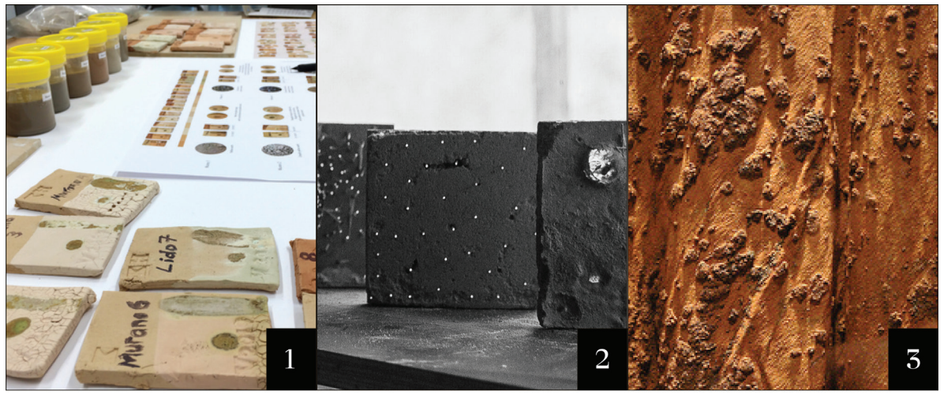


FIGURE 3: 1. Traces from the Anthropocene: Working with Soil (Latva-Somppi and Mäkelä, 2020). 2. Narratives of Soil: A Material Research Project (Teo and Collin, 2021). 3. The Tangent Flows, Hussein Chalayan (1993).

the search for decomposition-led studies where breakdown of matter was "designed-in"—studies surrounding altered meaning or perception resulting from designers directly engaging with or

"handling" (Bolt, 2006) the actual decomposition of textile materials beyond the design phase were not found and a gap within the field emerged.

Following the evidence of accumulating decomposition-led approaches, however, scaffolds the need for understanding more about the meaning found through textile afterlife. Kate Fletcher and Mathilda Tham advanced this thinking in their Lifetimes project, where alternative rhythms of consumption were presented and instructions for composting a garment post-use was included for wearers (Fletcher, 2014). At the Fashion Institute of Technology (FIT), students Lydia Baird and Willa Tsokanis designed a compost system to utilize muslin scraps from design mock-ups to feed green spaces on campus, such as a natural dye garden (Ego Sum Terra, 2018). Although both projects arguably present post-use solutions to existing textile constructions, the following emerging research highlights the need to "design in" compostable qualities at the onset. The Sneature project explores the complex disassembly and recycling of trainers by utilizing unconventional and fully compostable waste materials, such as hair and plant materials along with mycelium, a network of fungal threads, to create a sneaker designed for decomposition

FIGURE 4: 1. Sneature Project (Burfeind, 2020). 2. Petal+Ash (2020). 3. Disappearing denim: meeting demand for biodegradable textiles, Dirvanauskas (3 March 2021).

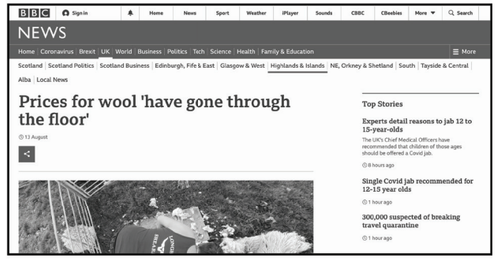
(Burfeind, 2020). Petal+Ash focuses on reshaping concepts of women's lingerie to reflect a soil-to-soil approach by instructing wearers on how to cut apart and then compost their garments (Petal+Ash, 2021). The interest in composting garments continues to develop commercially—specifically within denim collections who advertise jeans that will decompose in compost conditions in less than six months (Dirvanauskas, 2021). Each of the three approaches **(Figure 4)**

could be viewed as decomposition-led, with principles similar to Design for Disassembly (DfD) (Guy and Ciarimboli, 2007) where products are designed and manufactured so that they can be safely taken apart and incorporated into industrial recycling, though it is worthy of note DfD techniques can be seen in the early construction of Native American and Mongolian shelters (Rios *et al.*, 2015). Despite decomposition-led approaches leaning towards biocompatibility, where materials interact safely within natural environments at their end-of-life stage, the approaches do not require the designer to directly engage with the decomposition or afterlife or their own materials of practice.

Pushing for immersion of direct engagement with material decomposition through composting in soil, contends that new working knowledge of the more-than-human only emerges through direct, relational connection not theoretical reasoning. Humans are tuned for this type of relationship—"Our bodily rhythms, our moods, our cycles of creativity and stillness, and even our thoughts are readily engaged and influenced by shifting patterns in the land" (Abrams, 1996). This contrasts with design's historical engagement with nature which attempts to "bridge" and "compromise" only to fulfill the needs of production and economics (Fletcher, St. Pierre, Tham, 2019). Working in this historical manner, shuts down, "new relationships, languages and commensurate practices that will only arise slowly out of actual engagement and new ways of being present to, and interacting with the [natural] world (Jickling *et al*, 2018). Composting as a decomposition technique provides a place to interrogate meaning between designers and their materials of practice; new modes of understanding will only arise in designing from decomposition, rather than being led to design for decomposition. In the next section, wool, is evaluated for its potential to reveal meaning in the process of designing from decomposition.

2.4 WOOL

FIGURE 5: Knitting techniques and variants. 1. Fair Isle knitwear (McHattie, Champion, and Broadley, 2018). 2. Shetland lace (Abrams, 2006). 3. Sanquhar, Jennifer Kent (Jardine, 2016). 4. Gansey Techniques (Gordon, 2010).



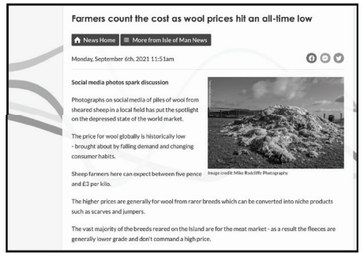


FIGURE 6: L to R, clockwise. 1. Sharp fall in wool prices confirmed (Farmer's Guide: UK's Leading Monthly Farming Magazine, 4 June 2020). 2. Prices for wool 'have gone through the floor' (BBC News, 12 August 2021). 3. Shear Waste: sheep farmers compost 'worthless' fleeces (The Times, 22 November 2020). 4. Farmers count the cost as wool prices hit an all-time low (Manx Radio, Isle of Man News, 6 September 2021).

Historically wool, it could be argued, has deep connection to the cultural, creative, and commercial economies in Scotland. Internationally renowned techniques and variants on knitting styles such as Fair Isle and Shetland lace (McHattie, Champion, and Broadley, 2018), Sanquhar (Jardine, 2016), and textured Gansey techniques (Gordon, 2010) are globally recognized and the production of knitted textiles remains one of Scotland's most identifiable exports (Fleece to Fashion, 2020) **(Figure 5)**. For example, Harris Tweed cloth, which is produced—from weaving to inspection—from an archipelago on Scotland's northwest tip, is the only textile in the world governed by an Act of Parliament (Harris Tweed). Prices for Scottish wool, however, approximately halved between 2020 and 2021 to 14 pence per kilo (BBC Radio, 2020; BBC News, 2021; Farmer's Guide, 2021; The Times, 2020; Isle of Man New, 2021) **(Figure 6)**. For many farmers, the cost to clip the sheep was more investment than the return received. In Scotland, shepherds sell their fleeces through the British Wool Marketing Board, now known as British Wool (British Wool, 2021). The price for wool in 2019 was 60 pence per kilogram. In 2020, when falling prices for wool

were exacerbated by Covid-19, the price of wool fell to 32 pence (BBC News 2020, 2021). Declining use of raw wool is evident in recent decades and reported in geographic regions outside of Scotland as well. According to the Nova Scotia Wool Board more than 30,000 kilograms of wool is stored annually, with most excess waste wool being discarded or landfilled (Zheljazkov, 2005). In California, of the approximate 1.4 million kilograms of wool produced annually only 4,500 kilograms can be milled regionally (Burgess, 2019) with use of the remaining wool unclear.

In comparison to the supply chain challenges associated with wool, the value of wool to soil is markedly different. Wool can make positive nutrient deposits into soil through decomposition. Ninety-five percent of a wool fibre (95%) comprises of keratin (Quartinello *et al.*, 2018, Cardamone *et al.*, 2009)—a range of fibrous proteins (Plowman, 2003) that can be digested by insects such as clothes moth larvae, carpet beetles, and chewing lice (Noval and Nickerson, 1959). Additionally, while wool keratins can initially resist enzyme attack, keratin-rich materials like wool do not accumulate in nature excessively (Zoccola *et al.*, 2015) and strains of Bacillus and Streptomyces genera are reported to act as natural decomposers (Daroit, Corría, & Brandelli, 2009). A strain of Streptomyces Fradiae, isolated from soil, has been shown to digest the native keratin of wool rapidly and completely (Novel and Nickerson, 1959). The elements of raw wool—carbon (50%), nitrogen (16-17%), and sulphur (3-4%) (Von Bergen, 1963)—are also rich in nutrients and many research studies have examined wool waste and wool residues as potential soil fertilizers to act as nitrogen sources (Abdallah *et al.*, 2019; Hustvedt, Meier, & Waliczek, 2016; Zoccola *et al.*, 2015; Zheljazkov, 1995). Such studies particularly focus on wool waste and residues from coarse wool fibres that are unsuitable for garment production and considered as by-products of agriculture (Abdallah *et al.*, 2019).

While the decomposition of wool can interact positively with soil, the production of wool can result in negative withdraws from the environment. A recent cradle-to-grave assessment of wool garments revealed that farming for wool production had the highest contribution of greenhouse gas emissions (Wiedemann, S., Biggs, L., Nebel, B. *et al.*, 2020), though this statistic interlinks with the meat industry and some researchers contest that the emissions could be reduced through better land management and changing sheep diets (Min *et al.*, 2021). However, within the Wiedemann study, the "use" (wear and launder) stage of a woollen garment was found to be the most influential factor in determining garment impact on the environment (Wiedemann, S., Biggs, L., Nebel, B. *et al.*, 2020). While this is not a clear indication that wool garments maintain long spans of use the fact that wool accounts for only five percent of donated clothing—with up to 75 percent of donated clothes comprised of synthetic fibres (Stanes, 2021)—it suggests that wool

garments maintain long spans of use.

In recent years, a renewed interest in woollen garments can be attributed to a variety of factors—a resurgence of craft (Luckman, 2015, 2013), recognition of wool's specialist and high-performance characteristics (Anon, 2007), and the value of 'preferred' wool that is sourced for sustainable properties and has resulted in the increased use of wool certifications for wool goods (Preferred Fibre & Materials Market Report, Textile Exchange, 2020) despite wool comprising of less than one percent of total fibre usage. Wool as a material of practice, however, is well-suited to designing from decomposition for several reasons: firstly, with an increase of interest in wool textiles, it could be contended that there may be an increase in the number of designers working with wool. Second, wool also holds value in the soil; it is not damaging or intrusive to soil processes or microbes. Thirdly, wool within Scotland, is also not a monoculture as Merino is in Australia. There exists a wide variety of sheep breeds, and as such, types of wool that can be selected from for this endeavour. In this context, wool composted in soil can be a place to safely interrogate the relationship between designer and wool through the act of decomposition.

2.5 CONCLUSION

Having described decomposition and its relationship to the afterlife of wool in soil, this Scope of Context provided understanding of how wool, and decomposition align within the research enquiry. First, returning to the Assay test as an open-ended technique allowed for more investigation between textile-making and soil interaction. Rather than decay as an activity to prevent, re-visiting textile degradation as a design pathway led to evaluation of textile afterlife beyond industrial means. Next, understanding soil-to-soil interactions in the context of calls to value the more-than-human through practice were found to intersect with research studies where practitioners pursued decomposition-led approaches. Finally, wool as a material whose intertwined origins and decomposition could be investigated through place-based practitioners in Scotland was established. In the following chapter (3), a research design framework is formed to ethically conduct a study centered on wool decomposition is established within a methodological framework.

CHAPTER 3:
METHODOLOGY

3.1 INTRODUCTION

Having established wool decomposition as "lively" and "engaging" through microbial soil activity in Chapter 1, led to questions regarding how human experience interacted with research design in more-than-human context. Therefore, a methodology was sought that investigated the human experience while not dismissing the life world found in soil. Several approaches, rooted in Participatory Action Research (PAR) or New Materialism, were theorized. However, the final research design framework **(Figure 7)** drew upon phenomenology and hermeneutics, particularly through the idea of Gadamer's play, to enable wool decomposition between participant and soil. In the following sections (3.2, 3.3, 3.4, 3.5, 3.6) the theory behind the selected approach, as well as the method and analysis are described. Appendix B provides further documentation for why other frameworks based upon PAR or New Materialism were not pursued.

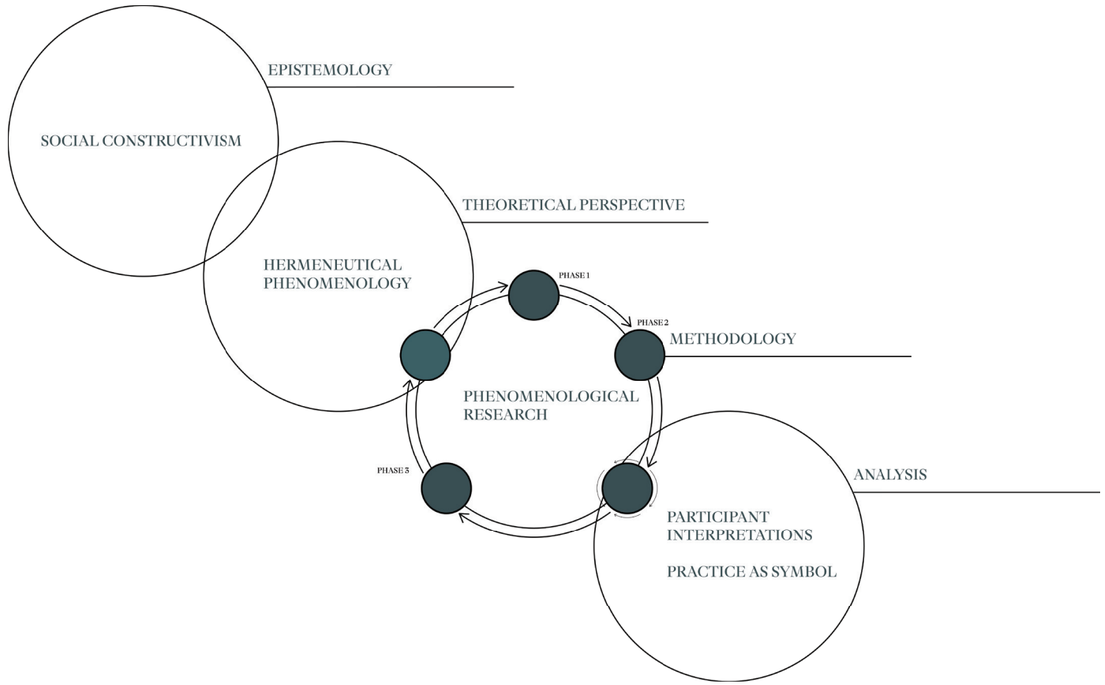


FIGURE 7: Research design framework (Researcher's own, 2021).

3.2 EPISTEMOLOGY: SOCIAL CONSTRUCTIVISM

Initially exploring the research focus involved speaking with designers and crafters, as well as scientists, gardeners, and farmers who work with soil. Dependent of their background, each expert provided a different insight surrounding wool decomposition. Their varied perceptions reflected the epistemological belief of social constructivism which asserts that the meaning humans find in an experience is constructed through the social interactions of their culture (Vygotsky, 1986). Culture, or a social world, teaches humans how to see experiences, and can influence what objects come into a person's field of view. Within social constructivism, an object of study like wool decomposition can exist as part of the natural world, but how an individual regards the object is still interpreted through culture (Crotty, 1998). A social constructivist approach recognized that how research participants viewed wool decomposition, like the experts consulted pre-study, would be informed by social realities beyond the experience itself (Lincoln and Guba, 2016).

3.3 THEORETICAL PERSPECTIVE: INTERPRETIVISM, HERMENEUTICAL PHENOMENOLOGY

First understanding that humans are influenced by their social world, directed the theoretical perspective of the research design, hermeneutical phenomenology. Phenomenology, a branch of philosophy often associated with philosopher Edmund Husserl (Farber, 1943), recognized that human experience informed knowledge in contrast to thinking that scientific knowledge was the only pathway to truth (Husserl, 1970), which aligned with the research purpose to interrogate meaning in wool decomposition rather than generate scientific data. Later, Husserl's phenomenological foundations were built upon and critiqued by philosopher Martin Heidegger (Jones, 1975). Heidegger rejected Husserl's distinct notion of "bracketing," where the researcher set aside their beliefs and experience, and instead put forth his foundational concept of "dasein" or being-in-the-world (Crotty, 1998). Heidegger argued that researchers, "do not come to 'know' the world theoretically" through distant concepts but rather all, "humans come to know the world theoretically only after we have come to understand it through handling" (Bolt, 2006) or being-in-the-world. As this research was reflective of practice, revisiting wool decomposition through "handling" rather than conceptual notions, provoked and challenged the interconnectedness researcher and participants maintained with textile decomposition. This was illustrated through examples where textile decomposition had occurred in natural environments. One such example demonstrated the documented effects of discarded, second-hand textiles in the town of Accra Ghana (OR Foundation) **(Figure 8)**. While seemingly distant and separate from the research origins of wool decomposition in Scotland, the second-hand textiles exported from the Global North to the Global South were found to produce residual negative effects to the culture and environment of

Accra. This socially constructed phenomenon of accumulated textiles specifically in Accra reflected the more extensive and conceptual interconnected tensions of the global textile industry. This reinforced the idea that revisiting the phenomenon of wool decomposition in Scotland practically could result in practice outcomes where decomposition was not detached from "handling" but explored materially. This also engaged Heidegger's assertion that the world is "the interconnected context of involvements" in the research (Johnson, 2000). In the next section, the research methodology and methods used during fieldwork built upon the theoretical perspective of hermeneutical phenomenology are described.

FIGURE 8: Discarded textiles. Accra, Ghana (The OR Foundation, 2016).

3.4 METHODOLOGY – PHENOMENOLOGICAL RESEARCH THROUGH PLAY

Structured research methodologies to engage in hermeneutic phenomenology step-by-step do not exist (Davey, 2006). Rather, hermeneutic philosopher Hans-Georg Gadamer (1900 – 2002) built upon Heidegger's work to propose that research rigor involved, "the discipline of attending to things," (Dostal, 2002) and acknowledgment that other modes of understanding (Gadamer, 2013) beyond only concrete data existed. Specifically, for this research to understand wool decomposition within a practice that has historically prioritized human-based need, Gadamer's construction of play

(Gadamer, 2013; 1986) served as a lens through which to recognize the liveliness of the human and non-human found in wool decomposition. Gadamer's perception of play for the intention of this research enabled non-human forces and human experience interact in a way that dissolved barriers between subject and object (Weinsheimer, 1985). In the following section, Gadamer's sense of play and its relationship to the study are further described.

3.4.1 PLAY

In the study, play derived from Gadamer's assertion of the aesthetic experience as an experience that encompassed three elements—festival, symbol, and play (Davey, 2013). Within Gadamer's play, tactility or "handling" was built-in, as visual forms emerged from the back-and-forth interactions among and between individual players (Davey, 2013; Vilhauer, 2010). The players could be human or non-human from Gadamer's view, from light beams or waves, mechanical gears, animals, or insects (Gadamer, 2013; 1986) or in this study, microorganisms found in soil. The players were merely the way play came into presentation (Davey, 2013) and the rules of play were inherently playful for Gadamer, as the purpose of the play was not to achieve a goal but to engage with the other players (Gadamer, 1986). As this research was not intended to reveal the best technique for decomposition, but to examine the meaning from what emerged when designers encountered the decomposition of wool in soil, play enabled an interaction that was not driven towards an outcome. Instead, players entered into play to see what emerged. Gadamer's play also allowed acknowledgment from the participants that the soil in the study was lively—without making it primary—and to speak from their experience of engagement with the soil. Additionally, play suggested balance among the players, where the centralized locus of their play was focal (Weinsheimer, 1985). This aspect of Gadamer's play has been described as "middle voiced" or "medial" (rather than active or passive voice) where the emphasis exists within the verb (here wool decomposition), instead of player nouns (Eberhard, 2007). This meant resisting imprinting a solely anthropological purpose onto decomposition in the context of the study but instead acknowledged the vitality of the non-human forces. Likewise in this research, the intention existed to not attempt to "give voice" to the microorganisms involved within decomposition. While understanding how lively matter in the soil acted, interpreted, and perhaps consumed different textile fibres with agency may exist within future research, fully unravelling the concept in an ethical manner deserved its own space outside the limitations of this study. The idea of "giving" voice would have also required a different dissection as attempts to "give voice" have been linked to research practices that disenfranchised human populations capable of speaking for themselves (Alcoff, 1991-1992). Unfortunately, this tragic attempt to "give voice"

can be extended to the more-than-human where it may always be anthropomorphized (Bennett, 2010). From this perspective, while the liveliness within the soil occupied a player role in the study, the study sought to interrogate the relationship between designer and textile practice through wool decomposition. This work occurred over three phases that fall within the bounds of hermeneutical phenomenological research and engaged play. A summary of each phase is included in the method and analysis section (3.5) and each phase will be further discussed in the fieldwork chapter (Chapter 4). In the next section, the approach to recruit participants for the study is described, which occurred prior to participant engagement.

3.5 RECRUITMENT

Following establishment of a research design framework, a recruitment approach developed that aligned with the safety guidelines of the Covid-19 pandemic that restricted in-person interactions and travel. In the original research design, it was envisaged thought that the participant sample may concentrate within one geographical area through a central decomposition site that participants could visit regularly. However, with Covid-19 restrictions present and more people spending time at home (ONS, 2020), the idea to connect with participants through digital and analogue means developed. This transition opened up the possibility for a more geographically diverse participant sample to include rural, suburban, and urban areas of Scotland where communication with all participants could uniformly transpire through the Post or via digital technologies that are documented further (section 3.5.2). Additionally, a small sample size was intentionally set for the study, as aligned with the principles of hermeneutical phenomenology (Frechette, 2020; Mapp, 2008; Padilla, 2003; Dukes, 1984) in order that appropriate time could be devoted to each participant's experience. This decision suited the focus of the study, as the research question is centered on the meaning between individual designers and the decomposition of their material of practice through play, rather than generalizable statistics about wool decomposition that might benefit from a large data set.

Having created a recruitment approach, textile designers with a specialization in wool as a material of practice were purposely contacted for the research. The designers who consented as participants, formed a geographically diverse sample from the following locations: Harris, Shetland, Black Isle, Loch Ness, Ayr, and Langholm. This approach reflected intentional, purposive sampling to, "document unique or diverse variations that have emerged in adapting to different conditions" (Patton, 2002) across different geographical contexts (Bachman, 2009) of Scotland's terrain. Additionally, a sample of this size allowed for individual time

to work through the participant experiences in an in-depth manner, which is considered useful within hermeneutical studies, in line with a smaller sample size. In the following section the methods and analysis derived from working with participants identified during recruitment is described.

3.6 METHOD & ANALYSIS

Following recruitment, three research phases occurred that included three methods, scoping work, and analysis **(Figure 9)**. Each phase is summarized in the following sections, though the three methods were concentrated within the second phase of research. Descriptions for phase one and phase three are included in this section (3.5) to demonstrate how each phase built upon the other

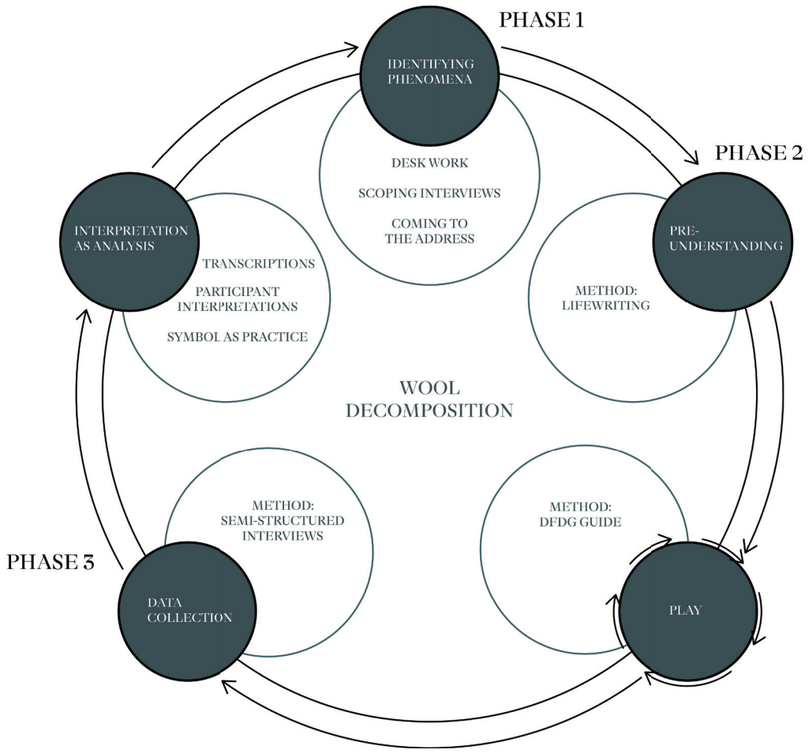


FIGURE 9: Research phases (Researcher's own, 2021).

to create an overall research design that reflected principles of hermeneutic phenomenology.

3.6.1 PHASE 1 involved the establishment of the research focus and design framework, as well as conversational and scoping activities which are further defined in Section 4.2. Beginning a hermeneutic study from Gadamer's work involved acknowledgment that the researcher brings their own "part" to the study and is part of its whole. This included documentation of how the researcher arrived at the research question. Gadamer called this process as "coming to the address" (Gadamer, 2013) where the topics presents itself through the reflective and reflexive work of the researcher. Though not a method, citing the address process is integral to hermeneutic research. The process for writing the address is included with Section 4.2.4 and the final address is included as the preface.

3.6.2 PHASE 2 comprised of three methods based upon hermeneutic principles. The first method, life writing in journal form, worked at uncovering the "prejudices" of the researcher (Gadamer 2013). For Gadamer, prejudices were understandings that were neither negative nor positive, but acceptance of a connectedness with the world that is acknowledged by the researcher so that their experience is not overvalued in the study (Gadamer, 2013). Life writing as a method, is not designed to centre self but as a means of using, "autobiographical narrative to give voice to webs of life and relatedness between humans and non-humans, animating the world from many centres" (Fletcher, 2021).

The second method involved participants, once ethical approval to work with participants was received. This method included the development of an analogue guide that drew upon participatory design (PD) principles, though PD was not selected for its limitations as described in Appendix B, for the participants to utilise and explore play. The guide was based upon the PD toolkit framework of Sanders, Brandt, and Binder at The Danish Center for Design Research. PD toolkits are, "a collection of tools that are used in combination to serve a specific purpose" based on three research variables form, purpose, and context (Sanders, Brandt and Binder, 2010). A visual representation of their framework is provided **(Figure 10).**

The Sanders, Brandt, and Binder framework allowed for kits that utilized online or individual " offline" contexts. Interestingly, the Sanders, Brandt and Binder framework included a category for "play". While "play" was utilized in the hermeneutic sense within the study, the idea of play in

the PD context was also applicable. Participants received the kit, referred to as the Design from Decomposition Guide (DfDG) within the study, that contained raw wool sourced from a farm in Scotland, a set of instructions to decompose wool in soil, and five weekly log sheets designed to document participant experiences through writing, drawing, sketching, and photography to encourage sensory engagement within the experience. As the kit was posted to the participants' residences, the researcher was not present for the act of play, which from a PD perspective limits analysis of the play itself. Rather, the interactions between researcher and participant were to understand the meaning of the experience through the talking, telling, and explaining of the participants' experiences during semi-structured interviews. Therefore, the DfDG was considered a method of engagement for talking, telling, and explaining to the researcher within the Sanders, Brandt, and Binder framework. As stated, each kit was posted to the individual participant in their context, thus employing all three categories of the Sanders, Brandt, and Binder framework through form, purpose, and context. As defined in the Findings and Analysis chapter, using the DfDG to explore wool decomposition near the participants' residences revealed insights for how wool factored into the designers' local ecosystems.

TOOLS AND TECHNIQUES	PROBE	PRIME	UNDERSTAND	GENERATE
MAKING TANGIBLE THINGS				
2-D collages using visual and verbal triggers on backgrounds with timelines, circles, etc.	X	X	X	X
2-D mappings using visual and verbal components on patterned backgrounds		X	X	X
3-D mock-ups using e.g. foam, clay, Legos or Velcro-modeling			X	X
TALKING, TELLING AND EXPLAINING				
Diaries and daily logs through writing, drawing, blogs, photos, video, etc.	X	X	X	
Cards to organize, categorize and prioritize ideas. The cards may contain video snippets, incidents, signs, traces, moments, photos, domains, technologies, templates and *what if* provocations.			X	X
ACTING, ENACTING AND PLAYING				
Game boards and **game pieces and rules** for playing		X	X	X
Props and **black boxes**			X	X
Participatory envisioning and enactment by setting users in future situations				X
Improvisation				X
Acting out, skits and **play acting**			X	X

Table 1: The tools and techniques of PD organized by form and by purpose.

CURRENT APPLICATIONS OF THE TOOLS AND TECHNIQUES	INDIVIDUAL	GROUP	FACE-TO-FACE	ON-LINE
MAKING TANGIBLE THINGS				
2-D collages using visual and verbal triggers on backgrounds with timelines, circles, etc.	X	X	X	X
2-D mappings using visual and verbal components on patterned backgrounds	X	X	X	
3-D mock-ups using foam, clay, Legos or Velcro-modeling	X	X	X	
TALKING, TELLING AND EXPLAINING				
Stories and **storyboarding** through writing, drawing, blogs, wikis, photos, video, etc.	X	X	X	X
Diaries and daily logs through writing, drawing, blogs, photos, video, etc.	X		X	X
Cards to organize, categorize and prioritize ideas. The cards may contain video snippets, incidents, signs, traces, moments, photos, domains, technologies, templates and *what if* provocations.	X	X	X	
ACTING, ENACTING AND PLAYING				
Game boards and **game pieces and rules** for playing	X	X	X	
Props and **black boxes**	X	X	X	
Participatory envisioning and enactment by setting users in future situations	X	X	X	
Improvisation	X	X	X	

Table 2: Current applications of the tools and techniques of PD described by context.

FIGURE 10: A Framework for Organizing the Tools and Techniques and of Participatory Design. The Danish Center for Design Research (Sanders, Brandt, and Binder, 2010).

The third research method occurred as participant and researcher engaged in semi-structured interviews after participants worked with the DfDG for five weeks. Participants spoke about their experience online via Zoom for approximately 45 minutes to one hour. Within hermeneutical research interviews constitute data that form a text for analysis when transcribed. Hermeneutical interviews are designed to be open and thoughtful whereby space for understanding is created and the researcher is tasked with considering participant voices with care. In this research, participant interviews and transcriptions comprised text for analysis. The analytic approach for evaluating the interview data is in the following section.

3.6.3 PHASE 3 focused on analysis of the research data collected during participant interviews. In hermeneutic research, data analysis is part of a circular framework where each part of the research is connected to the whole. Gadamer referred to this concept as the hermeneutic circle—a reflexive, ongoing process where researchers cannot pretend that they are objective and participant experiences are not viewed as isolated but collectively each part informs interpretation. The interpretation, asserted Gadamer, represented a fusion of horizons where the research data enlarged initial understanding of the research topic beyond everyday thinking. To develop fusion, numerous cycles of reading, reflective writing, and interpretation are needed (Laverty, 2003). As with hermeneutic method, a step-by-step process for hermeneutical analysis that leads to a fusion of horizons is not required. However, the work of hermeneutic scholar Max van Manen suggested that data is processed through uncovering thematic aspects (van Manen, 1990). Once the participant interviews in the study were transcribed, van Manen's approach of selective reading was applied to isolate thematic aspects by re-reading the transcriptions several times, re-listening to the interview audio recordings to confirm the transcriptions, and asking what statements or phrases were particularly essential or revealing about the experience of wool decomposition (van Manen, 1990). The statements were then highlighted in the text. This process was completed several times, to create a grouping of thematic elements. The elements were then viewed in the context of the research address, literature, and the DfDG guide to construct written reflections for each participant in the study. The reflections are included in Volume 2 of the thesis because the reflections form a pathway for understanding how the insights may inform future design work. The artefact also drew on Gadamer's use of "symbol" within hermeneutical

aesthetics, where the symbol is the place where meaning becomes present. “The power of the symbol resides in its ability to reveal that, unbeknown to ourselves, we are already in communion with something larger than ourselves, namely those horizons of meaning which implicitly sustain reflection” (Davey, 2013). The final phase of research also included a journaling exercise, which is also included within Volume 2.

3.7 ETHICS

Throughout the process of engaging in phenomenological research, from Gadamer’s viewpoint, required practical wisdom, or phronesis (Gadamer, 2013). This project, received confirmation and approval from GSA’s Ethics Committee to work with participants in June 2021. Subsequently, each participant received information regarding potential participation in the study and clear indication that participation is entirely voluntary. To confirm participation, each party dated and signed consent forms, which were then appropriately and confidentially stored by the researcher in line with GSA’s Ethics Policy. All participant data within the study will be destroyed within one year of the research completion in line with GSA’s General Data Protection Regulation (GDPR) policy.

CHAPTER 4:
FIELDWORK

4.1 INTRODUCTION

As established in Chapter 3, a methodological framework informed by epistemology and theoretical perspective allowed fieldwork to occur over three phases. The three phases were initially described in the previous Chapter (3) and are further defined over the next three sections (4.2, 4.3, 4.4) to illustrate the application of each phase in the field.

4.2 PHASE 1: COMING TO THE ADDRESS

Work with research participants began in June 2021, though Phase 1 of the fieldwork began earlier in the year-long study by exploring different aspects of wool decomposition to identify the research address. This involved three components—writing the address, scoping conversations, and wool sourcing—that enabled a working knowledge of wool decomposition to provide the foundation for the project.

4.2.1 WRITING THE ADDRESS

In the first component of Phase 1, the researcher documented the process of coming to the address through a hybrid approach of note-taking in journal form and narrative in storytelling form that was the result of a "storytelling as method" workshop undertaken with Dr. Michael Williams as part of the Master of Research training programme. The workshop prompts provided an opportunity to further understand the researcher connection to material afterlife, soil, and decomposition. This process unearthed connection points to the topic of study that may have otherwise remained unrecognized. Tuning into this perceptional shift described within Gadamer's work, reflects "being attentive" to what emerges and attending to it in a "profoundly ethical manner" (Davey, 2013). This shift resulted in returning to the essay in the Prelude that was the account of a former vegetarian turned shepherd who accompanied the sheep that they raise each year from birth to harvest. Reflecting on the essay, allowed the researcher space to write and explore questions surrounding the origin and afterlife of artefacts through a reflective and reflexive writing framework and an address for the research began to emerge that was included as the thesis preface.

4.2.2 SCOPING CONVERSATIONS

Having established the address, the second component of Phase 1 involved scoping conversations to investigate soil health and wool decomposition in Scotland. Experts with high

levels of proficiency in their respective fields working at agencies such as the Scottish Environment Protection Agency (SEPA) and Scotland's Rural College (SRUC) were consulted, as well as experts who were active in their work through land management to provide a more dimensional view of soil. This resulted in four scoping conversations with experts from the following fields: 1.) soil science 2.) permaculture 3.) community gardening 4.) food systems. Each conversation resulted in different techniques that participants might employ to enable the decomposition process. During scoping, the decision to utilize one type of fleece in the DfDG was also affirmed as two of the experts advised that fleece from one breed could create continuity in the results if soil testing was decided upon at a later stage. One expert also introduced the researcher to Scotland's Soils project **(Figure 11)**, which is a digital tool that allows individuals to learn about soil types across Scotland, as well as land capacity for agriculture and soil risk maps. Documenting participant locations on the map, provided insight into what types of soil samples participants might collect.

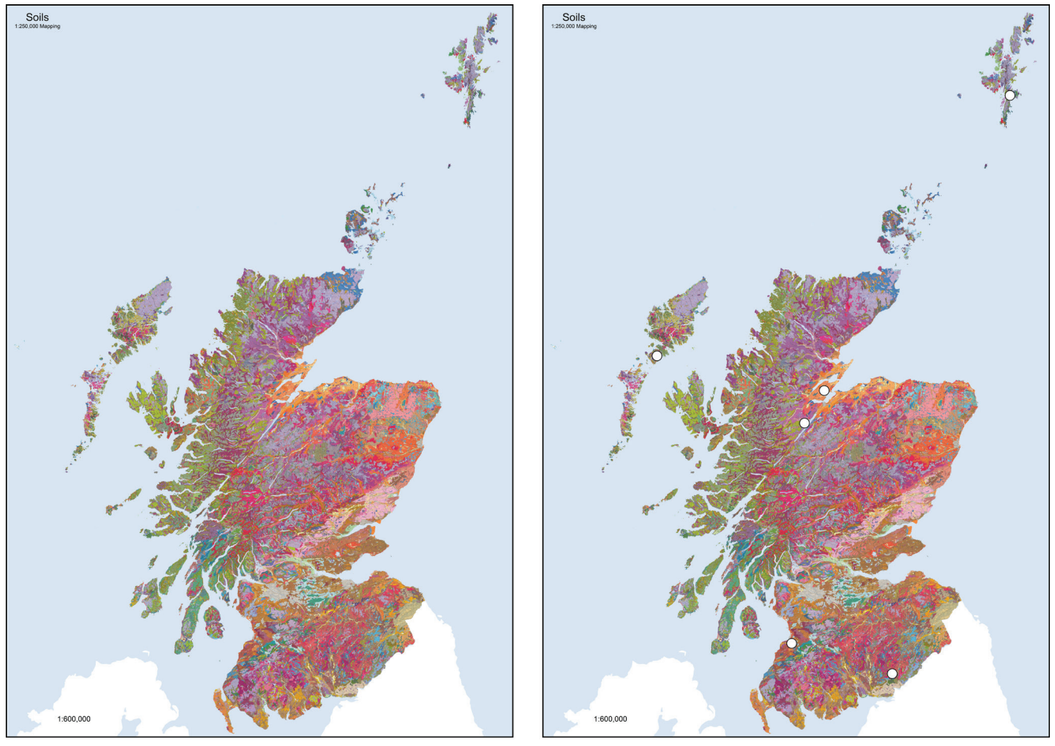


FIGURE 11: 1. Original 1:250 000 Soil Survey of Scotland map used to generate the digitised National Soil Map of Scotland (1980s). Courtesy, The James Hutton Institute. 2. 1:250 000 Soil Survey of Scotland map with research participant locations identified.

4.2.3 WOOL SOURCING

The third component of Phase 1, wool sourcing, activated the location of raw wool to include in the DfDG and the reflective practice work of the study. This process resulted in procuring wool in two forms—shorn fleece from Shetland, Jacob, and Swaledale breeds and hentilagets—from farms in Scotland in tandem with informal interviews with farmers, shepherds, and crofters who kept flocks. Hentilaget, a dialectic term from the Shetland isles of Scotland where Shetland wool originated, refers to pieces of fleece that flocks leave behind, often found in pastures or intertwined with barbed wire fences (Graham, 1993). Hent means to grasp or gather, and, laget refers wisps of a material such as wool or straw (Dictionary of the Scots Language, 2004). Locating hentilagets required walking fields over several months to identify fleece caught in fences. Securing the shorn fleece, was a separate process relying upon networking and technology. The decision to utilize both fleece and hentilagets was made in Phase 1 as both wool forms were at one time utilized and collected for textile making. However, a difference in decomposition quality did not appear visually between the two forms but their contemporary distinction was cited during the informal interviews as more related to value perception than practical use. One crofter, with a flock of 150 sheep on the Isle of Skye, recalled generational memories of collecting both shorn fleece and hentilagets in a different economic and historical context:

> *My father in the 1950s, I suppose, would walk . . . as a . . . kind of a teenager . . . would walk from one village to another village and Skye across Summerland. And as he walked for a summer, three months, he would pick up any bits of fleece that he would find on the ground or in a fence and he would pop it in his pocket. And when he got home, he would put it in a bag. And at the end of the three, three months, he went into Portree, which is our largest town of Portree, and there was a woolen mill there. And with these little clips of wool that he had gathered, he was given a payment, a brand-new woolen sports jacket. And that was for all of the tiny little bits that kind of come off as they're walking past. Even when I was a young girl say 40 - 45 years ago, my grandmother would insist after the clipping every single fiber of rue was lifted off the ground and was put in a bag and these bags of scrap wool would go away. And you'd probably get, I don't know, £5 - 10 for that bag.*

The year of the study was the first that the crofter quoted above worked the land under her name and not her father or mother's. At season's end, she submitted 215 kilograms of raw, shorn fleece to British Wool and received £5.22. The cost to shear the sheep was £225. She stated:

> *I actually don't know anything else that I could buy 215 kilograms of for the price that I got, I*

don't know anything else, there's nothing. There's nothing that I could buy that quantity of that I would be given or that I would pay five pounds for and it's actually do you know, it's actually not about the money anymore . .

. . . the real sense of how worthless it is, is seeing all the photographs and videos that I've seen of people burning their wool. And that's just the saddest thing even the people that have put it in inside their gates, if they've got very boggy ground, they've used to soak up that's got a purpose. I don't mind that. But seeing it burned, or just left in piles at the end of the side of the road, it's just heartbreaking it really is truly heartbreaking . . .

As established in Chapter 2, Section 2.4: Wool diminished wool pricing was not isolated to the crofter, as accounts of wool burnings or rotting were covered by journalists. Unfortunately, falling wool prices enabled economical sourcing of shorn fleece for the purpose of the study as most farmers contacted shared fleece for the minimal cost of postage. The three breeds of wool first offered—Shetland, Jacob, and Swaledale—were procured to provide an appropriate amount for the DfDGs and reflective practice. The Shetland wool was selected as the fleece to be included in the DfDG. This decision sought to minimize waste as the Shetland sample included several pieces of fleece that were unsuitable for processing and had been removed during a practice known as skirting (Scobie *et al.*, 2015), but were mostly intact and visibly had no abnormalities that would prevent decomposition.

4.3 PHASE 2: METHOD

Having written the address, spoken with experts, and secured wool for practice and the DfDG guides the transition from Phase 1 to Phase 2 began. In the second research phase, 15 potential participants were identified, and six agreed to move forward over the course of the five-week period to engage with the DfDG, which will be detailed more in the following section. While conversations were had with designers in urban, rural, and remote areas of the Scottish landscape, the participants who came forward and chose to participate were found to be from areas generally identified as rural. Additionally, a breakdown of the participant demographic also demonstrated that the majority of participants who came forward had a moderate to high knowledge of design and environmental issues.

4.3.1. DESIGN FROM DECOMPOSITION GUIDE (DfDG)

For the participants, the DfDG was designed to consider Gadamer's elements of play as described in the methodology chapter (3) and assist participants in their reflections. The DfDG therefore, was not designed to constitute research data. This purpose translated into a set of materials for participants to engage in play that was not too restrictive, as the play in Gadamer's view would ultimately be decided by the players and have an authentic nature. One participant suggested that the open and self-directed positioning of the guides enabled more autonomous connection with the experience. "If I feel that I have to do something for somebody, sometimes it takes the fun out of it. But, it [the guide] felt a bit more like as long as you did it within the week it all kind of tied together and broke down. It didn't feel like too much work at all." Selection of the material components of the DfDG also had the goal of authentic play (Vilhauer, 2010) in mind and were designed to be visually engaging and provoke curiosity through elements such as oversized paper for the weekly logs that allowed space for participant's visual reflections. Additionally, to align with the research focus on material afterlife, the decision to only include materials in the guide that easily decomposed or recycled took precedence rather than ideal or conceptual sourcing. What was at hand was utilized . After receiving the kits, each participant received weekly correspondence confirming the project's transition from one week to the next to build trust and rapport, and encourage participant engagement. During the process of designing and shipping the DfDG (**Figure 12-1, 12-2),** the researcher also engaged in a second method, life writing, which is further described in the following section.

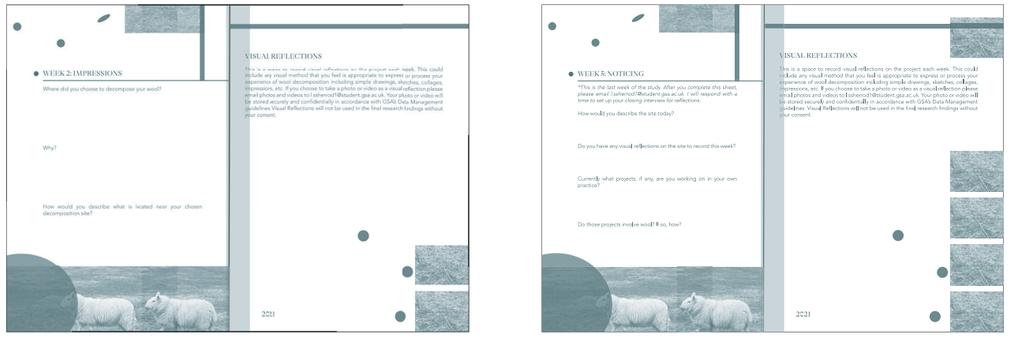


FIGURE 12-1: 1. Week 2, Sample log sheet (Researcher's own, 2021) 2. Week 5, Sample log sheet (Researcher's own, 2021).

FIGURE 12-2: DfDG assembly (Researcher's own, 2021). To assemble the DfDG guide, first, two clips of one wool breed (Shetland) were placed in acid-free glassine envelopes, which are often used for keeping plant and vegetable seeds dry, for transport to the participants. The next step was to locate recyclable glass containers with plastic lids that would not contaminate the soil samples by altering their properties, as would occur when using metal containers or lids (James and Wells, 1990). Finally, weekly log sheets were designed and printed with environmental considerations using recyclable paper in Glasgow and Risograph print techniques, and postal mailing tubes were upcycled from a local delivery outpost.

4.3.2. LIFE WRITING

The second method selected worked at uncovering pre-understanding, which reveals the "prejudices" of the researcher as established in the methodology chapter. For this research, writing **(Figure 13)** was a reflexive method (Van Manen, 1990) for situating the researcher within the study and understanding what existing beliefs, or prejudices, were brought to the study as documented through journal form. The researcher chose to begin life writing by examining their own garments worn on the day of the writing exercise, noting origins and decomposition properties. Connections to the researcher's embodiment to their space, clothing, and place of Scotland were documented, as well as challenged through reflexive writing in how the researcher's own clothing was embedded in a discourse regarding textile afterlife and wool decomposition. The life writing was then coded thematically.

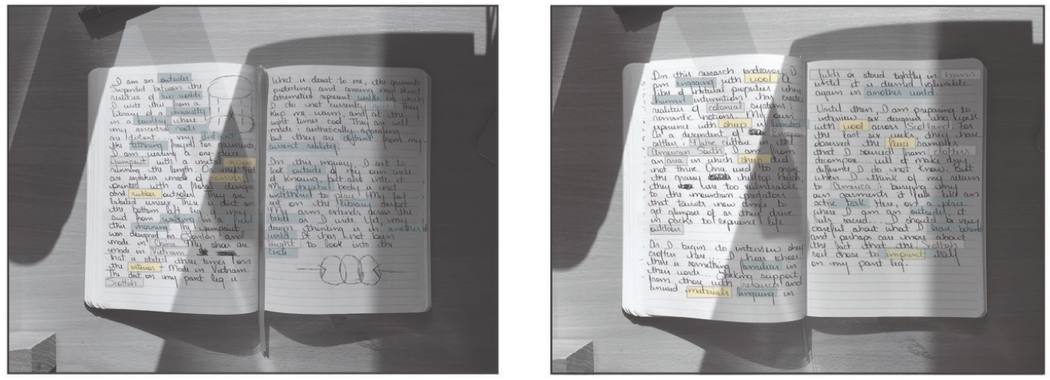


FIGURE 13: Method, Life writing (Researcher's own, 2021).

4.3.3. SEMI-STRUCTURED INTERVIEWS

The third and final fieldwork method consisted of semi-structured interviews that were completed after participants engaged with the DfDG over five weeks. During this time, one participant experienced a health emergency, and another did not respond to the final interview request. In retrospect, recruiting additional participants to prepare for those who might not be able to complete the five-week study during a pandemic would have been valued. However, the remaining four participants who returned their DfDGs agreed to interviews that adhered with Covid-19 guidelines via Zoom. The interview questions were intentionally open-ended (Laverty, 2003) to not lead or define the experience that participants had with wool decomposition, as in

line with the interview style of hermeneutic phenomenology. A guide of nine topical prompts, however, was maintained (provided below), to help return participants to their stories if needed. Techniques such as summarizing the participants' statements to make sure that the researcher interpretation "rings true" and using incomplete sentences to allow participants time to respond were also used (Vandermause and Fleming, 2011).

1. What were your general impressions of wool decomposition?
2. Had you decomposed wool before?
3. What was that experience like for you the first time you collected your soil sample?
4. Where did you bury your wool sample?
5. Why did you choose that decomposition site?
6. What did you notice about decomposition site over five weeks?
7. What did you notice about decomposition site when you collected the second soil sample?
8. Can you share about your work with wool?
9. If you were to decompose wool again, is there anything that you would do differently?

The first question asked of all participants, "What were your general impressions of wool decomposition?" was found to also relate to questions three and four of the topical guide. The question was also found to quickly connect to how each participant went about their practice as a designer. One participant referred to burying her fleece in two different locations on her property, which made her question what the land was used for before her house was constructed, and she questioned if the sheep that grazed there were part of a textile history. This participant's current practice of working had developed through her self-directed process of establishing a local supply chain over several years to procure wool. This connectivity was also found to be present within the other participant responses to the opening question and was further examined in the research analysis from which two main themes and two sub themes emerged that are described further in the next chapter.

Along with the recording and transcription of the interviews, field notes were taken during the interview as changing of voice intonations or body movements that may relate to the participants overall ideas or concepts (Crist & Tanner, 2003). This was challenging to consistently note over the technology required for remote fieldwork, however, the research annotations documented that participant body shifts or gestures often occurred when references to land or place were made, such as "the sheep near my house" or "the compost in my garden". This same level of bodily shift or movement was not observed when conceptual theories related to practice

or wool decomposition were discussed. When design and theory did come up the researcher, who is also a designer, sought to balance the familiarity of design terminology used by the participants in interviews by clarifying what the terminology meant to them as part of the practice known as hermeneutical alertness where meaning is sought beyond face value (Van Manen, 1990). This occurred as one participant detailed how past professional experiences led to her current sourcing approach that she considered more ethical, and how that related to wool decomposition. Rather than assume the meaning that the designer found through this process, practicing hermeneutical alertness allowed the participant to define the meaning on her own terms which provided additional insight into why wool decomposition was meaningful to her. After the interviews were completed, the interviews were transcribed and analyzed in the final fieldwork phase, which is detailed in the following section.

4.4 PHASE 3: ANALYSIS

As described in Chapter 3, the research analysis comprised of three elements—analysis of the interview transcriptions, written reflections of the participant experiences, and a reflective "symbol" of practice which embodied what was learned during the study, and is further documented in the Volume 2 of the thesis. Each of the elements built upon the other to interact with the research question. Working through each of the participant stories using this technique revealed a set of repetitive themes. While some themes were outliers, there were concentrations surrounding concepts such as place, where are further defined in the next Chapter (5), Analysis and Findings. Once the thematic elements were established, the reflections of participant experiences were written and structured in the context of the research design framework and literature. The reflections were provided to each of the participants for their review. Once finalized, the reflections formed a foundation for creating an experimentive embodied symbol resulting from the research. In this manner, the reflections informed the symbol, which are included within Volume 2 of the thesis. To create the symbol, the wool collected during Phase 1 was reassessed for practice. Next, appropriate wool processing tools were procured from a local craft guild **(Figure 15).** The researcher also took a tutored course with a local fibre artist to refine their technique. For the final symbol, which is presented in Volume 2, undyed fleece and hentilagets sourced from Scottish farms were utilised so that no dye materials would add complexities to the decomposition process.

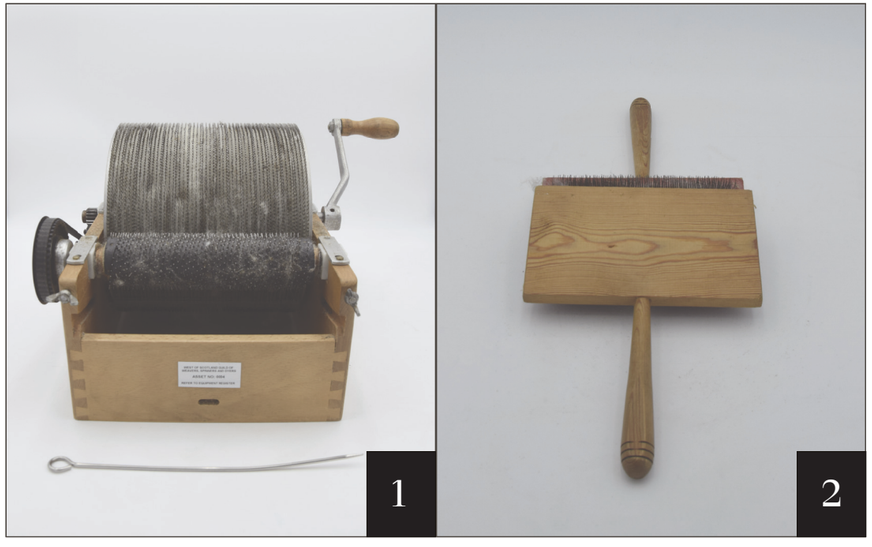


FIGURE 14: 1. Wooden drum carder (Researcher's own, 2021). 2. Set of wooden hand carders (Researcher's own, 2021). Carders courtesy of West of Scotland Guild of Weavers,

4.5 SUMMARY

Having described the three phases of fieldwork, the next chapter (5) further examines data and analysis as it relates to the original research questions.

Main Research Question: What meaning do designers who work and make with wool find in wool decomposition?

Sub-Question: Does the experience of wool decomposition influence the relationship between designers and their material of practice?

CHAPTER 5:
ANALYSIS AND DISCUSSION

5.1 INTRODUCTION

Intentionally decomposing wool within the context of play created space for designers to explore decomposition without an attached outcome—such as a product or strategy. This resulted in the two main themes, and two sub-themes that collectively reveal aspects of decomposition hidden from everyday aspects of textile practice. Reviewing the thematic elements of the study, reinforced the entanglements of modern textile sourcing, while also demonstrating that the designers exploring the meaning of wool decomposition generated deviations within their current practices that going forward could benefit the designers' local soil fertility. In the following sections, the two main themes and two sub-themes are further described.

5.2. THEME 1: CONNECTING TO PLACE THROUGH PLAY

In each participant interview and subsequent data analysis, a strong connection to place emerged. As participants spoke about their experiences with the fleece samples, they often referred to their surroundings and voiced interpretations of their environments. Firstly, this was observed in the everyday vocabulary used to describe the area in which they buried their fleece. The references moved from the general—wooded, acre, plot, land, mountain—to the detailed—my tomato plant, the slugs in our garden, a bin we use for compost. Next, this language extended to each of the participant's practice as they shared more about their work in the interviews. Embedded within their own approaches was an intention to engage their surroundings—for one participant it was working within the ecosystem and textile heritage on the remote island where she spent her childhood. For another participant, it was a move from an urban to a rural environment, which included a shift towards prioritizing what she described as natural fabrics in her work. The participant who studied forestry at university developed a local infrastructure to source wool for yarns through local farmers that she met through the organization that supplied her weekly veg box. For the participant living in the Scottish Highlands, cultivating her own natural dye garden led to constructing a composting system that could regenerate the material waste from the dyeing process into mulch for her green beds.

As each participant described the embeddedness of place within their practice, the concept of place was also revealed to be embedded within their approach to decomposition. Firstly, within the DfDG each participant was asked to bury their fleece samples within a location that they could visit regularly. It could be assumed, that for most participants this would be their residence. However, the placement or "burying" of the samples each participant described in their interview demonstrated specific knowledge in relation to their expertise and the land. For example,

the participant with ecological training at university buried the fleece samples in two different locations on her property; one with less moisture and more sunlight and the other spot in the shade where the ground retained water because she thought to have two soil samples would be helpful for the research, as well as her own experimentation surrounding vegetation growth on her land. She commented how burying the fleece affirmed her ability to influence her environment stating, "you can work on your soil fertility with fairly gentle natural methods, rather than going in with natural fertilizers and so on." The participant in the remote landscape who is a knitwear designer that also works for a local textile company, described the fleece's burial location in the context of the island's landscape. "there's the sea and more hills . . . it sort of felt quite . . . I don't know, a very typical Shetland environment." This relationship, a connection between place and participants, factoring into the participants' decomposition decisions in the study, raised the question of how designers' relationships to place might factor into the meaning designers find in the process. For example, in this research, each participant had access to composting systems and outdoor space, which led to specific techniques to decompose their fleece. In other place-based contexts, the associations to place could result in different language, meaning, and techniques, as well as decomposition outcomes.

5.3 THEME 2: PLAY SHIFTS PRACTICE

Each of the participants worked with raw wool in their practice and demonstrated little hesitancy in working with the fleece samples for the purpose of decomposition. One participant examined the fleece for approximately 20 minutes, speculating about its breed and performing a "snap test" to gain a sense of the wool strength while questioning if the characteristics of the wool would impact decomposition. Another participant specifically mentioned at the beginning of the interview that because they regularly experienced the smell and texture of raw wool at work, that they were very comfortable engaging with the samples. This theme consistently re-emerged throughout the interviews, where the exposure to raw materials that the practitioners had in their existing work opened up a sense of exploration and curiosity in the play within the research context. When asked where their experiences with raw wool originated, some had parents who had kept or managed flocks, while others came to work with raw wool by learning about knitwear designs first. Regardless of how the participants experiences with wool developed, the level of comfort with the raw materials translated into curiosity and confidence in decomposing the materials by employing a variety of techniques. Three of the four participants stated that after engaging in the research, the way that they engaged with wool would shift. This change was not suggested to be visual, but an extension of the way they currently worked throughout the life cycles of the material. The

modifications also intersected with the participants existing knowledge and expertise with composting (Figure 16). Two of the participants, who had previously added fleece to their at-home compost bins, stated that before the DfDG they left the fleece on the top of the compost pile and did not revisit it. After the experience, they stated that they realized burying it in the soil may have a greater impact on their soil fertility and mentioned future soil-based projects or experiments that they would like to attempt to test the concept. Another participant, who had previously been donating wool offcuts to a local crafting group, stated that they may alter this routine as they could not account for whether or not the offcuts ended up in the bin. Instead, she suggested that burying the wool in her garden might be a more traceable alternative after working with the DfDG.

5.4 SUB-THEME 1: PROVENANCE AND DECOMPOSITION ARE INTERTWINED

Each of the participants noted that the origin of their materials relates to the trust that they establish with their customers, and the customers' subsequent interest in their products. One designer has a strong customer base outside of the U.K. that the designer believes developed because of the customer interest in how she develops and sources her yarns, as well as the narrative of Scottish knitwear. This interest in the narrative of Scottish textiles was also noted with the participant in Shetland. Another designer stated that her customers appreciate her approach to natural fabrics and that the designs that can be worn for multiple seasons. However, challenges regarding the intertwined nature or material origins and material decomposition arose during the interviews, with participants bringing up concerns regarding synthetic dyes or unknown substances. For one participant, working with the DfDG brought up specific questions regarding incorporating other materials that she was not currently sourcing locally, such as rose fiber or silk, into her yarns. In her mind, not knowing the full origin of the materials would also mean not knowing what the materials release back into the soil when the materials decompose.

5.5 SUB-THEME 2: TENSIONS OF MAKING AND DESTROYING

Each of the practitioners in the study had composting experience and some participants had high levels of composting expertise, though this was unknown to the researcher during recruitment. Working with a cycle of regeneration, in the form of composting, fed into other aspects of the participants' lives such as the effect of their practice on their own surrounding land. Each of the participants had outdoor compost sites at their homes and integrated materials of practice into the composting systems through different methods. When one participant described the tension between translating the philosophy behind her natural dye garden compost and the pristine na-

ture of social media, she acknowledged that even though the composting is "not the prettiest" part of her design process, it was deeply meaningful to her:

> *"Actually, the idea of using something and creating waste and putting it down the drain for somebody else to deal with or putting it in the bins so it's somebody else's responsibility, even if you're using natural material, I just find that just completely odd and so disconnecting from the reason for choosing those things in the first place. And I'm very lucky to be able to do that and to actually fulfill all parts of that philosophy.*

This tension to conceal what is acceptable or desirable from a visual perspective, was addressed by another participant through the iterative cycles of mending. An avid knitwear collector, she surveys photos from the local school's archives to learn more about heritage patterns though she never copies them as she communicated that it would be unethical to copy another designer's work. Previously, she posted photos of her knitwear finds on social media but stopped because the focus from viewers became recreating the visual nature of the design. However, the process of mending an existing pattern on a jumper appealed to her and she described how she observed experienced knitters employing this technique over the course of several wear and use cycles, to the point where the majority of the current garment consisted of mended pieces and only fragments of the originals. Once the second-hand pieces reached a final cycle beyond mending, however, the participant stated that she did not like the idea of the garment lasting thousands of years like plastic. Once the garment had completed its purpose, she found the idea of the wool returning to nature agreeable and referenced the cultural significance of sheep to her community. In her mind, the decomposition of her practice felt, "very full circle".

The emerging tension between making and destroying was cited by all participants in different ways. Yet, there was a co-existing need in how to resolve customer expectations as the designers are thought to be creators of artefacts, while also addressing the full scope of their practice and its relationship to decomposition or endings. While embracing the practice and idea of decomposition during interviews, the participants were conflicted about the role of decomposition in visual outcomes and how to communicate its meaning to their processes. The meaning that designers found in working with decomposition through the DfDG did not resolve this tension but seemed to agitate it.

5.6 ANSWERING THE RESEARCH QUESTIONS

Having described the themes that emerged from the study, the purpose of this section is to return to the research questions to evaluate how the themes interacted with the original enquiry.

5.6.1. QUESTION 1: What meaning do designers who work and make with wool find in wool decomposition?

In the context of research interviews, working with wool decomposition focused the language between researcher and participant from larger conceptual ideas of sustainable design towards the participant's individual place. Rather than "soil" serving as a term for dirt or mud, soil fertility embodied a concept or relationship to land. At the end of the interviews, participants discussed future composting tests or experiments that they may try on their own land. The embedded nature of their practice within their sense of place, also translated to further explore the technique.

5.6.2. QUESTION 2: Does the experience of wool decomposition influence the relationship between designers and their material of practice?

The small-scale deviations described by participants resulting from experience with the DfDG were related to the designer interactions with the materials, rather than visual outcomes. The experience of wool decomposition interacted with the designers' philosophies and practically the experience was incorporated into their localized network as they buried the wool samples near their residences. Each participant identified solutions that extended their current interactions with the materials of practice—though each participant had a different solution based on their expertise. Whether or not their proposed solutions would be seen as valuable to their customers was undetermined, but the solutions were suggested as ways to nourish or enhance existing, active ecosystems within the participants' local network. One participant shared excess wool with a friend who owned an orchard and another participant wanted to test how the wool interacts in a permanently wet environment using a recently built pond that was at a further distance from her house than the composting site.

5.7 CONCLUSION

Both thematic analysis and responding to the research questions revealed insights into soil fertility and designer connections to place. The analysis and response also concluded the first volume of work within the research. The following Volume (2), reflects experimentation that resulted from three phases of research.

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APPENDIX:
VOLUME 1

PARTICIPANT INFORMATION SHEET

Hello, my name is Lindsey Sherrod and I am a postgraduate student in the Master of Research Programme at The Glasgow School of Art (GSA). For my thesis project, I am conducting a research study titled Design From Decomposition. I am contacting you regarding your area of expertise and would like to invite you to a conversation about your work.

What is the purpose of the study?
The purpose of this study is to understand how textiles interact with decomposition through local ecology and soil resiliency. While textiles and soil resiliency may not traditionally be thought of together, this research seeks to examine ways in which they might co-exist. Using textile materials sourced in Scotland, such as wool, I am seeking subject experts who would be willing to share their expertise to describe their perspective on how learning about local ecology in Scotland and biodegrading local textiles would affect the design process. I invite you to consider participating in this important and timely research study to contribute to understandings of how ecology can inform textile design and reduce textile waste.

Why have I been invited to take part?
You have been invited to take part in this study because of your work with textiles, as well as your lived expertise working and engaging in Scotland is relevant to this study. Your contribution would be very valuable to better understand how textiles and fashion relate to soil resiliency, and modes of engagement for future research.

What will happen to me if I take part?
Those who participate in this study will be asked to describe their experience of connecting with textile decomposition. This process will be supported by the researcher and will not involve economic cost for you, the participant. Over the course of six weeks in July/August 2021 you will: (a) receive a small packet of textile materials via the Post containing recommendations for decomposition (b) receive journaling prompts that ask you to interact with and describe your perceptions surrounding the decomposition five times over the course of six weeks. You will receive reminders to journal (c) contribute to the research by providing a simple sketch, photo, video, or other visual expression of your impression of the experience at the conclusion of the six weeks.

At the end of the six weeks, you will also be invited to a short 30-minute Zoom interview to share about your perceptions of the experience. If you consent to it, the interview will be audio recorded using digital tools that safeguard confidentiality, transcribed verbatim, and verified (and modified if needed) by the respondent. You will initially need to appear on camera via Zoom to confirm your identity, however, your image will not be recorded and you may turn off your camera when the

Continued on Page 2

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interview begins. The content of the interview will constitute additional raw data for the study. You will also receive follow up later in 2021 to see the creative synthesis produced from this research for the study.

Participants are also be invited to include any relevant visual imagery, stories, artwork, journal entries, or other forms of creative expression that have contributed to their own experience in the study. Any visual elements shared by participants in the interview would be the property of participant. If a shared visual is relevant to the study, the researcher would seek permissions from the participant and the appropriate citation would be used in research findings. If you require any visual or hearing accommodations for participation, please let me know and I will make a plan for them accordingly.

Some visual research methods specific to the study, such as photography or simple drawings, may be used during the research. These methods would be conducted using tools likely already in your possession, such as a pen, paper, or digital smartphone camera, and should not incur any additional economic cost to you. However, if these tools are not in your possession accommodation will be made to ensure that you are able to participate in the study if you choose.

Do I have to take part?
Taking part in this study is not required and your participation is fully voluntary. You may withdraw from the study at any time without consequence, before or after. If you have questions at any time, please do not hesitate to contact me using the information included below.

Will my taking part be kept confidential?
Your involvement in this project as a participant includes confidentiality and anonymity. If you prefer, a pseudonym of your choice can be used throughout the data collection, study, and all findings. Your personal information will be stored securely, as guided by GSA's Data Management Policy. Personal and research data will password-protected and retained for one year and then securely destroyed. Any information that you share will solely be used for the purpose of this research study.

What are the possible benefits and risks of taking part?
There is low to no risk anticipated in participating in this study. Benefits of participation include: a.) contributing to research highlighting how industries can incorporate principles of soil resiliency into their work, and in this case within textile design; b.) having an opportunity to integrate lived experience of working with textiles in Scotland; c.) highlighting soil health and resiliency in Scotland, along with textiles produced within Scotland. You will not be compensated for your participation in this research.

PARTICIPANT INFORMATION SHEET, PAGE 3

What will happen to the results of the study?
The results of this study will take the form of a thesis. This will be available through formats such as presentations, reports, publications, and a thesis paper that will also appear within GSA's research repository, RADAR. The thesis will also be used for teaching, research, and exhibition purposes. Raw data from interviews, journaling provided by participants, and responses from visual support methods, such as simple drawing or photography, will be included verbatim in the thesis. Participants can remain anonymous through a pseudonym of their choice as chosen by them on their demographic form. Otherwise, they will be referred to by first name only in the project.

How is the project being funded?
This research is occurring as part of my Masters of Research programme at The Glasgow School of Art. The study is not funded by an outside agency.

Who should I contact for further information?
If you have any questions at any time during this study or require further information, please contact me: Lindsey Sherrod, [redacted]

What if I have further questions, or if something goes wrong?
If you have concerns about this study, you may contact my supervisor(s) using the details below for further advice and information:

Dr. Lynn-Sayers McHattie, [redacted]
Dr. Paul Smith, [redacted]
Zoe Prosser: [redacted]
The Glasgow School of Art 167 Renfrew Street Glasgow G3 6RQ
+44 (0) 141 353 4500

What are the next steps if I agree to take part in this study?
If express interest in participating in the study, I will include a consent form in our email communication, along with a demographic form. Please complete the attached consent, along with the demographic form and return them to me. You will then receive your textile packet and journaling prompts in July/August 2021.

If you are not able to participate in the study, but would like to nominate a colleague, please e-mail me at [redacted].

Thank you for considering participation in this research. I value the unique contribution you can make to this study, to the understanding and evidence base of increasing ecology literacy by understanding soil health and decomposition. I am excited about the possibility of your participation and look forward to hearing from you. Please keep this sheet for future reference and know that you may ask questions about the study at any time.

Best Regards,
Lindsey Sherrod

CONSENT FORM

Lead Researcher: Lindsey Stewart Sherrod
Contact Details: [redacted]
Name of Participant:

- ○ I confirm that I have read and understand the participant information sheet for the study: Design From Decomposition.
- ○ I have had an opportunity to consider the information, ask questions and have had these answered satisfactorily.
- ○ I agree to being audio recorded as part of the research and understand that these recordings will be transcribed and used for research.
- ○ I agree to the audio recordings and subsequent transcripts being made public and available in publications, presentations, reports, exhibits, or examinable format (dissertation or thesis) for the purposes of research and teaching. I understand that I have the option to remain anonymous in all research and recordings.
- ○ I understand that in this study, I may be asked to take part in research activities where visual methods are used to support the research. (For example, I may be asked to take a simple photo using technology devices, such as a digital phone camera, that would come at no additional economic cost to me. Or, I may be asked to create a simple drawing on notepad paper that shows my connection to the study.) If do not wish to participate in these methods, or if I change my mind after participation, I understand that I have the option to do so at any time.
- ○ I agree to the visual methods being made public and available in publications, presentations, reports, exhibits or examinable format (dissertation or thesis) for the purposes of research and teaching. I understand that I have the option to remain anonymous in all research, recordings, and visual methods.
- ○ I would like to remain anonymous in all publications, presentations, examinable format (thesis or dissertation for the purposes of research and teaching) or reports. If you choose this option, the researcher will follow up with you to discuss an appropriate pseudonym of your choice to be used for the project.

INFORMATION AND CONSENT FORM — APPENDIX A: VOL. 1

CONSENT FORM

- ○ I agree to the results of this study being used for future research or teaching purposes.
- ○ I agree to take part in the above study.
- ○ I understand that in-line with GDPR, all personal information disclosed in the project consent forms will be securely stored. After the project ends, the consent forms and research data will be kept for a maximum of 1 year. This is to account for writing up the project report and for publishing future academic outputs. After this time, the forms and research data will be destroyed. My personal data will never be shared.

Name of person taking consent; *if different from researcher*:

Researcher Signature:

Date:

Participant Signature:

Date:

If you have any questions about the research project, please do not hesitate to get in touch:

Lindsey Sherrod
[redacted]

If you have any concerns about this research, please raise these with my Supervisor(s):

Dr. Lynn-Sayers McHattie: [redacted]
Dr. Paul Smith: [redacted]
Zoe Prosser: [redacted]

The Glasgow School of Art
167 Renfrew Street Glasgow G3 6RQ
+44 (0) 141 353 4500

A Note on Methodological Approaches:

In the pursuit of the research, a methodology which would allow for interaction with the more-than-human world through textile decomposition created research design challenges—and different methodological approaches were considered that could engage this work. Ultimately a phenomenological approach was taken as through the research preparation it was determined that uncovering the meaning that designers found in wool decomposition reconnected to their responsibility to shape the "handling" of wool in a more-than-human context. However, there are other methodologies which can work at uncovering relationships between the agencies of human and non-human forces. Further explanation of why such methodologies, particularly C&PD and New Materialism, did not form the overarching framework are included.

Collaborative and Participatory Design (C&PD)

At the beginning of the study, the use of Collaborative and Participatory Design became a focus. C&PD, also known as participatory design (PD), co-creation, or co-design emerges from the vision to create more democratic and empowering workplaces in Scandinavia during the 1970s (Bjeerknes, 1983; Ehn, 1988). C&PD allows for modes of rethinking stakeholder relationships and a re-distribution of power, by asking the question, "who should participate?" in decision making and "how?" (Enilson and Hillgren, 2014). In relation to textile making, C&PD offers "the hope that a broad distribution of fashion 'power' would foster skills, pieces, relationships and experiences that allow us to become better engaged with ourselves, each other and the material world (Fletcher, 2014).

While C&PD examines stakeholder relationships, it also emerges from, "the second half of the twentieth century to even further support humans in shaping solutions that satisfy their needs and wants" (Veselova and Gaziulusoy, 2019; Simonsen and Robertson, 2012) and does not consistently engage with more-than-human agency. There are emerging models of C&PD which seek to, "explicitly acknowledge humans and nonhumans in its core principles" (Veselova and Gaziulusoy, 2019) and "invite non-humans to participate actively in the research process" (Noorani and Brigstocke, 2018). However, C&PD was not selected as the overarching methodological approach for the research as the meaning found in designers reconnecting to wool decomposition became a focus. Also, studies regarding the use of C&PD in textile making did not incorporate nature as an active stakeholder within the system and "those who ultimately use a product are entitled to have a voice in determining how it is designed; and the quality of design increases if the stakeholders are included in the design process (Design Journeys, Fletcher, pp. 228,).

New Materialism

Additionally, considering decomposition in soil as lively and engaging opened up ontological tensions related to new modes of post-phenomenological research. Historically within Western culture and philosophy, lines between what is human-constructed or "social", and nature, have been distinct (Aryal, Yubraj, et al., 2016; Boyne, 1990). However, new theories assert the divide as "fantasy" (Noorani & Bridgestocke, 2018) and dishonest (Whatmore, 2002) arguing that the social has always been more-than-human and instead propose methodologies, such as New Materialism, that recognize human embeddedness within nature. New Materialism, which is rooted in feminist technoscience (Åsberg and Lykke, 2010) and the "historical interest and investment in bodies, nature, and ontology" (Coleman, Page, & Palmer, 2019) that has long resided in feminist studies, raises the idea of not simply being aware of, but learning "with" the world (McGregor, 2020; Coleman, Pag, & Palmer, 2019; Fowler and Harris, 2015). New Materialism is not the methodological tool selected for this study, though there are studies calling for New Materialism's inclusion in textile research citing fashion's prospect of blending with technology (Smelik, 2018) in a manner similar to Haraway's Cyborg Manifesto where the boundaries between human and technology blur (Haraway, 1987). Acknowledging the tensions that methodologies such as new materialism raise, however, presented a need to consider in what ways traditional methodologies do not address non-human forces and to seek out approaches for practice-based research that recognize a more-than-human context within textile making. Gadamer's use of play was relevant within this study because it engaged non-human forces, but also allowed the human experience to be distinct and for the designer to take independent responsibility for their actions. However, New Materialism or other post-phenomenological approaches would also be utilised to study wool decomposition and its outcomes in different forms.

VOLUME 2:
THE REFLECTIVE PRACTITIONER

READING VOLUME 2

Similar to Volume 1, Volume 2 "The Reflective Practitioner" can be read chronologically. Within the second volume, an experimental, dimensional working of the concepts explored in Volume 1 are documented with the researcher acting as a reflective practitioner to create a symbol that might embody the theory explored in Volume 1. During this experimentation, techniques that could alter or reconstruct a design process of working and making with wool were playfully proposed—and some were taken forward in physical form while others would require time and tools that remained outside the bounds of the study. The purpose of the process, however, was to consider how designing from decomposition might reshape the design process in the context of the research.

First, this experimentation drew upon the phenomenological research described in Volume 1 to uncover meaning through play, and by understanding participant experiences in relation to play, new insights were revealed in how the decomposition of wool textiles could relate to soil resiliency in accessory form. To draw this connection clearly, reflections of each participant experience in the study are firstly included in Volume 2, Chapter 1. Next, Chapter 2 in the volume re-examines the thematic analysis completed during Volume 1, Chapter 5 in light of the reflections to create a foundation for the ideation phase of an embodied symbol. The ideation phase resulted in four playful techniques that could apply specific knowledge gained from designing from decomposition. Full descriptions of the individual techniques are provided in the following Chapter 3. Finally, in Chapter 4, the production of the embodied symbol is documented from raw fibre to form through wet felting. The final chapter of Volume 2 (Chapter 5), is the transition of the symbol into soil as the artefact was buried underground at GSA's Forres Campus in the Highlands and a monitoring system was constructed above and below ground level to provide insight into ongoing interplay between wool fibre and soil health in a traceable fashion. Following the end of Volume 2, concluding remarks from the study are included in the Epilogue.

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CHAPTER 1:
PARTICIPANT REFLECTIONS

The work with research participants is reflected in the written "Participant Reflections" over the next several pages. The reflections were composed and titled by the researcher based on interviews and transcriptions with the participants. Each participant was able to review their reflection and offered the opportunity for corrections and modifications. As the study was anonymized each reflection is labeled accordingly as Reflection #1, Reflection #2, Reflection #3, and Reflection #4.

Wool decomposition site (2021). Courtesy, participant.

1.1 PIECING A SENSE OF PLACE

REFLECTION 1

At my company, we make all of our garments with natural fabrics. Our physical space is inside of a working wool mill, and sometimes we use fabrics that are woven in the mill. Our town, Langholm, used to have 13 mills and on occasion we can locate deadstock fabrics that are stored away within mill houses and purchase them. This allows us to make small quantities of things that are limited edition and quite rare. Previously, I worked for High Street retailers buying stock overseas and my partner was a designer at the same company until we moved to Manchester. She started working for a vintage-inspired retailer as their fabric quality started slipping. They went from using natural fabrics, which their customers really liked, to polyester in favor of higher profit. That company ended up going out of business.

When we moved back to Langholm from Manchester, being in a location where high-quality fabrics are made, led us think about our prior experience. We knew that we wanted to go local for sourcing. We lived in Langholm before, while working with the high street retailer and really loved the area. Though at the time, we did not know too much about the previous history of the mills. When we moved back, we had the idea to start our business and it really developed as we got to know more people in the area. We met the owner of the mill we are in now, when buying some locally sourced fabric. He had just purchased the Mill and he offered us space to work within it which is really nice. Every day coming to work and walking in the door, you smell the wool. When I used to walk past the mill with my son in the pram, I would just smell the wool as soon as I walked past. A dye house is attached to the mill and the wool is just walked around the corner and then woven here. Each day when I come in here it is nice to hear the looms going. Then, once the cloth comes, any of the yarns have broken during weaving are fixed on-site by experienced darners.

In my final collection at uni, which focused on men's tailoring, I used wool but in my professional career the company focus was definitely on polyester. I remember having discussions with factories where they would agree to put in four percent of wool just so they could say wool was in the garment. That was the end stage for me. It just wasn't sitting right. Then, we went to a Fashion Revolution workshop at the V&A in Dundee and that was the point where we knew that we had to make a change. We thought how long it would take for polyester to decompose, but the wools and things like that naturally dissolve. We don't want our customers to just throw their garments in a landfill, but we did think, well if these things do end up in landfill a natural fabric is probably going to be better. Even the washing and care process is better with natural fabrics than what comes from washing polyester. Even the characteristics of wool, that it's antibacterial and things like that, are interesting. Even though I had worked with wool quite a bit, I never knew anything like that about the fibres.

Working with the wool decomposition the over the last five weeks, to be honest, we have been so busy that I delayed it a bit. My original plan was to put it into my vegetable patch, which I did, but I haven't been back to visit the site as much as I wanted. When I buried the wool, I ripped up a few pieces and put them in my compost bin—which fascinates me. At the start of the year, I cut up a cotton t-shirt and put it in the compost, and now I can no longer see the pieces. When I buried the wool, I tried two things—I broke it down into small pieces, really pulling apart the individual fibres, and I left some of the fleece in clumps. When I did my final check at the site, I was surprised that I could only see the clumps and that the small pieces had mostly disappeared. As I was digging in the soil to try to find the fibres, the soil felt different. I don't know if it was because the fibres were in there, but it felt like I had been there before. I experienced a sense of familiarity, like I knew where to dig.

When I first learned about this research, my mind went to the small pieces of wool fabrics that cannot be used in production. We often give those scraps, and they are often tiny pieces, to local crafters, but this made me wonder—Could I add those in with my compost bin? Would they naturally decompose? I think now I will just put those pieces in my compost bin. I am not sure what happens to the pieces after we donate them, but this way I know they are in the compost. It feels like there are other ways of disposing of wool fabrics. When I initially buried my samples, the soil was quite clay and compact, but there were weeds growing on the site. I wish I had taken a photo, but after a few weeks with the wool buried there, I noticed different green shoots growing from the ground. I wonder if the wool had anything to do with that? The spot is in my vegetable patch, next to where I pick the potatoes and the cabbage is growing. I think if I were to bury wool again, I would find two separate locations to see the difference to plant the wool. This time, I chose one spot as I wasn't sure if my dog or my son might try to dig it up. Next time, I would have one site where I pulled the fibres apart, and one where I really clumped the wool together. Maybe I would do that in both locations. I also would have liked to plant one sample in the garden, and one in the compost bin, but I wasn't sure how I would be able to find the fibres again in the bin. So, if I were to plant the samples again, I think I would have done them both in my garden.

1.2 MAKING QUIET RITUALS

REFLECTION 2

It was good to have something to keep motivated right now, and the timing of the project was good as the weather had just shifted. Unpacking the guide and handling the fleece samples, for me, was comfortable. I work with wool physically at my job. Some people may not be familiar with that, or enjoy it, but it never bothers me. When I buried the wool, I had to dig quite far because the ground was dry. The spot I chose is located right in front of the house, where there is grass and a hill. Beyond that, there is the sea and more hills. The spot is in a very typical Shetland environment. I think it will get all the elements there, right in the middle of everything. I was actually quite surprised how quickly the elements began to take effect. First, I had to place a stone on the spot, so I was coming back to the right place. The grass is growing quite long there, and the wind blows, and I wanted to be sure. One time, I thought I had completely lost the spot, but my stone marker brought me back to it. To check the decomposition process I would kind of move the grass back, and my sample of fleece was a darker colour, so I really had to look. After the first week, I was surprised how quickly the wool was going back to nature. It felt like it was kind of melting back into the land.

As the wool faded in, I would dig more deeply and see more bits deeper down. It felt like it was doing what it should do. I think this was different than composting food, like we do at home. You just add layers on top of the compost, but this was different. You are physically going to check on it. I think overall it was good to have something that was in nature to do and that was a quiet thing to do. At the moment, it feels like everything is noisy online and this is kind of doing something that wasn't for anybody to see, but for yourself. It's not performative. It is kind of a quiet ritual. Since I started, the weather has turned. When I buried the sample, the ground was dry, but now it is muddy. I could kind of feel the seasons change when I revisited the spot.

This season at work, right now, we are busy. I mainly work with wool, and I also design hand knit patterns. I am always knitting with wool and Shetland wool predominately, and I am surrounded by it all day. I studied textiles at college, and we were taught to knit in primary school. I wasn't really interested in it at the time, but as I got older and studied textiles, I realized what a strong textile heritage we have here. Knitting has really come back again, and people are experimenting with bright colours, big patterns, and bold motifs. But doing this project, reminded me where wool comes, and it doesn't really matter what you do with it even if you dye it. If you bury it, it will still go back to nature. In this day, I feel like that is such an unusual thing. There's so much in life that is plastic but working with wool you feel that you're working with something that at the end of the day will come back to where it came from and with no kind of big impact, and it just reminds you that is a good thing. Hopefully, people can take pictures to create a record.

I collect knitwear, and sometimes I wonder if the pieces should be preserved, like a museum exhibit for example, but then I realize that the garments were meant to be used. That is their purpose. The irony though is that I make a lot of things and never use them even though they are designed to be functional pieces of clothing. I don't like the idea of things lasting forever. I think of plastic, and how it can survive for 65,000 years. I think things should exist for as long as they need to exist and then be able to go home back to nature. I think because sheep are such a big part of the culture here, where you look out your windows and see the sheep in the fields. It feels very full circle.

In my day-to-day life, I mostly wear wool cardigans and jumpers. The weather here, just this week, turned to cold air and I pulled out my fingerless gloves that I bought at a charity shop and headbands. It's not enough to just have a jacket here. You need a scarf or hat, and mittens as part of a daily uniform. I have all of those pieces to protect me from the biting winds, and for me it is comfortable to wear a wool jumper too because it keeps me warm. When I collect knitwear, I look for things that are different than my everyday uniform, but I try to be careful about collecting too much because there is only so much that you can wear. I only pretty much buy secondhand clothes. I have done this for a while now, and only buy new things for special occasions. It is important for me to buy clothes that have a functional purpose, which right now is to keep warm, and that they are made from this wool where I live and have grown up. I go through phases of the design motif, from traditional Shetland to Fair Isle, etc. One of my favorite pieces is a jumper that I have from my Granny. It is black with puff sleeves and even though it's not that old it looks like it is from the 1940s. I can remember her wearing it and how much she loved that jumper. The oldest jumper I have is probably a Fair Isle one that I found off Ebay. I think it is from the 1930s or early 1940s. I can tell from looking at old Shetland school photographs from that era. That is the best way to see what people wore day-to-day. The jumper from Ebay was inexpensive, but I have paid more for other jumpers that were not in very good shape. I think there is some of that in collecting, and you get excited when you have a real find.

I try to think though about giving the things that I collect at charity shops or online another life. Maybe someone is fed up with looking at a jumper, or someone that they love just passed away and they cannot bear to look at the jumper any longer because it is too hard. I can help give it another purpose. I used to take photos of my finds and share them, but then people would focus on recreating the designs. I would never take a pattern from something I found. I might take an element from it or be inspired by the colours or something like that, but I would never directly copy because I would not feel right making money off something that someone else created. Quite often, the garments show wear and tear as well. When you unfold them, you can see the lines where the jumper was folded. I think that is quite interesting, as well as how the colours of things change, particularly natural colours. For example, a dark brown becomes a warm gingery colour when it is bleached by the sun. That is not how it originally looked. The only thing I do then is mend things. It may start with a little hole that is going to get worse and worse. I like to patch it up. I've bought things before with amazing mends on them that people have done that you cannot see until you get home, and you really look at the garment. And, I like that because somebody really loved the garment, cared for it, and extended its life rather than getting rid of it. With Shetland knitwear, if a garment was past able to be worn a lot of elders would cut off the pattern and save a swatch to reknit from that extends its life. I think there is such a value of wool here and I have seen that through my lifetime. I think there has been so much focus on sportswear in the 1990s especially, and people are going back to natural fibres and finding comfort in them. I saw so much of that during the pandemic. Sometimes I am conflicted working in a retail environment, but then I think this is a product that I believe in and have a connection to, and I feel like there is a purpose to it. It makes people happy that they are creating things on their own that they can wear, love, and pass on, and go back to nature. Yeah, that's ok.

1.3 TESTING PLACE

REFLECTION 3

I think I was just intrigued. For me, I started thinking about whether different soils and different soil health might impact on how the textiles decompose. So, I went on to use two different sites in my garden. It also got me thinking about where my garden sits and the history of textiles. I am in a new house on land, which would have been a field ten years ago. I live in a very small town, of just a couple of 1,000 people. Seeing the sheep in nearby fields, there may have been sheep grazing where my garden is before the house was built. Land use had changed so much, and burying the fleece, made me think about that more than I have in the past. I have been gathering pieces of wool for years, mostly from when I skirt the fleece thoroughly and remove all the extra bits and thorns, and so on. Once that is complete, there is quite a bit of fleece that I cannot use for yarn. I've put it around my raspberry canes as a method to keep down weeds so that they will slowly break down and add in nutrients. Sometimes, the wool also goes into my compost heap. When I think about decomposing wool, yes, I want to find a productive use where it is not going to the landfill. It is probably a combination of factors that I think this way, right from childhood until now. My parents had a flock of sheep at a time, and I grew up with a very productive vegetable garden. I was heavily involved in both. Then, I went on to my teenage jobs which were all in farming. I studied ecology at university but took an atypical ecological route and went into forestry, which is not always considered an ecological land use. But my perspective, is that we need timber for a lot of what we do in our lives and if it is managed well timber can be a sustainable resource. If you use timber in your buildings, you are actually storing carbon, so you can use it as a carbon sink. You do not want to be ploughing up pristine bog and so on, but we can work with land that is already forested. But again, if you forest it well it can be a very sustainable production. For me, you can actually carry out quite good conservation projects with within a forested context.

Once I stopped working, I started natural dyeing and doing a lot more crafting. Then, I ended up producing yarn because I didn't want to use imported yarn, which I didn't know if I could do. At the time, there was very little British wool yarn, and there definitely wasn't any local. So, that's why I started producing yarn. I guess the natural dyeing came from my interest in plants and what grows locally. Then, when buying the fleeces from local farmers, I am very careful to work with ones who manage their land as carefully as possible. Yes, they're producing sheep mostly for meat and the wool is a byproduct, but they are farming as environmentally soundly as they can within a productive system. They care about the welfare of their flock, and the wool is virtually valueless to them, even when I pay them significantly more for the wool than they make any other way. They are all people who really want to see that particular byproduct of their farming going on to proper use, rather than a fairly valueless use. I suspect my approach would have been different if I hadn't had my background, though I may have still fallen into crafting. Though, I do not think I would have been as familiar working with farmers and given them a phone call to chat about buying wool. I really did not see the point of using wool that came from Australia, given that there is good quality wool in the UK. My first step was to see if I could have it spun, and the mill that suited me best was in the Scottish Borders because they had really small batch minimums. They were very approachable and friendly. The next step was The Natural Fibre Company with a minimum that at the time seemed like quite a lot. Beyond them, the next step is a larger mill, and the minimum is a significant jump. I don't think I would have been able to start if I hadn't been able to use The Border Mill to submit small batches. Once I confirmed with them, I initially approached the owner of a small flock who I buy my weekly veg box from. From there, I tended to work from word of mouth. If I was searching for a particular kind of wool, I would either ask around or I would have seen a flock. Then, it would just be a case of tracking down a phone number. There was maybe one person who wasn't interested, but on the whole people were glad to see their wool given extra value. I don't think there would have been another way to do it. I was learning as I went along. Looking back, I suspect that my approach linked to the experiences that I have had through life.

I often think about soil health because I want to use the garden to grow vegetables. This experience made me think more about the properties of the soil, and how you can influence them by what you put into them. For me, this made me think of what breeds the fleece samples were from and how would that interact with the soil. I was very intrigued to see what would happen over five weeks and if that was long enough. I guess it felt like an appropriate thing to bury the fleece in the soil and see what happens. I was quite satisfied as it seemed that the samples upon first site had been influenced more by being in the soil. For me, that confirmed a feeling that you can work on your soil fertility with fairly gentle natural methods, rather than going at it with artificial fertilizers. It made me consider soil health more and the best way to go about improving it. I would like to know if there was a difference in the soil qualities between the two burial spots on my property. I think often and struggle with what I should do with my leftover fleece, and this made me think I really should stick it a few inches under the soil and let it work its magic through the winter. It also made me intrigued about what happens to waste wool on a larger scale. There is an awful lot of wool in Britain that doesn't get used. There is probably a way that it could be used very

effectively. There is a small company producing compost from fleece, but it is not mainstream. I think there would be satisfaction of knowing that you were making use of every last bit of wool and not wasting a resource. I hope that would attach value to wool in a wider sense.

Many of my customers are from the States, and they appreciate the fact that the wool is Scottish and the textile history here, and that they know where the wool comes from. I think they like that it is naturally dyed, but I am not sure if they consider whether the farmers have been paid a decent rate or if the farms are well managed. However, I was surprised a couple of weeks ago when a lovely crafter that I have been working with testing yarns actually looked up one of the farms that I work with on a map. I am not sure other people would have taken that extra step. I think they are placing trust with me to make sure everything is well sourced. There is a page on my website where I detail how I work with the farms. It is not one of the most-visited sites, but whereas for me that was really important and one of the first things that I did. I always put information about the yarn provenance on the labels. I have mulled over using different materials in my yarns, such as nettle or rose fiber, but always held back because of not knowing where it comes from which now, I am thinking affects decomposition too. I cannot verify the composition side and what that will release back into the soil.

Following this experience, I will continue to decompose wool, but perhaps in a different way. I have been laying it on top of the soil and this had made me think about whether it could be buried and used in the veg beds, rather than only as mulch. As a result, I am thinking more about my connection to my garden and the local area. I haven't thought much about the land's past uses, but at some point, there was bound to be sheep wandering around on that patch of ground, which is now the edge of a semi-suburban garden.

1.4 LIVING IN CONCENTRIC CIRLCES

REFLECTION 4

This is not the first time that I have decomposed fleece. We regularly use leftover fleece from other projects, such as slug repellent in our garden. We also bury fleece into the garden beds, where the decomposing process incorporates twigs and other matter, each in a different layer, then soil over the top. It is quite a long process. This is the first time, I've returned to check the progress, which is quite interesting. Our garden is about one-third an acre. We also have a vegetable plot, as well as a dye garden for dye plants, an orchard, and a woodland area. We have been in our house for five years and cultivated the garden over time. The plot was originally all woodland. Once the house and garden were built, the woodland area became about one third of the property.

Initially, I found the wool samples that I received quite greasy. They seemed to have a high lanolin content, and it felt greasy to the touch. From that quality, I thought the wool would resist water quite strongly. There was also a good amount of vegetable matter in the fleece. Coming from the point of view where I assess fleece for the spinning and milling process, my fleece starts off in a similar condition, but looks different after it is finished. I couldn't tell the specific wool breed, but it didn't seem to be a primitive breed or a heritage breed either. It had a good staple length to it. There was a slight kink, so when you pulled the fibres they became a longer staple length. It was strong in terms of the snap test too, where we do test the health of the fleece. It felted very easy when agitated and would be good for felting projects. Assessing the wool took about 20 minutes, which is what I do when I am deciding whether to buy a fleece. I think about how much processing would be required and what else could it be used for? This takes a good 15 – 20 minutes of analysing—doing the snap test, agitating it, smelling it, and dipping it in water. So, for this research, I spent time doing the assessment to learn how the wool's characteristics might translate into decomposition before I picking out two spaces in the garden to bury it. I put one half of the fleece in the dye garden over there—which is why I am pointing over there. The second sample, I put into the outdoor compost bins, which I use to break down the natural dying materials that I have used during my processes. So, I thought it would be quite good to returning to both spots again because normally I just put the fleece in and walk away. I don't go back to monitor it, as it requires a lot of time. So, I was thinking, it was quite useful to have an opportunity and a reason to go back and dig it up to learn more about this process. The first time I went back, the fleece in the dye garden was intact, but I wasn't surprised because the weather had been extremely dry. There were signs of insect activity centering around the fleece though. The fleece in the other spot, the outdoor compost bins, had more moisture because of the composting activity and the fact that the dye material is thrown in when the dye is done. It surprised me how much of a difference there was between the two areas, one very dry and the other very wet. I was not surprised at the residual lanolin in the fleece, as that's going to repel some of the water.

I would consider myself an enthusiastic composter. We've done a course online, provided by the West Highland Rural College. That had a couple of fantastic, remote training courses that they delivered over Covid. We also did one on how to use a polytunnel, as well as tree planting. We were already keen on composting and maintained composting sites since we moved in. We have a domestic compost cycle, which is for kitchen waste, and a separate practice-based composting cycle for dye materials and waste because of the dye mordants. Those are materials that require composting in a different way and more active involvement. I check the second compost site every day for about 10 minutes. This involves monitoring insect activity and the progress of materials in the compost that would not break down in a domestic compost. Every day I am looking to see what is going on. Between the summer and winter, slightly different types of attention and nurturing are required for the second compost. At the moment, I am keeping an eye on the weather to see if I am going to cover the dye compost for the winter. Then, we start the whole process again in a separate bin for the next few weeks. We work on a three-year composting cycle. In the winter, we also make the decision to cover it so that the heat stays in. We also cover it because although moisture is good for compost, you don't want it to get too wet and washed away, then you lose all the nutrients. We also do not add anything else to them or tend to turn them. We just tend to leave the compost alone for year two, whilst we start another bin up. Then, in year three, everything gets used. The domestic compost goes onto our vegetable plot. The dye material compost goes back into the dye plant garden. So, it completes a circular process. So yes, we are kind of knowledgeable and involved with compost. We have no social life. It's not the prettiest thing to take pictures of for social media. I do mention it when I'm talking about the process online, but it gets the most coverage when I am teaching courses in person or doing tours in the dye garden. It's absolutely a feature of learning or just demonstrating the process to take people and show them the compost or the dye materials. I talk about what happens and the circular process. We always say it's not the prettiest part. It's also not the nicest smelling, although the dyes smell worse. It's actually ok though. It is an important part of the philosophy of my sustainable process that as a creator and a maker, I take accountability for everything that's used in my process. I absolutely cannot imagine operating and dyeing in any other way. Actually, the idea of

using something and creating waste and putting it down the drain for somebody else to deal with or putting it in the bins so it's somebody else's responsibility, even if you're using natural material, I just find that just completely odd and so disconnecting from the reason for choosing those things in the first place. And I'm very lucky to be able to do that and to actually fulfill all parts of that philosophy. I don't think that I could do it any other way. There was one point where I went back to do an observation at the dye compost bins and there have been some rains so that was quite wet. But the whole fleece sample was just covered in insects, and not small wing flies, but massive creepy crawlies and there was a whole ecosystem going on in there. It's just fascinating that you could sit and spend a whole day just watching the interaction of one thing eating something else or perhaps a slug making his journey across the top. It was nice to see everything doing its job and working away. However, I did say we were using fleece as a slug repellent, but when I did this check there was a large slug sitting in the middle of the fleece, quite cosy.

After this experience, in the future, I might not cover up the compost so much in warmer months. I am quite interested in the bugs or little color insects and things that go on in there. Most people cover compost because of rats and mice, but we do not have rats and only a few small mice in the garden. However, we have two cats of our own, and several cats in the neighbourhood who visit. So, we could leave the compost open and give the bugs and insects things that they need to live. We're kind of taking away that ecosystem because we want everything to be clean, nice, and smelling beautiful and presented beautifully. That's not really the way that ecosystems work. So yes, I think that I am probably going to leave this a bit more open to nature and see what moves in.

During week 5 of the study, I was also preparing my own fleece to go off to the mill. I was cleaning, picking, and beginning my process. All my fleece rejects that were too dirty or contained too much vegetable matter, were all going into a box that I have not put on the compost yet. So, it is quite interesting to be taking part in a study at the same time as sorting out my own compost. Some of the fleeces, I was going to reject completely this year and make vegetarian fleece rugs with them instead. So, I was looking for a bit more use for my own discarded materials this year, which is something I do in practice anyway. It was quite nice to be doing that in conjunction, you know, as part of a bigger picture and the cycles of trying to reduce waste by using every part of what is coming into my process. If I were to do this study again, I would have liked to bury a sample in a really wet area because I built a pond this year am really interested to see how fleece reacts in a permanently wet area. I am aware of another project that uses fleece as a base for a wetland footpath, but I would like to experiment and for myself. Right now, the fleece sample in the dye garden is next to the bed that I use to grow madder. The plot next to it is awaiting planting. So,

REFLECTION 4 — CHAPTER 4, VOL. 2

it's in transition. There is a sweet chestnut tree just behind it, but immediately around it is a green base material of manure that we continue to add into and try to encourage nitrogen uptake in the soil. The plot may not be used until next year. I'll have to take a look at the soil and see what I think. Having seen this soil sample, it looks very dry and sandy. That area might need another year of soil improvement.

CHAPTER 2:
EXPERIMENTING WITH A SYMBOL

2.1 INTRODUCTION

By analysing the participant reflections in Chapter 1 individually and then collectively two main themes and two sub-themes emerged as described in the thesis Chapter 5: Data and Analysis (Volume 1). The themes worked to interrogate the original research questions, and then served as a foundation for practiced-based experimentation as a reflective practitioner. The two main themes and two sub-themes analysed as presented in Chapter 5 were:

Main Themes
1. Connecting to Place Through Play
2. Play Shifts Practice

Sub-Themes
1. Provenance and Decomposition Are Intertwined
2. Tensions of Making and Destroying

In the context of reflective practice, each of the themes were considered in potential relationship to the designer's work. Particularly, how accessory design is thought to reveal something essential or historical about the lives of those who interact with the artefact (Clark, 2012). In an era of climate emergency, the research themes were considered through this lens.

To build interconnectedness between the thematic analysis and the symbol design, each of the elements was evaluated in the context of the other, alongside the participant reflections. What emerged were distinctive links between certain participant interpretations and themes. This is not to say that all of the themes were not connected to all of the participants, but that revisiting the themes through the lens of practice, drew out specific interconnections. These observations are documented in the **Figure 1** below:

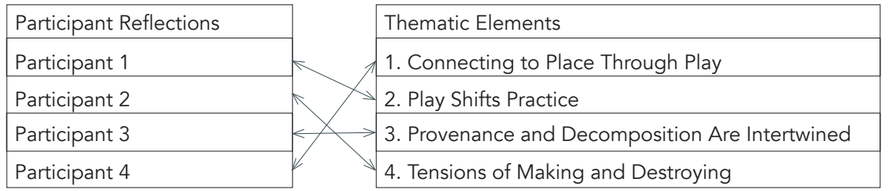

FIGURE 1: Participant reflections and thematic elements (Researcher's own, 2021)

Next, viewing the interconnections as a collective grouping **(Figure 2)** , rather than individual occurrences between theme and participant led to factoring how each participant theme might intersect with the practice of the researcher and factor into the design and construction of a symbol.

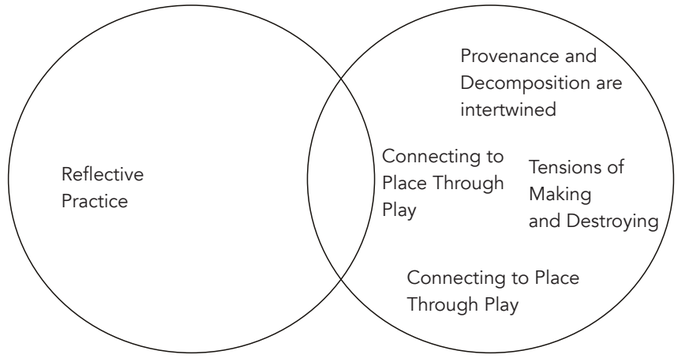

FIGURE 2: Collective reflections, elements, and reflective practice (Researcher's own, 2021).

2.2 IDEATION

The examination of how the participant reflections and themes might factor into the design process, also involved reassessing how other dimensions of the research factored into the construction. This reflects the work of the hermeneutic circle described in Chapter 3 of the thesis, where Gadamer viewed each part of reflection as connected to a larger whole. This perspective was considered during the ideation phase of the symbol experimentation.

The tension of simply designing a symbol that would decompose or be decomposition-led, rather than returning the other research dimensions, such as literature and metholodogy, could have remained unresolved. However, evaluating all of the aspects together allowed the researcher to consider how the meaning that the participants found in the study could be factored into the design of a symbol and return to the original research questions.

Practically, this involved re-reading literature, examining the address of the study, scoping conversations, and notes collected over a year of research. This also included tests that the researcher conducted at-home during lockdown, including evaluation of garments located in the

researcher's residence and examining the objects for the potential decomposition in comparison to years or wear/use, and how each garment might interact in soil **(Figure 3).**

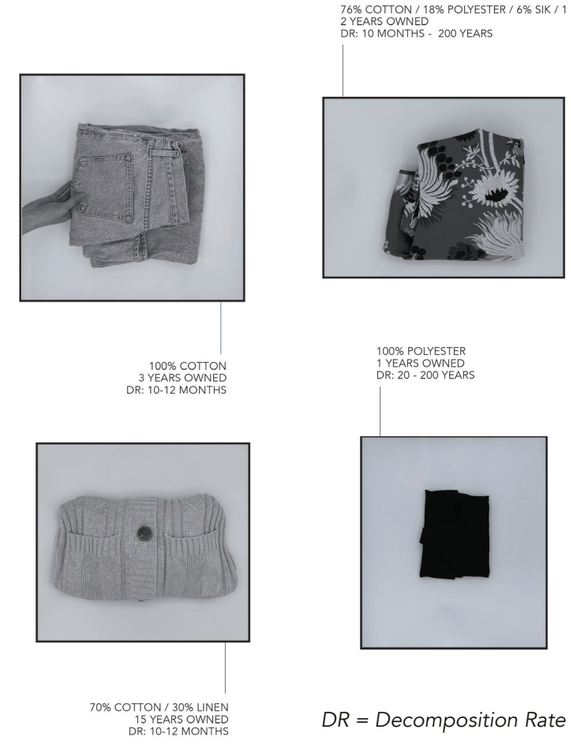

FIGURE 3: At-home garment analysis (Researcher's own, 2021).

This reflexive process first informed the ideation phase by assessing design elements that would be essential in the larger context of the study. This is broken down further in **Figure 4**. Next, the process informed a set of playfully formed techniques that could be incorportated into a symbol that distinguished it as designed from the decomposition processes within the study, rather than a decomposition-led project where it could be asserted that an artefact "would" theoretically decompose, but the decomposition of the materials did not inform the design. This led to the development of (4) techniques, which are described in the next Chapter (3).

1. Material Interaction in Soil	As established in Chapter 1 of the thesis, using a material that would interact with the soil (rather than remain intact) was essential, and for this purpose wool was selected as the material for reflective practice. This was confirmed in field-work.
2. No/Low Impact on Soil	In addition to interaction with the soil, the wool used should not have negative effect with the soil. In fieldwork, one participant maintains separate composting sites for food-based composting and composting of natural dye materials. The effects of the natural dye materials were untraceable in the context of the study and therefore, only undyed wool was used.
3. Lack of Mixed Materials	During the literature sourcing, it was confirmed that use of mixed materials would complicate the decomposition process and therefore no additional fabrications to the wool or hardware was utilised in the design.

FIGURE 4: Essential design elements (Researcher's own, 2021).

CHAPTER 3:
TECHNIQUES

3.1 INTRODUCTION

To ideate the construction of the symbol, the participant reflections, thematic analysis, and decomposition of wool was considered as described in the previous chapter. This process was helpful **(Figure 5)** in playfully developing **(4)** techniques that could positively interact with soil fertility, which are described individually over the following pages.

Each of the **(4)** techniques has the potential to interact with a foundational symbol shape, in the case of this study that is an accessory form **(Figure 6)**. The form's shape was created by the researcher as reflective of essential soil-to-soil requirements described in **Figure 4** (Page 110). Rather than solely be directed by the researcher's preferences and human-based need, the techniques were considered as a part of socially-constructed process that integrated the experience and culture of the study and its participants within the design. By incorporating what meaning the designers found in the study, through their reflections, the conceptual techniques were also developed in a manner that would benefit the soil, the other player within the study. (See Volume 1, Chapter 3, for a discussion of play within the Gadamerian hermeneutical view.)

The techniques **(Figure 7)** were also designed to be reflexive within the concept of ongoing play, meaning that the finality of the accessory as object was not ideal. But, in continually viewing the object as part of play within the process of wool decomposition, the play continued to cycle throughout the objects conceptual pre-life, as well as afterlife to form a regenerative cycle. By creating each of the techniques as reflective of the play process, the intention to form the symbol from meaning of the study was illustrated in form.

While the techniques were proposed to adhere to the form, they could also be adaptive and removed or altered over time. Within other design disciplines the playful approach could be adapted to different objects or forms. Each of the four techniques were not fully constructed

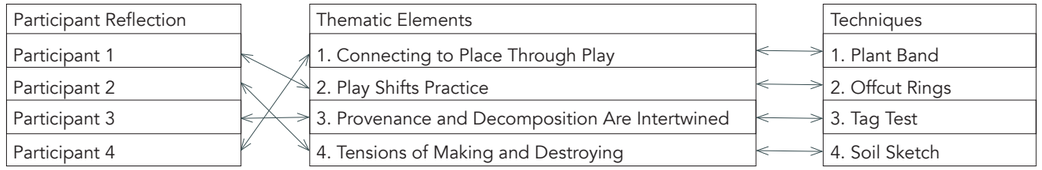

FIGURE 5: Techniques resulting from participant reflections/thematic elements (Researcher's own, 2021).

during the course of the research, but could be considered for future work. The creation of the accessory form however was carried out to further explore the principles of decomposition, as described in Chapters 4 (Carding) and 5 (Accessory Form) of Volume 2.

3.2 ACCESSORY FORM

TECHNIQUES / CONSTRUCTION

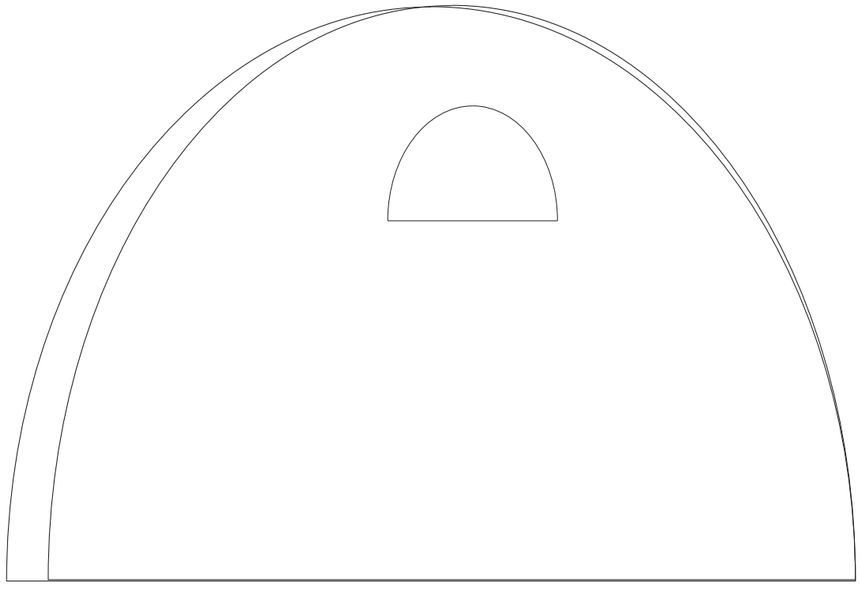

FIGURE 6: Accessory form (Researcher's own, 2021).

3.3 COLLECTION OF TECHNIQUES

TECHNIQUES / CONSTRUCTION

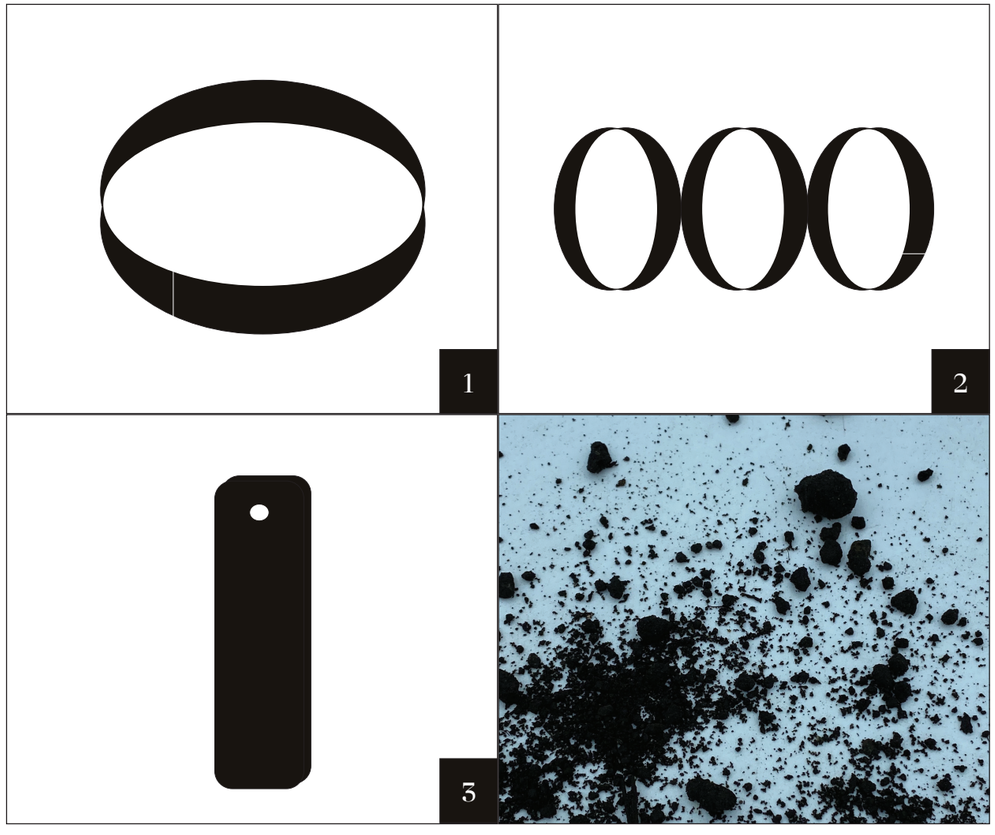

FIGURE 7: Collection of techniques (Researcher's own, 2021).

(1) PLANT BAND

(2) OFFCUT RINGS

(3) TAG TEST

(4) SOIL SKETCH

Rather than ensuring biocompatibility from a distance, engaging in wool decomposition yielded techniques that would interact with the soil as a lively, engaging player who would benefit from interaction with the object if it was discarded in landfill, or buried in the ground.

3.4 PLANT BAND

TECHNIQUE 1 / CONNECTING TO PLACE THROUGH PLAY

The participants cited connections between the activity of play and place throughout interviews. All participants maintained composting experience and some had high levels of composting expertise. However, one participant with a high level of expertise discussed that the burial of wool in the soil of her plant beds yielded new insight. The intersection of play, place, and this outcome resulted in the plant band technique **(Figure 8).**

The plant band is designed wrap around the base of a plant or young tree to deposit nutrients and support growth. The base is easily removed from the inside of the accessory form-post use, and the width is only 5 cm wide so that space can easily be created for the band in the soil using everyday gardening tools that would be available to the person disposing of the artefact. The plant band also re-engages that person in the ongoing play of the artefact in soil.

If the researcher had engaged their practice first and primarily, to design a decomposition-led artefact, rather than one designed from the decomposition insights of the participants, the band design would most likely not exist. The artefact may have still decomposed easily, but not with a design element such as the band that would adjust to vegetation or plant life through the soil in an ongoing manner.

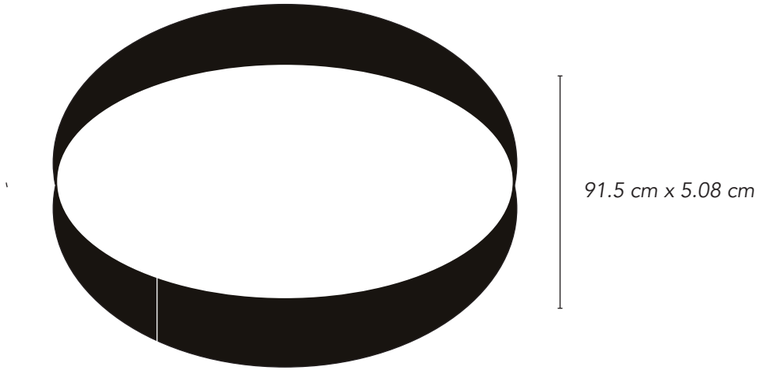

FIGURE 8: Plant band (Researcher's own, 2021).

3.5 OFFCUT RINGS

TECHNIQUE 2 / PLAY SHIFTS PRACTICE

In addition to connecting to place through play, one participant reflection raised the idea of utilising pre-consumer offcuts as fertiliser for the soil in her at-home garden beds. The second technique embodies this insight **(Figure 9)**.

The rings are designed to be made from offcut or surplus wool materials that result in production processes. They engage ongoing play by allowing the person using the artefact to remove the rings over time for placement within a vegetable garden or plant environment of their own. The rings may be removed at one time, or one by one, which connects to the participant's relocations from one geographic location to another for work, until taking up her current residence and studio. The multiplicity of the rings allows play to occur over time at various residences that a person with the artefact may inhabit over several years. The rings can also remain as part of the artefact until its use is complete and it returns to the soil.

The research involved the process of hand-carding fleece and welt felting, which is a practice that would not result in traditional fabric cuts that would result in working with woven and non-woven fabrics. However, the carding and felting process did result in "extra" materials that could be utilised for the purpose of the rings.

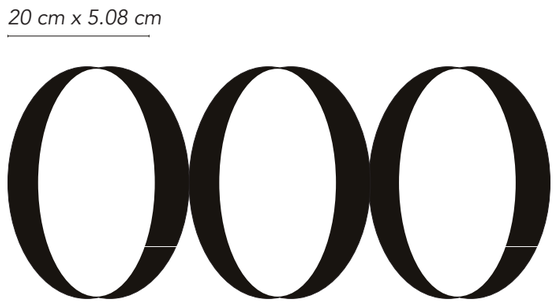

FIGURE 9: Offcut rings (Researcher's own, 2021).

3.6 TAG TEST

TECHNIQUE 3 / PROVENANCE AND DECOMPOSITION ARE INTERTWINED

The third technique emerged from hearing the intention that participants placed on the provenance of the materials used in their products and designs. This also intertwined with the historical and cultural narratives of Scottish knitting and wool. During the researcher's own preparation of evaluating artefacts within their own closet, mostly garments, it was noted that provenance and origins were often documented within the composition of artefact itself, but there was no embedded knowledge of the decomposition. Studying this intersection, led to the creation of the Tag test **(Figure 10)**.

The Tag Test is a way for a person using the artefact to experience the decomposition of the materials that compose the artefact, prior to the artefact's final use. The tag can be easily detached from the artefact, and could contain information about provenance, as well as instructions for decomposition. The narrative of the tag could be determined more fully by the designer and customized to their individual practice.

The Tag Test would likely not be utilised by every customer. However, the test serves as a form of low-tech, low-cost intervention to bring forward the environmental impact that the objects that the person possesses will create post-use. During the researcher preparation, tags that were detached from garments/objects appeared to be comprised of synthetic materials, even those garments/objects made of primarily naturally-derived fibres.

FIGURE 10: Tag test (Researcher's own, 2021).

3.7 SOIL SKETCH

TECHNIQUE 4 / TENSIONS OF MAKING AND DESTROYING

The fourth technique emerged from listening to one of the knitwear designers describe her personal practice of collecting knitwear artefacts. This practice enhanced her own work, and strengthened her knowledge of local culture as she studied photos from local community archives to identify vintage patterns. Her work now, focuses on creating distinctive designs that can be appreciated by the wearer, building potential for connection to the garment that would result in long wear and use. The idea of design as a distinctive element that is embedded in the tension of an object being formed by human concepts and later unformed by soil activity, informed the final technique **(Figure 11**).

Each participant returned two soil samples, which were studied for their form, shape, and composition within photographic light boxes. Noting the variance, the design of the front panel of the accessory form could be detailed to reflect the tension that each participant maintains with their own process of creation and reality of objects returning to natural elements, as described by the participant in Reflection 4: Making Quiet Rituals.

The design is most likely not one that could be exactly replicated, as the participant cited that she appreciated studying and noting historic patterns, but that their unique nature derived from a specific purpose and knitwear signature of the creator. Instead, the pattern could be translated into a visual record based on the soil sketches, and as described by the participant, returned to nature post-use.

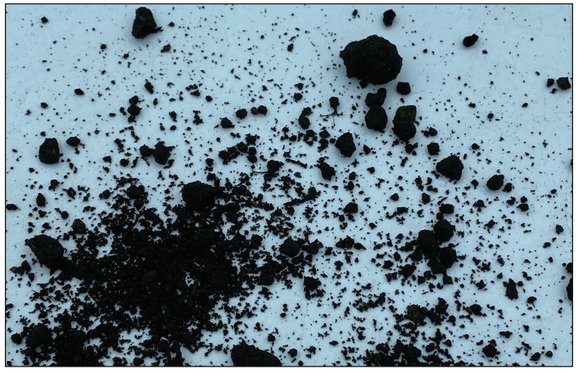

FIGURE 11: Soil sketch lightbox study (Researcher's own, 2021).

CHAPTER 4:
CARDING

4.1 INTRODUCTION

The process of preparing the fleece for use involved scouring, cleaning and carding the wool. Scouring and cleaning the fleece took place over several day as debris such as twigs and grass in the wool, known as vegetable matter, was removed through several cycles of washing.

Next, the fleece was arranged to air dry over the course of a week. During this week, the fleece was turned several times to aid the drying process, as well as check to ensure that the fibres had not felted together, which would have made the fleece unsuitable for use.

Once the fibres were dried, the wool was carded using traditional craft techniques. Carding is a process that ensures all of the fibres are untangled and aligned in the same direction.

For processing, two tools were provided on loan from a local craft guild in Glasgow. (1) set of wooden hand carders and (1) wooden drum carder machine. The drum carder consisted of a set of wood and metal rollers that multiple pieces of wool feed through so that the fibres were aligned.

Once the wool was carded through the machine, longer sections of wool, called wool batts **(Figure 12)**, were formed. Carded batts can be used for spinning or felting purposes and were integrated with collected hentilagets **(Figure 13)**. Through the wool collected for the purpose of reflective practice (8) carded batts were formed that were approximately 61 cm in length and 26 cm in width.

FIGURE 12: Carded Jacob wool (Researcher's own, 2021).

FIGURE 13: Collected hentilagets (Researcher's own, 2021).

CHAPTER 5:
ACCESSORY FORM

FIGURE 14: DfD form, made from discarded wool and hentilagets (Researcher's own, 2021).

5.1 INTRODUCTION

After the wool batts were prepared, as described in the previous chapter (4), the wool and hentilagets collected were wet felted together into the accessory form **(Figure 14).**

The felting occurred over several days in Glasgow. First, a pattern for the form was constructed from the packaging that several of the fleece samples were shipped in to minimize waste. Next, the wool fibres were applied in multiple, various layers to the pattern pieces. Over iterative cycles, the felting process was completed using water, soap, and agitation to interlock and compact the wool fibres **(Figure 15)**. Once the form was completed, it placed on an aerated drying rack for 48 hours to complete a DfD form.

FIGURE 15: Beginning welt felting in Glasgow (Researcher's own, 2021).

CHAPTER 6:
DECOMPOSITION

FIGURE 16: Decomposition site, Forres (Researcher's own, 2021).

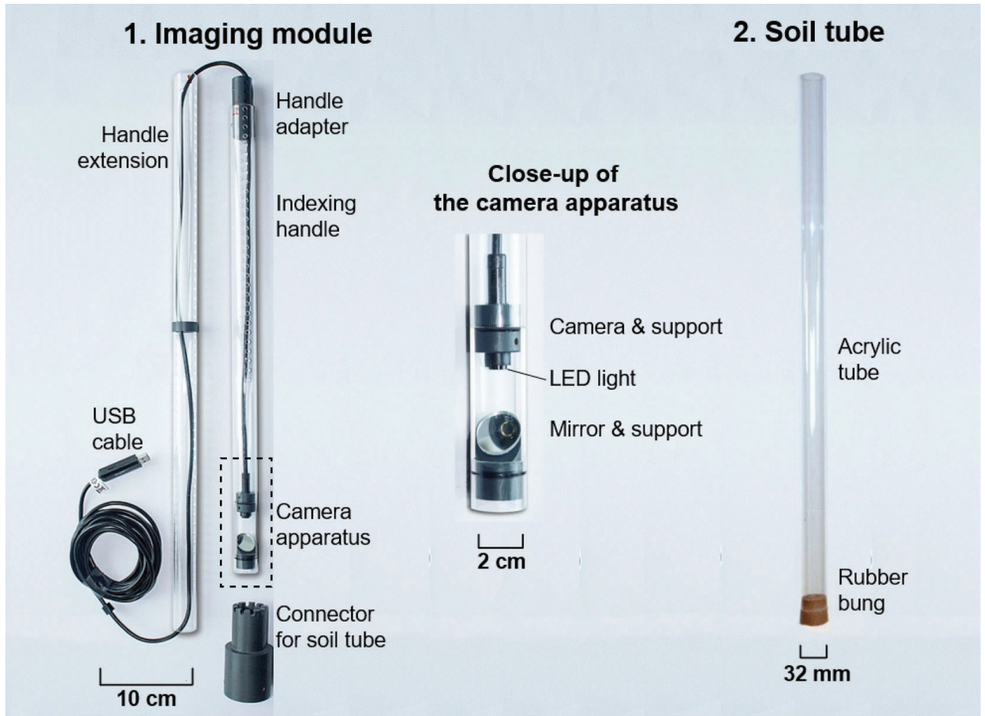

FIGURE 17: EnRoot imaging open-source components. (Arnaud, M., Baird, A.J., Morris, P.J. et al, 2019)

6.1 INTRODUCTION

Having completed the accessory form, it was evaluated where the form might be stored once the research was complete. As the study was centered on material afterlife through wool decomposition, a suitable plan for decomposition of the form was sought as it would seem contrary to the study not to address what would happen to it post-thesis. Additionally, a decomposition plan would also allow the physical components of the wool to re-enter into "play" in the soil and contribute to an ongoing cycle of regeneration.

Identifying a location where the form could return to the soil required a site where 1.) the artefact would remain mostly undisturbed for several weeks so that decomposition could occur as wool is thought to decompose within six months 2.) progress of the decomposition could be monitored in an ongoing manner to provide to provide additional insight into not only how wool fibres decompose, but how wool decomposition can enhance understanding of a more-than-human world.

Firstly, to secure a location where the form could return to soil mostly undisturbed, permission was sought from the GSA Forres campus administration to construct a decomposition site **(Figure 16)** on the campus grounds. Approval was granted, and a research trip was arranged in October 2021 to identify the site location. Secondly, to monitor the artefact's disintegration above and below ground imaging tools were utilised. From the human perspective (above ground) a trail camera, which is often used by professional wildlife photographers and observers, provided digital images to observe how the artefact might affect ground level. From the soil level, a minirhizotron integrated with digital software was used to document the artefact decomposition. A minirhizotron is a non-destructive observation tool used in qualitative and quantitative research to study fine root production. This tool can cost £15,000 in the field, however, Dr. Marie Arnaud, a research fellow investigating the below ground carbon dynamics of wetlands in response to global changes, designed EnRoot as a collaborative, open-source device that would remove economical barriers to underground imaging research in a wide range of ecosystems (Arnaud, M., Baird, A.J., Morris, P.J. *et al*, 2019). The EnRoot components **(Figure 17)** were downloaded, constructed using 3D print techniques, and assembled for use in Forres. Next, the EnRoot was placed in Forres **(Figure 18)** where the observation tool enabled below ground imaging **(Figure 19),** along with the solar powered above-ground imaging system, to monitor the decomposition site **(Figure 20).**

FIGURE 18: EnRoot minirhizotron placement (Researcher's own, 2021).

FIGURE 19: EnRoot, minirhizotron (Researcher's own, 2021).

FIGURE 20: Above and below ground imaging at decomposition site, Forres. Solar-powered camera (bottom center) and EnRoot imaging minirhizotron (top center) (Researcher's own, 2021).

EPILOGUE:
CONCLUDING REMARKS AND FUTURE RESEARCH

1.1 INTRODUCTION

Setting an intention to study material afterlife through hermeneutical phenomenology as a reflective practitioner created conditions that both revealed and concealed aspects of wool decomposition. Some elements, such a connection to place, were brought sharply into focus, while other elements such as how this work could translate into other material objects and fibre types remained on the periphery. Initiating the enquiry, however, raised clear indications in gaps, both broadly in textile making and within the researcher's own practice, where interdisciplinary engagement even in design-oriented processes could produce unexpected, but more ecologically aware outcomes. Working with the participants also reinforced the gap, as the participants composting knowledge and expertise demonstrated their own pursuits to expand connections beyond their own textile discipline to reconnect to a sense of place. In the next three sections, this gap is reflected as an Epilogue to the original research questions (below) through researcher reflections, addressing limitations of the study, and a conclusion.

Main Question: What meaning do designers who work and make with wool find in wool decomposition?

Sub-Question: Does the experience of wool decomposition influence the relationship between designers, their material of practice, and the more-than-human world?

1.2 RESEARCHER REFLECTION

Following the construction of the decomposition site and burial of the accessory form at GSA's Highland's Campus, I was surprised at the sentiment associated with the process as a researcher. Recognizing the potential and limitations of my own human voice as I had considered designing within the bounds of what would primarily be beneficial to the soil microorganisms—or from decomposition—shaped my understanding of the possibilities and limitations of my own role within an ecosystem and upon placing the form within the ground, I was curious what the soil might accept as food or reject as waste. The wool was undyed, minimally processed, the plan to decompose and monitor it was clear—and from all of my research for the purpose of the literature review it was thought that the keratin fibres in the wool would enhance and not destroy the soil.

Over the years working as a consultant and designer, I have experienced many moments of anxiety at the concluding of a project wondering what would occur next. Did our team make a difference? What would happen to the creative assets? Would they be stored away, continuing to occupy space? The result of this research was different. And if made me wonder it having clear plans for textile afterlife could be a positive outcome for those of us alive today—perhaps decreasing

climate anxiety and increasing wellness and health of our surrounding ecosystems—as well as producing positive benefits for those who may come after us.

Before leaving Forres, I was able to begin an imaging process that would allow for ongoing monitoring of the artefact's decomposition above the ground using a solar-powered trail camera and below ground using the minirhizotron. The minirhizotron, which as described in the thesis is a tool that it typically used in root imaging in soil, will remain at the campus for the next six months to monitor the decomposition of the artefact. Prior to break, I spoke with the Operations Director of the Forres campus, and there is likely possibility of engaging with an environmental studies student who may be able to assist with the imaging in an ongoing matter.

FIGURE 20: Below ground imaging at the Forres Campus using EnRoot minirhizotron. (Researcher's own, 2021).

Drawing others into this work post-research, whose expertise may be different than my own could help expand the research implications for wider community benefit. Personally, this research altered my thinking and opened conceptual possibilities that the objects that humans surround themselves with could nurture and not destroy. If a wider mindset to design from decomposition, were adopted among other disciplinary applications and was reflexive of systems of co-existence with the

environment rather than escapism or design dominance—new and interesting design possibilities could also emerge. This type of work could also expand within interdisciplinary textile systems and situate within selected themes aligned to key UN Sustainable Development Goals adopted by institutions such as GSA:

UN Sustainable Development Goals (SDGs)

1. Sustainable Environment and Economies
SDG 11 (Sustainable Cities & Communities) SDG 13 (Climate Action); SDG 14 (Life Below Water)

2. Cultural Landscape & Identity
SDG 10 (Reduced Inequalities); SDG 15 (Life on Land);

3. History, Heritage, Archives & Collections
SDG 11 (Sustainable Cities and Communities)

4. Health and Care
SDG 3 (Good Health & Wellbeing); SDG 9 (Industry, Innovation & Infrastructure)

In returning to the research questions as a researcher, the implications of broader themes became unraveled in the specific questions asked and perhaps designers who work with other materials of practice might find different answers or solutions. In this inquiry, engaging with the meaning of decomposition revealed insights that may have remained overlooked or cleverly concealed had I instead focused the study on methods to accelerate or maximize wool decomposition. Instead, working in the soil agitated ideas of how reciprocal relationships in textile making can form within a more-than-human world. Considering the soil as an active player and afterlife as ongoing and generative, positioned future scenarios in which alternative envision tests and techniques for co-existence with their materials of practice rather than dominance or mastery only although the time frame in the study limited the practicality of carrying the techniques through to completion as a researcher. As it did within the research, however, this pursuit challenged my notions of how materials form, from origin to afterlife, and opened up the possibility to encounter new design solutions that move matter beyond an inevitable waste cycle.

1.3 LIMITATIONS

Having additional research participants in a variety of locations would have enhanced the findings. While all of the participants self-identified as living in mostly rural environments,

participants from urban ecosystems may have provided unique insights into the meaning of wool decomposition. Additionally, the study could have had further segmentation of participants with high, low, and moderate levels of composting experiences to understand more about how their experience correlated with the meaning they found through the experience of wool decomposition. Another limitation of the study was also certainly the impact that the wool had upon on soil and more attention to how the more-than-human aspects of the experience contributed to the decomposition sites. However, this endeavour would have required a specific set of tools and timescale that were beyond the bounds of the study. However, the approach could serve as another volume of research to understand the effects of wool decomposition within the soil, and specific techniques that could increase the soil's fertility during the wool decomposition process.

1.4 CONCLUSION

The meaning making process in this research was informed by different realities unified through the research questions. Conversations were constructed and physical elements such as data and the decomposition site held space where the experience of wool decomposition could be explored. Even the task of searching for ecological texts generated the purchase of new materials for inclusion within GSA Library collections for future student use. The phenomenon of wool decomposition also drew focus towards the complex social worlds that influence fibre production, both in origin and afterlife. Some aspects of wool production flourish within this social context, as is the case of the research participants who have constructed hyper-local supply chains with high standards of animal care and land management. Other aspects of this fibre life cycle struggle, as much about the final traceability of a wool artefact remains far outside of the control of a designer. However, connecting to the cycle of decomposition presented unique insights that given different levels of expertise, could translate into future research that works at larger industry challenges such as reducing landfill waste. Or, enhancing local green spaces such as shared community gardens. Future research might also expand beyond wool, raising questions of what materials contribute to ecosystems shared by human and non-human forces who rely upon soil. Embracing material afterlife as generative removes the constricting idea that what designers create must last forever and take up space within already crowded ecosystems. Rather, associating decomposition with positive notions of material afterlife opens pathways to design and wellness that support a sense of place and meaning. Future research in additional volumes could also develop as an expansion into what soil types and vegetation would benefit from the decomposition of textile materials, which would also expand the methodological considerations of the research. This may be of particular interest to designers working and making with textiles who want to understand their personal connections to material afterlife and address climate anxiety surrounding outcomes of their practice. The research might also benefit textile manufacturers who seek ecological solutions for pre-consumer textile waste or the disposal of textile materials in addition to upcycling and recycling.

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VOLUME 2

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