Getting ‘the feel’:

Craft learning as perceptual transformation

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Abstract

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Becoming a wooden boat builder requires 'getting the feel' for the tools and materials of the trade by learning to perceive these objects in terms of their practical purposes in the workshop. In this project, I explore such learning from a sensory-ethnographic perspective, journaling how my own perceptual experience transforms over six months of work building boats. To supplement this first-person method, I carry out participant observations and long-form interviews with boat builders, paying particular attention to the ways in which newcomers to the workshop are guided through the learning process. I interpret the rich accounts of learning that result through concepts from philosophy, exploring how the perception that I record can be seen to demonstrate a fundamental mode of human understanding. Using Heidegger's idea of 'being-in-the-world', I show how learning entails a constant re-alignment of understanding through which individuals continually rediscover their human capacity for meaning-making. By investigating the link between perception and understanding in the craft workshop, I contribute to theoretical debates over the nature of human cognition while also illuminating the complex and often-overlooked cognitive processes that underpin practical work.

My findings show how 'getting the feel' entails learning to perceive practical objects in new ways, recognising aspects of tools and materials that are invisible to the unaccustomed viewer. In some cases, 'the feel' involves specific combinations of objects appearing together in terms of work that they perform, rather than separately as discrete entities. In other cases, it entails tools and materials appearing to transform, splitting apart or combining in perception as their defining practices demand. Throughout the investigation, I show how understanding varies between the three workshops, and how each contains its own mechanisms for introducing the newcomer to situated ways of seeing and feeling. Despite their differences, however, the workshops share three main modes of learning: self-motivated exploration, expert guidance, and participation in a community designed to reproduce the skills and understanding it requires of its future members. By continually participating in each of these three modes, boat builders accumulate expertise as they move between settings and progress within them, 'getting the feel' for gradually-shifting constellations of materials, people, and practices.

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The digital floorplans in Appendices F and G were produced with PlanningWiz online modelling software; my thanks to the publisher for a courtesy subscription.

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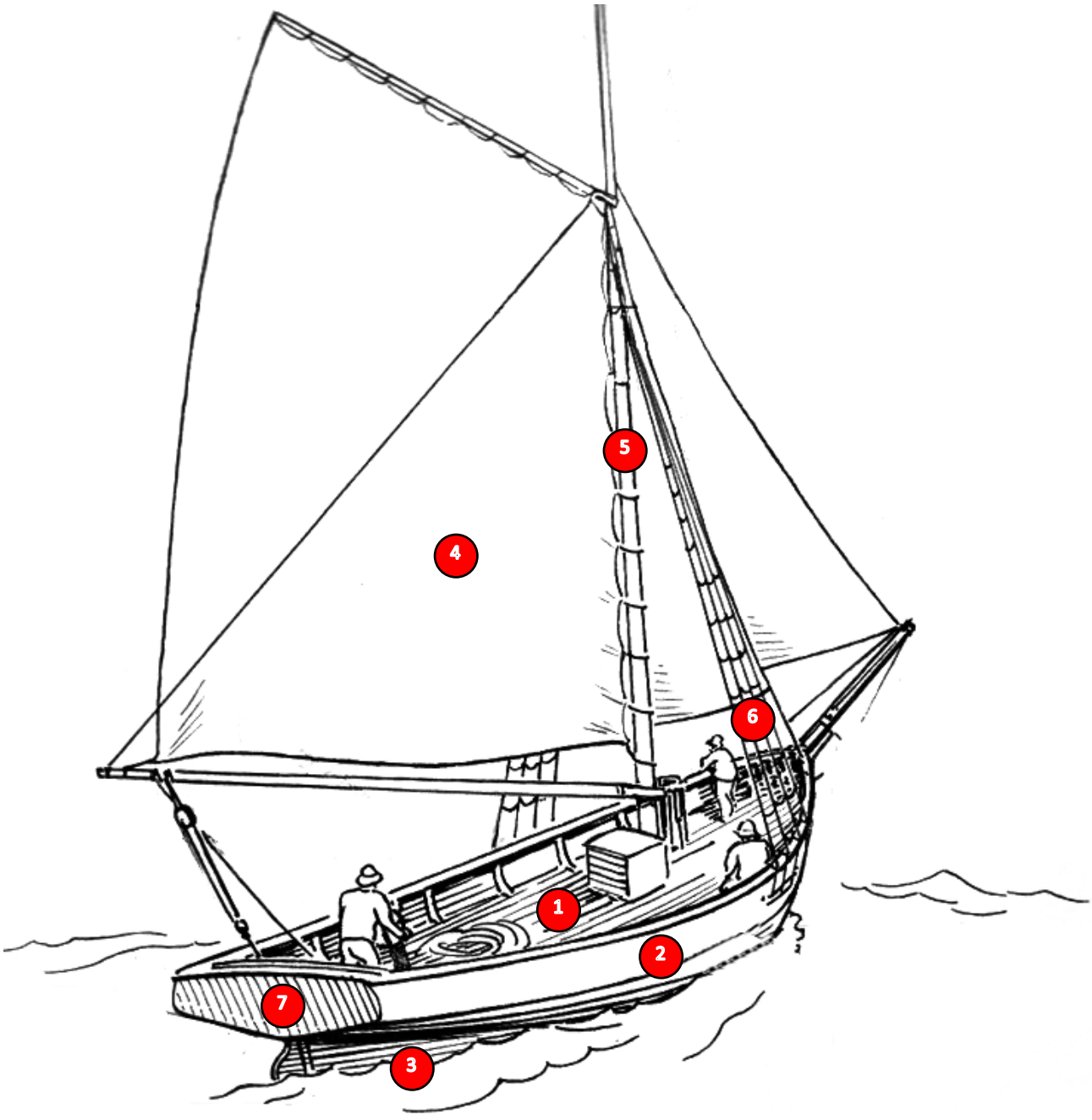
Glossary of Boat Building Terminology

The following terms are defined here as I understood them during fieldwork. Some definitions vary between contexts. Numbers in parentheses refer to diagram opposite.

Aft – Toward the rear of a ship (opp. 'fore'; see also 'stern')
Binnacle – A case for navigational equipment mounted on the ship's deck
Bowline – A non-binding knot well-suited to nautical applications (pronounced *bowlyn)*
Brightwork – Visible trim on the topside of a ship, normally varnished
Bung – A short wooden dowel manufactured to fill a hole in a wooden surface
Cat-head – A thick wooden beam used to support a raised anchor
Deck (1) – The topside surface of a ship, traversed by sailing crew
Deck beam – A structural support running beneath the deck, supported by a frame
Dry dock – A drainable basin used for working on ships below the water line
Dutchman – A replacement section fashioned for the repair of a wooden surface
Epoxy – A two-part adhesive polymer used to seal and reinforce wooden surfaces
Fair – 1. Even or flat; 2. Shaped so subsequently-added components will produce a flat surface; 3. Consistently curved; 4. Aesthetically pleasing (also v., as in 'to make fair')
Fore – Toward the front of a ship (opp. 'aft')
Forecastle – The forward area below deck, including living quarters (pronounced *fox'l*)
Foremast – A secondary mast forward of the main mast
Frame – A structural component spanning the width of the ship laterally
Galley – The kitchen of a ship
Gangway – A removeable passageway leading from the ship to the shore
Grain – The fibres that make up wood, or the alignment thereof
Hatch – An opening in the deck, designed for the passage of sailors or supplies
Heartwood – Dense, hard wood from the inner part of a tree (compare 'sapwood')
Hold – Cargo storage area below the deck of a ship
Hull (2) – The sides of a ship, which comprise the bulk of its construction below the deck
Keel (3) – The fore-to-aft member at the bottom of a ship, often weighted for stability
Line – Any rope used in the operation of a ship; often used to control or hoist sails
Mainsail (4) – The principal sail, normally the largest (pronounced *mains'l)*
Mast (5) – The upright structure that supports sails and rigging
Mizzenmast – A secondary mast aft of the main mast
Oarlock – Fittings that keep the oars of a rowboat in place
Pilot house – An enclosed space on deck containing navigational equipment
Pin-rail – A railing supporting the pins used to secure the lines that control the sails
Port – The left side of a ship, as seen when facing forward
Rib – A frame (colloquial)
Rigging – The ropes and wires around the masts, climbed by sailors to set sails
Rolling hitch – A knot used to secure a rope to a pole
Sapwood – Soft, porous wood from the exterior growth of a tree (compare 'heartwood')
Sheave – A grooved pulley along which a rope is pulled
Shroud (6) – Wires supporting the mast on either side (part of the 'rigging')
Starboard – The right side of a ship, as seen when facing forward
Stern – The aft end of a ship, encompassing the transom and aft section of deck
Tall ship – A traditionally-rigged ship, normally of historic value (colloquial)
Thwart – The cross-piece of a rowboat upon which the rower sits
Transom (7) – The flat surface at the aft end of a ship
Windlass – A mechanical device used for hoisting heavy objects via cable



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1. Introduction

The Riverside[1] wooden boat workshop sits nestled among the bars and restaurants of a bustling waterfront promenade, and is easily overlooked by busy passers-by. Occasionally, the rhythmic percussion of historic tools or the inviting scent of freshly-cut wood will attract the interest of a tourist meandering past, who will briefly peek through the open back door to observe the dozen or so boat builders at work there. The scene that greets such a visitor is one of craftspeople intently focused on tools and materials, absorbed in the intricacies of the work in front of them. At certain points, the boat builders will pause, lean back slightly, and run a hand across the piece on the work bench, feeling for some telling detail in its surface; a furrowed brow or a hint of a pursed smile will indicate how they see its progress unfolding. From the perspective of an outsider, this act of interpretation has a mysterious quality, since the boat builders clearly register aspects of their work that the unaccustomed observer does not. What is it like, one wonders, to read the materials as they do, finding meaning in the undulating slope of the planking and the twists and turns in the grain of the wood?

Philosophers, anthropologists, and cognitive scientists have long been interested in how objects appear to their users during practical work, and in the role that such perception plays in human understanding. These topics have not yet been properly explored within the field of education, though, where they imply questions about how craftspeople learn their trades and how perception fits into existing conceptions of skill. In this project, I joined wooden boat builders in three workshops on the American East Coast to

[1] The names of the fieldwork sites and participants are anonymised throughout this project (see section 3.7).

experience the development of this kind of perceptual understanding first-hand. Using a sensory-ethnographic method, I journaled changes to my own perception of tools and materials as I learned the basics of the trade, then supplemented my first-person record by interviewing other boat builders and observing them at work. The account that has resulted is one in which the world around me transformed as I became familiar with the equipment in the workshop; in coming to see things as the boat builders did, I learned to draw meaning from my bodily senses in new ways, perceiving details in physical objects that had been invisible to me when I first arrived in the workshop.

Since I had almost no experience working with wood when I started fieldwork, I was initially paired with other volunteers, people who had spent significant time in the workshop and could guide me through simple projects. On my first day, a man named Dusty and I were instructed to glue together sets of wooden planks, preparing them to be cut to size later by the more expert boat builders. Following Dusty's example, I slathered the planks with wood glue, pressed them together, and attached a series of clamps to hold them in place while they dried. As I was about to move from my first set of planks to the next, Dusty came over and rearranged the clamps I had installed, craning his neck at various angles to examine the effect of this redistribution. When I asked him how he knew where the clamps should be put, he shrugged and said 'who knows?', adding that in time I would 'get the feel' for it too. This idea of 'the feel', which boat builders regularly used to discuss learning and understanding, gave me familiar language with which to spark conversations about perception and its relationship to practical skill. With this organising concept in mind, my project quickly became an ethnography of 'getting the feel' in the wooden boat workshop.

By investigating how new boat builders 'get the feel', I contribute to the broader literature on 'craft', and more specifically on 'craft learning'. Renewed interest in craft over the past decade has brought into focus the ways in which practical skills can demonstrate complex understanding, shifting attention from the value of finished products toward the capabilities that underpin the processes of production. In defining 'craft', I draw from Korn (2017) in emphasising the mastery of physical materials; from Sennett (2008) in challenging the pervasive distinction between mind and body; and from Crawford (2009) in recognising how skill is situated within shifting cultures, histories, and economies. Synthesising these definitions, this project aims to illuminate craft as organised practice requiring acquired familiarity with physical materials, manipulation of those materials through tools and with the body, and a sensibility for the aesthetic, social, and practical value of the objects produced. My contribution to the existing literature on these topics hinges on my attention to the first-person experience of learning as the transformation of perception, as I will discuss in the following section (1.1) as well as in the full literature review in Chapter 2.

1.1 Literature on craft learning

The premise of this project, of reconceptualising understanding in a way that more fully captures human interactions with the physical world, has a precedent in the work of philosophers of education concerned with broadening definitions of knowledge and skill. In particular, investigations of 'know-how' (Winch, 2013) and 'vocational capability' (Lum, 2009) have examined practical work using concepts from the philosophers Heidegger (1927/1962), Ryle (1949), and Wittgenstein (1958/2009) to describe the non-propositional understanding that such work entails. Lum's concept of 'capability' bears

particular relevance to the present project, as it points at the same perceptual understanding that the boat builders refer to with their notion of 'the feel':

> In becoming capable we learn to adopt a particular stance, a certain interested and purposeful viewpoint which in turn structures our consciousness and our experience... we are able to see things as certain things, we are able to interpret what we experience and extrapolate from it in a way which is appropriate to the world in which we wish to operate. (2009, p. 113)

In arguing that vocational capability allows one to 'see things as certain things', Lum makes the case that the practical setting in which objects are used defines how those objects are perceived.[2] Certain ethnographers of craft learning have employed similar ideas, showing how expertise in craftwork allows practitioners to perceive tools and materials in terms of their meanings in particular contexts. Grasseni (2004a), for example, shows how her cattle-breeder participants can instantly identify important aspects of particular breeds of cow; Rice (2010) explores how trainee doctors learn to recognise heart problems by listening through stethoscopes; and Hindmarsh and colleagues (2011) show how trainee dentists learn to see meaningful aspects of their patients' teeth, a skill they only develop through prolonged practice. In each case, these authors use observation and conversation analysis to show that skilled practitioners see, hear, and feel the world in ways that outsiders to their respective fields do not, just as my boat builder participants describe with the notion of 'the feel'. Each of these studies also presents a detailed exploration of the community in which craft understanding exists, showing how knowledge and skill are situated within the social settings in which they are enacted and among the people who employ them. In some communities,

[2] Throughout this project, I will use the term 'perception' to refer to recognition of physical objects based on sensory input, and the term 'sensation' to refer to the content of that input; for example, one perceives an object visually based on the sensation of the light it reflects hitting the eye. This distinction mirrors Heidegger's use of the term 'perception', as I will discuss in the theoretical framework (Chapter 2).

newcomers are actively encouraged to learn; in others, experts closely guard the secrets of their trade to discourage professional competition (Herzfeld, 2004; Singleton, 1989).

In this project, I have built upon existing work in philosophy of education and ethnography of craft by adding first-person experiential texture to my account of perception and the development of understanding. In so doing, I have joined a growing set of authors, mainly situated within the field of anthropology, who endeavour to reveal the lived experience of craftwork and craft learning. One popular analytical trend within these experiential studies is to examine the 'embodied' perception of objects in the workshop, where authors like O'Connor (2007a) and Atkinson (2013a) consider the experience of tools blending into the sense of the user's body. Another trend takes materials as its focus, asking how craftspeople and materials collaborate to produce finished objects; Gowlland's study of becoming a potter (2015), Paton's study of sculpting granite (2013) and Pratchett's study of learning taxidermy (2016) all focus on how materials, rather than master craftspeople, instruct the novice in the basic procedures of a trade. In each of the studies above, the author joins a craft workshop as a novice in order to record the experience of learning the trade from the beginning, focusing mainly on their sensory experience of tools and materials as it evolves through learning.

The above work from the perspectives of embodiment and material dialogue shows how a first-person, sensory-ethnographic method can illuminate bodily engagement with objects in the material world. In the recent turn toward exploring the lived experience of craftwork, however, the constitutive effects of perception – by which 'we are able to see

things as certain things' – have not yet been fully explored. In this project I have combined the first-person methods of studies of embodiment and materiality with philosophical premises connecting perception and skill, showing how learning leads to transformation of the way that the learner perceives the craft workshop. My main theoretical resources in this project come from the work of Heidegger (1927/1962), whose notion of 'being-in-the-world' illuminates the ways in which practical objects are immediately encountered in terms of their practical purposes. Because Heidegger's work is mainly focused on individual perception, I have also introduced the compatible notion of the 'community of practice' (Lave & Wenger, 1991) to describe the groups of people and modes of interaction in which learning occurs. This combination of theories and the perspective it produces is discussed in the theoretical framework at the end of Chapter 2.

1.2 The research questions

In this project I capture the transformation of the content of the novice's perception as he or she 'gets the feel' for wooden boat building, learning to understand tools and materials in terms of their purposes in the workshop. To explore how such learning occurs, I also examine the pedagogical interactions, social structures, and modes of self-motivated exploration for which each workshop allows, conceptualising it as a 'community' of shared practices and modes of interpersonal interaction. To address these dual interests, I have designed this research to simultaneously look inward towards individual perceptual experience and outward toward the social structures that govern participation in the workshop, as is apparent in the three research questions that I have used to guide my investigation:

1. How is ‘having the feel’ for tools and materials experienced in the wooden boat workshop?

2. How do newcomers to the workshop learn ‘the feel’?

3. How is ‘getting the feel’ a function of, or supported by, the boat-building community?

The above questions are answered in turn in the discussion at the end of the thesis (Chapter 8), with support from evidence from the findings chapters that precede it. The structure of the thesis and the logic through which it unfolds appear in the following section.

1.3 Thesis overview

This introductory chapter is followed by the Literature Review and Theoretical Framework (Chapter 2), which collates the existing literature on craft learning and establishes the theoretical perspective from which I approach this research. As in the summary above (section 1.1), the literature review explains how I combine the philosophical premises used in some previous studies with empirical methods popular in others, examining learning as the constitution of objects in perception through a joint focus on individual experience and the social setting in which that experience is shaped. In the theoretical framework that follows the literature review, I explain how concepts from Heidegger suit my investigation by establishing the area of inquiry as the boat builders’ phenomenal ‘world’, where objects are perceived with regard to the meaningful interrelationships among them.

After setting out the literature context and explaining the theoretical tools I use in analysis, I present the Research Design and Methods (Chapter 3), where I explain the

specific techniques I use to conduct fieldwork and analysis as well as the general logic underpinning their selection. The central concern in this chapter is establishing a method by which I can capture my own experience of learning, compare it with the experience of other boat builders, and interpret it in light of concepts from philosophy. To these ends, I present a sensory-ethnographic method through which observations and theory are reciprocally engaged, informing one another as the findings emerge. This chapter also includes an explanation of the process by which I selected the fieldwork sites, showing how these three wooden boat workshops present suitable sites for research; in the chapter that follows, titled The Fieldwork Sites (Chapter 4), I explain each site in detail, describing the people there and the work that they perform.

The three chapters at the centre of the thesis (Chapters 5 – 7) present the research findings, cumulatively building an account of how 'the feel' is experienced and how it is developed through participation in the workshop. The first findings chapter (Chapter 5) introduces the idea of 'perceiving as', a central analytical notion by which I connect perception to the understanding that underpins practical skill. As the chapter progresses, I show how boat builders 'see as', observing meaningful details in practical objects through sight, but also 'feel as' and 'hear as', perceiving details through other bodily senses as well. In the final section, I explain how deep familiarity with tools and materials leads their users to lose track of them as discrete objects entirely, their interrelated purposes filling the boat builders' attention instead. Throughout this first findings chapter, I mainly link learning to the novice's own curiosity as he or she explores the contents of the wooden boat workshop and attempts to decipher their purposes.

The second findings chapter (Chapter 6) builds upon the first, exploring the experience

of ‘perceiving as’ and how it develops as the newcomer to the workshop learns necessary practices. I begin the chapter by more fully exploring the constitutive aspects of perception, whereby certain objects appear to their users only once their contextual purposes are fully understood; I refer to this phenomenon as the perceptual ‘realisation’ of tools and materials. Because the network of meanings that defines tools and materials in the wooden boat workshop is dense and deeply interconnected, however, boat builders often struggle to keep every meaningful aspect of a project in mind at once, as I show with examples from various complex processes. My focus on learning in this second findings chapter shifts to the ways in which experts place relative novices into positions from which the latter will be instructively exposed to new practices, a pedagogical ‘guiding’ that takes the place of explicit instruction in the workshop.

In the third and final findings chapter (Chapter 7), I show how learning is not only a consequence of individual curiosity and expert guidance, but also of the ways in which each workshop community absorbs newcomers and encourages their progression. Using Lave and Wenger’s (1991) concept of the ‘community of practice’, I show how each workshop is built around a unique set of interests, practices, and ways of guiding newcomers into positions from which they can learn. Unlike Lave and Wenger, however, I do not argue that the understanding developed in each workshop community is relevant only to that setting; using Heidegger’s concept of the ‘we-world’, I differentiate between the shared understanding that extends across workshops and the communities of practice that scaffolds its development.

After the three findings chapters I describe above, I present a Discussion (Chapter 8) in which I answer the three research questions in turn. In this discussion chapter I return to

the work discussed in the literature review, showing how my findings compare to and build upon previous investigations. Considering the findings of the project as a whole, I show how my results compare to existing accounts of the stages in practical learning (e.g., Dreyfus & Dreyfus, 1988), the lived experience of embodiment (e.g., O'Connor, 2007a), and the situated nature of practical knowledge (e.g., Lave & Wenger, 1991). I end the thesis with a series of Conclusions (Chapter 9) about the nature of human understanding and the value of craftwork as part of a fulfilling, humanistic education. The question with which I close the thesis is how complex ways of engaging with tools and materials might be positioned within a craft education that nurtures the fundamental human capacity for meaning-making, rather than solely emphasising efficient material production.

2. Literature review and theoretical framework

The field to which this project contributes is already well-populated with studies on craftwork and the development of practical skills. Starting in the 1980s, rising interest in apprenticeship led many researchers to approach craft learning in terms of increasing participation in systems of situated meaning. Although these early studies illuminated the relational aspects of understanding and the ways in which the meanings of objects are defined by the situated practices in which they are used, all but a few studies overlooked sensory experience in favour of systematic conceptualisations of group practice. Later research, often centred around ideas of embodiment and dialogue with materials, captured the first-person experience of tools and materials that those earlier studies missed, accounting for the role that bodily engagement with the material world plays in craftwork. While these later studies set a strong precedent for sensory-ethnographic research, however, they generally abandoned the earlier premise that the objects of work are defined by the practices in which they are used; instead, first-person ethnographies of craft learning tended to focus on the relationship between the embodied individual and the objects of an external material realm, discovered in practice rather than constituted by it.

After reviewing the relevant literature in this chapter, I proceed to present a theoretical framework with which to capture the first-person experience of objects changing in perception as their situated meanings become clear, combining elements of the two trends that I identified. To do so, I adopt concepts from Heidegger's *Being and Time* (1927/1962), in which he explores the nature of reality from the perspective of engagement with an individual phenomenal 'world'. Focusing on reality-as-perceived

allows me to capture learning as apparent transformation to the tools and materials that surround the learner, an aspect of learning that has been suggested by previous studies, but has yet to be given a central position in research.

2.1 Systematic approaches to craft learning

In this section, I trace the development of interest in craft learning from early studies of apprenticeship in the 1980s through studies of situated learning in the two decades that followed. The studies in this section generally consider learning in terms of the systems of situated activity in which it occurs, rather than with regard to its effects on individual understanding. In the final sub-section (2.1.3), however, I present several exceptions to this trend, in which authors link learning to the development of new ways of perceiving the objects of practical work.

2.1.1 New interest in apprenticeship

Starting in the 1980s, the concept of apprenticeship began to attract new academic interest, especially within the fields of anthropology and education research. The notion of apprenticeship provided a conceptual frame within which researchers could address problems with conventional models of learning, which conceived of it as a linear process of knowledge transfer from teacher to student; in apprenticeship-style situations, learning could be seen as a multi-directional process between actors of various statuses and personal motivations (Coy, 1989c; Lave & Wenger, 1991). Furthermore, apprenticeship offered a counterpoint to a conceptualisation of learning as the reception of static propositional knowledge, opening up new avenues for exploring knowledge developed through observation and co-participation rather than language-

based teaching (Handley, Sturdy, Fincham, & Clark, 2006). As Coy argues in the introduction to his edited collection of ethnographies of apprenticeship (1989a):

> Apprenticeship… is a means of learning things that cannot be easily communicated by conventional means. … This knowledge relates not only to the physical skills associated with a craft, but also the means of structuring economic and social relationships between oneself and other practitioners, between oneself and one's clients. (1989a, pp. xi–xii)

The essays in Coy's *Apprenticeship* (1989a) set an early precedent for participant-observer studies of learning in context, introducing both theoretical and methodological innovations that have remained influential to the present day. In the definition of 'apprenticeship' above, Coy sets out the dichotomous theoretical perspective on learning that these studies collectively adopt, which recognises both the individual and systematic functions of the apprenticeship model. On the one hand, apprenticeship leads to individual transformation, with the learner adopting 'implicit' (Coy, 1989c, p. 2) ways of understanding the materials of the craft and mastering specific forms of material production. In this individual view, it is the apprentice who develops as a consequence of learning, much as in conventional conceptions of learning within a teacher-student dyad. On the other hand, apprenticeship requires participation in the social relations that come with the production and exchange of material artefacts, reproducing aspects of culture rather than just adopting them. From this second perspective, the apprentice is as much the producer of knowledge as its receiver, so studies of learning must account for systems of cultural reproduction in addition to individual transformation. Reacting to contemporary analyses of learning as the formation of representations within the individual mind (Hanks, 1991), many of these early researchers of apprenticeship opted to focus mainly on the second, more system-oriented approach to analysis.

In addition to the theoretical innovations that the new interest in apprenticeship brought about, Coy and his contemporaries also attempted a methodological innovation, studying apprenticeship from within the settings where such learning occurs. Employing 'apprenticeship as a field method' (Coy, 1989b), the authors in Coy's edited collection visited and sometimes participated in craft workshops across the world, providing an enlightening window into everyday work there and showing how non-formal learning is a persistent and geographically wide-ranging phenomenon. Yet, in entering fieldwork with a theoretical position designed in part to counter individualist conceptions of understanding, Coy and the others in his book tended to explore the apprenticeships they studied as collective social systems, rather than sites of individual experience. These authors usually positioned themselves at the margins of the workshop as visitors or short-term participants, gathering a breadth of observational and interview data on interpersonal interactions or the navigation of social hierarchy. As with their theoretical innovations, these methods demonstrate a focus on apprenticeships as systems of activity rather than sites for individual transformation.

The piece in Coy's collection in which the apprenticeship-as-system approach is most obvious is Singleton's (1989) study of Japanese potters, whom he observes only briefly through a series of guided visits to their workshops. Watching apprentices work, Singleton is struck by the tedium of fashioning thousands of identical *sake* cups, commenting on how this work mainly serves the purpose of winning the master's respect rather than honing the students' ability. Struggles like this are built into the Japanese apprenticeship model, Singleton concludes, because masters cannot afford to reveal their 'secrets' to anyone but the most committed apprentices, who have proven

that they will then dutifully pay off their training through productive future work. Thus, as a system, the potters' workshop reproduces itself in ways that speak to the economic needs of the master potter, and as a consequence, to those of the apprentice and of Japanese society as well. Yet, despite this thorough sociological analysis, the reader is given little insight into how the apprentices develop their ability to craft pottery; while learning is evidenced in the apprentices' progression through the various stages that Singleton identifies, their relationships to tools, materials, and the form of the finished object are all left largely unexplored. Singleton's interest in apprenticeship as a cultural system rather than a process of individual transformation is also reflected in the fact that he chooses not to participate in pottery himself, closing off avenues for exploring the first-person experience of the craft.

One advantage of the observational style of research that Singleton employs is the ability to attend to the reproduction of historically-situated power relationships in the workshop, rather than solely the acquisition of craft techniques. Herzfeld (2004) later employs a similar method to show how young Greek apprentices, ostensibly employed as trainee goldsmiths or floor-makers, must first learn to navigate inherently conflictual social relationships within the workshop. An early lesson that these apprentices learn is that, despite the purportedly educational nature of the apprenticeship, the masters in each workshop 'discourage them quite deliberately from learning anything at all' (p. 51), as a well-trained apprentice presents the risk of future professional competition. As a result, apprentices train themselves to feign disinterest in the work they are assigned in order to hide the fact that they are actively 'stealing the master's secrets' (p. 119).

Coy (1989b) also contributes an account of apprenticeship to his edited volume on the

subject, describing his time as an apprentice in a blacksmith's workshop in Kenya. In some ways, Coy's essay serves as a counterpoint to those of Singleton and Herzfeld, since Coy worked with metal under the direction of a master smith. As a result, Coy relates some sense of participating in the workshop from the perspective of the novice, although he mainly attends to the social relationships that the blacksmith and his apprentices negotiate in their everyday work. For example, where Coy discusses the blacksmith's bellows, his observations focus on how the price of such a large piece of machinery prevents apprentices from easily starting their own workshops, rather than describing how he himself learns to operate it. Likewise, Coy is at least as concerned with the master smith's identity as local spell-caster as his ability to work steel; while such observations lend Coy's work the tenor of traditional anthropological ethnographies, revealing unfamiliar social interactions and understandings set in far-away places, they do less to illuminate craft learning as a skilful relationship to material objects. Although Coy is under no obligation to relate his experience of working with materials – his study succeeds as a portrait of Kenyan blacksmithing culture, rather than of the lived experience of blacksmithing practice – his limited commentary on personal experience brings into question his claim that participating in an apprenticeship is an ideal way to 'learn about learning' (Coy, 1989c, p. 2). Instead, Coy uses his apprentice position to learn about the social relationships that surround and support learning, without much comment on how he experienced learning himself.

The piece in Coy's collection that is most attentive to the experience of the apprentice, Cooper's (1989) study of wood carvers in Hong Kong, is also the one in which the author was most fully integrated into the workshop in which he worked. Cooper took on the

apprentice role for several months, participating full-time alongside his peers and fully inhabiting his position at the bottom of the workshop hierarchy; his commitment to the trade is illustrated in descriptions of his body aching after hours of repetitive work, exacerbated by the poor treatment he suffers from his master. Yet from this challenging perspective, Cooper is able to relate his changing experience of the materials of the workshop as he becomes more familiar with them, providing a first-person portrait of learning unlike most other contributions to Coy's volume. In one telling moment, Cooper is accidentally tasked with repairing a poorly-made piece constructed by another apprentice, without realising that he himself had made it. Cooper initially regards the piece with contempt, but upon realising that he was the creator, is confronted with how his perception of the work has changed over the course of his apprenticeship. This anecdote serves to show how apprenticeship is not just a system for reproducing the social structures that govern material production, but also a pedagogical mode for altering the apprentice's understanding of the physical world. While Cooper's discussions of identity formation and cultural reproduction do ultimately overshadow his account of his own engagement with wood, the few glimpses he provides of his changing experience remind the reader of the role of the apprentice as an experiencing subject, rather than just a player in a social system.

Overall, these early ethnographic studies of apprenticeship raise the idea of a mutually-constitutive relationship between individual and social structure, but emphasise the social side of that equation much more heavily. Where authors such as Cooper do invest themselves fully in the work that they study, more comments on experience appear, implying that a deeply-integrated first-person perspective suits the 'apprenticeship as a

field method' (Coy, 1989b) to which Coy and colleagues aspire. Even Cooper's work, however, illustrates the difficulty of balancing experiential and systematic analyses of learning, distinct perspectives that each entail their own methodological and theoretical commitments.

2.1.2 From apprenticeship to situated learning

As the above studies show, the contributors to Coy's influential collection were primarily concerned with apprenticeship, rather than apprentices, asking how skills are passed from experts to novices without much exploration of how the novice experiences new ways of working and understanding. While the focus of these studies is on the systems in which learning occurs, however, a common underlying presupposition is that learning still involves individual internalisation of technical facts, bodily movements, and social norms. As interest in apprenticeship-style learning continued into the 1990s, researchers began questioning these basic conceptual tenets, asking whether learning itself could be seen as an interactional process, rather than an individual one (Hanks, 1991). Such radical epistemological claims appeared in work around the concept of 'situated knowledge', particularly as described by Lave and Wenger (1991).

In their book *Situated Learning* (1991), Lave and Wenger argue not only that the social context for learning is highly important for how it occurs, but that learning and social participation are essentially equivalent. The authors introduce the notion of the 'community of practice' to bound the set of interpersonal relationships in which learning-as-practice occurs as a fluid, evolving process:

> Conventional explanations view learning as a process by which a learner internalizes knowledge, whether "discovered," "transmitted" from others, or "experienced in interaction" with others. … In

> contrast with learning as internalization, learning as increasing participation in communities of practice concerns the whole person acting in the world. Conceiving of learning in terms of participation focuses attention on ways in which it is an evolving, continuously renewed set of relations; this is, of course, consistent with a relational view, of persons, their actions, and the world, typical of a theory of social practice. (Lave & Wenger, 1991, pp. 47–50)

In Lave and Wenger's conceptualisation, 'knowledge' describes a relationship between practitioners situated within a community built around shared goals, identities, and ways of working. Given this relational definition of knowledge, it would be impossible for any individual to possess it in a 'cognitive' (1991, p. 51) sense, in which static representations are captured in the mind; instead, 'learning, thinking, and knowing are relations among people in activity in, with, and arising from the socially and culturally structured world' (p. 51). From this perspective, Lave and Wenger analyse ethnographic accounts of midwives, tailors, and butchers to show how learning entails taking on greater responsibility within these communities of practice, rather than memorising rules or ways of acting. In so doing, they move past Coy's assertion that learning does not require the linear transmission of propositional knowledge to argue that learning need not be strictly mental or individual at all. As the forward editor to their book explains, the theoretical contribution of Lave and Wenger's version of 'situated cognition' was that it 'located learning squarely in the processes of coparticipation, not in the heads of individuals' (Hanks, 1991, p. 13). In later solo work,[3] Lave (2011) uses the idea of complex situated collaboration to argue that craftwork is no less likely to foster the development of intellectual abilities than formal schooling, an implicitly political

[3] While Wenger continued to publish work on communities of practice after *Situated Learning* (1991), which he co-authored with Lave, it is widely held that his use of the concept quickly shifted away from the interpretative analytic that appears there (Contu & Willmott, 2000).

conclusion of the type largely absent in her early work.[4]

The popularisation of the concept of situated learning led to a turn away from models of the mind imported from the field of psychology (Lave, 1982) towards 'practice theory', a set of ideas gaining popularity throughout the 1980s and onward (Ortner, 1984). A particularly influential version of practice theory was put forward by Bourdieu in his *Outline of a Theory of Practice* (1972/1977), which is cited throughout Lave and Wenger's *Situated Learning* (1991). Key to Bourdieu's work is the idea of 'habitus', or 'systems of durable, transposable dispositions ... principles which generate and organize practices and representations' (1972/1977, p. 72). The concept of habitus collapses the dichotomy between agent and social structure by showing how dispositions are distilled into actors by way of participation in social practices, much like how players of a game learn to conform to its rules through playing it (Bourdieu, 1980/1990, p. 66). Because the habitus is reified in the commonality of individuals' actions while participating in practices, it is neither entirely individual nor entirely determined by pre-existing social structures; instead, it relies upon people working together, collectively reproducing shared ways of understanding and acting. It is from this conceptual background that Lave and Wenger present their conceptualisation of understanding in community, in which learning and social participation are essentially synonymous.

The studies that Lave and Wenger (1991) and later Lave and Chaiklin (1993) collect follow Bourdieu in exploring 'relations among person, activity, and situation, as they are

[4] Although Lave's *Apprenticeship in Critical Ethnographic Practice* (2011) does clarify some of the ideas about community and situated learning that she developed in her earlier work with Wenger (1991), more of the book is devoted to the politics of her anthropological practice. Her notion of 'research as apprenticeship', based around a political commitment to the gradual evolution of one's methods and theoretical perspectives, has also influenced the design of this project, as I describe in section 3.1.2.

given in social practice, itself viewed as a single encompassing theoretical entity' (Lave & Chaiklin, 1993, p. 7). Yet, while Lave and her colleagues' assertion that learning and knowing are entirely relational was quickly adopted as the theoretical basis for many studies of learning in context (Amin & Roberts, 2008), other researchers maintained that knowledge must logically be at least partly individual. Proponents of this 'cognitive' position, especially Anderson et al. (1996, 1997), argued that the transfer of knowledge across situations and the applicability of abstract concepts in different settings show that understanding cannot be strictly relational. The debate between adherents of the cognitive and situative positions unfolded slowly throughout the late 1990s, particularly in dialogue between Anderson et al. (1997) and Greeno (1997). Eventually this debate was partly resolved with the mutually-agreed proposition that '[s]ituative and cognitive approaches can cast light on different aspects of the educational process' (Anderson, Greeno, Reder, & Simon, 2000, p. 11), with situative approaches capturing the role of collaboration in learning and cognitive approaches addressing the ways in which it is achieved by the individual. The definitions that Anderson and Greeno eventually agree upon clarify how the situated learning paradigm illuminates one aspect of the reciprocal relationship between individual and context, but does not capture every element of 'learning' as the term is commonly understood.

Where Anderson and Greeno settled their debate by drawing a distinction between the situative and cognitive aspects of learning, authors like Hutchins chose instead to extend the idea of cognition to include collective processes, rather than just individual mental ones. Through a series of ethnographic descriptions, Hutchins (1996) shows how the navigation of a large ship illustrates 'distributed cognition', with the navigators in the

cockpit collaboratively performing cognitive processes distinct from those carried out by any single person; in so doing, Hutchins attempts to 'move the boundaries of the cognitive unit of analysis out beyond the skin of the individual person and treat the navigation team as a cognitive and computational system' (1996, p. xiv). While Hutchins' distributed approach brings the notion of cognition back into studies of social interaction, the individual experience of his participants still remains unexplored, given his focus on 'unobservable processes that are capable of generating observable behaviour' (1996, p. 287).

Hutchins' notion of distributed cognition has some resonance with the perspective of cultural psychologists, who also hypothesised a connection between cognition and social interaction (Cole, 1996). Instead of expanding the idea of cognition to encompass interpersonal interaction, however, authors like Cole and Scribner (1974) explore the ways in which culture influences individual cognition, leading people from different cultural contexts to approach language, perception, and problem-solving differently. Much of the work in cultural psychology and socio-cultural theory draws upon ideas from Vygotsky, a soviet psychologist focused on the ways in which culture and cognition are intertwined (Daniels, 2005). In particular, theorists make use of Vygotsky's (1978) notion of 'higher psychological functions', culturally-transmitted cognitive devices that are distinct from their biologically-innate counterparts. Following this tradition, Rogoff (2003) explores how differences in cultural setting influence not only what children think, but also how they think; for example, her work shows how cultures built around formal schooling instil specific modes of perceiving and classifying physical objects (pp. 241-246).

Ideas about situated learning, distributed cognition, and cultural psychology allowed the authors discussed in this section to insightfully investigate relationships between socio-cultural context and modes of collaborative work. Yet, the focus on observable evidence of cognition over descriptions of experience from those participating in the practices under observation shifted research even further from individual perception than the work on apprenticeship discussed previously (section 2.1.1). In a minority of cases, however, authors interested in situated learning persisted with questions about how practices are perceived by those who participate within them; in the next section, I review studies in which authors attempt to investigate individual experience as it arises from participation in collaborative work.

2.1.3 The role of perception in practice

Although the overall trend in studies of situated learning following Lave and Wenger was to re-frame analysis in terms of collaborative understanding, several researchers continued to grapple with the question of individual experience within apprenticeship-style settings. For the most part, this question was addressed by way of one of two analytical manoeuvres: re-define perception as a collaborative endeavour, or present evidence of individual experience within ethnographies of apprenticeship as a social structure.

The first way in which some researchers of situated learning attempted to address perception was by transforming the concept in the way that Lave and Wenger transformed learning; that is, re-defining it as a collective activity, rather than an individual mental one. Goodwin (1995) in particular champions this view, writing that 'perception is not … located in the psychology of the individual brain and its associated

cognitive processes, but instead lodged within, and constituted through, situated endogenous social practices' (p. 256). This socio-cultural take on perception entails a significant redefinition of the term, as its usual sense implies the interior experience of a single individual. The idea of perception as a collective and culturally-situated activity helps Goodwin make sense of how the participants in a courtroom collaboratively determine the meaning of video evidence (1994); how oceanographic scientists from related disciplines manipulate common tools (1995); and how even the classification of colours can be socially determined (2000a).

Followers of Goodwin's approach use a similarly social definition of perception, including Nishizaka (2000) in arguing that 'seeing' is a socially-determined process in the classroom, where children all learn to look at the same things and react to them in predictable ways. Likewise, Heath (2000) shows how, in a control room for the London Underground, the meaning of the on-screen images that controllers discuss is created on-the-fly in their interactions, and therefore that 'discovering and seeing the object' (p. 98) is a collaborative activity. Yet, both of these studies rely on a particular logical circularity: perception, as they define it, is the collective and culturally-determined process of perceiving an object. Kawatoko (2000) makes this circularity particularly apparent, writing in his study of heavy machine operators that vision is 'the practice through which people make objects or events visible within the organisation of their perceptual fields' (p. 37). If vision is 'the practice through which people make objects or events visible', there must still be some primary activity called 'vision' that is practiced individually, although this individual sense of the term is not explored by Goodwin's followers.

Grasseni (2004a, 2009) breaks from Goodwin's collective account of perception by showing how vision is determined by participation in socially-defined practice, but not synonymous with practice itself. With her concept of 'skilled vision', Grasseni links participation in common practices with her participants' ability to perceive their work in particular ways. The alpine cattle breeders with whom she works intuitively recognise meaningful qualities in their livestock, and even the children of the herders can beat her in games of 'cow spotting', recognising each cow by way of its individual characteristics. For the most part, Grasseni bases her findings on observations of others who are able to see aspects of particular objects, normally cows and cheese, in ways she cannot; sometimes, Grasseni complements these observations with analyses of short conversations in which her participants' remarks are particularly telling. In one brief section (2009, sec. 3.4), Grasseni even describes participating in a kind of apprenticeship herself, shadowing a cattle breeding inspector while he conducted his daily work. Grasseni recounts how her impromptu apprenticeship experience led to 'sharing the view' (p. 96) of cattle with the experts around her, seeing them as beautiful and meaningful in ways she previously had not. While she thoroughly accounts for such learned ways of seeing by reference to the theoretical work of Berger (2008), Goodwin (2000b), and Ingold (2001; see section 2.2.2) – along with citing Lave and Wenger to explain how skilled vision is reproduced – Grasseni's description of her own sensory experience during her apprenticeship is comparatively limited.

Several other researchers employ similar strategies to Grasseni, observing the actions of their participants at work and deducing what those participants must be perceiving. Rice (2010) explores how trainee doctors learn to use stethoscopes, describing a process of

'learning to listen' (p. 42) that mirrors Grasseni's 'apprenticeship of the eye' (2004a, p. 42). Rice's participants gradually come to display a capacity to separate meaningful 'acoustic objects' (p. 51) from their background, immediately recognising the sounds of heart murmurs and differentiating between their causes. Hindmarsh and colleagues perform a similar analytic manoeuvre, determining how their participants' perception of medical phenomena change as they achieve proficiency in their trades, first among trainee aestheticians (Hindmarsh & Pilnick, 2007), then among trainee dentists (Hindmarsh et al., 2011). Both of these studies employ conversation analysis to determine what the trainees and their mentors are perceiving, noting moments when trainees misidentify their patients' bodily characteristics and are corrected aloud. Yet while these studies by Rice and Hindmarsh et al. posit changes in perception as trainees advance in expertise, again, none of them fully relate the experience of this kind of perception, a consequence of the researchers' outsider positions in the practices at hand. As a result, new ways of seeing and hearing are proposed as evidence of learning, but the lived experience of such learning remains largely unexplored.

Studying learning as the transformation of an individual's own experience of perception would require some level of access to perceptual experience, a hurdle for researchers who are not deeply involved in apprenticeships themselves. Roth (2012) attempts one such investigation, joining his participants in a fish hatchery and recording his perceptual experience first-hand. Although his published work on the experience is brief, he recounts learning to recognise different species of fish during his apprenticeship-style research in a hatchery, intuitively differentiating between fish that he had initially seen as all being the same. While such observations lead Roth to similar conclusions to Rice

and Hindmarsh et al., his remarks on how the fish appeared to him differently over time produce a richer portrait of 'learning to see' (2012, p. 202), in which objects transform in perception through repeated exposure. One striking example involves Roth's colleagues debating which fish in a particular pile were salmon smolt, stickleback, or sockeye, differences that Roth was initially unable to parse. The learning that Roth eventually accomplishes results in him 'seeing a specimen *as* a specimen of a particular category' (2012, p. 204), appearing to him as such at a glance. As a consequence, Roth is not only able to carry out a new set of tasks involving the identification of different fish, but is also introduced to a world of distinct objects that did not exist for him previously. The constitutive element of perception that Roth points out in his first-person study of apprenticeship is suggested by other researchers as well; Goodwin claims that objects such as scientific tools are 'constituted' (1995, p. 237) through practice, and Grasseni describes how skilled vision provides 'frames that actively constitute reality' (2004a, p. 47). Where Roth's study stands out is in capturing the changes to the content of his perception as he learns how his new context constitutes the practical objects within it.

Much recent ethnographic work on craftsmanship has followed the trend that Roth exemplifies in his study in the fishery, exploring learning from an insider's perspective rather than viewing it solely as a function of a system of practice. And yet, despite the new interest in first-person perspectives, most recent work has left behind the question of whether 'learning to see' is experienced as the constitution of new meaningful objects. Instead, the major themes from recent studies have been 'embodied experience' and 'materiality', both of which replace the emphasis on the constitution of objects in perception with an emphasis on the discovery of objects in a human-external

material reality, as I will argue in the following section. In the conclusion to this chapter, I will return to the idea of the constitution of objects to argue for its place among contemporary interpretations of craft learning.

2.2 Developments in the study of craft learning: Revisiting personal experience

Much progress has recently been made in exploring the first-person perceptual experience of apprenticeship-style situated learning. Two main themes have come to the fore, which I will discuss here in turn. The first is analysis of findings with reference to the idea of embodiment, a perspective that attempts to overcome persistent conceptions of mind and body as distinct entities. The second theme relates to engagement with physical materials, interrogating the ways in which people engage with and learn from the material world. Studies engaging with either of these themes establish a new precedent for sensory research and first-person introspection, perspectives that were notably absent from most of the work in the previous section. Yet both sets of studies share a conception of material objects outside the human body that stifles the idea of the constitution of objects, an analytical insight provided by several authors working at the margins of the tradition of situated learning, as I described at the end of the section above. After explaining the two recently-popular theoretical themes, I will return to the constitutive perspective in the conclusion to examine how it can build on this recent work without losing sight of the idea that objects are to some extent defined by the context in which they exist.

2.2.1 Embodiment

Since so much work on craft learning has come from the discipline of anthropology, it is

not surprising that the rising popularity of the concept of embodiment there – which took place in the 1980s and 1990s (Csordas, 1999) – should have carried over to studies of craft. Indeed, craft learning is especially well-suited to investigation from an embodied perspective, since one of the hallmarks of craft is the bodily manipulation of physical objects (Pye, 1968; Sennett, 2008; see discussion in Introduction). Acknowledgement of the role of the human body in craftwork does not itself constitute a paradigm for research, however, given how fundamental the body is in all human behaviour. In the main, researchers have introduced the body into empirical studies in two ways, as Cheville explains in her review of embodiment in education:

> For some scholars, embodiment represents the performance of one's body within cultural contexts that sanction particular forms of comportment and display… Others note how certain neurological or cognitive functions arise from bodily activity. (2005, p. 86)

In the first part of the section that follows, I will review studies of craft learning that deal with comporting, displaying, observing, and learning from human bodies at work. In the second half, I will review studies that appeal to embodied cognitive activity, particularly perception. As Csordas (1990) points out, studies that employ the former perspective tend to engage with ideas from Bourdieu, while studies employing the latter often look toward Merleau-Ponty.

- 2.2.1.1 Embodied practice: Observing bodies at work

One sense of 'embodiment' employed by researchers of craft learning relates to the ways in which the understanding of practices is apparent in how expert bodies move during work, and how learning therefore requires observation and mimicry of these movements. An early theoretical discussion of embodiment was put forward by Bourdieu (1972/1977), who writes that 'a whole system of techniques involving the

body and tools' is 'transmitted in practice' (p. 87). Ways of speaking, acting, and holding oneself are instilled in the individual's body as he or she observes and unconsciously mimics the bodies of others, especially during childhood:

> In all societies, children are especially attentive to the gestures and postures which, in their eyes, express everything that goes to make an accomplished adult – a way of walking, a tilt of the head, facial expressions, ways of using implements… (Bourdieu, 1972/1977, p. 87)

Thus, for Bourdieu, the body is both the medium through which cultural meaning is enacted, and the site from which observers are inculcated into specific ways of acting.

This practical mimicry that Bourdieu describes 'speaks directly to the motor function' (p. 87) without the learner being conscious of the habits that he or she is adopting. Later authors draw upon this idea of gestural mimicry to explain how newcomers to unfamiliar cultural spaces automatically adopt the bodily comportment typical of the people there; Herzfeld (2009), for example, describes adopting local conversational hand gestures during fieldwork, then finding that they fail to convey his intended meaning as he moves between cultural contexts. Other authors, however, have resisted the idea that the movements necessary for craft practice are learned in this automatic, unconscious way. Portisch (2010), in her study of learning Kazakh embroidery, remarks that such separation of the body from consciousness only performs 'an implicit reversal of the Cartesian dualism: the body, not the mind, is elevated to a status worthy of investigation' (p. 64).

Marchand (2007, 2010b) and Downey (2010) both point out shortcomings of Bourdieu's idea of embodied learning, arguing that it lacks clarity around the ways in which practices are reproduced and changed. Downey, in his study of practitioners of the Afro-

Brazilian dance-fighting style 'capoeira' (2010), challenges the idea that practices are transmitted through a process that is invisible to those who participate in it. Instead, Downey's participants purposely try to imitate their capoeira masters, attempting to experience the rhythm of the movements that allows for seamless performance. This is possible, Downey claims, through the engagement of 'mirror neurons' (p. 29), structures in the brain that allow the novice to experience the movements that they witness others execute. Observing others carry out capoeira moves allows the new players to experience those moves vicariously, then carry them out themselves later. This 'neuroanthropological' approach (p. 22) gives Downey the grounds for claiming that mimetic learning is deeply experiential, rather than the passive process of the reception of ways of acting that Bourdieu describes.

Marchand similarly develops the idea of mimetic learning, first through examples from his ethnography of mud-and-brick masonry (2007), then with reference to his time as a British cabinet-maker's apprentice (2010a). In both cases, Marchand concludes that observation allows novices to form mental representations of the bodily movements necessary for enacting a craft practice, as well as mental images of the ideal finished forms. By way of a highly technical explanation of 'dynamic syntax theory', Marchand shows how the movement of the master is parsed by the novice, who understands each component action as he or she would understand each word in a sentence. With the entire phrase of movements in mind, the novice can then construct a model of how particular movements relate to the production of the finished form, re-creating the mental model held by the master without it being transmitted *per se*. Overall, Marchand's analysis of imitative learning points to the role of the mind in the process,

where Downey cites the importance of the brain; in both cases movements are observed and recorded, although the two authors' explanations of how they are stored varies slightly.

Downey and Marchand both contribute significantly to conceptions of mimesis and embodied learning, moving forward Bourdieu's account of the technicalities of mimesis with novel ideas about the syntactic and biological structures of bodily imitation. Both authors continue to follow Bourdieu, however, in conceptualising learning in systematic terms; like Bourdieu, both Marchand and Downey are primarily interested in mimesis as a way of explaining how skills are passed from one person to another through co-participation in practice. Marchand and Downey defend the role of the individual in this process, moving the focus from practices to people-in-practice, but still stop short of relating the experiential transformation that follows from the development of these skills. Such omission becomes problematic where either author draws conclusions, based only on outside observations, of their participants' subjective experiences of learning. For example, it is unclear how Marchand concludes that with motor representations, one 'imaginatively 'feels' oneself (as differentiated from 'picturing' oneself) to be executing an action' (2010a, p. 101) when he does not describe using methods to capture either 'picturing' or 'feeling'. To make such points, both Marchand and Downey rely on the precedents set in the highly technical cognitive science literature they draw upon, diminishing the descriptive aspect of their work in favour of imported conceptual accounts.

Using Marchand and Downey's definition of embodiment to underpin empirical investigation allows for a more 'agent-centred' perspective (Marchand, 2008, p. 100),

asserting the role of the embodied individual where Lave and her contemporaries had left it largely unarticulated. Yet, even in adopting a perspective more attuned to the role of individual experience, Marchand and Downey remain committed to investigations of the systems where learning occurs, within which the body is a necessary component. In the studies described in the section that follows, authors use a different definition of embodiment to explore the lived experience of bodily engagement with objects, presenting the detailed first-person descriptions largely missing in Marchand and Downey's work. This second sense of embodiment comes with limitations as well, however, as I explain below.

- 2.2.1.2 Phenomenal embodiment: Experiencing work through the body

Around the time that Marchand and others began exploring embodied communication in workshop settings – that is, the ways in which individuals observe one another's bodies in order to adopt skilful practices – another trend was developing in which researchers attempted to capture participants' lived experience of using their bodies to participate in work. While this second trend also employed the concept of 'embodiment', the sense of the term used in these studies is distinct; instead of treating the body as a medium for the expression and adoption of meaningful movements, the body becomes the site at which self and world, both social and material, are combined.

The theoretical premise underlying this second sense of embodiment reflects a shift from practice theory to philosophical phenomenology,[5] particularly the variety described by Merleau-Ponty. Where Bourdieu discusses embodiment in terms of

[5] N.B., the use of the term 'phenomenology' in this section refers to the 20th-century philosophical tradition. The distinction between this philosophical work and the 21st-century qualitive research method referred to by the same name is discussed in section 3.1.4.

observable practices, Merleau-Ponty (1945/2002) discusses it in terms of perception, specifically how the world is always perceived from the perspective of the embodied individual (Csordas, 1990). In so doing, Merleau-Ponty joins the phenomenological philosophers Husserl and Heidegger, for whom the nature of consciousness was a central concern (Macann, 1993). As a result, research that draws its theoretical basis from Merleau-Ponty's work tends to be more concerned with the experience of embodiment than the role that the body plays in the reproduction of social structures. In line with their theoretical premise, studies of embodied learning often take as their focus activities with heavy bodily engagement, such as martial arts, dance, and the use of mobility aids. For example, Papadimitriou (2008) explores the experience of learning to use a wheelchair by conducting a series of long-form interviews with physically disabled adults, focusing specifically on their perception as they became familiar with the chair. He concludes that his participants' reports point to a variety of perceptual experiences that would not be recognised from an outsider's perspective, such as coming to see the objects around them as overlaid with new possibilities for action; the curb that appeared to the novice wheelchair user as an impassable barrier becomes a surmountable hurdle once basic techniques for manoeuvring are mastered. In so doing, Papadimitriou illustrates the phenomenological thesis that, as Csordas puts it, '[c]onstitution of the cultural object is thus dependent on intentionality' (1990, p. 10), in that an object exists in the perception of the viewer in terms of the way it can be encountered by that person's individual body.

In a similar piece to Papadimitriou's, Standal (2011) explains that with proper experience, the wheelchair 'ceases to be an object' in the mind of its user, instead

serving as a medium through which to feel the external world (2011, p. 180). This way to 'incorporate' (p. 179) equipment into the sense of the body is common throughout such phenomenologically-inspired studies of learning, and is taken directly from the work of Merleau-Ponty. With his concept of the 'bodily schema' (1945/2002, p. 55), Merleau-Ponty explains that familiar objects can extend the perceptual reach of the physical body, as the walking stick does for the blind man:

> The blind man's stick has ceased to be an object for him, and is no longer perceived for itself; its point has become an area of sensitivity, extending the scope and active radius of touch, and providing a parallel to sight (1945/2002, p. 166)

Two aspects of this incorporation of tools into the body schema are repeatedly cited throughout the empirical research reviewed here: first, that expert users can feel through tools as they feel through parts of their body; and second, that tools disappear from attention during this incorporated use, much as the body itself ceases to be the object of attention during skilled work. Banlield and Burgess (2013), who interview artists about their experience of materials, also record accounts of implements 'becoming part of the artist' (p. 86), and Aalten (2007) shows how expertise in ballet entails the body itself disappearing from attention. Such conclusions demonstrate a major strength of the phenomenological perspective on embodiment, that it allows the researcher to consider how expertise is closely linked to experience of the relationship between body and world.

The studies discussed in this section so far reveal the interior experience of research participants through varieties of interviews designed to capture an individual's subjective experience. Other studies return to the 'apprenticeship as method' technique (discussed in section 2.1.1) to study learning from a first-person perspective, with

researchers taking on the role of the learner themselves. The effect of this first-person perspective is generally that such studies provide more sensorial detail; Potter's (2008) study of ballet generally confirms Aalten's (2007) findings on the same topic, but adds descriptions of the feeling of gravity and 'groundedness' (p. 450) that were more readily apparent to her as a participant. Likewise, Spencer's (2014) first-person study of training as a mixed martial arts (MMA) fighter picks up on physical sensations that are not remarked upon in Downey's (2010) work on capoeira, which is mainly based on observations of other people. Yet, while these first-person studies do allow the researchers a privileged vantage point on experience, access to personal experience does not necessarily entail the ability to record or make sense of it. For example, Spencer's study focuses mainly on the sights, sounds, and tactile sensations of his gym between MMA matches, rather than the embodied experience of fighting, possibly because he does not have the reflective capacity to examine his own perception during high-pressure combat. This methodological challenge draws into question Spencer's conclusion that fighting is ultimately 'improvisation by thinking bodies' (2014, p. 238) rather than the conscious efforts of individuals, as the inability to capture fleeting aspects of perception and decision making does not necessarily mean that they do not occur.

In a series of articles about learning to work as a glassblower, O'Connor (2005, 2007a, 2007b, 2017) presents the most detailed exploration of sensory experience among these Merleau-Ponty-inspired studies of embodiment. Joining the glass-blowing workshop herself as a complete novice, O'Connor traces her perceptual experience over months of participation alongside both experts and other novices, creating a detailed portrait of

learning from the perspective of the learner herself. One of her main conclusions is that novices begin with a deliberate approach to working with glass, 'lifting', 'lowering', and 'twirling' a piece in step-wise progression (2005, p. 188), but eventually develop a more intuitive sense of the process, in which they automatically respond to subtle material changes. A key aspect of this learned perception was the experience of seeing through tools, such as the blowpipe revealing the sense of the ledge of the kiln rather than its own weight in the hand (2005, pp. 188–189). Additionally, as O'Connor became accustomed to them, the tools 'receded' from her awareness (2007b, p. 188), combining with her body to facilitate the work at hand.

O'Connor's writing succeeds in relating how, over time and through experience, 'practice take[s] on a lived character, a graceful extended movement, an arc of embodied techniques' (O'Connor, 2007a). As she becomes an expert glassblower over what would eventually be years of fieldwork in the studio, O'Connor continually journals the ways in which her practice is further instilled in the automatic rhythms of bodily movement and learned ways of seeing through tools. Yet the ways that O'Connor, as well as the majority of authors discussed in this section, 'see' materials is distinctly different from the ways of seeing revealed in the studies at the end of section 2.1.3, which implied that objects are constituted in perception by way of the practices in which they are used. In O'Connor's analysis, the glass and the blowpipe remain static objects throughout fieldwork, despite the differences in how they appear (or cease to appear) to her. While O'Connor records becoming more proficient with the blowpipe, she does not record the experience of learning that it *is* a blowpipe; Grasseni, Hindmarsh et al., and Roth (section 2.1.3), by contrast, imply that the objects of work only appear as such

because of how they are defined in situated practices, asking deeper questions about the nature of the objects of work.

In this section so far, I have explained how studies of embodied learning illuminate the lived experience of the body at work, but generally lead to new questions about the nature of the tools and materials that are perceived by the body. In the second half of this section that follows, I describe another trend in the study of craft learning, that of engagement with ideas of material dialogue and materiality, through which the nature of materials is examined more closely. As will become apparent, however, the resulting conception of materials as extent in physical reality also comes with limitations, particularly around assumptions about perceptual access to the material world.

2.2.2 Materiality

The work that I will introduce in this section is chronologically parallel to work on embodiment, but instead focuses on the nature of the materials involved in craft practices and the ways in which people learn from the materials themselves. The philosophical questions that these authors engage with, about the perception of the material world and the projection of form onto materials, have been perennially debated in philosophy, from Aristotle's distinction between form and matter (trans. 2016, bk. I) to modern-day work on the problem of perception (e.g., Chalmers, 2006; Mcdowell, 1994). Where the authors I discuss below diverge from this tradition of philosophical inquiry is in applying their ideas to ethnographic accounts of the perception and manipulation of materials, rather than focusing on *a priori* investigation. As the studies I cite here illustrate, interpreting real-world examples in light of ideas from philosophy allows for insightful analysis of ethnographic cases, but can constrain

inquiry through commitment to a single perspective.

- 2.2.2.1 Material dialogue

Early research that introduces the idea that materials influence both work practices and the learning thereof includes Keller and Keller's (1993, 1996) studies of blacksmithing, which first appeared as part of a volume edited by Lave and Chaiklin (1993) titled *Understanding Practice: Perspectives on Activity and Context*. Like most of the other essays in that volume, Keller and Keller discuss the tools and materials of their work as parts of an 'activity system', a grouping of individuals, objects, and modes of practice that collectively govern action. Unlike many of their contemporaries, however, Keller and Keller introduced a degree of circularity to the activity system, writing that:

> Internal activity that arises largely out of external, practical activity retains a fundamental two-way connection with that external world. Action continually brings the human into practical contact with objects that deflect, change, and enrich prior organizations of knowledge. (1993, p. 126)

In this definition of activity, finished objects in the craft workshop are not just the result of the individual adapting to collective processes of production, but of the individual also reacting to the materials themselves. The smith begins with an 'umbrella plan, an internal representation of goal and procedure' (1993, p. 135) that defines the desired outcome at a high level of abstraction, such as the shape of the 19th-century reproduction 'skimmer' that Keller and Keller record making. While the purpose and general design of the skimmer are included in the original mental umbrella plan, once the blacksmith begins working the material, seeing the way that the metal bends under pressure requires that the umbrella plan be slightly modified. The process unfolds with a continuous circular flow, with the smith attempting to impose a pre-conceived form, encountering the limits of the material, adjusting his or her mental image to

accommodate the material qualities encountered, and so forth.

Keller and Keller's notion of interacting with materials reflected a growing trend in anthropology, championed in particular by Ingold (1992),[6] who challenged the popular focus on the social construction of material artefacts. Instead of asking about the social value inscribed in material goods, Ingold attempts to 'take materials seriously' (2007, p. 15) by showing how they are equal partners in skilled work, not just the innate substances onto which form is projected. Ingold demonstrates this point in an essay about sawing wooden planks for making a bookcase (2006), in which he describes sawing as a dialogue with the material; he presses his saw into the wood, feels how it resists him, and rearranges his stance and motion to respond to the feedback he receives. Ingold moves beyond the idea of an umbrella plan to show how his process unfolds moment-by-moment at the scale of single movements of the hand and saw, in an 'intimate coupling between movement and perception' (2006, p. 76). Such coupling means that the form of the object is never conceived solely in the mind, arising instead within the 'gestural synergy of human being, tool and raw material' (Ingold, 2000a, p. 352).

Ingold's attention to the role of materials in skilled practice also has implications for how those practices are learned. Since the form of an object relates to how its constituent materials react to being worked, learning to reliably produce objects requires experimenting with materials until those properties become clear. Such learning occurs

[6] The work of Keller and Keller and of Ingold on plans and their execution was prefigured by Suchman's (1987) writing on situated action, in which she describes plans as rhetorical devices for retrospectively describing action rather than blueprints that precede it. As Suchman's work focuses on artificial intelligence rather than craft technique, however, it shares more similarities with Dreyfus' work on computing (1972; see section 2.3.1) than it does with that of the authors discussed in the present section.

through ‘guided rediscovery’ (Ingold, 2000a, p. 356), in which novices are led to discover the properties of materials by manipulating them in specific ways. Observing experts at work, novices take note of certain routine movements, which they then attempt to copy in their own early pieces. This is not, Ingold says, a matter of memorising procedures or creating a mental image of the finished piece; instead, it requires copying the movements that place the novice into dialogue with the material, from which he or she learns how it demands to be worked: ‘Through repeated practical trials, and guided by his observations’, Ingold writes, ‘[the novice] gradually gets the 'feel' for things himself’ (Ingold, 2000a, p. 354). This conception of the development of skill, part of what Ingold (2011) calls ‘enskilment’, points to learning that is processual and interactive rather than the passive reception of mental forms; Pálsson (1994), in his work on the enskilment of Icelandic fishermen, describes it as ‘immersion in the practical world, being caught up in the incessant flow of everyday life’ (p. 901). As such, enskilment relies upon complex social arrangements that introduce the learner to the material and cultural context for craft practice, conditions that are easily disrupted when learning is overly standardised or routinised (Gieser, 2014).

The idea of enskilment through guided rediscovery has greatly influenced the ethnographic study of craftwork, especially within the past decade. In her study of Slovak lace-makers, Makovicky (2010) writes that imitating the movements of older craftspeople allows novices ‘to understand how to respond to the visual and sensual clues generated by the thread, tools, and pillow’ (p. 86). Likewise, Portisch (2010) recounts observing a young girl imitate the motions of her mother’s hands while weaving a carpet, then attempting the same movements herself, encountering on her

own the material limitations that her mother deftly navigated. These examples challenge the account of embodied cognition presented earlier (2.2.1), in which observing and mimicking ways of moving the body constituted the development of practical skills. In these instances of guided rediscovery, mimicry only produces the scaffolding for initial interactions with materials, from which the materials themselves then come to serve as instructors.

Reading Ingold's account of how novices learn from both expert practitioners and from materials, one might intuitively conceive of the materials as agents in the process, exerting their effects alongside the human craftspeople. The notion of 'material agency' does indeed play a role in theories of craftwork, although Ingold himself resists this conceptualisation (2008b). For several other authors, however, conceptualising materials as active players in the process of making helps to bring the collaborative and dialogical nature of human-material relations to the fore.

- 2.2.2.2 Material agency

Malafouris (2008, 2013a) draws from his ethnographic work on pottery-making to conclude that the potter is not the only agent in the process, which is a collaborative activity between potter, clay, and potting wheel:

> In any given stage … the wheel may subsume the plans of the potter and define the contours of activity or at another point serve as a passive instrument for his or her manufacturing purposes. At one moment, movement is effortless and feels like happening [sic] to the potter rather than being done by the potter as if totally absorbed into the micro-structure of clay. At another moment, the potter is clearly conscious of moving clay around and shaping it, directing the flow of the clay and struggling to control the act and handle the clay. (2008, p. 34)

Malafouris does not conceive of materials taking on the wilful, sentient characteristics of

human beings, but rather achieving 'agency' only in the sense that they influence the construction process as it unfolds (Malafouris & Knappett, 2008). This definition of agency is heavily influenced by Latour's (1992) 'actor-network theory' (ANT), with which he asserts that 'the material world pushes back on people because of its physical structure and design' (p. 151), influencing human action without mirroring the ability to form intentions. In Latour's view, the history of human-material interaction has unfairly stressed the human side of the equation, even though the non-human elements have equal effect on how processes of production unfold. Asking how objects in the natural world, or even man-made technologies, shape the everyday activities of human beings allows Latour to produce a more holistic interpretation of individuals and materials working in concert. It is this sense of agency that Knappett and Malafouris (2008) adopt when they write that 'what we call actors or agents are essentially the products or effects of networks' (p. xi), entities that play a role in complex processes regardless of their ability to form intentions about the outcomes of those processes. Such a perspective on agency not only serves as the basis for researchers' own analyses, but also helps them to relate to the understanding of their participants, who may intuitively hold similar views; Dudley (2014) cites Latour to explain how her luthier participants understand the acoustic frequencies of their guitars as 'not a bane to be suppressed but a host of nonhuman agents to be coaxed into harmonious and spirited collaboration' (p. 9).

The idea of non-human agency is not totally uncontroversial, however, and Knappett and Malafouris (2008) spend much of their book on the subject defending the position from its detractors. Ingold (2008b) in particular resists this notion of material agency

based on the critique that it leads to a diminished conception of the 'complexity of living organisms as opposed to inert matter' (p. 214). Attentiveness to the environment, Ingold argues, is what sets living organisms apart from non-living entities, a point that is missed in combining them under the labels of 'agents' or 'actors'. Kirchhoff (2009) refers to Malafouris' conception of agency (via Latour) as the 'strong view', and Ingold's conception as the 'weak view' (p. 206) in order to differentiate between them. In the strong view, any entity contributing to a process can be understood as an agent, where in the weak view, 'the lived body of human beings[7] makes a *special* and *ineliminable* contribution to the agentive dimension of material-cultural entities' (p. 206; org. emp.). The difference between these points of view can be reduced to the two authors' relative willingness to overlook the unique position that living entities occupy in interactions with materials in order to better explain how processes unfold and objects are constructed.

Despite their differences, Ingold and Malafouris both build their work on a particular philosophical premise, that materials are encountered partly by way of their independent physical characteristics rather than strictly in terms of human practices. Even if water vessels (Malafouris, 2013b) or candles (Ingold, 2007) are understood as such due to the human need for water and light, the materials from which those objects are made – clay and beeswax – exist in the physical world regardless of human intentionality, these authors argue. Both Ingold (2007) and Malafouris (2013b) rely on Gibson's (1979) idea of 'affordances' to explain how finished artefacts have roots in the material world, and how materials are perceived in relation to human purposes.

[7] Kirchhoff neglects to point out that Ingold includes non-human animals in his definition of 'agents' (Ingold, 2008b).

Affordances are the possibilities for use that are presented to specific animals (including humans) based on the compatibility between features of the animal and features of the environment. Affordances are, therefore, 'in a sense objective, real, and physical, unlike values and meanings, which are often supposed to be subjective, phenomenal, and mental' (Gibson, 1979, p. 121). Gibson writes that it is the inherent usability of objects, relative to the animal to whom they relate, that defines them as tools:

> An elongated object, especially if weighted at one end and graspable at the other, affords hitting or hammering (a club). A graspable object with a rigid sharp edge affords cutting and scraping (a knife, a hand axe, or a chopper). A pointed object affords piercing (a spear, an arrow, an awl, or a needle). (1979, p. 35)

Before his work, Gibson contends, theories of perception were limited by the fact that recognising an object required already knowing that such an object existed to be recognised. His theory, by comparison, begins with the notion that certain characteristics – particularly size and shape – are available to perception regardless of the object that they reveal, and that these characteristics signal affordances on their own.

By drawing from Gibson's theory of affordances, both Malafouris and Ingold commit themselves to a particular philosophical premise, that materials exist in a world distinct from human intentions, and that such a world is the root cause of all sensory perception. Gibson refers to this idea as 'direct perception' (1979, p. 139), and uses it to resist interpretations of the world as subjective and phenomenal, arising primarily from human ideas about purpose and use. Perception of affordances, he writes, begins in the physical environment, rather than the human mind: 'An affordance is not bestowed upon an object by a need of an observer and his act of perceiving it. The object offers

what it does because it is what it is' (p. 130). While this premise is generally uncontroversial, neither Ingold nor Malafouris explain their rationale for identifying *specific materials* as directly-perceived entities in the material world. Drawing a line between clay (matter) and pottery (material culture) raises the question of whether clay is, on some level, a product of cultural understanding as well. This question goes unaddressed in both Ingold's work and Malafouris' work, in which the authors are so focused on establishing an objective conception of engagement with materials that they set aside more fundamental questions about how we conceive of materials at all.

In summary, the work on materiality that I have reviewed in this section reinstates the role of materials in the fabrication of material artefacts. Where early theorists of craftwork focused on situated practices as the site of understanding (2.1) and some later theorists placed understanding within the human body (2.2), authors like Ingold and Malafouris show how understanding is partly distributed into extant physical matter. Once again, however, this insight closes down exploration of the ways in which the phenomenal reality of the craftsperson is constituted by participation in social practices, a theoretical sub-current from early work (2.1.3) that has yet to be fully explored. By focusing on how material qualities underpin the being of objects, authors committed to the idea of direct perception pre-empt exploration of the social origin of the materials themselves, at least within the perception of the observer. This point is especially important for research that is concerned with learning as transformation of the ways in which materials are perceived, such as described by boat builders getting 'the feel' for the materials used in their work.

2.3 Theoretical framework

In this review of trends in the literature on craft learning, I have identified a general movement from systematic conceptions of practice as a distributed process to explorations of craft learning through individual, embodied interactions with the material world. The influence of ideas of embodiment and material dialogue have reminded researchers that understanding exists not only in the community in which practice takes place, but in the individual practitioner as well, through learned ways of perceiving the human body, tools, and materials. And yet, in gradually refocusing on the experience of the individual participant, these later studies have turned away from a latent thread in earlier work on craft, which posited that objects are defined by the meaningful practices in which they are used, and that learning therefore involves the constitution of these objects in perception. In this section, I suggest Heidegger's idea of 'being-in-the-world' as an analytical vantage point from which to focus explicitly on this yet-undeveloped thread.

One hurdle to combining the themes of individual perception and the constitution of objects through social practice is that, at an intuitive level, objects appear to belong to an extant material reality that is not constituted by practices, but rather discovered by the novice on his or her way towards becoming an expert. It is possible, however, to ask how these objects are constructed in perception without denying the existence of a human-external material realm; Heidegger allows for such a perspective simply by shifting his object of inquiry from the physical world to the phenomenal world. While Heidegger concedes the existence of a material world outside individual perception, the lack of unmediated perceptual access that humans have to that world makes him

discount it as a possible subject of investigation. The 'world' of Heidegger's being-in-the-world therefore refers to that as the individual perceives it, rather than the extant material world referred to by Ingold and others. Communication and collaborative work are explained by Heidegger in terms of commonalities in perception, ways of seeing that are adopted through participation in situated practices.

Before presenting the theoretical framework that will underpin this project, I will briefly note that my interpretation of the various concepts below developed throughout fieldwork and well into the period of writing that followed. While I did approach fieldwork with ideas from Heidegger and others in mind (see Chapter 3 – Research Design and Methods), my understanding of these concepts and of their relevance to this project changed significantly as my research progressed. The theoretical framework that appears below reflects an interpretation of concepts from philosophy and social theory influenced by my observations in the three wooden boat workshops, rather than a rigid structure for analysis that preceded fieldwork.

2.3.1 Previous analyses of learning using being-in-the-world

While Heidegger's writing has influenced philosophical discussions of the nature of understanding and skill since its publication in 1927 (Blattner, 2006), it was not until Dreyfus' work decades later that Heidegger's ideas were applied to empirical questions. As early as the 1970s, Dreyfus (1972; Dreyfus & Dreyfus, 1988) used Heidegger's ideas about understanding to explain why early attempts at artificial intelligence failed to produce computers that could understand the world in the way that humans do. The problem, Dreyfus explained (1988), was that the human understanding that computer programmers were attempting to recreate was not based on rule-following, as the

programmers had imagined. Instead, human understanding is marked by intuitive recognition of objects in terms of their contextual purpose and social value, a dimension that he argued computers would likely never replicate. Dreyfus' work was highly influential in the field later known as 'embodied cognitive science' (Shapiro, 2014, p. 208), which explores how cognition extends from the human body into the physical world, engaging with the physicality and socially-constructed value of objects (Wilson & Golonka, 2013).

Dreyfus' (1995) use of Heidegger's ideas focuses on how understanding leads humans to complete specific tasks, rather than on how understanding is experienced and developed. These questions are inextricably related within a Heideggerian framework, since Heidegger asserts that learned ways of perceiving objects are what allow humans to carry out meaningful work. Yet Dreyfus' articulation of understanding as 'coping' reveals a particular perspective, that understanding is synonymous with the action wherein it is evident; to understand a task is therefore to complete it successfully (Wrathall, 2013). This 'pragmatist' (Wrathall, 2013, p. 178) interpretation overlaps with Lave and Wenger's conception of understanding in that it highlights the communal aspects over the individual experience, citing instances of the execution of skilled practice as evidence of learning. It does not, however, expose the individual experience of learning, or how the phenomenal world changes as a result of participation in situated practices. These aspects of learning are implied by Dreyfus, who mentions the 'progressive changes in a performer's ways of seeing his task environment' (Dreyfus & Dreyfus, 1980, p. i), but never deeply explored. In this project, I make the perceptual experience of learning my central focus, asking how learning entails objects

transforming in the eyes of the learner, and how these new ways of seeing allow for the completion of meaningful work.

Several other authors since Dreyfus have already discussed the applicability of Heidegger's ideas to analysis of learning in the workplace, drawing out the implications of his theory of perception where Dreyfus did not. A common conclusion is that objects in the 'work-world' (Gibbs, 2008, p. 431) appear differently to the expert user than they do for the novice, and that training for work should encourage the development of this way of seeing rather than focusing on specific behavioural competencies (Lum, 2009). Nielsen (2007) identifies apprenticeship as the ideal format for a Heideggerian conception of learning, given the ample opportunities the apprenticeship model provides the novice for encountering objects within their meaningful context. Each of these authors relies heavily on the idea that learning means coming to perceive the phenomenal world in new ways, a point made only in passing by Dreyfus (Dreyfus & Dreyfus, 1980, p. i). Yet, these Heideggerian theorists of apprenticeship learning stop short of identifying real-world examples of learned ways of seeing; instead, they point to the applicability of Heidegger's ideas within a vocational context, but do not conduct such exploration themselves. As such, these studies provide a conceptual starting point for the present study, but not an empirical precedent.

Some of the most popular uses of Heidegger's work in research on learning and education involve ideas that are less directly relevant to questions about perception and skill. After *Being and Time,* Heidegger undertook an intellectual 'turn', refocusing his work on language, freedom, and the purpose of being (Van Buren, 2005). While Heidegger maintained his overall attention to the idea of being and the human

relationship to it, in his later work, he abandons his previous method of determining the structure of being by examining subjective human experience (Dreyfus & Wrathall, 2005), thereby moving away from his previous emphasis on perception. Using this later work, Biesta (2016) picks up on Heidegger's notion of 'the becoming of the self' (p. 832) to argue for an embrace of teaching as a way to introduce students to what it means to be human; D'Agnese (2015) borrows Heidegger's idea of 'disclosure' (p. 452) to posit a kind of education that encourages students to understand other people; and Hodge (2015) adopts Heidegger's critiques of technology and humanism to imagine how education may grapple with these topics in the future. Each of these authors rely on Heidegger's later emphasis on being as an objective phenomenon, rather than a subjective experience, and therefore move further from ideas about perception and understanding.

2.3.2 Operationalising concepts from Heidegger

To focus on the constitutive nature of understanding in the craft workshop, I have limited my engagement with Heidegger's work to *Being and Time,* Division I, Part One (1927/1962). It is in this first part of his major work that Heidegger established the foundational tenets of his ontological and epistemological theses, from which I will draw my inspiration for exploring the lived-in reality of the craftsperson. The remainder of *Being and Time* is devoted to explaining how human understanding as described in Part One springs from our relationship with the passing of time and the coming of death, neither of which are as relevant to my exploration of learning; while time certainly plays a role in the development of skill, Heidegger's link between time and the essence of humanity presents no obvious avenue for empirical exploration of craft learning. After

Being and Time, Heidegger moves from the fundamental philosophical problem of the nature of being to asking how human comportment toward being has changed throughout history (Dreyfus & Wrathall, 2005); this later work mainly applies ideas from *Being and Time* to questions of language, technology, and religious belief as historically-situated cultural phenomena (1959/1971).

Although Heidegger's (1989/1999) late-career 'turn' towards investigation of the cultural constitution of being has ostensible relevance to the questions of situated understanding explored in this project, his focus on historical epochs rather than identifiable cultural groups provides a poor standpoint for interpreting the granular details of everyday social interaction that I record in the boat workshop (I present alternative theoretical concepts for bounding social context in section 2.3.4). Heidegger's later thoughts on technology, however, bear more direct relevance to this investigation. In *The Question Concerning Technology* (1977), Heidegger moves beyond the essential nature of tools and materials to show how, in the modern technological era, the physical world has come to be conceived of only as a collection of resources to be exploited; as a result, he argues, humans are at risk of forgetting the deep interconnectedness of meaning in the perceived world, the understanding of which defines us as a species. I return to these ideas from later Heidegger briefly in the Conclusion (Chapter 9) in arguing for the importance of the kind of learning and understanding I observe in the wooden boat workshop as a mode of fulfilling, humanistic education.

Employing ideas from Heidegger's early work in an empirical study first requires recognising that to do so is to divorce them from their originally-intended purposes. In

Being and Time, Heidegger did not explain human understanding solely for the sake of clarifying how individuals make sense of the world. Instead, Heidegger intended to isolate the essential nature of being itself, the way in which anything can be said to be real, or 'that which determines entities as entities' (1927/1962, p. 25). Rather than taking a purely *a priori* approach to this question of the being, Heidegger uses a 'phenomenological' method (p. 27) to decipher the essential structure of being from instances of everyday experience. Heidegger's interest in experience is therefore limited to thought experiments about the experience of 'Dasein', the prototypical human subject;[8] he focuses his attention on what it means to experience being in the way that an average human does, rather than recording and interpreting the experiences of any specific human beings.

The reason that Heidegger sees everyday experience as the window into the nature of being is that, in the sense of the word 'being' that he uses, entities are only what they are experienced as within the meaningful 'world' in which they exist (p. 78). This is not to say that Heidegger is a philosophical idealist, or that he believes that all reality is entirely a construction of the human imagination (Stepanich, 1991). Instead, Heidegger is concerned with how the objects of everyday experience – he cites tables, chairs, hammers, and nails as examples – exist as those objects, rather than as meaningless physical matter. These objects are 'available'[9] to us in that they are defined by the

[8] Heidegger's use of the term 'Dasein' is famously opaque (Blattner, 2006), referring sometimes to a category of entity and sometimes to the act of being that entity (Heidegger, 1927/1962, p. 27). The sense of the term that I use above echoes Heidegger's assertion that '[t]his entity which each of us is himself… we shall denote by the term "Dasein"' (1927/1962, p. 27), and refers to a single typical instantiation of humanity.

[9] The Macquarrie and Robinson translation of *Being and Time* that I cite throughout (1927/1962) translates Heidegger's terms *zuhanden* as 'ready-to-hand' and *vorhanden* as 'present-at-hand'. In these two cases, I substitute Wrathall's (2013, p. 52) translations of 'available' and 'occurrent', following his reasoning that these translations better capture Heidegger's intended meaning.

purposes to which they can be put, such as a chair for sitting or a hammer for building houses. In the ‘occurrent’ sense, the objects are merely meaningless assemblages of inert material, considered in terms of their colour, texture, or weight. Thus, for Heidegger, ‘being’ is that which makes an object a meaningful entity within a subjective phenomenal ‘world’.

The ‘world’ to which Heidegger refers in his idea of being-in-the-world is not the occurrent sense of a planet or an external reality, but the realm of experience in which entities are defined by the network of meaningful relationships in which they exist. The world of the carpenter, for example, includes the hammers and nails with which carpentry is carried out; these objects would not be perceived in the same way by someone with no understanding of carpentry, and therefore would not exist in the same way within his or her phenomenal world. Heidegger provides a further distinction between two types of world that can be thought to exist, the individual world of ‘one's 'own' closest … environment’, and the shared ‘we-world’ in which multiple individuals experience meaningful objects in the same way (1927/1962, p. 93). While a major tenet of Heidegger’s early work is the notion that perceptual understanding is individual, and therefore that objects are defined by their roles within a particular individual’s phenomenal world, the idea of the we-world shows how individual worlds overlap, allowing for broad intersubjectivity. Carpenters regularly collaborate, for example, demonstrating a shared understanding of tools and materials within an experiential we-world, rather than isolated understandings with no relation to one another. While the concept of we-world has clear relevance to the present research project, Heidegger’s relative lack of detail around how it is bounded and how it can be shared by multiple

people will require a higher degree of interpretation than the other concepts explained in this section (which I present in the next section, 2.3.3). The concept holds promise for this analysis, however, in illuminating both individual perception and collaborative work at once, spanning the individual-social dichotomy apparent in previous work (see section 2.1.1) without collapsing it entirely as proponents of a practice theory approach have done (see section 2.1.2).

Finally, given the prominent role that perception plays in this project, the concept of 'circumspection'[10] will play a central role in analysis. Circumspection is the perceptual experience of available understanding, the mode of engaging with the world in which objects appear as what they are, or 'subordinate themselves to the manifold assignments of the 'in-order-to'' (Heidegger, 1927/1962, p. 98). Through circumspection, one sees, feels, hears, or otherwise perceives objects in ways that are defined by the meaningful interrelationships in which they exist, such as the hammer appearing in perception pre-reflectively as a hammer, rather than requiring deliberate consideration before it can be understood as such. Other theorists, some of whom are cited in existing studies of craft learning (see O'Connor, 2005), have put forward accounts of perception that are closely aligned with Heidegger's idea of circumspection; in particular, Polanyi's (1964) 'subsidiary awareness' and Ryle's (1949) 'knowing how' bear strong resemblance in similarly accounting for the non-propositional elements of understanding. Where Heidegger differs from those two other theorists is in positioning circumspection as the fundamental human mode of engaging with reality, rather than a special mode reserved

[10] While Macquarrie and Robinson present 'circumspection' as the translation for Heidegger's term *umsicht,* or 'looking around' (1927/1962), this use carries none of the English connotations of wariness or prudence.

for practical applications. Employing a Heideggerian conceptual framework therefore allows for exploration of craftwork as a medium for the development of broad intellectual capabilities, rather than for adopting specific practical skills.

While Heidegger himself was unconcerned with exploring the experience of particular people, my intention is to use the concepts presented above as the theoretical premise for exactly such an investigation. The point of this project is not to continue Heidegger's work of searching for the essential structures of being, but rather to examine the lived experience of learning a craft from the perspective that Heidegger establishes, in which the being of objects is tied to how they are experienced within a meaningful context. The use of these conceptual tools therefore implies the sort of experiential, first-person perspective on the nature of objects that I identified as missing from much of the existing literature.

2.3.3 The analytical limits of 'being-in-the-world'

Although Heidegger's philosophy supports close consideration of individual perception and its relationship to understanding, his description of intersubjective understanding and social interaction is relatively underspecified. Regarding such questions, the only guidance provided by Heidegger appears in his description of the 'we-world' (1927/1962, p. 93), the 'public' world as opposed to the individual, subjective phenomenal world. While the idea of the we-world helps to point to the intersubjective aspect of understanding, Heidegger does not explain whether the entities that are commonly encountered within a shared world are exactly the same for every perceiver, or merely understood in compatible ways. Exploring the intersubjective aspects of understanding therefore requires specifying the concept of we-world beyond the basic

outline that Heidegger provides.

Considering the concept of we-world in light of Heidegger's work on the whole, I have decided to interpret it as a degree of similarity in understanding rather than a bounded set of understandings precisely reproduced in each of its inhabitants. My reasoning for this interpretation is that no two individuals ever have precisely identical exposure to shared practices, and therefore will never have strictly identical conceptions of the objects that those practices entail. Every individual takes a different path through life, in professional endeavours and otherwise, and is therefore exposed to a unique perspective on everyday activities. Furthermore, as Merleau-Ponty points out (1945/2002), the differences in the composition of individual bodies mean that no two people ever have identical perceptual experiences, since all perception ultimately arises from the perceiver's unique body. The practical effect of such an interpretation is that, in analytical terms, the we-world ceases to be a discretely-bounded environment or set of individuals, instead becoming a way of describing compatibilities in ways of perceiving practical objects.

Thinking of we-worlds as broad perceptual compatibilities between groups of individuals helps to address problems of intersubjectivity and the possibility of collaborative work. What the concept of we-world does not explain, however, is how understanding comes to be aligned between individuals in the first place; Heidegger makes it clear that shared practices rely on common ways of understanding, but is largely silent on the structures through which such understating is developed. Heidegger scholar Gilbert-Walsh (1999) has argued that the social structures that govern learning and which bound shared phenomenal worlds are described by Heidegger in the concept of *gemeinschaft*, which

Gilbert-Walsh translates as 'community', but even if this is the case, Heidegger's fleeting discussion of the concept does not provide a sufficiently robust framework for analysis. With this limitation in mind, I have elected to base my interpretation of learning in community on a hybrid model combining being-in-the-world with Lave and Wenger's notion of the 'community of practice' (1991), which I introduced earlier in the literature review (section 2.1.2). I explain the premise of this combination of theories in the following section.

2.3.4 Learning and understanding in a community of practice

While Heidegger's work is not completely devoid of references to sociality and interpersonal interaction, the concepts he presents to account for these phenomena are again under-developed in comparison to his theory of perception. It may be possible to examine social interactions in terms of Heidegger's ideas of 'being-with' and *mit-dasein* (1927/1962, Chapter IV), with which he explains how we encounter other individuals not only in terms of their place in our phenomenal world, but as other *dasein* like ourselves. One avenue for such exploration might be to consider how perception of other people within professional contexts itself demonstrates a learned skill, then asking how such skill is developed in context. I have chosen not to employ the concept of 'being-with' in this project, however, because the relative lack of detail that Heidegger provides around sociality (see Rousse, 2013) would require a lengthy philosophical exegesis on the subject to produce an analytical framework suitable for use in an ethnography. Instead, I have chosen to adopt a well-developed theoretical model for interpreting social interaction and learning from the work of Lave and Wenger (1991).

As a complement to the ideas from Heidegger that I use in this project, I have adopted

Lave and Wenger's ideas of 'communities of practice' and 'legitimate peripheral participation' to examine the social structures that govern participation in workshop practices, and therefore which govern learning. In my interpretation of these concepts, the former is a formal structure organised with regard to cultural, historical, and economic pressures, and the latter describes reliable pathways for entering such structures through increasing participation in situated practices. The idea of shared practice serves as the hinge that connects Heidegger's philosophy and the model of social reproduction put forward by Lave and Wenger; Heidegger is concerned with the ways in which perpetual understanding reflects the purposes of objects as defined by the practices in which they are used, whereas Lave and Wenger explain the ways in which those practices are adopted by newcomers to a community and eventually transformed over the course of generational change. As such, a combination of Heidegger's definition of understanding with Lave and Wenger's idea of the community of practice produces a two-way analytical lens that can be oriented inward toward perceptual understanding or outward toward the social structure in which understanding is reproduced.

In contrast to Lave and Wenger, my attention to understanding in this project focuses solely on its individual aspects, rather than on understanding as a function of a community operating as a whole. Lave and Wenger oscillate between these two senses throughout *Situated Learning,* conflating the operations of the individual mind with those of the entire community working collaboratively. On the one hand, they assert that learning requires that the newcomer 'master new understandings' (p. 53), absorbing attitudes and ways of acting that lead to individual transformation. On the

other hand, Lave and Wenger claim that 'mastery resides not in the master but in the organization of the community of practice of which the master is part' (p. 92), suggesting that understanding is a function of a system of activity, rather than an individual mental phenomenon. While I agree with Lave and Wenger that understanding is collective in that isolated, individual understanding cannot serve the collaborative and inter-subjective aspects of everyday work, the studies of situated learning presented earlier in this chapter (2.1.2) show how conflating the individual and collective aspects of understanding obscures the role of perception in practice. By introducing a Heideggerian conception of understanding, developed through participation in formal social structures, I differentiate between the individual and social aspects of learning so that they can be observed as separate yet interactional.

Chapter conclusion

In reviewing the existing literature on craft learning, I identified two distinct bodies of research, an earlier set of studies that examined apprenticeships as systems of knowledge and situated activity, and a later set concerned with capturing the embodied experience of learning to manipulate materials. My interpretation of the first set of studies emphasised how taking a systematic view of apprenticeship-style learning allowed authors to illuminate the relational and situated nature of understanding, but obscured more experiential characteristics, such as the transformation of perception as new practices become familiar. Several studies at the end of this initial era of research on craft learning, including those by Goodwin (1994), Grasseni (2009), and Roth (2012), did attempt to incorporate remarks on first-person experience, but did so within a focus on the reproduction of communities of practice rather than taking perception as their

primary focus. As a result, this work argues that learning entails coming to see the objects of work in terms of their place within the communities in which they are used, but provides relatively little explanation of how such learning is experienced. Such work therefore provides a conceptual precedent for the present study, which I undertake from a similar theoretical footing but with greater emphasis on reporting the perceptual experience that learning entails.

Other work on craft learning that followed the initial wave of academic interest in apprenticeship shifted from systematic conceptions of learning in community to individual accounts of embodied learning and the experience of discovering the properties of materials. These later studies provided an empirical precedent for the present study, showing how first-person reflection on learning can illuminate both the learning process and the nature of what is learned. Unlike the systematic studies of apprenticeship that preceded the shift towards first-person accounts, however, these later studies generally disregarded the notion that the objects used in work are defined by the settings and activities in which they are used. Instead, later authors turned their attention to the lived experience of bodily encounters with physical objects, largely approaching those objects as extant within a human-external material reality. While this position reflects common sense, it prevents conceptualisations in which the world around the learner transforms as he or she adopts new practices, an account suggested by previous researchers but which has yet to be fully explored from a first-person, experiential perspective.

To explore the perception of learners in the wooden boat workshop, I have elected to base my analysis around Heidegger's concept of circumspective understanding, as he

presents at the beginning of *Being and Time* (1927/1962). This choice of theoretical perspective reflects the fact that Heidegger focuses on the phenomenal world instead of the physical world, and therefore provides a lens through which to attend mainly to objects-as-perceived rather than objects as they exist outside of human interaction. Such a perspective promises new ways of capturing the experience of objects transforming in perception as their purposes become known. Although the physical world may remain unchanged as the novice boat builder comes to understand the practices in the workshop, the perceived world around the learner is likely to change as the purposes of tools and materials become clear; a phenomenal perspective on learning will better capture such perceived change than a perspective that focuses on the world outside the learner and the interactions between humans and physical materials.

While Heidegger's work on perceptual understanding will help to illuminate the individual aspects of understanding, I have argued here that the explanations of intersubjectivity and community that he presents in *Being and Time* (1927/1962) are insufficiently developed to support the analysis that this project demands. In developing my theoretical framework, I have addressed this shortcoming in two ways: first, by more precisely specifying Heidegger's concept of 'we-world' as a description of compatibility between individual perceptions, and second by incorporating Lave and Wenger's notion of the 'community of practice' into analysis. The idea of the we-world will allow me to show how understanding is simultaneously individual and compatible between actors in a particular setting, and the idea of the community of practice will allow me to show how individuals enter that setting and adopt the social and perceptual understandings

necessary to participate fully within it.

In the chapter that follows, I will explain how I intend to utilise the ideas presented in the Theoretical Framework above to make sense of my observations in the wooden boat workshop. Having identified the utility of these concepts for analysis, the challenge going forward will be to implement them in such a way that they do not overshadow my observations, yet still bring to light a specific perspective missing in the literature so far. As I will explain, the ethnographic methodology I have chosen is well-suited for such a combination of theory with real-world observations, allowing me to examine the work of the wooden boat builders in light of a robust and nuanced theoretical framework.

3. Research design and methods

3.1 Methodology

Before explaining the specifics of conducting fieldwork, I will first identify the methodology that underpins the project, or its 'general logic' (Bogdan & Biklen, 2007, p. 35). I present the methods, specific strategies for gathering information during fieldwork, in section 3.4.

3.1.1 Ethnographic methodology

This project accomplishes two goals: investigating a particular case of learning and understanding within a situated community, and interpreting that case to draw out its implications for learning and understanding in general. My decision to conduct this research within the ethnographic paradigm reflects this dual goal, in which neither the particulars of the situation nor the theory generated from them hold greater importance. Ethnography combines attention to detail with readiness to extrapolate synthetic conclusions, two qualities that work in concert to produce vivid interpretative accounts of the real world (Ingold, 2008a). The combination relies on more than just participation alongside other people, long-term immersion in a social context, or the taking of field notes (topics I cover in section 3.4); it demands a commitment to both description and theorising, recording the particulars of real-life situations and forming analytical connections among them (Mills & Morton, 2013).

The challenge this project faces, which I will return to repeatedly over the course of this chapter, is keeping both the detail-oriented and theory-generating aspects in mind at once. Much of what I will discuss in this chapter are safeguards against slipping into

either a philosophical argument merely illustrated by my observations, or a descriptive account with little relation to larger questions about learning and understanding. My strategy hinges on the use of interpretation, examining different perspectives – both my own and those of my participants – in light of a body of theory that I treat as a situated account in its own right. By interweaving these perspectives, I create an account of the workshop that respects the lived experience of the people there, but also reveals implications for thinking about learning more generally.

3.1.2 Ethnography of apprenticeship

There is a strong precedent for the use of ethnography to study the kind of craft learning that takes place in the wooden boat workshop, including the work of Lave (2011), Roth (2012), and Coy (1989a). The notion of 'apprenticeship', broadly defined, appears throughout this literature, providing a way to group together and compare instances of situated, practice-based learning. Apprenticeship also provides a useful parallel to ethnography in that both require long-term participation in a particular setting, learning through gradual exposure to shared practices, and the cultivation of a context-specific identity (Roth, 2012). While the roles that I take on in the sites I research are not formal apprenticeships in title, they do exhibit a number of these key elements, aligning this study with previous work on situated, non-formal learning.

Just as ethnography is well-suited to studies of apprenticeship, so too is an apprentice's mindset useful within an ethnography. Lave argues that the 'apprentice ethnographer' is always apprenticed to the craft being explored as well as the craft of ethnography itself, integrating him- or herself into both the professional/social setting and the theoretical problematic (2011, p. 12). Apprentices adjust their understanding of the craft at hand as

they progress, and so too should apprentice ethnographers be ready to adjust their theoretical accounts and research methods, engaging in a continual process of learning and refinement. I have built this flexibility and openness to change into this project by continually adjusting my fieldwork methods to ensure their continued fit (section 3.4) and by delimiting the role of preconceived theoretical notions (section 3.5.2).

3.1.3 Autoethnography, sensory ethnography, and introspection

Ethnography tends to be 'an approach to research that is a little unconventional' (Mills & Morton, 2013, p. 4), a trend I follow by documenting my own perceptual experience and incorporating it into research. While researcher reflexivity, or cognisance of one's role in the field, is essential to ethnography (Hammersley & Atkinson, 2007), I go a step further in reflecting on my experience during fieldwork by recording my own account of perception. In addition to asking my participants what it was like to 'get the feel', I have also journaled the experience of 'getting the feel' myself, examining my perceptions of tools and materials and noting how they changed over time.

The technique of using myself as research subject has some connection to 'autoethnography', a reflexive style of research that uses personal experience to illuminate the culture under investigation (Ellis & Bochner, 2000). Autoethnography tends to be autobiographical, using narratives about the researcher's past self to explore a cultural setting (Reed-Danahay, 1997). I do something similar here by documenting my movement from one workshop to the next, considering how my changing understanding of the world of wooden boat building allows me to negotiate my developing professional identity. Yet the tradition of autoethnography does not normally include the present-moment perceptual reflection with which I record the details of my lived

experience, the bodily sensations and interior experiences of understanding that come from participating in the workshop. My strategy takes inspiration from the traditions of sensory ethnography and introspection as well, two separate research heritages that focus on the immediate aspects of bodily sensation.

Sensory ethnography is a genre of research and writing attuned to 'multisensorial and emplaced ways of knowing', taking into consideration the researcher's own experience of engaging the body with the physical world and incorporating touch, taste, and smell into a field where the traditional method of participant observation preferences sight and speech (Pink, 2009). As Pink notes, the construction of a specifically 'sensory' ethnography does not imply that such experience was not within the purview of ethnography beforehand; rather, it confirms the role of the sensory in everyday experience and explicitly accounts for it in analysis (2009, p. 10). Following this logic, I use descriptions of physical sensation to add to the richness of my account without dominating it entirely, complimenting rather than replacing more traditional forms of observation.

My use of sensory ethnography does deviate slightly from Pink's, however, in that even within my sensory observations, I still rely heavily upon my sense of sight. At first this emphasis on seeing might seem to contradict the sensory approach, which challenges the centrality of visual observation in research (Pink, 2009, p. 63). Instead, I contend that a sensory ethnography of seeing is possible as long as it explores the sensation of seeing, rather than just considering the objects that are observed. Grasseni makes the point that attention to vision need not always demand the kind of 'detached observation' that sensory ethnographers react against, and that sight itself can be understood as learned

and culturally-specific (Grasseni, 2004a, p. 41). In her ethnography of situated learning, Grasseni refers to this visual technique as 'apprenticeship of the eye' (Grasseni, 2004b, p. 25), learning to see in the same way as those in the context being studied.

While explicitly focusing on the sensory aspects of ethnography has become more popular in recent years, the technique of examining sensory stimuli also has a long history in psychology, where it is referred to as 'introspection' (Petitmengin & Bitbol, 2009). Although this study does not make the kind of definitive, testable claims that psychological experiments do, I still draw from the history of psychology in considering the limits of such introspective methods. Introspective psychology has fallen out of favour due to problems with the trustworthiness of introspective reports, as questions arise around whether a researcher can reflect on sensory experience without altering it, or if experience is necessarily distorted by the researcher's theoretical assumptions (Hurlburt & Schwitzgebel, 2007). To address these concerns and ensure that my findings are meaningful, I have incorporated first-person sensory introspection alongside a variety of other methods, taking into account my co-participants' descriptions of experience as well as my own. I discuss the specifics of these methods in section 3.4, then return to the credibility of first-person reports of sensation in section 3.6.

3.1.4 In contrast to contemporary phenomenological methods

To avoid confusion, it is worth noting that while this project draws inspiration from a body of philosophical work called 'phenomenology', it has little connection to the distinct methodological position known by the same name. The key difference between the two is that the early/mid-20th-century phenomenological philosophy I presented in the literature review was only concerned with individual experience insofar as it

presented an avenue for investigating the nature of consciousness. Much later, a methodological trend developed in the social sciences of using 'phenomenological' first-person reports to 'see things from [another's] point of view' (Bolton, 1979, p. 246), retaining the focus on consciousness but abandoning philosophical questions. Research techniques such as 'descriptive scientific phenomenology' (Giorgi, 2009), 'interpretive phenomenological analysis' (J. A. Smith, Flowers, & Larkin, 2009) and 'hermeneutic phenomenological reflection' (van Manen, 1990) aim to capture subjective experience, but make no attempt to connect it to philosophical themes in the way that I do with the philosophically-informed ethnographic approach I set out here.

3.2 Pilot project

In this section I describe a pilot project I conducted in August of 2016 to trial the methods, refine the research questions, and establish the suitability of my chosen fieldwork site. The pilot took place at the Riverside Maritime Museum, where I volunteered twice a week for three weeks. I discuss my logic for selecting Riverside as a fieldwork site in detail in section 3.3.1, which outlines my choice of sites for the main phase of research as well, where I would return to Riverside for a further three months.

The pilot project I describe here did not align perfectly with the interpretative ethnographic methodology set out in the previous section. Instead, the pilot was heavily influenced by a specific idea from the theoretical literature and attempted to produce findings that related to that idea, rather than generating novel findings inductively. I see the progression from the pilot to the more open-ended and site-specific main study as evidence of the 'ethnography as apprenticeship' I described previously; only by

participating in the practice of ethnography was I able to refine my sense of which questions to ask and how best to answer them.

3.2.1 Theoretical basis

Before starting my pilot project, I had only visited Riverside once, on a short introductory visit to determine its suitability as a fieldwork site. The design of the pilot therefore reflected theoretical concerns rather than the nature of the site itself, and was consequently highly conceptual. The pilot revolved around taking a single idea from phenomenology and investigating how well it tracked into a real-world setting, asking whether this narrow philosophical construct had any promise as an interpretative device in a study of learning. The concept in question was one that I had seen in the work of Heidegger (1927/1962), Polanyi (1964), and others, that learning to manipulate tools and materials in skilful ways entails those objects 'receding' from consciousness.

The ideas that I employed in the pilot project did eventually come to play an important role in the main study, although my relationship to theory changed in two important ways. First, operationalising concepts from the literature in such a technical way proved ineffectual, as asking whether or not the theory fit with my observations hindered my ability to develop new ideas or challenge my theoretical premise. I found myself asking my participants pointed questions about their experience of consciousness during tool use that were difficult for them to answer and for me to analyse, given my strictly-defined theoretical framework. Additionally, many findings from the pilot project came from incidental observations in the workshop that had little connection to the theory I was using, indicating the need for a more open-minded approach.

The second lesson about the use of theory I took from the pilot project was that my original interpretation of the work of Heidegger and others focused on what I had seen as implementable specifics, rather than the theories as a whole. The original rationale for this design was that the main themes in this body of philosophical theory were too broad to use in empirical fieldwork, so narrowing the scope to a handful of specific ideas would retain a connection to the literature without committing me to a fully-fledged philosophical investigation. This strategy backfired both in over-specifying my theoretical preconceptions, as I described above, but also in distancing my analysis from the heart of the literature I was using, which considered the nature of being and consciousness rather than just concrete expressions of them. The grand theory that had sparked my curiosity had lost its philosophical thrust as I distilled it into a topic for empirical investigation.

Despite these difficulties, the pilot project did show that these ideas about perception and consciousness held clear relevance, even if my relationship to theory needed to be adjusted. This relevance was particularly apparent in boat builders' descriptions of 'the feel', which pointed towards philosophical accounts of perception without perfectly aligning with any particular one. 'The feel' therefore provided a 'sensitising concept' (Hammersley & Atkinson, 2007, p. 165) around which to group observations from the field before exploring them in light of the theory, rather than importing overly-specific theoretical ideas directly into fieldwork. I describe this use of theory in the main project further in section 3.5.2.

3.2.2 Methods

The methods I employed in the pilot project were similar to those I would later use in

the main fieldwork phase: participant observation, interviews, and autoethnographic recording of my own sensory experience. Some minor complications in employing these methods in the pilot led me to revise them for the main phase, however.

Immediately upon starting the pilot project, I realised that it called for investigating how the design of the workshop supported learning, rather than simply how people learned there. I had inadvertently introduced a significant assumption, that learning occurred as a consequence of the environment being specifically designed to support it. Over the course of the pilot, I came to see learning as a largely accidental process in the workshop, where the long-term staff knew that learning happened, but did not know precisely how, when, or why. In designing the main phase, I made sure to aim the study at learning rather than educational design.

Another realisation was that while my interview schedule asked how people learned within the Riverside workshop, most people I interviewed had developed some familiarity with woodworking before they arrived there. My initial interviews explored what the boat builders had learned recently, which in most cases was not representative of their overall career paths; one had previously been an architect, another a US Marine, and another a preservationist on a historic homestead. After the pilot, I adjusted my interview schedule (Appendix A) to focus more on personal history and intended career trajectory, adding a career mapping exercise as well (which I will describe in section 3.4.5).

Finally, analysing the photos and videos from the pilot project proved that these would be more important in the main phase of research than I had assumed. The 25 photos I

took during the pilot allowed me to relive and reconsider my experience in the workshop during analysis, and I regretted not taking more. Additionally, I found that I had mainly taken pictures of the objects that I wanted to show the reader, rather than summary shots of the workshop as a whole, pictures of objects and events to include in my fieldwork notes, or shots of other people working. These *aide memoire* photos would allow me to capture images for my own future use, either as stand-ins for field notes or prompts for introspective reflection (further discussed in section 3.4.3).

3.2.3 Fit of chosen fieldwork site

The pilot demonstrated that Riverside was a strong choice for this kind of research, as I was quickly put to work in a meaningful capacity, with a relatively clear path ahead of me for gaining access to complicated tools and procedures. My sense was that I was swiftly integrated into the flow of everyday work because the Riverside staff were used to taking on new volunteers, and had informal structures in place to keep us busy within the bounds of what we could accomplish. In addition to providing excellent access for my study, this structure also provided a way to explore the social dynamics of learning in the workshop.

In designing the pilot, I had imagined that a single fieldwork site would be sufficient, given my focus on situated practices. I had not anticipated how aware the boat builders would be of the differences in practices between workshops, however, as I had not yet understood the constant flow of boat builders between sites. The realisation that the setting I was investigating was in some ways porous and multi-sited led me to the decision to visit other workshops as well, some of which were suggested by my Riverside colleagues. I explain the process for selecting other fieldwork sites in section 3.3.1.

3.3 Arranging fieldwork

Having established the general position that this project takes towards research and explained my conclusions from a pilot implementation of the project, I will now move on to describe the concrete details of the main fieldwork phase. Included here are remarks on site selection, access, participant selection strategies, and the development of relationships in the field.

3.3.1 Site selection

The pilot project led me to conclude that I should conduct fieldwork at several workshops, but did not immediately indicate how many or which ones. On the question of the number of workshops to investigate, I was initially torn between the potential for depth that would come with staying in one place, and the potential for breadth and comparability that would come from participating at several. I resolved this question with a compromise, spending half of the fieldwork at one workshop, then splitting the other half between two more. The key to this plan would be sustained fieldwork at each site, despite my movement between them. To ensure sufficient time in each setting, I expanded my scheduled to include three months of fieldwork at Riverside, followed by six weeks at each of the two other sites.

Choosing which workshops to participate at presented a logistical challenge, as I needed three workshops in the same geographical area to eliminate confounding factors such as differences in weather and nautical design. Specifying a single geographic area also allowed me to investigate whether that collection of workshops constituted a single broad community, or if each workshop functioned as a bounded community in itself.

With this geographical constraint in mind, I made contact with two nearby sites, the *USS Integrity,* and another East Coast boat-building workshop that I eventually abandoned.

Integrity was a promising addition to my fieldwork schedule in that it presented a counterpoint to Riverside, with fewer volunteers and staff, but a much larger vessel. My other chosen fieldwork site was another workshop much like Riverside, but logistical complications led me to abandon that site, leaving me short of a third workshop shortly before my fieldwork there had been planned to begin. On the recommendation of my colleagues at both Riverside and *Integrity*, I reached out to the historic wooden fishing vessel *Paloma*, adding the counterpoint of a case with an all-volunteer crew. Although the everyday work at the three settings was similar, the scale and the organisation of the communities in which it was conducted were markedly different, allowing me to juxtapose them while considering my research questions.

Hammersley and Atkinson warn that '[w]here a setting is selected on the basis of foreshadowed problems, the nature of the setting may still shape the development of the research questions' (2007, p. 29), and this was indeed the case in this project. I had only set out to find craft workshops that matched my general research interest, but ended up choosing three examples of a particular sub-genre of craftwork, historic restoration workshops. The nature of this work meant attuning my fieldwork to questions of historical accuracy and authenticity, themes I had not previously expected. More abstract themes presented themselves as well, such as differences in age and motivation for work, both of which were immediately apparent when I arrived at Riverside. I track these themes throughout the findings chapters, then remark on their significance for craft learning on the whole in the final discussion.

Table 1 illustrates the year between August 2016 and August 2017, over which I conducted both the pilot project and the main fieldwork phase. The pilot took place over three weeks in August 2016, and was followed by several months revising the design of the project. I spent three months at Riverside starting the following January, followed by a month of collating and analysing my notes. I then spent six weeks on *Integrity*, followed by another month of desk work, then a final six weeks on *Paloma*.

Table 1: Fieldwork timeline

Aug 2016	Sept	Oct	Nov	Dec	Jan 2017	Feb	Mar	Apr	May	Jun	Jul	Aug
Pilot					Riverside				Integrity			Paloma

A downside to selecting wooden boat workshops as fieldwork sites is the risk of implying that the kind of understanding that I explore in this project is exclusive to industries in which the practicality of finished objects is second to their aesthetic and cultural value. In considering potential fieldwork sites, I found no reason why the restoration of historic wooden boats would serve as a better example of craftwork than the assembly of fibreglass fishing trawlers or welded-steel cargo ships, modern-day fabrication processes that also call for intimate familiarity with tools and materials. My main reason for avoiding such large-scale market-driven production is that, judging from the contact I made with people in these fields, commercial ship-building is highly competitive and difficult to access for outsiders such as myself. Where I could drop in as a volunteer to historic boat workshops, commercial shipyards would require significant prior training and long-term commitment, neither of which would be practical in a project like this.

3.3.2 Access

The question of access was resolved very simply in the case of each fieldwork site, as a single email always elicited a prompt positive response. This excellent receptivity to my proposed research was due in part to the offer I was making, to work without pay in any capacity that the boat builders needed. This arrangement established a useful *quid pro quo* relationship in which I was granted research access and the workshops were given a volunteer, thus eliminating much of the indebtedness I may have felt if I were merely observing the work of others.

At each site, my first contact was with the head of the workshop, who inevitably became my 'gatekeeper' (Hammersley & Atkinson, 2007, p. 27); these people were Nick at Riverside, Harvey on *Integrity,* and Anton on *Paloma*. At Riverside, I initially faced a bottleneck in having only a single contact in the workshop, since my lack of relevant skills meant I was unable to step directly into projects with the other boat builders. By the time I arrived on *Paloma,* however, I was able to immediately participate alongside the other volunteers, with very little oversight from Anton.

I had decided at the outset of fieldwork that working three days a week would give me the ideal balance between time in the field and time for early analysis, transcribing interviews, and reading around new theoretical issues as they arose. While the regular schedule at Riverside made it easy to stick to a Tuesday-Wednesday-Thursday routine, on *Integrity* I was more useful on an on-call basis, coming in whichever three days Harvey needed my help the most. On *Paloma,* the schedule for crew was so variable that some weeks I could only find two days to volunteer, and others I worked four days in a row.

3.3.3 Participant selection

Within the sites I had chosen to study, there was still the question of 'sampling within the case' (Hammersley & Atkinson, 2007, p. 35), selecting which people I would observe and interview at each workshop. During participant observation, my strategy for selecting participants was simply to observe the people I had been assigned to work with, as long as they had already consented to being observed. As a result, my early observations record brief interactions with experienced staff while they explained my work tasks, followed by long stretches of work alongside other volunteers. As I learned the basics of woodworking, however, my observations started to include more sustained interactions with experts. Luckily, each site had enough collaboration between people at different levels of expertise that I was eventually able to record interactions with participants in many different roles.

Choosing people to invite for interviews required a more formal approach, since I was limited in the number of interviews I could conduct by the effort they took to prepare for and transcribe. I based my selection of participants on two criteria: the depth of our interactions up until that point, and the range of perspectives that they would bring to research. I wanted to interview people I had worked with closely, since those were the people for whom I would have the most specific questions, and whose interview responses I would best understand. At the same time, however, I wanted to make sure that I interviewed people at different levels of experience and on different career trajectories, so that I could capture as wide a variety of perspectives as possible.

Table 2 lists the individuals I interviewed and the sites at which they worked, along with several other characteristics. My initial plan called for three interviews at each

workshop, but by the time I left Riverside I had conducted eight, followed by another five on *Paloma*. These additional interviews went beyond my initial plan in order to capture distinctions that I deemed important as fieldwork progressed, such as a formally-educated boat builder among otherwise self-trained ones, or a novice on a temporary paid contract working alongside permanent staff. On *Integrity,* where I only worked regularly with two people, I interviewed both, and also later returned to interview a volunteer taken on after I had left. While at each workshop I succeeded in interviewing at least one long-time participant and one newcomer, I was less successful at ensuring diversity along other lines, particularly gender (as I discuss further in section 3.7 on design limitations).

Table 2: Interview participants

Interviewee	Site	Role	Approximate time with organisation	Gender
Wes	Riverside	Volunteer	< 3 months	M
Mitch and Ray[11]	Riverside	Volunteer	10 years each	M/M
Jay	Riverside	Staff	2 years	M
Chris	Riverside	Apprentice (staff)	2 years	M
Lou	Riverside	Staff	20 years	M
Nick	Riverside	Director (staff)	3 years	M
Lucy	Riverside	Intern, then staff	1 year (cumulative)	F
Ed	Riverside	Staff (seasonal)	1 year (cumulative)	M
Harvey	Integrity	Staff	20 years	M
Lizzie	Integrity	Staff	20 years	F
Darlene	Integrity	Volunteer	< 3 months	F
Emmitt	Paloma	Volunteer	3 years	M
Bennie	Paloma	Volunteer	10 years (cumulative)	M
Anton	Paloma	Volunteer (president)	30 years	M
Gerald	Paloma	Volunteer	10 years	M
George	Paloma	Volunteer	< 3 months	M

[11] I explain the rationale for this two-person interview in section 3.4.4.

3.3.4 Field relations

Having grown up in the American Mid-Atlantic region myself, I found that forming amicable relationships with my participants came easily, as we shared interests around things like local sports and politics. These relationships sometimes extended past working hours, moving to the bar after work or visiting someone's home for a weekend barbecue. Out of respect for personal boundaries, I have excluded remarks about these out-of-work engagements in this thesis (as I describe in the Ethics section, 3.7). These social engagements did contribute to my research, however, in that they gave me the chance to better explain my personal reasons for conducting it, reassuring my participants of the benign intentions behind it. Sharing the goals of my project in detail helped me to establish a level of trust that supported my integration into each of the sites.

Despite my familiarity with the regional culture in which my research was set, there were still certain aspects of my identity that set me apart from the people I worked with, the most obvious of which being my role as academic researcher. One limitation this produced was that I was excluded from conversations in which the other boat builders discussed their career ambitions, since it was clear that I did not intend to stay in that line of work long-term. Another limitation was that my identity as an Oxford doctoral student was a constant source of attention at the beginning of fieldwork, detracting from my ability to inhabit my role as boat builder. While I recognised that my identity as researcher was ultimately inescapable (Hammersley & Atkinson, 2007), I did find that I was set apart less after developing a genuine interest in woodworking and historic boats. Once my participants discovered that we could discuss the tall ships circuit or

debate the relative merits of different construction materials, these topics naturally took precedence over talking about my degree.

3.4 Methods

The methods I employed in the main study, the choice of which was heavily influenced by the findings of the pilot, reflected three areas of interest: the perceptual experiences and work practices of the boat builders at the three sites; my own changing experience of tools and materials as I learned to use them; and ways in which boat builders were integrated into some sort of community over time. I implemented a variety of methods during fieldwork, some of which related to multiple areas of interest at once.

Since I had refined my choice of methods during the pilot project, they were relatively well-considered by the main phase, and therefore required no major changes during fieldwork. I did continue to make constant minor adjustments, however, which I recorded in weekly 'method memos'.

3.4.1 Participant observation

The mainstay of my fieldwork was participant observation, which given the apprenticeship-style mode of ethnography I was conducting, emphasised the 'participant' aspect over the 'observer' aspect (see Atkinson, 2013b; Coy, 1989a). I participated in the three workshops in as close to a genuine capacity as possible, taking on the responsibilities of a volunteer rather than observing work from a distance. While this meant that my opportunities for recording field notes were limited, I still managed to record thorough observations by making 'jotted notes' (Emerson, Fretz, & Sha, 2001) in a pocket notepad and expanding them into narrative form after work. This strategy

was convenient in that many boat builders carried small notepads to record material dimensions or make sketches, so my note-taking drew little attention. Occasionally I needed to disappear into the hallway or toilet to record a particularly striking anecdote or verbatim quote, but normally a scribble in my notepad sufficed to retain thoughts until evening.

I took no strict strategy into the field for choosing what to observe. Instead, I kept the themes in my research questions – perception, learning, and social organisation – in the back of my mind, guiding my curiosity without strictly delimiting it. I took note of anything that struck me as interesting within this frame of mind, and as a result, my daily fieldwork narratives touch on everything from what the boat builders ate for lunch to how they positioned their bodies as they worked. This 'descriptive observation' strategy (Robson, 2011, p. 324) produced a massive amount of information, much of which does not appear in the final thesis. The benefit of this technique was that the observations I collected led to the generation of a number of ideas that I had not considered before starting fieldwork, as I discuss throughout the findings chapters.

3.4.2 Sensory introspection

What I refer to as 'participant observation' above looked outward toward the other boat builders and my interactions with them. To address the emphasis on perception in this project, I coupled my participant observation with sensory introspection, turning the observational lens inward toward my own perceptual experience. Sensory introspection was my method for moving past observing how tools and materials were used to consider how they felt, sounded, smelled, or looked, allowing me to consider changes to my perception over time, as well as how these changes constituted evidence of learning.

My method for sensory introspection draws from two related research traditions, sensory ethnography (Pink, 2009) and psychological introspection (Vermersch, 2009). From sensory ethnography I took ideas about incorporating physical sensations into observational research, including the premise that no ethnographer can capture every sensory experience at once (Pink, 2009, p. 63). From the beginning of fieldwork, therefore, I tried to tune my attention to the sensory modes that I observed the boat builders using; if I saw that someone was staring intently at a bandsaw cut as it progressed, I did the same, and made note of the resulting perceptual experience. While this was not a perfect strategy, since I could only ever guess what senses my colleagues were using, the clues I gathered pointed to the central roles of vision and touch, augmented by hearing and smell. This observation narrowed the scope of senses to be aware of, which otherwise could have stretched past the well-known set of five (Paterson, 2007).

From the literature on psychological introspection I noted the difficulty of reflecting upon experience in the moment when it occurs, and also the ways in which experiences are transformed as they are considered retrospectively (Vermersch, 2009, p. 12). As a participant in the wooden boat workshop, I rarely had the opportunity during work to ruminate on my experience of tools and materials, as I always had a schedule to keep. The strategy I devised for dealing with this problem was to take quick notes and photos to mark striking perceptual experiences, then use these resources in recollecting the experience as I wrote my daily fieldwork narrative every evening. While this method inevitably distorted the experience to an extent (Hill, 2011), it allowed me to preserve the natural flow of work while still capturing some aspects of my perception.

3.4.3 Audio-visual recording

My use of audio-visual recording was not a method in its own right, but a technique for supplementing the observational methods above. In the simplest instances, my camera took the place of my note pad, capturing something that I wanted to write about in my daily narrative (Coover, 2004); I have named this genre of images 'notational aids'. These images also indicated the placement of tools and the layout of the workshops, upon which I based the floorplans included in Appendices F and G.[12] Other times, I took photos because I suspected that an object or process would be better presented to the reader as an image, rather than in words (Canal, 2004). A final genre of images tracked my perception of objects over time, helping me to note the difference between how I saw tools and materials at first, then again months after I first experienced them (Grasseni, 2004b). Since I never knew which objects, if any, would come to appear to me differently, I took hundreds of photos in each workshop (1,266 in total), some of which now appear to me quite differently than my notes indicate they did when I captured them.

I preferred taking photos to taking videos, as the latter usually affected my participants' behaviour, which became stilted and awkward in front of the camera. I did take 23 videos during fieldwork, however, sometimes recording myself completing a process and other times recording someone else, when I felt I could do so without being disruptive. These videos have proven useful for documenting changes in my perception of moving objects and end-to-end processes, both of which are poorly captured in still

[12] These digital floorplans were produced with PlanningWiz online modelling software, with a subscription courtesy of the publisher.

images. In particular, videos I took of myself using hand-tools illustrate subtle changes in my grip and posture as I came to understand the tools and materials better. Like my inconspicuous paper notepad, the mobile phone that I used to take these photos and videos was a familiar sight in the workshop, attracting less attention than a stand-alone camera would have.

3.4.4 Semi-structured interviews

I conducted a total of 16 interviews during fieldwork: eight at Riverside, three on *Integrity*, and five on *Paloma*. These interviews had a semi-structured format, based on a set of open-ended questions with prompts to keep the conversation moving (Appendix A). For each participant, I supplemented the interview schedule with questions specific to that person, following up on unique aspects of their work or career that I had made note of prior to the interview. Inevitably, however, the semi-structured format meant that participants would take the interviews in a direction of their choosing, focusing more on some questions than others or introducing entirely new topics (Fontata & Frey, 2005). While I attempted to keep the interviews at least broadly thematically relevant, I did not resist these changes of direction, which sometimes introduced new lines of reasoning.

Not wishing to disrupt the boat builders' work, I normally chose to conduct interviews either over the workshop lunch break or directly after work, at the preference of the interviewee. The *Paloma* interviews were an exception to this rule, as I conducted them over the course of a Saturday workday. The informal atmosphere on *Paloma* meant that this strategy was not disruptive to work on the whole, since volunteers came and left as

they pleased anyway. Interviews were all conducted one-on-one,[13] separated from the rest of the workshop participants, with the interviewee and I seated in front of my audio recorder. On average, the interviews lasted roughly 45 minutes, and were transcribed in full in the days directly after I conducted them.

The interview process created a markedly different dynamic between my participants and myself than participant observation did, as they temporarily dissolved my identity as a workshop volunteer and introduced a new element of social difference. My role suddenly became one of expertise, and my participants often changed their comportment to fit that change, using more technical language and a less familiar tone. To a certain extent, I saw this as unavoidable, and scheduled interviews for the end of fieldwork at each site in order to establish my identity as workshop volunteer as much as possible. As I conducted more interviews, however, I learned to take on a more relaxed demeanour, noticeably setting my interviewees at ease and inspiring more natural conversations. These later interviews deviate from the interview schedule more readily, but tend to include a greater level of personal detail.

3.4.5 Career mapping

At the end of spoken interviews, I asked my interviewees to participate in a process I named 'career mapping', in which I asked them to illustrate their history with wooden boat building on an A1 sheet of paper. I also invited them to include any other work that they felt was relevant in the development of their identity as a boat builder, such as

[13] In one case, I experimented with interviewing two people (Mitch and Ray) at once, based on their similar roles in the workshop and their habit of working together. This group interview method did not produce sufficiently better results to warrant repetition.

hobby work with wood, domestic carpentry, or time in the maritime branches of the armed services. My instructions were to place the setting of each event on a middle line, then indicate the community in which it took place above the line and the identity it entailed taking on below the line (see example in Figure 1). These instructions were often misunderstood or ignored, however, resulting in a collection of maps that are individually meaningful but difficult to compare. Furthermore, much of what was revealed by these maps was captured in the audio recording of the mapping exercise rather than the drawings themselves, as the boat builders would normally narrate their life stories to me as they mapped them onto paper. These career maps and related conversations played an important role in analysing community and perceptual context, themes central to Chapter 7.

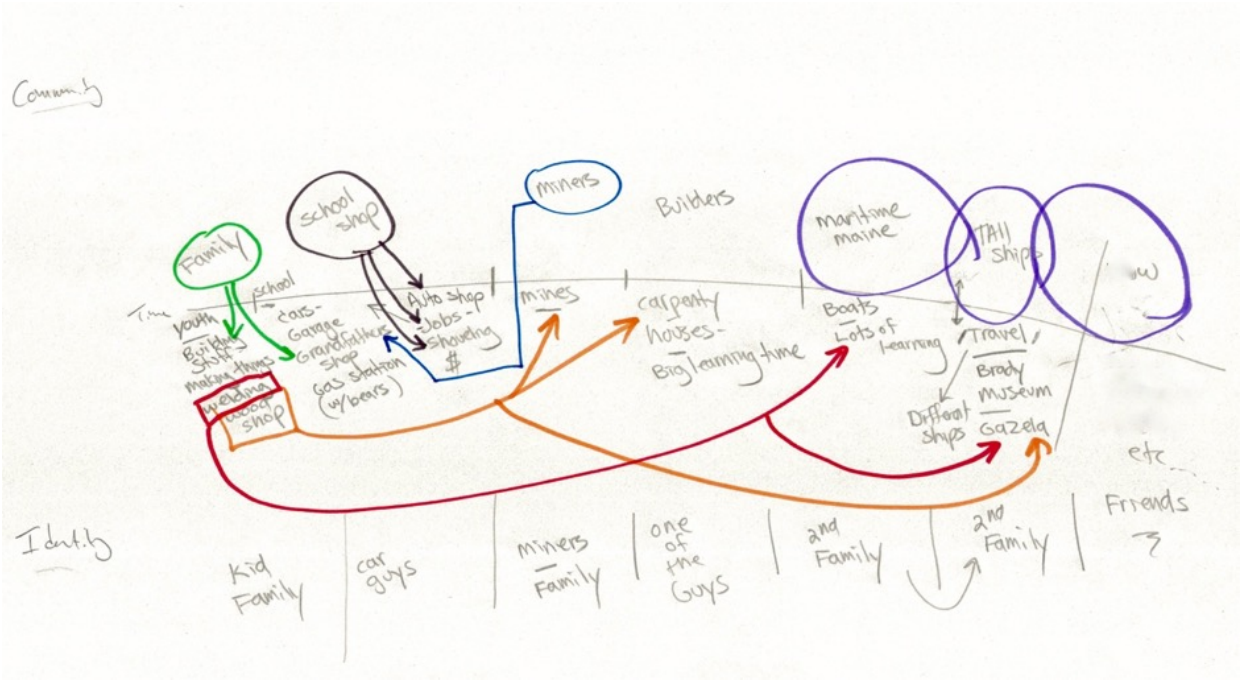

Figure 1: A sample 'career map'

3.5 Analysis

This section explains how I analysed the notes, photos, and other outputs I collected through fieldwork, identifying themes and collating evidence with which to answer the research questions.

3.5.1 Organisation of the fieldwork outputs

Fieldwork led to the production of a massive amount of information, with a total of 1,266 photos, 23 videos, and 130,500 words of fieldwork notes and interview transcripts. Having anticipated this volume, I had established a strict organisational system beforehand, which I then used throughout the project. This system involved storing the photos and videos from each day in the same directory as the daily fieldwork narrative, the roughly 2,000-word narrative expansion of my jotted notes. In this fieldwork narrative I referred to each photo and video individually, either describing its contents and importance or using it to illustrate a point, as in this extract from my notes:

> I went to the tool box and was confronted with a comical variety of tools, none of which was obviously a scraper more than the others [IMG_0175].

In the above extract, 'IMG_0175' is the filename of the photo that illustrates this moment in the fieldwork narrative. Integrating the photos and videos directly into the fieldwork narrative in this way recorded their significance while saving me from annotating each photo separately.

3.5.2 The role of theory in analysis

One way in which this project deviates from more traditional ethnographies is that it introduces a large number of theoretical concepts at the outset, establishing a broad

toolkit for interpreting fieldwork. Hammersley and Atkinson warn that 'it is rare for ethnographic analysis to begin from a well-defined theory, and indeed there are dangers associated with such a starting point', since employing a highly-developed theoretical premise risks presuming findings before fieldwork has begun (2007, p. 163).

I recognise the validity of this concern about theory overshadowing fieldwork, and have designed my analytical strategy to stay true to the details of my observations rather than only reflecting my theoretical preconceptions. The key to this strategy has been keeping theoretical tools at a high level of abstraction rather than specifying them into narrow implementable constructs. These tools therefore serve to orient the project towards particular ideas about reality, but lack the specificity that would determine findings in advance.

To illustrate how the level of abstraction of theoretical concepts aids analysis, consider the example of Heidegger's (1927/1962) work, which I have relied upon extensively. Heidegger's philosophical exploration of understanding is a genetic account, explaining the nature of human understanding and how it has developed over time. As a result, it serves as a useful vantage point from which to reconceptualise understanding as a general concept, but provides little guidance for how to analyse specific instances of understanding in the lived-in world. While theoretical tools from Heidegger have inspired my exploration of practical understanding, my job has been to bridge between the abstraction of these philosophical concepts and the specificity of my fieldwork observations. In so doing, the resulting interpretation gains theoretical clarity while remaining true to the details of the situation that I experienced.

Another aspect of analysis that serves to prevent theory from overshadowing fieldwork is the fruitful tension between the theories that I use. Starting with a set of competing theories has allowed me to draw from different points of view, considering when each applies best rather than reading every moment through a single theoretical lens. Drawing from multiple theories at once illustrates how this project contrasts with the goals of pure philosophy; rather than aim for perfect theoretical coherence, I express my real-world observations in terms of the theoretical tools that best illuminate my personal experience. In this use, theory becomes a subjective account in its own right rather than an objective analytic, a frame within which to present my situated interpretations (Daly, 1997).

3.5.3 Analysis in the field

In this section I begin to move from general analytical principles to the specifics of analysis. Rather than leave analysis entirely for the end of the project, I regularly examined my notes while I was still in the field, drawing out developing themes and considering them in light of my chosen theoretical tools.

The first step in my in-the-field analysis was weekly analytical memoing. Every week, on days when I was not scheduled to work in the boat workshop, I produced a 2,000 to 3,000-word essay on emerging themes and their relationship to theory. These analytical memos were organised around the aspects of fieldwork that had drawn my attention during the week, focusing on new avenues for exploration rather than preconceived theoretical problems.

Every second week, I distilled my provisional findings into an email for my supervisors,

who would then respond with comments. While the only ostensible analytical work these emails did was to combine the past two analytical memos, the challenge of moving my developing ideas out of my notes and into a document intended for other people sharpened my ideas and clarified my use of language. My supervisors' comments were also part of the analytical process, as they flagged possibilities that I had not considered and suggested new avenues for inquiry.

The last analytical step in the field took place directly after finishing work at each site, when I would produce a roughly 10,000-word initial report. These summary papers described the progress I had made as a boat builder, how the themes that came up related to the theory I brought into the project, and how my fieldwork pointed to ways of answering the research questions. At this point, hypotheses about learning and understanding in the wooden boat workshop started to coalesce, although they were still quite general. Some examples of these hypotheses follow:

> My own experience leads me to believe that a key part of this learning involves not only coming to see objects as laden with purpose, but seeing them simultaneously as both parts of a larger system and bounded wholes in themselves. (Riverside initial report, 10 April 2017)

> This line of thought implies an interesting reconceptualisation of learning, that it is not the learner who changes through learning, but rather the reality in which the learner lives. (*Integrity* initial report, 14 July 2017)

> All of these differences of opinion about the shape of the community around *Paloma* lead me to revisit my previous idea that community is not an identifiable, abstract social structure, but a phenomenal object which appears differently depending on the history of the observer. (*Paloma* initial report, 29 September, 2017)

The examples above show how I integrated my developing hypotheses into an ongoing first-person fieldwork narrative, journaling the development of my thinking rather than

isolating specific conclusions. While these hypotheses spoke to the research questions at an abstract level, they did not yet provide specific answers.

3.5.4 Establishing themes through coding

Drawing out the themes for my weekly analytical memos had been relatively easy, as it only required re-reading my fieldwork narratives from the week and noting down the observations that struck me as important. Moving from the weekly memos to the initial reports, however, there was too much information to keep in mind at once, leading me to begin coding documents with NVivo.

I carried out coding in four drafts, one after each of the three stints of fieldwork coding only what I had collected at that site, then again as a whole when I returned to Oxford. In each instance, my general strategy was the same, alternating between processes of descriptive coding and inferential coding (Punch, 2001, p. 205). I established descriptive codes by reading over everything I had collected and marking important passages with a descriptive phrase, such as 'competition' or 'disappearance of tools'. My criteria for importance at this point were broad, including anything that came up repeatedly, one-off occurrences that stuck out as unusual, or incidents that related directly to my research questions. Given these broad criteria, I often found that most of the text of documents had at least one code applied (see example in Appendix B). Because the resulting codes were more descriptive than thematic, I will refer to them here as 'low-level' codes.

The next step in the coding process was inferential coding, grouping the codes together to form clusters that aggregated the descriptive codes and spoke to the themes in the

research questions. In each attempt at coding, I identified different overarching themes, but settled in the final coding exercise with 'Perception', 'Learning', and 'Community'. These 'high-level' codes collated the descriptive instances such that if I were writing about perception in the workshop, I could examine the dozens of low-level codes that I had grouped under that label and consider them as a whole. Initially I attempted to draw conclusions by rearranging the low-level codes within these categories, juxtaposing different descriptive examples within broad themes.

Eventually, however, I realised that the analytical work I was attempting required an intermediary layer to group the low-level codes into 'middle-level' codes that linked the descriptive to the abstract. The introduction of this new level solved a persistent problem, that the 73 low-level codes I had identified were too granular to point to findings, but the three high-level codes were too broad to serve as anything but thematic containers. The middle-level codes, displayed in the NVivo screenshot in Figure 2, illustrate the analytical work of linking the textual descriptions to the research themes to which they relate. Each of the middle-level codes still contained within it the many low-level codes it summarised, but these low-level codes now served as bookmarks in the fieldwork record, indicating where to find examples of the findings that the middle-level codes implied. The screenshot in Figure 2 shows 'Perception', 'Learning', and 'Community' as high-level nodes, with middle-level nodes listed beneath; for illustration, the middle-level node 'demonstrating competence' is expanded as well, revealing the five low-level nodes within it.

Throughout the coding process, I continually practiced what Miles and Huberman refer to as 'data reduction' and 'data display' (1994, p. 12), although the NVivo graphical

interface allows the user to collapse these into a single activity. The software displays the codes as a nested structure, allowing the user to continually examine how the higher-level codes relate to the lower-level codes within them. I regularly combined similar codes, split apart overly broad ones, and rearranged hierarchical relationships before I established the structure displayed in Figure 2.

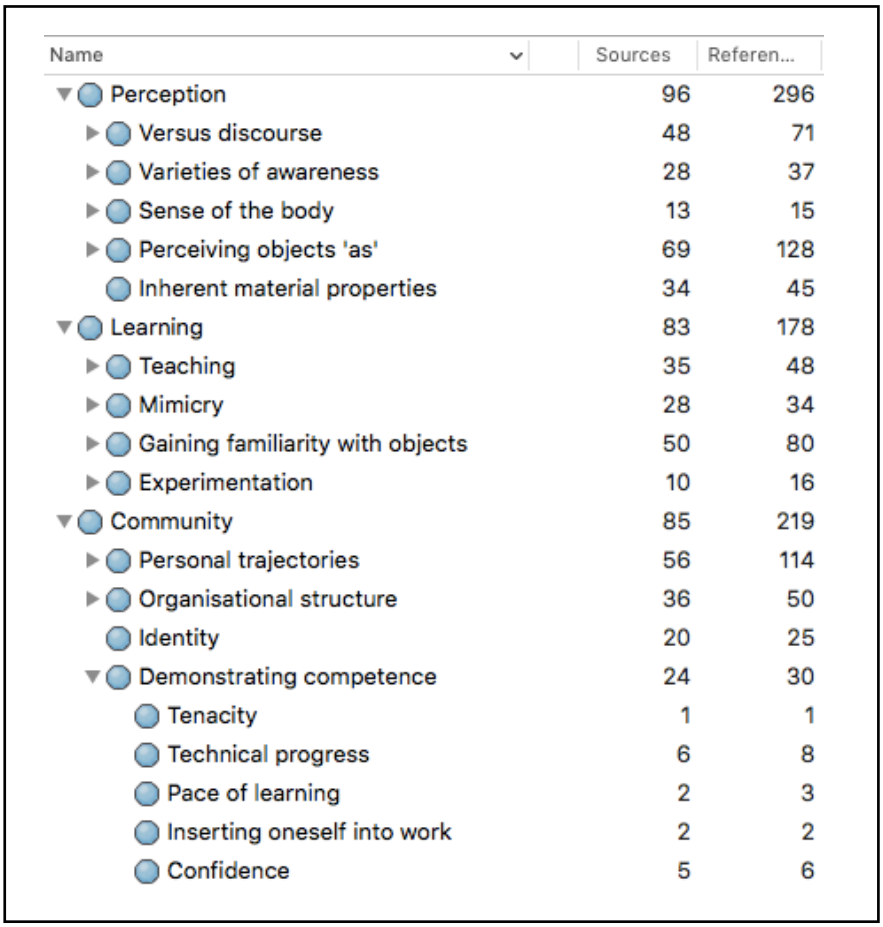

Figure 2: A screenshot from NVivo, illustrating the nested coding structure

3.5.5 Building the account

While coding had been a productive exercise in organising information and beginning analysis, writing constituted the core analytical process, as it required making explicit links between my observational evidence and my theoretical resources. My process for doing so was iterative, making connections between observations and theory, organising

these connections into a narrative, then examining that narrative for internal coherence, relevance to the research questions, and overall readability. I interrogated each draft with a series of questions: Do my observations support the theoretical conclusions I have reached? Do the theoretical conclusions synthesise, rather than just summarise, the observations? Are these conclusions relevant to the research questions? Early drafts of the findings chapters failed to adequately meet these criteria, sending me back to outline the argument again from the beginning.

In early outlines of the thesis, the high-level themes of perception, learning, and community each had a chapter of their own. Eventually, however, I realised that perception and community were both difficult to disentangle from learning, which was more an integral aspect of each than a topic on its own. With this realisation in mind, I split the findings along different lines, with one chapter on learning as change in the perception of materials, one on learning as the reinterpretation of the being of materials, and one on learning within and across communities of situated practice. This new structure preserved a focus on learning by tracking it throughout the findings, rather than presenting it separately.

The process of outlining the overall argument of the thesis took place over a number of drafts, in which other themes arose but were eventually discarded. Of particular note was a chapter idea on the role of discursive understanding in the workshop, showing how ‘the feel’ is one among several ways in which boat builders engage with their work. While I still believe that discursive understanding is a highly important topic that deserves to be investigated elsewhere, its relationship to the research questions about the non-discursive ‘feel’ is only tangential. Leaving out that potential line of investigation

and several others limited the scope of the thesis, but gave me room to adequately grapple with the complexity of the topics that remained.

3.6 Criteria for evaluation

Traditional tools for determining the quality of a research design, such as validity and reliability (De Vaus, 2001), cannot be easily applied to a study that is more concerned with first-person accounts of experience and individual perceptions of reality. That said, the fact that commonly-used evaluation criteria are a poor fit does not remove the responsibility to show that these findings are authentic and meaningful, with some connection to the lived-in world. In this section I set out alternative 'trustworthiness criteria' that better convey the credibility of my findings, based on guidance from Lincoln and Guba (1985).

3.6.1 Credibility

Lincoln and Guba suggest 'credibility' as a better measure than 'internal validity' for interpretative studies because it pertains to the plausibility of the conclusions, rather than their necessity (Lincoln & Guba, 1985, p. 296). Findings are deemed credible if they are believable and convincing based on the process for collecting observations and the strategy for developing conclusions. The simplest warrant of credibility in this project is the quantity of information collected, with hundreds of pages of fieldwork narrative covering dozens of participants. The scope of these records attests to my long-term participation among the wooden boat builders and my commitment to producing a richly-detailed account.

The size of the fieldwork record does not demand credibility on its own, however, as it

does not speak to the process by which observations were collected and analysed. To address this point, I have repeatedly subjected my findings to 'intersubjective validation' (Petitmengin & Bitbol, 2009, p. 393), comparing my own perceptual experiences in the workshop to the accounts given to me by my colleagues, then considering how and why the observations differed. The similarity between my account and those that I collected from others demonstrates that the themes I have uncovered align with the interpretations provided to me by my colleagues in the workshop, and therefore exhibit a degree of credibility.

Further proof of credibility is apparent in the changes to the design of this project throughout its development, which document a history of challenging theoretical preconceptions and embracing new ideas suggested by fieldwork observations. For example, neither the insufficiency of Heidegger's work for describing the lived experience of the human body (Chapter 5) nor its inability to fully explain social structures (Chapter 7) were apparent at the outset of research, yet both have central roles in the findings.

3.6.2 Transferability

The notion of 'transferability' takes the place of 'external validity', the measure by which findings can be said to be generalisable across different settings and participants (Lincoln & Guba, 1985, p. 316). As I explained in the section on methodology (3.1.1), the ethnographic nature of this project means that the findings are highly situated, and therefore do not warrant direct transposition onto other cases. Two features of this project do support broad transferability, however. First, throughout the findings and discussion, I clearly differentiate between the specifics of my fieldwork observations and

the more general theoretical conclusions that I draw from them. By examining my ethnographic account in light of ideas from philosophy, I establish a series of theoretical conclusions related to learning, understanding, and perception that can be applied to other settings, where they can be challenged, confirmed, or clarified. Second, the level of detail with which I present my ethnographic vignettes will allow future researchers to determine whether my findings are applicable to their own work; as Lincoln and Guba point out (1985, p. 316), the burden of proof for transferability lies partly on those who would adopt the findings for their own use. In presenting a highly-detailed account of my fieldwork sites and the participants and practices within them, I have provided the basis for future researchers to adequately judge the relevance of the findings to other cases.

3.6.3 Dependability

This measure correlates to the notion of 'reliability', or the ability to reproduce the findings again in the same setting. The nature of this ethnographic study is that even if I repeated research myself in the same workshops, I would undoubtedly produce different results. My participants and I would all have progressed as boat builders in the time between iterations of the project, orienting the study toward different themes and producing different findings.

Instead of reliability, Lincoln and Guba suggest 'dependability', a measure of whether the logic linking the observations and the conclusions can be followed by the reader (Lincoln & Guba, 1985, p. 296). To evidence this logic, I have included a detailed explanation of my process for coding the data and drawing out themes that speak to the research questions. I have also engaged with theoretical tools more rigorously than

some authors of prior empirical work (see Chapter 2), making clear the logical relationship between my observations and the theories that I use in analysis.

3.6.4 Confirmability

Instead of 'objectivity', the criterion by which potential for researcher bias is classically judged, Lincoln and Guba suggest 'confirmability' (Lincoln & Guba, 1985, p. 296). The notion of objectivity implies a single static reality against which results can be compared, an idea that is antithetical to a project such as this. Confirmability, on the other hand, simply asks whether the results of a study seem reasonable to the other participants. The process of 'member checking' ensures that the findings have some relationship to the shared reality in which the researcher participated, and are not a pure construction of his or her imagination (Lincoln & Guba, 1985, p. 301).

My main strategy for ensuring confirmability was hosting feedback sessions with my participants after I completed fieldwork. I returned to each of the three sites to give a short presentation of my first-draft findings, explaining what I thought had happened and asking my participants whether my interpretation seemed fitting. I audio recorded these sessions and incorporated participant feedback into my analysis, finding that while no one outright disagreed with my account, my participants sometimes rephrased it in poetic ways that prompted me to reconsider my interpretations. Perhaps most importantly, everyone agreed that 'the feel' was a key part of their work, and that the connections I was drawing between 'the feel' and sensory perception were understandable.

3.7 Ethics

This project has continuously looked towards the ESRC 'Framework for Research Ethics' as a standard of responsible behaviour (ESRC, 2018). The framework is centred around minimising risk and harm, voluntary participation with informed consent, and the definition of clear lines of accountability. This project has also been reviewed by and received approval from the Oxford Central University Research Ethics Committee (CUREC) (see Appendix C).

I designed the process for obtaining informed consent mainly with potential damage to the boat builders' professional reputations in mind, should I accidentally characterise their work or interactions in ways that could be interpreted negatively. Before participating in this project, each boat builder was given a copy of the Participant Information Sheet, which described the purpose of the project, the availability of the data, and the option of having one's name anonymised (see Appendix D). Each participant was then asked to provide written consent (Appendix E) to indicate that he or she had read, understood, and agreed to the main points on the information sheet. Despite this extensive process for obtaining informed consent, however, I have still chosen to anonymise the names of all the individuals and fieldwork sites, as I see little to be gained in not doing so. As the anonymised account stands, only someone with intimate knowledge of the world of wooden boats will be able to identify the fieldwork sites or participants.

The member check sessions that I described in the previous section (3.6.4) also played an important part in my strategy for achieving informed consent. In addition to checking to see if my participants felt that the findings were plausible, these sessions also allowed

them to see how the information I had collected would be used in the thesis, albeit in very general terms given the early stage in analysis. The sessions were relatively well-attended, with approximately one-third of the combined volunteers and staff at both Riverside and *Paloma* attending, as well as both of my colleagues from *Integrity*. At no point did the attendees raise ethical objections to my characterisation of their work.

As I mentioned in the 'field relations' section previously (3.3.4), the line between fieldwork and informal social engagements was not always clear; conversations that began in interviews often continued at the local bar, sometimes shifting to more personal subjects. Although such conversations often illuminated my understanding of participants' work lives, I have elected only to cite observations and conversations that occurred within the workshop during normal working hours or at formally-arranged after-work meetings focused on research. My reasoning for excluding conversations that took place outside the workplace reflects the possibility that my participants may have seen these interactions as taking place beyond the scope of research, and therefore did not explicitly consent to their publication.

3.8 Limitations and indications for future work

The design of this project includes several notable limitations, some inherent to the methods and methodology, and others perhaps avoidable in retrospect. The clearest limitation relates to the use of a methodology which prioritises unique interpretations over externally-verifiable results. While I have endeavoured for transparency and a reasonable measure of objectivity, my theoretical preconceptions may have led to a 'selective attention' (Robson, 2011, p. 328) that influenced what I observed. While this

effect does not disqualify the findings outright, it raises the question of how ethnographic work like this might be combined with less interpretative experimental protocols in the future, such as the use of computer simulations in Dotov et al. (2010).

The methods I employed in research entail limitations as well, most notably in regard to sensory introspection. It is well-known within the field of psychology that reflecting on perceptual experience influences one's memory of it (Hill, 2011), presenting a challenge for my technique of jotting notes during work and deeply considering my experience each evening. While such limitations are ultimately unavoidable, my engagement with the literature on the challenges of sensory methods and introspection – as evidenced in sections 3.1.3 and 3.4.2 above – has allowed me to recognise the limits of these methods from the outset of research and incorporate complementary techniques to support the credibility of the findings.

A more technical issue with fieldwork methods relates to the difficulty of taking notes and photos while working. Because my hands were normally occupied during work, making notes required me either to put down the tools I was using or to save up insights until a more convenient moment. This problem was further compounded by the difficult conditions of work, which was often exhausting and not conducive to focusing on anything outside the task at hand. These technical hurdles are well-known within ethnographies of practical work, however (see Coy, 1989a, throughout), and were largely unavoidable as well.

One limitation I may have avoided with greater foresight was the difficulty of selecting interview participants who illustrated the variety of identities in each workshop. Since

my strategy for selecting interviewees was to choose from those people I had worked with most closely, the available choices were limited to an arbitrary sub-set of people rather than the workshop as a whole. On *Paloma* in particular, this incidentally led to interviewing only white men, when the ship's volunteer crew was much more diverse. In the future, a more purposeful participant selection strategy may be called for to pre-empt such problems.

4. The Fieldwork Sites

In this chapter I introduce my three fieldwork sites: Riverside Maritime Museum, the historic American warship USS *Integrity*, and the wooden cod-fishing ship *Paloma*. The chapter sets out the physical spaces, the people who worked in them, and the kind of work that took place at each. All three fieldwork sites were engaged in the restoration of wooden watercraft, although the scale of the work and the social organisation of the boat builders varied from site to site. In the Riverside workshop, volunteers worked alongside paid staff to rebuild small wooden boats of historic value, working on behalf of private collectors and the attached maritime museum. The ship *Integrity* was enormous in comparison to the boats at Riverside, but since it was non-operational, its surface maintenance could be carried out by two paid staff, with me as the only volunteer. *Paloma*, meanwhile, was maintained by a large volunteer crew and no paid staff. It was also set apart from my other two sites in that it was still a functional sailing ship, therefore demanding more attention to structural integrity than to aesthetic concerns.

The primary purpose of this chapter is to situate the reader within each of these three fieldwork sites, showing how my learning was always connected to the type of work being done, the social organisation of the boat builders, and the layout of the physical space. In presenting this rich description, though, I also begin to explore how my technical skills and my understanding of the social world of boat building developed as I moved from one site to the next. Arriving at Riverside, I was an outsider among relative experts, but by the time I arrived at *Paloma,* I was starting to feel like a genuine participant, speaking the language of the trade and contributing useful work with little supervision. This transition came about through working alongside boat builders and

paying attention to their techniques, their interactions with one another, and the narratives they presented about their careers.

4.1 Riverside Maritime Museum

My first contact with Riverside was over email at the end of 2015, when I wrote to explain the goals of my project and to enquire about volunteering there. I was answered by Nick, the workshop director at the time, who invited me to stop by and discuss my research. I made it clear that I had no experience in woodworking or boat building, but he assured me that he would find something for me to do in the workshop (Figure 3), even with my limited skills.

Figure 3: The Riverside workshop, as seen from the front

4.1.1 The workshop

I visited Nick at Riverside shortly after our first email exchange. Opening the door to the workshop when I arrived, the smell of freshly-cut wood flooded out, tinged at its edges

with sharp paint fumes and the earthy aroma of a coffee pot sitting on the warmer too long. Nick sat at a computer in the little office in the back of the workshop and jumped up to greet me when I arrived. He seemed to be the amiable, down-to-earth person he came across as over email, and immediately set out to give me a tour of the workshop.

The space was long but narrow, filled with half-built boats along the centre, workbenches lining the southern wall, and wood storage lining the wall opposite (see diagram in Appendix F). Several sizable wood-shaping machines were dotted around the edges of the workshop, resting with a deep electrical hum until someone passed a piece of timber over them, which raised their tone to a shriek. The noise constantly interrupted Nick as he showed me around, and I saw that most people were wearing protective earmuffs to block out the sound. I noticed that the earmuffs meant that people in the workshop seldom spoke to one another while working, instead communicating through hand signals and nods of their heads. Apart from the noise level, however, the workshop was a comfortable place, well insulated against the December cold. The space was brightly lit by the bank of windows along the south wall, which looked onto the river and the continuous flow of work barges and tanker ships that traversed it. I had been afraid that the workshop would be a miserable place to work in the extreme East Coast weather, but unlike the outdoor boatyard I had been picturing, the Riverside workshop was entirely enclosed and climate controlled. The heating and air conditioning allowed the boat builders to work year-round, Nick told me, in contrast to other boat-building projects where work was seasonal.

As we walked around, I recognised the wooden-handled chisels and steel carpenters' squares that I had expected, the sort of tools I pictured in carpentry workshops of the

distant past. In addition, however, there was a bank of power drills charging in one corner, sleek black and yellow plastic that contrasted with the neutral wood tones around them. Somewhere in between the vintage of the wooden tools and the modern power drills were the wood shaping machines, the planer, jointer, and table saw, which looked to be of mid-century design with their sturdy steel bases and thick rounded edges (Figure 4). Nick confirmed that these tools had been bought second-hand or were donated by friends of the museum, hand-me-downs from older workshops. I commented that I had not expected to see these electric machines, given the age and style of the boats being restored, which I had assumed required the use of historical equipment. In response, Nick explained that the workshop had to strike a balance between preserving historic techniques and making use of modern time-saving tools, as doing everything by hand would have been impractically inefficient.

Figure 4: The planer (left) and jointer (right)

There were three boats being worked on that day, two small rowboats and a much bigger sailboat named *Obadiah*. Nick estimated that *Obadiah* was 25 feet overall, although it was hard for him to know the exact length without the plans in hand. I had

expected to see more boats under construction, but Nick explained that a single boat as large as this one could easily take a year to complete. The timescales for work were further extended because the boat builders at Riverside never had their attention fully devoted to one project, he explained, as little pieces of restoration work continually came in from the museum.

Visitors from the museum exhibition space were not allowed to enter the workshop itself, but could look in at the boat builders over a waist-high swinging gate at its far end. This arrangement meant that the boat builders formed their own sort of museum exhibit as they worked, observed by a constant trickle of visitors. Nick said that sometimes these visitors would call over and ask a question, drawing one of the staff or volunteers into a conversation about maritime design or woodworking. Other than that, however, the people in the workshop rarely interacted with the visitors to the museum. I got the sense that the workshop was a distinct entity, co-existing as an affiliated project within the museum's building more than functioning fully within the museum itself.

Nick and I agreed that despite my lack of experience working with wood, he could find some simple work for me to do, and that I could start my fieldwork whenever was convenient. I came back the following summer to pilot my project, and once I got to work, I started to see that the space of the workshop was informally divided into zones to which different staff had laid claim. Jay, one of the staff boat builders, normally set himself up on the workbench facing *Obadiah*, as that boat was mainly his responsibility. Lou, another staff member, normally worked on a temporary work surface across from the skylights he was refurbishing, moving pieces of them back and forth as they were

completed. The volunteers tended to congregate in the space outside the kitchen between tasks, chatting and drinking coffee from the constantly replenished restaurant-style carafe. Next to the kitchen was the little office where Nick did administrative work, although he told me that as a boat builder by trade, he would always have been happier out on the workshop floor.

4.1.2 The people

Once I began volunteering at Riverside, I saw that the organisational structure of the workshop had a variety of roles, not just the staff/volunteer dichotomy I had observed on my first visit (see organogram, Figure 5). Nick was the workshop director, but he worked under the director of the museum, a man who rarely appeared in the workshop. Below Nick were two boat builders, Lou and Jay, both of whom were quite experienced and clearly committed to the trade. Still below them was the long-term workshop apprentice, a rotating cast of short-term interns, and occasional contract workers hired to take on specific projects, all on the workshop payroll. I worked with three permanent paid staff and eight temporary staff over my time at Riverside, although not all of these people were employed there concurrently. With the exception of one short-term contractor and one intern, all of the paid positions at Riverside during my fieldwork were occupied by men.

Out of all the staff in the Riverside workshop, Lou was arguably the most experienced, having worked on boats for several decades. The others regularly pointed to him as a model for expertise, despite the fact that he had no formal education in boat building, having learned the trade strictly through on-the-job experience. Lou's career had been long and wandering before he even discovered boats, having previously worked in

mining and then fishing, where he had eventually transitioned from crewing the fishing boats to repairing them. He was a tall man with a quiet, gentle demeanour that could be mistaken for gruffness if one was not acquainted with him, exhibiting a combination of expertise and self-possession that I found intimidating when I started volunteering. He dressed in the unaffected style of someone who thought practically about his clothes, with canvass trousers and work jackets that could stand up to strenuous physical work. Although Lou and I rarely worked together on projects, he always seemed to have a sense of what I was doing and how it was progressing, resulting in a number of minor interventions to point out how I could improve my technique.

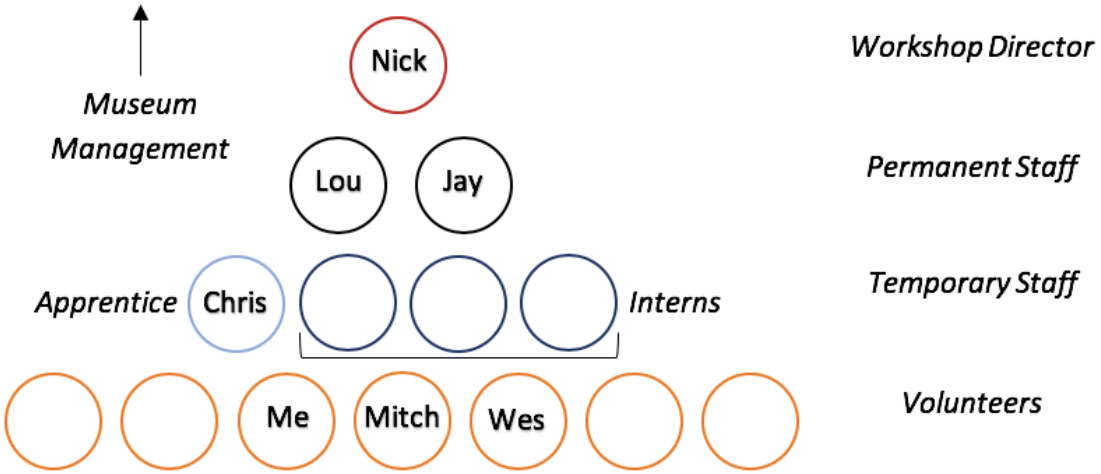

Figure 5: Simplified organogram of the Riverside workshop

I worked much more closely with Chris, the workshop apprentice, as he was normally assigned simple projects to which I could more easily contribute. Chris had only started working with wooden boats when he arrived at Riverside about a year earlier, but he had already become a competent woodworker and was well-versed in maritime history. In addition to his work at Riverside, Chris was also completing an online degree in museum studies, signalling his appreciation for historical preservation in general rather

than specifically the restoration of wooden boats. He had previously worked on a historic homestead, and saw his current job as thematically connected to that, even if the day-to-day techniques he had learned there did not carry over to Riverside. His interest in the distant past was also apparent in how he dressed, with a flat-cap and braces reminiscent of a 19th-century shipwright, contrasting with the modern work clothes that most of the other staff wore.

Although my day-to-day work was directed by paid staff like Lou and Chris, I spent most of my days working alongside the other volunteers, 14 of whom I encountered on a regular basis. While the volunteers outnumbered the paid staff in total, on most days there was roughly an equal number of each in the workshop, since most volunteers came in once a week and some came in much less. In the organogram here (Figure 5), I have represented the volunteers as the bottom rung of the workshop hierarchy to emphasise the formal leadership structure, in which they were required to follow the directions of paid staff. In informal terms, however, the volunteers' experience and tenure in the workshop often gave them significant standing, and on many occasions I observed paid staff turning to volunteers for technical consultations.

The volunteers fell roughly into two groups, one composed exclusively of retirement-age men, and the other composed of younger people, mixed in gender. The older volunteers were very visible in the workshop, as they outnumbered the younger ones and displayed a familiarity and comfort with the space that even some of the staff did not. Several of these older volunteers had been at Riverside for longer than anyone, with a few approaching their 10-year anniversary. Congregating outside the workshop kitchen between tasks, these older volunteers displayed an intimate familiarity with one

another, sipping coffee and chatting about each other's families, home improvement projects, and upcoming vacations. While some of these volunteers may have been experienced enough to work at Riverside in an official capacity, they all agreed that they were there for leisure, which would be spoiled by taking on the responsibilities that came with paid employment.

Figure 6: Mitch operates the Riverside wood lathe

Of the older volunteers at Riverside, Mitch was one of my favourites to work with because of how artfully he straddled the volunteer-professional divide. He was a skilled carpenter, and in fact the only person in the workshop comfortable working on the wood lathe, a complicated tool made even harder to use by the vintage of this particular model (Figure 6). Mitch also took ownership of projects in a way that other volunteers could not, seeing them through on his own terms, with the paid staff trusting that he would get the job done correctly and on schedule. And yet, he balanced his professionalism with a humour and disregard for formality that only an unpaid volunteer could get away with. His jokey running commentary would read as insolence coming

from staff, but his liminal role in the organisation meant that it came off as charming banter.

A minority of volunteers at Riverside were not part of this clique of retirees, tending instead to be younger people in their 20s and 30s more interested in learning than in socialising. A driving motivation for volunteering within this younger group was access to a workshop filled with expensive tools and materials; volunteers and staff alike repeatedly explained to me that a limiting factor in becoming a carpenter, shipwright, or even fine artist was the scarcity of opportunities for practicing woodworking skills. This appetite for learning and progression into a career in craftwork appeared to be one reason for the relative lack of younger volunteers, who regularly disappeared when paid work presented itself elsewhere. The older volunteers, by contrast, were less likely to be drawn away from the workshop by other opportunities.

Wes was one of these younger volunteers, starting at Riverside shortly after I began fieldwork. He had a professional background as a bicycle mechanic and had only recently started to work with wood, which had clearly captured his interest. Wes regularly brought in old tools he had found at flea markets, or mid-century books on carpentry that he had tracked down on the internet. The staff encouraged this curiosity, discussing the quality of the tools he brought in and showing him how to care for them. On one occasion Nick took Wes aside and showed him how to sharpen his chisels, an act of mentoring in keeping with the atmosphere of community apparent among the regulars in the workshop. I finished my volunteering in early April, but would sometimes stop in to say hello if I was in the area, and in September I came in to find Wes formally employed at Riverside.

4.1.3 The work

The arrangement I had worked out with Nick was to volunteer three days a week, from Tuesday through Thursday, for three months. Since the volunteers enjoyed working together, they tended to come in on the same days, with Tuesday being the most popular. Some, including Mitch, came in on Thursday as well, but on Wednesday it was usually just me and the staff. The work day officially started at 9:00, but I quickly learned that the first 20 minutes or so involved staff milling around the workshop with a cup of coffee in hand, examining one another's projects and discussing the order in which work would have to be completed. In my first few weeks, I stood around idly during this process, waiting for staff to decide what work I could be assigned. Only towards the end of my stay at Riverside did I myself start to have work that carried over from day to day, which meant participating in this morning triage process as well to determine whether I should help someone else or carry on with my own project.

As a rule, the staff always arrived at opening, but most of the volunteers showed up closer to 10:00. The more experienced volunteers set right to work on projects they had in progress, and the rest hovered around waiting to be put to work. The projects carried out by experienced volunteers like Mitch were often comparable to those done by paid staff, and involved shaping, cutting, and joining wood. For example, Mitch had previously made dummy cannons for a replica Revolutionary War ship, a time-consuming and complicated task that called for his expertise with the lathe. Most other volunteers were not relied upon to this extent, and were instead assigned less complicated work like sanding, painting, or otherwise preparing materials. On some exciting days, a mismatch between the volunteers available and the work that was

needed meant that people with my level of expertise were assigned projects just at the edge of our capability, perhaps using a tool or process we had helped out with in the past but never taken charge of ourselves. I looked forward to these days, as I felt that they were the ones on which I learned the most.

Figure 7: Obadiah*, at an early stage in rebuilding (left); a skylight from* Hercules *(right)*

Three large projects took up most of the boat builders' time while I was at Riverside: reconstruction of the sailboat *Obadiah* (Figure 7, left); refinishing the trim from the USS *Hercules* (Figure 7, right); and refurbishment of the fleet of rowboats that Riverside would rent out in the summer. Jay oversaw the *Obadiah* project and normally worked by himself, as its construction required a level of boat-building expertise that few, if any, of the volunteers possessed. *Obadiah* had been donated to the workshop as a complete boat, but was in such disrepair that most of its components needed to be replaced. Such rebuilding entailed a time-consuming process of disassembling the boat, determining which parts were salvageable, and then reassembling it with a mix of original parts and reconstructions. Jay explained that it would have been easier to build the boat from scratch, but that this process at least maintained some connection to the original.

The trim from *Hercules* was being managed by Lou, who was much more open to help, since it was mostly repetitive physical work that he could easily teach other people how to do. *Hercules* was one of two big ships managed by the museum, neither of which were the responsibility of the wooden boat workshop, since neither was made of wood; each had its own maintenance crew, people who worked on the adjacent pier and with whom I rarely crossed paths. The skylights and other minor trim pieces from *Hercules* were wooden, however, and therefore fell to the workshop to restore. While this kind of restoration was not complicated work, it needed to be perfect, since the wooden accents on *Hercules* were a point of pride for the ship and attracted quite a bit of attention from visitors. Lou applied upwards of seven coats of varnish to each piece he restored, working inside a plastic tent of his own construction so that no dust from the workshop could settle on the varnish before it dried.

The last big project was the refurbishment of the fleet of rental rowboats, work for which Chris, the apprentice, was responsible. For the most part, this work only required scraping off the old paint, sanding the wood down, and applying several fresh coats. Chris would occasionally discover some little carpentry job that needed to be done, though, such as patching a rot pocket or bunging old screw-holes, giving him the opportunity to work with more interesting tools and materials. I found that if I was ever at a loss for what to do, I could join Chris working on the rowboats, as the work was plentiful and there was little competition for it. I usually tried to insert myself into more complicated projects, however, since it seemed that woodworking offered more learning opportunities than repainting did. Chris preferred woodworking for the same reason, although I could see that over the course of the rowboat restoration he did learn

quite a bit, handling the last couple of boats almost entirely on his own without asking Nick for much advice.

4.2 The USS *Integrity*

I asked the staff at Riverside where else I should visit if I were to compare different volunteer boat building experiences, and several people suggested the USS *Integrity*. Lou had worked there at one point and had good things to say about the small crew, some of whom he still remembered by name. I looked up Harvey, the head carpenter on *Integrity*, and called him to gauge his interest. After a brief conversation, he agreed to put me to work in one capacity or another, although he warned me that the work might not be particularly interesting. The projects available on *Integrity* varied depending on the needs of the ship, he said, and he had no idea what he would be doing the next summer when I was proposing to start volunteering. I told him that the specifics of the work were not a major concern, and we agreed to get back in touch to work out the details of my volunteering as the time came nearer.

4.2.1 The ship and its workshop

When I stepped aboard *Integrity* for the first time in the summer of 2017, I felt as if I were on one of the Riverside rowboats, but scaled up a thousand times. The top deck was larger than the entirety of the Riverside workshop (see diagram in Appendix G) and there were three decks below that as well. Yet despite the difference in scale, I saw a number of similarities between this huge ship and the little boats I had worked on earlier in the year. The breast-hook at the bow of the ship, which supported the two sides of the hull where they met, was the same design as on the Riverside rowboats, but

12 feet long rather than 12 inches (Figure 8).

Figure 8: The breast-hook on Integrity *(left, at arrow) versus one from a Riverside rowboat (right)*

Harvey gave me a tour of *Integrity* on my first day, showing me the work we would be doing and explaining the ship's confusing history. A ship named *Integrity* was built at the end of the 18th century, but then totally rebuilt 50 years later into this version (see Figure 9, left). Harvey said that the ship I was standing on was rumoured to have only seven components from the original, making it difficult to claim that the present version was the same ship. Some of my Riverside colleagues had brought up this puzzle as well when they heard I was going to work on *Integrity*, and one even questioned whether the anachronistic epoxy lamination that had been done to the hull in the 1990s spoiled any historical credentials it had once had. Harvey dismissed this idea when I brought it up; it was a museum ship, he said, so the goal was to give visitors an idea of how the ship would have looked in its heyday, even if the underlying construction used newer techniques.

Moving from the seaworthy boats at Riverside to a non-operational museum ship was a

challenge at first, as I had to learn to see the ship as an exhibition rather than as a functional watercraft. *Integrity* was incapable of sailing, as the sails had long since been removed and several structural components had been replaced with dummies that could not bear the stress of real use. And yet, despite being inoperable, the superficial aspects of the ship were meticulously maintained, with a sharply-detailed paint job, smoothly-faired deck, and neatly coiled lines (Figure 9, right). These details were for the appreciation of visitors, who strolled through the ship as they would through a museum, examining exhibits on the sailors' living quarters or the process of loading the cannons, which was re-enacted daily by the ship's tour guides. Everything was made to look as if the ship could slip off the dock and set sail, but in reality, the *Integrity* was unlikely to ever move under its own power again.

Figure 9: A painting of Integrity *after the 19th-century rebuild (left), and a view from the deck (right)*

Just like at Riverside, visitors touring *Integrity* could observe the staff as we carried out restoration work on the ship. Since *Integrity* was so much bigger than the boats at Riverside, though, the power tools we used to demolish old components and hoist new

ones into place gave the work the feeling of modern-day construction rather than historical fine woodworking. Where at Riverside parents had brought their children up to the railing around the workshop to show them what we were doing, on *Integrity* I more often noticed parents pulling their children back, warning them not to get too close. On the one hand, this difference made the work feel more professional, as I had been trusted to use these heavy-duty tools that intimidated passers-by. On the other hand, I sometimes felt more like a general contractor than a boat builder, especially when I spent whole days climbing up and down the scaffolding doing demolition.

Not all of my work on *Integrity* took place on board the ship, since there was little room to do carpentry work there. Although there was a carpenters' closet on board for little jobs, the space below deck was designed for efficient storage rather than comfort, and even standing up was difficult in some places. Bigger projects were carried out in a workshop on land a five-minute drive away, where we had access to larger tools and a stock of materials. Harvey would load projects to be repaired into his pickup truck in the morning and drive us from the ship to the workshop, sometimes bouncing back and forth several times in a day when something needed to be fitted or more measurements needed to be taken. For projects too large to be transported, though, there was no way of getting around working on deck, where the summer sun was intense by the end of my time volunteering. Unlike at Riverside, there was no way to control the climate either on *Integrity* or at the workshop, and as a result, the days there were much more exhausting.

The workshop on land was similar to the Riverside workshop, but with a squarer floorplan and less open space (Figure 10, left; see Appendix F). The same three power

tools – planer, jointer, and table saw – held prominent positions, with the space around them relatively clear of the off-cuts and projects in progress that cluttered the work benches. Most of the fabrication work and wood dimensioning took place on land, as the smaller power tools on board the ship could not handle the huge timbers needed to replace major components. There was also a handy patio (Figure 10, right), led onto by two barn-style doors, which meant that larger projects could be moved out of the workshop with a forklift and worked on outside. The patio gave us more space to manoeuvre around the bigger fabrication jobs, and allowed paint and epoxy fumes to dissipate more quickly than they would have indoors.

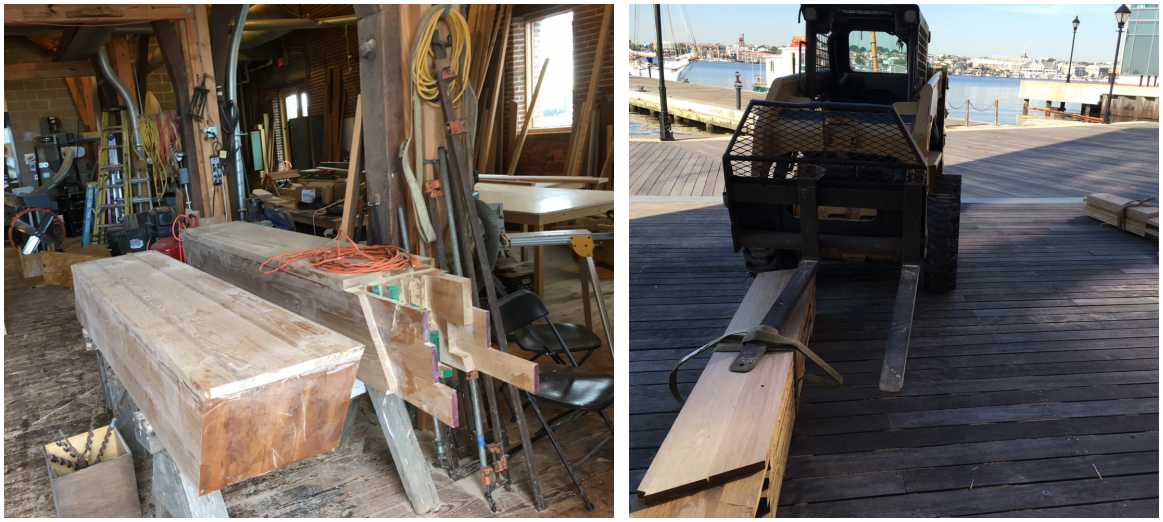

Figure 10: The on-shore workshop (left); a cat-head being removed to the patio (right)

4.2.2 The people

The staff on *Integrity* was much smaller than at Riverside, a fact that initially took me by surprise. I had assumed that a 200-foot wooden ship would require a larger maintenance crew than a handful of wooden boats, but this turned out not to be the case. In maintaining *Integrity*, complicated repairs were made only when they became absolutely necessary, with the focus otherwise being on preventative maintenance.

Despite being much smaller, the boats at Riverside often needed to be completely rebuilt, a time-consuming and labour-intensive process akin to building a boat from scratch which therefore required a greater number of people. Where I had worked with maybe ten people a day on average at Riverside, on *Integrity* I worked with just two, Harvey and Lizzie (see organogram, Figure 11).

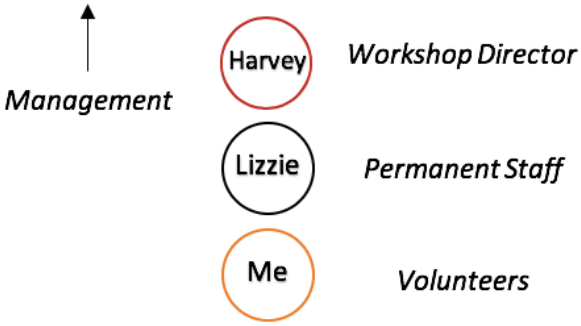

Figure 11: Organogram of the Integrity *staff*

Harvey managed the preservation of *Integrity*, and had been in that post for the previous 20 years. I was surprised to learn that he had come to maritime carpentry halfway through his career, though, and that he had not originally intended to work on ships. His father had been a professional carpenter and Harvey had learned the basics of the trade by working alongside him as a high school weekend job. After leaving school, Harvey went into contracting himself, and did that for two decades before coming across *Integrity*. As he told the story, he heard that a major restoration project was underway on board the ship, called up to enquire, and was put straight to work. The project being done at the time was close enough to general carpentry that Harvey was able to slot in with his existing skills, and by the end of it, he had such a good sense of the ship's construction that he was kept on permanently as the ship's carpenter. By the time I met him 20 years later, *Integrity* was still the only ship that Harvey had ever

worked on professionally.

Lizzie, the other person I worked with regularly, had been there just as long as Harvey, but came from a background as a house painter rather than as a carpenter. As a result, she and Harvey had developed a working relationship in which he made most of the decisions about cutting and shaping wood and she carried out most of the sanding and painting. While Lizzie was handy with power tools, she did not share Harvey's joy in using them, nor did she have much patience for long conversations about different types of wood and their proper uses. Harvey, by contrast, would occasionally pull one of us aside to marvel at an unusually beautiful cross-section in a cut, or a spot in a glue-up where the wood and glue had interacted in some unusual way. At one point Harvey went into a little too much detail in one of these asides to Lizzie, causing her to exclaim, 'I'm not here for an apprenticeship, I'm here for a pay check!', comically feigning exasperation. I could relate to this sentiment, as even though I was there 'for an apprenticeship' in a manner of speaking, I still found that Harvey became much more engrossed in the work than I did, sometimes even failing to notice that it was time to pack up for the day.

Despite the small size of the preservation team on *Integrity,* Harvey normally discouraged volunteers, as he said the effort needed to bring new helpers up to speed usually made taking them on more of a liability than an investment. The attrition rate among new volunteers was very high, and any time spent training a volunteer who would eventually disappear was time lost. The specifics of my research proposal made me a more attractive candidate, as I was committed to working for at least six weeks, a chunk of time that Harvey told me he felt was significant enough to warrant the

attention I would initially require. Occasionally, interested visitors would enquire about volunteering, and while Harvey did not turn them away, he emphasised the need for commitment and his preference for prior experience, and I never saw any of them return.

The only other *Integrity* volunteer I met was Darleen, who started just after I left the ship. While she and I never worked together directly, we met a couple of times after my own stint of volunteering had ended, when I stopped by the ship for Friday after-work beers. Darleen worked in an office nearby in a high-level management job, but said she missed hands-on creative work, her desire for which brought her to the ship for a weekly volunteer shift. Before taking an office job she had worked as an interior decorator, work she convinced me was similar to the preservation of a museum ship, as both required arranging the space to draw in the visitor, highlighting the attractive features while covering up the rough spots.

4.2.3 The work

Arriving at *Integrity* was different from arriving at Riverside in that I showed up on the first day with some prior experience working on boats. I was eager to present myself as a capable volunteer, but was also wary of over-selling myself by implying that I was a more seasoned boat builder than I really was. Harvey would later tell me that he had a different concern before we met, that I might be more interested in taking notes than doing any work. One of the first things he said to me when I arrived was that he was relieved to see me in my paint-splattered work clothes, since they showed I was ready to get my hands dirty.

Figure 12: The starboard cat-head, partially demolished (circled)

I ended up with much more responsibility on *Integrity* than I had at Riverside, although not entirely because of the progress I had made as a boat builder. At Riverside, there had always been a surplus of volunteers, so there was rarely any reason for staff to assign complicated work to me rather than someone more experienced. On *Integrity*, I was the only volunteer, and on days I volunteered I increased the workforce by half. Harvey and Lizzie were therefore much more motivated to keep me constantly busy, especially since they had recently been tasked with an unusually large project. We were to rebuild the cat-heads, two seven-foot beams that projected from the hull of the ship to hold up the anchors while at sea (Figure 12). The previous set had rotted out from the inside, since some flaw in their construction had allowed water to seep into them. The new cat-heads we built weighed hundreds of pounds each when they were complete, and Harvey and Lizzie repeatedly explained how thankful they were to have my help in

lugging them in and out of the workshop each day.

The *Integrity* staff and I fashioned the new cat-heads by milling planks of white oak down to the appropriate length and width, then gluing them together with a two-part epoxy that Harvey mixed in one-gallon disposable paper buckets. Even though Harvey and Lizzie had started this process just a few days before I arrived, by the time I got there they had perfected it, laying out the components for the operation in advance, spreading the epoxy over them, then quickly assembling everything. Working with the epoxy required two layers of gloves, a chemically-resistant pair to protect the skin, covered by a thicker pair to protect the first. Doing this work I was constantly reminded of how wrong I was in my naïve initial vision of the boat builder's workshop, which I pictured revolving around the use of ancient-looking hand tools. While hand tools did play a small role in our work on *Integrity*, the toxic chemicals and enormous electrical woodworking machines featured more prominently, giving the place more of an air of modern-day construction.

I worked on Integrity through May and the first half of June, so by the end of my time there the summer weather began to set in, and working in the mid-day sun became seriously uncomfortable. It was amazing to me that Harvey and Lizzie worked throughout the year, since as bad as the summer temperatures were, working in the freezing cold must have been worse. They explained that the summer was a busier time, and that winter work was more about shovelling snow and intervening in areas where freezing water could damage the woodwork. Because *Integrity* was outside and exposed to the elements, there was no time it could be left safely unattended, unlike the Riverside boats which could be set to one side if another project temporarily took

precedence.

The intensity of the summer sun was one reason that Harvey liked to start work at 7:30, if not a little before, and finish around 3:30 in the afternoon, leaving the real heat for the end of the day. Harvey and Lizzie said they appreciated having their afternoons free with this schedule, but I found I was too exhausted to do much more than write up my fieldwork notes after the combination of the early morning starts and the long days of physical work. The day was less structured than at Riverside, where opening, lunch, and closing all occurred at set times. On *Integrity*, since there were only three of us working, we could decide to come early or stay late depending on the work that needed to be accomplished that day. The small size of the *Integrity* team also meant that I grew closer to Harvey and Lizzie during my time volunteering than I had with the cast of characters at Riverside, where I rarely worked with the same people for more than a couple of days at a time. I visited *Integrity* regularly after I had finished volunteering, sometimes for a follow-up interview, and sometimes just to say hello.

4.3 The *Paloma*

At the same time I made arrangements to volunteer on *Integrity,* I also arranged to volunteer at a local boat-building yard, but for various logistical reasons that plan fell through, leaving a gap at the end of my fieldwork plan. As a result, I found myself searching for a third site in the summer of 2017. *Paloma* was the first place I enquired about, as everyone at my two previous workshops knew the crew there and had positive opinions, although they were less optimistic about the condition of the ship itself. I made contact with Anton, the president of the organisation that maintained the ship,

and within a few weeks I was working on board.

4.3.1 The ship and its workshop

The *Paloma* (Figure 13) was originally a fishing vessel built to cross the Atlantic from Europe in order to work the North American coastal waters. Built in the late 19th century, it was in service until the 1960s, when changes to fish stock management made the journey unprofitable. The ship's owners then sold it to an American interested in 'tall ships' culture, who brought it back to the American East Coast, where a European-built wooden tall ship was a rarity among almost exclusively American-built ones. The downside of its uniqueness in this context was that *Paloma* had little relationship to the country in which it now rested, and as a result, it garnered less attention than ships connected to American trade and warfare.

Figure 13: The Paloma *at dusk*

The most notable difference between Paloma and my other fieldwork sites was that this was still an operational sailing ship, not just a restoration project. While there was constant maintenance and repair work to be done, the purpose of this work was to keep the ship sailing, not just to keep it attractive for the benefit of visitors. It was obvious that practical work took precedence over aesthetics, as the paint on the hull was flaking and showed rust stains where fasteners under the surface were starting to corrode, and the wood of the deck was sun-faded with chipping tar seams. And yet, the three masts each had a tidy network of lines running down from their sails, carefully arranged and neatly coiled on the pin-rail[14] below, clearly the objects of fastidious attention (Figure 14). Firehoses and foam life-saving rings dotted the length of the rail, each dutifully signposted, and the marine radio could be heard chirping to life periodically in the pilot house, relaying messages from the coast guard. This was a ship meant for sailing, rather than just admiring.

Figure 14: The busy rigging indicated that Paloma *was still a working ship*

[14] A railing that holds the 'pins', used to secure the lines running from the sails. See Glossary.

Climbing below deck on *Integrity,* a visitor was presented with a re-creation of the living and working spaces that sailors inhabited in the distant past. On *Paloma*, the forward hatch led directly to the living space of modern sailors, specifically those crew members who would still occasionally sleep on board, whether during journeys at sea or just for long weekend work parties. There were 18 bunks in the forecastle[15] below deck, stacked three-high by three-wide on each side. Most of these bunks had some clutter of personal effects, although it was rarely clear to me whether this meant that someone had stayed in the bunk the night before, or if those things had been abandoned there years ago. The main hold contained two refrigerators filled with soda, beer, and leftover pizza, plus two long shelves stocked with non-perishable food for journeys at sea. In the ship's working days, this space had been filled with cod, and the salt that the fishermen had used as a preservative still stained the thick timbers that supported the interior of the hull.

Perhaps the most remarked-upon aspect of *Paloma's* design was the rigging, a 'barquentine' setup that incorporated square sails on the foremast and fore-to-aft sails on the other two masts. A square rig, like that on *Integrity*, is instantly recognisable as the mark of a historic tall ship, and fore-to-aft rigging looks more modern in comparison. The combination of the two types of rigging on *Paloma* drew constant attention from tourists walking down the pedestrian promenade along which the ship was docked, a surprising number of whom demonstrated proficiency with obscure sailing terminology. The practical benefit of this type of rig for *Paloma* was that the ship could sail with only the comparatively uncomplicated fore-to-aft sails, but also provided an environment for

[15] The forward part of a ship below deck, where the sailors' living quarters are located; see Glossary.

new sailors to master the square rig, a sought-after skill in the world of tall ships.

Like *Integrity*, the *Paloma* had a tiny on-board carpentry closet, but required a separate space for the heavy woodworking machines that maritime maintenance work requires. For this reason, the organisation that ran the ship had procured a work barge that was docked several piers away, about a ten-minute walk. This was a smaller space than the *Integrity* workshop, and did not have the benefit of an outdoor work area (see Appendix F for comparison). The tools inside were older than those at either of my other fieldwork sites, with the planer in particular striking me as especially antique (Figure 15). My first time using it I jumped back as it powered up, certain that the sound it produced signalled some serious problem. Bennie assured me that the machine was supposed to sound that way, and that while it could be a little finicky, it was actually a very nice model to use.

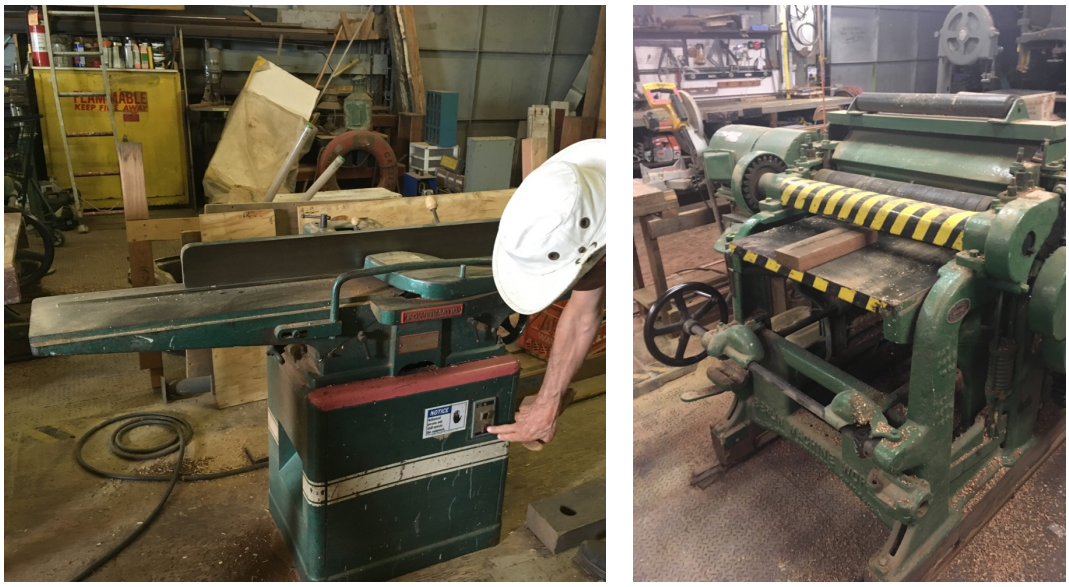

Figure 15: Inside the workshop barge: Bennie turns on the jointer (left), and the ancient planer (right)

Another thing that struck me about the workshop barge the first time I saw it was that there seemed to be a lower bar for determining which materials to keep than there had

been at either of my two previous workshops. There was a pile of wood near the front door made up almost entirely of off-cuts that would have been scrapped at Riverside or on *Integrity,* and the lower deck of the barge was filled with paint cans and chemical bottles with ancient faded labels. Several times over my stay on *Paloma*, someone would dig out a can of a particular colour paint only to find that it had dried out years ago, but not been discarded. While at first this extreme thriftiness frustrated me, I came to realise that it was the necessary consequence of the ship's tight budget. Money for new materials was scarce, and as a result, everyone adopted a frugal attitude in their restoration work.

4.3.2 The people

Paloma was run by an all-volunteer organisation, each member of which contributed $65 a year in the form of membership dues to contribute to the ship's upkeep. These paying members collectively referred to themselves as the 'crew', although not all of them were interested in sailing the ship, as the title implied; a minority of people on board were primarily interested in learning how to maintain a wooden ship, or practicing the woodworking skills they already had. Those intent on sailing were normally distinguishable by the rigging knife and marlin spike that they wore in a hip-bound leather pouch (Figure 16), as well as by a preference for synthetic athletic gear. The crew who tended toward carpentry had a subtly different look, with canvass work trousers and solid boots, accented by splatters of paint and ground-in sawdust. Most people mixed and matched elements from these two aesthetics, but I found I could usually guess the main motivation of someone I was meeting for the first time based on a couple of key stylistic choices.

Figure 16: A Paloma *sailor wearing a marlin spike and rigging knife*

The crew on *Paloma* were more diverse in terms of age, interests, and level of experience than the staff or volunteers at either of my other two fieldwork sites. There were college students as well as retirees, sailors as well as ships' carpenters, and 'old salts' alongside new volunteers. Also notable was the rough gender parity within the crew, which contrasted sharply with Riverside, where the large majority of staff and volunteers were men. The *Paloma* was also different from my previous two fieldwork sites in that no one was paid for their work. Maintenance was carried out by people who could commit a few hours in the evenings or on weekends, and was seen as a way to pay back the ship for the opportunity to sail. Some people took on more responsibility by acting as 'foreman' to direct work days, but many of my participants told me that they saw this position as more of a burden than a privilege, since it meant committing to a regular work shift rather than stopping in whenever was convenient. In fact, there was such a lack of foremen when I arrived on *Paloma* that I myself was promoted to the role within a few weeks. While flattering, this promotion was clearly more about finding someone willing to take on that responsibility than recognition of my personal expertise.

Bennie was the first *Paloma* crew member I met in person, as he was the one who greeted me in July 2017 when I first came to visit the ship. He was a spry man of retirement age, and reminded me of the older volunteers at Riverside, chipping away at satisfying projects while trying not to get too sucked into the potentially endless work or the politics of the organisation. Bennie told me that he had at one point been much more involved in *Paloma* work, but had 'burnt out' on it, finding that it took up all of his free time. This was not an uncommon problem, he said, as the longer people spent on *Paloma*, the more crucial they became to the upkeep of the ship, and the harder they found it to dial back their commitment. When it got to the point that his work on *Paloma* was competing against commitments at work and at home, Bennie decided that he needed to leave, only to return years later when retirement meant he had sufficient time to spare. He now worked on the ship once or twice a week, constantly resisting pressure to take on greater responsibility.

In contrast to Bennie was Emmitt, a man in his mid-20s who seemed eager to get as deeply involved in the world of wooden ships as possible. He had previously worked on other ships and in wooden boat workshops, although always in tenuous, short-term intern or apprentice roles. Emmitt had even completed a carpentry apprenticeship on *Paloma* a few years earlier, when the organisation had the means to support such a position. Like Chris at Riverside, Emmitt would not have stuck out among deckhands in the age of sail, generally dressing in a vintage flat-cap and other period flourishes. Also like ships' carpenters of old, he was insistent on entering the trade solely through on-the-job experience rather than by completing a formal boat-building course. While Emmitt admitted that formal programmes in boat building supplied the abstract skills

that were hard to come by through practical experience, such as 'lofting' a boat on paper, he questioned the extent to which these skills translated to everyday work. The challenge for formally-trained boat builders, he told me, would be seeing past their technical education to address messy real-world problems, a skill he was trying to develop exclusively through practical experience.

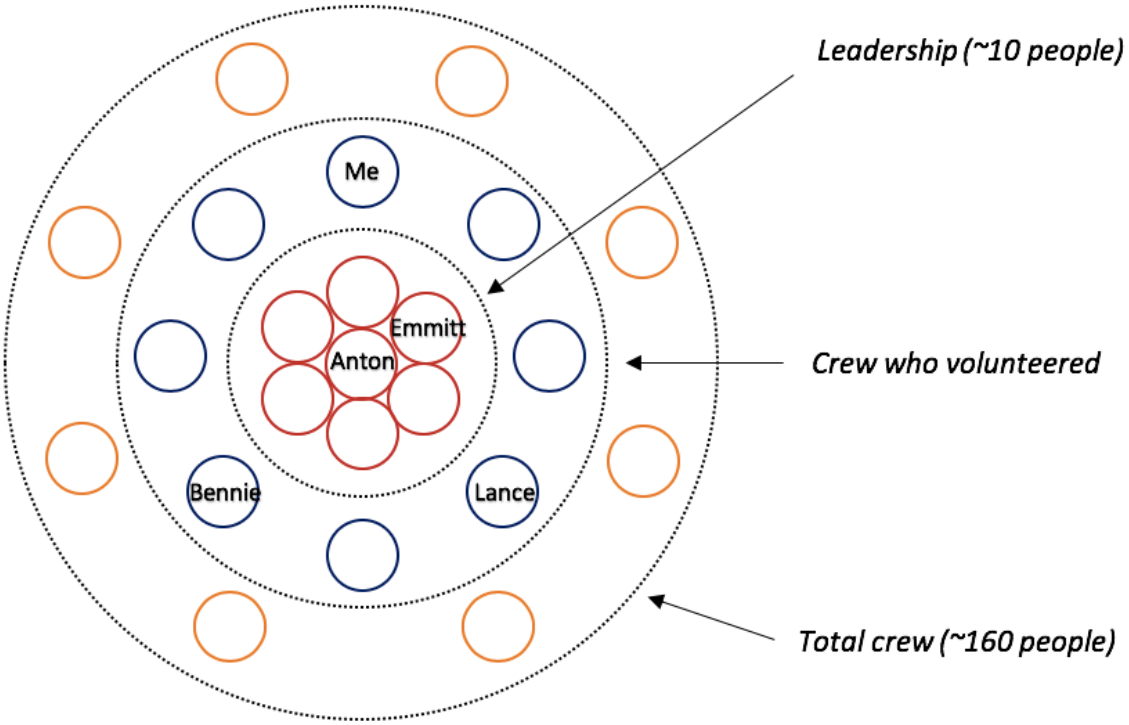

Figure 17: Simplified organogram of the Paloma *crew*

While no one was formally employed to work on *Paloma*, there were some elected positions that entailed increased decision-making power, such as the president role that Anton held (see organogram, Figure 17). Anton joined the crew in the late 1980s in order to get more time sailing, but soon realised that the ship needed managers more badly than it needed deckhands, and transitioned into a leadership role. In describing his history with the ship, Anton seemed disappointed that the administrative needs of the ship had pulled him away from the sailing and maintenance work that he preferred,

instead requiring him to write the newsletter, lead fundraising efforts, and court donors. He still made time to join the crew for weekend work days, though, pitching in with painting the hull or scraping down the deck. Seeing him hard at work on the weekends and then receiving his detailed weekly crew newsletters during the week, I marvelled at how much time Anton devoted to the ship, which was a hobby he maintained in addition to a separate full-time job.

The concentric circles of the organogram in Figure 17 illustrate the largely non-hierarchical organisation of the *Paloma* crew, which contrasted sharply with the linear hierarchies I encountered at my previous two fieldwork sites. For the most part, crew on Paloma all held the same role, and authority was achieved through presence on the ship and technical expertise rather than appointment to formal positions. While this organisational structure made it easy for newcomers such as myself to join in, it also led to occasional squabbles between crewmembers over maintenance techniques and responsibilities. These disagreements could ultimately be resolved when addressed by the leadership committee, a group of crewmembers who had been democratically elected to decision-making roles. Even the decisions of these elected committee members were subject to push-back from crew, however, to a degree I had not witnessed at either of my previous fieldwork sites.

4.3.3 The work

Most of the *Paloma* crew were drawn to the ship by the promise of sailing, rather than the appeal of routine maintenance. Since a hundred-year-old wooden ship needs constant work to stay afloat, however, the crew were required to contribute to its upkeep in return for the right to sail. There was a minimum yearly requirement of 40

hours of work per member, and although many never met this mark, some did much more. Anton estimated that of the 160 dues-paying members, about half contributed the work hours they needed to be allowed to sail, and about ten reliably committed significantly more time. While the ship's co-operative organisation meant that it could survive mainly on membership dues, it also optimistically assumed that the sum of work provided by volunteers would at least counter-balance *Paloma's* gradual deterioration. By the time I joined, the deterioration of the ship was outpacing repair work, and the coast guard had recently restricted it to shallow waters until major repairs could be completed.

Work on *Paloma* was carried out during work parties, full-day events on the weekend or half-days on a Wednesday evening depending on the availability of foremen to take the lead. Work parties were organised such that anyone could join, regardless of level of expertise, and were an easy way for new crew to become better integrated into the community of the ship. The main priorities during my stay were painting the hull and scraping the deck, both projects that anyone could learn to do with limited instruction and which required hundreds of hours of work in total, an ideal combination for unskilled group labour. Sometimes there were as many as a dozen people at these work parties, but the total was usually closer to eight, and on especially rainy days there could be as few as four. Lunch was served in the early afternoon, prepared by one of the crew who had taken on this responsibility as a way to complete volunteer hours, and each person contributed four dollars towards its cost.

I learned quite a bit about the ship and its crew during these work parties, but I rarely felt that I learned much about woodworking or ship-building techniques. The projects I

carried out involved simple work that I had already done at my other two fieldwork sites, and I found myself teaching others how to do it more often than being taught myself. I learned much more working on Mondays and Tuesdays, when Bennie and Lance came down to do more complicated woodworking projects. These days were not advertised to the rest of the crew, as the technical projects that Bennie and Lance took on were better accomplished by skilled individuals than by large unskilled groups. I managed to get permission to work alongside them because I already had experience doing simple woodworking, and therefore could help out without distracting them too much.

Working with Bennie and Lance, I was given more autonomy and more complex work than I had at either of my other fieldwork sites. To an extent, this was because I had made significant technical progress since I started fieldwork; I would never have been able to do such work when I first started in January 2017. On the other hand, for a couple of reasons, the standards for work were lower on *Paloma* than they had been elsewhere. The most obvious of these reasons was that *Paloma* was not a museum ship, so repairs needed to be structurally sound, but not necessarily beautiful or historically accurate. In addition, there was more work to do on *Paloma* than there were people available to do it, requiring a constant balance between finishing one project perfectly and getting the next one started. Luxuries like matching species of wood or stripping materials bare before refinishing them were generally ignored, as the work could be done almost as well without taking these extra steps.

My main task on *Paloma* was installing 'dutchmen' on the rail (Figure 18), small repairs that allowed the ship's crew to put off a major restoration effort as long as possible. The

rail was the waist-high barrier that ran around the circumference of the ship, made from thick planks of wood joined together with intricate seams that sometimes developed pockets of rot. My job was to chisel these rot pockets out and install dutchmen, the nautical term for strips of wood used to fill small voids in larger planks. At Riverside I had helped fabricate a couple of very small dutchmen, and on *Integrity* I had helped to apply the type of epoxy used to install them, but I had never overseen the process from start to finish by myself. I explained my prior experience to Bennie and Anton, and they agreed that I should just get started doing dutchmen on my own, because if I ran into problems I could always consult one of them. This attitude gave me the space to experiment with the materials enough to start to really understand them, but also set me up to make some notable mistakes. Luckily the crew were quite forgiving, happy that I was making a positive contribution on average, even if I complicated some projects slightly along the way.

Figure 18: Dutchmen that I installed in the rail

Chapter conclusion

By the time I left *Paloma,* it had been nine months since I entered the world of wooden boats, and my sense of my place in that world had changed completely. While I had initially been a visitor observing from the side-lines, I now felt connected to the boat builders and their work, and had developed a deep appreciation for how they engaged both with their materials and with one another. The work and the people who did it were remarkably different between my three fieldwork sites, but they overlapped in their respect for professional expertise and their sense of pride in participating in the preservation of a historical craft.

In the chapter that follows (Chapter 5), I start my exploration of learning in the wooden boat workshop by considering the understanding displayed there in light of the notion of 'circumspection', which describes perceiving tools and materials in terms of their practical purposes. As I will show throughout the next chapter, participating alongside the other boat builders led me to gradually align my perception with theirs, seeing and feeling meaningful objects in the workshop in ways that allowed me to begin 'getting the feel' for the work of the trade.

5. ‘The feel’ as circumspective perception-as-understanding

In this chapter, I illustrate the central characteristic of ‘getting the feel’, that learning in the wooden boat workshop entails coming to perceive tools and materials in terms of their purposes in context. For the most part, my findings align with Heidegger’s concept of ‘circumspection’, the perception-as-understanding through which objects immediately appear to their users with reference to the meaningful interrelationships in which they exist. In early examples, this circumspective ‘seeing as’ simply entails indexing tools and materials to the tasks in which they are used, learning to recognise purpose-specific objects in the workshop in the way that the other boat builders do (5.1). My later examples add more experiential texture to this account of learning, recording how perceptual understanding accrues in cumulative layers, rather than all at once, as well as how certain meaningful objects come to grab the attention as if of their own accord. In the final section (5.4), I argue that the expertise I developed during fieldwork eventually meant that the relationships between tools and materials predominated in perception, where objects appeared to me as parts of an unfolding process, rather than as discrete entities. Throughout the chapter, I show how learning is a consequence of novices’ curiosity and initiative as they explore the deeply interconnected meanings among the practical objects in the workshop.

5.1 Learning to see ‘as something’

My fieldwork at Riverside started in earnest in January of 2017. The little I had learned about woodworking during my pilot project the summer before seemed to have evaporated in the intervening months, which I had spent in the library refining my research design. My first day back, I milled around the workshop sipping coffee and

catching up with the boat builders, hoping to get roped into something interesting. The work underway was unfamiliar, though, and even if I had recognised it, the state of my woodworking skills meant that there was little I could do to help. Jay's *Obadiah* rebuild looked to be at a very technical stage, and I knew from the summer that if I tried to help, I was likely only to slow the process down. Lou was busy with a project I did not recognise, and while it looked like something I could manage, he was so engrossed in the flow of his work that I hesitated to interrupt him. I tried to busy myself with tidying up the workshop, feeling somewhat like an interloper rather than a legitimate volunteer.

Lou eventually noticed me wandering around and suggested that I help with some prep work he needed, an offer I was relieved to receive. There was a pile of wooden trim from *Hercules* that needed to be scraped of old paint and sanded smooth, work simple enough that Lou said he thought I could handle it. After explaining what needed to be done, he told me to grab a scraper and get started, gesturing towards an old tool-box sitting on the window sill (Figure 19). I walked over and saw that the box was filled with a variety of long-handled tools, some with wooden handles, others with plastic ones, and the rest just lengths of bare metal. Each had a sharp edge that looked like it could scrape along a surface, but the differences between the tools were lost on me, and I had to return to Lou to ask which he wanted me to use. The question seemed to surprise him, and he grabbed one out of the box for me as if the choice should have been obvious.

Looking back at my photos from that day, the reasons behind the differences in the shapes and sizes of scraper are clearer to me now. The long black scrapers with a ball handle are good for floors, since they provide a grip for a second hand, allowing the user

to apply more bodyweight onto the work surface. The triangular ones are for scraping along corners, as their long handles keep one's knuckles out of the way of the work. While there are still a couple of tools in this picture that I do not recognise, the short cream-coloured scrapers in the bottom right look perfect for the job Lou wanted done, since they are small enough for the nimble work of cleaning off delicately rippled wooden trim. At the beginning of my fieldwork, though, I had no sense of the differences between the scrapers, as I had not yet put in the dozens of hours learning first-hand which scrapers worked best for which tasks. The shape, size, and colour of the tools was apparent to me, but I still failed to register the meaning in them. The first step in 'getting the feel' for these tools was realising that such meaning existed, and that I could not yet perceive it.

Figure 19: The box of scrapers

Recognising which scraper is right for a certain job illustrates what Heidegger refers to as 'circumspection', through which objects appear to the user in terms of the context-specific purposes to which they can be put (1927/1962, p. 98). The notion of

circumspection folds perception and understanding into a single phenomenon, revealing associations between objects and their purposes in the act of seeing, rather than through deliberate consideration:

> Whenever we see with this kind of [circumspective] sight, we already do so understandingly and interpretatively. In the mere encountering of something, it is understood in terms of a totality of involvements; and such seeing hides in itself the explicitness of the assignment-relations (of the "in-order-to") which belong to that totality. (Heidegger, 1927/1962, p. 149)

As my interaction with Lou shows, a wealth of nuance is obvious to someone familiar with the context in which tools and materials are used, allowing him or her to see them 'as something' (Heidegger, 1927/1962, p. 149) where the uninitiated person would not. As I will explain throughout this chapter, this circumspective perception-as-understanding underpinned the technical abilities of the wooden boat builders at each of the workshops I visited.

A central fact in Heidegger's account of understanding is that circumspection is our normal way of interacting with the world, rather than a special mechanism for dealing with unusual circumstances. A Heideggerian interpretation of perception would therefore stress that my encounter with the scrapers at Riverside was circumspective from the start, in that I immediately recognised them as tools, even when their exact purpose was not obvious to me. Where I have come to disagree with Heidegger is in his description of circumspective experience always revealing the '*totality* of involvements' within which an object exists (Heidegger, 1927/1962, p. 149; my emphasis). Perceiving the scraper as an unspecified tool upon first encountering it indicates that I understood it in terms of its meaning in context to some degree, but that my familiarity with that context was so limited that the extent of its meaning was still hidden. As I worked with

each scraper more, I progressed through a gradient of meaning, seeing more aspects of their purposes in context as time passed. There must, therefore, be more and less complete instances of circumspective perception, with a learning process in between that leads to seeing the 'totality' of contextual purpose. Heidegger hints at this gradient, writing that 'the more we seize hold of [the hammer] and use it, the more primordial does our relationship to it become, and the more unveiledly is it encountered' (Heidegger, 1927/1962, p. 98), but otherwise neglects to incorporate these shades of meaning into his account.

Figure 20: A hinge after polishing (left); close-up of marks from an electric grinder (right, at arrow)

The gradated nature of circumspective understanding was especially apparent when I thought I was familiar with something before learning some new aspect of it, as I did while polishing a pair of hinges from Lou's *Hercules* project (Figure 20, left). This was simple work, requiring hours of buffing with brass cleaner and an old rag to remove the built-up patina. Very light scratches might eventually disappear as well, but the deeper nicks were clearly permanent, so I ignored them; I had decided that they were the sort

of wear-and-tear that should be expected on an old warship like *Hercules.* After a full morning of work, I was proud of the shine that I had managed to produce, and was preparing to move on to the next set of hinges when Chris brought my attention back to the scratches. They were not, he said, the sort of authentic damage I had taken them to be, but rather the tell-tale marks of power tools that had not existed until a century after the hinges were forged (Figure 20, right). Evidently, someone had tried to cut corners by buffing the hinges with an electric grinder, inscribing the unfortunate effect of this decision onto them forever. As Chris explained this, the hinge in front of me underwent a subtle transformation, changing from a pristine historical artefact to a botched restoration project.

Lou had shown me how the hinge connected to the window frames for the skylights when he asked me to polish it, transforming it in my mind from a curiously-shaped strip of metal into a piece of functional equipment. He had also polished a tiny spot at the bottom of it to show me the shine I should try to achieve, revealing it as a dirty, corroded specimen in need of restoration. But even as my sense of its purpose and history deepened through these interactions, I still failed to recognise the meaning of the other minute details, even though I could see them clearly. The sight of the hinge contained the potential for layer upon layer of perceptual meaning, rather than just a single 'assignment-relation', and learning to see it properly meant recognising it both as functional maritime equipment and as a museum artefact.

Another way in which my experience in the workshop challenged Heidegger's account was around his singular sense of circumspective 'seeing'. Instead, I found that my own experiences of circumspection fell roughly into two categories. Where my early

examples involved purposely looking at tools and materials, in later cases I found that objects called my attention to themselves as if by their own accord, a markedly different experience. I have come to think of this latter phenomenon as 'noticing' an object, as opposed to the 'looking at' that I engaged in earlier in fieldwork.

Initially, I only observed this circumspective 'noticing' when other people did it, presumably because I was not yet familiar enough with the workshop to experience it myself. Nick was particularly good at it, perhaps because it was his job as director to notice everything happening around him. One such example begins with Chris and I working on the boat dock and realising that we needed a second rope to secure a particular boat. I ran into the workshop to get it, grabbing the rope closest to the door and quickly turning to head back outside. Nick could only have seen this out of the corner of his eye, but it still caught his attention, and he managed to catch me right before I walked out again. I had picked up a leftover manila rope from a previous restoration project, the kind that was long ago replaced by modern synthetics for day-to-day work, and which Nick only kept around for use in museum displays (Figure 21, left, second rope from the right). The sight of me walking out toward the dock with this historical artefact must have immediately conveyed the mistake I was making, given how quickly Nick reacted. He had not been 'looking at' the rope in the way that I had looked at the scrapers or the hinges, taking it as the main focus of his attention. Instead, the sight of it attracted his attention within the tumult of a workshop in full swing, with him 'noticing' it among the myriad other meaningful sights and sounds around him.

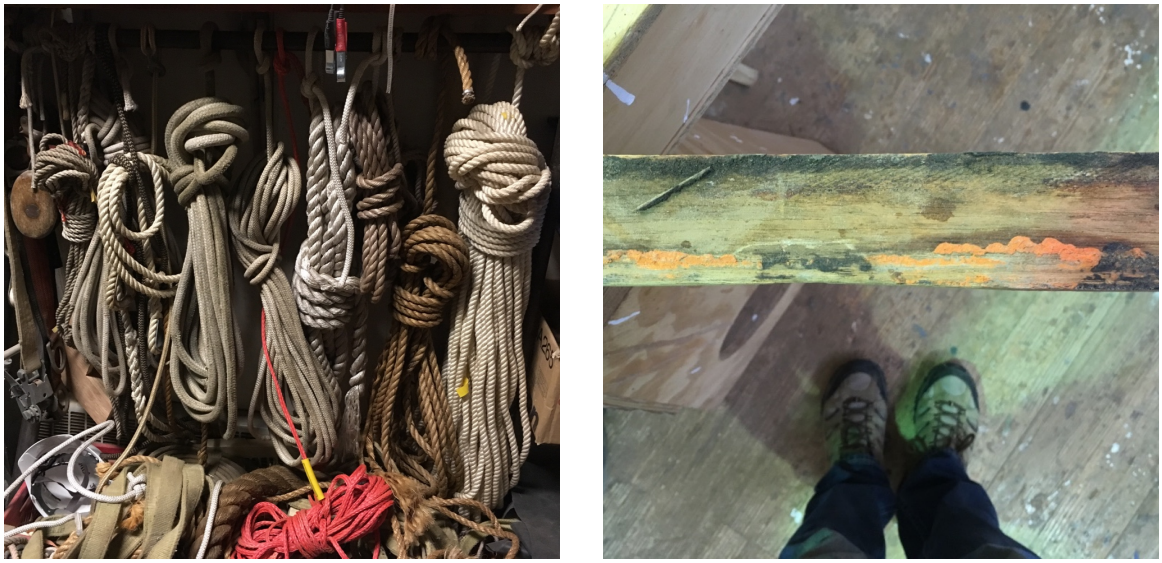

Figure 21: Various kinds of rope, some historical (left); a stripe of red lead on a piece of trim (right)

I eventually developed a degree of this sort of visual attraction myself with several objects, the most striking of which was a toxic substance called 'red lead'. I first encountered red lead as I was preparing wooden trim from *Hercules,* some of which had traces of what looked like orange paint (Figure 21, right). The colour struck me as an unusual aesthetic choice for a historic boat, but nothing more, so I gathered my usual scrapers and sanding block and prepared to get started. Ken, another volunteer, saw what I was doing and stopped me, explaining that this was a lead-based sealant for coating surfaces that were in constant contact with one another. Although the lead was great for preventing moisture damage, he explained, it posed a hazard when sanded down into dust, which meant that I should work with goggles, gloves, and a respirator. I suited up as he recommended, and immediately found that the paint looked much more sinister to me, with each flake that landed on the cuff of my shirt sticking in my attention until I brushed it away. While I had been getting used to learning to see new meaning in materials, this experience was different in that once I knew the danger the red lead posed, it drew my attention towards itself on its own, as if magnetically. The

purpose of the scrapers and the history of the brass hinges only occurred to me if I were looking at them, but now the slightest glint of orange caught my eye, even when I was focused on something else.

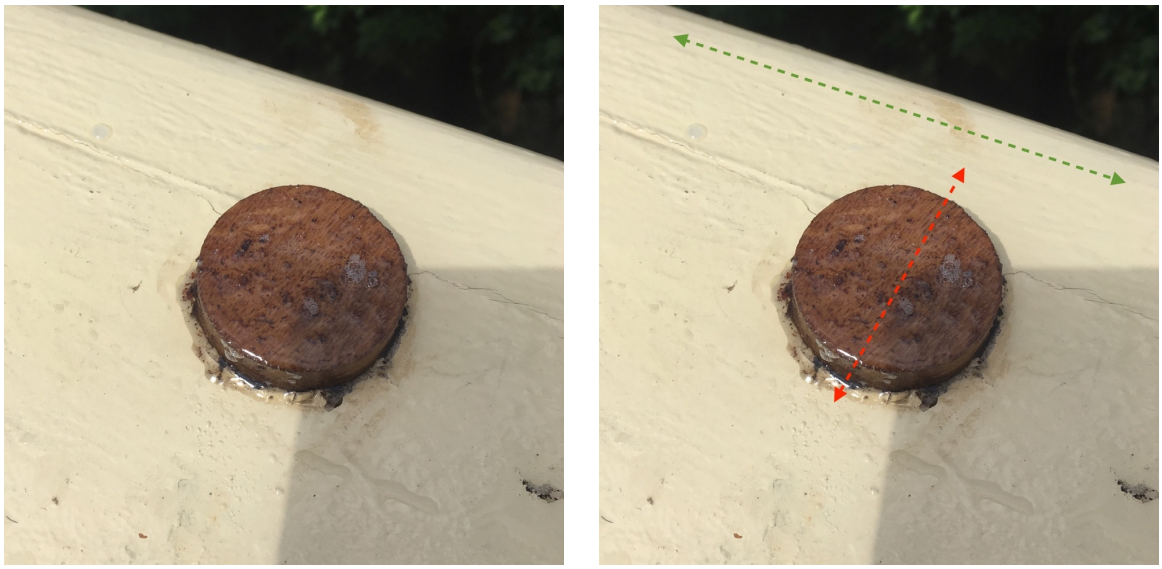

Figure 22: A dutchman (left), the grain of which is running in the wrong direction (as illustrated, right)

Over time, noticing objects came to play an important role in my work. A mislaid piece of expensive timber would grab my attention from the next workbench over, as would a hand-plane left resting blade-down, where it risked getting dulled. Yet while the depth of meaning in objects was steadily becoming more apparent, my ability to reliably recognise it was still inconsistent. Early on in my time at the boat workshop, I had learned how to read wood grain, the direction of which influenced how the wood could be worked and how it would behave after it was installed. Despite being able to articulate the importance of the direction of the grain, however, it failed to reliably appear in my attention as I was working. Towards the end of my fieldwork, working on *Paloma*, I was rushing to install a dutchman in the rail before my epoxy hardened, and somehow mistakenly installed it perpendicular to the grain of the piece under repair (Figure 22; grain direction of the dutchman indicated in red, and correct orientation in

green). This configuration meant that the dutchman would expand along the opposite dimension to the rail on a hot summer day, leading the two pieces to pull apart and the joint to snap.

Bennie, a much more seasoned woodworker, noticed my mistake immediately when he came on board, and politely pointed it out. He seemed surprised that I had not realised the error myself, as it reflected an elementary point that my other work on *Paloma* had shown I had mastered. When he saw my embarrassment, he smiled and told me that it was to be expected, and that 'you have to do something a hundred times to be able to see its significance right away'. I was apparently not yet prepared to rely solely on my intuition, which in this case had failed to flag up what should have been an obvious problem. As Bennie and I worked together to remove the misaligned dutchman, he remarked that he should have reminded me of the importance of the grain direction earlier, since it was such an easy thing for a new woodworker to forget. The reason he had not, he said, was that he no longer thought to mention such things, as they had become so obvious to him.

As the wood-grain example above shows, 'noticing' requires the capacity to see competing and interacting markers of contextual significance at once. The mistake I made was the result of attending to the immediate challenge posed by the rapidly drying epoxy, allowing my focus on that material to eclipse the wood-grain orientation, which was at least as important in the long-term. A more experienced boat builder like Bennie would recognise that perfect application of the epoxy would be pointless if the dutchman were misaligned, thereby drawing the grain orientation into prominence in perception. Learning is therefore not just a matter of seeing deeper meaning in objects,

but also of intuitively attending to their most important features first.

In summary, while Heidegger's idea of circumspective understanding helps to illuminate the perception-as-understanding that boat builders employ, applying it to a complex ethnographic record raises several points in need of further theoretical clarification. There is first the question of the manifold role of objects in context, which I have linked to the experience of revealing layers of meaning as the user becomes more familiar with the work. Next, I have also made the distinction between purposely 'looking at' objects and having the attention drawn to them in the act of 'noticing', the latter of which is the result of practical experience. Finally, I have combined these ideas into the notion that extensive experience leads the boat builder to notice aspects of work based on their relative importance, intuitively ranking them and allowing the most pressing aspects to predominate in perception; I explore this point more thoroughly in Chapter 6 (sections 6.3 – 6.4). These ideas move beyond the generality of Heidegger's philosophy to show how learning entails not only coming to perceive objects differently, but also allowing facets of objects to capture the attention as the needs of the work at hand demand.

5.2 Occurrent strategies for 'seeing as'

In the previous section (5.1), I described the circumspective mode in which boat builders understand tools, materials, and the relationships between them at a glance, rather than by purposely deliberating over them. Something missing from this interpretation, however – and also missing from the Heideggerian theory that underpins it – is the fact that such circumspective seeing always happens from a particular physical perspective, influencing what is perceived. Early in fieldwork, I realised that the understanding that

allowed me to place my body into positions from which I could better see tools and materials needed not itself be circumspective, even if the perception that resulted from those positions was. In these instances, I learned to see circumspectively by placing tools, materials, and my body into arrangements that at first seemed meaningless to me, but became meaningful over time.

Copying the ways of arranging tools and the body that other boat builders used involved what Heidegger calls the 'occurrent' mode of understanding, in which one views objects as 'worldless', abstracted from their meaningful context (1927/1962, p. 82). Heidegger stresses that occurrent perception is not the normal way of interacting with objects, but rather a mode in which one can step back from the immediacy of circumspection to address particular problems (1927/1962, p. 103). In each of the examples I provide in this chapter, I found this to be the case, with some problem in work requiring me to reconsider my relationship to objects by momentarily putting my circumspective sense of them aside.

The importance of occurrent strategies for holding the body first occurred to me while attempting to choose between drill bits for piloting screw holes. A pilot hole is drilled out in order to create a path for a screw to follow when it is installed, so that the screw does not do all of the cutting work by itself. I had been told that pilot holes were especially important when working with hard woods, which could provide enough resistance to snap a screw before it sank completely, leaving its bottom half in the hole and requiring some creative method to extract it. The problem I faced was in selecting the correct diameter drill bit to create the pilot holes, as the holes needed to be exactly the right size. If they were too large, the threads of the screw would fail to grab the

inside of the hole, and the screw would tear out once any force was applied to it. If the holes were too small, the screw would encounter too much resistance, and be as likely to snap as if there were no pilot hole at all. While all of this made sense to me in theory, the trial-and-error approach it led to was frustrating and tedious, as it involved drilling several trial holes every time I switched between styles of screw and checking one-by-one to see which was an appropriate match.

After snapping several screws, creating more work than I was accomplishing, Nick pulled me aside to explain the pilot hole technique again. I told him I knew the theory, but that I was struggling to pick the right size drill bit, especially since the project required regularly switching between sizes of screw. He picked up a bit and a loose screw off the work bench and held them both in the air, positioning them in a line between his eye and the lights on the ceiling. What I should look for, he said, was the bit obscuring the view of the body of the screw, but not of the threads protruding from its sides (simulated in Figure 23, right). If the body of the screw were visible behind the drill bit, that part of the screw would be doing work better accomplished by the drill, and therefore a larger bit should be used. If the bit obscured the threads, the resulting hole would be too wide for the screw to grab at all, and a smaller bit was needed.

In this example with Nick, I did not understand the relationship between the screw and the drill bit in an immediate, circumspective sense until the moment that I aligned them in front of my eye. The instructions that Nick gave me were abstracted and processual, describing steps that held no apparent meaning until I executed them and saw what they revealed. In the moment before I realised what Nick was trying to explain, I had the screw and the drill bit held in front of me in a seemingly arbitrary orientation, using

them in a way totally divorced from my sense of them as tools. This occurrent sense of them almost immediately gave way to the circumspective sight in which the drill bit became a measuring device, gauging the diameter of the path that the screw would need. For a moment, however, my stance and Nick's instructions were only abstract scaffolding for reaching this way of seeing, 'worldless' steps for me to follow.

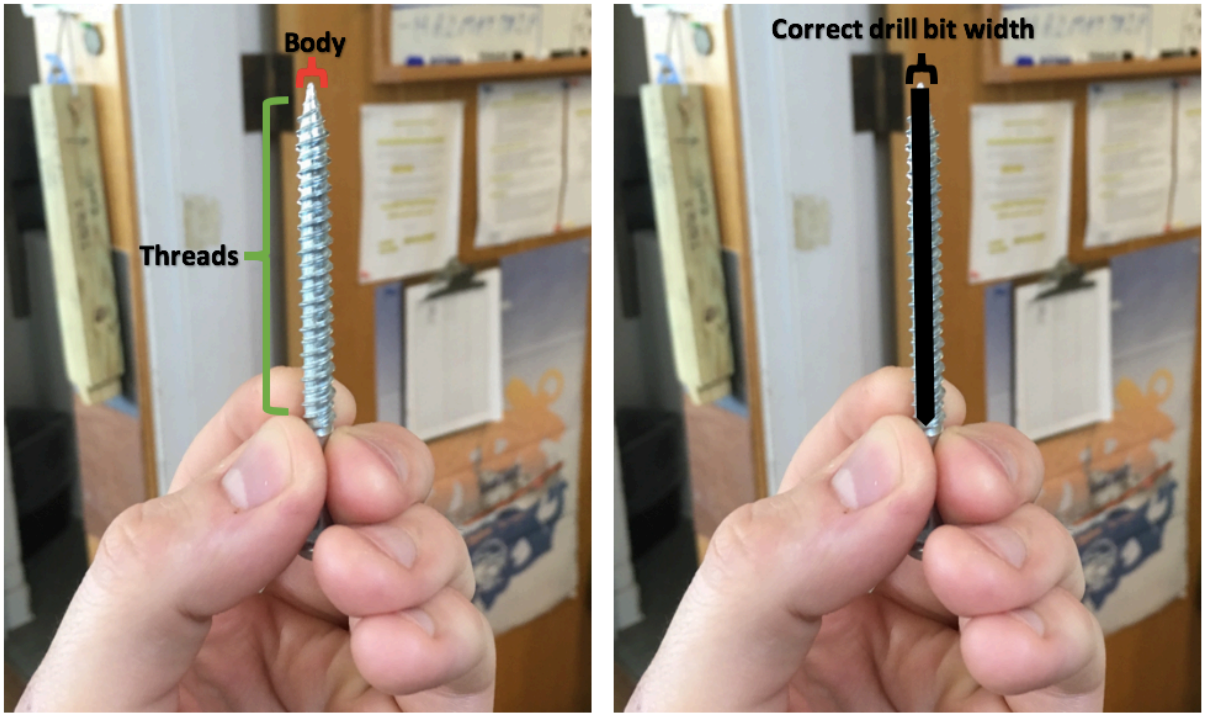

Figure 23: Screw, indicating body and threads (left); simulation of a drill bit obscuring only the body (right)

The role of occurrent understanding is particularly clear in discursive exchanges like mine with Nick, where his instructions guided me towards discovering a new way of understanding the materials. Not all instances of occurrent understanding involved spoken language, however, as I observed while learning to improve the cuts I made with the bandsaw. The bandsaw is a simple machine, and after only a few weeks of volunteering I found that I could use it sufficiently well to complete basic projects. Unlike the other saws in the workshop, the blade of the bandsaw stays in one position,

and the user moves the work piece around it to follow the pencil line that the cut should follow. Initially, my strategy was to watch the path that the blade had cut as it progressed, adjusting the angle of the work piece if the cut were too close or too far from the line. This strategy required tiny course corrections any time the blade started to wander, and as a result my finished pieces ended up with jagged edges that needed to be painstakingly sanded down by hand. While this technique sufficed for simple projects, I found that I had insufficient control over the direction of the blade to do anything complicated, since my cuts ended up much sloppier than those that my colleagues made.

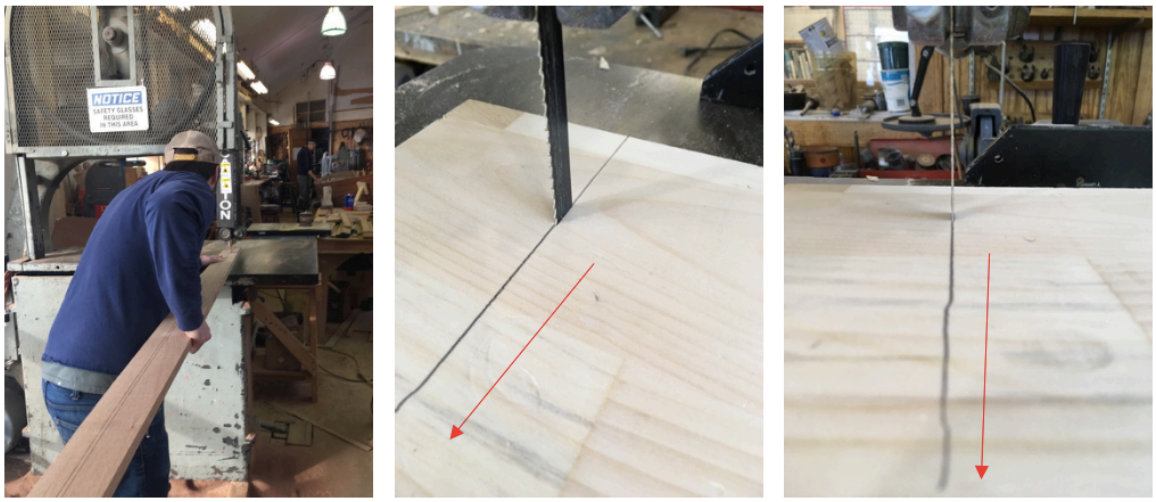

Figure 24: Jay's stance at the bandsaw (left); line viewed from above (middle) and from eye-level (right). Red arrow indicates direction of cut.

Frustrated by my ugly bandsaw cuts, I made a point to watch how other people used the tool, looking for some way to improve my technique. Other people, particularly Jay, usually held themselves in front of the machine in a particular posture, with eyes close to the level of the cut (Figure 24, left) rather than hovering over it as I had done. This position confused me at first, as I imagined that it would obscure the shape of the line, which a view from above presented as a whole (Figure 24, middle). After adopting this

stance, though, I realised that the point of it was not to see the entire pencil line, as I had been attempting, but to position the board such that the pencil line appears directly in front of the blade (Figure 24, right). Cutting a board with a view from above meant that I had been adjusting to account for inevitable errors, rather than feeding the line into the blade from the right position in the first place.

To the seasoned volunteers in the workshop, Jay's method was common sense, as Mitch and Ray brought up in our interview:

> MITCH: … if you've got a line, you're trying to make sure you're going to make a cut to follow that line, you have to get your eyes — or your nose, really — right in the middle of that line, between the line and the blade. If you're over here [indicates up, above the cutting surface] then it's not going to be accurate.
>
> RAY: You're reacting, not acting.
>
> MITCH: … That's why you want to get in that position. So that's a basic learning thing.

As Ray pointed out, by adjusting the angle of the cut when I saw it had gone astray, I had been reacting to mistakes I had already made rather than preventing them entirely. Copying Jay's crouched position allowed me to realise that I could feed the line into the blade from the start, avoiding mistakes before they happened rather than compensating for them afterward. Again, the strategy through which I had come to this new way of seeing was clearly occurrent, in that I initially did not understand why Jay held his body the way he did. I copied the angle at which he stood hoping that the reason for it would become clear, and in so doing, came to see the relationship between tool and material in a new way.

Not every strategy for positioning my body during work came to me by interacting with

or imitating others, as I also developed strategies for managing perspectives on my own when the need arose. For example, while I had realised on *Integrity* that my Forstner drill bit (described in detail in section 5.3; see Figure 28) would bind if I accidentally tipped it to one side, the angle of the bit was difficult to see when looking directly down at it. Not only did the body of the drill obscure my view of the bit, but the minute differences in angle were difficult to see from above, where they produced only minor changes in my field of vision. To reliably correct the problem, I needed to find a perspective from which the angle of the bit was more clearly apparent.

By the time I arrived at *Integrity*, I had already learned that the answer to many perceptual dilemmas involved re-arranging the body such that a new, more meaningful perspective became clear. At Riverside, sometimes these perspectives were explained to me, and sometimes I discovered them by mimicking others. On *Integrity*, though, I wanted to figure out the problem with the Forstner bit on my own, as I was embarrassed to ask Harvey to show me how to look down at the driver, given that I had arrived on the ship under the premise that I already had some practical experience. I attempted a decidedly occurrent strategy, moving my head into random positions around the drill until some meaningful aspect of it caught my attention. The tactic I discovered was to position myself slightly to one side of the work piece, so that the drill bit took a more prominent place in my field of view. Moving my head to the side while I drilled made the tilt of the tool much more apparent, as shown in Figure 25,[16] where I have craned my neck to the left in order to watch for tilt along the x-axis. This strategy did not make tilt along the y-axis any more obvious, but I found that eliminating one of

[16] Note that Figure 25 shows a different bit than the Forstner bit I have been describing. This longer auger bit illustrates the concept more clearly.

the two variables still helped significantly. When I really struggled drilling a particular hole, I would ask Harvey to stand to the side and watch for tilt along the axis I was unable to see.

Figure 25: My view from above the drill (left) with x/y axes labelled (right)

This technique of viewing the drill bit from the side relied upon a more intricate interweaving of circumspective and occurrent understanding than in the previous two examples. In the earlier examples, my occurrent strategy for positioning my body preceded my circumspective understanding, which then took place within the perspective that resulted; I memorised what seemed like an arbitrary bodily stance, then realised how that stance allowed me to see a greater depth of meaning in my work. In this example, by contrast, I began with a circumspective understanding of the drill, its angle, and the qualities of the wood I was drilling. I fully understood that deviating from perpendicular would cause the drill to bind, but still struggled to see the angle of the bit.

This problem led me to experiment with the position of my head relative to the tool and the workpiece, an occurrent take on the relative positions of objects in space, rather than as contextually-defined meaningful entities. Having devised a strategy in this occurrent mode, I found that craning my head to one side did, in fact, better support circumspective perception.

I maintain that the understanding displayed in the wooden boat workshop is primarily circumspective, in which objects immediately appear to their users in terms of their contextual purpose. Throughout this section, though, I have suggested that occurrent understanding – that which divorces objects from their usual context – is sometimes important as well, in as far as it introduces new perspectives for circumspective perception. This interpretation adds a new purpose for occurrent understanding, which Heidegger mainly connects to the inspection of practical objects when the meaningful relationships between them begin to break down (1927/1962, p. 103). Instead, I found that bodily stances and the arrangement of objects in space were the focus of my occurrent understanding, and that adopting initially-meaningless new stances allowed me to learn useful new perspectives for circumspective sight.

5.3 Circumspection and the other senses

My account of understanding in the workshop has so far focused entirely on sight, a sensory modality that proved to be central to my experience of work. Touch, hearing, and smell played parts in my interpretation of objects in the workshop as well, though, and I learned to experience greater depth of meaning in objects with these senses in much the same way I did through seeing them. Heidegger also insists upon the

importance of the other senses, clarifying that the 'sight' of circumspection need not be visual, but rather anything that 'lets entities which are accessible to it be encountered unconcealedly in themselves' (1927/1962, p. 187).

My impression is that I began making sense from tactile sensation later than I did from visual stimuli, perhaps because I initially did more observing than working hands-on. Towards the end of my stay at Riverside, however, my deepening interactions with complicated tools and materials meant that I needed to rely more on non-visual senses as well. One of these more complex projects was the construction of a set of 'cradles' for moving the skylights back onto *Hercules* once they were completed (Figure 26). This was a simple project using coarse materials, but the cradles would play a key part in the delicate process of moving the skylights onto the ship by crane, so the project entailed an exciting new level of responsibility. I was determined to do an excellent job on them to show how much I had learned in the workshop so far.

Figure 26: The cradles under construction (left), and the cradles in use (right)

The construction process for the cradles involved laying out four thick timbers to form a square with overlapping sides (see Figure 26, left), then screwing the timbers together

where they met. My instructions were to drill a wide clear hole in the upper timber for the body of the screw to pass through, then a narrower pilot hole in the lower timber where its threads would engage the wood. This way, as the screw sank into the lower timber, it would pinch the two timbers together, forming a strong joint. I went straight to work drilling out holes and installing screws until Lou interrupted me, as I recorded in my fieldwork notes:

> … when I got the head of the screw to the surface of the board, Lou stopped me, saying that the driver had so much torque it would actually shear the screw once the screw had sunk far enough. I commented that I didn't know if it was in far enough, because it hadn't pulled the lower timber up to connect with the upper timber yet; after all, the hole in the top timber was only a clear-hole. He replied that maybe I had some room to go yet, and that I'd 'get a feel for it' as I went.

The problem that Lou was pointing out was that I was attempting to determine whether the screws were tight enough by watching the gap between the upper and lower timbers disappear. The timbers were warped and twisted, though, so flattening them together would have required enough pressure to twist them straight, much more than was needed simply to secure them. The driver was capable of applying that much pressure, but the steel screws were likely to shear if I tightened them that much. The strategy Lou was suggesting was to determine whether the screws were tight enough by paying attention to how the driver felt in my hands, rather than by looking at the gap between the timbers, which was an unreliable indicator.

At first I was sceptical of Lou's advice, since the driver exerted so much force that I struggled just to keep it in position, and the prospect of interpreting subtle differences in how it felt seemed unlikely. Bit by bit, though, it became apparent that the sense of the driver in my hand was not constant, but varied according to what obstacles the

screw encountered. If the screw provided little resistance going into the wood, I would feel little resistance from the driver, whereas finishing the last few turns on a tight screw required me to put my back and upper arms into holding the driver in place. I also came to recognise the sound of the tool when it encountered various levels of resistance, changing from a quick whir to a guttural, struggling growl. None of this meaning was apparent to me the first time I used the tool; while I must have been hearing and feeling the same things, I had yet to develop a meaningful framework in which to make sense of them. Reflecting over the sense of the tool in my hand, however, I found that there was more to be parsed from its noisy vibrations than I had initially realised. I puzzled over all of this while putting the cradles together, until Lou interrupted me again. 'Yep, you learned how to do that', he told me. 'That's all there is to it'. Apparently my work signalled that I had started to get 'the feel' that he had wanted me to get.

The experience of getting 'the feel' of the impact driver was, in one way, much like my earlier experiences of developing circumspective perception in the workshop, but instead of 'seeing as', I had begun to 'feel as'. At first, the sensations the driver produced had struck me as meaningless, merely distractions from the work of watching the screw as it progressed. As I came to better understand the driver and the materials I was working with, though, the feeling of the driver in my hands started to convey a sense of meaning. I could feel the tension on the screws and gauge when they were in danger of snapping in a similar way to how I had learned to see the purposes of different objects in the workshop.

A difference between seeing and feeling 'as', however, was that learning to see entailed overlaying meaning onto objects that were already apparent, whereas learning to feel

meant coming to perceive meaning from raw tactile sensation. In my early days in the workshop, before I learned the names and purposes of different tools, I still recognised them as discrete objects, even if their meaning was unclear. I once mistook a tool for cleaning electric buffing pads for a rubber band pistol (Figure 27), but I never questioned the size and shape of the object in question; I always experienced the sight I was seeing as the sight of *something*. By contrast, new tactile sensations often seemed meaningless at first. My hands on the drill registered its symphony of humming, shaking, and fitful jerking, but these sensations did not themselves bring a perceptual object to mind. It is difficult to even imagine a similar experience with sight, which would entail registering the sensation of light hitting the eye without having an object arise in the mind. In contrast, when Lou asked me to be mindful of the tension of the lag screws, the idea that the feeling of the tool was meaningful for the work I was doing had not yet occurred to me. I interpreted the pressure of the tool against my hand just as meaningless sensation, not as an indication of something to be considered and reacted to in its own right.

Figure 27: A tool for cleaning buffing pads

Heidegger's phenomenology does not provide much guidance for these sensory experiences that do not, at least at first, convey an object, as his account mainly relates to the perception of meaningful objects. To think about these initially meaningless sensations, it helps to incorporate Armstrong's distinction between 'mediate perception' and 'immediate perception', where the first describes the perception of an object, and the second describes sensation with no referent (1962, Chapter 2). In the visual examples at the start of this chapter (5.1), learning involved deepening my mediate perception of objects, seeing them with more meaning as I became familiar with their role in context. In the example of the tactile sensations of the electric driver, however, learning meant moving from immediate sensations to meaningful perception, a distinctly different category of experience. Over time, I learned to feel the tension on the screw being driven rather than just feeling the pressure of the driver against the palm, with an object coming to mind where previously none had.

As soon as I learned to interpret the vibration of the drill in my hands, the sense it conveyed was that of the tension between the screw and the pine timbers, as driven by the electric tool: a relational nexus at which tool and materials met, rather than a single static object (a phenomenon I explore further in the next section, 5.4). While this kind of perception allowed me to experience several meaningful aspects of the work at hand at once, it also meant that any alteration to the constellation of tools and materials changed the experience entirely, as I discovered upon moving from Riverside to *Integrity.* As the context changed, and with it the materials and purposes to which I had connected the driver in my mind, I found I could no longer read the sensations it produced at all.

I was proud of mastering the driver at Riverside, and when I moved to *Integrity,* I was eager to demonstrate what I had learned by taking over the drilling tasks for the fabrication of the cat-heads. Harvey needed holes drilled that were relatively large and perfectly straight, a combination that called for a 'Forstner' bit, the type more often used in a drill press (Figure 28). I confidently grabbed a driver similar to the one I had used at Riverside and got started, only to discover that what I had learned previously did not translate well to this new job. The reason why, I eventually realised, was that the driver itself was just one variable in the equation, which also included the drill bit and the material being worked. At Riverside, the pine timbers and steel lag screws were both very soft, so my main concern was breaking one or the other. All I needed to develop a 'feel' for was the change in resistance the screw encountered as it sank, which was signalled by a slight increase in the pressure on my palm.

Figure 28: Drilling out holes in a cat-head (left); close-up of the tool with Forstner bit attached (right).

On *Integrity*, however, the combination of the qualities of the white oak and the peculiar nature of the Forstner bit meant that I had to be aware of a very different set of possibilities. Since the oak was extremely hard, it pressed back against the drill bit, resisting its turning motion. If the force of this resistance overcame the force with which I was holding the driver, the driver itself would rotate rather than the bit, causing it to buck back against me and knock me off my feet. Normally this resistance would have been constant, and I could have prevented the tool from bucking just by learning how hard I needed to grip it. The design of the Forstner bit, however, meant that tipping the driver a few degrees in any direction increased the resistance it encountered significantly, so that if I accidentally changed the cutting angle at all, it would kick back violently. Getting 'the feel' therefore meant learning to differentiate between degrees of heavy resistance from the driver, determining when the force with which it pressed back indicated a clean cut, and when it meant the bit was about to bind up and buck.

The tactile sensations arising in my body were not my only non-visual sources of perception, although I relied on my other senses much less. Hearing, for instance, was also important in some situations, as I discovered while using the power-planer, a hand-held electrical tool for levelling wooden surfaces. At one point I was tasked with using the power-planer to level off the backs of the cat-heads, and since I knew it made an awful whining noise, I decided to wear foam ear plugs underneath my normal ear muffs. I worked at levelling the back of one cat-head for a while, but the process seemed unexpectedly slow and difficult. Ronny, who sometimes shared the *Integrity* workshop with us when his own ship needed repairs, happened to walk in while I was working, and mimed to me that the tool sounded wrong, making a sour expression while pointing

between the tool and his ears. At first I thought he meant that the normal sound of the tool was annoying, but he persisted with his gesturing, and I turned it off to ask what he was trying to say. The sound it was making was 'awful', he said, and something was probably wrong. Sure enough, I had run over a patch of wet epoxy and clogged up the blades, choking the motor and changing its pitch. It had not occurred to me that the sound of the motor might be important for my work, and my inability to interpret it nearly led me to destroy the tool.

This difference in attention to sounds in the workshop again points to the difference between 'looking at' and 'noticing' that I introduced in the first section of this chapter (5.1), although in this case the former might be renamed 'listening for'. Since I did not initially associate the sound of the tools in the workshop with distinct meanings, they blended into a single cacophony that I recognised only as distracting noise. Ronny, on the other hand, could not only pick out an individual sound in the workshop, but was so familiar with the tool that made it that a deviation in pitch caught his attention from across the room. Sound is perhaps even more amenable to 'noticing', as loud noises permeate one's experience as if by their own accord. Vision, by contrast, requires training the eyes on an object in order to notice it, even if only momentarily.

Finally, there were even some situations in which smell became meaningful, although it seemed to play a lesser role in the workshop than sight, touch, or hearing. Walking into the workshop and being greeted by the scent of fresh-cut Christmas trees meant that we would be working with pine, or some related construction-grade soft wood. Likewise, I learned to associate the smell of my dresser drawers – not something I had consciously registered before this experience – with the use of cedar. When I mentioned

this connection to Chris, he explained that dressers were often made of cedar to leave a fresh scent on clothes, and that he had the same association. Sometimes when I drilled into a painted piece of wood, it would kick up the citrusy smell of cedar or the fresh, minty scent of pine, announcing itself as its species before I could see the colour of the shavings that came off it. In these moments, unrecognisable blocks of painted material transformed into specific types of wood, and their hardness, texture, and colour instantly came to mind as well. I explore the perceived transformation of materials as their contextual relationships become clear in more detail in Chapter 6 (sections 6.1 – 6.2).

As with sight, getting a tactile 'feel' for tools and materials meant learning to interpret the relationships between them and the effect those relationships had on the work process underway. Unlike sight, however, touch produced no discrete, contextually-independent objects before I learned to properly interpret it; in the Discussion (Chapter 8), I link my difficulty learning to interpret meaning from sound and touch to the effects of 'visualism', the culturally-transmitted preference for understanding through vision (Paterson, 2007). Once I did learn to interpret the range of sensations coming from the tools and materials, what I perceived was the sense of material interactions rather than distinct objects, such as an over-tightened screw at risk of snapping or the binding of a Forstner bit against hard oak. As a result, using similar tools and materials in a new context required learning to interpret the entirely different tactile sensations produced within the new arrangement of objects and work tasks. I explore this relational perception of tools further in the following section.

5.4 Seeing the work, not the equipment

Throughout this chapter so far, I have phrased my account in terms of learning to see and feel objects in the workshop in meaningful, context-specific ways. Some of the more complex examples, however, raise the question of whether this sort of perception reveals the object *per se*, or if the sense of objects as discrete entities is overshadowed by a sense of their relationships to one another. For instance, in using the impact driver at Riverside, I learned to feel the tension on a screw as it pulled together pieces of pine. In one sense, I was feeling the driver in my hands, but in another I was feeling the combination of screw and wood that the sensation of the driver brought to mind.

This idea of perceiving the relationships between objects rather than the individual objects themselves was brought to my attention by my interview participants before it occurred to me based on my own experience. In response to questions like 'What tools and materials is ['the feel'] particularly connected to?' (See Appendix A: Interview Schedule), boat builders sometimes produced specific examples – a particular hand tool, or a species of wood – but often pushed back on the question, explaining instead that their attention was filled with the work as a whole. Mitch and Ray provided one such response:

> ME: Now, say something like this bandsaw; when you're using it, where's the focus of your attention? On the blade? On your hands? On the wood? ...
>
> MITCH: I mean, I know where my hands are… but I'm focusing on where the material is, where the line is, relative to the blade. And more important, where it's going to be in the next couple seconds, what adjustments do I have to make in order to keep that exactly where I want it. …
>
> RAY: [Nodding] I think I'm more conscious of the work I'm working on, not the tool.

Mitch particularly draws out the relational nature of his perception in this excerpt, with the idea that his focus is on the point at which the blade and pencil line meet. This point is constantly in motion as the materials change in response to being worked, calling Mitch to attend to an unfolding process, rather than a static set of objects.

Heidegger points to a similar perceptual focus on work over equipment in explaining that the interconnectedness of equipment means that no individual piece of it is ever seen on its own:

> That with which our every-day dealings proximally dwell is not the tools themselves. On the contrary, that with which we concern ourselves is primarily the work – that which is to be produced at the time… The work bears with it that referential totality within which the equipment is encountered. (1927/1962, p. 99)

Since the 'referential totality' of meaningful relationships is what determines how objects are perceived, it follows that to perceive an object is primarily to perceive these relationships rather than a sense of it as independent from its context. And yet, a relational notion of perception is at first counter-intuitive, as it is not immediately obvious how a relationship is something that can be perceived. In my earlier examples, perception always referred to a single physical object, even if that object was coloured by the context in which it existed.

I found some guidance for this question of the experience of relational perception in considering another idea that came up repeatedly in my interviews, that familiarity with tools led to the sense that they faded into the body during use, as Lou described:

> LOU: … I like to say that you have to be part of the tool; it has to become you. You're not holding the plane; the plane becomes part of you. So a lot of times I watch people, and it seems like they're fumbling with this item, rather than that item being an extension of themselves, and I think that's

> where some of the skill comes in. You learn to use something… you learn and learn, and it becomes so second nature that you can pick it up and it becomes just part of you.

To an extent, I had expected this sort of description of experience in the workshop, based on having read Heidegger's account of equipment 'withdrawing' from attention once its user fully understands the context in which it exists (1927/1962, p. 99). To call Lou's description an example of 'withdrawal', however, would be to imply that his hand-plane simply ceased to be perceived, somehow retreating into an automatic process of which he was not aware. While the plane did cease to register in Lou's attention as its own discrete object, that was not because the plane had disappeared; rather, it was because the plane had become part of Lou's perceptual apparatus for examining the external world, as I observed watching Lou use a large, unwieldy 'slick' chisel to remove a pocket of wood rot (Figure 29):

> What Lou had to do was bring the rotten, uneven wood down to the level of the adjacent good piece. He placed the slick flat against the good piece and pushed forward, running it into the rotten piece and sending up curls of old wood. … I asked how Lou knew he was at the right depth, and he responded, 'I can feel it', pointing to the place where the bottom of the slick lay flat against the reference surface.

Mitch, who was also watching, seemed as impressed as I was, remarking to Lou that he 'could probably shave with that thing'. 'You could', Lou replied, humbly mistaking the compliment as a comment on the sharpness of the tool. '*You* could', stressed Mitch, '*I* couldn't. I'd probably slit my throat'.

Because Lou was very familiar with the use of the slick chisel, he was able to feel the surface of the wood he was working through the tool, rather than only perceiving the tool itself. Merleau-Ponty explains this kind of perception with his idea of 'bodily synthesis' (Merleau-Ponty, 1945/2002, p. 176), in which one comes to understand tools

as one normally understands the body, as a lens through which to perceive the world rather than as an object upon which the attention is focused (1945/2002). In light of this idea from Merleau-Ponty, the slick does not 'withdraw' so much as it becomes integrated into Lou's most fundamental way of understanding the world, that for which the body is the ultimate precedent. The idea of bodily synthesis therefore illuminates one aspect of the relationality of perception, that some objects present other objects to our attention rather than presenting themselves, much as the hands reveal the sensation of an object touched rather than the sense of their own weight and texture.

Figure 29: Lou at work with a large 'slick' chisel

Yet in using the slick to feel the level of wood he was shaping, Lou accomplished more than feeling through the tool to sense the material as he would with his hands; instead, he relied on the specific properties of the tool to examine aspects of the work that his hands could never reveal, features of the interface between tool and material rather

than just the material alone. Since the bottom of the slick was a completely flat edge, Lou could feel where the uneven rot pocket he was removing finally gave way to the smooth surface produced by the slick, sensing the level of the wood by the way the tool sat on the work piece. When I had done similar work with smaller chisels, I had needed to regularly stop what I was doing to check the level of the wood with a ruler, looking for gaps between the ruler's edge and the work surface that showed high spots I still needed to remove. Lou, by contrast, could sense the interface between the slick and the wood surface through the sensations that the tool produced in his hands, not only feeling through the tool, but feeling aspects of the work that only the tool could show him.

In my early days in the workshop, I struggled to develop this relational way of perceiving tools and materials, unable to feel much more than the shape and weight of them in my hands. While I cannot say I mastered any particular tool over the course of my fieldwork, I did eventually begin to experience certain tools in more familiar ways, such as the thin-kerf handsaw I used to trim down wooden 'bungs'. The process involved fashioning tiny wooden plugs, setting them in place with wood glue, then sawing off the protruding ends once they had dried (Figure 30). While at first I managed to 'fumble' with the saw just adequately enough to get the work done, my attention was mostly devoted to the saw itself and the way I had to contort my body to use it, as I noted in my fieldwork notes:

> I found myself tensing my hand as I used it, trying to keep it steady while applying the necessary pressure to cut back and forth; as a result, my hand cramped up within minutes. … When I wrapped my hand around the saw handle rather than pressing down on it with my pointer finger, it felt unwieldy and bound against the material constantly. … I was only really able to keep it from binding (and therefore stopping mid-push) by tensing up my body and making little back-and-forth cuts, which I suspect is amateurish.

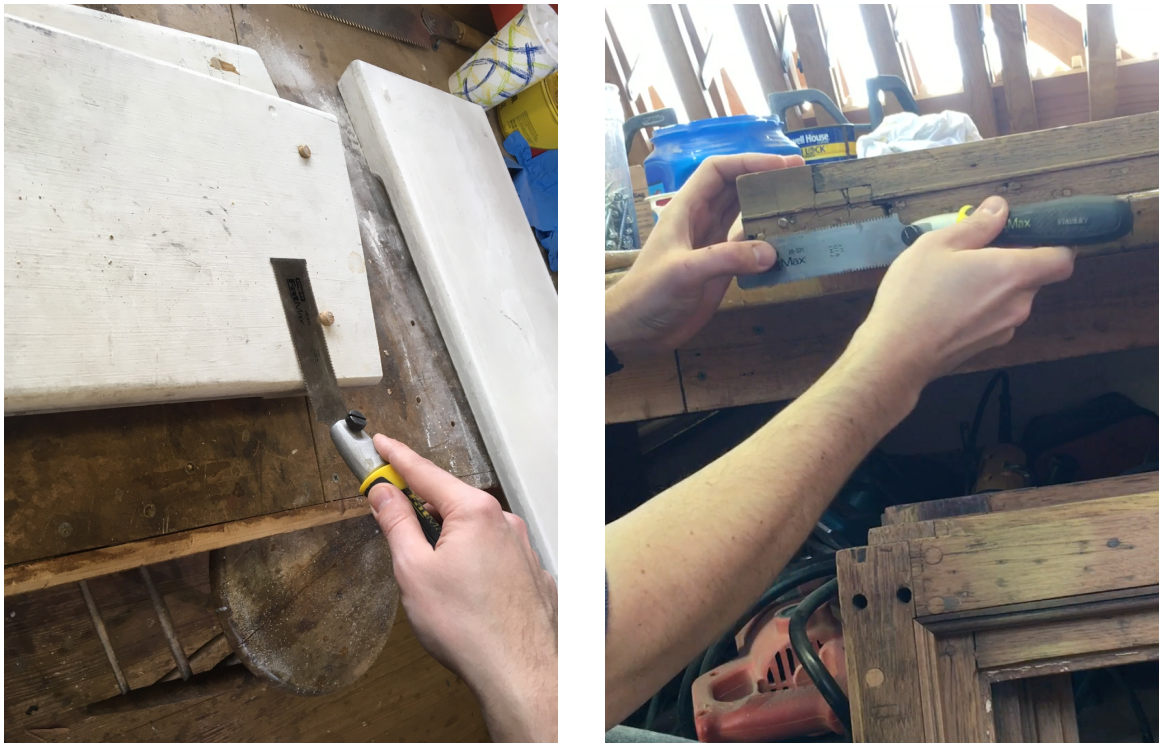

Figure 30: My original grip on the thin-kerf saw (left), and after becoming more comfortable with it (right)

Struggling through these first few bungs, I focused almost entirely on the saw, trying to figure out why it kept binding against the wood. It jerked back and forth across the bung, giving no obvious indication of when it would get stuck, when it would glide through easily, and when the line it cut would change directions. I kept my hand rigid in an attempt to control the angle of the cut (Figure 30, left), but the tendons across its top quickly got sore from the constant tension, and I needed frequent breaks to let my hand relax. I managed the work, but the results were imprecise, and the pain in my hand lingered into the evening.

I carried on doing bunging work anytime it came up, though, and eventually my sense of the thin-kerf saw changed. Two weeks after first encountering it, I noted that it demanded less of my attention, allowing me to better focus on the process rather than just the tool:

> I seem to have made enough progress with the zero-kerf saw that my grip on it, the feeling of it in my hand, and even my sense that it is there have largely disappeared. Instead, I watch just the cutting edge of it, seeing it not so much as a tool but rather as the advancing line being cut into the wood; it is the cut I am watching, not the blade. Occasionally it snags on some rough patch or bit of glue, pulling my attention back to it, but I find that when I have cleaned it recently (it gets filled with wood glue and then behaves poorly) it eases out of perception, leaving only the changing materials.

My photos from this day show a much softer grip on the saw, cradling it in my palm rather than choking it between two fingers (Figure 30, right). Meanwhile, my left hand had come into play as well, flattening the saw blade against the work surface to ensure a level cut. It is remarkable that I did not register the other hand in my notes, as my attention was entirely on the progressing cut. In the excerpt above, I remark that the saw had 'largely disappeared', but in light of ideas from Heidegger and Merleau-Ponty, a more precise interpretation is that I came to experience the work that my hand, saw, and material produced in combination, rather than attending to each as its own discrete object. My sense of my body, the tool, and the material all collapsed into a single perception of the progressing cut, the work that defined each of its constituent components in this particular context.

In the previous sections of this chapter, I introduced the idea that perception in the workshop can be described as seeing and feeling 'as', perceiving objects in terms of their meanings in context. In this section, I have described how through becoming more familiar with the workshop, the relationships that I had learned to see in objects eventually overshadowed those very objects themselves. The progress in work came to fill my attention rather than the individual objects that I manipulated, and the tool in my hand changed from the object of my attention to the lens through which my attention was focused. Rather than contradicting my initial ideas about 'seeing as', though, this

experience illustrates their ultimate instantiation. I had started to understand things in the way that would be most important for my work, in terms of the unfolding process that defined them.

Chapter conclusion

In this chapter I have shown how my learning in the wooden boat workshop involved coming to perceive tools and materials in new, more meaningful ways. The first signs of this learning were starting to 'see as', recognising objects in terms of the roles they play in work. While this phenomenon largely aligns with Heidegger's concept of circumspection, I have stressed here that an important difference in my account is the gradual accumulation of layers of meaning, rather than an instant recognition of the 'totality of involvements' that Heidegger describes (1927/1962, p. 149). As I will explain in the discussion (Chapter 8), I suspect that Heidegger's lack of emphasis on the gradated nature of circumspective understanding has led several previous authors to identify circumspection as the end product of learning, and occurrent understanding as that which necessarily precedes it. I insist otherwise, that occurrent understanding is an entirely separate mode of understanding, in which objects are purposely divorced from their meaning in context in order to better consider newly-discovered relationships between them. As my examples show, this occurrent way of perceiving objects requires purposeful determination in order to step back from the more fundamental circumspective mode.

At the end of the chapter, I follow the idea of circumspection to its logical conclusion, that perceiving objects in terms of their meaning in context means understanding them

in purely relational terms, rather than as discretely-bounded entities. The examples here show how the much-cited phenomenon of objects 'disappearing' or 'withdrawing' from consciousness (see Literature Review, Chapter 2) captures the bodily synthesis that occurs by incorporating tools into the sense of the self, but poorly represents the relational perception that results. A better description, I argue, is that circumspection allows the wooden boat builder to perceive the interface at which tools and material meet, revealing an interaction between tool, materials, and the body rather than a sense of them as discrete entities. Combining ideas about bodily synthesis from Merleau-Ponty (1945/2002) with ideas about relational perception from Heidegger (1927/1962) has allowed me to move beyond discussion of the sense objects disappearing to exploration of the relational sense of object-interaction that appears in their place (see Discussion, Chapter 8).

In the next chapter, I illustrate another consequence of relational perception, that meaningful objects are perceived as transforming in the eyes of the learner as the purposes that define them become clear. Because the perception of tools and materials is determined by the context in which they are used, increasingly familiarity with that context leads objects to appear to combine or split apart as their defining purposes demand, changing before the craftsperson as he or she 'gets the feel'. In addition to exploring this new aspect of perception, I will shift my attention to learning from the self-motivated exploration of tools and materials that I described in this chapter to guidance from experts in the chapter that follows. In brief, I will describe a pedagogical method by which experts put new boat builders into positions in which the malleability of the being of practical objects becomes clear.

6. ‘The feel’ and the constitution of objects in perception

In the previous chapter, I showed how boat builders perceive their tools and materials circumspectively, in terms of the practical purposes that define those objects within the workshop; as Heidegger explains, useful objects appear within an individual’s phenomenal world as components of familiar practices, rather than solely in terms of their material properties. In this chapter, I illustrate a consequence of this circumspective understanding, that ‘getting the feel’ entails allowing objects to transform in perception as their contextual purposes become clear. Learning wooden boat building involves watching certain objects come into existence or split apart as newly-discovered practices demand, presenting themselves to their users as functions of complex systems rather than solely as static material entities (6.1 – 6.2). New boat builders must also learn to see objects in multiple ways at once, simultaneously looking at boat components as parts of the whole vessel and as distinct wholes unto themselves, so that the variety of interconnected parts can properly coalesce into a coherent product (6.3 – 6.4). Since all of this perceptual transformation is difficult for expert boat builders to put into words, teaching is often accomplished through experts putting novices into instructive situations, where the necessary ways of perceiving equipment become apparent on their own.

6.1 The contextual definition of tools and materials

Travelling to and from the workshop in the early days of the East Coast spring inevitably meant contending with some nasty weather, and transportation disruptions occasionally meant that I arrived to work later than I had intended. On one of these days, walking into the workshop around 9:45, I was struck by the contrast between the chaos of slushy

streets filled with frantic commuters and the relative peace of the workshop, where everyone was already deep in concentration. The space rumbled along with its usual cacophony of power drills and wood-shaping machines, but within this raucousness was the meditative stillness of the boat builders engrossed in their work. I took a brief moment in the doorway to appreciate this striking peacefulness before I set out to find my task for the day.

Figure 31: The disorganised wood pile (left); Chris identifies wood by its species (right)

In the far corner of the workshop, I saw that Chris was in the middle of some sort of organisational project, surrounded by off-cuts of wood and apparently sorting them into piles. He had established himself at a spot on the floor near the north wall of the workshop, where the Riverside wood supply was stored on tall scaffolding (Figure 31, left). I knew from helping out with various projects that there was a supposed logic to the wood pile, but that in actuality, it was a jumble of old and new planks, off-cuts on top of virgin stock. The reason for this disorganisation was that much of the wood was quite heavy, and no one ever felt like removing all of it to file away some small piece in a logical place. Instead, the pile accumulated in layers of sediment, the most visible

related to more recent projects, and the planks on the bottom familiar only to the oldest staff, if even they could remember. The provenance of some planks at the bottom of the pile was a mystery to everyone.

Seeing Chris next to a half-bare shelf, surrounded by little piles of similar-looking wood (Figure 31, right), I immediately intuited the task he had been assigned, which was to organise the wood by species. It was worthwhile work, certainly, as everyone had at some point grumbled about the lack of organisation within the wood store. Chris was being assisted by a new volunteer, an older man I had never seen before whom Chris had clearly taken on as a sort of pupil. Walking over to join them, I saw that Chris was declaring different chunks to be poplar, cedar, or pine, then handing them to his assistant to be distributed into their respective piles, which were starting to form a circle surrounding the two men. There was clearly an element of thinking aloud in this identification process, in which Chris sometimes recognised a piece immediately, and other times held it up to his eyes, adjusting his glasses and squinting at some minute feature.

To some extent, Chris had clearly been given the work of sorting the wood pile because there was little else to assign him on such a quiet day. At the same time, however, this was the sort of practice that allowed Chris to test out his growing understanding of boat-building materials and ask for clarification when he was confused, reinforcing his understanding while also expanding it at the margins. Much of the 'teaching' that took place at Riverside followed this formula, in which an expert in the workshop would assign a task to a relative novice that was just within his or her capability, leaving room for the sort of fruitful confusion that would allow the person to learn. Teaching in this

way spoke to a pedagogical constraint around one-on-one instruction in the workshop, as Nick explained during our interview, using Chris as an example:

> NICK: I try to teach Chris — I have a hard time sometimes, I don't explain it well, sometimes, just because it's intuitive for me now, and it's hard to express it.

It would be difficult for someone like Nick to explain the differences in wood species to a relative novice like Chris, since Nick differentiated between them on an 'intuitive' level, seeing them for what they were in context rather than deliberately considering them. Such perceptual understanding came from repeated exposure to the materials in context rather than explicit instruction, making organisational tasks like the one Chris was assigned excellent pedagogical exercises.

Curious about what Chris was seeing in each piece as he worked his way through the main pile of wood, I asked him how he was carrying out the identification process. His response was 'it depends': some species, such as pine, were instantly recognisable, while others required investigation, examining the different physical characteristics until one gave away a telling clue. Colour could be one such indicator, he explained; poplar is yellow or cream, often with hints of brown or green, while exotic hardwoods like mahogany or teak are much darker. Scent can also reveal the species of wood, with the fresh and earthy smell of cedar setting it clearly apart from the crisp high notes of pine. The grain of the wood is a third tell-tale, as species differ in grain density, porousness, and patterning. Each piece that Chris used as an example received a final pronouncement before being shuffled into its proper pile while the new volunteer and I looked on, admiring Chris' mastery of wood taxonomy. Even though he was still an apprentice, Chris had clearly memorised a wealth of technical details.

Chris' strategies for wood identification corresponded to the two modes of understanding that I explained in the previous chapter, with familiar wood appearing circumspectively as its species and unfamiliar wood requiring occurrent deliberation. Asking Chris to identify a piece of pine or oak was like asking him to identify a common object like a shoe or a pencil; the answer was so obvious that I was almost embarrassed to have asked. With rarer kinds of wood, Chris would debate the possibilities aloud, announcing various characteristics until one or a combination of them struck him as definitive. Watching Chris grapple with more unfamiliar pieces of wood, at first it seemed as if the occurrent aspects he examined were clues that he would eventually come to recognise instantly, and that the circumspective perception he exhibited was merely a faster processing of the same information. Thinking through an incident that occurred that morning, however, has returned me to a conclusion from the previous chapter (section 5.2), that circumspective understanding is an entirely different mode of understanding objects, not just the end-point one reaches when he or she becomes fully familiar with the work. This difference in the kind of understanding, rather than the degree, struck me while watching Chris and Lou debate the species of a hard-to-identify wood scrap.

It was a small, sandy-coloured chuck of soft wood that confused Chris, not so much because it failed to track onto his taxonomy, but because it could have belonged in several categories. It was light enough in colour and in weight to be something like pine or fir, but scuffed enough on its surface that the grain was obscured, making a definitive judgement difficult. Mitch and Ray, who were hanging out nearby, overhead Chris puzzling over this wood scrap and tried to weigh in, but were also unable to produce a

conclusive answer. Curious now, we collectively brought the question to Lou, as I recorded in my notes from the day:

> Mitch chimed in that 'Lou can always tell', a testament to Lou's superior experience and know-how … Lou heard this and walked over, and while still a few feet away, asserted 'it's poplar.' … I asked Lou how he knew it was poplar, and he gave a great response: 'I can tell because of how it is. It's different. That's all I can tell ya.'…

Lou's mode of understanding the wood in question was clearly circumspective, given how the wood appeared to him immediately and from a distance. And yet, Lou's understanding seemed somehow underdeveloped compared to Chris' occurrent approach, which was more studious and focused. As Mitch pointed out in response to Lou's assessment, the circumspective method of identifying wood presented more room for error:

> Mitch made a good point: 'It could be sassafras', he said, choosing an unusual wood that we would be highly unlikely to have in the workshop. ... Lou, to my surprise, agreed: 'It could be sassafras, but we don't have any of that, so it's not'.

Mitch's idea that the wood could be sassafras perfectly illustrates the difference between the occurrent and circumspective modes. Consulting an online reference ("The Wood Database," 2008) after work that day, I noted that sassafras has many of the same characteristics as poplar, with a similar straight grain of 'paler yellowish brown', indicating that the two species might be easily confused. At the time, however, Mitch's suggestion sounded ridiculous, since sassafras was not a name that was ever brought up in the workshop, at least in my time there. Indeed, Mitch's comment was meant to point out exactly this logical disconnect: while everyone acknowledged that the piece had characteristics that could have mapped onto any one of a number of more unusual soft woods, the relatively greater plausibility of it being poplar made it appear to him as

such. It was not just familiarity with the physical characteristics of the wood that made it appear as poplar, but rather familiarity with the workshop and the activities within it.

Figure 32: Bung-holes to be filled (left); a cup of newly-fashioned bungs (right)

It was through examples like that with the scrap of poplar/sassafras that it eventually occurred to me how deeply the context in which objects exist define their nature in the eyes of the perceiver. Even when sensory clues were totally removed, some objects presented themselves with particular meanings based solely on how they were used, as was apparent in another interaction in the workshop, this time with Nick. He had asked me to bung some old screw holes on the rowboat 'thwarts', or bench seats, work I had done several times already at that point (Figure 32). I knew that I would need to drill the old screw hole to a standard diameter, fashion suitable bungs, then fit the bungs with wood glue and saw them flush. Nick walked me through the specifics anyway, telling me to begin by sanding down the old paint before I set out making bungs, handing me what I took to be a wooden sanding block. When I asked how I would determine what kind of wood to use to make bungs – the species of wood for the bungs needed to match that

of the thwarts, after all, so that both would expand and contract at the same rate – he gave me a confused look, then pointed to the wood in my hand. He was already a step ahead of me, it turned out; the block he had given me was not a sanding block, but a piece of pine stock to match the pine of the thwarts. Despite the fact that the thwarts were covered in many years' worth of thick paint, obscuring their physical characteristics, it somehow went without saying that they were pine. How Nick knew that, though, was a mystery to me at the time.

As I pressed my drill bit into the first thwart to widen out the screw-hole, the soft flesh of the wood presented only a spongy, soft resistance, a classic characteristic of pine wood. As the first curls of sawdust began to fly off the spinning bit, the clean scent of pine rose up from it as well, further confirming Nick's initial assessment. Yet how Nick had determined that the thwart was pine was still unclear to me, since he had not had access to any of these sensory experiences. Perhaps he had built the rowboats himself, and remembered what wood he had used? While this was possible, it seemed an unlikely basis for all of Nick's decisions, since there were too many artefacts in the workshop for him to have worked on all of them in his time there. Perhaps some telling aspect of the wood was visible under the thick layer of white paint? Again, this seemed unlikely, since only the faintest outline of wood grain showed through.

I found an answer to my puzzle over Nick's ability to identify the pine of the rowboat thwarts when I surprised myself by performing a similar sort of circumspective seeing on my own a few days later. I was still working on refinishing the rowboat thwarts, which by that point meant painting them with another layer of matte white. Painting the dozen or so thwarts and related bits of trim required setting up a pair of sawhorses in the middle

of the workshop, putting me just a couple of feet away from Mitch and Ray, who were busy running a series of long planks through the planer. Another one of the older volunteers, coffee in hand, came over to chat with Mitch and Ray as they worked, and casually asked why they were milling down so much teak. In retrospect, his guess at the species made sense, as both teak and mahogany (the correct answer) have quite similar colouring, especially when viewed from a distance. Yet the suggestion that Mitch and Ray, two volunteers, would be handling twelve-foot lengths of teak struck them and I as comical, given the preciousness of teak in the workshop. Lou, who was working with much smaller lengths of teak in the restoration of the skylights, had brought in a hand-held vacuum to collect the sawdust he produced so that even that did not go to waste; seeing this volume of wood being worked by two volunteers meant that it could not be anything so valuable. It was not the physical properties of the wood itself, therefore, upon which I made my split-second judgement of its species, but rather the way in which it was being handled.

Returning to my puzzlement over Nick identifying the species of the wooden rowboat thwarts, I see now that there were few options for the species of the wood other than pine. The rowboats were of inexpensive, simple construction, and the thwarts required minimal material strength, making pine the obvious choice. Of course, Nick could have been proven wrong; perhaps some inexperienced volunteer had accidentally fashioned the thwarts from maple or oak, then painted them before anyone had the chance to notice. From an occurrent perspective, in which the physical properties of objects define them, Nick would then have realised that he had originally held an inaccurate assumption about the object in question. The wooden rowboat thwart would not have

changed, since it remained a static object in the extant material world, unaffected by Nick's ideas about it. In circumspective terms, however, the object itself would have been transformed as Nick 'realised' it differently, in the sense of making it 'real' in his perception. In circumspection, since the context in which an object exists helps to define it, objects are less permanent than they appear, and are liable to this kind of radical transformation. Although circumspection therefore presents a constant risk of misidentification, it is also the only perspective from which certain objects can be seen at all, as I explain in the following section.

6.2 'Realising' the existence of contextually-dependent objects

In examples like that of Lou seeing our scrap of wood as poplar, it would make little practical difference whether Lou based his judgement on his initial circumspective encounter with it or on a more deliberate, occurrent investigation. Even if looking at the wood under a magnifying glass revealed that it was in fact a hybrid of poplar and fir rather than pure poplar, it would continue to be a light-coloured, inexpensive softwood. In other cases, however, taking a circumspective perspective on materials entails a more radical transformation, conjuring new objects in one's phenomenal world rather than simply redefining what was already present. In the examples that follow, learning to work with different materials leads me to 'realise' several new objects entirely, calling them into existence in the world I perceived around me.

One such instance of realising new objects took place while working on *Integrity*, where a conversation with Harvey produced a radical transformation in my sense of the wood we were using. As I have explained previously, I convinced Harvey to take me on as an

assistant partly under the premise that I would have several months' experience working with wood when I arrived. This was indeed the case, and everything I had learned at Riverside served me well as I moved onto the much bigger ship. Ships' carpentry is a complex field, however, as evidenced by the fact that even after three months at Riverside, I was still encountering very basic elements of the work for the first time; in these moments, Harvey sometimes seemed surprised at the gaps in my knowledge. One of these gaps became apparent when he asked me to trim the excess 'sapwood' off the planks we were going to use for the cat-heads. I knew the basics of milling wood, and I knew that I would have to pass these planks over the table saw in order to remove the parts that Harvey was referring to, but during his initial explanation, I simply could not see what he referred to as 'sapwood'.

With the benefit of hindsight, I can now explain that Harvey wanted me to separate the two constitute components of a plank of wood, the 'sapwood' and the 'heartwood'. The sapwood is the new growth on the trunk of a tree, the soft structure that transports water and nutrients from the roots to the leaves. As the tree grows, the sapwood ossifies into heartwood, a denser and dryer material that forms the rigid internal structure of the tree as a new layer of sapwood grows beyond it. Harvey insisted that we only use pure heartwood for the cat-heads because its density gives it better resistance against moisture and rot; since the sapwood is, by its nature, good at transporting water, it is terrible for the construction of ships. To Harvey, the danger that the sapwood posed made it stand out within the expensive wood stock, which had already been selected for its high proportion of heartwood. Judging by his reaction to noticing rogue patches of sapwood, the way that the sapwood struck Harvey was not unlike how I

learned to see lead paint in the previous chapter (section 5.1), with it grabbing my attention as if by its own accord.

Figure 33: A stripe of heartwood between two marker lines (left); the end-grain, another visual clue (right)

I, on the other hand, initially could not see the sapwood at all. When Harvey discovered that I had no idea what he was talking about when he referred to the two parts of the wood, he attempted to mark out an example on a nearby plank, highlighting the heartwood between two lines that he drew (Figure 33, left). Watching him carefully draw on the wood was almost comical to me, however, since their position seemed entirely arbitrary; the situation felt like a practical joke. Having narrowly avoided being sent to find the 'board stretcher' at Riverside when a plank I cut ended up too short, I was wary of such pranks, and suspected that this so-called 'heartwood' might be part of another. But Harvey insisted, and slowly I came to see what he meant. In between the two lines he had drawn, the colour of the wood was a little darker, and the grain was

slightly denser. Looking at the end-grain of the plank later helped solidify my understanding, as the bottom showed more clearly where dense central rings gave way to thicker new growth (Figure 33, right).

In the first few days, my approach to finding sapwood was decidedly occurrent. Laying a plank on the work bench, I would try to find a point where the darker heartwood definitively ended, giving way to the pale sapwood next to it. In these early attempts, the plank remained a single object, with a gradient from dark to light running lengthwise across it. I would then make a somewhat arbitrary decision about where the heartwood ended, marking out in pencil some distinctive feature that I had decided signalled the transition from one substance to the other. As time went on, though, the wood began to split into two distinct halves when I looked at it, producing two objects where I had initially seen only one. The sapwood struck me in the same way as the peel of an orange, a necessary component of the entity as a whole, but still a distinct layer that would be difficult to confuse with the fruit below. Trying to visualise the wood as a cohesive whole, as I had when I first encountered it, became more difficult now, since it required eliding the two distinct objects in front of me.

When I reminded Harvey of my initial interaction with sapwood during our interview, he seemed unsurprised that I was initially unable to see it:

> ME: …the first couple days, when you were like, 'this part of the board is all sapwood, so we have to take it out,' I was like, what the hell it this guy talking about? It all looks the same; it's one big piece of wood, what is he talking about? …
>
> HARVEY: I was seeing something you weren't. But in time, you would have seen it.

Apparently to Harvey, this sort of material transformation was to be expected, as it took

no convincing on my part for him to buy into the idea that my time on *Integrity* affected my perception of boat building materials. Harvey seemed completely at ease with the fact that the world in which he lived as an expert boat builder was filled with different things than the world that I occupied as a novice, even though we worked in the same physical space. Furthermore, the fact that Harvey left me to separate the sapwood from the heartwood after I admitted to being unable to tell the difference between them shows that he knew this perceptual feature was within my grasp, if I were to practise with the materials; leaving me to work separating out sapwood was clearly a pedagogical strategy, since if Harvey had doubted my ability to figure it out, he would have assigned me to a simpler task. By placing me in a position to take over sapwood culling, though, Harvey could tackle more complex work himself while also satisfying my desire to learn, which he knew was my main concern.

In the sapwood example above, it took my learning about the constituent parts of the wood to realise them in front of me, after which they remained distinct and separated. In other examples, such as knot-tying, this was not the case; to the trained eye, knots sprang into existence full of purpose and meaning, but could just as easily be dissolved again into a straight length of rope. At all three of the workshops where I volunteered, knot-tying was a highly-regarded ability, both because it was immediately applicable to the work at hand and because it had a mystical quality to it, calling into existence a range of useful objects that others may not have known even existed. The practical uses for knots around the workshop were everywhere, from obvious cases like sailboat rigging to more inventive uses like the construction of pulleys to facilitate lifting heavy materials. In most cases, simple knots would suffice for these purposes, and where more

complex knots were called for, novices could usually get by with increasing the quantity of knots instead: ‘if you can't tie a knot, tie a lot’, the adage went. Watching someone skilled in knot-tying was always a treat, though, because it opened up a whole language that was normally hidden away. Twists, turns, and loops in the rope were the letters, adding up to unfamiliar words and phrases with distinct, precise meanings. When one of the older boat builders executed the perfect knot for some obscure purpose, novices like myself would marvel at his or her secret fluency in this unknown language.

One of the first instances in which the constitutive aspect of knot-tying struck me was when another novice asked me to teach him a ‘bowline’, a very common knot. By chance, I knew how to tie that particular knot before starting fieldwork; it is common among scouts and outdoorsmen, and one of the only knots I remember from a brief interest in them during my youth. The purpose of the bowline is to produce a loop in the rope that is sturdy, but easily removed, making it the perfect knot for tying down anything with a hole in it. To teach the knot, the beginner is given a mnemonic story of a rabbit popping out of a hole, running around a tree, then retreating back into the hole, in which the rabbit is the end of the rope (in blue in Figure 34, left), the hole is a loop in the rope’s middle (red), and the tree is the ‘standing end’, the section of rope not being manipulated (green). This story is recited during bowline-tying until the novice can see the different parts of the knot as it develops, at which point the procedure becomes obvious and the mnemonic is no longer needed.

Wes, the volunteer who wanted to learn the bowline, knew the mnemonic but still struggled to produce the right knot, instead ending up with a jumble that either fell apart immediately or required frustrated unpicking, both of which signalled failure. Even

with the mnemonic, there were various mistakes a person could make: the rabbit-hole could be twisted in the wrong direction, or the rabbit and tree could be confused for one another. What Wes particularly struggled with was remembering which loop was meant to remain once the knot was tied, and which was only an ephemeral product of the knot-tying process, meant to disappear into the shape of the finished product. What struck me about his approach to learning was that he would repeat each of the steps of tying the knot, then present what he had made for my assessment, unable to see if he had done it right. To my eye, it was obvious when he had failed to produce the characteristic horseshoe shape (Figure 34, right). The horseshoe is laden with meaning: pull the top of the horseshoe from the back to release the knot, or the bottom of the rabbit-hole to slide it into a different position. None of this was obvious to Wes, though, who spoke of loops and turns as actions to be carried out with his hands rather than objects he was creating. Where to my eye the knot and its constituent parts came into being as distinct new objects, Wes continually manipulated the rope without establishing anything new.

In trying to teach Wes how to tie a bowline, I unexpectedly found myself in the position that Nick described in regard to teaching Chris (section 6.1). Every important part of the knot stood out to me in terms of its purpose, but despite that fact, it was difficult to put the process of tying it into words that Wes could understand; I was talking about things he could not yet see, even though we were both focused on the same materials. One problem pointed out by my colleague Ed, a newer boat builder on a short-term contract at Riverside, was that Wes was approaching the knot in terms of twists in the rope instead of its function in context, as I recorded in my notes from the day:

> Ed made a good point, that this was a hard knot to learn on its own, and was easier to learn in context. This is because it's easy to confuse the initial loop (which remains after the knot is tightened) with the other loop, which disappears into the structure of the knot. In context, the initial loop is almost always around something, making the purpose of the knot clear.

With this thought in mind, Ed and I set Wes up with a bronze oarlock to tie the bowline around, practising the way the oarlock would eventually be connected to the boat (Figure 34). With this method, Wes eventually 'got the feel' for it, seeing which parts tightened into a fixed closure and which remained an open loop for holding the eyelet of the oarlock. By giving Wes the opportunity to see the bowline function in context, Ed and I allowed him to make sense of the various turns in the rope as meaningful objects, interconnected parts of a single whole. By the end of the day, the three of us were competing against the other volunteers to see who could tie a bowline fastest, or even behind our backs.

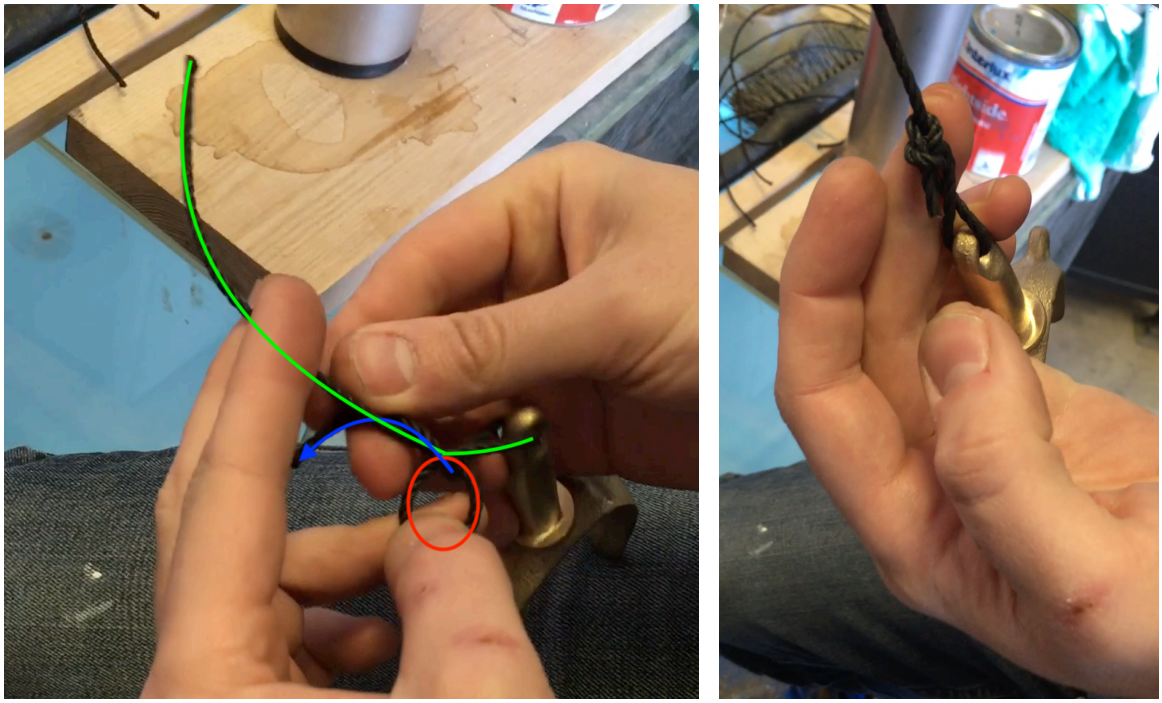

Figure 34: A bowline knot under construction (left); the finished product (right). My hands pictured here as I demonstrate the knot.

Once I moved onto *Paloma,* a working sailing ship with myriad knots I would never master, my expertise with the bowline became much less impressive. In my introductory class in ship-handling, required for all new crew members, Anton walked us through a series of knots that were all new to me: rolling hitches, running hitches, sheet bends, and a variety of others that I immediately forgot. He taught us these new knots by demonstrating each step in front of us (Figure 35, left), then examining what we had produced, which was almost always incorrect. My mind went back to my interaction with Wes, who seemed baffled by my ability to immediately read his bowlines as correct or not. This time, however, it was I who could not interpret the finished product, and Anton who could. Examining my results, I saw a scrap of rope twisted around itself, but no discernible new objects. Even when Anton concluded that I had tied the knot correctly, the arbitrary arrangement of the rope in front of me was disappointingly meaningless.

Figure 35: Anton demonstrates a knot (left); I tie a rolling hitch on one of the shroud turnbuckles (right)

I struggled with one knot, the rolling hitch, for longer than most of my classmates, as it initially looked to me like it was only a series of consecutive loops. Forming the knot in the palm of my hand, the direction of the turns and the ways in which they overlapped seemed inconsequential, a series of steps that always resulted in a coil rather than a fastener. It was only when Anton positioned me in front of one of the ship's shrouds[17] that I came to understand what the knot did; the orientation of the loops meant that it would cross over itself, setting into place when the standing end was pulled tight. Immediately the knot itself appeared in front of me, defined by the point where its various components crossed one another and produced the friction necessary to keep it in place. The shroud – the object that was being tied down – was as much a part of the knot as the rope itself, the two working in concert to establish the function of the object.

When I later asked Anton if he recognised the sort of perceptual transformation I had experienced, he said that not only was he familiar with it, but that he structured his teaching around encouraging that phenomenon:

> ANTON: … that's how I teach people in the knots classes for our Level One class, I can see what they did and recognise immediately that it's not quite right; like, instead of on a rolling hitch, where all of the motion is in the same direction, just with crosses, people tend to roll two and then back at three, and have a little corrupted ending; the half-hitch isn't in the right direction. I can see when somebody doesn't quite have it, and then step in. …
>
> ME: What do you get that they don't get?
>
> ANTON: … I know the conclusion, I know what the knot should be…
>
> ME: You can see it? And they can't see it?
>
> ANTON: I can see it. And they don't have the same exposure, necessarily, [to] the outcome of it.

[17] The wires supporting the mast; see Glossary.

Teaching knot-tying, Anton said, could be a frustrating experience, since the intended outcome was obvious to him, but invisible to his students. Encouraging students to see the knots required exposing them to the experience of tying the knot correctly in context, as he did by positioning me in front of an object around which to tie my rolling hitch. In so doing, Anton relied on the circumspective principle that objects are defined by the relationships in which they exist, and that encouraging someone to see a new object requires positioning them amongst those meaningful relationships. This method of teaching allowed me to move from seeing the rope to seeing the knot I had created, a new object in its own right within my phenomenal reality. As a teacher, Anton had employed the same principle that Ed and I had with Wes, emphasising the function of the knot and its role in context. Impressively, however, Anton had managed to teach a whole class at once, where we had struggled to teach a bowline to a single person.

In this section I have mainly discussed objects that come to appear as defined by a single, static purpose in context. As I will show in the following section, however, some objects speak to multiple purposes at once, and need to be seen from different perspectives to be properly used in work. In particular, objects often need to be understood both as parts of a whole, and as wholes unto themselves.

6.3 Seeing mutually-constitutive parts and wholes

In the previous section, I presented two examples in which learning in the wooden boat workshop entailed either coming to see a whole object as a collection of parts, or coming to see a collection of parts as a meaningful whole. The planks of white oak on *Integrity* split into heartwood and sapwood once I realised the distinction between the

two, and the knots on *Paloma* appeared out of the various twists and turns in a length of rope. In both of those cases, however, the transformation moved in one direction, from parts to the whole or *vice versa*, and then was complete. Other procedures in the boat workshop, however, require continually switching between the perception of objects as parts and as wholes, as became apparent talking to boat builders about the concept of 'fair'.

The idea of 'fair' took me several months to grasp, as it turns out to have several closely-related meanings. The first sense of the word relates to the geometrical uniformity of individual boat parts. At each workshop, I was routinely asked to 'fair down' different components, usually meaning that I should sand them until they were completely flat, removing ridges and divots that had appeared during construction. While this work was simple, doing it well required the ability to see minute differences in the height of the surface, then knowing how to eliminate them without producing new irregularities. Emmitt, an aspiring shipwright I worked with on *Paloma,* cited this ability as one of the most elusive for the beginner boat builder:

> EMMITT: One of the concepts that's very hard for me to grasp still is this concept of a 'fair line', which maybe you encountered at the [Riverside] boat shop. … It all comes down to understanding the very, very subtle discrepancies, nuances that are inherent to anything. … I can look at a plank and tell you if it's square or not, because I've been doing it for about a year and a half now. And it may be a tolerance of like a 64th [of an inch].

Emmitt's description of seeing 'fair' was reflected in workshop colloquialisms like 'the carpenter's eye' or 'the calibrated eyeball', ways of describing the ability to make minute measurements without the use of tools. Without having developed this 'carpenter's eye' myself to any appreciable extent, I initially relied on rulers and levels to determine

whether the flat surfaces I was assigned to fair down were becoming more uniform as I worked on them. While this method allowed me to struggle along well enough, it limited me to working on flat objects, which were the simplest to fair. The more advanced boat builders were usually concerned with whether a curved surface was fair, or uniform in the arc it formed, which was much more difficult to determine. Because the process of measuring the uniformity of a curve is complicated and time-consuming – there are several methods used in the workshop, each of which requires specific training – the ability to see a 'fair curve' with the naked eye is essential in boat building, where sloppy curvature of a deck or hull can greatly affect the performance of a boat.

The second sense of the word 'fair' that I encountered in the boat workshop encompassed the first sense above, but added another element, that a 'fair curve' was one that was not only uniform within a single component, but one which extended across components to create a purpose-specific curve along the boat as a whole. This second sense was the one that Mitch and Ray focused on when I asked them to define the term in our interview:

> ME: What does that mean, when something's 'fair'?
>
> MITCH: It means that it's — it's an interesting term — it's… pleasing… usually it's a curve, it's an adjective to describe a curve; it's pleasing, it fits well together, one piece flows into the next, nothing seems jarring, or inappropriate…
>
> RAY: Or lumpy.
>
> MITCH: …or lumpy. […]
>
> MITCH: At a certain point, you begin to see — maybe you can't even describe it — but you know what looks right, and you know how it should look.

The sense of ‘fair’ that Emmitt had described related more to occurrent understanding, in which boat parts were examined without regard to their roles in context. The way that Emmitt described the concept, any object could be fair, as long as it was geometrically uniform. The way that Mitch and Ray spoke about ‘fair’, however, having a ‘calibrated eyeball’ with which to precisely judge the material uniformity of a component would not be sufficient on its own. Their second definition of ‘fair’ required judging by eye whether the shape of a curve suited its intended purpose in the design of the boat, how the boat ‘fits together’ as a cohesive entity designed with water, air, and its crew in mind; this description points to a circumspective understanding of the parts within the context of the boat as a whole, and the boat itself as a part of the context in which it is used. As Ray put it, ‘if it doesn't look fair, it's not going to work’, asserting that the function of the boat, rather than just its geometrical symmetry, was immediately available to the trained eye.

The necessity of keeping these two senses of ‘fair’ in mind at once – the geometrical uniformity of individual components and their effect on the shape of the boat overall – became apparent to me while observing Nick and Jay struggling over the aft quarter of the *Obadiah.* At first, I assumed that the two men were concerned that the deck beams (Figure 36, in green) were not ‘fair’ in that they were not neatly curved from side to side. While Jay was far from sloppy in his work, the process through which he fashioned the deck beams was bound to introduce some error. His method involved tracing the shape of a bent piece of thin, flexible wood onto the new stock, then cutting out the resulting shape with the bandsaw. This was a common method for transposing an outline onto the wood from which curved components would be cut, and was handy in that it did not

require the boat builder to employ any mathematical calculations. No matter how exacting Jay's measurements and bandsaw cuts were, however, it was always possible that the piece of scrap wood used as a guide had bent in some unusual way, producing a curve with unwanted high spots or low spots. While eliminating such irregularity would be important for a boat that was intended to be perfectly symmetrical from one side to the other, it turned out that the two men were in fact looking at something totally different.

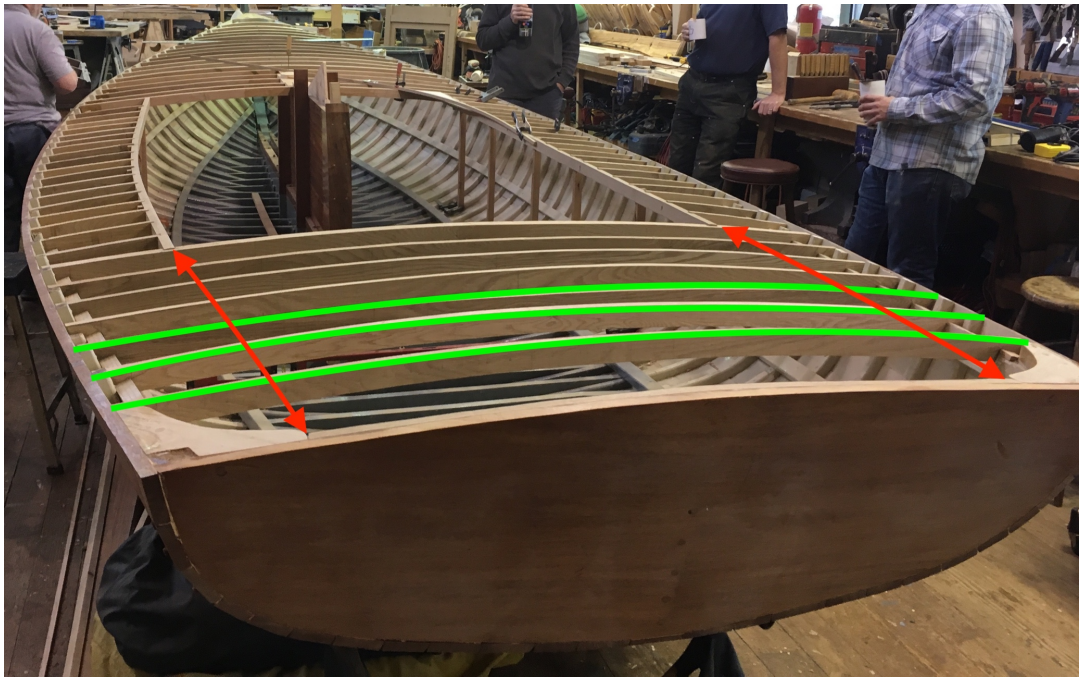

Figure 36: The fair across the deck (red) will be established by the curve of the deck beams (green)

In addition to the fair of each individual beam, the deck of *Obadiah* also needed to be fair fore-to-aft[18] (Figure 36, red). I had a difficult time seeing what Jay and Nick were talking about when they discussed the fore-to-aft fair because the deck they were referring to was not yet installed, instead only implied by the relative heights of the deck beams upon which it would eventually sit. If the deck beams were at even slightly

[18] 'Fore': Toward the front of a ship, opposite of 'aft'. See Glossary.

different heights, gaps would appear between the beams and the decking, and the deck would develop pockets where it had been forced into place. In addition to producing an unsightly end product, these pockets would mean that water would pool on the top of the boat instead of spilling off the deck, sitting in place until it seeped into the woodwork and led to rot. Once I figured out what Nick and Jay were discussing, the boat came together before me in a way that it had not up until then. Where I had been used to seeing the boat primarily as a collection of parts, I now began to see the shape that the parts collectively produced, that of the boat as a whole. The deck beams became ribs across which the plywood skin of the boat would eventually be stretched, rather than just elegantly arching aesthetic motifs; from this new perspective, the boat suddenly did look somewhat 'lumpy' where the beams failed to line up with one another.

The relationship between the heights and shapes of the different deck beams was not the only factor that contributed to the aft quarter of the boat being 'fair', in Mitch and Ray's second, circumspective sense. Not only did the beams need to collectively form an even foundation for the deck to rest upon, they also needed to create a specific slope in the deck. The uniformity of the deck would prevent water from pooling up, but keeping water out of the cockpit required a gentle slope towards the transom[19] as well. In addition, the slope of the deck from side-to-side needed to be aggressive enough that water spilled away readily, but gentle enough that sailors could climb across the deck when they needed to, in order to set the sails or adjust the rigging. Frustratingly, all of these concerns were only apparent once the boat was assembled, since the shapes of

[19] The flat, aft end of a ship. See Glossary.

the individual components were irrelevant on their own; instead, it was the relationships *between* the components that mattered. Looking at the individual deck beams before installation (Figure 37), it was impossible to see how they would interact with their partners and with the rails and hull planks to which they would be attached, especially before many of those other parts had been constructed. As a result, the boat needed to be built through a progressive series of drafts, being partially deconstructed between them. The deck beams would be installed, problems would be identified in how they lined up, measurements would be taken to determine how the beams needed to be modified, and the beams would be removed again so that alterations could be made. From day to day, progress on the boat appeared to wax and wane, with components coming and going rather than steadily accumulating.

Figure 37: One of the deck beams before being installed

The system for boat building that I witnessed watching the *Obadiah* reconstruction struck me as surprisingly inefficient, with its installation and removal of components multiple times. As Jay pointed out, it would have been easier to build a new boat from scratch than to restore *Obadiah* from the derelict version that the workshop had inherited. Jay did have the plans for the boat (Figure 38), which helped him to

understand the designer's original intentions; the plans showed elegant lines intersecting at decisively sharp modernist angles, aesthetic aspects that were not apparent in the husk of the boat as it arrived at Riverside. The problem was that building an entirely new boat would mean giving up any claim of reviving a piece of history, and that the result would be a re-creation, rather than a restoration. And so reconstruction began with the original *Obadiah* being disassembled part-by-part, with each part painstakingly labelled and assessed for its potential to be integrated in the rebuilt version. Some parts, like the decking and most of the hull planks, were totally unusable, having rotted past any possibility of repair. Others, including several of the hull frames, were salvageable, but had warped as they sat in storage over the decades. Since these parts had changed shape, reusing them meant that the boat would no longer perfectly reflect the designer's plans, which specified the angles and curves that the parts would have had when they were first constructed. Instead, the boat that Jay was restoring represented a conversation between the original design and the shape of the fragments that he had inherited, reflecting both the designer's original intentions and the effects of the passage of time. While this combination of effects would make for an interesting museum piece, it presented serious challenges for construction.

The practical ramifications of salvaging some of the original parts from *Obadiah* were that Jay had to constantly balance forcing old parts into the shape he wanted with building new parts to accommodate the shape of ones that were worn and weathered. More so than with building a boat from scratch, this meant that the parts of the boat and the boat as a whole were mutually constitutive; the parts existed to serve a function in the whole, but the whole of the boat was determined by the shape of the parts that

already existed. While a boat is always defined by the totality of interrelationships between the parts that make it up, the design of a boat normally takes precedence in the construction process, dictating the shape that the constitutive parts will take. In Jay's work, though, it was necessary for him to constantly alternate between thinking of parts as components of the intended design and as wholes unto themselves, historic artefacts to be salvaged wherever possible. In the resulting struggle between these two poles, the shape of the boat fluctuated over the course of its development, kicking up problems when unexpected conflicts made themselves apparent. Lou, always ready with a sage boat builder's adage, attested that this was simply how boat building worked, even if *Obadiah* was a particularly difficult example; 'the boat is going to be what she wants to be', he was fond of saying, as Jay and Nick nodded along in agreement.

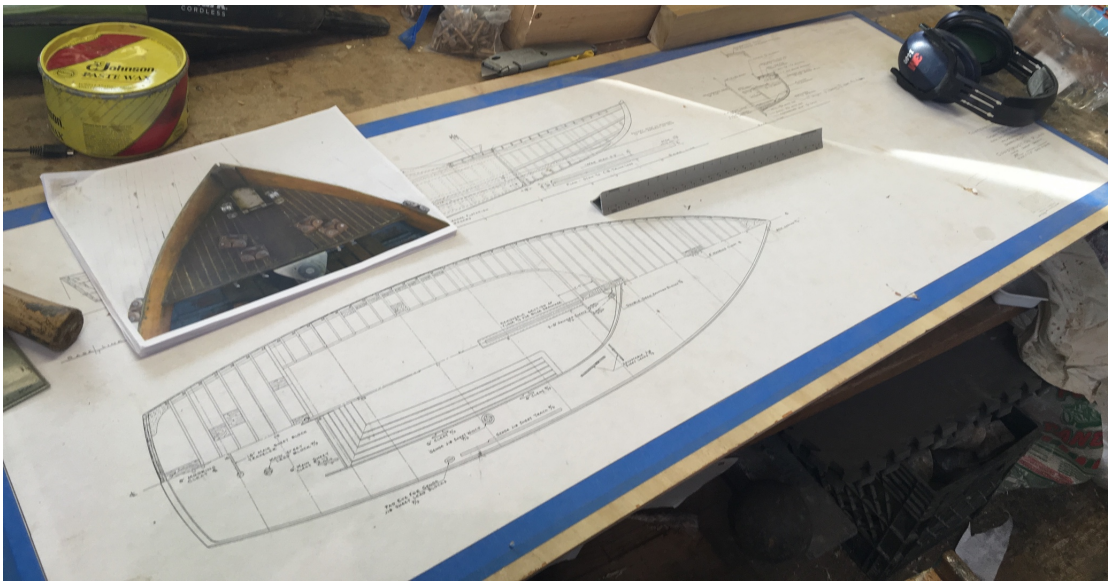

Figure 38: The original plans for Obadiah

Watching Jay at work, I struggled to follow the logic he used to determine which problems to address, and in which order to address them. Hearing him explain his thinking aloud while weaving between addressing individual components and the boat

as a whole left me disoriented, as I was unable to follow his rapid series of shifts in perspective. Considering this example in retrospect, I see that while I was mostly able to adopt a circumspective understanding of the boat parts with which Jay was working, I lacked his ability to keep multiple purposes in mind at once, fluidly switching between them as new problems arose. In this case, getting 'the feel' was not just a matter of 'seeing as', recognising a single meaning in an object; instead, it meant seeing objects in terms of multiple purposes and allowing the most pressing consequences of their orientation to one another to catch the attention. Not only was Jay 'noticing' objects as I myself had learned to (Chapter 5), he was noticing them in different ways at once.

Jay's work refurbishing *Obadiah* was understood throughout the workshop to be unusually challenging, and took well over a year to complete. In the end, however, the result was just a small boat, sailable by a handful of people at a time. The complex interrelationships between the hundreds of parts and the frustrations that came with trying to knit them all together were obscured by the tidiness of the finished vessel, which struck me as disappointingly unassuming once it was finally put into the water. Moving onto *Integrity,* I would have the opposite impression, this time of a massive ship that filled my field of view until I stepped far enough back from it that the individual features were blurred past recognition. Working on *Integrity,* Harvey applied many of the same procedures that Jay had used, making compromises between the shapes of existing parts and the designs he had in mind as he went about refurbishment. Unlike *Obadiah,* however, *Integrity* could not be disassembled and spread out across the workshop floor when problems cropped up; instead, Harvey had to rely on his intuition to capture all the ways that parts would interact together, intuiting problems in advance

rather than working through trial and error. As I will describe in the following section, the impossibility of keeping all the necessary interrelationships in mind at once eventually caused minor delays in our project, an inevitability with work on such a massive scale.

6.4 The limits of 'noticing'

Figure 39: An old photo of the port-side cat-head

The interplay between parts and wholes struck me again during the rebuilding of the cat-heads on *Integrity*, the purpose of which was a mystery to me when I first encountered them. In explaining the project that I would be assisting him with, Harvey showed me a picture of one of the existing cat-heads at some point in its past, before it had begun to disintegrate (Figure 39). In the photo, the cat-head appeared as a wooden protrusion springing from *Integrity* at just over 45 degrees, and could easily be mistaken for one of the broadside cannons if one was not looking carefully. The lion's head embellished on the front gave it the look of an ornamental bowsprit, the protrusion at the bow of a ship often adorned with the shape of a mermaid or some other mythical

figure. But the purpose of the cat-heads, Harvey explained, was not just to carry this image; they supported the anchor while the ship was at sea, keeping it a safe distance from the hull. Because the anchors were so heavy, the cat-heads were supported by the ship's rigging at their top, with lines running down to them from the main mast. While all of this description made sense to me on some abstract level, it was difficult to mentally transpose Harvey's description onto the photograph in front of me, in which the rigging and the anchor chain had already been removed.

When Harvey took me to the *Integrity* workshop for the first time, seeing the replacement cat-heads under construction did little to help me make sense of their purpose or place in context. What struck me instead was that these were not solid blocks of wood, as I had naïvely imagined. Harvey was constructing the cat-heads by gluing together layer after layer of thick white oak, slowly building up the width that we needed to match the originals. Therefore, not only were the cat-heads working parts within the system of the boat, they were also themselves collections of interconnected parts, made up of wooden planks, thick layers of epoxy, and dozens of alignment pins. The parts that made up the cat-heads would eventually be hidden from the viewer with a coat of heavy black paint, giving the impression that they were unified objects, as I had thought when encountering the originals. For now, though, each cat-head was a stack of two-inch boards glued together, their ends cut at seemingly random angles, with some left short to leave open gaps. In my first few days working on the replacement cat-heads, Harvey's reasons for cutting each new plank to the dimensions that he did were a mystery to me. Every day, he would consult his plans, mark up the next planks to be cut according to his secret formula, then set to work.

Of course, Harvey's formula for cutting the planks to size was anything but secret; anyone with the same intimate knowledge of the design of *Integrity* could have seen that the gaps in the new cat-heads would hold the wheel-like sheaves for raising the anchor, and that the rear of the cat-heads (Figure 40, lower left) was left rough because the complex camber of the hull of the ship had not yet been transferred onto them. Harvey kept all of these concerns in mind at once, planning for the placement of the thick metal through-bolts which supported lines from the bowsprit, the angle of the anchor chain as it cleared the cut-outs for the sheaves, and even the angle of the lion's head plaque on the front of the piece. I struggled to follow along as Harvey explained these various concerns, but even when I recognised the vocabulary he was using, it was difficult to imagine how the parts he listed would fit together, let alone to predict the problems that they may pose for one another as the shape of the cat-head fluctuated throughout construction.

Figure 40: The new cat-heads under construction

While Harvey normally worked mostly from memory and intuition, the cat-heads were complex enough that he needed to off-load some of this thinking onto paper. His main vehicle for mapping out their construction was a white legal pad, where he had sketched pictures of the cat-heads as seen from various angles (Figure 41). These drawings were constantly updated and scribbled upon when new dimensions needed to be recorded, or when some dilemma had to be overcome. For the most part, the sketches were the arena for playing around with design decisions, rather than hard-and-fast blueprints. The final designs always played out in the construction of the cat-heads themselves, which, as Lou might have put it, 'will be what they want to be'. Unforeseen problems would crop up during their fabrication and be dealt with in the moment, without updating the written plans. Moving different elements an inch or two from their originally intended locations was just a part of the process unfolding, as it had been in my work at Riverside.

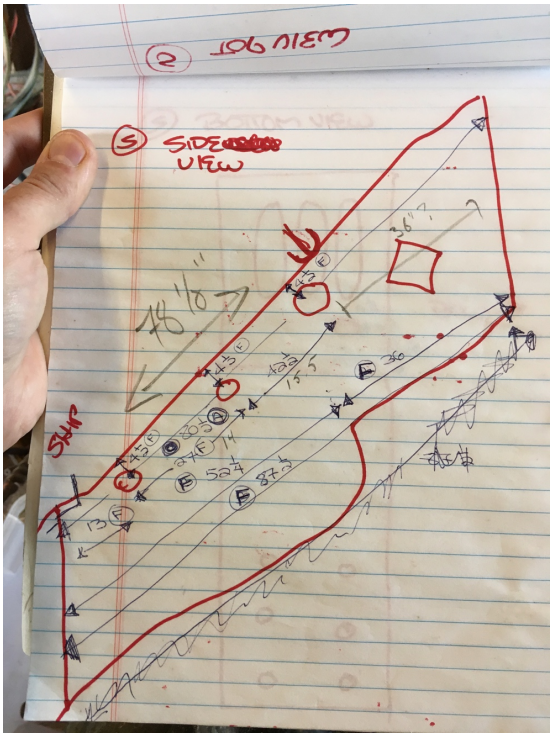

Figure 41: A working sketch of the cat-head

Before describing the nature of the problem that presented itself during the construction of the cat-heads, it is worth emphasising the mass of interrelationships between components that needed to be recognised in order to prevent problems from occurring. At the simplest level, the construction materials needed to be constantly attended to; mis-orienting the grain of the wood, which ran back-and-forth across the surface of the board as well as wandering throughout the wood stock along its height and depth, could be disastrous. Using the wrong formulation for the epoxy or taking too long to apply it would create a weak bond, possibly compromising the strength of the entire piece. Even the temperature and humidity of the workshop were important to keep in mind, as they affected how the epoxy would cure and determined the ways in which it could be worked. Since none of these concerns were apparent to me at the beginning of my stay on *Integrity*, working alongside Harvey and Lizzie initially felt like assisting medieval alchemists, transmuting substances and bringing new matter into existence. The colours, textures, and responses to being worked that the materials presented all told a story that I could not yet decipher.

At the same time that my bosses on *Integrity* watched for the meaning that the materials conveyed as they coalesced into the form of the cat-head, Harvey and Lizzie also kept an eye on how the cat-heads would fit into the ship as a whole. Having 'the feel' for the cat-heads in their intended context was much more difficult, though, since we were building the reconstruction cat-heads far out of sight of the ship, in a workshop on land several minutes' drive away. Thus, while Harvey could see problems that cropped up within the cat-heads as wholes unto themselves, problems that arose in their relationship to the ship were more difficult to spot. Harvey's work plans helped in

this regard to some extent, as they allowed him to capture some aspects of the shape of the hull where the cat-heads would be installed. In jotting these measurements down, however, Harvey translated the complex web of meaningful interrelationships in front of him into a two-dimensional diagram that only captured certain elements of the ship's design. Furthermore, the diagrams that Harvey produced were static representations of one moment in the developmental flow of the cat-heads, the forms of which were still shifting around as they came into shape in the workshop. The diagrams were therefore useful aides in the design process, but by no means reliable workplans. As in the building of *Obadiah,* definitive workplans would have been of little use in Harvey's project, which involved a constant dialogue between the existing shape of the ship and the unfolding form of the cat-heads to be added to it.

Unlike on *Obadiah,* however, Harvey could not fit the cat-heads onto *Integrity* to see how they fit, then remove them for adjustment. Once the cat-heads were complete, a mobile crane would be hired for a full day of installation onto the ship, an expensive endeavour that could not be repeated for the kind of trial-and-error problem-solving that I witnessed at *Riverside*. Instead, the cat-heads needed to be perfect before they were installed, meaning that Harvey would need to address any possible problems with how they fit before those problems presented themselves on installation day. Such foresight required keeping in mind every possible way in which the cat-heads would interact with the ship as a whole, a difficult task when the objects were never in the same visual frame at once. This difficulty was compounded where the interaction between the cat-heads and the ship was highly complex, such as the point at which they were to be attached to the ship's hull, which curved across two planes, fore-to-aft

(Figure 42, indicated with green arrows) and deck-to-keel (red and blue arrows). To complicate matters, neither curve was constant, as both angles became more extreme towards the bow of the ship, as apparent in the deck-to-keel angle being flatter towards the stern (Figure 42, blue arrow versus red arrow). The resulting shape was highly irregular and difficult to capture in any way that would facilitate being transferred onto the corresponding end of the cat-head. Harvey's work-around was ingenious, if labour-intensive, requiring the construction of a plywood mock cat-head to serve as a template to map out the space (Figure 43). He could then easily take the template back to the workshop and copy its dimensions directly onto the new cat-heads, as if he were fitting them into place on the ship – although without having to lift the cat-heads, at several hundred pounds each, dozens of feet into the air to their final position.

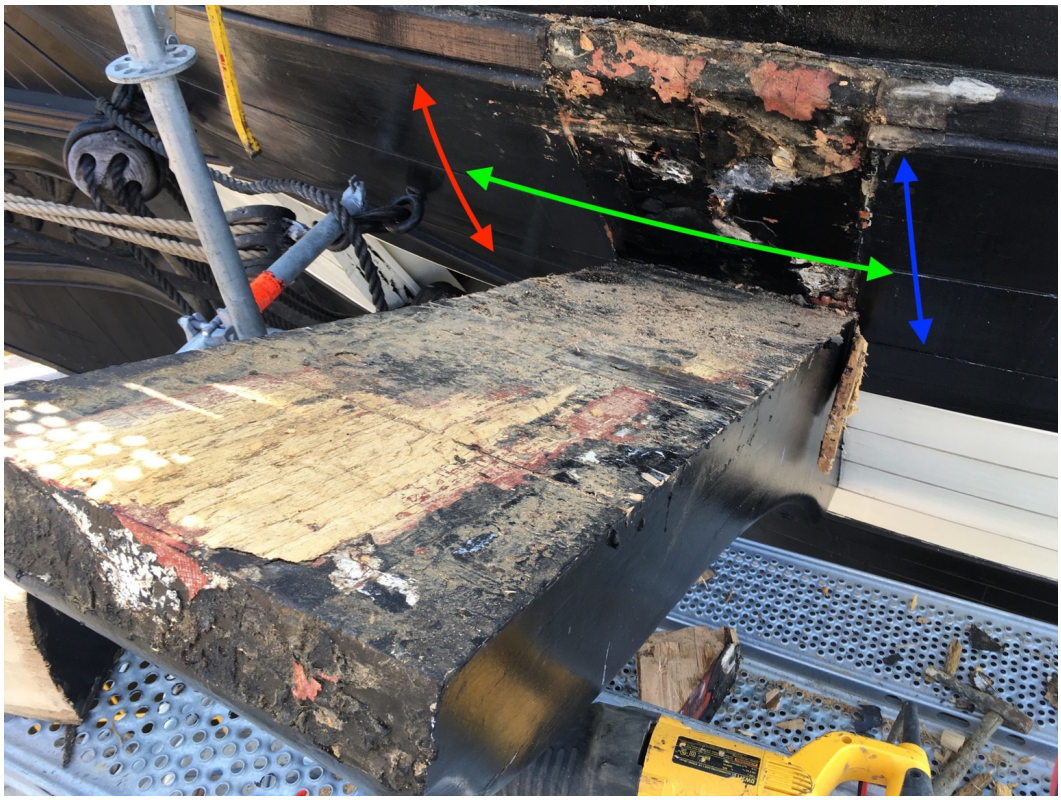

Figure 42: The hull of the ship where the cat-head will meet it. The wooden platform in the foreground is the 'knee'.

Figure 43: Harvey creates a template for the port cat-head by building it in place

The risk that Harvey's plan entailed was that the multitude of meaningfully interconnected dimensions that would have been apparent to him in looking at the ship in person were poorly captured in the diagram, where they were reduced to single facets of the design. For example, Harvey's diagram lists the cat-heads as seven-and-a-half feet long. Measured across their tops, the cat-heads were indeed that long, so Harvey proceeded by cutting the lengths of white oak to slightly more than seven-and-a-half feet – leaving room for inevitable measurement error – and gluing them together. Since every plank that Harvey cut was the same length, the bottoms of the new cat-heads were also seven-and-a-half feet long, which again was the correct length, at least when measured from their bow-facing sides. The problem was that the hull of the ship curved inward as it moved aft relative to the angle of the knee upon which the cat-head would sit, meaning that the bottom rear corners of the cat-heads would need to extend several inches further than the bottom front corners. This detail had initially escaped

Harvey's attention, since the measurements he had copied down implied that the cat-heads were more or less elongated cubes. Looking at the space that the cat-heads would fill, however, it was clear that they needed to be much more irregularly shaped, in ways that were difficult to record on paper.

The problematic relationship between the overall length of the cat-heads and the irregular shape of their rear ends only became apparent to Harvey (and subsequently to me) towards the end of the project. Placing his template against one of the replacement cat-heads, Harvey realised that taking enough material off the back of it to mirror the shape of the hull would reduce their length overall by more than the margin of error he had allowed. The cut-outs where the anchor chain should run would now slightly overlap the knee upon which the cat-head would sit (see Figure 42), meaning that rain would accumulate in the resulting crevasse and rot out the entire structure well within its expected working lifetime. Returning to the ship to think about how we had made this mistake, the problem seemed obvious; the length of the cat-head and the angle at which it met the hull were mutually defined, and changing one would always change the other. Since the majority of our work had taken place in the workshop, however, this relationship had been lost to the simplicity of the written plans. With so many important relationships to attend to within the cat-heads, Harvey had accidentally overlooked one aspect of how they would relate to the ship as a whole.

Once Harvey realised the problem with the dimensions of the new cat-heads, all of the implications for the function of the piece in context came to mind; or as he put it, 'once you make one mistake, it really starts to snowball'. It would be possible to insert wooden wedges to slope rain water away from the knee, but the anchor chain would

still rub against it as it was being raised and lowered. We could shorten the knee itself, but doing so would not only spoil the historical authenticity of the design, but change the structural integrity of the interface between the cat-heads and the hull, leaving them precariously balanced. Every possible work-around presented a series of new complications, leading Harvey to decide that the only option was to lengthen the replacement cat-heads. Design-wise, this plan presented no problems, since the cat-heads were entirely glued together to begin with, and gluing more wood onto the back of them arguably made them stronger, given the impressive qualities of the epoxy we were using. Making a mistake that required more work was frustrating to Harvey, however, who had up until then expected to complete the job ahead of schedule. We quickened the pace of our work and managed to complete the project in good time, but the tail end of my stay on *Integrity* was slightly more exhausting as a result.

As this minor mistake on *Integrity* shows, the boat builder's ability to work 'by feel' – that is, by relying on his or her ability to see the meaning of objects in context – is ultimately limited by two factors. The first factor is the sheer number of meaningful aspects of objects to be noticed at once, especially in objects like the cat-heads, which need to be seen as the sum of their constituent parts as well as themselves parts of the whole ship. Misinterpreting the ways in which the parts of the cat-head would fit together would be as disastrous as miscalculating how the cat-head would fit into the ship as a whole, requiring Harvey to constantly keep one eye on the workshop and the other on *Integrity*. Second, this example shows how working 'by feel' is difficult when there are limited opportunities to perceive objects in their intended context. If we had built the replacement cat-heads in place, the necessity of compensating their lengths to

account for the shape of the hull would have been immediately obvious. Working in the workshop, however, Harvey and I relied on these relationships coming to mind based on diagrams and mental images of the ship, neither of which proved entirely sufficient. In a setting like *Integrity,* where many of these larger construction projects are carried out away from the ship, it is impressive that such work can happen at all, given that boat builders like Harvey need to work from a picture in their mind's eye, rather than perception in context.

Chapter conclusion

The examples in this chapter show how the 'seeing as' that I discussed previously (Chapter 5) reveals aspects of tools and materials that are determined by the practices in which they are used, rather than by their physical attributes. In the first section (6.1), I showed how recognising different kinds of wood required not just looking at their colour, texture, or smell, but also by seeing where they were located in the workshop and how boat builders handled them. In the second section (6.2), I showed how circumspection presents a sense that objects are constituted by their context, and not simply discovered within it. In regard to how 'the feel' is experienced, a key finding here is that 'getting the feel' entails re-arranging the novice boat builder's phenomenal world, splitting objects apart or combining them into a single whole as different practices demand.

In the last two sections of this chapter (6.3 – 6.4), I described some of the difficulties that working within a world of contextually-defined objects entails. In the earlier section (6.3), I showed how an expert boat builder like Jay must juggle multiple senses of an

object at once, since many objects speak to multiple purposes simultaneously. The clearest case of this juggling appeared in switching between perceptions of objects as wholes within themselves, judged in terms of uniformity or structural integrity, and parts of other wholes, judged in terms of their suitability for achieving a collective purpose. Jay was able to fluidly switch between these ways of perceiving the same objects, allowing either parts-as-wholes or wholes-as-parts to grab his attention as new challenges arose in the construction of *Obadiah.* On *Integrity,* however, such fluidity of perceptual object-constitution was more difficult to manage, since the much larger ship had significantly more components to keep in mind at once. The degree of foresight that Harvey employed in rebuilding the *Integrity* cat-heads with minimal complications demonstrated a significant difference in the degree of detail available to each of us in our work.

In terms of learning, my findings in this chapter point to the idea that novices are not generally taught 'the feel' in the standard sense of linear, explicit instruction. Instead, they are assigned tasks in which they will realise that experts perceive tools and materials in terms of context, rather than just based on their physical qualities. One such pedagogical situation played out in front of me as I watched Chris struggle to identify a rogue piece of poplar (section 6.1). When Chris was finally stumped by the species of the piece, having looked at it closely and studied its grain, colour, and texture to no avail, he took it to Lou, who recognised it mainly in relation to the types of wood that were stocked in the workshop. Pedagogical examples like this were built into the everyday operations of the workshop, where novices were assigned useful work that exposed them to the ways of understanding tools and materials that the experts employed.

A puzzle presented by the findings I have related in this chapter is the question of the transferability of understanding between settings, given the context-specific nature of all the boat-building practices I have described so far. If, as I have argued here, objects are defined in large part by the way in which they are employed in context, how do boat builders move between workshops without forfeiting the understanding they have already developed? If 'context' stretches between workshops, what are its boundaries? In the next chapter, I answer these questions by introducing the concept of the 'community of practice' to complement the Heideggerian conception of understanding I have employed so far.

7. Getting ‘the feel’ in and across workshop communities

In the previous two chapters, I showed how ‘getting the feel’ entails learning to perceive tools and materials in terms of their purposes in context. So far, however, I have left the notion of ‘context’ largely undefined, leaving open the question of whether perceptual understanding is specific to each workshop or compatible across the trade as a whole. In this chapter, I explore the boundaries of the context for understanding through the use of two complementary analytical devices, the ‘community of practice’ (Lave & Wenger, 1991) and the perceptual ‘we-world’ (Heidegger, 1927/1962). From one perspective, the idea of the community of practice allows me to show how understanding is situated within the communities that shape it, as well as how those communities guide newcomers into position in which they can learn. From the other perspective, the Heideggerian concept of we-world allows me to argue that while communities of practice may align the understanding of their members, each individual’s understanding is ultimately unique, owing to their specific career histories and positions in the community. Because individuals in each community of practice therefore all understand their work in slightly different ways, the we-world of perceptual compatibility that they share can extend to other similar settings as well. As a result, boat builders are able to continually develop their expertise as they move between workshops, adopting site-specific perceptual nuances in each new community but otherwise accumulating a broadly-applicable understanding of the trade.

7.1 The socially-situated nature of work practices

The argument that unfolded throughout the two chapters before this was that

perception in the wooden boat workshop is determined by the interrelationships between meaningful objects within the practices in which they are used. So far, I have discussed these practices in terms of the technical purposes that they achieve, such as manipulating the impact driver at Riverside such that I could join wooden timbers together without splitting them (Chapter 5) or learning to see heartwood on *Integrity* so that I could remove the weaker sapwood around it (Chapter 6). While such practices achieve technical functions in the workshop, they are also shaped by the social forces that affect work, such as the interests and ambitions of the people conducting it and the economies in which it is performed. The effects of such conditions are deeply intertwined with the material and structural concerns that shape particular practices, and therefore have necessary consequences for boat builders' understanding.

As I explained in Chapter 5, ideas from Heidegger help to show how '[i]n the mere encountering of something, it is understood in terms of a totality of involvements', (Heidegger, 1927/1962, p. 149; see section 5.1), a complex web of meaningful interrelationships that determines how equipment is understood. Heidegger's own examples relate to the technical interconnectedness between equipment, such as a hammer being understood in relation to the nails and wood that together allow for the building of houses that provide shelter (1927/1962, p. 98). As Brandom (1983) points out, however, even the most ostensibly technical practices are inseparable from the social context in which they are performed; to properly build a house is always to build it with the cultural appropriateness of the design in mind (p. 394).[20] Likewise, the boats I

[20] It is debatable whether Brandom's (1983) explanation of the social aspects of circumspection clarifies Heidegger's original argument, or whether it introduces a degree of social relativism that Heidegger never intended. The difference depends on how one reads Heidegger's claim that 'the context of references or

worked on during fieldwork were not being built or restored primarily to serve as functional watercraft; since steel and fibreglass construction methods have long since replaced wooden boat building techniques for the construction of vessels designed to ferry passengers, haul cargo, or carry out battles at sea, a boat builder would never learn to work with wood if he or she were concerned with these practical purposes. Instead, the wooden boat builders I worked with came to the trade through appreciation of the pleasures of craftwork, a love of maritime history, or simply the desire for remunerative careers. The boats themselves, and consequently the practices used in their construction, therefore served social functions in addition to practical ones, acting as repositories of historic techniques, sites of enjoyable collaborative work, and opportunities for professional advancement.

While boat builders at each of the three workshops at which I volunteered used largely similar tools and materials, the social purpose of work varied greatly between them, and as a consequence, so too did the work practices. At Riverside, the boats were either museum pieces or high-end restorations, so work practices revolved around aesthetics, historically-appropriate materials and techniques, and precise joinery. As a result, completing work in the house style was an important factor in completing it correctly, as I learned while attempting to assist Chris, the workshop apprentice. Chris oversaw the restoration of the fleet of rental rowboats, work that I offered to help with under the assumption that it would be like painting apartment walls and second-hand furniture,

assignments which significance implies is tied up with Dasein's own-most Being' (1927/1962, p. 160); Brandom uses Heidegger's idea of 'being-with' to argue that 'Dasein's own-most Being' is essentially social, where Heidegger himself more clearly connects Dasein's essential constitution to its desire to survive (1927/1962 Div. II, Sec. 1). I have chosen to follow Brandom's social interpretation of perception here in order to emphasise how the purpose of wooden boats extends past the practical functions apparent in most of Heidegger's examples.

tasks I had managed on my own in the past. Indicating to Chris that I knew how to paint and would be happy to help, I was met with a sceptical response: 'OK, but have you ever painted *here*?', he asked, implying that whatever casual painting experience I had brought into the workshop would be insufficient for the work ahead of us. 'People think painting is easy' he explained; 'not painting boats!'.

Figure 44: Chris demonstrates 'tipping'; note roller in upper-left

Chris then set to work teaching me the necessary techniques, including 'tipping and rolling', a two-person strategy for using both a brush and roller at once. One person, in our case Chris, would start out by 'tipping in' with a three-inch brush, covering the corners and tight spots that a roller would miss (Figure 44). As the second person in the pair, I was to follow closely behind with a roller, evening out the brush strokes and filling in the flat surfaces. After several planks, it occurred to me how well-suited this process was to small boats, which presented an awkward combination of long flat stretches and numerous tight corners. As Chris had intuited, I had not, in fact, known how to paint 'here'.

Chris' 'tipping and rolling' strategy did not serve a technical function, in that the rowboat was no better off mechanically or structurally for having such an even, glossy coat of paint. Instead, this style of work signalled a level of precision and attention to detail that was necessary in Riverside projects for the workshop to attract more high-quality commissions. Even if the rowboats that Chris was refinishing were summer rentals rather than museum pieces, his ability to complete them in the house style was a necessary precondition for his advancement within the organisation; I explain how work practices are affected by career ambitions and relationships among colleagues in the third section of this chapter (7.3).

As in the previous chapter (Chapter 6), picking up the house technique for painting boats at Riverside entailed realising several new objects defined within that practice. In this case, the things that I came to see were 'windows' and 'curtains', aspects of a poorly-executed paint job that were to be avoided. A window was a patch on the hull that had been covered with the first coat of paint, but not the second, leaving a difference in hue perceptible only at certain angles, but which was frustratingly difficult to ignore once it revealed itself. A curtain was in a sense the opposite of a window, an area where too much paint had been applied, its weight dragging it down in the shape of an elongated drip. Like windows, curtains were not obvious unless one was attuned to their existence, but once they became apparent they were even more frustrating, as they required sanding down the surface before a touch-up coat could be applied. Again, curtains and windows served no distinct technical purposes, as the rowboats would sail roughly the same regardless of such imperfections; instead, they signalled that whoever had painted the piece was not working to the workshop standards for precision. Therefore, even the

existence of certain objects in the workshop was determined in part by social concerns, aspects of the 'totality of involvements' that defined how boat builders saw their work.

Figure 45: An example of woodworking at Riverside (left) and on Integrity *(right)*

When I eventually left Riverside and moved onto *Integrity,* I found that the work in my new setting was shaped around an entirely different set of concerns. Instead of showcasing historic construction techniques, *Integrity* was maintained with ease of maintenance in mind, with the use of modern-day glues and sealants (Figure 45, left) where the Riverside boats would have been painstakingly jointed together, relying on a tight fit for strength (Figure 45, right). The difference in construction practices was a consequence of the fact that, while the staff at both Riverside and *Integrity* were concerned with the construction and maintenance of wooden boats in a general sense, the artefacts produced in the two workshops served markedly different functions. Where the Riverside boats existed to capture and showcase the details of historic construction techniques, *Integrity* had been restored for the purpose of teaching visitors

about early American Naval warfare; exhibits on board the ship explained how sailors worked, ate, and slept, but generally put little emphasis on the specifics of the ship's construction. When I first arrived on *Integrity*, the construction techniques in use there struck me as coarse and imprecise, owing to the sensibility I had absorbed at Riverside, where such techniques would never have been allowed. As time went on, however, I realised that the work practices in my new setting simply reflected a different set of influences, and that the appropriateness of different techniques was entirely dependent on the context in which they were employed.

By the time I arrived at my third fieldwork site, *Paloma*, I had come to think of myself as a competent beginner, at least passingly familiar with the tools and materials present at each of the three workshops. *Paloma* required a greater re-orientation of my understanding than my transition to *Integrity* had, however, since the crew on *Paloma* set themselves apart from the majority of wooden boat builders in their general disregard for aesthetics. Even on *Integrity,* where precision and historical construction techniques were significantly less important than they had been at Riverside, the ship still needed to be attractive and superficially historically accurate, as its purpose was to evoke a sense of the vessel as it had existed in its prime. On *Paloma,* there was little reason for the ship to be maintained with aesthetics in mind, as its primary purpose was neither the demonstration of precise techniques nor the presentation of a picture of life in the past. Instead, the *Paloma* crew were mainly interested in sailing the ship, orienting the activities on board toward crew training rather than the upkeep of the aesthetic features that had received so much attention at my other fieldwork sites.

Figure 46: The starboard side of Paloma

Given the experience I had with painting from my Riverside work, when I arrived on *Paloma,* Anton suggested that I lead work crews painting the ship's hull. Many of the new volunteers had never painted before, and there was a shortage of experienced foremen to lead them, so I was promoted into this new position without having done much painting on the ship myself. During my first shift, I insisted on teaching tipping and rolling to the new volunteers, who had initially startled me by slapping paint against the hull by the roller-full (Figure 46). Although the work that we accomplished once we started tipping and rolling was neat and precise, it was comparatively slow-moving, and we covered less ground than had been expected of us. Anton soon made it clear to me that coverage was a more serious concern than detail, since the ship needed to be protected from the coming winter weather, and no one was going to look too closely at it anyway. While at first I felt uneasy lobbing paint onto the hull and ignoring the obvious imperfections, my perception of the surface slowly shifted, the paint striking me as protective armour against the elements rather than evidence of precise craftwork to be admired. The curtains and windows that I had learned to recognise in my work at

Riverside eventually faded from my attention, their unimportance in this context allowing my eye to be pulled towards more pressing concerns.

In this section, I have extended the Heideggerian idea of the 'totality of involvements' to include the social conditions that influence work practices and the understanding that those practices entail. Moving from one workshop to another led me to see common objects in different ways based on the different purposes around which the workshops were arranged, many of which related to social, rather than technical, concerns. In some instances, particular objects arose in my perception defined entirely by their social purposes, such as the curtains and windows in paint on Riverside boats; these objects appeared to builders of high-end boats, but not to crew mainly concerned with keeping their vessel afloat. Throughout these examples, however, I have displayed a paradoxical conception of understanding, as the ways of interacting with tools and materials that I developed in each workshop were at once specific to that setting and part of a cumulative learning process. While each workshop did entail new ways of interpreting materials, some basic aspects of understanding extended across settings, pointing to a broad transferability of skills. The tension between the situated nature of understanding and its transferability between settings presents a question largely unaddressed by Heidegger, that of how the context that determines understanding is bounded. In the section that follows, I employ two complementary analytical devices to describe the bounding of shared understanding, the 'community of practice' and the phenomenal 'we-world'.

7.2 Complementary perspectives on context

The three workshops at which I volunteered collectively presented a paradox regarding the situated nature of understanding. On the one hand, understanding was clearly specific to the workshop at which it was developed, with the shared interests and ambitions among the participants at each influencing the work there and the ways in which it was understood. On the other hand, many of the boat builders I met over my six months of fieldwork had learned the trade by moving between workshops, accumulating understanding in a way that demonstrated its compatibility between contexts. As a consequence of this apparent paradox, I initially struggled to conceptualise the context in which boat builders learned and understood their professional practices; it seemed as if boat builders simultaneously inhabited a world of meaning specific to their local context, as well as a phenomenal world that stretched across workshops and the trade as a whole.

In this section I employ two complementary analytical perspectives to begin to resolve the paradox in which understanding is simultaneously situated and transferable across settings. I first examine the three workshops as 'communities of practice', following Lave and Wenger (1991) in conceptualising understanding as inseparable from the social structures in which it is developed and reproduced. In this initial conceptualisation, I show how understanding cannot be divorced from its context, since wooden boats are always understood from specific social perspectives in addition to the technical functions of their design. In the second half of this section, I return to ideas from Heidegger to show that even though understanding may be situated within a particular community, no two individuals in that community ever possess precisely the same

understanding of the tools and materials with which they work; since professional histories differ from one member of a community to another, so too do individual ideas about work practices. Shared understanding is therefore less a consequence of the identicality of understanding between community members than the broad alignment of understanding within perceptual 'we-worlds', areas of overlap between individual phenomenal worlds that allow for collaborative work. Compatibility in understanding between workshops is possible for the same reason it occurs within workshops, that boat builders perceive tools and materials in ways that are always slightly different, yet still generally harmonious. In the hybrid analysis of the context for understanding that I present in this section, the community of practice provides the social structure through which boat builders align their understanding with that of their colleagues, and the we-world describes the compatibility of that understanding within and across settings.

I will begin this analysis of the context of understanding by showing how each of the three workshops constitutes a community of practice in the sense that Lave and Wenger (1991) describe. The key feature of Lave and Wenger's model that I have chosen to apply here is the conflation of technical and social aspects of practice; as the authors explain, in a community of practice, 'participants share understandings concerning what they are doing and what that means in their lives and for their communities' (1991, p. 98). As the examples in the previous section show, the building of wooden boats in modern times always relates to purposes beyond the ostensible practical functions that those boats serve. Depending on the goals of the people building or maintaining the boats, the work may serve to demonstrate technical competence, capture a sense of maritime history, preserve a particular vessel for use in sailing training, or some

combination of the above. These goals are at the foundation of each community of practice, attracting new members with similar ambitions and reproducing situated ways of understanding the work and its purpose.

My analysis of each workshop as its own community of practice differs slightly from that applied in *Situated Learning* (1991), where Lave and Wenger rarely use the concept in such a neatly-delineated way. Instead of analysing organisations, the authors usually look instead at communities bounded by common interests and identities, explaining that 'the concept does not imply a well-defined, identifiable group, or socially visible boundaries' (1991, p. 98). The non-drinking alcoholics and Yucatec midwives that they describe (1991, Chapter 3) are bound together more by common identities and practices than membership in a particular organisation; although participation in specific organisations is a factor in learning in both of those cases, the communities include members across a variety of sites. It would be possible to look at the wooden boat builders in this way as well, considering the network of similar workshops as a single community of practice centred around interests and practices related to maritime construction and restoration work. The reason I have chosen to interpret each workshop as a community rather than looking at the trade as a whole is that, considering the dual influence of technical and social influences on situated practices, the practices in use at each workshop were clearly distinct. Working at Riverside required learning Riverside practices, even if the similarity between such practices and those employed on *Integrity* or *Paloma* meant that boat builders could transition between contexts without learning their trade again from the start.

At Riverside, the motivation shared by the paid staff and the younger volunteers was the

ambition to enter into or progress within the boat-building trade, a professional goal unique among the workshops I visited. While participants there cited different aspects of the trade that attracted them to it – the aesthetics of maritime design, the satisfying use of hand tools, or appreciation of natural building materials – they shared the intention of making this work their livelihood, rather than approaching it as a hobby. Jay was a typical example of someone with ambitions to progress within the field professionally, as he explained during our interview:

> JAY: Really from a young age, I've always liked working with my hands; it just took me the majority of my life to figure out that that's what I wanted to do for a living. You know, I tried a little bit of everything; did office work and all that, but found that working with my hands was the most rewarding, so kind of just came back to it and was able to find a way to make a living doing it.
>
> ME: Always boats?
>
> JAY: More or less … I've always enjoyed boats; I grew up around boats. I actually saw — I was in the airport going to a training session for an office job that I had and I was looking for something for the plane, and there was a wooden boat magazine on a rack in a newsstand and I picked it up and started leafing through and was like, 'ah, this stuff's awesome.' I saw ads for a couple of boat schools, and that got me thinking about it. And then a couple years after that — it was actually right around the time of the stock market crash, the housing crisis, and I was working for one of the companies involved, so I was like, 'you know what, now's the time to make that change if I'm going to do it.' So I shifted gears and kind of took a chance, hit the reset button, and here I am.

Since so many of the Riverside boat builders were trying to enter or progress within this line of work, projects that would foster new skills or which would signal their expertise were in high demand among the staff and volunteers. Unlike the other two workshops at which I worked, this eagerness to take on more complex work produced a surplus of labour at Riverside, incentivising competition among the newer boat builders for interesting projects, as I describe in the next section on learning (7.3). As a result, advancement within the organisation required newcomers to demonstrate not only

proficiency in work practices, but excellence in relation to their peers, quality of work that set them apart as prepared for advancement. The workshop consequently saw a high calibre of performance in entry-level tasks, with a level of precision and attention to detail that went far beyond that necessary for the technical functions of the boats.

The *Paloma* community of practice provided a stark contrast to the Riverside community in that very few of the crew were interested in professional maritime work, and of those who were, most were trying to find positions as sailors on tall ships rather than as ship's carpenters and boat builders. Anton, the president of the organisation that operated the ship, represented much of the crew in that while he could competently carry out maintenance work, he was much more interested in sailing:

> ANTON: I mean, I've learned enough that if I wanted to turn professional, I could…
>
> ME: As a shipwright?
>
> ANTON: No no no, as a sailor; I'm never going to be a shipwright. I mean, I know enough to hold up the end of a piece of wood. And I know enough to spile[21] something, I know in theory how it's done, but I've never done it.

With a common focus on sailing rather than carpentry among the *Paloma* crew, the upkeep of the ship consequently became a necessary chore rather than an opportunity to progress professionally, removing the motivation to complete maintenance tasks to a high level of quality. Rather than removing and replacing the caulking between seams in the ship's woodwork, for example, the *Paloma* crew often elected to cover the seams with waterproof tape, which they would then paint over. While such a trick would likely have resulted in a Riverside boat builder being reprimanded, if not dismissed, on *Paloma*

[21] 'Spiling' is a traditional technique for measuring the curvature of a boat's hull.

it allowed the crew to devote more time to practising sailing drills and preparing the other aspects of the ship for journeys at sea, and therefore became an acceptable practice in most people's opinion. Although certain crew members always insisted that these quick work-arounds would ultimately cost the ship many more work-hours in the future, the general consensus was that the crew did not have the time, money, or expertise to do all of the necessary work to professional standards; as a result, *Paloma* practices prioritised short-term practicality over precision, attention to detail, and long-term structural reliability.

The *Integrity* community, which I participated in between Riverside and *Paloma*, was less obviously a durable community of practice than the other two, since there were only two people employed there. While Harvey and Lizzie, the ship's carpenters on *Integrity,* could be conceived of as belonging to the same community as the director of the organisation, that man's role as a fundraiser and organiser meant that the three shared very few work practices. Harvey and Lizzie did share a specific way of approaching their work and of conceiving of the tools and materials within it, influenced by a shared commitment to superficial historical accuracy over authentic construction techniques; because the only ship either had ever worked on was essentially a reproduction (see Chapter 4), their conception of their work was markedly different from that shared at either Riverside or *Paloma.* In terms of a social structure in which this understanding could be reproduced, however, *Integrity* presented few opportunities for new boat builders to become engaged in the organisation and gradually adopt situated practices, all but ensuring that whoever eventually takes over from Harvey and Lizzie will bring their own ways of perceiving the work. I explore such

movement between communities and the effects it has on situated understanding in the final section of this chapter (7.4).

In characterising each workshop as a community of practice, I have shown how the shared interests and ambitions at each had a significant effect on the practices developed there, explaining differences in ways of working and in the ways that tools and materials are understood. In so doing, I have echoed Lave and Wenger's assertion that '[a] community of practice is an intrinsic condition for the existence of knowledge' (1991, p. 98), showing that to understand boat building is always to understand it in a particular context, rather than to understand it as a general capability. Where this explanation is insufficient, however, is in its inability to account for the ways in which boat building expertise is transferable across workshops, allowing new boat builders to learn cumulatively across a series of settings. While moving between workshops requires adopting community-specific ways of using tools and materials at each new setting, such movement is possible due to the fact that understanding is broadly compatible between them; as I experienced myself, ways of perceiving tools and materials could be adapted from one workshop to the next, even if the network of significances that defined these objects shifted slightly with each transition. For the remainder of this section, I will explain how this transferability of understanding points to a we-world of understanding between workshops, a level of similarity in individual perceptual worlds that allows for collaboration.

Lave and Wenger explain that understanding is normally not transferable between communities of practice because understanding is, by its nature, situated rather than abstract (1991, pp. 33–34); as my boat builder participants demonstrated in the

examples in the previous section, situated practices demand ways of understanding shared equipment that are shaped by the unique social and economic demands facing each community of practice. Rather than contradicting Lave and Wenger by arguing for a generality in understanding, my contention here is that understanding is in fact more specific than those authors imply, and that each individual's understanding is distinct from that of those around them. Emphasising the individuality of understanding returns to a precept from phenomenology, that understanding is ultimately the product of an individual's prior experiences (Heidegger, 1927/1962) as perceived from the perspective of a unique human body (Merleau-Ponty, 1945/2002). The concept of the we-world, as I have interpreted it for implementation in this project (Theoretical Framework, section 2.3.3 – 2.3.4), describes the similarities between these individual ways of understanding, rather than a bounded group of meanings to be adopted identically by each of its inhabitants. It is therefore the general alignment of individual-specific ways of understanding that serves as the premise for intersubjectivity, rather than the general applicability of what is understood.

The specificity of understanding was apparent during my fieldwork any time I interacted with someone in the same workshop who perceived shared equipment differently than I did. I noticed such a difference in perception one day on *Paloma* while I was patching a hole on the starboard quarter,[22] a complex job that I was having difficulty finishing. The project was beginning to look worrisomely sloppy, a consequence of the difficulty I was having working with the limited materials available, as well as the fact that I needed to complete the work by hanging over the aft rail. Just as the patch was reaching a peak in

[22] The right-hand side of the hull, at the rear of the ship; see Glossary.

its messiness, Christy came aboard and walked over to talk. I mentally prepared a defence of my work strategy as she came down the gangway, as I assumed she would have something critical to say about the appearance of the project. And yet, Christy seemed not to notice what I was doing at all, instead pointing out something in the rigging, none of which had drawn my attention when I had come aboard. Smiling, she commented that she appreciated how neatly one of the other crew members had put away the mainsail (Figure 47), which was secured with tidy overlapping daisy-chains, a detail characteristic of the person who had skippered the ship on our most recent day sailing. While I could see the neat daisy-chain loops holding the sail furled once Christy pointed them out, I would never have noticed them myself, let alone connected them to the handiwork of any particular sailor. Meanwhile, the messy hull patch apparently failed to catch Christy's attention. When I took it upon myself to point out the project I was working on, she shrugged, commenting that I would get it done eventually. Meanwhile, the unusual mix of materials and my unconventional method of applying them appeared not to cause her much concern.

Christy and I had worked together before the moment in the example above, scraping the deck, painting the hull, and carrying out other routine maintenance that the ship required. Never during this basic work had I noticed that our understanding of these various work practices diverged significantly; while Christy had been a *Paloma* crew member for far longer than I had, the ways in which we interpreted key equipment like paint and wood in these simple tasks were so complementary as to be functionally equivalent. Where our understanding differed was at the more specific sides of our expertise, with Christy much more familiar with sailing, where I was more interested in

ship building and repair. Since both of these sets of skills were necessary for the functioning of the ship, the community around it encouraged multiple ways of understanding rather than a single perceptual standard. Therefore, while Christy and I possessed slightly different ways of seeing *Paloma*, we still inhabited a shared phenomenal we-world in that the differences in our perception did not prevent us from collaborating in work.

Figure 47: The mainsail, put away after a day of sailing

In an opposite example, Gerald was one of the *Paloma* crew least interested in sailing, but had the distinction of being one of the ship's more competent mechanics. To capture this difference, Gerald contrasted 'sailors' with 'seamen' in our interview:

> GERALD: I'm not a rag sailor; I like to think of myself as an adequate seaman.
>
> ME: 'Rags' being the sails?
>
> GERALD: Yeah.
>
> ME: Who are the 'rag sailors'?

> GERALD: Well, people brought up sailing as a hobby, who then were attracted by this whole concept, or people who were attracted by the vessel and then learned how to sail and have been here forever. … I don't think that I have totally grasped the enamour of being a rag sailor as much as I enjoy working on a boat. I am perfectly happy replacing a bilge pump on this boat, perfectly happy doing mechanical things, or for that matter seamen-like things on this boat. But when they start talking about shrouds and lines and stuff, my head gets foggy.

The shrouds and lines to which Gerald refers above are very basic components of an operational sailing ship (see Glossary), so it surprised me at first that he professed neither a deep understanding of these things nor a particular interest to learn. Gerald had been a professional ship's pilot before he retired, so navigation and ship-handling were very familiar to him; the historic aspects of *Paloma* predated his career on the water, however, so equipment related to wind-powered sailing was unfamiliar to him. Yet, in walking around the engine room with Gerald, it was clear that his perceptual experience was much richer than mine, with the readings on certain mechanical gauges catching his attention where I had not even registered their existence. Scraping the deck or painting the hull, Gerald and I occupied individual phenomenal worlds that were largely compatible, but once work shifted towards his area of expertise, Gerald could interpret a depth of meaning in the ship that I could not.

The individuality of understanding in each workshop indicates that the community of practice aligned the understanding of its members, rather than reproducing a shared set of meanings identically in the minds of each. In the examples above, I have shown how slight differences in understanding do not hinder collaboration, sometimes even strengthening it where communities demand a plurality of practices. It follows, then, that if differences in understanding do not hinder collaboration within a community, neither will they prevent individuals from understanding other communities built

around similar goals; as a result, a phenomenal we-world is strongly aligned within a single community, but can extend to other communities as well. In the next section (7.3), I show how newcomers to a community of practice gradually align their understanding with that of those around them by participating in situated practices, learning to interpret tools and materials in ways necessary for the work there. In the section that follows (7.4), I explain how the similarity between practices in different workshops allows for a we-world of perceptual compatibility that extends across them, allowing boat builders to accumulate expertise over the course of itinerant careers.

7.3 Learning within workshops

The defining characteristic of a community of practice that I have focused on so far is the presence of shared practices and their attendant ways of understanding, reflecting the common interests and ambitions of the community's members. A second key characteristic exists as well, that communities of practice contain reliable routes through which newcomers can join the community and establish themselves within it. Lave and Wenger examine such routes through their concept of 'legitimate peripheral participation' (1991, p. 34), a mode of working that allows newcomers to learn through exposure to situated practices while still contributing to the goals of the community; legitimate peripheral participation is therefore simultaneously a mode of working and of learning, of contributing toward the activities that define the community while aligning one's understanding with those within it. The examples that follow show how styles of legitimate peripheral participation are unique to each workshop, the social structure of which guides newcomers into positions of increasing responsibility and authority in ways that reflect the goals and tensions within each community.

Early on at Riverside, I often found myself with little to do, since the projects that the senior staff were working on were so complicated that there was little I could do to help. Since Lou had assigned me some easy material prep work on my first day at Riverside (section 5.1), over the next few days I sometimes loitered around his work station, hoping that he would notice that I was available to help and delegate some of his work to me. When he did not, I eventually interjected and offered my assistance unprompted; to my disappointment, Lou suggested that I take out the garbage, rather than help him with the teak skylights he was repairing. While the work he was doing appeared to be simple enough that I could have helped, I would later realise that the teak was so expensive that it could only be trusted to the senior staff, experts who could reliably do the job correctly on their first attempt. Seeing I was disappointed, Lou explained, 'I'd let you help, but… if it weren't teak, you know?', and I left to carry out the clean-up work he had suggested.

Initially, I was frustrated with the cleaning and organising work that I spent much of my time on at Riverside, as it did little to help me develop the technical skills that I had come to learn. What I eventually realised, however, was that these everyday tasks served to orient me within the workshop, learning how its participants interacted with one another and how I could eventually insert myself into more complex projects. As Lave and Wenger point out, this social understanding is often a prerequisite for the development of the technical skills more representative of situated practice:

> From a broadly peripheral perspective, apprentices[23] gradually assemble a general idea of what constitutes the practice of the community. This uneven sketch of the enterprise (available if there is legitimate access) might include who is involved; what they do; what everyday life is like; how masters talk, walk, work, and generally conduct their lives; how people who are not part of the community of practice interact with it; what other learners are doing; and what learners need to learn to become full practitioners. (1991, p. 95)

One thing I noticed from my peripheral position cleaning up the workshop was that the work there was not as collaborative as I had at first presumed. Because the workshop was populated by boat builders at various levels of experience and expertise, I had initially assumed that learning occurred as a consequence of the newer boat builders working alongside their more experienced colleagues. While I would eventually observe some examples of such collaboration, a more frequent mode of interaction between the senior boat builders and their novice counterparts was the assignment of simple tasks from the former to the latter, with newer boat builders like Chris taking on relatively uncomplicated work from senior staff like Nick and Jay.

A practical effect of this distribution of work from more expert boat builders to their less-expert colleagues was that work was tightly regimented, preventing newcomers like myself from immediately getting involved with complicated procedures and expensive materials. Instead, there was an unofficial chain among the boat builders along which work was passed, with the senior staff handing their simpler projects down to the apprentice, interns, and long-time volunteers, who in turn handed very basic tasks down to newcomers like me. By asking Lou what I could do to help him directly upon arriving, I

[23] Lave and Wenger use a broad definition of the term 'apprentice' in *Situated Learning*, usually referring to anyone in an entry-level position with opportunities for learning and advancement. While there was only one person engaged in a formal 'apprenticeship' at Riverside, I take Lave and Wenger's remarks as pertaining to all of the entry-level positions in the workshop.

had inadvertently attempted to circumvent this hierarchical distribution of work, presuming that I could immediately work directly alongside the experts. Other novice boat builders had already put in months or even years of volunteering or low-level paid work in order to gain access to such opportunities, so I was highly unlikely to be assigned to such projects in my first days in the workshop.

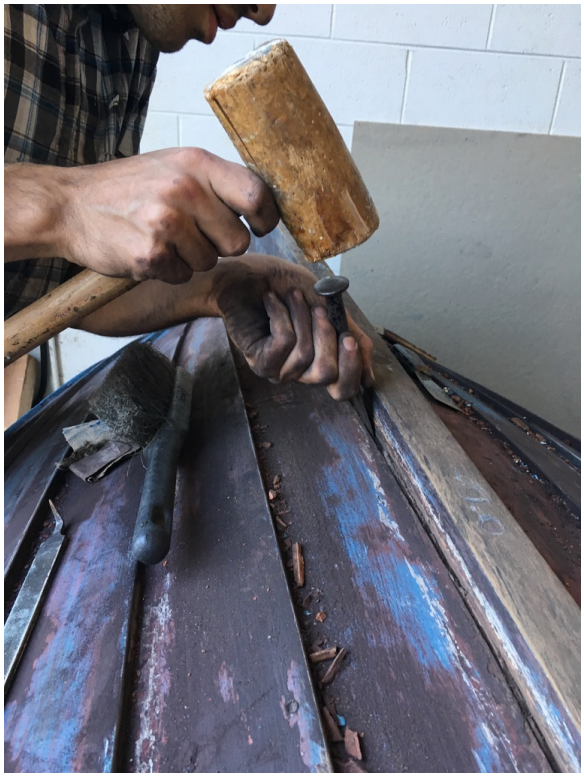

Figure 48: Chris installed cotton caulking on a rowboat while I scraped away old paint

The chain through which work was distributed throughout the workshop was neither official nor perfectly strict, and I regularly accepted small projects from Nick, Lou, and Jay once they saw I was capable enough to carry out basic material preparation tasks – or at least, responsible enough that I would ask for help before hurting myself or damaging something important. Much more work was assigned to me by Chris the apprentice, however, who was pleased to be relieved of the tedious scraping and sanding he was normally assigned at Riverside. By handing the simplest parts of his work

to me, Chris could spend time focusing on its more complex and interesting aspects, especially those that required the woodworking processes he was trying to perfect. Working on the restoration of the museum's rowboats, for example, I could take over stripping the old paint while Chris patched holes, replaced cotton caulking (Figure 48), and rebuilt small components that had broken over the previous rental season. While I was somewhat jealous of these more interesting tasks, I had not yet mastered the simpler work that preceded them, thereby proving to the staff that assigning me more complex assignments would be useful to the workshop, rather than just enjoyable and instructive for me.

Working alongside Chris meant more than gaining access to the procedures he felt comfortable delegating to me; it also meant watching him while he worked, and feeling able to ask him questions without embarrassing myself. Where I may not have wanted to expose my ignorance of certain procedures to the more senior boat builders, I felt comfortable asking Chris to explain his work, since I knew he had only learned to do it recently himself. In our interview, Chris explained that he had learned in much the same way, through 'being around' the work and having the opportunity to ask questions:

> ME: How do people learn here — or how did you learn here?
>
> CHRIS: Just by doing it, and being around it. Really it's just a matter of watching someone work, and asking them what they're doing and why.

Jay echoed Chris' sentiment about learning by watching, but added an emphasis on the learner's curiosity, rather than simply his or her passive exposure to new practices:

> JAY: The volunteers that I've seen be successful at moving on as professional shipwrights — probably one or two that have come through here — those are the guys that are, you know, yeah, we give them sanding to do or some menial task, something that's not that great, but they still find the time

> when you're doing something on your own over here, they'll come over and say, 'hey, what are you doing,' like, 'how does that work? Why are you doing it that way?'. So it's on the volunteer to have the desire to learn and pick up those details; a little bit by osmosis and observing and that sort of thing, but curiosity goes a long way in the desire to further your education.

The hierarchical distribution of work at Riverside was successful in large part because these newer boat builders were willing to endure long stretches of tedious work in exchange for such exposure to complex work practices, and consequently the possibility of eventually working on more enviable projects in the future. The expert Riverside boat builders conducted some of the best-respected work in the local market, evidenced by the high-end restorations and new builds that were regularly commissioned to the workshop. With access to this high-end work as an incentive, the workshop staff could reasonably expect someone like Chris or myself to serve in low-level roles for extended periods before advancing to a more senior position, given the competition for those positions and the level of skill that they required. The possibility of advancement into more attractive work also inspired boat builders at each level of expertise to complete their work with a particular attention to detail; because there was generally a sense of competition for advancement into more senior roles, each boat builder was incentivised to make his or her work stand out as faultless, regardless of its level of complexity. The excellence of the work at Riverside was therefore reproduced in a circular fashion, with newcomers attracted to the organisation based on the appeal of its reputation, then incentivised at each step in their learning to produce work that was as close to perfect as possible.

When I eventually arrived on *Paloma,* I found that the community of practice there was reproduced along an entirely different logic than it was at Riverside. The century-old

ship required more work than the available volunteers could complete, so projects were assigned freely to anyone willing to do them, rather than being reserved for those who had proven themselves capable. Interested newcomers could walk aboard the ship expecting a tour and quickly find themselves scraping the deck (Figure 49), as I recorded in my fieldwork notes:

> It was interesting to see that even the greenest volunteer could jump right in with the scraping task… Someone even made a remark to this effect, that Paloma is a great place for me to be studying because they'll take anyone off the street and put them to work immediately.

Figure 49: The Paloma *crew scraping the deck*

Tasks like deck-scraping and hull-painting formed the main avenues for legitimate peripheral participation on *Paloma,* since they involved crew at all levels of experience and expertise. Scraping the deck put newcomers shoulder-to-shoulder with long-time crew, where conversations about the ship's history and organisational structure could unfold and newcomers could develop a sense of how the organisation operated. A facet of the organisation commented on regularly by new volunteers was the surprising lack of hierarchy, with little sense that newer crew were expected to follow the orders of the

more experienced members. Instead, workdays had an air of collaboration, with new crew joining whichever projects suited them, regardless of their prior experience.

The collaborative atmosphere on *Paloma* had several effects on learning, some positive and some hindering. On the positive side, more than one new volunteer pointed out to me that the absence of barriers to new work practices allowed them to experiment with tools and materials that they had never encountered, quickly realising that certain kinds of work were within their capability. Bennie cited the pleasure that new volunteers took in learning simple tasks in our interview:

> BENNIE: I've seen people come on board that knew nothing about tools, but were eager to learn, and they were so happy that you could give them a drill and they drilled a hole; they thought that was this wonderful thing. And now they know how to drill a hole.

I witnessed exactly the kind of learning that Bennie described while working with a brand-new volunteer, a woman who had been out for a jog, was enticed onto the ship by the offer of a tour, then convinced to immediately start volunteering. When I suggested that this new volunteer help me screw in new radio mounts around the ship, a simple project that only required the use of an electric screw gun, she baulked; she had never used anything like that, she said, and doubted that she could. Since I knew that the trigger-operated screw gun was entirely safe for an unskilled user and that the materials I was suggesting using would be difficult to damage, I encouraged the woman to at least attempt installing a couple of screws under my supervision. By the third or fourth try, she had mastered the process, cheerfully setting to work alongside me and cutting the time my project took in half.

The calibre of the work at Riverside and on *Integrity* was such that few opportunities to

attempt completely new processes existed like they did on *Paloma,* where the plethora of work and the low standards for its completion meant that new volunteers did not need significant prior experience. What hindered learning on *Paloma* was that after someone had mastered basic maintenance tasks, there were no obvious avenues for them to progressively develop their skills by moving on to more complicated work. Those on board the ship doing the bulk of the maintenance fell roughly into two categories, those who did it for enjoyment, and those who needed to fulfil their yearly quota of work hours before they were entitled to join the ship for trips at sea. Neither of these groups of people provided a clear path for progressive learning, since the carpenters who worked for pleasure were not incentivised to teach, and the crew focused on sailing were not incentivised to master complex woodworking. While a few people came to the ship specifically to improve their woodworking skills, they were a small minority, and often quickly moved on to other opportunities elsewhere. *Paloma* had previously offered a winter-long shipwright's apprenticeship, but by the time I arrived, the budget for the head shipwright – the only paid position in the organisation – had run out, and the apprenticeship was consequently terminated.

Three or four people on *Paloma* could be described as devoted ship's carpenters, all older men who had retired from unrelated careers to pursue woodworking in their spare time. Each one had previously played a more significant role on *Paloma,* serving as foreman on workdays or coordinating volunteers, but had eventually given up these commitments in order to focus specifically on carpentry. Like the older volunteers at Riverside, the carpenters on *Paloma* all expressed the idea that they preferred working alone or in pairs to teaching new volunteers, as managing new crew inevitably involved

spending more time explaining procedures and supervising the work of others. Bennie and Lance, the two carpenters I worked with most closely, had even established a routine of working on the ship on Mondays and Tuesdays during the day in order to avoid the normal work shifts on the weekends and evenings. If a person had no prior experience working with wood, he or she was discouraged from volunteering on these days, which Bennie and Lance had set aside so that they could focus uninterrupted. While the two men did accomplish an impressive amount of the ship's routine maintenance on their weekday schedule, they also effectively isolated the main sources of woodworking expertise from the rest of the community of practice, preventing it from being reproduced among newer crew members.

Apart from the sequestering of woodworking skills from newcomers to the *Paloma* community, the reproduction of boat-building techniques was also hindered by the fact that there was little incentive for new community members to learn them. Most of the new volunteers I spoke to had joined the ship in order to start sailing, for which *Paloma* presented the unusual opportunity to learn for free. Sailing skills were taught to new members in a comparatively regimented manner, with a series of classes culminating in participation in days at sea, during which mistakes were pointed out and corrected by crew who had already been sailing for decades. No such process for learning-through-participation existed for woodworking skills, however, which were more often regarded as a necessary cost of keeping the ship afloat rather than an area of expertise to be mastered. Since the crew's commitment was measured in hours of work rather than practical abilities, as it was at Riverside, there was no pressure for maintenance work to be conducted at a high level of quality. Instead, whatever work needed to be done

would be completed by those available to do it, with the general understanding that a mediocre job was better than no work done at all, as Bennie explained to me:

> BENNIE: …the main thing is, don't do any harm, don't do anything that's irreversible, you know? Don't tear something out before you ask, that sort of thing. But fixing a rot pocket even temporarily is better than just leaving it open.

Paloma was covered in such 'temporary' repairs, many of which were forgotten over time, only to be rediscovered when they eventually decayed and developed into more serious problems. Unable to offer incentives to complete work to a higher standard, however, the ship made do with the maintenance work that was available.

Despite the lack of a structure to incentivise newcomers to learn carpentry or the availability of experts to teach it, *Paloma* did offer certain specific opportunities for developing one's woodworking skills. If a person had developed a basic understanding of ship's carpentry in another context, he or she received a great deal of autonomy and room for experimentation on *Paloma*. Because the standards for work were lower there than at the other two workshops I had visited, moving onto *Paloma* meant that I could take charge of projects that I had previously only been allowed to assist other people with, designing repair jobs rather than following work plans designed by others. Emmitt recounted a similar experience of learning on *Paloma*, marked by minimally-supervised experimentation with tools and materials that more formal boat building programs would not have allowed; while he admitted this kind of learning meant that his understanding of ship-building was insufficient in certain highly technical areas, aspects of the trade that are difficult to learn on one's own, Emmitt felt that his problem-solving skills were relatively well-developed as a consequence of the responsibility he had been given on *Paloma.*

Furthermore, because I already had significant experience in woodworking when I arrived on *Paloma*, I was allowed to learn from Bennie and Lance, the resident carpentry experts, in ways that other *Paloma* crew were not. Since Bennie and Lance only worked by themselves to avoid interruptions from inexperienced crew who needed constant guidance, they allowed me to join them on their weekday work shifts, operating under the assumption that I would not distract them. While I was able to handle most of the simple tasks I came across on *Paloma* with minimal oversight, working in proximity to Bennie and Lance meant that we all observed one another's work as it unfolded, constantly learning from each other's successes and mistakes. The kind of learning I experienced working alongside these experts, the result of moving laterally into a community of practice rather than progressing vertically within it, points to a process distinct from legitimate peripheral participation. I will explore the idea of learning through horizontal movement between workshops in the next section of this chapter (7.4).

In this section I have shown how Riverside and *Paloma* have distinct structures for legitimate peripheral participation, reflecting differences in the goals around which the two communities of practice are organised. Overall, I have portrayed the Riverside community as more effective at incentivising newcomers to learn complex carpentry practices, as well as better at providing them opportunities for doing so. Yet, not all of the learning that the wooden boat builders engage in occurs in this fashion, through participation and gradual advancement within a single workshop. As my experience on *Paloma* shows, learning is also possible through arriving at a community of practice with existing understanding developed in other contexts, then aligning that understanding

with that of the members of the new community. In the next section, I will show how boat builders are able to move between communities, relying on the we-world compatibility of their understanding to integrate themselves into workshops that do not have well-developed structures for legitimate peripheral participation.

7.4 Learning across workshops

In introducing the conceptual tools that I would use in this chapter (7.2), I argued that understanding is ultimately individual rather than perfectly shared, since different career histories and perspectives on tools and materials necessarily lead to differences in perception, even within a community of practice where understanding is generally well-aligned. Since nuanced differences in understanding within a community do not prevent collaborative work, neither do they prevent movement between communities structured around roughly similar practices, since the understanding developed in each community is largely compatible. The concept I have introduced to describe the range of an individual's compatibility in understanding is the 'we-world', which I have interpreted as a measure of similarity between ways of understanding rather than a bounded context or a fixed set of ways of perceiving. In this section, I show how boat builders make use of this we-world similarity in understanding to move between workshops, accumulating expertise across a variety of settings.

While specific construction techniques differed between my three fieldwork sites, reflecting the different goals around which the workshop communities were constructed, many of the general woodworking principles in use remained the same. Moving from Riverside to *Integrity,* I could still identify grain direction, wood species,

and the tell-tale signs of wood rot, even if these aspects of the work had particular ramifications in my new context that I would need to learn to recognise. Furthermore, I retained the sense of aesthetic I developed at Riverside; the sense of fair curves across component parts and their collective wholes, the 'eye' for historical anachronism, and a general sense of how a ship should neatly fit together. Such foundational ways of understanding were shared across all three workshops, a consequence of the fact that each community was constructed around similar high-level commitments, including historical accuracy and structural integrity of the ships being built or maintained. These similar commitments led boat builders in each of the three workshops to inhabit largely-compatible phenomenal worlds, and therefore to understand one another's work in ways that allowed them to move between workshops as new opportunities presented themselves.

Owing to the degree of transferable expertise that they had developed elsewhere, new boat builders in a workshop may have been 'newcomers' to that community in Lave and Wenger's language, but were not necessarily always novices. In fact, someone interested in carpentry at Riverside might find that their understanding was better aligned with the carpenters on *Paloma* than those carpenters were aligned with their sailor crewmates on the same ship; the situated differences in ways of dealing with wood could be smaller than the differences in understanding that already existed within a community, given the natural differentiation in understanding that occurs there. Therefore, for the wooden boat builders, the community of practice served as a social scaffold for entering the trade, participating alongside the members of that community to develop widely-applicable skills. From this perspective, each workshop presents a

specific avenue for developing the skills of the trade as a whole, rather than a repository of workshop-specific ways of understanding. The nuances in understanding situated in each community required boat builders to briefly reorient their practices as they moved from one workshop to the next, but were not great enough to undermine the we-world similarity between them.

At each of the three workshops, I met boat builders who had taken advantage of the mobility provided to them by occupying a common we-world, moving between boat workshops or even into boat building from similar professions. Harvey had worked for two decades as a house carpenter before moving onto *Integrity,* where he was taken on as a ship's carpenter based on the idea that the two sets of skills were largely compatible; while he spent much of his first few years on *Integrity* learning the skills specific to the trade and to the ship itself, his transition from one field to the next indicated that a single we-world spanned between them. Lucy's career progression was more predictable, but still involved moving between settings several times, transitioning from a Riverside internship to another maritime museum, then to a private workshop, and finally back to Riverside where she took on a permanent role executing the skills she had learned since she first left. Each of the roles that Lucy recounted to me during our interview required more responsibility than the one before it, indicating that she had continually accumulated expertise while moving between settings rather than collecting a series of incompatible situated understandings. Nick, one of the most well-travelled ship builders I met during fieldwork, had the longest list of previous jobs, and started our interview by handing me a five-page CV listing boat-building jobs going back to his teenage years. Nick explained that while so much moving around in his professional life

had prevented him from establishing strong roots in any single workshop community, it had allowed him a great variety of different experiences, which collectively made his understanding of the trade richer than if he had stayed in one place.

As Harvey explained it, the movement between workshops was largely a result of the nature of the industry, where opportunities for work frequently shifted from one location to the next:

> HARVEY: There's a lot of people there who've worked on a lot of different boats. … They would come in, work on these projects, and they find something else, and before this one was over they may leave and go to that one, because they know, 'okay, there's eight weeks of work left here; I go here now before that job fills up, I've got a year's worth of work'. So they would say, 'okay, there's enough people here to finish; X number of people are going to get laid off here; there's eight weeks of work left; in two weeks half the people are going to get laid off. So if I leave, what difference does it make? That means somebody else isn't going to get laid off'.

Some of my other interviewees, including Emmitt and Lou, pointed out that there were times when they would have preferred to stay in one location rather than move between jobs. The nature of the work, however, was that large ships only required significant refitting every decade or so, meaning that opportunities for short-term work would constantly arise in different parts of the country, requiring boat builders to relocate. In addition to the effects that such expansion and contraction of work opportunities had on the personal lives of the boat builders, it played a part in structuring the communities in which the work took place, which consequently needed to be open to accepting boat builders with little or no experience on the particular vessel being restored.

Because the staffing needs of each workshop shifted so frequently, each was designed to easily accept individuals who had learned to work in other communities, and whose

understanding could translate to their new context. This was the process that Harvey described when he first moved to *Integrity,* without having worked on ships previously:

> HARVEY: Back in… 1997, I guess it would have been… I went down for an interview, and they needed carpenters, not necessarily people with boat experience. I started working there, and I had a lot of experience, so my skills quickly transferred once I got the concept down, and I expected to work down there for a couple of months until they ran out of work, which I expected to happen and it didn't; when that restoration project was over, they needed a couple people to stay on and they offered me the job, and I took it. And it's been nearly twenty years since that happened.

Harvey explained that 'getting the concept down', or aligning his existing understanding of tools and materials with that of his colleagues in the new setting, mainly resulted from watching the work practices of the people around him. One major difference was the extent to which his new colleagues on *Integrity* worked 'by eye' rather than using straight-edges and carpenter's squares, which were essentially useless in a maritime context, where there were very few 90-degree angles. Since Harvey came from a domestic carpentry background, learning to see fair curves across the ship's surface was an important part of his incorporation into the *Integrity* community.

In his twenty years working on *Integrity,* Harvey had progressed from a newcomer trying to adapt his existing understanding into the workshop's resident boat-building expert, and was therefore responsible for gauging the extent to which other people's existing understanding would be applicable to work on his ship. Because he had worked on *Integrity* through several temporary expansions of the community – including one long stretch in dry dock, which required a crew of over 40 people – Harvey had developed a technique for determining a newcomer's abilities, gradually assigning him or her new tasks until the applicability of that person's existing understanding became apparent:

> HARVEY: You realise, 'OK, well, give her this, give her that, and see if she can do the task'. It's also a

> little bit of protecting yourself; ‘cause then all of a sudden, ‘I'll give you this’, then you screw something up, and you’re further behind then you were…

I experienced the vetting process that Harvey described first-hand, as I recorded in my notes when I moved to Integrity:

> I noticed some ‘feeling out’ going on, where Harvey tried to determine what I do and don’t know. Harvey is pleasantly straight-forward in this regard, just asking if I know what a tool does, then asking me to go use it if I do know; this is what he did with the jointer and the power sander.

Figure 50: Harvey watches me at the planer. (Photo by Lizzie)

In my first few days at *Integrity*, I found that Harvey would assign me simple projects, then watch from a distance while he worked on something else himself (Figure 50). I initially saw this observation of my work as a kind of test, in which I was supposed to prove my abilities and earn my right to participate in the workshop. While Harvey did have good reason to test my skills, making sure that I was capable of using the power tools safely before he let me work unsupervised, I eventually realised that he was also concerned with the style of my work and how it would fit into his workshop. We had many conversations in those first days about ‘how they do it over at Riverside’,

comparing techniques between the workshops before Harvey explained why work needed to be carried out in a particular fashion on *Integrity.*

In our interview towards the end of fieldwork, Harvey described the calculus with which he determined a newcomer's suitability for work on *Integrity* in terms of 'investment'. Newcomers would prove to be a worthwhile investment if they could, over the length of time that they were involved with the ship, 'pay off' the time that Harvey spent on them with a greater return of productive work. Harvey explained that, unlike at my other two fieldwork sites, this investment rationale made it unlikely that he would take on inexperienced newcomers, even as volunteers. I had only been allowed to join the ship as a volunteer, he explained, because I had already spent three months at Riverside, learning elementary aspects of woodworking and proving that I would be a benefit to the workshop, rather than a burden. Even with this prior experience, however, Harvey's vetting process showed that he was aware that I was bound to understand work practices in Riverside-specific ways after my experience there, and that taking me on would require an investment of time and effort on his part while I 'got the feel' again in this new context.

I have focused mainly on *Integrity* in this final section because, unlike my other two fieldwork sites, there was no structure there for novices to accumulate expertise through gradually-increasing participation. The small size of the workshop staff meant that there was no chain of expertise through which absolute beginners could receive work from colleagues only slightly more advanced than them; instead, on *Integrity*, newcomers with no experience would have needed to be constantly guided by the two experts, slowing down their work significantly. Furthermore, the professional standards

for work on *Integrity* and the expensive materials in use there closed down avenues for self-guided experimentation, a key factor in learning on *Paloma*. Rather than relying on these vertical strategies for bringing newcomers into the workshop, Harvey employed a horizontal strategy, taking on people who had experience in other contexts that could transfer to this new setting. The minimum amount of experience in another setting that would make a person a worth-while 'investment' was apparently quite low, since Harvey was able to make use of my assistance after I had spent only three months working on boats previously. While the bar for expertise may have been low, however, Harvey insisted it was firm, since there was no reason for him to take on newcomers who would take more from the workshop than they contributed.

Although the horizontal method of recruitment was most obvious on *Integrity*, it existed to some degree at the other two settings as well. As I mentioned previously (7.3), it was only because of my prior experience in boat building that I was allowed to work with the carpenters on *Paloma;* while the *Paloma* community had inroads for access to very basic work practices, there were no reliable routes within the organisation to the more complex work that Bennie and Lance conducted. Even at Riverside, where a strong system for legitimate peripheral participation existed and several of the staff had advanced into their roles from lower positions, boat builders were occasionally hired for short-term projects from other shipyards or restoration projects, temporarily moving horizontally into Riverside before transitioning to the next professional opportunity. The porousness of each workshop community and its mechanisms for adopting and vetting those trained in other workshops allowed for significant inter-workshop movement where we-world compatibility allowed, with boat builders routinely moving between

settings as their careers progressed.

Finally, although the various boat-building communities of practice were all structured such that differences in understanding were accounted for and could be overcome, the cross-pollination of understanding provided by the boat builders' constant movement gradually aligned practices between communities. For example, Harvey explained that he had learned quite a bit by watching Lou when the two of them worked together on *Integrity's* drydock repair, an extensive project for which boat builders were hired from across the country. When I interviewed Lou, he explained that he had learned much of what he knew about tall ships when working on *Paloma,* where he had been employed as a carpenter before arriving at either *Integrity* or Riverside. Boat builders continually moved along these routes, re-aligning their understanding with that of their new community of practice while shaping that community with the understanding they brought with them. Speaking of the boat builders he had worked with in the past, Harvey told me, 'if you want to do that whole 'seven degrees of separation' thing, they've worked on every ship in the world – every wooden ship, anyhow'. Since these boat builders had all worked together, at least within a few degrees of connection, they had all experienced one another's ways of working as well, comparing techniques and gradually establishing a similarity in their work practices.

In this final section, I have argued that movement between workshops is possible because different workshops, despite not collectively constituting a single community of practice, lead their members to perceive tools and materials in broadly compatible ways. Because the Riverside, *Integrity,* and *Paloma* communities of practice were all formed around common goals – historic preservation, woodworking, and nautical design

– the perceptual understanding developed at one site could be largely transferred to the next. Moving between workshops still required a newcomer to a community to adopt certain nuances in understanding that resulted from the pressures affecting that particular community, meaning that understanding was never completely identical between sites. Since understanding was never uniform within communities either, given the unique histories and ways of seeing that boat builders brought with them, the we-world compatibility in understanding between communities functioned much in the same way it did within communities.

Chapter conclusion

In this chapter I introduced the notion of 'communities of practice' to help capture the social structures for learning not easily recognised within a Heideggerian conception of understanding. By interpreting each workshop as a separate community of practice, I have shown how each consisted of its own routes for progression, strategies for exposing newcomers to new practices, and unique social and economic pressures that affected the style of work there. Departing from Lave and Wenger, however, I have argued that the understanding developed in a community of practice is compatible with that developed anywhere else similar practices are employed, although certain nuanced ways of perceiving tools and materials may need to be adjusted. I have based my argument for the compatibility in understanding between communities of practice in part on a premise from phenomenological philosophy, that understanding is ultimately individual, and that intersubjectivity is therefore the result of similarities in unique phenomenal worlds. Similarities in understanding can exist within or across communities of practice, depending on the practices that individuals have been exposed

to over their careers; in this chapter, I have described the compatibility of understanding that results in terms of the phenomenal we-world.

Key to the analysis above is that the concepts of the we-world and the community of practice describe different aspects of learning. I have used the idea of the community of practice to describe durable social structures in which people work together towards a common purposes, with agreed ways of incorporating newcomers into their ranks. The we-world, by contrast, is not a group of people or even an objective structure within which meaning is defined; instead, I have used the concept of we-world to describe the compatibility in understanding that allows for collaboration between practitioners with similar experience. A we-world develops within a community of practice as a consequence of the people there working together towards common goals and coming to perceive the tools and materials in similar, compatible ways; where other communities are also built around those goals, similar we-worlds develop, allowing for movement between communities of practice as boat builders progress in expertise. While moving between communities always means adopting the social norms and modes of interaction defined within the new community of practice, the extension of the phenomenal we-world across communities allows individuals to traverse communities without returning to an absolute novice position each time.

In the discussion chapter that follows, I synthesise the main points from this findings chapter and the two that preceded it, answering my original research questions in light of the collection of findings as a whole. In that chapter, I will continue to detail the interaction between the community of practice and the phenomenal we-world, showing how the understanding of practical objects is at once subjective and intersubjective,

unique in the mind of the perceiver but compatible enough between boat builders to allow for collaborative work.

8. Discussion

In this chapter, I return to the three research questions that guided this investigation, as I set out in the Introduction (Chapter 1). These questions ask how 'the feel' is experienced (RQ1, section 8.1), how it is developed (RQ2, 8.2), and what role community plays in its reproduction (RQ3, 8.3). As I answer these three questions in turn, I will compare my conclusions with those reached by previous researchers of craft learning, discussing where my findings align or contrast with those of similar investigations.

8.1 How is 'having the feel' for tools and materials experienced in the wooden boat workshop?

My findings about the experience of 'the feel' revolve around three key ideas: contextual dependence, through which objects are understood in terms of their purposes in context; the relationality of perception, where work processes are understood in interactional terms, rather than through attention to discretely-bounded objects; and ontological realisation, in which the being of objects is connected to their use within situated work practices.

8.1.1 Contextual dependence

Contextual dependence is the element of 'the feel' that I had predicted while designing this project, and around which I structured much of my investigation. The findings from my pilot fieldwork and literature search both suggested that non-discursive understanding, that which is employed in the manipulation of tools and materials, can be characterised in terms of perception, through which those objects come to be seen,

felt, or otherwise perceived in terms of their purposes in context. Several authors have explored this phenomenon in previous ethnographies, coining the terms ‘skilled vision’ (Grasseni, 2004a) and ‘professional vision’ (Goodwin, 1994) to describe learned ways of perceiving meaningful objects (see Literature Review). My project has built upon this previous work in providing a first-hand account of developing ‘the feel’, showing how perceived objects transform as the individual becomes more familiar with them. The sensory-ethnographic technique that I employed throughout this project has allowed me to convey the experience of tools and materials taking on new meanings and relating richer perceptual information. Where previous authors have pointed to such transformation through interviews and conversation analysis, my first-person technique has allowed me to record the nuances of my perception as it aligned with those around me, adding more experiential texture to the resulting ethnography.

The central theme throughout my findings is that of perception ‘as’, which I have explored using Heidegger’s concept of circumspection. The idea of circumspection has allowed me to highlight the ways in which objects relate to what Heidegger refers to as the ‘totality of involvements’ within which those objects exist (1927/1962, p. 149), the multiplicity of interrelated purposes that define them. In becoming familiar with this network of purposes, I came to see objects in the way that the other boat builders did; for instance, recognising tools related to specific purposes, or immediately differentiating between similar types of wood. Another finding revealed by my first-person approach to research relates to what I have named the distinction between ‘looking at’ and ‘noticing’ tools and materials in the workshop (Chapter 5). Although I quickly learned to perceive certain objects in terms of their purposes while I was

focusing on them during work, I observed that my more expert colleagues had their attention drawn to objects without directly focusing on them. As I walked out of the workshop with a historic length of rope in hand, the workshop director Nick caught the mistake I was in the process of making from across the room and interceded before I damaged a valuable artefact. Heidegger's work does not specifically account for this kind of 'noticing',[24] in which one's attention is drawn to objects rather than wilfully focused upon them; my ethnographic account adds experiential detail to the existing theory, conveying the lived experience of varieties of circumspective understanding.

8.1.2 Relationality in perception

Although I initially phrased my first research question in terms of 'the feel' for tools and materials, I eventually concluded that the experience of 'the feel' does not relate to an object in isolation, but rather to the relationships between objects as they collectively fulfil a purpose. This relationality of perception follows from the premise in the section above, that objects are perceived in terms of the network of meaningful interrelationships in which they exist; where this finding differs is in suggesting that it is the purpose-oriented interrelationships, rather than the discrete objects within them, that become the focus of attention.

One particularly clear example of relational perception appears in my use of the impact driver (Chapter 5). At first, the vibrations that the driver produced were meaningless to me, and I took them as excess sensory information that distracted from my work. With

[24] Although Wittgenstein (1958/2009) also discusses what he calls 'noticing' (p.203), his use of the term stands for his account of perception on the whole (Dinishak, 2013), which is closely connected to linguistic meaning (Borutti, 2017).

time, however, I learned to judge the tension on the lag screw from the feeling of the driver in my hand, paying attention to differences in resistance and vibration, both of which signalled when the screw was close to snapping. In considering my perception of the driver-screw combination, it is impossible to identify a single object of my perception in the way that I had in my earlier examples. I was interpreting meaning based on the sensory input from the tool itself, but my perception related more clearly to the object manipulated by the tool; it was the screw, not the drill, with which I was concerned. Even the screw itself was not the sole object of my perception, however, since the tension I perceived existed between the screw and the wooden timbers that I was securing together. My perception was that of screw and wood interacting, as driven by a tool with particular capabilities, resulting in a relationship that I perceived as 'tightness'. The relationality of this perception was further indicated by my losing the ability to interpret the same tool when used in combination with other materials, which interacted in different ways. Once any one of the factors in the network of meaning changed, the range of possible perceptions changed as well.

To some extent, the relationality of perception was indicated in a description of experience cited by several of my participants, which the expert boat builder Lou explained as tools 'becoming part of you' (Chapter 5). Such accounts of the incorporation of tools into the body point to the relationality of perception in that they stress the shift away from a sense of the tool as a discrete object, much in the same way that touching material with the hand does not convey a sense of the hand as a separate entity. As a consequence of this shift, Lou described being able to feel through the tool, experiencing the wood below it as he would with his own fingers. Similar descriptions

appear in previous ethnographies of craft learning, including those by O'Connor (2007b), who recounts that in becoming a proficient glass-blower, her tong-like 'jacks' disappeared from her awareness. O'Connor writes, 'I was able to attend to the glass through the jacks to the extent that the jacks were no longer a conscious term of my action' (p. 72), stressing that the jacks appeared to her in the same way that her own body did, as a sensory apparatus with which to perceive objects outside herself. Like O'Connor, I have drawn from the work of Merleau-Ponty (1945/2002) to explain how tools extend the sensory capabilities of the human body, allowing for certain kinds of mediated perception and action that would not otherwise be possible.

Unlike O'Connor, Standal (2011), and others who draw on the work of Merleau-Ponty, however, I have ultimately concluded that describing tool-mediated perception in terms of the incorporation of objects into the 'body schema' only conveys a limited sense of this perceptual experience. The limitations of Merleau-Ponty-inspired interpretations relate to that philosopher's relative inattention to object ontology (Dillon, 1988); by focusing so narrowly on the sense of objects as perceived through the body, a kind of perception sometimes mediated by tools, Merleau-Ponty largely sets aside the question of how objects are conceived of as such in the first place, a theme central to Heidegger's work. Returning to Heidegger's notion of the relationality of perception, I have argued that perception does not merely reveal the connection between body and object, but between the body and the endless interconnectivity in which objects and their practical functions are defined.

While I agree that familiar tools fade from awareness as bounded objects while in use, using ideas from Heidegger in conjunction with those of Merleau-Ponty, I have argued

that the materials being worked by the tools cease to appear as singular entities as well, giving way to a sense of the process as a whole. Processes such as sawing, drilling, and painting are experienced in the boat building workshop in terms of the progress of the practice toward its goal, rather than in terms of the transformation of the individual objects in use. A common example of this kind of relational perception, something I experienced myself as well as had reported to me by participants, was the perception of a hand saw cutting through a wooden board. While the saw itself may have ceased to appear as a discrete object, giving the user the impression that it receded into the body, so too did the wood and the saw blade, which combined to produce the sense of the progressing cut. Each of the components in use in the process of cutting contributed an aspect to the perception of the practice, but none appeared in awareness as a bounded entity, as if examined out of context. Therefore, where previous authors have focused on the disappearance of tools from awareness, I have stressed the disappearance of every discrete object, replaced with a sense of the progress of the work on the whole.

8.1.3 Ontological realisation

In the second findings chapter (Chapter 6), I address an ontological consequence of the premise of contextual dependence, that if objects are defined by the context in which they exist, then those objects only exist as such once one is familiar with that context. From this perspective, learning becomes a way of describing the constitution of meaningful objects within one's phenomenal world, a process I have called 'realising' objects. With the term 'realising', I hope to capture two aspects of the experience of learning: first, that it involves becoming aware of the existence of particular objects, and second, that it entails making those objects 'real' within an individual's phenomenal

world. In stressing the context-dependence of the being of objects, I do not mean to imply that there is no physical environment outside of human understanding; indeed, the existence of a human-external material substrate from which sensory input arises is a basic tenet of this project. Following Heidegger, however, I have argued that circumspective understanding divides this sensory input into the perception of different objects based on the background and practical expertise of the observer. Where a novice sees a single uniform object, an expert may see a collection of many, differentiated by minor variations that the unaccustomed eye interprets merely as extraneous sensory noise, rather than as the basis of meaningful distinctions.

The advantage of employing a Heideggerian conception of the being of objects has been the ability to capture the way in which learning is experienced as a transformation of the learner's phenomenal world. A key example of this kind of experience involved coming to see white oak as a combination of two distinct components, sapwood and heartwood, where I had initially seen it as one uniform substance (Chapter 6). In learning that workshop practices called for recognising the sapwood and heartwood as distinct, I experienced a cleavage in my perception of the wood, which transformed from one object into two. From a perspective on the wood as extant in a physical reality outside my understanding, no change occurred when I learned to see it as the local practices demanded; the arrangement of atoms that made up the wooden plank remained the same, regardless of how I interpreted them. My reasoning for focusing on the *perceived* reality of the objects in the workshop is that it has allowed me to capture the experience of learning, in which objects appear to radically transform as their roles in situated practices become clear. The Heideggerian perspective therefore better aligns

with my ethnographic intention to observe and describe the experience of learning, relating the ways in which the learner's perception is transformed as he or she progresses toward expertise.

My analysis of the perception of objects in the phenomenal world bears a close resemblance to Ingold's (2000b, 2007) account of the perception of the environment, which he bases largely on Gibson's (1979) theory of affordances (see Literature Review). Ingold argues, as I do here, that perception does not reveal the intrinsic properties of materials, but rather the ways in which those materials 'unfold' (2007, p. 14) in relation to the substances and agents around them:

> …the properties of materials, regarded as constituents of an environment, cannot be identified as fixed, essential attributes of things, but are rather processual and relational. They are neither objectively determined nor subjectively imagined but practically experienced. (Ingold, 2007, p. 14)

In arguing that materials are 'neither objectively determined nor subjectively imagined', Ingold endeavours to collapse the dichotomy between mind and material, arguing that humans exist as part of the environment rather than acting against it (2000b). While this monist conception of person-in-environment leads Ingold to insightful analyses of the 'ecology' that defines skill (Ingold, 2012), my contention is that it obscures certain aspects of the subjective experience of learning. The way that learning is experienced as transformation of one's phenomenal world is less easily captured from Ingold's ecological perspective, which leads instead to descriptions of learning as 'discovery' of objects that already exist (Ingold, 2000a). A Heideggerian perspective also better accounts for the fleeting existence of objects that are functions of a construction process, rather than its end result; the windows and curtains that developed in drying paint (Chapter 7) were neither materials nor qualities of materials in the senses that

Ingold uses, but rather phenomenal objects created and eliminated entirely in the mind of the perceiver. Finally, interpretation through the lens of being-in-the-world more easily explains the purely social aspects of perception, such as seeing objects as historically accurate, culturally valuable, or even aesthetically pleasing. Such qualities are distinct from the physicality of materials and are therefore 'subjectively imagined' in a way that Ingold's account avoids engaging.

8.2 How do newcomers to the workshop learn 'the feel'?

The second research question shifts the investigative focus from the experience of 'the feel' to the ways in which it is developed by newcomers to the workshop. While the idea of the 'newcomer' served as a useful analytical category at the outset of this project, my findings eventually led me to differentiate between newcomers and 'novices' (see Chapter 7); I will reiterate that distinction in the following section. In the present section, I identify three avenues for learning, namely self-motivated investigation of contextual relationships, guidance from workshop experts, and mimicry of movements and postures that do not have initially-apparent meaning.

8.2.1 Stages in self-motivated learning

Since much of my work in the three workshops took place under minimal supervision, my learning was often self-directed, encountering objects in context and determining their meaning rather than explicitly being taught. The experts in each workshop repeatedly cited 'curiosity' as a strong driver of such learning, explaining that novices who were interested in the purpose of tools and the qualities of materials were more likely to end up becoming professional boat builders. In this section, I posit three stages

in this self-directed exploration: *acknowledgment* that various contextual interrelationships exist, *reflection* on the nature and experience of those interrelationships, and finally perceptual *understanding* of objects within their meaningful context.

The first stage, acknowledgment, merely consists of recognising that the way in which one initially perceives objects in the workshop does not convey all of the meaning necessary to successfully use them in work. In visual examples, this acknowledgment took the form of realising that I failed to see what my colleagues were seeing in different tools and materials; examples include my initial inability to see which tools were appropriate for a specific job (Chapter 5) or to see the sapwood that Harvey tried to point out to me (Chapter 6). In these cases, interactions with my colleagues did not directly lead me to perceive the workshop in the way that they did, but instead only led me to acknowledge that my own perception was inadequate for the tasks at hand. In such moments, I recognised the parameters of 'the feel' while acknowledging that I did not yet have it.

Acknowledging the shortcomings of my tactile perception was equally important for learning as acknowledging the limits of my vision. Unlike with visual perception, however, acknowledging the initial superficiality of my tactile perception meant realising that certain sensations could convey meaning at all. As Paterson (2007) explains in detail, tactile[25] perception need not be considered a different form of understanding

[25] Paterson prefers the term 'haptic' to the term 'tactile', as it includes sensations of the body in movement and of the body in space; while these added dimensions are certainly important in the boat building workshop as well, my own findings related to haptics are mainly limited to the perceptual interface between body and objects, making 'tactile' a more precise label.

than visual perception, as both equally bring meaningful objects to mind through bodily sensation (see in particular Paterson, 2007, Chapter 3). The stronger connection between vision and the perception of objects, what Armstrong (1962) refers to as 'mediate' perception, is argued by Paterson to be the consequence of 'visualism' (Paterson, 2007, Chapter 4), a social predisposition towards vision over the other senses. My findings provide no specific evidence that the connection between sensation and perception[26] is stronger for visual encounters with tools and materials than for tactile encounters. I have, however, recorded several examples in which the presence of a connection between tactile sensation and perception was more surprising to me than it was in visual cases. In 'getting the feel' for the combination of the impact driver, steel lag screws, and wooden timbers that I was asked to use in combination (Chapter 5), I needed to be explicitly instructed to feel, rather than see, the results of my work to judge its progress; it had not occurred to me while working to attend to the tactile sensations arising in the task. One element of 'getting the feel' therefore appears to be recognising the depth of possible meaning in tactile perception, which may be obscured by visualist tendencies outside the craft workshop.

Once I came to acknowledge that my colleagues were perceiving aspects of the work that I was not, I entered what I will call the 'reflection' phase. This phase was generally brief, marked by pointed consideration of the qualities of my sensory encounters with tools and materials. Looking at the paint scraper that Lou chose for me, the reflection phase consisted of asking myself why this particular tool was the correct choice for the job at hand. I examined the blade of the tool, the handle, and the alternative choices,

[26] 'Sensation' as defined as unprocessed input to the bodily senses, and 'perception' as the meaning derived from such sensation; as discussed in the Theoretical Framework (Chapter 2).

puzzling over the ways in which different tools and materials might interact. Likewise, once Lou told me that I needed to 'get the feel' for the driver, I made a point of thinking about the feeling of the driver in my hands, the sounds it made, and the other sensory clues revealed in the work process. In Heideggerian terminology, this reflection demonstrated an 'occurrent' mode of understanding, deliberate consideration of the objects in question as abstracted from their normal context.

A key point about the reflection phase is that it shows how the occurrent and available modes of understanding are not hierarchically arranged, with the available serving as a more developed mode founded on the occurrent. Instead, I first encountered tools as available, recognising them as objects naturally at home in the workshop. It was only once I realised that my perception of those tools failed to reveal all of the meaning necessary for their use that I switched to the occurrent mode, deliberately questioning which aspects I was missing. My experience therefore aligns better with an interpretation of occurrent understanding as a mechanism devoted to problem-solving (see Wrathall, 2013) than as a first stage in learning, as Dreyfus and Dreyfus (1980) assert in their five-stage model of skill acquisition.

The final phase in learning involved returning to available understanding with a deepened sense of the purpose of objects within their usual contexts, marked by the ability to immediately associate sensory input with its meaning in work. In one sense, progress through these stages was linear, in that the novice follows a step-wise progression towards the deeper and more nuanced available understanding required for participation in the workshop. In another sense, however, the three stages of learning that I have identified are circular and cumulative, revealing layer after layer of

contextual meaning rather than its sum total at once. For example, although pointed occurrent deliberation eventually led me to intuitively differentiate between brass and bronze fittings on historical boats, I was still surprised when I learned that the scratches and nicks in the fittings signalled particular meanings to the other boat builders (Chapter 5). Discovering that these features had meaning returned me to the first phase in learning, from which I re-examined the objects I was already accustomed to in other regards. Therefore, where Heidegger describes available understanding as familiarity with the 'totality of involvements' among which objects exist (1927/1962, p. 149), I would suggest that available understanding relates particular constellations of involvements, rather than their totality as a whole. Indeed, my findings show that the totality of practical involvements is so deep and complex that it would be difficult to perceive every meaningful aspect of a difficult boat-building job at once (see sections 6.3-6.4).

8.2.2 Expert guidance

In discussing learning in the section above, I phrased my conclusions mainly in terms of how I approached the process myself, actively considering tools and practices until their meanings became apparent. Such an individual analysis represents only one aspect of learning, however, which often involved other people as well. In particular, my expert colleagues facilitated my learning by assigning me tasks that were within my capability, but which would still lead me to encounter tools and materials in new ways.

In general, the ways in which my expert colleagues shaped my learning are better described as 'guidance' than 'teaching' because they involved structuring work tasks such that I would discover necessary features of the work myself, rather than explicitly

explaining techniques. At Riverside, Lou explained the expected outcome and the possible hazards present in my cradle-making task, but limited his instructions on how to use the necessary tools to the assertion that I would eventually 'get the feel' for them (Chapter 5). Likewise, Harvey pointed out the characteristics of sapwood and heartwood to me, then left me to practise separating them on my own, even though I initially struggled to tell them apart (Chapter 6). In either case, Lou or Harvey could have explained what it was that they were seeing and feeling in the work, in the hopes that such explanation would allow me to perceive it in the same way. Instead, however, the experts set up scenarios in which I would learn by myself through watching the materials interact to generate the end product.

There are several reasons why this strategy of pedagogical scenario construction suited workshop learning better than explicit instruction would have. The simplest of these reasons is that in setting me up with instructive tasks, the experts in the workshop could return to work themselves, from which long periods of time spent teaching me would have been a distraction. Additionally, if the work I had been assigned was at an appropriate level, it would be productive in itself rather than simply a learning exercise, contributing to the goals of the workshop while addressing my own goals for learning and career advancement. Finally, as I have illustrated throughout this ethnography, recognising and explaining the experiential nature of the understanding necessary in the workshop requires lengthy description and philosophical rumination. It would be impractical for my expert colleagues to explain what I should be perceiving and how such perception-as-understanding underpins work, since the effort required in doing so would far outweigh the effort it would take me to discover such features of

understanding on my own.

While establishing learning scenarios may have made guiding my learning simpler for the experts I worked alongside, the method by which the experts determined which tasks were appropriate was relatively complex. In interviews, my participants pointed out that they recognised how the workshop must have appeared differently to me than it did to them, given my early stage of familiarity with tools and materials (Chapter 6). Assigning me appropriate work must therefore have required these experts to imagine how I understood the workshop, then choose tasks that could expand this understanding without overwhelming it entirely. The facility with which the experts made these judgements initially prevented me from realising how the work that was assigned to me was specifically curated for a particular point in the development of my understanding. Lou and Harvey demonstrated an ability to see the workshop through my novice's eyes that I did not fully appreciate until I myself came to see the work more as they did, then reflected on the degree to which my understanding of tools and materials had transformed. This kind of empathetic comparison of worldviews, marked by the experts attempting to perceive the workshop in the way that I did, would be a suitable topic for further investigation on its own.

8.2.3 Occurrent mimicry

As I explained at the beginning of this thesis (Literature Review), observation and mimicry have been cited in previous literature as key factors in craft learning. While my study has reinforced the idea that observing colleagues at work and copying their behaviour is an important part of learning, my analysis contributes a new perspective on the way in which this learning occurs.

I argued in the literature review that authors such as Marchand (2010a) and Downey (2010) ultimately produce highly technical cross-disciplinary adaptations of Bourdieu's (1972/1977) notion of 'hexis', through which movements are unconsciously instilled in the body. While Marchand and Downey produce more nuanced analyses of embodied learning than Bourdieu does, they both continue a trend of interpreting skill as a record of specific movements. In my fieldwork, by contrast, it was perception of the tools and materials of the trade upon which understanding hinged, rather than the movements by which those objects were used. Learning to work with tools and materials required coming to understand their meaningful interrelationships and to perceptually interpret their relation to one another in light of the work at hand; with these features of work in mind, bodily movement becomes a way of accommodating the interaction between tool and material, rather than the primary driver of material production.

Connecting understanding to perception of the objects of work rather than to the bodies carrying it out does not exclude the possibility of observation and mimesis in the workshop, however. In several instances, I found myself copying my colleagues' stances as they performed their work, finding that composing my body as they did theirs produced better results (Chapter 5). The difference in my analysis is that mimesis serves the function of presenting the novice with the perspective on objects taken by the expert, and therefore allows the novice to determine which aspects of the work the expert is watching. Copying Jay's stance at the bandsaw, for example, did not itself result in a better way of working, but instead gave me a perspective from which to discover that Jay attended to the point at which his pencil line and saw blade met (Chapter 5). Such examples take place in what I have called above the 'reflection' phase

of learning, during which the learner deliberately attempts to discover the meaningful aspects of the work at hand that he or she has determined are missing from perception. As a result, the strategies that the learner employs are occurrent, in that he or she does not at first understand why one must hold the body in the way that the experts do. Only after copying the bodily comportments observed in the workshop do novices realise the useful perspectives that such positions allow, making mimesis a strategy for learning rather than a form of learning in itself.

8.3 How is 'getting the feel' a function of, or supported by, the boat-building community?

This third research question asks what role community plays in encouraging learning. While my inclusion of the idea of 'community' in the design of this project was partly inspired by Lave and Wenger's 'communities of practice' model (1991) and the many ethnographic studies of apprenticeship in which it has been employed (see Literature Review), I did not initially intend to limit my use of the term to their specific definition. In building my analytical account, however, I realised that Lave and Wenger's model provided a sociological complement to Heidegger's theory of understanding, which lacks sufficient explanation of social structures to thoroughly explore learning in the workshop. In the final findings chapter (Chapter 7), I combine the idea of the 'community of practice' with that of the phenomenal 'we-world', exploring the reciprocal relationship between understanding and the social structure in which it is developed.

8.3.1 The role of the community of practice in learning

In Chapter 7, I show how learning is the result of participation within communities of

practice, bounded groups of practitioners who share interests, ambitions, and work practices. Rather than providing a third explanation for learning – in addition to the self-guided curiosity (Chapter 5) and guidance from experts (Chapter 6) that I described earlier – the idea of community has allowed me to show how the kinds of learning that I have already discussed take place in social structures that govern the activities of the participants within them. Exploration of tools, material, and construction processes can occur in communities where precision work is not a central concern, since lower standards for work quality allow for broader participation in practices. In other examples, guidance from relative experts takes place where the structure of the community is such that both the newcomer and the established member of the community both benefit from the exchange; a multi-tiered workshop community makes such productive partnership possible, incentivising each member to aspire to more complex work.

The main mechanism that I cited for within-workshop learning was 'legitimate peripheral participation', a concept that Lave and Wenger use to describe entry-level activities through which a newcomer to a community learns basic practices while contributing necessary work. At Riverside, access to work was strictly controlled, with new opportunities presented to boat builders who had already proven themselves in the workshop. Novice boat builders like myself began by taking over the simplest tasks from slightly more experienced boat builders, establishing ourselves within the workshop hierarchy while relieving our colleagues of tedious routine work; attempting to step out of this hierarchy was discouraged, since taking on work too far beyond one's capability would require experts to spend more time on guidance, and would also deprive more

advanced novices of the opportunities for which they had been training. Like in Herzfeld's (2004) ethnography of Greek apprenticeships, it was the workshop experts at Riverside who determined when a novice might be exposed to instructive work. Unlike in Herzfeld's work, however, the Riverside staff controlled access to complex tasks in order to promote efficiency in the workshop, rather than to guard their professional knowledge. On *Paloma,* legitimate peripheral participation worked through an opposite logic, with novices working directly alongside experts, helping with whatever work attracted their interest. This mechanism for legitimate peripheral participation, which was significantly less 'peripheral' on *Paloma,* was the result of a relationship between workload and available labour that was the inverse of what existed at Riverside. With more work available on *Paloma* than the crew could handle, the community encouraged completion over quality, encouraging newcomers to work anywhere they could help. The result of this easy access to work was that no hierarchy of progressively-responsible positions developed, and therefore no routes for the gradual development of expertise existed.

Integrity, my second fieldwork site, did not have clear opportunities for legitimate peripheral participation, drawing into question its status as a community of practice at all. While the two-person staff on *Integrity* did share practices and ways of understanding their work that were specific to that one setting, it was not clear how these would be passed on to subsequent generations in the workshop. Harvey and Lizzie only took on extra help on a temporary basis, and as a result, whoever would eventually replace them in their roles would likely have learned the trade in a different setting, therefore bringing with him or her a new set of ideas about tools, materials, and work

practices.

The third research question also asks how 'getting the feel' is a *function of* the boat-building community, a slightly different take on learning than implied by the question of how the community supports learning. My inclusion of the phrase 'a function of' reflects the early influence of Lave and Wenger's work on the design of this project, which at one point questioned whether 'the feel' was a feature of the community, rather than of the understanding of the people within it. Such an interpretation aligns with the conception of understanding prevalent within work on situated learning that I presented in the literature review (section 2.1.2), in which understanding is described as an interactional process rather than the working of an individual mind. As Lave and Wenger explain, their use of the concept of the community of practice reflects a shift 'from the individual as learner to learning as participation in the social world, and from the concept of cognitive process to the more-encompassing view of social practice' (1991, p. 43). I have ultimately elected to break with Lave and Wenger on this point, looking at understanding as an individual process aligned within durable social structures rather than conflating the activities of the community with the understanding of the people within it. Where Lave and Wenger claim that 'focusing on the structure of social practice and on participation therein implies an explicit focus on the person' (1991, p. 52), I have found that their interpretation of understanding obscures the question of individual perception, which I have made my main focus.

A limitation of aligning the community of practice with individual workshops rather than imagining an inter-workshop community as a whole has been that I have partly overlooked my participants' descriptions of identities and common concerns that stretch

across workshops. In interviews with my participants, especially the post-fieldwork member-check sessions in which they contributed as groups (see section 3.6.4), conceptualisations of community were suggested that included the boat-building community, the carpentry community, and even the community of American craftspeople. My own interpretation is that none of these broad conceptualisations of community captures the specificity and situated nature of practices and ways of learning; that said, I recognise that my workshop-specific interpretation does not account for certain questions of shared identity and common values. Most of my participants explained to me at some point that their work was driven by a belief in the edifying and personally-fulfilling nature of their work, which they explained would not be found in work that did not require use of the whole body and the skilled manipulation of physical materials. Future work with American craftspeople could fruitfully explore questions of common identity and motivation across workshops and perhaps across trades, asking if there is a sense in which they constitute a single community, given their common commitment to specific kinds of work.

8.3.2 The role of the we-world of shared understanding

To address the perceptual understanding that Lave and Wenger leave largely unexplored in their focus on interactions between individuals, rather than on the understanding possessed by the individuals themselves, I have adopted Heidegger's concept of the perceptual 'we-world'. In Heidegger's explanation, the we-world is to a group of people what the 'world' is for a single individual, a collection of meaningful interrelationships that determine how practical objects are understood. My own interpretation is that the we-world is a measure of similarity between phenomenal

worlds, marking the extent to which an individual's understanding is compatible with that of others. While Heidegger does not explicitly define the we-world as a compatibility of understanding rather than an identicality, I have interpreted the concept in this way based on his premise that understanding is developed through exposure to objects with specific situated meanings; since no two people have precisely identical histories of experience with practical objects, no two ways of understanding can be identical, so the intersubjective we-world must be based on similarity rather than identical replication of ways of perceiving.

An important aspect of my use of the concept of we-world is that it and the concept of the community of practice are not directly comparable. The community of practice, in the interpretation I have presented here, is an identifiable set of people and practices, located in a particular geographical space and cultural context. The we-world, by contrast, does not describe a bounded set of people or ways of understanding; instead, it describes only the compatibility of understanding that allows for collaborative work. Defining the shared perceptual we-world in terms of compatibility has helped me to avoid an analytical problem around identifying the social context in which collaboration can occur. Thinking of 'the boat-building world', for example, would imply that only people who build boats are capable of understanding how boats are constructed; as my findings show, this is not the case, with people like Harvey stepping into roles as boat builders directly from previous work in areas such as domestic carpentry. By differentiating between understanding and the social contexts in which it is developed, I have allowed for a broader sense of compatibility in understanding, accounting for similarities that are not obvious when considering understanding as bounded within

particular trades.

Because the we-world is not a bounded group or social structure, it would be misleading to claim that the we-world 'supports' learning in the way that the community of practice does, by directly influencing interpersonal interactions. We-world compatibility in understanding does, however, allow boat builders to move into new communities of practice and learn from new colleagues, enabling cumulative learning that otherwise could not take place. Because the concept of the perceptual we-world has allowed me to show how newcomers to a community of practice sometimes already possess a degree of relevant expertise, I have differentiated in my discussion between 'newcomers' and 'novices', the latter of whom have no experience in similar settings. Since a newcomer to one particular workshop may be an expert in similar work, these two descriptors serve to describe both familiarity with a particular setting and understanding that is applicable across settings.

While Lave and Wenger's work is generally focused more on systems of activity than on the understanding of the people within them, there are certain aspects of their theory that imply a conceptualisation of understanding similar to the Heideggerian version I have presented in this project. In particular, their language of 'technology' shows how certain objects are overlaid with cultural meaning, and therefore perceived in terms of their particular purposes in context:

> Becoming a full participant certainly includes engaging with the technologies of everyday practice, as well as participating in the social relations, production processes, and other activities of communities of practice. … Participation involving technology is especially significant because the artifacts used within a cultural practice carry a substantial portion of that practice's heritage. … Thus, understanding the technology of practice is more than learning to use tools; it is a way to connect with the history of

> the practice and to participate more directly in its cultural life. (Lave & Wenger, 1991, p. 101)

The example that Lave and Wenger use to illustrate the concept of technology is that of the naval quartermasters' 'alidade', a sighting device used to take directional bearings at sea (1991, p. 101). The alidade embodies a long history of social and technical practices in that while it remains a functional navigational device, it also serves to signal the navy's insistence on reproducing foundational navigational theory, since the alidade is an outdated technology in the age of computer-aided navigation. While I agree with Lave and Wenger's interpretation of the alidade as embedded in both a practical and social context, though, the findings in this project imply that the constitution of objects by the communities in which they are used extends past such easily-recognisable 'technology'. The power tools and hand tools I used in the workshop carried with them certain contextual meanings, but so too did scratches in a metal hinge (Chapter 5), colours in a plank of wood (Chapter 6), and even the ways that paint dried on the hull of a boat (Chapter 7). Where Lave and Wenger claim that technology offers a vantage point on situated meaning, I would argue that every object within a community of practice is understood in a unique, contextual way, as part of a 'totality of involvements' there (Heidegger, 1927/1962, p. 149). Substituting Heideggerian terminology, what Lave and Wenger call 'technology' might then be better referred to as 'equipment' (as discussed in Chapter 5).

8.3.3 Understanding as capacity, not situated activity

A final point about the joint communities of practice/we-world analysis that I presented in Chapter 7 is that conceptualising understanding as an individual activity rather than a function of a group emphasises how each individual already possesses a particular way

of understanding before joining a community of practice; it is the content of perception that is transformed when the newcomer 'gets the feel', rather than the basic mechanism for understanding. By collaborating together, newcomers to a community align their understanding with those around them, but continue to demonstrate the same basic kind of perception-as-understanding that underpins their everyday activities, interpreting objects around them in terms of their contextual purposes. Interpreting learning as the alignment of understanding returns this discussion to a fundamental philosophical premise that I expounded at the beginning of the project (Theoretical Framework; also Chapter 5): that understanding is the basic human capacity for projecting possibilities into the world, rather than an epistemological function over and above what we do in our dealings with everyday objects (Heidegger, 1927/1962, p. 185). In learning to build wooden boats, I aligned my understanding with those around me and deepened my appreciation of the nuanced meaning available in objects; I did not, however, develop a mode of understanding completely separate from that I possessed before fieldwork.

Following Heidegger, I argue that all perception presents the meaning of objects as we have learned to understand them, rather than solely as they exist physically. This conclusion largely aligns with accounts from anthropology (particularly Grasseni, 2007, 2018) that show how perception always presents culturally-situated meanings. While all perception may be of this general kind, however, the findings here show that perceptual understanding still varies by degree, and that craftwork can play a role in introducing individuals to the extent of their capability to see and feel 'as'. As a coda to this research project as a whole, I argue that 'the feel' is not just a skill used by boat builders and

other craft professionals, but an opportunity to experience the full extent of the human capacity for understanding. Further thoughts on the humanistic potential of craft education appear in the final chapter (see Conclusion, Chapter 9).

In the Conclusions chapter that follows, I summarise the answers to the three research questions as I have presented them here, then move on to ask what implications these findings have for craft learning, as well as for education more generally.

9. Conclusion

I set out in this project to document how wooden boat builders develop what they refer to as 'the feel', the ability to perceive the tools and materials of their work in terms of the purposes those objects hold within the workshop. The questions that guided my research asked how 'the feel' is experienced, how newcomers to the workshop learn it, and how the community of boat builders supports that learning. To answer these questions, I joined three boat building workshops myself as an entry-level volunteer, working alongside novices and experts alike in an effort to experience learning and understanding in the ways that they did. Over six months of fieldwork, I jotted notes about how I perceived objects in the workshop during the day, then unpacked those notes into narrative reflections in the evening, trying to capture the texture of my experience as tools and materials became more familiar to me. I supplemented these sensory-ethnographic reflections with observations about social interactions among the boat builders, photos and videos of the boat building processes, and long-form interviews with my colleagues, during which I invited them to map out their individual career journeys.

Addressing the question of how 'the feel' is experienced, my findings illustrate the boat builders' ability to 'perceive as', or to recognise a depth of meaning in objects invisible to the uninitiated. In the first cases I recorded, seeing, feeling, and hearing 'as' simply meant identifying objects in terms of the processes in which they are used; for example, seeing a paint scraper as a paint scraper. As my fieldwork progressed, however, I realised that growing familiarity with these processes led objects to transform in more radical ways, splitting apart or combining in perception as the work at hand demanded. In the moments

in which I felt most comfortable with tools and materials, I found that my sense of them as discrete objects faded almost entirely, their relational interdependence within the work at hand filling my attention instead of the individual components. Throughout the project, I have analysed these kinds of perceptual understanding by way of Heidegger's concept of 'circumspection', which involves projecting context-specific possibilities into one's phenomenal world. The idea of circumspection has allowed me to interpret 'getting the feel' not just as the development of a practical skill underpinning professional work, but as a radical transformation to the novice's lived reality.

In terms of how 'the feel' is developed, it is clear throughout the findings that exposure to tools and materials used within situated practices is what leads the novice to see them circumspectively. Curiosity is a key driver in this learning process, since the learner must be motivated to seek out the myriad meaningful relationships between tools and materials in everyday work processes. Yet, my ethnographic account shows that individuals do not learn in isolation; they are guided in their exposure to unfamiliar practices both by the experts around them and by the structure of the organisations in which they participate. The role of the expert in instruction is often to interpret learners' existing levels of familiarity with tools and materials, then assign tasks that stretch that familiarity into new procedures. In so doing, experts foster gradual perceptual transformation in the novices they work with while also delegating work that can reliably be accomplished by lower-level boat builders. This mutually-beneficial relationship exists across organisations in their entirety, which are structured such that monotonous, routine work is accomplished by those who will learn the most from it, while more complex work is assigned as a reward for demonstrations of competence and commitment.

In the third and final findings chapter, I analysed each of the three organisations at which I worked as its own community of practice, showing how each included unique routes for progression into and throughout the organisation's structure. My analysis reflects a specific reading of the communities of practice model, which is often applied to more loosely-bounded groups of collaborators, or even to entire professional trades. My logic for identifying each organisation as its own community of practice is that such an interpretation allows me to highlight how there is no single path to becoming a boat builder; instead, there are only routes to becoming a Riverside boat builder, an *Integrity* boat builder, or a *Paloma* boat builder. By pointing to the specificity of what is learned, however, I do not mean to imply that understanding is not transferable from one setting to another. Indeed, by returning to a Heideggerian conception of understanding as an individual engagement with a phenomenal world, I show how even within a community of practice, no two individuals understand their work in precisely the same way. The slight differences in understanding between individuals allows for collaboration both within and across communities of practice, as long as different communities are organised around similar purposes.

Viewed as a whole, the novel contribution of this project is to capture how the perceived world around the novice transforms as that individual is incorporated into a community of craft practitioners. In contrast to prior research, I have attempted to focus my account on the experience of the learner at different stages of expertise in craft practice, rather than trying to establish an external view of the process of production as a whole. This experiential perspective has allowed me to ask questions that have yet to be explicitly addressed in studies of learning in the craft workshop, particularly around the lived experience of tools and materials. Building upon empirical researchers such as O'Connor

(2017) who employ ideas from Merleau-Ponty (1945/2002), I have attended to the experience of tools receding into the body during skilled use; unlike such authors, however, I have also questioned how tools come to be understood as such in the first place, and whether the experience of skilled practice is more nuanced than just the 'disappearance' of discrete objects from attention. Likewise, building upon authors like Ingold (2007) who employ Gibson's (1979) idea of material affordances, I have examined how materials present themselves differently in different contexts; unlike Ingold and his followers, however, I have explicitly tied the being of objects to their functions within shared phenomenal worlds. In so doing, I have produced an account in which learning entails the experience of new objects coming into existence, a world-transformative quality overlooked by research that focuses on interaction between extant materials and those who discover them.

A plausible critique of my analysis in this project is that, by relying so heavily on ideas from Heidegger, I have limited myself to a narrow, philosophically idealist interpretation of reality. Such criticism would point out that craftspeople do not manipulate objects that exist solely in their own phenomenal understanding, but in fact transform real, physical materials into shared cultural artefacts. To be clear, I do not wish to challenge the idea that there is a perceptually-accessible material substrate upon which understanding, and therefore craft skill, is based. Unlike much prior research, however, my intention has not been to model the objective relationships between people, materials, and objects of material culture; instead, my focus has been on craft *learning*, and on how perceptions of materials and senses of their interrelationships are developed. At the end of a day's work, a discarded scrap of oak will be physically the same regardless of who examines it. What I have attempted to capture

in this project are the ways in which that same scrap calls out to craftspeople differently, segments itself into its constituent components, blends into the fair curve of a lapstrake hull, or submits itself to the progress of a bandsaw cut. These first-person experiences are so varied in phenomenal texture that to describe them as expressions of a single material object would be to overshadow the learning through which tools and materials appear in completely new ways in the eyes of the novice. A Heideggerian conceptual standpoint helps to capture this experience by focusing on objects-as-perceived, rather than on objects as objectively-defined materials within a human-external reality.

As with all ethnography, a question exists as to the applicability of these findings to other settings. In a limited sense, the account I present here applies only to these three workshops, and in fact only to the people and projects within them at the time of my research; the flow of boat builders between workshops and the variety in projects that are undertaken there mean that the settings that I describe in these pages undoubtedly no longer exist as I have described them. The potential applicability of these findings relates instead to a more general reorientation towards conceptions of understanding and learning in craft communities. By presenting the case of 'the feel' in these three boat building workshops, I mean to challenge a prominent conception of understanding as discursive and deliberate, presenting instead an interpretation of understanding as perceptual and pre-reflective. Likewise, I have presented a reading in which understanding is not a capacity that is developed from scratch when the newcomer appears in the workshop, but a fundamental mode of engaging with the world that is gradually aligned with those around him or her. These general perspectives on learning and understanding have clear relevance to other settings, in which future researchers might ask what intelligent abilities are overlooked by

present descriptions of craftwork, and how craft learning might lead to deepening of the inherent human capacity for engaging with the world.

The final point above returns this discussion to the premise set out in the Introduction (Chapter 1), that a narrow focus on demonstrable skill in vocational training and career education obscures the other ways in which such opportunities are formative and valuable. Having served as a workshop trainee myself, I can confidently claim that learning to build wooden boats is a worthwhile undertaking for reasons that extend far past the market value of the resulting skills. In aligning their perception with that of those around them, novices like myself are introduced to the possible depth of understanding that perception can relate, as well as with the nuance in meaning that can be comprehended in a short glance or with a passing touch. While getting 'the feel' does not entail developing an entirely new way of interacting with the world, it does require exploring the extent of the possibilities of our fundamental mode of understanding, which we take for granted in our everyday dealings with physical things. Working somewhere like the wooden boat workshop allows the learner to encounter the myriad layers of meaning and context-bound purposes that operate at once within such a complex system, exposing him or her to the full extent of our inherent human capacity for meaning-making.

This conception of boat building as a medium through which our fundamental mechanism for understanding the world can be refined points to a vision of craft as 'liberal education', a mode of fostering personal growth rather than solely achieving extrinsic ends (Peters, 1970b, p. 43). Of course, competence at work should still be a concern in a well-rounded education, which serves as an introduction to ways of interacting with others in society,

fulfilling the collective functions through which we support one another's needs (see Dewey, 1916/2004). As Pring points out, however, intellectual growth and training for work are not necessarily incompatible:

> …there is a mistaken tendency to define education by contrasting it with what is seen to be opposite and incompatible. 'Liberal' is contrasted with vocational as if the vocational, properly taught, cannot itself be liberating – a way into those forms of knowledge through which a person is freed from ignorance, and opened to new imaginings, new possibilities (Pring, 2004, p. 57; org. emp.)

In the passage above, Pring echoes long-standing criticisms by Dewey (1916/2004) and Oakeshott (1989), who challenge the notion of a liberal/vocational divide in education. Collectively, these authors argue that subject matter has little bearing on the promise for fulfilment of educational aims such as intellectual growth and personal fulfilment. What does matter is the perspective from which a subject is taught; if the goal of teaching is to foster new ways of engaging with the material and social world, then the outcome might rightly be called 'education'. A strict focus on the production of finished goods, by contrast, leads only to 'training', the memorisation of routines detached from context and therefore deprived of their full significance. Returning to the definition of 'craft' that I provided in the Introduction (Chapter 1) – organised practice combining tools, materials, and the body, joined with a sensibility for the aesthetic, social, and practical value of the objects produced – it becomes apparent that craft learning is therefore liberal education, by definition. My analysis throughout this thesis merely serves to translate into the technical language of philosophy the premise that craftspeople intuitively understand, that historical ways of working with tools and materials in their meaningful contexts demand a highly-sharpened intellect.

In arguing that craft learning is intellectually comparable to the learning of literature, history, and the other mainstays of liberal education, I do not merely mean to defend craft education against those who would see it as mere job training. Indeed, this investigation also provides the logical foundation for asking what craft learning provides that those traditional 'liberal arts' do not. Peters (1970) argues that a liberal education cannot result in a single, narrow mode of understanding the world, writing that '[n]o scientist should emerge, for instance, without a good understanding of other ways of looking at the world, historically, for instance, or aesthetically' (p. 44). The circumspective understanding that the wooden boat builders employ demonstrates a rich, nuanced way of 'looking at the world' in the most literal sense, recognising meaning in physical objects and their interrelationships rather than through words and numbers. Following Peters, it is possible to ask whether a person can be considered well educated without refining their perceptual capacities, especially if, as Heidegger asserts, pre-reflective perceptual understanding is our foundational mode of engaging with the world, upon which other ways of knowing are founded. Unfortunately, one wonders whether opportunities to nurture such understanding are disappearing as small-scale craftwork is replaced by mechanised mass production, as Heidegger (1968) suggests in his final lectures on understanding in the era of technology.

It is beyond the scope of this project to suggest what a curriculum centred around craft as liberal education would look like, or how it would fit within existing education systems; my work in this project has been to interpret understanding such that the plausibility of such education becomes apparent, rather than to advocate for a specific implementation. I do wish to speak to a common concern among the expert participants in this project, however, who regularly lamented not having the time to teach the novices with whom they shared

their workshops. The notion of formalised, hierarchical instruction is so well established as the normal method of education that it seems collaborative and practice-based learning in the workshop goes partly unnoticed, even by those who participate within it. In my six months as a wooden boat builder, I witnessed learning in constant interactions between novices and experts, people and materials, newcomers and communities, and even individuals confronted with the limits of their perceptual apparatus. Very little of this learning involved 'teaching' in an explicit sense, so I suspect that my participants' concerns about their lack of time and resources for teaching are largely unfounded. Instead, I would encourage my participants to consider learning in the workshop in terms of being-in-the-world, the constant re-alignment of understanding and practices through which individuals collaborate, produce, and continually rediscover their human capacity for meaning-making.

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Appendix A: Initial interview schedule

- How important is having ‘the feel’ in your work?
    - Probe: Do other people talk about ‘the feel’ a lot?
    - Probe: Do you have the sense that people recognise whether you have it?
    - Probe: Do you look for ‘the feel’ in other people? How would you know that they have it?

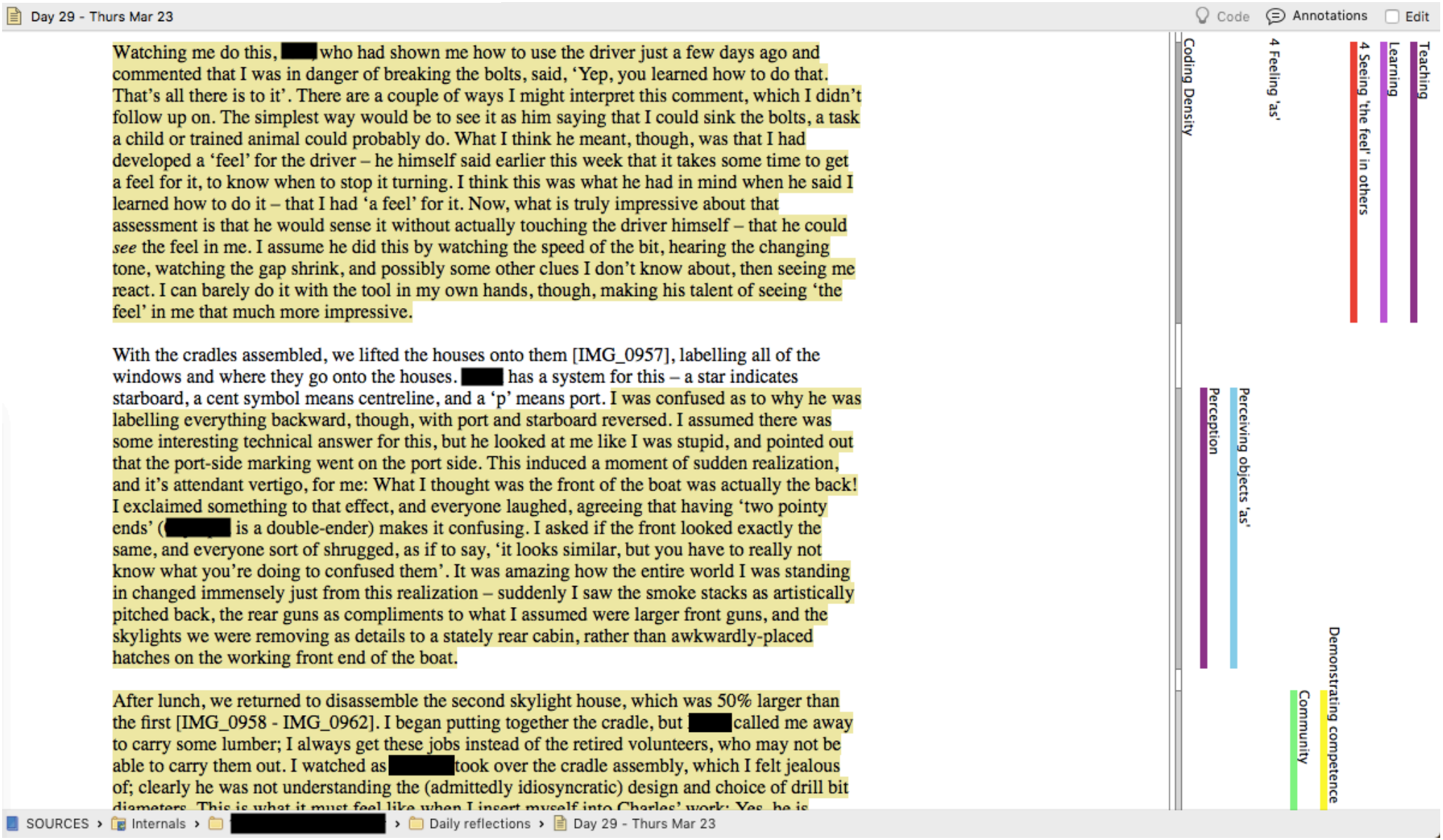
- What exactly is ‘the feel’?
    - Probe: How do you experience it?
    - Probe: What tools and materials is it particularly connected to?

- What do you think about when working?
    - Probe: Do you think about the tools? The materials?
    - Probe: What would you say you are most aware of while working?

- How did you get ‘the feel’?
    - Probe: Do you remember a time when you did not have it?
    - Probe: Do you remember what led you to develop it?

- Do you help other people to get ‘the feel’?
    - Probe: How do you encourage that?
    - Probe: What leads someone to ‘get the feel’?

Appendix B: Example of a coded document



Gmail Tom Martin <martincommatom@gmail.com>

CUREC Approval
1 message

Heath Rose <heath.rose@education.ox.ac.uk> Mon, Oct 24, 2016 at 7:38 PM
To: Tom Martin <tom.martin@education.ox.ac.uk>
Cc: Susan James Relly <susan.jamesrelly@education.ox.ac.uk>, Alis Oancea <alis.oancea@education.ox.ac.uk>, Education Research Office <research.office@education.ox.ac.uk>

Application Approval

Title: 'Getting the feel' in the wooden boat workshop: The phenomenon and its development

Researchers: Tom Martin (Supervisors: Susan James Relly, Alis Oancea)

Dear Tom,

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to DREC, the proposed research has

been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

Please note that CUREC approval does not guarantee access to participants, and it is your responsibility to check whether countries or contexts in which you plan to conduct your research might impose additional requirements.

If your research involves participants whose ability to give free and informed consent is in question (this includes those under 18 and vulnerable adults), then it is advisable to read the following NSPCC professional reporting requirements for cases of suspected abuse

http://www.nspcc.org.uk/globalassets/documents/information-service/factsheet-child-abuse-reporting-requirements-professionals.pdf

Should there be any subsequent changes to the project which raise ethical issues not covered in the original application you should submit details to research.office@education.ox.ac.uk for consideration.

Good luck with your research study.

Yours sincerely,

Heath Rose

--

Heath Rose, Ph.D.

Appendix D: Participant information sheet

OXFORD DEPARTMENT OF EDUCATION
15 Norham Gardens, Oxford OX2 6PY (UK)
Phone: (+44) 01865 274020 or (+44) 01865 274179
http://www.education.ox.ac.uk

Tom Martin (Researcher – DPhil Candidate)
Tom.Martin@education.ox.ac.uk

Participant Information Sheet

1. **Study title**

   'Getting the feel' in the wooden boat workshop: The phenomenon and its development

2. **Background and aims of the study**

   I am a doctoral student in the Education Department at the University of Oxford. I am currently undertaking a study that explores how boat builders 'get the feel' for tools and materials in the workshop.

   This study involves:

   - *observing* workshop participants and taking note of my interactions with them
   - *taking photos* of the workshop and its participants
   - *interviewing* a selection of workshop participants

   I would like to receive your written consent for the above activities. You are free to decline, and if you do, you will be excluded from all observations and photography.

   If you have any questions after reading this document, feel free to contact me at Tom.Martin@education.ox.ac.uk.

3. **Why have I been invited to take part?**

   You have been invited to take part in this study because of your role at one of the workshops selected for fieldwork. I aim to involve participants with all different levels of skill to get a clear picture of workshop know-how and how it develops.

   You must be 18 to take part in this study.

4. **Do I have to take part?**

   Participation is completely voluntary. You may ask any questions you wish before participating; you may contact me or my university before or during participation; and you may withdraw your participation and any data already collected at any point, without penalty, and without giving a reason.

5. What will happen in the study?

Before collecting any data, I will ask you to sign a consent form and make sure you understand what the research entails. After that, I may make notes about how you work or about our interactions together, as well as occasionally taking photos of you and your colleagues. *This is not an assessment of your work*. I am only interested in how participants experience their work and this experience develops over time. You may choose to use your real name in the study or have it anonymized.

You may also be asked to participate in a brief interview with me about your experience of tools and materials and your history as a boat builder. Not all participants will be asked to do this, and inclusion in interviews has no relation to the quality of your work.

To participate in the study, you do not need to alter your daily work activities in any way.

6. Are there any potential risks in taking part?

There are no apparent risks to participating in this study. You should note that even where I make every effort to anonymize research data, it is possible that you may still be identifiable in the final publication. That said, I will not be collecting any personal or confidential information, but rather will only observe how you work and how we interact.

7. What happens to the research data provided?

I will securely store all data on a password-protected computer with password-protected backups. This data will be preserved for a minimum of three years, and only my supervisors and I will have access to it.

8. Will the research be published?

This research will be published as part of a doctoral thesis. On successful submission of the thesis, it will be deposited both in print and online in the University archives, to facilitate its use in future research. The thesis will be published with open access, freely available on the internet. The data may also be used in academic journal articles, informal blog posts, or book-length publications.

The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

9. Who has reviewed this project?

This project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.

The research design has also been approved by the researcher's supervisors, Dr Susan James Relly and Dr Alis Oancea, who may be contacted with any concerns using the contact information in Section 10 below. This project is funded by the Economic and Social Research Council of the UK (ESRC) and complies to all of their ethical and methodological standards.

10. Who do I contact if I have a concern about the study or I wish to complain?

If you have a concern about any aspect of this project, please speak to the relevant researcher or his supervisor:

Researcher: Tom Martin
Tom.Martin@education.ox.ac.uk

Supervisors:
Dr Susan James Relly
susan.jamesrelly@education.ox.ac.uk
Dr Alis Oancea
alis.oancea@education.ox.ac.uk

Either of the above individuals will do his or her best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how he intends to deal with it. If you remain unhappy or wish to make a formal complaint, please contact the chair of the Departmental Research Ethics Committee at the University of Oxford (using the contact details below) who will seek to resolve the matter in a reasonably expeditious manner:

Education Divisional Research Ethics Committee (DREC)

Dr Liam Gearon, Chair

Department of Education

15 Norham Gardens, Oxford OX2 6PY (UK)

Email: research.office@education.ox.ac.uk

Appendix E: Written consent form

OXFORD DEPARTMENT OF EDUCATION
15 Norham Gardens, Oxford OX2 6PY (UK)
Phone: (+44) 01865 274020 or (+44) 01865 274179
http://www.education.ox.ac.uk

Tom Martin (Researcher – DPhil Candidate)
Tom.Martin@education.ox.ac.uk

Consent Form

Study Title: 'Getting the feel' in the wooden boat workshop: The phenomenon and its development

Purpose of Study: This study looks at learning in wooden boat workshops, with specific emphasis on how boat builders 'get the feel' for the tools and materials they work with. The researcher will explore this type of learning by observing, interviewing, and participating alongside wooden boat builders in three different workshops.

	Please initial
I have read the information sheet, asked questions and received satisfactory answers	
I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee	
I understand that my participation is voluntary and that I am free to withdraw myself or my data at any time, without giving any reason, and without any adverse consequences	
I understand who will have access to personal data provided	
I understand how personal data will be stored and what will happen to the data at the end of the project	
I understand how research will be published, that it will be used in an openly-available doctoral thesis first, then possibly in journal articles and other publications	
I understand how to raise concerns or make a complaint	
I consent to the audio recording of any interviews I participate in	
I consent to being photographed in the workshop, with the understanding that these photographs may be published alongside the final text of this project	
I agree to take part in the study	

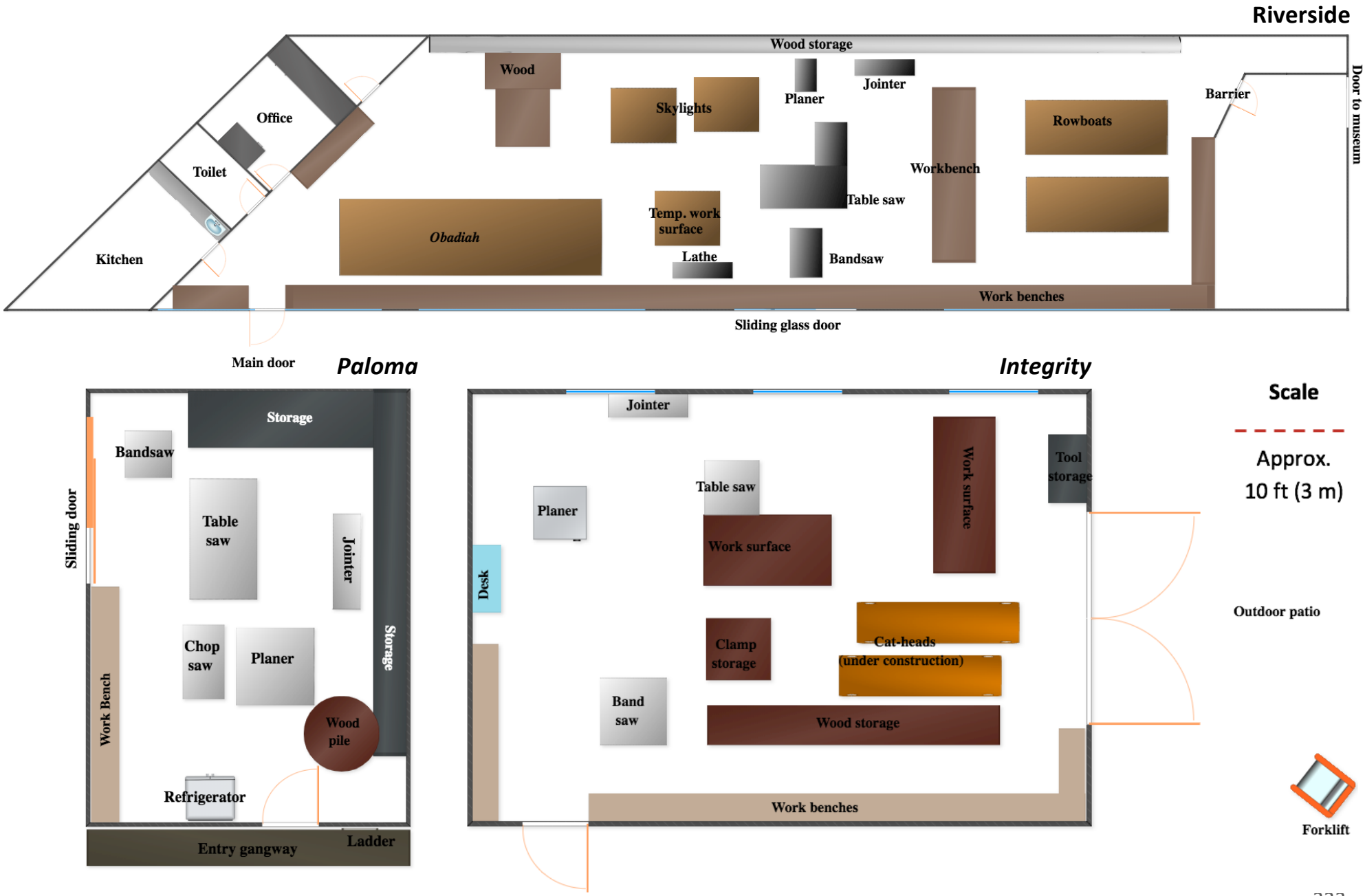
Name of participant: _____

Signature: _____ Date: _____

Name of researcher: Tom Martin

Signature: _____ Date: _____

Appendix F: Workshop diagrams



Appendix G: Ship diagrams