

RECLAIMING EXPERIMENT

GEOGRAPHIES OF EXPERIMENT AND EXPERIMENTAL GEOGRAPHIES

Submitted in partial fulfilment of the requirements for DPhil

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ABSTRACT

This thesis investigates the injunction to experiment in the social sciences and, more specifically, geography. This is both a geography of certain ways of thinking experiment, and an exploration of how particular strands of geographical thinking are being re-imagined and reworked as experimental under the influence of ideas and practices from within and beyond the discipline. Against the backdrop of recent debates about the status of experiment, it poses a number of key questions about what it means to be experimental, how experimental practices emerge and travel, and how these processes are inflected by the organization and atmospheres of particular sites of experimentation. These questions are addressed through a form of attentive participation at four key sites: The SenseLab and the Topological Media Lab in Montreal, the Institut für Raumexperimente in Berlin, and FoAM in Brussels. Based upon these encounters, and drawing upon the work of a range of exemplary experimentalists, the thesis develops the argument that there are new spaces of experiment which are worthy of such examination as part of a renewal of experimentation within geographical thinking. As such, the thesis outlines the *logics* of these forms of experiment and proposes the notion of *ecologies* of experiment. It also speculates on the possibilities for re-imagining what constitutes a geographical experiment, foregrounding the necessity of reactivating experiment as an ongoing ethos that needs careful cultivation and tending.

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ACKNOWLEDGEMENTS

It is often difficult to know where to start, or stop, in making acknowledgements; indeed, all work is a joint endeavour.

I would like to begin, though, by thanking the Economic and Social Research Council (ESRC), award number PTA-031-2007-ES/F020015/1, for its generous financial support of this research.

I would like to thank the kind people at the various experimental sites I visited, who welcomed me and made my being there possible. My thanks go to Erin Manning and Brian Massumi, and the rest of the SenseLab collective for encouraging me to attend their reading group, to ask questions and to be part of the *Generating the Impossible* event. My thanks go to Sha Xin Wei, and those at the TML, including Morgan Sutherland and Michael Fortin for technical help, camaraderie and delicious tea. My thanks go to Olafur Eliasson, Anna Engberg-Pedersen, Christina Werner and Eric Ellingsen, as well as the many others I met and learnt from at the Institut für Raumexperimente and Studio Olafur Eliasson. My thanks go to Maja Kuzmanovic, Nik Gaffney, those present at *Luminous Green 2011* and those who make up the Brussels contingent of FoAM. My thanks go to Neal White and fellow Office of Experiments collaborators, Gail Davies and Angela Last.

I would also like to thank those who contributed to this project through their personal and intellectual generosity; their encouragement and suggestions have been a fantastic support. My sincere thanks go to my supervisors, Derek McCormack and Sarah Whatmore, for their generous feedback and critical engagement with my work, for their

advice and mentorship. Thank you, in particular, to Derek for helping me when I could not see the end of the thesis. Thank you to Sarah for making it possible for me to be part of the remarkable Mellow-Sawyer Series on creativity. I would also like to thank Andrew Barry and Richard Powell for their collegial interest, and critique, at the department.

For their friendship, patience, and inspiration, my thanks go to Christoph Brunner, Joe Gerlach, Jack Sanderson-Thwaite and David Seifert. Thanks to Christoph for his infectious philosophical zeal, on-going collaborations and the companionship in the forest. Many thanks to Joe, filter coffee champion, for his kind words, excellent questions and the countless shared beers. Thanks to Jack, for the board-games and the thoughtful comments, although not in that order. Thanks to David, for his interest in all things geographical, as well as the careful advice on topology.

Thanks must also go to my family. My parents have been an incredible support and have been only too keen to help in any way that they could. I am not sure it is possible to thank them enough for encouraging me to pursue my studies. Thank you to Robin for his belief in me. Thank you to my extended family; I hope to be able to better explain what it is I have been doing.

Last, but certainly not least, my love and thanks go to Soohyun Park for her remarkable tolerance and support; to borrow a line, she has mostly experienced this thesis as a series of bad moods. Thank you so much for all your encouragement.

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EXPERIMENTAL RETURNS

Increasingly, the notion of experiment is attracting a certain cachet within geography and the social sciences more broadly. Moreover, multiple spaces, practices and events are being described as experimental, ranging across disciplines and more-than-disciplinary collaborations. What is most striking is that these experiments are no longer understood to be the domain of the sciences, nor of a narrowly exclusive range of avant-garde aesthetic practices. Indeed, it might be claimed that, like the injunction to be critical in the 1990s, the injunction to be experimental has more recently become one of the defining refrains of contemporary research in the social sciences and humanities, including geography.

Such developments raise various questions. What does it mean to be experimental? What counts as an experimental space? How do experimental practices emerge and travel, and how is this process inflected by the organization and atmospheres of particular sites of experimentation? Equally, if a sense of experiment is becoming part of the fabric of scholarly practice across a range of disciplines, then what are the limits of experimentation?

While experiment and experimentation is more-than-disciplinary, geography has a particularly interesting relation with these terms, and this relation is central to what follows. The discipline has seen a marked proliferation of the term experiment to describe a range of activities. These new geographies of experimentation have tended to examine knowledge controversies (Whatmore, 2009), such as flood-risk management (Landström *et al.*, 2011; Lane *et al.*, 2011; Whatmore and Landström, 2011), non-human ecologies (Hinchliffe *et al.*, 2005; Lorimer and Driessen, forthcoming), climate change governance (Bulkeley and Broto, forthcoming), and geopolitics (Ingram, 2011). However, geographers have not only engaged with experiment as a means to articulate new forms of knowledge production. Some have also suggested that to experiment can be generative of new ways of thinking and doing geography. As such, this re-imagining of geography as experimental has foregrounded methodological experiments. It is non-representational styles of geographing in particular which have made a case for experimentation (Dewsbury *et al.*, 2002; McCormack, 2010a; Thrift, 2004a; 2008a), developing approaches such as observant participation (Thrift, 2000), witnessing (Dewsbury, 2003) and performative ethnography (Morton, 2005). This has gone hand-in-hand with new ways of presenting these materials (McCormack, 2003; Wylie, 2005), in much the same way that cultural geographers have attempted to develop new modes of storytelling (Desilvey, 2012; Lorimer and Wylie, 2010).

Within this context, it becomes important to investigate the particular ways in which experiment is mobilised and what effects this has for how thinking is understood as a form or practice of experiment. This thesis, then, is both a geography of certain kinds of ways of thinking experiment, and an exploration of

how particular strands of geographical thinking, perhaps most obviously non-representational styles of thinking, are being reimagined and reworked as experimental under the influence of ideas and practices from within and beyond the discipline. As I shall show, there are many things at stake here, not least of which is the question of how conceptual and empirical developments within the discipline are shaped by experimental practices beyond. What is also at stake here is the question of how one holds on to a sense of experiment, shaped by disciplinary concerns, in the context where a myriad of practices and processes are potentially becoming experimental. That is, what is the value of experiment when its currency is in danger of being devalued through its proliferation across a range of disciplines and sites?

In the context of these questions, this thesis might best be thought of as an emissary of a reclamation of experiment, a 'something/happening' (Whatmore, 2006) that is gathering force through diverse energies (Born and Barry, 2010; Connolly, 2006; Davies, 2010; Latour, 2011; McCormack, 2010a; Powell and Vasudevan, 2007; Stengers, 2010; Thrift, 2008a). This is a reclamation understood as "an adventure, both empirical and pragmatic, because it does not primarily mean taking back what was confiscated, but rather learning what it takes to inhabit again" (Stengers, 2008b: 58). Put differently, this reclaiming is a reappraisal of experiment, in order to consider how it can inform and inflect geographical thought and practice. Equally, as author I have deliberately sought to position myself as both investigator of how this inflection is taking place and, in a very real sense through my attentive participation in various research practices, a vector of this inflection. In that sense, I

am a participant in this process of reclamation, a claim whose implications will be explored later.

The aims of the thesis are therefore three-fold. Firstly, it examines the extent to which the question of what counts as an experiment is transforming across a range of different sites. Specifically, it focuses on a loose constellation of sites that share a commitment to ethico-aesthetic experiment as a way of articulating new modes of being and thinking. Importantly, these sites are also significant because they are part of the source of various ideas upon which geographers have drawn in their efforts to rethink experimental practice. Secondly, it interrogates the kinds of technologies and techniques which inform these experimental spaces. My concern here is with the way in which the constraint provided by these technologies and techniques allow a sense of the promise and pragmatics of experiment to become explicit, albeit in ways that are sometimes difficult to discern. Thirdly, through a series of empirical encounters with experimental spaces, the thesis explores the possibilities for re-imagining what constitutes a geographical experiment. This is the more speculative moment of what follows. But I take such speculation to be a crucial part of the cultivation of an experimental ethos in and for geographical thinking.

These aims can be expressed as research questions which drive this project.

- Firstly, what does experiment mean at these spaces? How is experiment understood? What kinds of theorisations of experiment are engaged with? What associated concepts are needed to think experiment?

- Secondly, how is experiment enacted or practised? What do these experiments look or feel like? How do they operate, and according to what kinds of logic?
- Thirdly, what is distinctive about these kinds of experimental spaces? How does experiment differ from conventional understandings of the term? To what extent are these experiments new?
- Finally, what opportunities do engagements with these spaces offer, in terms of both vocabulary and technique, for experimenting differently within the social sciences, and specifically geography? How can a series of engagements with experiment contribute to a burgeoning experimental geography?

1.1.RECLAIMING EXPERIMENT WITHIN GEOGRAPHY

This thesis, then, situates itself within geography's experimental tradition in order to explore possibilities for a careful renewal of this tradition via encounters with other disciplines and practices. Surprisingly, there have been very few reviews of geography's engagement with experiment as a concept and method; these have been restricted to editorials (Davies, 2010; Powell and Vasudevan, 2007).¹ And yet the importance to geographical thinking of experiment is clear, and can be traced through various key traditions and figures. For instance, David Harvey discusses experiments at various points in his seminal text, *Explanation in Geography*. In an early chapter on 'techniques of investigation', he argues that the distinction between natural and social science "frequently amounts to drawing a line between

¹ The exception is Angela Last's (2012) recently published review, *Experimental geographies*, which also attends to the recent alignment of 'experimental' with 'geography'. Importantly, she notes that the "practices of thinking and doing that are embraced under the banner of experimentation do not comprise a unified body of work" (2012: 706).

sciences where experimental techniques can be employed” (1969: 46). This line can be rather difficult to establish, he remarks, later suggesting that a range of activities of interest to geographers, such as a “journey to work, a journey to shop, passing on information to other people, a migration, the movement of soil down a hillside, the impact of a raindrop on a soil surface” may “in some senses be regarded as experiments” (Harvey, 1969: 264). Several decades later, David Livingstone noted a “renewed emphasis on the importance of experiment” (1992: 20) and even described the discipline as an experiment. This ‘geographical experiment’, as he put it, was an “experiment to keep culture and nature under one conceptual umbrella” (1992: 190). Since Livingstone’s argument, there have been a variety of inquiries into the promise of keeping human and physical geography together (Bracken and Oughten, 2009; Harrison *et al.*, 2004; 2006; 2008). It may well be that disciplines are experiments, but more recently the value of experiment within geography has been rearticulated in different ways in relation to a range of social, political, aesthetic concerns. Indeed, geography is being shaped by experimental practices beyond the discipline (see Dwyer and Davies, 2010).

In the same way that Livingstone has suggested we need to pay attention to the importance of experiment, a crucial point of departure for this thesis is the necessity of attending to the geography of experimental practices. To date, considerable attention has been paid to the geographies of scientific practices (Bingham, 1996; Livingstone, 1995; 2003; Naylor, 2005; Whatmore, 2002). Bringing a scientific practice to light, such as the scientific experiment, has involved attention to a wide range of bodies, texts and practices that constitute these spaces. Indeed, the idea that the sciences have a geography, has become a well-rehearsed argument. By way

of contrast, this thesis seeks to investigate experiments which are not, ordinarily, understood as scientific. At the same time, it is also difficult to call them narrowly artistic or aesthetic. Many of these experiments are found in the interstices of disciplines (Arends and Thackara, 1999), and the experiment, as well as the laboratory, is invoked by a plethora of organisations and collectives. Since the Arts Lab was established in 1967 as an alternative arts centre, there have been a staggering range of artistic or cultural laboratories. For instance, participants at a recent workshop on the future of the lab represented Ars Electronica Futurelab, BALTAN Laboratories, Culture Lab, Constant, iMAL Center for Digital Cultures and Technology, iShed, LABoral Art and Industrial Creation Centre, Les Laboratoires d'Aubervilliers, Le Laboratoire, LaMe, Locus Sonus, MAD Emergent Art Centre, Medialab Prado, Medialab Utrecht, NIMk, The Patchingzone, Píksel, Melinda Rackham, Timelab, U-centre for Art and Creativity, and V2_Lab. Moreover, this engagement with what has been termed extra-scientific experiments (Vasudevan, 2007) raises the question of the status of the experiment within geography.² Given that the “vocabulary of experiment has never been more common in geographical discourse” (Powell and Vasudevan, 2007: 1790), this is an urgent task. Therefore, while the thesis is concerned with outlining new geographies of experimentation, it can also be read as a (partial) geography of recent geographical thought and theorisation. To be sure, the relation between geographical thinking and an experimental turn is becoming increasingly evident, in the form of calls for papers (*Experimental Spaces* at the RGS-IBG 2011), events (a recent workshop on

² Perhaps extra-scientific is not quite the right term. After all, there is no need to argue that there is a “beyond, or above, or below, or beside the sciences, other ways of thinking and believing than science, who would deny that?” (Latour, 1987a: 89). It is also worth nothing that these experiments may not only be extra-scientific but extra-aesthetic. However, for the purpose of emphasis, I invoke the term as a way to make clearer my argument that experiments are proliferating, and exceed the conventional understanding of experiment as belonging to the scientific domain.

Experimenting with Geography in 2010), and websites (Experimental Research Network, Experimental Geographies, Experimental Geographies in Practice, or Spaces of Experimentation).³

Following Powell and Vasudevan (2007), then, the thesis aims to take seriously experiment by exploring how new and emerging geographies of experiment within particular sites and forms of ethico-aesthetic practice can and might be reshaping the sense of what counts as experiment within and for geographical thinking and practice.

1.2. THESIS STRUCTURE AND ORGANIZATION

Chapter Two, **Experiment: A genealogy**, examines the ways in which experiment and experimentation have been considered within geography and beyond. It elaborates upon the contention that the concept and practice of experiment has been closely associated with the sciences before interrogating how experiment is increasingly invoked to describe activities in the arts, humanities or social sciences. Faced with this seemingly new experimentation, the chapter works up a genealogy of minor experimentalists in order to develop a vocabulary and set of techniques for engaging with experiments. As such, the chapter introduces and maps out a series of conceptual motifs for the thesis.

Attempting to attend to these diverse experiments holds serious methodological implications. Chapter Three is less a methodology chapter and more a series of **Notes on method**, which consider to what extent it is possible to be experimental

³ Experimental Research Network (<http://experimentalnetwork.org>), Experimental Geographies (<http://experimental-geographies.wordpress.com>), Experimental Geographies in Practice (<http://merlepatchett.wordpress.com>) or spaces of experimentation [<http://www.spacesofexperimentation.net>].

when investigating experimental sites, practices and events. This chapter takes its cue from social scientists and geographers who advocate a change to the conventional, and somewhat limited, methodologies that are currently employed. Therefore the chapter both acknowledges calls for human geography to be “more imaginative, pluralistic, and pragmatic” (Latham, 2003: 1993), and looks to extend these efforts. The chapter pays particular attention to what it is to do theory and practise empiricism in ways that are faithful to an experimental approach to experiment. More specifically, the notion of an attentive participation is advanced.

Four empirical chapters follow, which mobilize a series of encounters with experimental spaces and collectives. Typically, ethnographers study communities who are themselves unfamiliar with the work of ethnographers or their theoretical concerns. Yet during the course of this thesis, the practitioners – as intellectuals concerned with space, performance and experiment, immersed in debates about art, social theory and philosophy (if not geographical thought and its disciplinary concerns) – were familiar with a range of conceptual vocabularies. Consequently, the project does not resemble an ethnographic one in a narrowly canonical sense of that term. While it does draw out a series of ethnographic exposures and acknowledges the capacity for ethnography to go beyond exemplification, this might better be understood as a form of co-experimentation. The challenge, therefore, is to establish some critical distance between the aims and concerns of this thesis and the assorted experimental projects investigated while also acknowledging my own role in contributing to the experimental milieu under investigation, and in facilitating the circulation of ideas across and between sites. These chapters are,

therefore, also conceptual encounters: between experiment and creativity, and modelling, and topology, and ecology.

Chapter Four, **Generating spaces for research-creation**, explores the idea of creativity, as it relates to non-representational research, in a context that is directly associated with the emergence of non-representational theories within geography. Taking this suggestion is not to create an artificial situation in which to explore non-representational theories, but an opportunity to examine how some of the people who are very influential on non-representational theory are doing 'creativity'. Drawing, then, on field research at a site which has influenced geography, this chapter pays attention to a particular space of experimentation that is part of an unwritten geography of geographical ideas. In other words, this chapter is an examination of a site of experimentation, the SenseLab, that has produced ideas which have shaped non-representational theory across disciplines including geography. Indeed, Brian Massumi, a co-instigator of a series of SenseLab events, has had a considerable influence on geography, and been widely cited by those engaged in working up non-representational theories. The chapter draws upon my on-going engagements with the SenseLab precisely because they try to experiment with ideas that geographers have become really interested in, and allows for the examination of a relation-specific context for what has been termed 'research-creation'. In the process, I also move against the grain of critiques of non-representational thinking that problematise the overly abstract ethos of these theories. Instead, as I show, such theories are deeply embedded in and emergent from practices of micro-experimentation that actively rework the possibilities of

thinking and doing while also challenging the distinction between abstraction and the empirical.

Chapter Five, **Experimental modelisations**, takes up this concern with the relation between abstraction and experiment by examining a particular form of abstraction, that of modelling. While modelling tends to be regarded with suspicion by human geographers, and is seldom reflected upon by physical geographers, recent work across various disciplines has revalorised modelling through the notion of metamodelling, in part because it suggests a more productive way of thinking about models as generative abstractions. This chapter interrogates to what extent this really is a new way of thinking about modelling. To this end, the chapter poses the question: what is the relation between modelling practice and the process of experiment? Put differently, to what extent are models and modelling concepts which can provide analytic purchase when considering extra-scientific experiments? And what is the scope for thinking about models as certain kinds of abstractions that facilitate experimentation? The chapter puts these ideas to the test through a series of encounters with a contemporary artist, Olafur Eliasson, who understands modelling as an on-going experimentation. The focus on Eliasson is in part because of the centrality of models in his own work, as well as the establishment of his Institut für Raumexperimente [Institute for Spatial Experiments].

Chapter Six, **Topological sensibilities**, asks to what extent does topology prompt us to re-think space and spaces of experiment? What 'shock to thought' (Massumi, 2002b) does topology offer? The chapter pursues answers to this question through interrogating human geography's topological sensibility. My concern here is with

the kind of price of admission for geographers who might want to develop this sensibility. In particular I explore, through details drawn from an empirical context, how topological experiment demands the cultivation of forms of expertise that challenge some of the taken-for-granted reference points of geographical research. This empirical context is the Topological Media Lab (TML), an 'atelier-laboratory' which hosts philosophical, ethico-aesthetic experiments. As such, the chapter attends to the tension that is found between the metaphorical and the mathematical by drawing attention not only to how concepts are used and practised, but how they transform as they move across disciplines.

While geographers and social scientists have been interested in sites of experimentation, they have also attended to how experimental practices tend to exceed these sites, variously described as a condition of 'experimentality' (Szerszynski, 2009), 'experimental society' (Davies, 2010), and the 'laboratization of society' (Callon *et al.*, 2009). Chapter Seven, **Experimental ecologies**, problematises the notion of a coherent lab-space and argues that we might best understand this emerging geography of experiment in terms of what Stengers calls an 'ecology of practice'. Thinking in terms of an 'ecology of practices' is a technique for avoiding a kind of reductionism, and provides a way of holding onto the specificity of situations, and how they make a difference to thinking. This chapter does not seek to apply Stengers' work, but to put it to a kind of a test; an experiment with theory, where concepts are propositions for thinking within the world, rather than part of a framework for understanding experiment.

The concluding chapter, **Geo-experiments**, recalls and reflects upon the preceding substantive chapters, and in so doing, aims to outline a speculative agenda for the

burgeoning 'experimental turn' within geography (Thrift, 2011). This, then, is an agenda which takes seriously experiment, yet questions the persistent injunctions to experiment. In light of the chapters that have gone before, I dwell upon two key arguments. The first is the need to attend to new geographies of experiment. I make the case for examining experiments which are not exclusive to the domain of the sciences, nor a narrow range of avant-garde aesthetic practices. These experiments are markedly different; these differences are considered in terms of their logics and sites of experiment. The second is the need to expound an experimental geography. In particular, I outline the value of an experimentalist 'orientation' (Thrift, 2011) or 'imperative' (Whatmore, 2006). While acknowledging that this value is far from certain, the urgency and purpose of such an orientation is in danger of subsiding given how often experiment is invoked. This requires, most particularly, an understanding of experiment's specificity. Drawing on concepts and techniques introduced in previous chapters, I consider how it is possible to gain purchase on experiment without reducing its potential for being taken up in new and unexpected ways within the social sciences and geography. The chapter concludes by revisiting the related notions of recuperation and reclamation as it looks to future geo-experiments. What is at stake here, then, is developing a stronger sense of what is distinctive about an experimental imperative.

2

EXPERIMENTS: A GENEALOGY

Geographical scholarship is abuzz with passion, performance and affect, infused with a sense of playfulness and a spirit of optimism and experimentation. (Popke, 2009: 81)

...take risks and experiment... (Whatmore, 2006: 607)

Experiment is becoming ubiquitous. Invoked in myriad ways, experiment is also becoming increasingly 'aligned' with geography (Last, 2012). Indeed, as Jeff Popke (2009) attests, ever more geographical scholarship is animated by a 'spirit of experimentation'. However, the status of experiment within geography, and beyond, is altogether unclear. So too, are the implications of taking seriously experiment. How is experiment understood? What conceptual resources provide purchase on experiment? What difficulties are presented by an extended notion of experiment? In an interview with Foucault just before he passed away, Paul Rabinow asked him to elaborate upon his notion and method of problematization (Foucault, 2000).⁴ For Foucault, thinking on the order of problematization is to analyse the development of a particular domain of acts, practices and thoughts which are problematic. Problematic, he went on to outline, in the sense of uncertain, unfamiliar, or difficult

⁴ The philosophical concepts of problem, problematic and problematizing, have all featured in recent social science and geographic inquiry, renewing the notion of criticism in various ways (see Rambeau, 2012).

to grasp.⁵ Problematization is rather apt, then, for starting to think about the inexact status of experimentation today precisely because experiment has been rendered unfamiliar through its very proliferation.

The purpose of this chapter is to examine and problematise the ways in which experiment and experimentation have been considered within geography and beyond. In doing so, it elaborates upon the contention that the concept and practice of experiment has been closely associated with the sciences. As such, I consider how the history and philosophy of science have engaged with experiment, before examining how these ideas have been taken up within geography. In order to consider how the status of experiment has become indistinct within geography, the chapter explores the notion of extra-scientific experiment. By grappling with a range of literatures, the chapter interrogates how experiment is increasingly invoked to describe activities in the arts, but also the social sciences. Faced with this seemingly new experimentation, the chapter works up a genealogy of minor experimentalists in order to provide some orientation for the substantive chapters that follow.

2.1.SCIENCE AND EXPERIMENTS

Experiment, as a specific category of scientific activity, did not emerge until the Scientific Revolution of the seventeenth century. (Morrison, 1998: np)

Although the use of trial and error methods to establish scientific results can be traced back to the Greeks, as Mary Morrison (1998) notes, experiment as a particular kind of scientific activity did not surface until the seventeenth century.

⁵ As he puts it, for something “to enter the field of thought, it is necessary for a certain number of factors to have made it uncertain, have made it lose its familiarity, or have produced around it a certain number of difficulties” (Foucault, 2000: 117).

When it did emerge, an emphasis on experiment was associated with empiricism, and was understood to occupy a role that was distinct from theory. Indeed, theory held the more prominent position, and accounts of experiments were brief. Traditional epistemology tended to “endorse a theory-centred view of scientific knowledge, according to which what we know is encapsulated in our (best) theories, and the latter are supported by the available empirical evidence” (Guala, 2012: 598). While some crucial experiments such as those associated with important discoveries were discussed, much of the “intricate detail that represents such an important part of experimental work, detail [found in] notebooks and investigations of laboratory practices, was excluded” (Morrison, 1998: np). This is succinctly recapitulated by Ian Hacking (1983), in his now seminal text, *Representing and Intervening*: “Philosophers of science constantly discuss theories and representation of reality, but say almost nothing about experiment” (1983: 149).

Franklin’s (1986) *The Neglect of Experiment* makes clear that the experimental side of the sciences had been overlooked; there had up until then been very little in the way of work on actual experiments. Indeed, prior to a series of studies (Achinstein and Hannaway, 1985; Batens and van Bendegem, 1988; Galison, 1987; Hacking, 1983; Gooding *et al.*, 1989; Shapin and Schaffer, 1985), there had been “almost no reflective philosophy of experiment” (Hacking, 1988: 147). The historians, sociologists, and philosophers who tackled the “problem of the function of experiment with considerably more attention to practice ... made the history and philosophy of experimentation one of the most exciting ... lines of inquiry in the history of science” (Galison, 1988: 467). Crucially though, and as Galison notes,

these engagements with experiment were limited to the sciences, and especially physics.

The emphasis on experiment as a distinct field of philosophical inquiry brought with it some perplexing questions. Philosophers of science were not only urged to focus on activities which comprise 'experimental culture', such as the building and operation of instruments, calculation and measurement, the creation of phenomena and the manipulation of entities in the laboratory, but were tasked with a new set of philosophical issues. How were they to understand experiment's relation to theory in light of Hacking's claim that "Experimentation has a life of its own" (1983: 150)? Was there a methodology of experiment that could furnish validating procedures and constraints for evaluating results? How did the credibility of particular instruments and the theories implicit in their operation bear on the integrity of laboratory events?

The flurry of historico-philosophical work on experiment during the 1980s brought two concerns into focus. The first of these concerns was the 'how to' of experiment and the emphasis on scientific techniques helped differentiate experiment from theoretical work. This did not entail a privileging of experiment over theory – "theory is not one thing but many, and experiment not one thing but many" (Hacking, 1988: 148) – but drew attention to how experiments were practised. The second is that attending to these experimental practices contributed to an epistemological debate about the characterization of experiment and the implications this would have for scientific realism and theory confirmation. An emphasis on experiment therefore shaped a new theoretical debate about what a proper philosophy of experiment and science could look like. Moreover, this

emphasis foregrounded the degree of complexity involved in the relationships between experiments, phenomena, instruments and theories (Morrison, 1998). This work, somewhat bizarrely, has since slipped from the radar for philosophers of science (although see Rheinberger, 2006). Moreover, this work has barely been acknowledged by geographers (with a few notable exceptions: Davies, 2010; Powell and Vasudevan, 2007).

Despite there not being a demonstrably close engagement with the philosophy and history of science, geographers have nevertheless written extensively on experiments. This is all the more surprising because conventionally, experiments and experimentation have tended to be understood in terms of their historical geographies. Such studies of experimentation have gained prominence over the past few decades and have “drawn attention to the spatialities which embed, and are produced through, scientific practices” (Powell and Vasudevan, 2007: 1790). Bringing the scientific experiment to light has involved attention to the full range of bodies, texts and practices that constitute these spaces and the idea that the sciences, and scientific experiments, have a geography has become a well-rehearsed argument. Arguably, this work has been the product of conversations between geography and science studies – or, more specifically, science and technology studies (STS) – although not necessarily philosophy of science. Emerging from a confluence of a variety of disciplines and disciplinary sub-fields, STS is an interdisciplinary research area (see Asdal *et al.*, 2007). Concerned with the ways in which social, political and cultural values affect, and are reciprocally affected by, scientific research and technological innovation, STS offers a way of addressing how the material, social and cultural boundaries of a laboratory (or field site) become

established. As a field of research, STS brings together work in the anthropology, sociology, geography and economics of science and technology. Importantly, STS has developed alongside ethnographic and micro-sociological approaches.

Given their shared interest in the spaces of the sciences, the sustained dialogue between geography and STS is hardly surprising. Beth Greenhough (2006) identifies two specific geographical engagements with STS. The first concerns 'placing the view from nowhere'. This is a critique of the idea that authentic scientific ideas are disembodied and universal and instead it looks to place scientific 'truths' within their social and cultural contexts (see Shapin, 1998). This mapping out of the geographies of scientific knowledge has a key role to play in stressing the social contingencies of scientific practice. However, the result can be a functional sense of science's relationship to space. While scientific practices may define particular spaces, they also serve to question pre-existing understandings of spaces and the social relations sustained within them. The second geographical engagement has arguably been driven by a theoretical curiosity about the novel philosophical approaches advocates of STS have adopted (see, for example, Bingham, 1996; Hinchliffe, 2001; Whatmore, 2002). Drawing on the work of philosophers of science, such as Isabelle Stengers (1997; 2000), these authors do not focus their attention on the spatial parameters set by scientific practitioners, such as the boundaries of laboratories, but on the ways in which these boundaries are constantly being challenged or re-negotiated. These spaces might be thus be re-thought of as spaces of disruption, contingency and risk, as well as structure and coherence, which are constantly being re-negotiated by their human and also their non-human inhabitants. Yet these two sets of engagements belie the breadth of conversations

across geography and STS which have initiated a host of publications. These include substantial monographs (Livingstone, 2003; Whatmore, 2002; Withers, 2001), special issues of journals (Castree and Nash, 2006; Greenhough and Roe, 2006; Naylor, 2005), compilations of essays (Jöns *et al*, 2010; Braun and Whatmore, 2010) and numerous articles (see, for example, Barry, 2005; Davies, 2003; Finnegan, 2008; Greenhough, 2006; Murdoch, 1997; Powell, 2007a). Among the more recent outcomes is the seminar series and online reader *Locating Technoscience*.⁶

2.1.1. LABORATORY STUDIES

The site/space of experiment that has attracted the most attention within STS is the laboratory, although there has been much work on 'field sciences' (see, for example, Kohler, 2002; Powell, 2007b). Indeed, during the late 1970s, a succession of key ethnographic studies of laboratory practices was published. As Michael Lynch (1985) notes in the foreword to his book, *Art and artifact in laboratory science*, there was an array of concurrent and similar studies. Amongst these, the touchstones in laboratory studies have come to include Bruno Latour and Steve Woolgar's (1979) *Laboratory Life: the social construction of scientific facts*, and Karin Knorr-Cetina's (1981) *The Manufacture of Knowledge*. These detailed studies pointed to the 'messiness' of scientific research and to the importance of attending to the local circumstances of knowledge production, as well as the practical work of laboratory science. In effect, these studies made the case for different research practices having different spatialities and modes of knowledge production. This was striking as up until then, sociologists of science had been mostly concerned with the study of institutions and the values of science, and had rarely interrogated scientific

⁶ This reader can be found at <http://www.ucl.ac.uk/locating-technoscience/index.htm>.

practices or claims. Science turned out to be “just as local, particular and contingent as anything else” (Roberts and Mackenzie, 2006: 158).⁷ Indeed, it is now a commonly held view that all science is situated knowledge (Haraway, 1991). Laboratory studies encouraged a reconsideration of the sciences, emphasising the interests, techniques, materials and discourses involved in the stabilization of supposedly neutral facts. In other words, the understanding that the laboratory was somehow set apart from the ‘outside’ world was effectively problematised by these studies.

While the importance of these studies is not to be dismissed, these works were few in number. Moreover, the once active field of laboratory studies is now rather neglected (Kohler, 2008). In the preface his book *Putting Science in its Place*, David Livingstone (2003) argues that the significance of the “sites where experiments are conducted, the places where knowledge is generated, the localities where investigation is carried out” remains under-played (2003: 3). Although Livingstone is discussing science here, the argument can be extended to consider sites where any kind of experiments are taking place. To be sure, the notion of experiment has tended to be less commonly invoked to describe the activities of those in the arts and humanities, or social sciences. Gooding *et al.*'s (1989) seminal work, *The uses of experiment*, focused on scientific experiments yet it neither aimed to exhaust the fields in which experiments matter, nor intended to suggest some essential unchanging activity which might be called experimentation. What is interesting then, is to ask “why any activity gets labelled experimental” (Schaffer, 1995: 258) in a particular context, and moreover, how this is recognised across and between contexts?

⁷ Isabelle Stengers formulated this as: “scientists are just like the rest of us” (1997: 64).

Reflecting on the laboratory studies as they were happening, Knorr Cetina (1992; 1995) pondered whether there was a “theoretically interesting difference between the notion of an experiment and the notion of a laboratory” or if they were merely “different labels for what is basically an orientation to the same phenomenon, knowledge production” (Knorr Cetina, 1992: 113). In many ways, the notion of a scientific laboratory in the sociology of science came to stand for what in the history and methodology of science had long been the notion of experiment. However, Knorr Cetina contends that the first laboratory studies “opened up a new field of investigation not covered by the methodology of experimentation” (1995: 143). While a focus on experiments had provided a means to understand how the scientific method was performed, a focus on the laboratory “shifted attention away from methodology and toward the study of the cultural activity of science” (1995: 143). This rendering of the laboratory as more than just a site which houses experiments is important. Moreover, examining the trope of the lab as a privileged space for experimentation remains vital as there has not been sustained research on the topic. Indeed, Knorr Cetina herself hoped that earlier laboratory studies would be extended by investigating “processes of laboratization” (1995: 163) in a variety of settings. This prescient remark hints at the heterogeneity of the laboratory today, evident in its various uses by “academic research institutions, ... policy think tanks, planning departments, economic development agencies, architectural firms and creative clusters” (van Heur and Brand, 2009: np).

As if in answer to Knorr Cetina’s hope for investigation, Michael Guggenheim’s (2012) paper – *Laboratizing and de-laboratizing the world* – considers these very processes of laboratization. Noting that STS have contributed to expanding the

notion of the laboratory, Guggenheim investigates the use of the term 'laboratory' in sociology and science studies. His contention is that contemporary practices of laboratization are a return to an earlier metaphorical use of the term. Guggenheim's objection to the metaphorical use of the lab is not to "limit the sociological imagination [but to] highlight a specific career of a specific metaphor" (2012: 100). Although this examination does not attempt to capture every historical notion of the term (see Gooday, 2008), what Guggenheim brings to the fore is that several notions of laboratory have existed alongside each other. I want to extrapolate from this to suggest that several notions of experiment may also co-exist. That is to say, multiple kinds of laboratory are indicative of multiple kinds of experiment. While this may sound simplistic, I make this point here because, as I shall show later, it is critical in allowing us to get purchase on the different qualities of experiment that take place at the sites investigated by this thesis.

2.2.EXTRA-SCIENTIFIC EXPERIMENTS

In the wake of the proliferation of new laboratories, there have, increasingly, been attempts to think experiments beyond the sciences. For instance, geographers Gail Davies (2010) and Alexander Vasudevan (2006; 2007; 2010) have begun to ask, in various ways, where do experiments end? What about experiments and experimental practices beyond the sciences and the scientific laboratory? Davies' (2010) guest editorial attends to concerns about turbulence of boundaries between "the laboratory and the landscape, experimental objects and experimental subjects, and communities of aesthetic and scientific practice" (2010: 667). Drawing upon an experimental art-group, Davies proposes that the nature and scope of experimentation is changing. Rather than only experimental sciences, there are also

experimental aesthetics, and even experimental geographies. The argument she develops is that an experimental aesthetic, or aesthetic experiment, seeks to “amplify and articulate ... alternative knowledges and enact their ontological implications” (2010: 670). In a similar conceptual move, Alexander Vasudevan builds on recent geographical approaches to the investigation of scientific experimentation too, arguing that too little “attention has been directed toward the cultural geographies of experimental science and the extrascientific zones in which modes of experimental practice were themselves developed and contested” (2007: 1812). Put differently, this is an attempt to “shift attention away from a discussion of controlled arrangements and embodied scientific protocols to an alternative set of experimental systems” (Vasudevan, 2010: 200), offering up both performative art and political theatre as examples of extensions of the experimental into extra-scientific zones.

The notion of extra-scientific zones or spaces does not mean that we need to abandon the laboratory and focus exclusively on the studio or the workshop as spaces of experiment. Scientific labs were designed and organised to *exclude* much of the world from experimentation, and in particular experience, in order to avoid subjectively contaminating objective experiments. Laboratories have, nevertheless, also been understood as spaces which can *make* worlds (McCormack, 2010a). It bears repeating: more than just letting the world ‘out there’ in, laboratories can facilitate the production of new worlds. At this point, it is important to note that the verb ‘to experiment’ is closely related to another: ‘to experience’. Indeed, as Stengers (2008a: 109) notes, in French, “there is no clear distinction between the terms ‘experience’ and ‘experiment’ as there is in English”. As William Connolly

writes eloquently, “experimental and experiential perspectives circulate back and forth, with each sometimes triggering a surprising change in the other” (Connolly, 2011: 45). This twin concern with experiment and experience is similarly found in non-representational styles of thinking (Dewsbury, 2003; McCormack, 2010a; Thrift, 2008a).

2.2.1. AVANT-GARDE, ART AND EXPERIMENTS

This shift to the extra-scientific is, in many ways, unsurprising. The avant-garde, for example, gathers together a whole set of experiments:

early experiments in expression of DADA, the Futurists, the Surrealists, through to post-war avant-garde artists, groups and movements, ... early performance, video and conceptual art, as well as those involved in experimental music, free jazz and improvisation. (Gere, 2007: 2)

Indeed, the experimental has come to be almost synonymous with the avant-garde, a modernist term for movements (theoretical, artistic or political) considered ‘ahead of their time’ and which aim to institute new ways of living (Dewsbury, 2009a). Put differently, it is about merging art and life (see Sheringham, 2006).⁸ Although the notion has been diminished given the pluralism of different avant-gardes, the term still holds sway. Indeed, it has been argued that there are indications of an avant-garde of sorts within geography itself, evidenced not only by nonconformist geographers but by “artists-in-residence now peopling the contingent of geography staff in many a UK geography department” (Dewsbury, 2009a: 253). Despite some suggestions that art and geography are not exactly kindred spirits (Miles, 2006), greater affinities between geographers and artists have been established more recently through these residencies (see, for example,

⁸ Much more could be said about the avant-garde and its philosophical affiliations, politics and ethics (see Dewsbury, 2009a) but I only want to gesture to it as a way to begin thinking experiment beyond the domain of the sciences.

Nash *et al.*, 2002; Foster and Lorimer, 2007; Phillips, 2004).⁹ What is more, the interest in art within the discipline has attracted a number of reviews, not to mention conference sessions, on the topic (Hawkins, 2011; forthcoming).

Alongside various artist residencies, there have been several engagements with avant-garde thinkers and ideas, such as the special issue of *cultural geographies* on the *Arts of urban exploration*, which addresses the ways in which artists and cultural geographers have recently been using urban exploration as a “means of engaging with, and intervening in, cities” (Pinder, 2005: 383). This work details how the practices of walking, investigating, story-telling, mapping and performing combine to differently explore urban spaces. These modes of exploration can play a “vital role in the development of critical approaches to the geographies of cities, where they may challenge norms about how urban space is framed and represented, and where they may help to open up other possibilities” (2005: 385). Crucially, a “growing dialogue and interconnection between academia, artists, cultural workers and activists, and between critical and creative practices” has proved important, and a “search for tactics, spatial practices and modes of expression with which to explore urban culture is leading to an increasing turn to work traditionally associated with the creative and performing arts” (2005: 387). What is interesting

⁹ Of course, art has long been of interest to geographers; architecture, sculpture, and painting have held great fascination within geography (Cant and Morris, 2006). Since at least the nineteenth century, art has been mapped, analysed and interpreted by generations of geographers: from Vidal de la Blache’s exploration of *genres de vie*, and Carl Sauer’s fascination with vernacular architecture, through to the early twentieth century German tradition of *Kunstgeographie* (Kaufmann 2004). Geography’s interest in visual art also stems from field practices within the discipline, observing, sketching and mapping landscapes (Dewsbury and Naylor, 2002; Powell, 2002). Indeed, the appreciation and practice of art had much to do with this focus on observation, “part of a repertoire of techniques, including map reading, lantern slide viewing, landform modelling, and section drawing, to instruct people in picturing the world and participating in it” (Daniels, 2004: 431). Studies of the meanings of landscape art, of the way pictures and designs mediate cultural and material worlds through such conventions as perspective and symbolism, developed in the 1980s from an engagement between geography and the arts (Cosgrove, 1984; Cosgrove and Daniels, 1989; see also Nash, 2005).

to note is that practices across this field are rehearsals of earlier avant-garde activities in terms of the form of writings, echoing figures such as Walter Benjamin, Michel de Certeau, Henri Lefebvre, the surrealists and situationists. In doing so, these are attempts to blur the boundaries between art and the everyday.

These collaborations seek to address the tension between the simplistic practices of artists aestheticizing academic geography and the practices of geographers who continue singularly to communicate visual culture through written text. What is clear is that there has been a “shift in modes of engagement that sees geographers taking up a range of creative practices” (Hawkins, forthcoming). One way of characterising this shift in modes of engagement is to consider Nigel Thrift’s (2008b) notion of ‘arts of experiment’. Arguing that attention be paid to the “battery of performing arts that exist on the borderline between the humanities and the social sciences” (2008b: 82), Thrift makes the case for cultivating arts of experiment. Using installation art as a brief example, he outlines that these work on the principle that “the best kinds of experiments are risky because they allow the world to speak back” (2008b: 87).¹⁰ Thrift’s ‘arts of experiment’ are indicative of a broader shift in the social sciences towards experiment.

2.3. EXPERIMENTS IN THE SOCIAL SCIENCES

[T]he marginalized status of experiment in sociology goes back to the duality between the natural sciences and the human sciences. (Gross and Krohn, 2005: 64)

Within social science the experiment has had an uncertain status. This is, in large part, because experiments in social science have attracted two main criticisms. The

¹⁰ I return to the notion of risk in the following chapter in order to develop an experiment geography which is adequate to attend to experiment.

first is from researchers who claim that techniques used to control factors within ‘non-experimental’ situations are unrealizable with current statistical methods. That is to say, it is impractical to apply the logic of (scientific) experiment to situations where it is not possible to directly manipulate the experimental conditions. This logic of experiment is to “organize inquiry so that it bears decisively on hypotheses and the theories from which they are deduced” (Hughes, 1998: np). As such, the conventional means of achieving this is to establish a controlled comparison between two groups which are as alike as possible at the outset. Second, and related, is the broader issue of experiment in social science, and the nature of the social sciences themselves. This experimental logic is very much a hypothesis-testing procedure and intended as a means of building general theories. The criticism advanced, then, is by those who reject the very idea of hypothesis-testing as an ambition for social science. Put differently, this criticism is aimed at positivist tendencies within the social sciences.

There have, however, been some interesting developments within the social sciences. The argument that a “notion of experiment that is not modelled on the laboratory ideal of the natural sciences” (Gross and Krohn, 2005: 65; see also Gross, 2009; Krohn and Weyer, 1994) is increasingly gaining traction.¹¹ In some ways, this should not come as a surprise. We might think of The Chicago School, which was understood to be an experiment in social science research (Smith and White, 1929).

An experiment in co-operative research, and launched in 1923, Burgess was

¹¹ This thesis differs from Gross and Kohn (2005) in that it does not look to recuperate the concept of ‘society as experiment’. Indeed, their acknowledgement of the work of the Chicago School is somewhat contradictory with regards their claim that the social sciences need not be modelled on the natural sciences. A case in point is Smith and White’s (1929) *Chicago: An Experiment in Social Science Research*, which includes several chapters that reflect on the difference between the laboratory of the physical scientist and that of the social scientist. At one point it is argued that the “social sciences [can] obtain what is an approximation of the controlled experiment in the method of the physical sciences” (Burgess, 1929: 47).

confident that the “social sciences [could] obtain what is an approximation of the controlled experiment in the method of the physical sciences” (Burgess, 1929: 47). We might also note, that the same city was host to Jane Addams’ experimental work at Hull House. Although a form of social science, this differed from the Chicago School in that experiment, for Addams, “was not necessarily to take place in a ‘scientific’, and in this sense detached, laboratory” (Gross, 2009: 89). We might also think, further back, of Gabriel Tarde’s suggestion that sociology should be “an experimental and observational as well as a statistical science” (Barry, 2010b: 179).¹² The social sciences, then, have something of a precedent for experimentation.

This work is being revisited in various ways across the social sciences. Here it is worth exploring recent work carried out in anthropology, where the idea of an anthropological laboratory has been mooted. Paul Rabinow (2006: 1) asks “What would an anthropological laboratory look like that was not attempting to imitate a positivist model but that still sought to develop systematic knowledge?” Rabinow’s project builds on three key methods drawn from STS and its various antecedents. Firstly, it concentrates on specific concepts, technologies and experimentation rather than a general theory of the ‘scientific method’. Secondly, it acknowledges the historical and material conditions of knowledge production rather than universal truths. And thirdly, it embraces the diversity of scientific practices and results rather than their unity.

¹² “Whereas Durkheim studied society at a distance using statistics, leaving the object of research apparently undisturbed by the conduct of research itself ... Tarde’s vision of sociology was intentionally interventionist” (Barry, 2010b: 184).

Rabinow also traces anthropology's experimental tendencies, asserting that the main stream of experimentation happened during the 1980s and 1990s. Although there was no program or school as such, this experimentation consisted of various attempts to modify academic forms of writing and carried out in diverse media. As Rabinow notes,

there have been no common norms agreed upon as to what new forms of expression should look like. And ... there has been no common understanding or explicit set of criteria for how to evaluate such experimentation. (2006: 11)

This 'experimental moment' (Marcus and Fisher, 1986) for anthropology was full of the spirit of avant-gardism, but it is still unclear what implications this has had in terms of how ethnography is practised or for the future of the discipline (Rabinow, 2006). Interestingly, this is hardly the first such experimental moment in anthropology, with Levi-Strauss' *Laboratoire d'anthropologie sociale* (LAS) established in 1960 (see Wilcken, 2010). This antecedent laboratory has a half-century of impressive accomplishments, although it could be criticised for its emphasis on hierarchy and its charismatic figurehead. While the consequences of an experimental moment may be vague, Rabinow is still eager to propose that in order to renew the discipline, it is necessary to modify

the norms and forms of current practices, habits, and affects. Above all, it entails recursive experimentation and learning of a collaborative sort. (2006: 1)

Rabinow takes experimentation to mean "trying out different configurations of inquiry and critique", highlighting the need to reconfigure by prefixing the term with recursive. In this manifesto of sorts for his on-going project, what he terms *Anthropological Research on the Contemporary*, he does not dwell on experimentation. This is at odds with his recently co-authored book, *Designing Human Practices: An Experiment with Synthetic Biology*, where the term is much

more prominent. This book provides, as the authors put it, “an account of a productive experiment in the human sciences” (Rabinow and Bennett, 2012: 1). Moreover, they choose the term on purpose, and it is not used in a metaphorical sense. Indeed, they note that in the social sciences it is

unusual to claim (beyond the mandatory rehetorical prose required in grant proposals) that one is working in an explicitly experimental ... mode. Indeed, reactions from colleagues have shown us that the term experimental can function as much as a hindrance to understanding as an aid: We have been asked: Are we being literal, figurative, analogical, metaphoric, or simply ironic? The answer is metaleptic, but that is another story... (2012: 2)

Although they are not forthcoming on their answer – “that is another story, for another audience” – metalepsis is rather appropriate for a term such as experiment. Put simply, metalepsis is the use of metonymy¹³ to replace a word already used figuratively. In a round about way, Rabinow and Bennett acknowledge the difficulty in thinking experiment by deflecting the question and, in turn, raising yet more questions. Put differently, experiment can prove rather elusive.

Arguably something similar has been bubbling in geography. Or at least, an experimental ethos is being espoused in strands of cultural geography (Thrift, 2004a; 2008a). Out of sorts with cultural geography’s “stubbornly humanist metaphysics, the repeated application of methodologies that just confirm the world’s existence, and a politics which still attempts to take the moral high ground”, Nigel Thrift instead proposes to revivify the discipline with “an ethos of constant experimentation” (2004b: 121). This experimentation has

no exact goal in mind but is rather simply a means of changing the situation in order to see what will turn up, which may well simply be another form of

¹³ Metonymy is the use of a name for that of another to which it is related, such as ‘the bottle’ for a strong drink. Rather than create the relation between the two (metaphor), metonymy presupposes the relation (see Bredin, 1984).

awareness/appreciation of that situation. An artful and sensual bridge to something else. (2004b: 131)

Taking as axiomatic that cultural geography has lost its way, Nigel Thrift's development of non-representational theory (1996; 1999; 2000; 2004a; 2004b; 2005; 2008a) has attracted much interest and discussion within the discipline (see, for example, Lorimer, 2005; 2007; 2008). Indeed, as Hayden Lorimer carefully notes, non-representational theory has catalysed a certain busyness about the discipline. Thrift describes it, quite simply, as "the geography of what happens" (2008a: 2)¹⁴, and draws on a "long and complicated genealogy which can claim all kinds of ancestors" (2004a: 84). Non-representational styles of thinking and working question why only certain ways of knowing the world count. As such, non-representational theory can be considered "a machine for multiplying questions and thereby inventing new relations between thought and life" (Thrift, 2004a: 82). This stance necessarily has implications for the repertoire of theoretical and methodological techniques employed.

An upshot of this has been to intensify appreciation of the affective dimensions of space, requiring us to draw upon the "kinds of skills and sensibilities more readily associated with performance practices, practices that valorise and affirm the creative as much as the critical elements of knowledge production" (McCormack, 2004: 12). The point of attending to non-representational processes and practices is not to replace one kind of politics with another; rather, the point is to *multiply* the kinds of conceptual and empirical approaches available to geographers. As the world is incomplete and inconsistent, so it "must be approached through a spirit of affirmative experimentation" (Thrift, 2004a: 87).

¹⁴ He also uses the expression, "what is present in experience" (2008a: 2).

2.4. EXPERIMENTAL EXEMPLARS

Non-representational theory's antecedents are numerous (see Anderson, 2009). However, among the various sources of inspiration, Gilles Deleuze has often been positioned at the foreground and the "initial energies of non-representational theory were decidedly Deleuzian in tone and argument" (Wylie, 2010: 104). That Deleuze has been so important is indicative of the influx of 'French thought' in recent social theory (Cussett 2008; Elliott and Attridge, 2011) and geographical thought (Barnett, 2009; Elden, 2009b). This is not to say, however, that all non-representational theory is Deleuzian: Thrift himself acknowledges that there are aspects of Deleuze's work that he remains out of sorts with (see Thrift, 2008a). It is for this reason, then, that Ben Anderson suggests that,

The plural – non-representational theories – perhaps conveys a better sense of the complicated genealogy of these theories and the constantly shifting, contestable foundations of non-representational theory in human geography. (Anderson, 2009: 503)

Instead of tracing these 'foundations', I want to draw attention to a minor tradition of thinkers who have engaged with experiment in both conceptual and practical ways and who can contribute to a non-representational agenda. This is a tradition, and I use the term loosely, made up of maverick thinkers: William James (1842-1910), John Dewey (1859-1952), and Félix Guattari (1930-1992). These three have arguably been neglected, certainly within geography (although see McCormack, 2008; 2010a), yet can help gain purchase on experimental activities. Why this particular trio?

Firstly, while I do not want to restrict thinking experiments or experimentation to a different handful of philosophers, I think that these three provide a good point of departure for grappling with experiment and for developing a vocabulary and

techniques for engaging with experimentation.¹⁵ Secondly, taking seriously Isabelle Stengers' observation that the verb 'to experiment' is very close to that of 'to experience', Dewey, James and Guattari all pay particular attention to the experiential. Indeed, all three came to reconceptualise experiment by attending to experiences, and wrote in detail about spaces of and for experimentation. Put differently, Dewey, James and Guattari considered experience as something (with) which one can experiment. This is crucial as experience is central to the practice and promise of non-representational styles of thinking (McCormack, 2010a; Thrift, 2008a).

James affirmed the need for experimentation in thinking, argued that nothing exists outside the flux of experience, and established one of the first psychology laboratories. Dewey noted the tendency to confine experimentation to scientists and scientific laboratories and argued that the artist also operates experimentally, or adventurously, to open new fields of experience. As for Guattari, there is an insistence on "the pragmatics of experience/experiment in [his] writing that resonates particularly intensely with the writings of Dewey and James" (McCormack, 2010a: 213). In drawing on and working up this minor tradition, I choose not to ignore the differences between the various thinkers, but to augment, to play up, the resonances between them. As such, I affirm the similarities between their concepts and practices. For all three thinkers, experiments are both facilitated by and produce *transformative* spaces. They also radically alter and expand the laboratory's vocation: what a laboratory could do and where it might be located.

¹⁵ It should be noted that a range of thinkers are introduced and put to work throughout this thesis, and is not limited to these three. I do not want to imagine these thinkers as an emerging 'School X', or 'beatnik brotherhood', as Graham Harman (2009: 6) does, but there are some interesting affinities. Therefore, while I do not aim at amalgamation, this is nevertheless a collective of speculative thinkers (Stengers, 1997: 54).

The three of them all sought to harness “the transformative potential immanent to open-ended spacings” (McCormack, 2009: 280; see also Doel, 1996). By emphasising the spacing of relations, this thinking strives to elucidate an ontogenetic form of thinking space, rather than as a container within which activity takes place. The next section of this chapter therefore explores what experiment means in the kinds of contexts envisaged by James, Dewey, and Guattari. Collectively they challenge the notion that experiments are restricted to particular disciplines, approaches or locations.

2.4.1. JAMES

William James engages with the notion of experience throughout his work. Indeed, his doctrine of radical empiricism¹⁶ is built upon a belief in the ontological and epistemological primacy of experience, arguing that “Everything real must be experienceable somewhere, and every kind of thing experienced must somewhere be real” (1996a: 160). This empiricism is a method of ‘resorting’ to particular experiences when dealing with philosophical problems (Perry, 1996).

James understands experience as a relational field, where relations are simultaneously intensive and extensive, temporal and spatial. This is clear when James writes that our

fields of experience have no more definite boundaries than have our fields of view. Both are fringed forever by a more that continuously develops. (1996: 71)

James’ interest in experiential questions came at a time when the lab as a space for experimental psychology was emerging (McCormack, 2010a). Indeed, James was closely involved in establishing the laboratory as a particular work-space, as well as

¹⁶ I address James’ radical empiricism more fully in the following chapter on method.

developing specific practices for experimenting; his psychological laboratory was one of the first two to be established (Harper, 1950).¹⁷ In the basement of a building at Harvard University were a few rooms which “constituted the laboratory referred to by James and his students” (1950: 159). As James remembered it,

For a long series of years the laboratory was in two rooms of the Scientific School building, which at last became choked with apparatus, so that a change was necessary. I then, in 1890, resolved on an altogether new departure, raised several thousand dollars, fitted up Dane Hall, and introduced laboratory exercises as a regular part of the undergraduate psychology course. (James, 2008: 179)

It has been suggested that while James made much of the value of experimentation, he found the process to be tedious (Hunt, 1994), even writing to a friend that he hated experimental work (James, 2008: 301).¹⁸ He would usually spend no more than a few hours a day in the laboratory, yet both he and his students performed an array of experiments. Early laboratory work was largely physiological – with a great deal of brain dissection – whereas later laboratory exercises were on attention and imagination. For example,

[t]he assignment for the lab on attention was for each student to try to recite one line of poetry out loud while writing down a different line, timing one’s efforts, and noting how one’s attention veered (or not) back and forth. For imagination James asked his students to sit down an hour after breakfast and recall the breakfast table, with special attention to matters of illumination, definition, and colouring. (Richardson, 2007: 307)

For James, these experiments in his laboratory were not distinct from philosophical speculation.¹⁹ Likewise, he did not think that experiments were confined to such labs (McCormack, 2010a). Indeed, James’ experience-experiments did not only take

¹⁷ There is some debate as to whether it was James or Wilhelm Wundt who first performed laboratory experiments (see Harper, 1950; Hunt, 1994). Yet James acknowledges and discusses the experiments of his contemporaries – Wundt, Carl Stumpf and Gustav Fechner – in much of his early work (see Goodman, 2012).

¹⁸ He also wrote to Stumpf that his “experimental aptitude [was] but small” (James, 2008: 249).

¹⁹ And, of course, his experiments were only one source of his ideas about psychology, alongside his reading (both philosophical and psychological), visits to various universities and lectures, regular correspondences, and collections of reports and clinical studies.

place in the lab but also in disciplinary adventures. As Francesca Bordogna (2008) notes,

James's trespassing of boundaries – far from being a peripheral sidelight as often portrayed, a consequence of his metaphysics, or a product of his legendary vocational uncertainties and his piecemeal, unsystematic education – represented an essential strategy within a broader intellectual and social project. (2008: 6-7)

Indeed, the research carried out in and beyond James' laboratory at Harvard had very real effects on psychology; it would be no exaggeration to claim that these experiments contributed to shaping the growing discipline. For instance, several of the students who had worked with James at his laboratory went on to establish their own (see Harper, 1950). Moreover, James' experiments did not only help shape psychology but were a means to blur disciplinary boundaries, to "suspend – if only for a while – those disciplinary habits" (Bordogna, 2008: 272).

James features as an exemplar for a number of reasons, then. While his experimental aptitude – as he put it – may be in doubt, his dedication to developing specific micro-practices for experimenting is not. What is more, these experiments were on-going and wide-ranging, foregrounding the relation between experience and experiment. James also draws attention to the notion that experiments need not – or cannot – be distinct from speculation; experimental endeavours are both speculative and more-than-disciplinary.

2.4.2. DEWEY

John Dewey's oeuvre, much like that of James, can also be read as a blurring of disciplinary boundaries, with the former well-known for his work in logic, scientific

inquiry and the philosophy of education (Leddy, 2012).²⁰ Further similarities between the two include their affirmation of experience, their interest in psychology and their commitment to experimentation. They did, however, have their differences. Not only did Dewey tend to prefer the term instrumentalism to pragmatism, he also disagreed with James on a variety of issues, including belief. Yet these differences are not insurmountable. Far from it, Dewey's reworking of James' thought is useful here as it makes a more explicit link to extra-scientific activities.

Although Dewey was very fond of what he called the 'scientific method', this did not mean that he was solely interested in science. The scientific method was rather an approach which affirmed the significance of experiment (Dewey, 1938). This is evident in his book *Art as experience*, where he notes the tendency to confine experimentation to scientists in the laboratory. Dewey asserts that this is not the case and that "one of the essential traits of the artist is that he is born an experimenter" (2005: 149).

The artist is compelled to be an experimenter because he has to express an intensely individualised experience through means and materials that belong to the common and public world. This problem cannot be solved once and for all. It is met in every new work undertaken. Otherwise an artist repeats himself and becomes esthetically dead. Only because the artist operates experimentally does he open new fields of experience and disclose new aspects and qualities in familiar scenes and objects. (2005: 149-150)

Not only does Dewey refer here to Jamesian 'fields of experience' but these are only opened through experimentation. The close link between experiment and experience returns anew. Clearly, Dewey was preoccupied with the process of experiencing. In the same book, Dewey goes to argue that if "instead of saying 'experimental' one were to say 'adventurous', one world probably win general

²⁰ Dewey's work ranged more widely than this though, which is reflected by the fact that his collected writings take up 37 volumes (see Boydston, 1991).

assent” (2005: 150). And it is in this experimental-experiential-adventurous sense that he established the Laboratory School in the late nineteenth century, around twenty years after James had set up his lab.²¹

An experiment in what later came to be known as progressive education, the project was conducted under the management and supervision of the University of Chicago’s Department of Philosophy, Psychology and Education. A handbook of sorts, *The Dewey School: The Laboratory School of the University of Chicago 1896-1903*, was compiled by two sisters who were both teachers at the school, Katherine Camp Mayhew and Anna Camp Edwards.²² In the first chapter, the authors outline that the school bore the same relation to the laboratory-work performed by

biology, physics, or chemistry. Like any such laboratory it had two main purposes: (1) to exhibit, test, verify, and criticize theoretical statements; and (2) to add to the sum of facts and principles in its special line. In consequence, it was often called the Laboratory School, The name is significant. (Mayhew and Edwards, 1936: 3)

The school was developed with the maxim that “the core of school activity was to be found in occupations, rather than in what are conventionally termed studies” (1936: 5). Alongside this, was a second axiom: that the establishment of the school would itself be a form of community life that would function as a smaller-scale cooperative society. Indeed, throughout the book, the school is variously described as a ‘community-centred’ school (1936: 467), a cooperative society (1936: 466), and an intermediary between home and community (1936: 461).²³ The study of social life “furnished the thread of continuity, linking all these modes of experience whether constructive or experimental” (1936: 45).

²¹ James’ lab dates back to 1874-76, he himself was unsure (James, 2008: 179n.1), while Dewey initiated his Laboratory School in 1896 (Mayhew and Edwards, 1936).

²² The sisters note, however, that Dewey had “guided the entire development of the book” (1965: vii).

²³ The aim was to plan “a school program that was to be an experiment in cooperative living” (Mayhew and Edwards, 1965: 39).

Dewey was evidently fascinated by the potential that particular space might have for “facilitating a kind of experiential experimentalism” (McCormack, 2010a: 207). As such, the school had no syllabus. The ethos, according to the sisters, was that “whatever else was lost, vitality and constant growth were gained” (Mayhew and Edwards, 1936: 366). Indeed, the handbook discusses the impulse to investigate and experiment. In the school there was

no distinction made between the experimental science for the little children and the work done in the carpentry shop. They liked best of all to do things just to see what would happen. (1936: 41)

Examples litter the book and include the pupils apparently playing during their History or English classes, as well as cooking through arithmetic and science. The school, then, instilled a sense of the scientific method by encouraging an “instructive spirit of inquiry, to build in his [or her] mind a concept of scientific method as a practical tool and thereby guide him [or her] into the experimental, the scientific habit of mind” (1936: 283). Concurrently, the education strived to introduce an “artistic element into all typical school experiences” (1936: 362). To be sure, the Laboratory School demanded a “very considerable break with the aims, methods, and materials familiar in the traditional school” (1936: 6).

The school might be understood as a transformative space on a number of registers. Firstly, the school itself was forever in the making: with no syllabus and only broad principles, it meant that it was able to change from day-to-day but also year-on-year. Indeed, the school “affirmed pedagogy as one of the key practices through which experience is understood as a process of on-going experiment” (McCormack, 2010a: 207). And secondly, the “inclusive scope of the ideas in question demanded something more than a laboratory of experimentation in its restricted technical

sense” (Mayhew and Edwards, 1936: 3); in effect, this statement highlights that the school aimed to radically expand the laboratory’s vocation: what a laboratory could do and where it might be located.

Dewey reaffirms the importance of taking seriously the imbrication of experience and experiment by drawing attention to art as a mode of experiment; to operate experimentally opens new fields of experience. Here, then, Dewey can be productively allied to James as proponents of kinds of experiential experimentalism. Moreover, Dewey’s establishment of the Laboratory School raises questions about the lab as a particular site for experimentation.

2.4.3. GUATTARI

James and Dewey both offer useful orientations for engaging with experimental practices and spaces, not only in terms of conceptualisation but also in giving these ideas material form. The work of Félix Guattari points to ways in which James’ and Dewey’s explorations might be extended. Guattari’s writing shares a number of important concerns with them both, not least his affirmation of experimental practices. Like James, Guattari insists on considering his work as theoretico-practical, and echoed Dewey’s optimism about artistic practices, highlighting the importance of “poetry, music, the plastic arts, the cinema – particularly in their performance and performative modalities” (1995: 91). What sets him apart is his insistence on jettisoning much of psychology, in favour of a schizoanalysis.

His writings are often informed by and reference La Borde, an experimental psychiatric clinic which he considered to be the first experiment in institutional psychotherapy. For example, throughout his last book *Chaosmosis* there are

examples developed from his work at the clinic. In one particular essay, Guattari discusses this relation between theory and practice unequivocally.²⁴ Indeed, he writes that spending time at La Borde leads him to reconsider psychosis less in terms of strangeness or violence, but rather as a different relation to the world. This is part of an approach which he describes as ethico-aesthetic. He argued that psychoanalysis

continues to be marked by an original defect which consists in having been born under the aegis of a scientific (or at least scientific) paradigm. Freud and his successors always wanted to present themselves as scientists who were discovering the universal structures of the psyche. The truth is that they invented the unconscious and its complexes as great visionaries in other epochs invented new religions, new ways of experiencing the world and social relations. It in no way devalorizes the invention of psychoanalysis in thus placing it under the aegis of an aesthetic paradigm. Treatment is not a work of art, yet it must proceed from the same sort of creativity. (2009: 191-192)

Characterising Guattari as having jettisoned psychology is perhaps unfair then. Instead he wants to detach psychology from its putative scientific practices, and understand it as an art of sorts. As he is at pains to note, the psychology he clamours for is not art per se, but is nonetheless artful. As the art critic Nicholas Bourriaud (2002) notes, Guattari tends to discuss potential aesthetics and actually wrote very little about art. Much of this would be “incomprehensible if we did not underline his effort to de-naturalize and deterritorialize subjectivity” (2002: 89), as it spills considerably beyond the limits of the individual, or subject. By encouraging, or facilitating, our ability to seize, enhance and reinvent subjectivity, Guattari is proposing that what matters is our capacity to create new arrangements and agencies; a creation that shows many similarities with artistic activity. This is a plural, polyphonic definition of subjectivity (Guattari, 1995).

²⁴ This is Guattari's (2009a) fascinating piece in *Chaosophy* entitled *La Borde: a clinic unlike any other*.

Guattari called for a suspension of habits at La Borde and encouraged, in his own words, a mini-revolution which “required all service personnel work to be integrated with medical work, and that, reciprocally, medical staff be drafted for material tasks such as cleaning, cooking, dishwashing, maintenance etc.” (2009a: 178). He notes that there were around forty different activities for just a hundred patients and seventy staff members. This was part of a concerted attempt to gradually desegregate the “doctor-patient relationship as much as that between medical staff and service personnel” (2009a: 179). Here there are resonances with Dewey’s project too, as the clinic was “not simply a matter ... of calling psychiatry into question, but also of pedagogy” (2009a: 182). This was part of his constant activity of calling things into question; that social segments should undergo molecular revolutions. Put differently, this entailed a process of permanent reinvention, of resingularisation. When Guattari was there, La Borde was a processual life-space which called forth all sorts of event-encounters by “drawing upon the transformational potentials of social, political and aesthetic practices” (McCormack, 2008: 7). While he does not “suggest extending the experiment of La Borde to the whole of society, no single model being primarily transposable in this way” (Guattari, 2009a: 182), he argues that this experiment – despite its various shortcomings – could still be “credited with raising certain important issues and indicating the axiological directions by which psychiatry might redefine its specificity” (2009a: 193).

We might draw from these minor experimentalists – James, Dewey, and Guattari – a shared concern with the relation between the aesthetic and the ethical, as well as a commitment to a certain kind of empiricism. Importantly, all three develop a

particular site-specific experiment: the lab, the school, and the clinic. Moreover, they are all heavily invested in these experimental activities and sites. Although experiment is not understood in exactly the same manner from one to the other, there are nevertheless some startling similarities. In each case, we find that to experiment is to suspend as much as it is to transform. We also find that to experiment entails an adventure of sorts: it is unknown and always accompanied by risk. In all sorts of ways, then, there are resonances with the push of non-representational theories. As Thrift (2008a) makes clear, non-representational styles of working and thinking keep faith “with the small but growing number of determined experimentalists” (2008a: vii) and look to cultivate an experimental sensibility (2008a: 4). What is more, the mantra of non-representational theories is one that both speaks to and can be extended by our three exemplars: to experiment in thought *and technique* with what constitutes the world (see Dewsbury, 2010).

2.4.4. STENGERS

How, then, might we bring the concern of these figures, and those of non-representational theories, back into some sort of dialogue or encounter with the sciences? Isabelle Stengers provides a way of doing this. Although she has carefully engaged with these minor experimentalists – indeed, she even dedicates one of her books to Guattari – she offers something quite different, as she refocuses our attention on the sciences. Described as a great philosopher by Bruno Latour (1997), Isabelle Stengers’ work has begun to be taken up by a handful of geographers (Bingham, 2008; Greenhough, 2010; Hinchliffe, 2007; Whatmore, 2003). Stengers is perhaps best known for her collaboration with the Nobel Prize winner for chemistry, Ilya Prigogine, but she has established an extensive set of writing in her

own right. This work has spanned science studies, drug legalization, hypnosis and witches, to name but a few topics. Across all these, Stengers “directs our attention to the ways in which the world is agitating itself and puzzling us” (Latour, 1997: x) as she forces science and philosophy together in interesting ways. She describes this strange mixture as cosmopolitics (Stengers, 2010; 2011a). At the heart of this style of working is a foregrounding of propositions, risk and constructivism.

These three are entwined. Drawing on Alfred North Whitehead, a proposition is “a suggestion, a theory, a supposition about things” (Whitehead, 1967: 244). Crucially, it is more important that a proposition be interesting than true. Indeed, Isabelle Stengers explains that “a proposition that does not interest anyone is neither true nor false” (1997: 84). For Stengers, to interest someone in something means “to act in such a way that this thing ... can concern the person, intervene in his or her life, and eventually transform it” (1997: 83-84). The acceptance of a proposition is risky, as it might force a re-thinking of what it is you are studying, and how to go about doing so. Put differently, thinking propositionally is a principle of ‘being at risk’. These propositions follow a logic of constructivism, a word that does not have an antonym (Latour, 1997); it is a logic of ‘co-becoming’ (Stengers, 2010:8). As such, she encourages her readers to embrace the

boldness that gives the experimental question its beauty and interest, while eschewing the recklessness so often claimed today as a condition of this boldness. Let us take, accept, and learn to measure the risks. (Stengers, 1997: 19)

Drawing together a range of philosophers – including Deleuze, Leibniz, Lucretius, Serres, and Whitehead – Stengers’ experimental approach is “not an experimentation on nature but on concepts and their articulations, an experimentation in the art of posing problems and of following the consequences”

(1997: 55). What I want to take from this, then, is that the task of experimenting with concepts and their articulations is vital. This is an important theme, and one which is revisited during many of the empirical engagements. Following Stengers, I speculate that these encounters with experimental practices hinge on the hope of inventing “new ways of working together that are not centred on the possibility of judging, but that enable us to learn how to learn” (1997: 106).

2.5. EXPERIMENTAL OVERTURES

To close this chapter, I want to reflect on what I am trying to present here. I have gradually sought to untether experiment from the domain of the sciences. However, I have suggested that it is important not to jettison much of the work that has been done on experiment in the history and philosophy of science. Accordingly, a brief history of the term is traced. The explosion of interest in experiment in the 1980s is something of an isolated, if protracted, episode. Indeed, experiment was considered inferior to theoretical work and was understood to serve and support theory. As Ian Hacking noted, there had been almost no philosophy of experiment itself; this is an argument which was echoed by a number of others. This philosophy of experiment features implicitly in a great deal of work in what is now termed STS. The laboratory studies identified here were contemporaneous with reflections on experiment, and paid close attention to the specific practices of ‘doing’ science. In doing so, these studies drew attention to how science was local, particular, and contingent. Outlining this work is important because there has been a sustained dialogue between geography and STS, on both substantive matters such as the relation between space and science, and conceptual concerns around disruption, contingency and risk.

In order to begin loosening experiment from the sciences then, I consider the ways in which a handful of geographers have considered where experiments end. Taking up the term extra-scientific, I gesture towards experimental spaces and practices which are *beyond* the sciences. The problem with this term, extra-scientific, is that it positions everything in relation to science. Notwithstanding this, considering experiment beyond the sciences can be a profitable endeavour as it highlights the way in which the avant-garde is caught up notions of the experimental. As such, I examine some of geography's recent engagements with art – although note that this has a much longer heritage – to consider how experiment has featured in quite different ways. I segue from thinking about art and geography to Thrift's notion of arts of experiment in order to attend to a broader experimental shift in the social sciences. Here, I dwell in particular on non-representational styles of thinking and working. I contribute to this agenda by presenting a trio of exemplars who provide purchase for thinking experiments in close conjunction with experience. These minor experimentalists draw our attention to *ethico-aesthetic* experiments (Guattari, 1995). More, they draw attention to the minor forms of life through an aestheticisation of different practices, across a range of experimental spaces, to the extent that science itself becomes an aesthetic practice.

Cannot technical and scientific setups be assimilated, on many points, to aesthetic performance, and, symmetrically, aren't works of art constructed in the same way as experiment? (Guattari, 2012: 160-161)

These experimentalists are introduced because I want to return to their vocabularies and techniques of experiment throughout the thesis. For instance, William James is going to help me to think about how to attend to experiment by way of drawing on his notion of radical empiricism in the following chapter. He also reappears later on in the thesis when I consider a plurality of experimental

practices. As I'm going to show later on, John Dewey and his Laboratory School can productively inform encounters with a similarly experimental school in Berlin. Guattari, meanwhile, features throughout the thesis as he assists in thinking the values of experimentation and provides the notion of metamodelling. However, as I have already suggested, Isabelle Stengers can be read as a productive addition to this group of thinkers, given that she is both well-versed in their work and proposes an experimentation which foregrounds propositions. Accordingly, I revisit the work of Stengers to offer a series of propositions for experimenting with theory and dwell upon her practice of attending to the ecology of practices. Moreover, I put this notion – ecology of practices – to the test in a later chapter.

Part of what I am doing, then, is establishing a set of experimental overtures: openings onto different ways of thinking and doing experiment. Moreover, this chapter serves to tease out the mottled relations between these thinkers and, more specifically, what they have to offer geography. In one sense, James, Dewey, Guattari and Stengers present a commitment to empiricisms, to foregrounding experience and the experiential. In another sense, they emphasise the particular sites of experiment through the way in which they draw upon their own experimental practices. In yet another sense, they collectively point to the difficulties in loosening thinking experiment and practising experiment.

3

NOTES ON METHOD

Throughout the research that informs this thesis, a central question has featured as a series of refrains: how to be experimental when attending to experimental practices? How to take concepts such as experiment and experience seriously when doing a geography of experiment through attending to the ways in which the experience of certain sites registers as experimental? How do experiment and experience encounter notions of empiricism, of performance, of fieldwork? The point of departure for this chapter is a set of recent interventions, several in the form of special issues of journals (Dewsbury *et al.*, 2002; Latham and Conradson, 2003; Rose and Thrift, 2000), which call for a change in the limited methodologies that are currently employed within the social sciences. As such this chapter both acknowledges calls for human geography to be “more imaginative, pluralistic, and pragmatic” (Latham, 2003: 1993) in its attitude towards methodology and looks to extend these efforts through a set of engagements with methodological issues. Accordingly, it is not a straightforward ‘Methods’ chapter. It is neither a ‘confessional’ report, nor is it separate from the ‘findings’ of this research. What is it then?

Put simply, the chapter can be read as a set of notes on method, anchored around two themes: theory and empiricism. The chapter opens with a consideration of the relation between theory and method. What is it to 'do theory' (Barnett, 1996) or to 'think through research' (Pryke *et al.*, 2003)? This is perhaps a little broad, as every researcher will need to reflect upon this relation. More precisely, I want to ask: what is it to do theory in a way that is faithful to an experimental approach to experiment? Taking its cue from the aforementioned recent interventions, this section expounds upon the notion of 'modest theory'. Moreover, by thinking through research via modest theory, it might be possible to "remake social science in ways better equipped to deal with mess" (Law, 2004). In keeping with non-representational styles of thinking and working, the ethos of this research is both experimental and affirmative. This is an ethos of apprehending the world "less as a series of sites from which to extract representational meaning, but as a field of processes and practices through which the ethical sensibilities of thinking may emerge" (McCormack, 2003: 489). Furthermore, this can be understood as an experiment in what Sarah Whatmore (2003) has termed 'risky research'.

While empiricism has been a source of distrust within the social sciences and human geography, no doubt due to its close association with positivism, there has been a renewed engagement with the empirical in the wake of reassessments of what it is to *do* social science. Indeed, re-thinking the empirical is an emerging agenda throughout the social sciences (see Adkins and Lury, 2009; Savage and Burrows, 2007). Although this has been less pronounced within geography,²⁵ a re-

²⁵ It should be noted that although similar reflections have surfaced in geography (Harvey, 1969; Smith, 1987; McDowell, 1993), the range of *emerging* perspectives has yet to be examined.

examination of empiricism is necessary given that calls for an experimentalist 'orientation' are tied up with an 'empirical turn' (Thrift, 2011):

This new empirical turn is born out of a desire to recapture some of these qualities in a social science grown middle aged. It privileges what might be called the experimental ... (2011: 18)

More specifically then, what might it mean, for example, to perform a kind of experimental empiricism? The chapter develops a distinctive ethnographic approach as a way to consider these empiricist aspirations. In so doing, it advances a number of concepts in order to gain purchase on what has been a 'patchwork ethnography'; specifically 'attentive participation' and 'exposure'.

3.1. EXPERIMENTS WITH THEORY

Geography remains a discipline deeply suspicious of theory, heavily invested as it is in notions such as 'the field', 'empirical work', 'politics', and 'practice'. (Barnett, 2009: 752)

What would it mean to adopt an experimental stance in relation to theory? What I want to explore and develop here is a way of understanding theory experimentally. At first blush, this may appear an odd way to start a chapter which purports to be on method. However, "acknowledging the event-ness of the world and taking the productiveness of practice seriously does *demand* a different stance to theory and empirical work" (Latham and Conradson, 2003: 1902, my emphasis). Of course, it is not so straightforward. As Barnett (2009) has noted, although there has been a veritable explosion of theory in the discipline, geography as a discipline remains suspicious of theory.²⁶ Indeed, there are concerns that there is "*too much* theory in geography, or too much of the *wrong sort* of theory" (2009: 752-753; original

²⁶ Dewsbury encapsulates this issue well when he writes that "geographers have been caught in the midst of accepting that the relation of theory to practice is one of either two approaches, namely: the priority of theory over practice, or vice versa" (2003: 1919).

emphasis). Why bother with theory then? Firstly, theories and concepts are unavoidable. No research is possible without some set of concepts; no research can be 'theory-neutral'. Secondly, and more affirmatively, theories can operate as thinking devices. That is to say, theories can help in the formulation of rigorous research questions. This section, following Pryke *et al.* (2003), is not so much about philosophy, or theory as such, but about the differences that it can make to doing research insofar as they relate to the matters of concern that are at the heart this thesis. Put differently, this section establishes the concerns of the thesis in thinking through research. Accordingly, I outline a series of propositions for orienting an experimental attitude to theory.

3.1.1. PROPOSITION I: AFFIRM MINOR/MODEST THEORY

The accusation that there is too much theory in geography seems to be a response to a particular brand of theory. This brand of theory is what Cindi Katz (1996) would describe as 'major': totalising theories bent on mastery. In other words, this is 'Theory', understood as "a tool for exposing" and "an instrument for debunking" (Barnett, 2009: 752). In order to combat or refuse a theory intent on mastery, Katz urges geographers to work towards 'minor theory'.²⁷ Simply put, for Katz this is "not a theory of the margins, but a different way of working with material" (1996: 489). How are geographers to work towards this though? And what might be considered as minor? On these points, Katz is not entirely obliging. However, we may take a few things from her forthright paper. Firstly, constituting the minor is not about naming something as such, but of working in and with "vocabulary in which one is not at home" (1996: 490). This is something that I look to

²⁷ Katz develops this notion following Deleuze and Guattari's (1986) examination of Kafka's 'minor literature'.

operationalise by engaging with a set of terms that are not readily familiar to human geographers, such as topology, modelling and ecology. Secondly, and relatedly, “the ‘minor’ is not so much a stable form existing in opposition to something major, but relentlessly transformative and inextricably relational” (Katz, 1996: 489). The task then is to rework the major from within; to use that vocabulary but to disrupt it in a way that is always contingent. For some this may still be too vague. For others, there will be concerns about the relation between the major and the minor.²⁸ Notwithstanding these concerns, Katz’s work highlights that there are many ways of doing theory and that to rethink theory does not necessarily require a dismantling of ‘major theory’ (see 1996: 498).

If we were to overlook Katz’s preoccupation with power and position, we might find that there is much in common with non-representational styles of thinking and working. Indeed, in a similar move to Katz, Nigel Thrift has recommended what he calls ‘modest theory’, understood as a “practical means of going on rather than something concerned with enabling us to see, contemplatively, the supposedly true nature of what something is” (1999: 304). As such, Thrift is open in his dislike for ‘grand theory’, which he describes as,

the kind of theory that wants to build systematic accounts of the world which aspire to rigorous standards of exactness, and which wants to understand the totality of social life in terms of those accounts, as stories that add up. (1999: 297)

Thrift returned to this topic a few years later, arguing that,

People want – want so much – a body of theory that acts out rules and conventions, orders and corrections, that they can sign up to and then legislate the world from: this is bad, this is good, this is passé, this is exciting and so on. I cannot meet those expectations since it is precisely this mechanical notion of theory that I want to junk in

²⁸ A concern here might be whether the major/minor distinction is nothing more than an unhelpful dualism. It is unclear if this is avoided by rendering the relationship between the two not as “one of size or importance” but as being “in exquisite and mobile tension” (1996: 491).

favour of a notion of theory as a modest supplement to practice, helping people to create new ways of living-thinking through which they can explore and add to the world – rather than offering ready-made solutions. For me, theory is a useful toolkit, a means of amplification but never a panacea. (2004: 83)

Certainly, this account of theory is not so dissimilar from Katz. Crucially, both of these mandates for theorisation call attention to the need to abandon the idea that theory holds all the answers; in this regard they are hardly original. However, both Katz and Thrift gesture towards theory as something that is both supple – it can be tweaked and reworked – and can be understood as something supplementary. This can be extended: theory in this sense needs to add to an account rather than explain.

Beyond simply calling for modest theorisation, Thrift has also developed a body of work which has gone under the banner of non-representational theory (see Thrift, 1996; 1999; 2000; 2004a; 2004b; 2005; 2008a). Here ‘theory’ may as well be “in scare quotes since one of the purposes of non-representational theory is precisely to undo what we think of as theory” (1999: 297).²⁹ It is an attempt to take seriously the notion of theory as a modest supplement to practice. What does this mean though? How can theory be a modest supplement to practice? For Thrift, non-representational styles of working can have an important methodological influence. Noting that current work in much of human geography “still draws on a remarkably limited number of methodologies” (Thrift, 2008a: 147), Thrift’s argument is that “fetishizing the values of methodological rigour seems ... to miss a large part of the point of social science by purposefully going about deadening itself” (Thrift, 2008a: 18). Non-representational theory, then, is concerned with multiplying

²⁹ However there are some who remain unconvinced. Clive Barnett, for example, writes that while “Non-representational theory is meant to exemplify this notion of modest theoretical practice ... its characteristic modes of presentation reiterate many of the rhetorical devices of distinction and exclusion associated with conventional forms of grand theory” (2009: 752). This seems to miss the point that non-representational styles of working do *not* have a characteristic mode of presentation; indeed, presentation itself is ‘up for grabs’.

methodologies, and specifically multiplying performative methodologies. Non-representational theory, as modest theory, is also grounded in a strong affirmative stance which understands the world to be incomplete and inconsistent.

3.1.2. PROPOSITION II: MULTIPLY METHOD

Thrift is not alone in the social sciences in developing this kind of critique about social scientific method. John Law makes a similar point when he notes that “talk of ‘method’ still tends to summon up a relatively limited repertoire of responses” (Law, 2004: 3).³⁰ Moreover, while “particular sets of rules and procedures may be questioned and debated ... the overall need for proper rules and procedures is not” (2004: 5). This methodological rule-following is not the only problem however. Perhaps more seriously, Law notes that it is all too rare to find acknowledgement that “methods, their rules, and even more methods’ practices, not only describe but also help produce the reality that they understand” (2004: 5). That is to say, methods are not a way of opening a window onto the world, but a way of interfering with it (see Mol, 2002). Therefore, Law tries to imagine what it might entail to remake social science so that it is better equipped to deal with the mess of the world. After all,

events and processes are not simply complex in the sense that they are technically difficult to grasp (though is certainly often the case). Rather, they are also complex because they *necessarily exceed our capacity to know them*. (2004: 6)

Here it is clear that Law’s confidence in the social sciences is similarly diffident to Thrift’s. Events and processes are difficult to grasp both technically *and* philosophically. This is a startling observation. If this is the case, what does Law

³⁰ Law goes on to explain that the problem is “not so much lack of variety in the *practice* of method, as the hegemonic and domatory pretensions of certain versions or *accounts* of method” (2004: 4; original emphasis). Like Thrift, Law notes that much of the social sciences understand the world as “a set of fairly specific, determinate, and more or less identifiable process” (2004: 5).

propose? And what ways are there for dealing with ‘mess’ in social science research? Law’s hope is that the social sciences will learn to

live in and through slow method, or vulnerable method, or quiet method. Multiple method. Modest method. Uncertain method. Diverse method. (2004: 11)

This is a little unsatisfying precisely because we are so accustomed to particular sets of rules and procedures when it comes to method. Yet what Law affirms is the need to multiply the methods available to the social sciences. It is here that we might return to Thrift’s concern for multiplying performative methodologies. Indeed, both Law and Thrift are in agreement that method is performative: it helps to produce realities. For Thrift this multiplication of methods has been aided, principally, by turning to the performing arts, which function as a “rich archive of experiments with disclosing and therefore describing and constructing space-times” (Thrift, 2008a: 148).

To be sure, over the past decade or so there have been a range of articles articulating interest in apprehensions of performance as a way of reinvigorating approaches to research. These are most evident in a set of special issues of journals, variously concerned with *Spaces of performance* (Rose and Thrift, 2000), *Enacting geographies* (Dewsbury *et al.*, 2002) and *Making place: Performance, Practice, Space* (Latham and Conradson, 2003). Thrift and Dewsbury, in the first of these special issues, present a case for performative techniques: performance offers “a whole range of techniques for making the world come alive” (2000: 424). More broadly, the special issues have called for an openness to experiment with approaches which generate and interpret research materials.

Adopting an experimental stance, or at least practising this openness to the possibilities of methodological experimentation, does not mean “ditching, wholesale, questions of rigour ... for methodological anarchy” (Latham, 2003: 2002).³¹ Instead it requires a shift from a mode of research that is “driven by the imperative to denote, to one oriented towards the work of description” (Latham and Conradson, 2003: 1903). Here, the aim is not to “seek after explanations that claim to go beyond the event being described, but simply to present descriptions that are infused with a certain fidelity to what they describe” (2003: 1903). This is what J-D Dewsbury (2003) might call ‘witnessing’: a stance that is oriented towards being in tune to the vitality of the world as it unfolds. Put differently, witnessing is concerned with the on-going attempt to articulate events. This calls for pluralism in how we think, research, and present geographies (see Dewsbury *et al.*, 2002). Echoing this pluralism is Latham and Conradson’s ethos of experimentation, what they describe as “a radical openness in our methods, our ways of thinking, our ways of writing” (2003: 1904).

3.1.3. PROPOSITION III: TAKE RISKS

In keeping with cultural geography’s rich tradition of experimentation, recent work in human geography has placed an emphasis on “experimentation and, by implication, on taking (and being allowed to take) risks” (Whatmore, 2006: 606). Importantly, Sarah Whatmore adopts the notion of ‘generating materials’, indicating that all data is produced rather than found. The consequence is that the generation of materials is always an intervention in the world. For Whatmore, the experimental imperative inspired by the research practices of Latour and Isabelle Stengers, leads

³¹ Indeed, “experimentation can be relatively modest” (Latham, 2003: 2012).

her to conceive research as 'co-fabrication' (Whatmore, 2003), of working together with those whom we are researching.³² This means, for example, allowing objections, valuing hesitation, and learning to be affected; making space(s) for surprises (Clark, 2003; Latham, 2003). Indeed, Jeff Popke's examination of geography and ethics, notes that recent geographical work in a non-representational register is animated by an ethos which "works toward encounters that open us to a generous sensibility, one that might be capable of re-enlivening our affective engagements with others" (2009: 84). This involves an ethical commitment "to learning to become affected ... by the relational movements of bodies" and a political commitment "borne of the claim that we can never determine in advance the kinds of relational matrices of which bodies are capable of becoming involved" (McCormack, 2008: 9). Here, ethics can be understood as a certain sensibility, or affective disposition, rather than as some kind of rigid code. The idea, as Dewsbury puts it, "is to get embroiled in the site and allow ourselves to be infected by the effort, investment, and craze of the particular practice or experience being investigated" (2009b: 326).

I am aware that much of this may seem overly abstract and theoretical. As Latham and McCormack (2004) have noted, a "common criticism of [this] kind of approach [is that] 'excessive theorizing' gets in the way of doing significant, important, empirically oriented research" (2004: 709). However, drawing out these various experimental propositions attests to the productivity in opening up novel ways of thinking and theorising. Therefore, experiments in theory facilitate a "process by which conceptual vehicles charge and activate the detail of the world with an

³² Co-production is understood to be synonymous with co-fabrication (Greenhough, 2010; Hinchliffe, 2009).

enlivening potential, a potential whose creative dimensions are as important as any of its critical dimensions” (2004: 709). Theory is not something that gets in the way, but provides ways of apprehending, valorizing, and intervening. Given that theory here is not understood as mastery, it is not surprising that it does not provide clarity. Indeed, theory can complicate the matters, and methods, at hand. At risk in these theoretical experiments are the very concepts themselves, which can become amplified or lose potency.

Perhaps what is most striking about these various theoretical orientations has been the overriding commitment to re-thinking what counts as data or as evidence, to what is research material. Further, this has involved a reappraisal of the *empirical*. While this opening section has, in a sense, established a number of propositions, which are neither prescriptive (‘should do’) nor methods (‘how to’) (see Woodward *et al.*, 2010: 272), the chapter now turns to a closer examination of what can be considered a rethinking of the empirical in the social sciences and in geography.³³

3.2.EMPIRICISM(S)

Just as various philosophers have articulated their approaches to empiricism – radical (James), transcendental (Deleuze), speculative (Whitehead), to name just a few – so too have geographers endeavoured to both extend what counts as the empirical, as well as proliferate the methods and styles of presentation enabling this. This chapter, and thesis, seeks to contribute to an empiricism that is not reducible to “the textbook definition that everything derives from experience or

³³ These propositions are not dissimilar from Dewsbury’s (2009b) series of injunctions, which are compared to *proscriptions* rather than *prescriptions*; *proscriptions* do not “suggest a formula or a known or better way to proceed to in performative methodological endeavour” (2009b: 322).

that there exist no innate or a priori ideas” (Rajchman, 2000: 16). Indeed, historically, empiricism has been understood as a

family of traditions in the philosophy of science which argue that scientific truths grow out of, and are properly generalized from, appropriate empirical observations. (Law, 2004: 16)

Moreover, in the social sciences, “empiricism and especially positivism are now usually seen negatively” (2004: 16). The task is to reopen the question of what constitutes empiricism (Massumi, 2002a). How then might the empirical be rethought? This is a question which occupies many social scientists, not only geographers. For example, Adkins and Lury (2009), there has been “a shift in the very ground of the empirical itself, that is, there are changes in the very matter of the empirical” (2009: 6). What is this shift? Crucially, the social sciences have seen the development of an *expanded* empiricism (Clough, 2009; Massumi, 2002a).

In the spirit of rethinking the empirical, I turn now to the work of William James on radical empiricism. Although a number of different approaches to empiricism have already been mentioned, the focus on James’ empiricism is partly because it also featured prominently in both Deleuze’s and Whitehead’s work (see Stenner, 2008). Radical empiricism has yet to receive much attention within geography. Up until now, it has only been taken up by a few working in a non-representational-register (McCormack, 2008; 2010a; 2010b; Thrift, 2008a). Even in philosophy, those who have taken up James’ work are few in number. Brian Massumi (2011) is one such exception and he has endeavoured to outline a series of guidelines for this approach.³⁴ Again, the emphasis here is on orientation rather than method per se. Firstly, everything that is, is in perception. Secondly, take everything as it comes;

³⁴ Another exception is David Lapoujade’s (2007) excellent book, *William James: Empirisme et pragmatisme*, but this has yet to be translated into English.

you cannot pick and choose.³⁵ Thirdly, since things come in lumps, groups and collections, as well as on their own, relations must be as real as the terms related.

The relations that connect experience must themselves be experienced relations, and any kind of relation experienced must be accounted as ‘real’ as anything else in the system. (James, 1996a: 42)

Fourthly, it then follows that relations are not only real but perceived. Lastly, and this rather complicates matters: the vast majority of what is, in perception, actually isn’t. The “terms and relations that appear are not actually but only virtually there, beyond the frame on the ‘chromatic fringes’ and at the processual vanishing point” (Massumi, 2011: 86).³⁶ Radical empiricism is radical because it begins with what is imperceptible: relation. In this version of empiricism, there is nothing prior to experience (Manning, 2009a).

How then might this radical empiricism be operationalised? How to take on the task of taking into account, rather than corralling, the “reality of contingent experience, of relations, of multiplicities, of encounters” (Murphie, 2008: 22)? The issue here is that even when radical empiricism has been discussed or embraced, it is actually rarely put into action; the examples of radical empiricism-in-practice are scarce.³⁷ While both Law and Thrift are (more than) somewhat dismissive of the “remarkably limited number of methodologies – ethnography, focus groups, and the like” (Thrift, 2008a: 147), it is important to recall Katz’s suggestion that a minor theory need not do away with major theory. That is to say, to theorise in a modest and minor register entails *reworking* – transforming – the major from within. Therefore, what I

³⁵ Interestingly, the same point is made by Whitehead when he writes that “Everything perceived is in nature. We may not pick and choose” (1964: 41).

³⁶ As Massumi notes, while the “virtual, as such, is inaccessible to the senses” it also “cannot but be felt, in its effects” (2002a: 133).

³⁷ For instance, Erin Manning (2009a) contends that her book, *Relationescapes*, is radically empirical because it works directly out of examples and delves into the complexity of relations: “When radical empiricism counts, it begins in the middle (milieu)” (2009a: 101).

propose is to deploy an approach which is familiar, yet foregrounds the tenets of radical empiricism. More specifically, I want to suggest that a modified suite of ethnographic habits and orientations, which already attend closely to situations, is well-suited to a minor yet radically empirical transformation.

3.2.1. ETHNOGRAPHY

... a curious mixture of humiliations and intimidations mixed with moments of insight and even enjoyment. (Thrift, 2003: 106)

Ethnography is a well-established method in the social sciences. Although it has been described as under-used in geography (Herbert, 2000), it has received plenty of attention recently (Allsop *et al.*, 2010; Crang and Cook, 2007; Morton, 2005; 2009; Till, 2009; Watson and Till, 2009). Ethnography may be fashionable, yet it remains a confused and broad term. This is partly because of the need to categorise or justify approaches to doing research; ethnography thus becomes an approximation, a place-holder. No doubt its introduction from anthropology also throws up problems as to what qualifies as ethnography. Certainly though, the ethnographic text is a particular genre, and tends to be “an account of lengthy fieldwork experience” (Barry, 2001: 55). Ethnography attaches particular weight to ‘doing fieldwork’ and could be argued “to come closest to the notion of ‘generating materials’, as opposed to ‘collecting data’” (Whatmore, 2003: 93). As such while ethnography may be an umbrella term, it also indicates long-term fieldwork in a particular site or situation.

Reworking ethnography by way of a radical empiricism holds potential for several reasons. Firstly, ethnography places emphasis on the “detail and complexity of empirical examples”, and is therefore “alert to, and respectful of, specificity and

difference” (Barry, 2001: 22). Secondly, ethnography is already being theorised as in tune with an expanded empiricism. For example, Georgina Born (2010) wishes to rescue empiricism from a narrow understanding of the term, through an ethnography understood as a post-positivist empiricism. Drawing on both Whitehead and Deleuze to develop her argument, she contends that this approach makes it possible for “empirical research to have theoretical effects or to serve as a site for conceptual invention” (2010: 197). Crucially, Born notes that the “strength of ethnographic fieldwork is that it throws up material and findings which cannot be incorporated into existing frameworks, and which demand that they be extended” (2010: 198). The term she uses for this (post-positivist) may differ from that of James or Massumi (radical), yet both draw attention to how the empirical can be unruly: take everything as it comes. Moreover, Born’s version of ethnography suggests that not only may materials resist conceptual apparatus, but be generative of concepts.

Critics may argue that this presents a rather optimistic view of ethnography. For example, David Graeber writes, with some disappointment that, where anthropology once drew its “theoretical terms – ‘totem,’ ‘taboo,’ ‘mana,’ ‘potlatch’ – from ethnography”, the discipline is now reduced to “the scholastic dissection of terms drawn from Continental philosophy (deterritorialization, governmentality, bare life...)” (Graeber, nd: np).³⁸ Graeber makes an important point here: while themes from philosophy can complement disciplinary-specific vocabularies, it

³⁸ However, the time that Graeber harks back to, when ethnographers were quoted by philosophers and psychoanalysts, was arguably the “twilight of colonial history” (Fish, 2012: np). Graeber’s longing for a different anthropology reads like a disciplinary project: he hopes to “return anthropology to its original and distinctive conceptual wealth – to critical concepts we bring from the field, whether exotic or urban – and thereby, to return ethnography not only to the forefront of theoretical developments in the discipline, but by doing so, making anthropology itself relevant again far beyond its own borders” (Da Col and Graeber, 2011: viii).

should not be the function of a social science to simply apply the work of philosophers (see Thrift, 2008: 18). As a counter to this application, and harking back to ethnography's conceptually productive past, Born's post-positivist empiricism, with its commitment to the theoretical potential of ethnographic insight, is a useful ally for radical empiricism. To develop this further requires closer attention to some of the logics of an ethnographic sensibility.

3.2.2. ATTENTIVE PARTICIPATION

As much as it is a well-established method in the social sciences, ethnography encompasses an eclectic range of styles and approaches. Accordingly, it is for geographers "to adopt and adapt the ethnographic methods of anthropologists" (Barry, 2001: 22-23). However, much of what passes for ethnography goes under the label of 'participant observation' (see Born, 2005). Here, I want to attend to the move that Thrift (2000) makes from participant observation to observant participation and explore how this might be extended. Accordingly, this chapter, and the thesis more generally, seeks to develop an *attentive* participation. Crucially, it takes seriously the claim that how research is done is an on-going experiment, an on-going attempt to articulate, animate and attend to recalcitrant empirical materials.

In order to work up the notion of attentive participation, let's turn to a dictionary entry first; the now out-dated fourth edition of *The Dictionary of Human Geography*.

The entry for non-representational is particularly instructive:

non-representational theory is an attempt to move off onto new ground where the witness must become an observant participant rather than a participant observer. Through its emphasis on the intensity of commitment and the commitment of intensity, non-representational theory allows of no hiding place. You must be in it. (Thrift, 2000: 556).

This theoretico-practical move, from a participant observer to an observant participant, is an important one. The shift is in emphasis: an appreciation that to do research is an on-going participation with the world, rather than something that you can choose. This is a participation understood as being about “becoming affected and inflected by encounters” (McCormack, 2008: 2; see also Latour, 2004). Moreover, this is a participation which *precedes* recognition: “Our awareness is always of an already ongoing participation in an unfolding relation” (Massumi, 2002a: 231).³⁹

This observant participation has elsewhere been thought of as a form of witnessing.⁴⁰ Following JD Dewbury (2003), witnessing is a stance oriented to attuning to the liveliness of the world. It is both an act and call, which pushes forward the agenda of non-representational theory. Yet we might pause to consider what witnessing can allow us to do differently. As Dewsbury himself notes, “our mode and focus of attention witness the world into being in quite different, and hence political, ways” (2003: 1903). In a later paper, Dewsbury examines further this notion of witnessing:

The idea is to get embroiled in the site and allow ourselves to be infected by the effort, investment, and craze of the particular practice or experience being investigated. Some might call this participation, but it is a mode of participation that is more artistic and, as with most artistic practices, it comes with the side-effect of making us more vulnerable and self-reflexive. It is not however an argument for losing ourselves in the activity and deterritorializing ourselves completely from our academic remit, but nor does it mean sitting on the sidelines and judging. Rather the move, in immersing ourselves in the space, is to gather a portfolio of ethnographic ‘exposures’ that can act as lightning rods for thought. (2009b: 326)

³⁹ To expand on this somewhat, Massumi examines James’ famous dictum that we “do not run because we are afraid, but that we are afraid because we run. We become conscious of a situation in its midst, already actively engaged in it. Our awareness is always of an already ongoing participation in an unfolding relation. It is only after we have stopped running and can look back that we are clearly cognizant of what it was that set us dashing.” (2002a: 231)

⁴⁰ Witnessing is increasingly becoming a topic of interest for geographers (see Carter-White 2009; 2012; Dubow 2007; Harrison 2007; 2010; Wylie 2007).

What Dewsbury foregrounds here is the importance of getting embroiled in your research, and how witnessing is about attending to “imperceptible, sometimes minor, and yet gathering, differences” (2003: 1907). Witnessing is not about showing that you are “trying to work through via different means – for example, a video of a performance, or a piece of text, or a particular painting – as if they could encompass in their different style of presentation that which is apparently non-representational” (2003: 1917), the point is what style we take up. Dewsbury’s proposed portfolio of ethnographic exposures seems an excellent example of a particular style of presentation. It is for this reason that throughout the substantive chapters, I develop an assemblage of *exposures*, as a means to exemplify and experiment upon witnessing.⁴¹ While witnessing is not something we are completely in control of, I wager that there are nevertheless particular spaces, events or practices which hold our attention. It is for precisely this reason that I propose the term ‘attentive participation’, signalling a subtle difference to witnessing. What is distinctive about this approach therefore, is that it makes brings attention into focus, an attention to the “push that keeps the world rolling over” (Thrift, 2008a: 113; see Morton, 2005).⁴² Accordingly, presenting this work involves constructing lures for attention (Thrift, 2008a), where attention is a means of “becoming able to add, not subtract” (Stengers, 2008a: 99). To call on Massumi once

⁴¹ Although I explore the notion of exposure in greater detail in the following section, my understanding adheres, to some extent, to Dewsbury’s (2009b) injunctions to: embrace experimentation (rather than fret about the risks), have conviction in your experiments, not fear the judgement that tethers social science to scientific values (such as efficacy and rigour), remember you are producing an understanding of the world because it is not given, concentrate on experience, and to be more acute and cute in the research stories told.

⁴² While acknowledging that ‘paying attention’ has recently been interrogated as part of a critique of the attention economy (Crogan and Kinsley, 2012), the foci of the paper and this chapter are rather different. Crogan and Kinsley call for a response to the commodification of human capacities of attention, whereas I propose that paying attention should be taken more seriously and need not be limited to the human (the situation, the atmosphere, various materials, and more, all participate in generating fluctuating intensities of attending).

more: the “key to an expanded empiricism is additivity. There is always enough room in this world for qualitatively ‘more’” (Massumi, 2002a: 256).

It is not, however, a question of ‘anything goes’. Embracing uncertainty through experimentation and employing an extended notion of the empirical, where encounters might include readings of philosophy, material sites or even research problematics, is part of an “ethos of *stretching* the means by which research is done and *striving* to continue as experiments fail or always come short in the attempt” (Dewsbury, 2009b: 323). Here, research is treated as an ongoing process, where data – or rather *materials* (Whatmore, 2003) – could, and perhaps should, include “the feelings, the codes, the awkward intensities, the architected space, the architecture of time, to name but a few” (Dewsbury, 2009b: 326).

3.2.3. EXPOSURES

To reiterate then, what I propose here is not ethnography so much as a form of co-experimentation. Pivoting off ideas introduced so far, the chapter now turns more specifically to the idea of exposure. Here I look to develop Dewsbury’s (2009b) notion of ethnographic exposure in two ways. Firstly, there are more-or-less developed exposures of various experimental spaces and events throughout the substantive chapters of the thesis. While this plays on the idea of photographic exposures, it does not mean that they are exclusively visual. Rather, they are presented as ways of exposing something of the encounters of field-work. Exposure here is understood as an ‘opening onto’ (see James, 2006).⁴³ It is for this reason that the exposures are akin to the examples that Massumi writes of. The exemplary

⁴³ Ian James’ work is instructive here. Not only does he interrogate Jean-Luc Nancy’s use of the term exposure, but he uses it himself to develop a critical exposition of the philosopher’s oeuvre (see 2006: 9-10).

method that he adopts, following Deleuze, understands an example as neither general, nor particular but singular.

As a writing practice, exemplification activates detail. The success of the example hinges on the details ... At each new detail, the example runs the risk of falling apart ... (Massumi, 2002a: 18)

The exposures then, operate much as an example would do. That is to say, in the singular. An example-exposure is “one singularity among others, which, however, stands for each of them and serves for all” (Agamben, 1993: 9-10). Secondly, deploying exposures facilitates a practice of risky research. The exposures are co-produced (albeit not co-written): they are composed of encounters. These exposures respond then, to calls to attend to the energetics of encounter (Greenhough, 2010; Thrift, 2004a), but they are also put up for re-negotiation. After all, it is not given what a particular exposure may open onto.

These exposures take the form of passages of text throughout the thesis and are predominantly worked up from a series of excerpts from field notebooks. To some extent it is description, but it also tries to animate some of what was taking-place. After all, there is nothing wrong with sticking to description (see Latour, 2005: 136-137).⁴⁴ This does not mean forsaking some sort of critical distance, however. Following Andrew Barry, I take critical distance to be indicative of “a perspective which tries to learn something from what is studied, without at the same time being in awe of it” (Barry, 2001: 21). These exposures therefore provide opportunities to reflect on what is happening at a range of experimental sites. As such, the substantive chapters tend to be as much reflective as argumentative (Mol, 2002).

⁴⁴ Latour goes further than just defending the importance of description, by arguing for the importance of *good* description: “If a description remains in need of an explanation, it means that it is a bad description.” (Latour, 2005: 137).

Understanding an exposure not as some exposé, revelation, or unmasking, but as a risky presentation (often of awkward ‘moments’ in field-work) which may fail to add up, seems to be one way of mobilising Whatmore’s call for risky research. More than this, the exposures chart “multiple vibrations, rhythms, and resonances working at distinct levels and speeds, periodically dampening and amplifying each other” (Connolly, 2011: 173). As such, resonance is particularly crucial here, as new patterns can open feelings, thoughts, or actions that had been unavailable until then. What sets resonance apart then, is that it allows for a specific configuration of the relation between theory and empirical work. This does not follow a logic of demonstration nor of illustration, but rather of charting partial points of convergence and divergence – through these exposures – between theory and the empirical.

3.2.4. FIELD-SITES; ON THE CASE

The exposures are a way to introduce, examine and interrogate a variety of field-sites. Although ‘the field’ has been an important topic for geographers (Dewsbury and Naylor, 2002; Driver, 2000; Massey, 2003a; Powell, 2002), field-sites often go under a different term beyond the discipline: the case (Castree, 2005; Flyvbjerg, 2006). There are important associations between the case, the example and the exposure. Rather than develop one case, this research draws upon a range of empirical engagements with experimental spaces and events, which might be described as a *patchwork ethnography*.⁴⁵ This patchwork eschews comparison in favour of charting resonances between sites, concepts and practices.

⁴⁵ While George Marcus (1995) offers the term ‘multi-site ethnography’, I employ ‘patchwork ethnography’ in order to elide the demands of anthropology, and to suggest that these sites or case-events are not necessarily distinct.

In a recent special issue of *Critical Inquiry*, Lauren Berlant (2007) writes of the many different ways in which the case can be used: an instance of something, a synonym of an argument, a genre, and a limit case.⁴⁶ But she ends this list with the case not “as a form but as an event that takes shape” (2007: 670). The case is understood as a ‘problem-event’.⁴⁷ Following Berlant, the case-studies featured in this thesis are not neatly defined; rather they are closer to case-events, which always exceed a particular space-time.

I introduce each particular site in more detail during the chapters in which they are encountered but I want to outline the sorts of empirical remit here. I spent three months at the Hexagram institute and several related laboratories in Montreal, in particular the Topological Media Lab (TML) and the SenseLab. Both labs are concerned with ‘research-creation’, a term I attend to in the following chapter, and are very conceptually informed. I went to Montreal, in part, because there seemed to be a centre of philosophical activity concerned precisely with experiment and experience. I returned to Montreal to revisit the labs 18 months later, as well as to attend a SenseLab event. I was a guest at the Institut für Raumexperimente [Institute for Spatial Experiments] in Berlin for a semester, and returned on several occasions. The Insitut was much more obviously artistic and had been recently established by Olafur Eliasson to explore the relationship between space and experiment, resonating strongly with my own interests. I was a resident geographer at a transdisciplinary laboratory, FoAM, in Brussels for several weeks. This came about following a suggestion in Montreal; the TML has strong links with FoAM due

⁴⁶ This special issues asks the “question of what makes something a case, and not a merely gestural instance, illustration, or example, [and] to query the adequacy of an object to bear the weight of an explanation worthy of attending to and taking a lesson from” (Berlant, 2007: 666)

⁴⁷ Berlant makes a distinction between the case and the event, arguing that “a case is what an event can become”; whereas, usually, “when an event happens there are no outcomes” (2007: 670).

to previous collaborations under different guises. As part of this engagement with FoAM, I also attended a retreat near Vielsalm. All of the sites were re-visited at various stages during the research and I have had a 'remote engagement' through mailing lists for many of them. I also participated in a number of shorter events within the UK, including a week-long workshop 'Experimenting with Geography', a series of events on 'Experimentality' and on-going conversations with Neal White on his Office of Experiments. Without a doubt, there have been connections and decisions have tended to be confirmed by the way these connections have emerged. In this sense, they are not so much distinct sites as different ways in which the things I am interested in can relate to one another. In other words, I look to mobilise these cases to investigate both a new geography of experiment, and to examine concepts and techniques which can inform and inflect a burgeoning experimental geography.

These sites were not particularly straightforward to become enrolled in and came about in sometimes quite serendipitous ways. For example, it was at a conference at the RGS-IBG in London that I heard Olafur Eliasson speak about the opening of his new institute; I followed up on this by speaking to him and was invited to visit. However, there was a lot of back-and-forth about how this would actually happen; it took close to a year from meeting Eliasson to arriving at the Institut. It was similarly difficult to visit FoAM; there were a number of emails and Skype chats to establish how they might accommodate me. However, the TML and SenseLab were more receptive to my initial inquiries, partly because both labs are accustomed to a changing composition of people.

Participating at these sites involved a range of activities – talking, reading, designing, cooking, walking, thinking – and I embraced the awkward role of not knowing quite what I was attending to. My affirmative stance was quite literal; I always said ‘yes’ to suggestions and became involved in all kinds of projects. As such, I was enrolled into these experimental spaces in a number of ways. Some of my work appeared at an art exhibition in Berlin; an essay I had written was published in a collaborative book; I became part of an editorial board for the SenseLab’s journal, *Inflexions*, where I was also involved in the translation of texts; I represented FoAM at a book launch and produced internal reports of events; I was also involved in copy-editing and invited to provide feedback on a manuscript for the TML. Much of this work, then, was textual, but nevertheless it indicates the ways in which I became part of – if only temporarily – these experimental groups and practices.

Drawing on a case-study is not without risk. As Andrew Barry has eloquently argued, the danger of using a case-study is

that the case simply becomes an illustration of an idea or principle that has been formulated somewhere else – that which we already know, and that which we simply want to make clear – whereas what we would like from a case study is that it something more than an example, that it tells us something that we do not know or creates an effect that is somehow unanticipated. The case should be placed in a setting where it can resist our explanations of it in some ways. There should be some irreducibility to the case. In other words, the case must make a difference. (Barry, 2010a: 89)

Rather than establish a distinction between the case and the example or exposure – which is difficult to maintain, especially as exemplification activates detail and every detail is essential to a case (Massumi, 2002a) – what is more important is the aim: to make a difference.

3.3.SPECULATION AND METHODOLOGY

Rereading a call for papers to a workshop on the 'New Empirics', you notice a reference to a text by David Harvey. There is just the author and date: (Harvey, 1969). You haven't come across this before and so stroll over to the library, hoping to find it there. Explanation in Geography. The copy you pick up is starting to fall apart, probably a good sign, and there are lots of scribbles. You flip through the pages, searching for the conclusion. There, Harvey has written that methodology "may curb speculation, dampen intuition, dull the geographical imagination" (1969: 481).

What I have been trying to suggest is that methodology can be rather different. Indeed, methodology encourages speculation. This chapter has foregrounded the way in which theory and empirical materials are put to work in this thesis. By introducing a minor or modest approach to theorising, the chapter has outlined a series of propositions for thinking theory experimentally. These propositions inform what comprises an expanded empiricism. To quote Massumi once more,

The key to an expanded empiricism is additivity. There is always enough room in this world for qualitatively 'more'. (2002a: 256)

This extended notion of the empirical facilitates an "ethos of *stretching* the means by which research is done and *striving* to continue as experiments fail or always come short in the attempt" (Dewsbury, 2009b: 323). In particular, this has called for the development and cultivation of an attentive participation, which presents a range of exposures. Not quite examples, cases or field-sites, exposures offer a way to detect resonances, and frictions, between theoretical commitments and empirical concerns.

This is an attempt to take seriously notions of co-fabrication and risk, and consequently involves attending to the energetics of on-going encounters with the world (Thrift, 2004a). If research is indeed co-fabricated, then it “cannot conform to pre-existing theories, convictions or ways of being” (Greenhough, 2010: 49). Take everything as it comes, as Massumi would say. This demands a re-thinking of analysis: a move from reducing things to their simplest form towards embracing process and its remainder, its excess. It also enables a change of attention: research outcomes might then be less about what we have found or extracted, and more about what we have done and are doing and the excitement or otherwise of it. To be sure, attempts at the articulation of these exposures is more important than their success; indeed, the very attempt *to articulate* is part of a project which takes materials seriously, allowing them to work-with, and against, initial research questions. As Woodward *et al.* (2010) note,

... *research is experimentation*, an ongoing process whose results are never a matter of stable states, but rather commentaries on relationality, affects and conditions of dynamic relation. (Woodward *et al.*, 2010: 276, my emphasis)

4

GENERATING SPACES FOR RESEARCH-CREATION

[N]otions of creativity ... have in actuality been undercooked within non-representational geographies. (Wylie, 2010: 101)

In this chapter I want to take up John Wylie's suggestion that notions of creativity have been, to use his term, 'undercooked'. The chapter explores the idea of creativity, as it relates to non-representational research in a context that is directly associated with non-representational theories. Taking this suggestion is not to create an artificial situation in which to explore non-representational theories, but an opportunity to explore how some of the people who are very influential on non-representational theory are doing 'creativity'. To be sure, there are some sites where the very ideas that geographers are interested in are being 'cooked'. Drawing on field research at a site which has influenced geography, this chapter pays attention to a particular space of experimentation that is part of an unwritten geography of geographical ideas. In other words, this chapter is an examination of a site, the SenseLab, that has produced ideas which have helped to shape non-representational theory. Indeed, Brian Massumi, a co-instigator of a series of

SenseLab events, has had a considerable influence on geography, and been widely cited by those engaged in working up non-representational theories. Further, it is a site where I can explore some of the ways in which these ideas might work in practice. By attending to the SenseLab, how might we then get a better sense of what it means to foreground the creative part of research? What does this mean for understanding creativity in geography, or the creative element of non-representational research?

The chapter is arranged around three questions. Firstly, what role do certain theories or concepts play in allowing us to understand research as creative? This section considers how particular sets of ideas have contributed to refiguring research, or thinking, as creative activities. As such, I examine various theorisations of creativity and propose that we attend to the notion of ‘research-creation’ as “a particular mode of inquiry that deals with creative practices and their relation to research” (Brunner, 2011: 33). Secondly, how does research-creation find a home in an institutional context? More specifically, I examine how research-creation has been developed as a mode of research and a funding category in the social sciences in Canada. This is important as it serves to make more tangible how particular ideas circulate and are taken up, and echoes the exploration of attempts to institutionalise creativity (Born, 1995). Thirdly, what specific micro-practices are involved in research-creation? Part of what I do in this chapter is show how difficult it is to disentangle the theory or philosophy of experimenting from the practice of experimenting. The chapter draws upon my on-going engagements with the SenseLab, precisely because it tries to experiment with ideas that geographers have

become really interested in, and allows for the examination of a relation-specific context for research-creation.

More broadly, the chapter offers an opportunity to explore questions of engagement in fieldwork. Typically, ethnographers study practices or communities who are themselves unfamiliar with the work of ethnographers or their theoretical concerns. How then do you do research at a site, like the SenseLab, where those who participate are more well-versed with the theories that you are trying to use to think about what they are doing? What does that do for your relationship with theory, and with the site you are investigating?

4.1. RESEARCH AND CREATION

It's about putting art and philosophy, or theory and practice, on the same creative plane, in the same ripple pool. (Massumi, 2011: 83)

The notion that research is 'creative' is increasingly pervasive. Take the proliferation of conference sessions exploring the use of creative practice as geographical research methods. Take the more-or-less formal collaborations of scholars working alongside artists and other creative practitioners (Barry and Kimbell, 2005; Foster and Lorimer, 2007). Take the development of 'practice-led' research courses. These examples are suggestive of both an interest in thinking and doing creatively. Importantly though, there has been little attention paid to what 'creativity' is within geography, and whether or not the notion of creativity dispenses with critique.

4.1.1. CREATIVITY

We live, it seems, in a veritable age of creativity. (Osborne, 2003: 507)

As Osborne (2003) notes, we live in an age where the aspiration to be creative is more or less compulsory in an ever-increasing number of areas of life: “managers, media workers, designers, futurologists, public relations practitioners, psychologists, consultants, marketing gurus, educationalists, ‘thinkers of the unthinkable’, doyens of ‘promotional culture’, sensationalist artists and postmodern philosophers” (2003: 507-508). Put simply, there is a widespread agenda for creativity yet this is accompanied by a reticence to interrogate what this entails.

Creativity is a value which,

though we may believe we choose it ourselves, may in fact make us complicit with what today might be seen as the most conservative of norms: compulsory individualism, compulsory ‘innovation’, compulsory performativity and productiveness, the compulsory valorization of the putatively new. (2003: 508)

Osborne’s lucid critique of creativity draws attention to the rise of the ‘creative economy’, which has been due to the growth of putatively ‘creative’ industries, such as design, fashion, software production, video games, marketing, advertising, pop music, the performing arts, publishing, the arts market and research and design (R&D). He also notes the kinds of expertise – psychological and managerial – which have been important in establishing what he describes as a ‘doctrine’ of creativity. Indeed, it is in economic life that the ‘creativity explosion’ has witnessed its most recent and marked manifestation (Osborne, 2003; Thrift, 2002). Turning to business culture, Osborne notes that it is the value of creativity which is given priority. As such, creativity cannot afford to be “something that you just hope to encounter” but instead is what you “can manage so as to produce creativity” (2003: 509). For instance, a recent study found that many CEOs believe that,

the key to navigating today's volatile, uncertain and increasingly complex business environment is creativity. The ability to instil creativity throughout an organisation was rated as more crucial than rigor, management, discipline, integrity or even vision as a means to future success. (Carayol and Carty, 2012: np)

However, it is not just the creative industries which have taken to celebrating creativity; the term has accrued a certain prestige in intellectual, academic and cultural life. Nor is interest surrounding creativity evident only in the social sciences: the term has been transformed from an academic concept into a compelling brand (Currah, 2009).

Non-representational styles of thinking and working within geography are distinctive precisely because they have attempted to understand research as creative in theoretically sophisticated ways. Indeed, Nigel Thrift describes non-representational geographies as attempts to "re-gather the ethic of craftsmanship, a means of composition" (2008a: 15). In the same chapter, an introduction to his book *Non-representational theory*, he outlines a number of 'tenets' which cut across the text. One of these is the claim that "non-representational theory is *experimental*" (2008a: 12, my emphasis). This experimental tendency is to be cultivated, he suggests, by drawing on the arts and specifically the performing arts.

Briefly put, Thrift's argument is as follows. Firstly, the arts can have as much rigour as any other experimental set-up. Secondly, they can offer unconventional means for tracing something of the world. Thirdly, they may help to encourage wonder, as well as explanation. Fourthly, and following on from this, the arts allow us to re-consider techniques in the social sciences. In other words, it is a call for the expansion of what is considered to be research, both in terms of the practices and the outputs. Moreover, it suggests that accounts in the social science and geography could benefit from embracing creative practices. Rather than suggesting that

geography has not been creative until now, Thrift instead highlights how geographers might think through and/or employ aspects of the arts to re-consider their own research practices. Certainly, non-representational approaches involve “an ethos of the affective, the emergent and the experimental, in which a certain premium is placed upon ‘creativity’” (Wylie, 2010: 101). John Wylie suggests, however, that whilst non-representational theories tend to be associated with conceptual and methodological experimentation, they have actually had relatively little to say about creativity. As he puts it:

the critical/political nature of non-representational theories is a given, whereas the potential for those theories and agenda to inform senses of ‘creativity’ in geographical practice still awaits, I think, a more specific consideration, even after Thrift’s (2008) reassertion of the centrality here of notions of experimentation. (Wylie, 2010: 101).

However, creativity is not about dispensing with critique. Indeed, as Wylie notes, claims for ‘creative geographies’ would need to come hedged with disclaimers “pointing to the criticality of so much contemporary artistic practice/commentary, including that by geographers themselves” (Wylie, 2010: 100). Therefore, some of the habits of thinking that inform critique, or the critical, might be very useful. Brian Massumi (2002a) insists that it is a question of ‘dosage’. For him, it is a strategic question: foster or debunk, and is “a question of timing and proportion” (2002a: 13). There are times when critique is needed, but these techniques should be used sparingly. Crucially, it is not about the replacement of one set of ideas (critique) with another set (creativity), or one ecology of practices for another. Perhaps we might imagine with Latour (2004b): “What would critique do if it could be associated with more, not with less, with multiplication, not subtraction?” (2004b: 248).

How might we operationalise this mode of critique to rethink the very notion of creativity? As we have already seen, the concept of ‘creativity’ has been extensively devalued; the “staking of claims regarding creativity and innovation in research processes and outputs has become almost mandatory” (Wylie, 2010: 101). It is not only an aspiration but an imperative, contends Osborne (2003); after all, “who could imaginably be *against* creativity?” (2003: 508, original emphasis). Osborne insists that to better assess the ‘creativity explosion’ requires the help of various exemplars; these exemplars are not anti-creativity but have a distinctive take on the term. As such, I want to examine, as he does, Deleuze’s efforts in thinking creativity.⁴⁸ However, this reading differs somewhat. While Osborne presents a generous engagement with Deleuze, there are two issues. The first is his claim that creativity for Deleuze remains, above all, a heroic affair. The second is his consequent dismissal of creativity. Firstly, Deleuze points to quite the opposite: creativity, for him, is to be thought of in terms of a “differentiating, impersonal, inventive power” (2003: 508). This counters the doctrine of creativity found in much contemporary psychology (though by no means all), which contends that creative individuals are

not those who simply innovate within accepted conditions, but those who can change the domain in which they work, that is, those who can change the conditions themselves. (Osborne, 2003: 508)

This notion of the genius or great thinker remains associated with creativity in conventional use. Indeed, creativity is still often seen to arise from the capacity of the individual human mind to come up with new ideas which could then be

⁴⁸ Osborne turns to Deleuze as he “is the great symptom and even ideologue of the creative turn but he is also its best diagnostician and – at times scathing – critic” (2003: 510). His other exemplars are F.R. Leavis, and Paul Cézanne.

implemented in the real world. However, Deleuze problematises this individual genius, positing that creativity is an impersonal and distributed process abroad in and immanent to the world.

Secondly, despite stating that Deleuze offers a reading of creativity that understands it as an impersonal power, Osborne suggests that to better escape the “romanticist and subjectivist associations that tend to go with the term (the concept as well as the word)” (2003: 520), we jettison creativity completely. In line with the aims of the thesis of reclaiming experiment, I favour a recuperation of the term. This recuperation, I want to suggest, may be helped along by reassembling the concept. This might involve turning to Alfred North Whitehead.

Perhaps the most surprising element of Whitehead’s deployment of the word ‘creativity’ is that he coined this very term. This bears repeating. Prior to his use of ‘creativity’ ... this word was not extant in the English language ... ‘Creativity’ is a term of Whitehead’s own devising. (Halewood, 2011: 35)

That Whitehead coined the term creativity (Halewood, 2011; Meyer, 2005; Shaviro, 2009) is another reminder of the importance of his work. For Whitehead, the term best expressed the mode, character and ubiquity of the role of novelty within existence (Whitehead, 1978: 21). The almost immediate uptake of the word, as Michael Halewood notes, masks both “the ‘originality’ of Whitehead’s intention in coining this word and the specificity of his rendering of the concept” (2011: 35).⁴⁹

Accordingly, Halewood invites us to reconsider,

the ugliness of the word ‘creativity’. It is a noun developed by adding a rather clunky ‘ivity’ to the stem of the word of the verb ‘to create’. It is akin, perhaps, to insisting nowadays on the need for the term ‘inventivity’ to distinguish it from that of

⁴⁹ “These concepts [creativity, novelty, innovation] (or at least these words) are so familiar today – familiar, perhaps, to the point of nausea – that it is difficult to grasp how radical a rupture they mark in the history of Western thought” (Shaviro, 2009: 71). Shaviro’s point is that the very valorization of change and novelty is itself relatively novel.

‘inventiveness’ in order to pinpoint a specific aspect of the inventive process which the latter term does not capture. (Halewood, 2011: 35)

In similar ways to Deleuze, and Osborne, Whitehead’s creativity is not necessarily a ‘good’ thing, nor is creation something that should be unquestionably celebrated. Although Whitehead’s texts “contain a certain degree of affirmation of creativity, this does not entail a conceptual benediction of all that is created” (2011: 36). Whitehead’s insistence that creativity is not a process only accomplished by humans, but an integral aspect of becoming, is of particular importance. Creativity, then, is not “some kind of free-floating spirit or energy to be tapped into by blessed or gifted individuals” (2011: 37-38).

4.1.2. RESEARCH-CREATION

In the Latourian (2004b) spirit of multiplication, and to reprise the suggestion of recuperation and reassembly, I turn now to the relatively recently developed notion of ‘research-creation’ which is becoming increasingly prevalent, particularly in Canada. This is worth dwelling upon in this chapter as it allows for an exploration of the intersection of creative practices and their relation to research. As research-creation foregrounds creative practices, it offers an opportunity to re-consider not only how research might be understood as creative, but also what this entails. Moreover, attending to the SenseLab, a laboratory for ‘thought-in-motion’, and how those there have attempted to think and practise research as creative animates some of the philosophical points that Whitehead and Deleuze raise.

Deleuze’s work on the ‘creative act’ is a key point of departure for the SenseLab. Treating philosophy, or geography, as the power to ‘think about’ something seems to be a compliment, but for Deleuze it takes everything away. For him, philosophy is

“just as inventive, just as creative as any other discipline, and it consists in creating or inventing concepts” (2007: 313). Different activities create different ‘blocks’. These might be, for example, blocks of concepts (philosophy), blocks of movement/duration (cinema), blocks of line/colour (painting), or blocks of functions (sciences). Philosophy is the “art of inventing concepts themselves, creating the new concepts we need to think our world and our life” (2007: 330). Following Deleuze then, the SenseLab proposes that research is the creation of particular blocks. What makes the SenseLab’s approach to this of particular interest is that they extrapolate from Deleuze’s notion of philosophy as the generation of new concepts. The corollary to the idea that philosophy is potentially productive creatively is

the notion that creative production is ‘proto-philosophical’. Any practice of producing the new is a ‘thinking-in-action’ of what cannot yet be fully expressed conceptually as it has not yet fully emerged. (Massumi and Manning, 2008: 3).

Therefore, for the SenseLab, research holds pragmatic potential because its creation of concepts can foreshadow new practices. Likewise, pragmatic experimentation is a form of incipient philosophising, concretising thoughts yet to come. Put perhaps too simply: making is a form of thinking-in-action, and thinking is a creative practice in its own right. The simple hyphen, or dash, between research and creation, might leave one wondering how to “move from one to the other, from the pedestrian rigor of research to the dramatic gesture of creation?” (Thain, 2008: 2). What the SenseLab suggests, as Brian Massumi (2011) elucidates, is to put theory and practice on the same creative plane. And yet, if all research is already creative – that is to say, if creativity is already guaranteed – then why is there a need for research-creation? I consider this question by addressing the institutional context.

4.2. INSTITUTIONAL CONTEXT

Research/creation: Any research activity or approach to research that forms an essential part of a creative process or artistic discipline and that directly fosters the creation of literary/artistic works. The research must address clear research questions, offer theoretical contextualization within the relevant field or fields of literary/artistic inquiry, and present a well-considered methodological approach. Both the research and the resulting literary/artistic works must meet peer standards of excellence and be suitable for publication, public performance or viewing. (<http://www.sshrc-crsh.gc.ca>)

In 2003, a new funding category entitled ‘research-creation’ was introduced in Canada to encourage hybrid forms of activity promising to capture, for research, the creative energies of artists working within the academic institution. The turn toward the institutionalisation of research-creation has been framed in interdisciplinary academic terms, to ‘bridge’ the gap between creative and interpretive disciplines, and to link the humanities more closely with the arts communities. There has been a clear emphasis on the role arts can and do play in the wider cultural field, and a recognition of “the potentially transformative nature of research undertaken by artist-researchers” (<http://www.sshrc-crsh.gc.ca>). As Manning and Massumi (2010) note, this move towards institutionalising research-creation is implicated in a “larger context where the dominant tendencies are toward capitalizing creative activity” (2010: 2).

The term research-creation has become increasingly prevalent in Canada, and particularly within Quebec, over the past decade or so, much as practice-led research has in the UK. In ‘scoping’ and evaluative documents it has been implicitly conceptualized as a *combination* of creative- and academic-practice. The term’s history is brief: research-creation is often traced back to a series of investigations in the 1990s, which recognized a number of problems faced by so-called ‘artist-researchers’ in Quebec. These artist-researchers were neither eligible for the

traditional funding provided for artists (which was oriented towards independent creators), nor most of the traditional funding for university researchers (which did not expect to have a creative output in the artistic sense) (see Archambault *et al.*, 2007). The 'Social Sciences and Humanities Research Council of Canada' (SSHRC) held a conference on the future of the humanities in Canada in 2000, and established a working group, the 'Sub-Committee on the Creative and Fine Arts', the following year. Shortly afterwards, the funding body approved the development of a new initiative to support artist-researchers and a pilot program was created, which began in 2003.

SSHRC's 'Research/Creation Grants in Fine Arts Program' was inspired, in part, by the development of another research-creation grant program in Quebec by the 'Fonds québécois de la recherche sur la société et la culture' [Quebec Research Fund for Society and Culture] (FQRSC). The FQRSC was designed to support artist-researchers in Canada in the higher education sector whose work includes creative art practice as a component of their scholarly research (Picard-Aitken and Bertrand, 2008). In terms of figures, SSHRC's pilot programme is notable in several ways. In total, \$13.4 million has been invested in research-creation projects, although with an award value of up to \$250,000 per project this outlay can appear modest. Nearly 100 individuals were funded during the pilot stage, for three years at a time. Aside from initiatives by the FQRSC, there has not been anything similar in Canada for researchers pursuing this kind of work.

Despite the paucity of specific programs that support research-creation, the difficulties experienced by artist-researchers in Canada are not unique. For example, in the UK, the 'Arts and Humanities Research Council' (AHRC) replaced the

'Small Grants in the Creative and Performing Arts Scheme' with the 'Research Grants: Practice-led and applied route' in 2006, which has in turn been discontinued. In this particular 'route', research had to include practice as an integral component and/or have an application beyond the higher education sector (see <http://www.ahrc.ac.uk>).

The evaluative reports note two important difficulties with research-creation initiatives, namely the term itself, and the outputs. As the reports make clear, there is a certain amount of confusion due to the term 'research-creation'. There is no consensus on which terms should be used to refer to research-creation activities. Indeed 'practice-led research', 'practice as research', 'research on/for/in/through the arts' and 'art-based research' are all, more or less, corresponding terms in these funding documents and reports. The second problem, output, has been due to the emphasis in the social sciences on publishing in journal articles and monographs. This is not nearly as prominent in artistic fields, where outputs take a much wider variety of forms (including performance, sculpture, painting, and multimedia presentations). Therefore, research-creation might be described as sharing many characteristics of research in the social sciences and humanities, but is in some ways distinct from these fields. The SSHRC 'Review and Conceptualization of Impacts of Research/Creation in the Fine Arts' final report notes that "as it is a practice-based discipline; the processes, outputs and knowledge mobilization of this type of research are ... not as firmly defined as those for strictly academic research" (Picard-Aitken and Bertrand, 2008: 3).

Research-creation has not only manifested itself through research council funding opportunities for projects, but also spaces for research-creation. For example, the

'Hexagram Institute for Research/Creation in Media Arts and Technology' describes itself as "the largest arts and design based new media lab in Canada" and "a pole for interdisciplinary research" (<http://finearts.concordia.ca/>). Hexagram was established around the same period as SSHRC's pilot program, in 2001, and provides a range of labs and equipment in an attempt to forge a collaborative environment for interdisciplinary work, with particular emphasis on new media art, design, and various interactive technologies. As originally instituted, Hexagram took the form of a public-private partnership with an explicit orientation toward tie-ins between university-based art practitioners and the culture industries as they were undergoing rapid digitization.

Although there is little in the way of documentation, Hexagram was initially created to provide resources for researchers located at two of the universities in Montreal: 'Concordia University' and 'Université du Québec à Montréal' (UQÀM). This has recently changed and the two research centres now operate autonomously as 'Hexagram-Concordia' and 'Hexagram-UQAM' (Proulx, pers. comm.). Hexagram-Concordia supports a number of 'laboratories' (see Fig. 1). As already examined in an earlier chapter, although the term 'laboratory' is more common in the sciences, within Hexagram "it has been embraced by researcher-creators in a university context to indicate an emphasis on experimentation, collaboration and interdisciplinarity, leading to new processes, creative communities and innovative works or prototypes" (<http://finearts.concordia.ca/>).

Hexagram-Concordia has two parallel thrusts. The first is to accommodate a *critical mass* of researchers who work on expressive and experimental new media and research-creation projects. This is funded by provincial and federal university

funding agencies, arts funding agencies, foundations, and other, unspecified sources. The second is to help *some* researchers develop processes, applications or products for transfer to industry. This is usually funded by the 'Ministère de Développement économique, Innovation et Exportation' (MDEIE) – the Quebec ministry for economic development, innovation and export – and by private industry. Therefore, alongside the aim of providing for researchers working on expressive and experimental new media research and research-creation projects, Hexagram is also concerned with researchers developing processes, applications and/or products transferable to industry. It is telling that research – and hence funding – is focused in areas where Quebec is emerging as a so-called world leader; these include responsive textiles, content and technologies for interactive performance and environments, and innovative approaches in interactive game design. Interdisciplinarity is encouraged, or rather justified, through the opportunities it offers to Montreal of assuring its reputation as a 'creative city'.⁵⁰ This orientation was further emphasized in Hexagram's move in 2005, to a newly commissioned building called the 'Integrated Engineering, Computer Science and Visual Arts Complex', now known more simply, as the 'EV Building'. Projects involving digital media have begun to take funding priority over traditional forms, as the artistic outputs are potentially patentable. There is then, a tension between the spaces provided for research-creation, along with the funding for these kinds of projects, and the way in which research-creation has been geared towards capitalising on the new. This is part of a broader question of the value of these experiments, and is something I return to both in the conclusion, and in the last chapter of the thesis.

⁵⁰ See <http://ville.montreal.qc.ca> for details of 'Creative Montreal'.

Laboratory	Description
aLab	Robotic art
d_verse lab	The d_verse laboratory reflects the poetic nature of and diverse strategies for collaborative research and creation
Institute of Everyday Life	The institute of everyday life (iel) is an art-ideas studio/lab which looks at the everyday as a site to generate, create and present artworks.
Interactive Multimedia Playroom	The IMP is a space in which groups of people can explore the relationships between – and their responses to – a variety of differing multimedia elements
Interstices	Interstices is a media arts research-creation group
matralab	matralab is a research space of inter-x art at Concordia University, Montréal
Obx Labs	Obx Labs is interested in living letterforms, massively multi-contributor texts and time-travelling provocateurs
Possible Movements Lab	The Possible Movements Lab focuses on experimental documentary and the questions it provokes
SenseLab	The SenseLab is a laboratory for thought in motion
xmodal	Studio-lab dedicated to the research, development, and creation of performative environments
Studio subTela	Developing intelligent cloth structures for the creation of artistic, performative and functional textiles
TAG	The Technoculture, Art and Games research group
Topological Media Lab	The Topological Media Lab provides a locus for studying subjectivation, agency and materiality from phenomenological, social and computational perspectives
XS Labs	XS Labs [Extra Soft] is a design research studio with a focus on innovation in the fields of electronic textiles and reactive garments

Figure 1: Laboratories at Hexagram-Concordia



Figure 2: The 'EV' Building, Concordia University

4.3.SENSELAB

The point we are trying to emphasize is not that research-creation in itself is a 'new' practice, but that we can take this politico-economic juncture as a starting point to redefine how research and creation practice modalities of intertwinement that give us new ways of conceiving both creative practice and research. (Manning and Massumi, 2010: 42n.17)

Established in 2004 by the philosopher Erin Manning, and later joined by Brian Massumi and members of his Workshop in Radical Empiricism, the SenseLab set about interrogating and re-working the notion of research-creation that had been presented to them by the funding bodies. Those at the SenseLab were not interested in simply taking a critical stance, as if as university-based researchers/artists they stood outside the situation and did not themselves participate in the new economy

(Manning and Massumi, 2010: 4). Instead, they hoped to practise an ‘immanent’ critique, which would engage with new processes more than new products.⁵¹ This style of working seeks to ‘energize’ new modes of activity that “seem to offer a potential to escape or overspill readymade channelings into the dominant value system” (2010: 4).

The SenseLab’s hunch then, is that the category of research-creation was implemented without a strong idea of how creative practice and theoretical research relate, or to use their term, ‘interpenetrate’. Fearing that the term could become no more than an ‘institutional operator’ – a “mechanism for existing practices to interface with the neoliberalisation of art and academics” – the SenseLab explores the modes of activity where the creative and research come together.

Key questions such as how the process of art alters what we might understand as research, or how art creates concepts, are backgrounded as institutionally-driven issues take the fore, such as by what standards research-creation might be accredited. (Manning and Massumi, 2010: 5)

The sense that research-creation was troubled, and troubling, became an opportunity to ‘start over’. Research-creation for Manning and Massumi offered a way of thinking at the

constitutive level of both art practice and theoretical research, at a point before research and creation diverge into the institutional structures which capture and contain their productivity and judge them by conventional criteria for added-value. At that pre-bifurcation level, making would already be a thinking-in-action, and conceptualization a practice in its own right. (Manning and Massumi, 2010: 5)

⁵¹ The disdain for ‘product’ is not at all new; nor is it my aim to make this case. However, that the SenseLab are focusing on process is important for thinking about how notions of creativity are not only theorised but practised. As I go on to note, foregrounding process offers the chance to exceed or escape (economic) valuation.

As part of this immanent critique, the SenseLab – once based in a more obviously ‘creative’ part of Montreal – is located in a small, sparse room on the top floors of the EV building, along with other Hexagram-Concordia laboratories. From the outside it looks nothing like a scientific laboratory (see Fig. 3). Inside, there is a wooden table, a few comfortable sofas and a collection of chairs arranged in one corner. There is just one window and it looks out onto another concrete construction; books are arranged on the window sill. The room only seldom seems to show signs of life, much of the time it is quiet and dark; the door is locked. When the monthly reading group or the special speaker series exploring work in progress (‘Bodies-Bits’) takes place, the lights come on, and people show up. Membership is based on elective affinities and so anyone who considers him or herself a member can attend. Each time there is a different combination, faces new and old. In other words, by dedicating itself to a practice of the event, the SenseLab avoids defining itself as a formal organisational structure (see Manning and Massumi, 2010: 6).⁵² It is a flexible ‘meeting ground’, with a form which arises as a function of its projects.⁵³ Furthermore, the ‘lab’ offers a thinking-space which is at once a “processual movement of thought and a privileged site at which this movement is amplified and inflected by novel configurations of ideas, things and bodies” (McCormack, 2008: 2).

⁵² Of course, even as it tries to avoid structure by explaining that it has none, the SenseLab nevertheless demonstrates a form of organisation.

⁵³ This claim is open to criticism, however. Indeed, conversations with those based elsewhere in Canada suggest that the SenseLab is viewed as a kind of elite space of knowledge production. As such, it is not entirely clear who this flexible meeting ground is open to.



Figure 3: Looking into the SenseLab in 2011

Importantly, the SenseLab's re-imagining of the notion of research-creation has been performed both theoretically and pragmatically. Theoretically, in terms of re-thinking what research-creation could do, and pragmatically, exploring how to create research-creation events. The SenseLab has organised a series of such events, in part set in motion by a challenge arising from discussions with the philosopher Isabelle Stengers, who had been invited to talk in Montreal. Stengers made clear that a criterion for her participation was for the academic event to be an *event*, for it to be a collective thinking process. The SenseLab's aim became to create an event that could foster a 'movement of thought', instead of providing a platform for the presentation of findings or conclusions. A movement of thought is not the movement from research to creation, or vice versa, but rather understood as a question of "what it means to sense the mobility of thought itself" (Thain, 2008: 2-3).

The first event, 'Dancing the Virtual', took place during the summer of 2005, part of a series called 'Technologies of Lived Abstraction'.⁵⁴ As was made clear in the call for participants, rather than a call for papers or abstracts, 'Dancing the Virtual', hoped to "instantiate new platforms of experimentation" (Manning, 2006: np). To succeed in encouraging academics to get out of their chairs and move, as much as get those unaccustomed to reading to engage with difficult texts, required attention to the design of the event, the 'techniques' for the event. It is this preparation and co-creation of *techniques* which have emerged as important facets in conditioning these events and spaces.

The SenseLab draws on the philosopher Gilbert Simondon's notion of technique as a tool for 're-composition' (see Manning, 2009b). Techniques are singular engagements which help to compose an event as they are recomposed by the event itself. Indeed, techniques are themselves always modifiable and re-composable. Techniques would provide opportunities for participation that could take on their own shape, direction and movement. A technique is at once processual and immanent. It is processual in that it includes the notion of the conditions through which a work or a practice comes to definite technical expression. Technique reinvents itself in the difference and repetition of a practice. It is immanent in that it can only work itself out, following the momentum of its own process. Therefore, what becomes key are the initial conditions for unfolding. There is a subtle shift in emphasis, from a structuring to a 'conditioning' of the event. The techniques would need to be both structured and improvised: tailored to the singularity of the event, and taking the desires and expertises of the event's particular participants into

⁵⁴ The series of events has been composed of: Dancing the Virtual (2005), Housing the Body, Dressing the Environment (2007), Into the Fold (2008), Society of Molecules (2009), and Generating the Impossible (2011).

account. Further, there would need to be techniques to set in place initial conditions, as well as techniques to modulate the event. These techniques provided generative or enabling constraints.

4.4.INTERLUDE: TANGENT

Diving into the fourth event, the 'Society of Molecules, in which I participated might help to give a sense, or form, to these techniques. More specifically, I want to trace how the generation of geographical techniques might facilitate a movement of thought.

We haven't put a sign up, or a thumb out. But there, on the slip-road, is a car, waiting for us. We exchange looks of surprise, then dash over. Where to? Southampton. A couple of lines, meeting another. Others forming. Could we come along too? What are you doing? We're not sure. But we're part of a molecule. And you are too. We're interested in maps. Me too. A map person, in fact. On the move, conversation unfolds. A life-story; a life-line? Therapeutic. For us or them? For both? Could this be a small act of repair? We don't know. But it just might be.



Figure 4: Hitching a ride

We're hoping to generate encounters. Different ways of meeting people, engaging with them, 'doing' research. We leave a postcard. Please draw some lines. Perhaps your journey, or journeys. It's up to you. We've put an address and there's a stamp on it too.

How about crossing the Channel, she suggests. Why not? These boys are on an adventure, she tells the security officer. But he's not having any of it. We're turned away, the line twists. We say thank you, thank you. She was lovely. What a start! We look for signs to the train station. We're following her advice. Let's see if we can get on a boat. France? Spain?! There are delays. We look up at the sign – Chichester is one of the stops. Surprised but not surprised. The train is slow and it doesn't feel right. We're not hitching. We read from Guattari's Chaosmosis. Page 100. Can we get a student rate? We're happy to work. No thanks. Please? Sorry. Are you sure? Sorry. We hit a

blank. Perhaps we're not going to get across the water. Scratch-card fails. Enthusiasm drops. We leave a few lines in an email. We sign out and move on.

Yellow chalk. On the floor, walls, pockets, hands. Traces of our trajectories. We draw a u-turn. There are more to come. We look for places to stop and hitch. We look at the roads differently. We end up in the town-centre. We turn around. The signs aren't working. Nobody is stopping. A few waves. Some thumbs up. Several cars hurl abuse in our direction. We pack away the signs. The adventure was fun, but now let's head back. We keep our thumbs out. Another five minutes? Ok.



Figure 5: Anywhere/everywhere

A BMW pulls over. I've always wanted to pick up hitchhikers. And you two look pretty normal! Where are you going? Plymouth. Could we please join you? Of course. More stories. Tales of happiness, woe, madness. Schizo-affective, he says. Is that a word?

Could be. And refrains. Resonances. Speed and slowness. Well, mainly speed. And swearing.

Early start, again. This time, with an objective. Head home. Big breakfast. More Guattari. Can't remember the page number. He suggests moving onwards; we concur. We walk to Texaco, near the A38. It's a good location we were told. Time passes slowly. Arms ache, thumbs are tense. We keep a certain distance between us. Maybe five metres, more or less. We take it in turns to take a quick rest. We stretch our arms, move them in different directions. Gestures, gestural lines. A hitch-hikers' dance.

A car brakes, the driver waves his arm at us. We run over. The window is wide-open. Where are you going? We get in. He's looking for some labourers. We're flattered but sorry. No thanks. We struggle for conversation but leave a postcard all the same. Fingers crossed. He suggests we stop at some services. Ok, sounds like a plan. They're not services though. It's another petrol station in the middle of nowhere. He drives off. We get the thumbs out.



Figure 6: Society of Molecules (SoM)

The traffic is going very fast. Can they see us? We cannot stand too close to the road. The noise washes over us. The rhythm of the traffic, the wind as they speed past. Fewer waves. Even fewer thumbs up. Several cars pull over. They need petrol, not hitchhikers. Time slows. We draw some lines during the interludes. They are squiggles. Some split, others turn on themselves.

We walk over to the station. It's a Shell garage. Just loitering. What are you chaps up to? Hitch-hiking. Are you students? Yes, we answer, cards at the ready. I'll give you a lift, he offers. Where to, did he say? He's disappeared into the shop. He's going to Thailand, he tells us. He's got a yacht there. Charts, maps, lines. Is this an act of repair, or destruction? We don't agree with all he says. We say so. Gently. We're thankful for the lift.

We take a break and buy over-priced food. One board is blank. We scribble Oxford on it. Maybe it'll help. The road outside the services is quiet but it looks like a perfect place to hitch. Nobody stops though. Some cars go round the roundabout two, three times. We laugh and wave them over. We're ignored. We trudge on. The last miles are the hardest. Perhaps. We try closer to the road itself. It's a perilous walk. Single-file: sharp drop one side and fast cars the other. Nobody stops. We walk on. Try the back-roads. We're in Chieveley. Maybe this road is parallel to the A34. It's called Oxford Road after all.

Cars race down the country lane. The Oxford sign falls from its clip on a bag. We carry it instead. Thumbs out when a car passes in the right direction. We sing. We chat. Only 20 miles left or so. A car flies by. We walk some more. A car flies past. Slows down. And stops. He's hitch-hiked all over Australia. He's interested in the project. Talk of how he monitors his fleet of lorries through mapping mobile phones. More maps. More lines. As he talks, he drives further than he expected. A bit further. Not here, it's not good for hitching. Next junction. Oh, maybe over to Wilton. And so, we leave another post-card and get out.

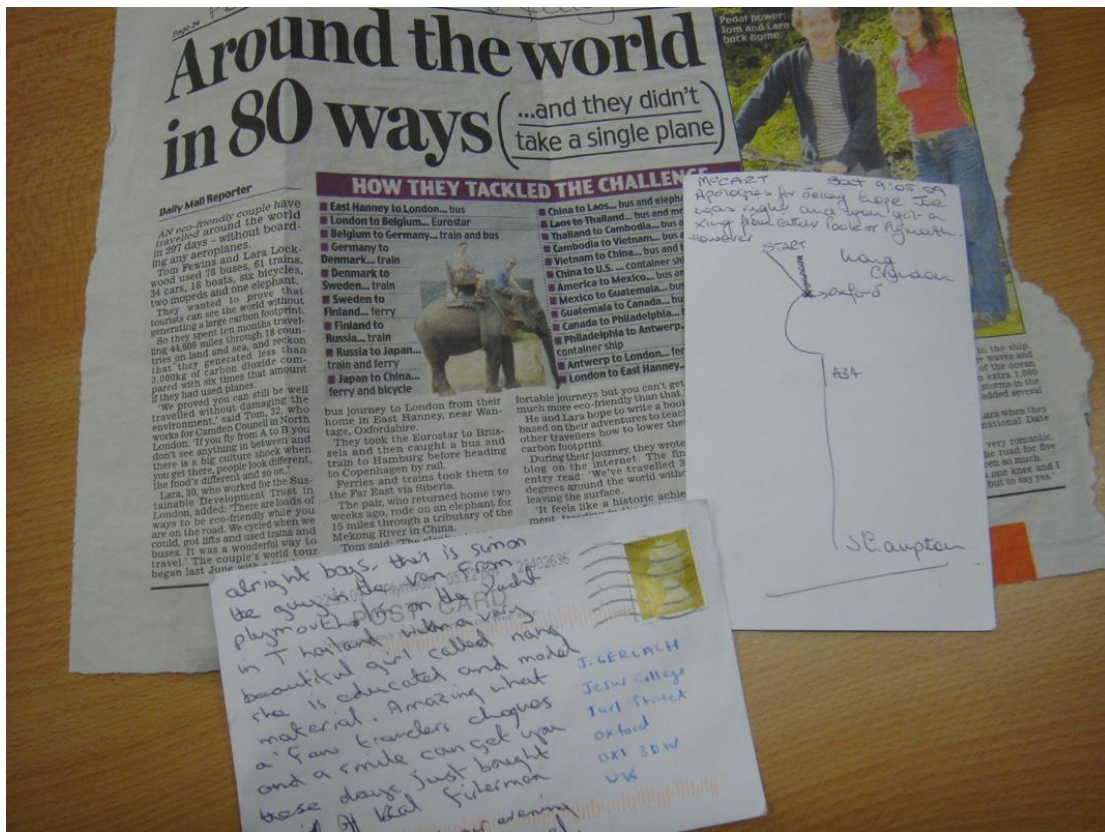


Figure 7: After the event?

We spot the towers of Didcot against the skyline. We head in that direction. A lone glove lays on the floor, on a new pavement. We draw some lines. Scribble SoM for good measure. Yellow chalk on our hands. We try our luck again, thumbs out. Hunting for something (anything) in the bag. We move on, forced onto the road by a hedge-cutter. Fencing, housing, car parks. Didcot Station. Train home.

We crouch down, resting. Happy but tired. Exhausted, in fact. The journey is quick, the miles are eaten up. We talk of those we met. We wonder where they are. What will they draw for us? We get on the X3: Redbridge Park and Ride please. Full-circle now. Lines still on the floor. A point of departure.

The experiential-experimental milieu for the attempts to rethink and reclaim hitchhiking as a fieldwork technology work its way, then, from the 'Society of

Molecules'. As such, I became enrolled in the SenseLab's experiments well before visiting them in Montreal. In one sense, the Society of Molecules took place in mid-May 2009, across 16 locations or, rather, 16 molecules. In another sense, this event cannot be restricted to these space-time coordinates. For example, it would be far from easy to locate the multiple durations and spaces of thought-in-action; and yet our molecule gained some form of consistency, tending towards the intersections of the carto- and choreo-graphic. Drawn out across Oxford-Chichester-London, we nonetheless had shared interests: in dance, in maps, in lines, in rhythm. We read some Guattari, hesitantly at first. The Society of Molecules as a distributed event was conceived as an experiment in co-producing interventions with ethico-aesthetic reverberations. For us – Joe Gerlach and myself – this injunction propelled a sensibility towards enacting hitch-hiking as a technique for geographical fieldwork.⁵⁵

4.5. TECHNIQUES FOR EXPERIMENTING

The enabling constraints which conditioned the SenseLab's events were various. As McCormack notes, these could be provided in all sorts of ways: "by close readings opening onto dancing with José Gil (1988); by string, fabric, baubles becoming material catalysing relational movement; by concepts becoming strange affective attractors; by relational movement exercises becoming movements of thought" (McCormack, 2008: 8). One such enabling constraint was to encourage participants to bring everything but completed work – a call for participation rather than paper presentation (McCormack, 2008) – it was hoped that they would instead share their

⁵⁵ The way in which our molecule brought this material together is documented in the 'tangents' section of the SenseLab's journal, *Inflexions* (Abrahamsson *et al.*, 2009; see also Jellis and Gerlach, in preparation).

passions, skills, methods and, in particular, their techniques. This would be a sharing without a predetermined sense of how these techniques would enter into and help shape the event. A way of encouraging this was to ask participants to bring something essential to the practice as an offering, or gift, to the group. It could be anything: “an object, a material, a keyword, a conceptual formula, a technical system” (Manning and Massumi, 2010: 10). Not something that was a representation of the person but something that moved them. All participants were also required to have read the same selection of philosophical texts before meeting. This was very much part of the event, part of the conditioning. Close reading and discussion of the texts were part of the activities but, more importantly, the readings provided participants with a shared set of conceptual resources. This was an attempt to avoid general ideas and/or pre-assumed positionings.

The ideas brought forth had to be performed in connection with texts that everyone had read. ‘Activating’ ideas on-site, in and for the group interactions, was essential given the differences in background amongst participants: no common set of references beyond the texts could be assumed. This meant that potentially exclusionary philosophical language, or movement exercises were less intimidating and more engaging. The constraint of ‘activation’ also worked against ideas of description or reporting when moving from smaller to larger group discussions. Activation helped intensify the passage between different modalities of experimentation rather than prioritising content. So what happened in a smaller group session, had to be re-activated for a larger group. These activations, or modalities of transition, emphasised the passage’s affective intensity, its generative force, and not necessarily the content of the last exercise. The challenge was “to

recreate tonalities of experience across modalities; to make felt the intensity of thought in practice” (Manning and Massumi, 2010: 12).

One such technique for facilitating ‘movements of thought’ was conceptual ‘speed-dating’. Half of the group would sit down in a circle as ‘posts’; the other half of the group would be ‘flows’ who would move from one post to the next at regular intervals, rather like speed-dating. The post and a flow would be given a minor concept to discuss as a way of re-entering a particular text. For instance, if you engaged with the phrase ‘the autonomy of affect’, you might pay particular attention to autonomy. It could be any concept that is understated yet active. The group might begin with the term, as well as a particular passage or page to read from. Conceptual speed-dating was a collective thinking process, where there was at once a working-through, in pairs, and a moving-forward, to the next pairing. How the event would transpire then, would be as much due to the structures as the improvisations.

Composing these techniques, or enabling constraints, is far from straightforward. To be sure, it is a thorough and exacting process, which has required a full year’s preparation for each of the SenseLab events. The most recent event was entitled ‘Generating the Impossible’. One enabling constraint for this event was to begin the event under conditions of chaos, and try to move these towards an ‘emergent attunement’. The creative chaos was meant to disable the limitative constraints of generic formatting (conference, talk, demo, exhibition, festival) and start from the most minimal formatting. The SenseLab claimed that the challenge was to not organise the event in advance. Although the event was not pre-determined, there was a great deal of work that went into the very organisation of the event. This preparatory work was primarily comprised of Skype conversations, which really

were chaotic (how to know when to talk if there are twenty-odd people?), and writeboard 'conversations' within 'affinity groups'.

The tension between structuring and conditioning was readily apparent. For example, the affinity groups were not developed by the participants; instead, I received an email telling me that I had been placed in 'Affinity Group 6'. We were to discuss what project we might engage with when we were to meet up on an online writeboard. Both the affinity group and the writeboards were envisaged as modalities of introduction, where introductions have to be performed. However, a figurative spanner was thrown into the works upon arriving at the forest, several hours drive north of Montreal. As an affinity group we were to develop a 'task' for another group, and in turn receive a task ourselves; we were to give away our nascent project before it had even got underway. Although our ideas had been very vague – something to do with diagrams and maps, I think – the frustration was palpable. As a group we tried to regroup and rowed out onto the lake beyond the campsite. Some of the group were eager to get on with the task, and just do something. Others in the group were keen to think about it, to discuss the concepts further. The group fractured. Some of us were left floating aimlessly in the lake, as others took to the shore. Tempers flared. And something emerged. The following day, our 'affinity' group met up once more – our affinity very much in question – and reconciliation was mooted. And as we became interested in the very idea of affinity, and how we might generate it, so we let go of the task that had been presented to us. For the following days, we explored techniques for cultivating affinity, going on long walks, reading aloud in the hot-tub, co-constructing a tent for those who felt overwhelmed by the event (and/or their own affinity groups) and cooking together.

One unexpected upshot of this was that our affinity group, already the largest and most unwieldy group, attracted others, affinity group refugees.

Another exposure. All of us attending the event are as a group after the morning's conceptual speed-dating. Most of us are on the floor, crouched, sitting, laying. We are listening closely. Erin and Brian occupy a guru-like status for many present⁵⁶; it is crucial that we hear what they think to the reading we have been engaging with. Of course, we are able to contribute to the discussion; it is welcomed. But then when somebody starts to suggest something... stop... because we're going down the wrong road... This seems more like moderation than modulation. The disappointment that some of us experienced for brief episodes while in the forest was no doubt due to raised expectations. Many present had, if not attended previous SenseLab events, read or heard much about them. Yet while I was initially struck by this structure to the event, as the event progressed it felt more like a condition which had facilitated particular ways of bringing people together, without determining what would happen.

During the course of writing, the SenseLab has continued. I was able to participate in both the Society of Molecules and Generating the Impossible events, but watched from the sidelines for the most recent: Into the Midst (2012). At Generating the Impossible it was rather dramatically announced that "The SenseLab doesn't exist after this..." As might be expected, there was a fair amount of shock among those present. Yet, it indicated the SenseLab's hunger to be more persistent than the institution which wants to house it. It was a statement of intent: that creativity cannot be considered without destruction. Following the recent SenseLab activity,

⁵⁶ This is not a critical reflection; rather it is an acknowledgement that many who attended this particular event were keen to learn from them.

then, has been confusing. Into the Midst was a week of improvisational research-creation activities that took place in and around the SATosphere, a newly built immersive environment at the Society for Arts and Technology, which had originally housed the SenseLab. The SenseLab did exist after all. Ironically enough though, this event was preceded by an eviction: a brief email a month or so earlier announced the need for people to help with the move. The SenseLab was to go into storage.

This raises the question of when experiment comes to an end. Do experimental events have a kind of half-life that means they will inevitably exhaust themselves? But it also draws attention to the difficulty of bringing things to an end; the passions that these events generate and how to manage these is surely difficult. What is more, the relation-specific (Massumi, 2003) configuration of the SenseLab is understood by those who participate to work as a way of making 'liveable' life in Montreal; the SenseLab is a way of going on. It doesn't exist as such, but has to be actualized: it is a project. And this kind of project is made up of twin processes of gathering-together and scattering. It is brought together in the forest or at a molecule, but the successes of these events are understood to be in their dispersal rather than their continuation or preservation.

4.6.CONCLUSION: CONCEPTS, VALUES, AND DISCIPLINES

It seems to me essential to organize new micropolitical and microsocial practices, new solidarities, a new gentleness, together with new aesthetic and new analytic practice. (Guattari, 2008: 51)

It has become imperative to recast the axes of values. (Guattari, 1995: 91)

What can we take from this encounter with research-creation, and more specifically, the SenseLab? There are a number of key issues that emerge. Firstly, arcing back to

John Wylie's claim that non-representational theories are 'undercooked', I contend that they will remain so unless there is an active engagement with particular sites and practices through which concepts emerge. What I have tried to show in this chapter is that there is this act of experimentation with concepts, in particular sites. Moreover, for the SenseLab, as with non-representational styles of thinking and working, "critique and affirmation are not mutually exclusive" (McCormack, 2010a: 216). Indeed, immanent or 'affirmative' critique (see Massumi, 2010) is an effort to affirm that which you most want to critique. As Latham and McCormack (2009) note, this style of thinking is "not reducible to techniques or tactics of critical thinking, whether this is taken to refer to a measure of reflective cognitive capacity or an implicit ethos of political engagement" (2009: 261). Rather, it is a shift towards affirmative methods: "techniques which embrace their own inventiveness and are not afraid to own up to the fact that they add (if so meagrely) to reality" (Massumi, 2002a: 13). Research-creation, as proposed by the SenseLab, is then, "a polyrhythmic attuning of mutually attuned autonomous activities which collectively resist definitive capitalist capture, and affirm value in terms that cannot be quantified" (Manning and Massumi, 2010: 31). By reformulating what the category 'research-creation' is and how it might work, the SenseLab is in effect, working against an institution which is funding it.

Secondly, and relatedly, this raises the question of the relationship between the kind of experimentation that the SenseLab mobilises and forms of capital value-generation. The SenseLab could be seen as a rejoinder to Félix Guattari's call for new practices and solidarities. Indeed, many of the events have included readings of his work. We might understand the SenseLab's micro-practices as ethical and

aesthetic engagements, which not only sustain a particular atmosphere or culture of experiment, but tend towards new systems of valorisation. The SenseLab is very aware that the funding for their work is primarily aimed at developing the cultural industries of Canada, and Quebec in particular. As such, the SenseLab has attempted to refuse the value-system, in that it does not necessarily produce anything tangible, favouring process over product. The question of good and bad experiments, or success more generally, thus becomes an important question. How are we to tell if an event has been a success? If there is no outcome as such, what does research-creation offer? And although it may be a question of process over product, the process may fail to convince. The SenseLab suggests that success is not measured by what is produced during the events, but whether there is a follow-up on its process afterwards. In other words, an event could be deemed a success if it set in motion something that could grow, such as a collaboration or a technique travelling. As for failure, the SenseLab are “aware that all explorations at the edge of inquiry risk failure”: when certain projects don’t take off, or even collapse, they tend to dissipate or combine with other projects:

‘Failure’, processually speaking, added a fissional and fusional dimension to the event that was not preplanned. From this point of view, failure was generative, a positive formative factor in the event’s self-organizing. (Manning and Massumi, 2010: 16)

The research council, SSHRC, seems to have taken a less open view of success however. Research-creation is no longer mentioned on their website, and has recently seen its funding ended (Pepe, pers. comm.). What this suggests is that research-creation may actually outlast its funding. Research-creation does not need to remain a funding category for it to be a mode of engagement, a modality of experimentation.

Thirdly, engaging with the SenseLab produces a number of interesting frictions. As Derek McCormack notes,

one of the difficulties encountered after participation in such an event might be in telling the story of what happened, a difficulty of trying to make too many things cohere and add up even when they don't. (McCormack, 2010a: 209)

McCormack suggests that we might consider how the after-effects of participation in these events “become part of the minor variations in sensibility through which one thinks and acts” (2010a: 209). One such minor variation might be a sense of disquiet that disciplines, such as geography, are backgrounded, if not jettisoned. This is due, in part, to the SenseLab’s emphasis on practices: research-creation elides the distinction between research and creation by foregrounding practices. Indeed, the SenseLab’s series of events tried to collectively find modalities of experimentation that connect practices at the levels of their intensive creative force. Not a mapping on to, or evaluating by, but a shared exploration which could be “generative of new modes of practice and inquiry” (Manning and Massumi, 2010: 10). Somewhat disconcertingly, there does not seem to be a need to think in terms of discipline. The SenseLab’s ostensible abandonment of the territories or refrains of particular disciplines seems to do away with an enabling constraint. Disciplinary questions, while parochial, are nevertheless matters of concern. And yet, it is not so simple. As Massumi makes clear, this is not an outright rejection of the notion of discipline, rather it is a consideration of how a creative discipline might function:

a creative discipline is defined by how it escapes its past content and internal constraints. It renews itself though the rigorous indiscipline of its effective couplings with processes other than its own. (Massumi, 2008: 27).

In sum, the chapter has worked up a substantive engagement with how concepts and micro-practices emerge from a particular site. It has drawn on the SenseLab to

think though how notions that are of interest to geographers are being both 'cooked' and practised. Furthermore, the SenseLab has allowed for a consideration of the value of experiments, and how experimental practices or fields may become institutionalised in various ways. This is an issue which I return to in the final chapter of the thesis.

5

EXPERIMENTAL MODELLISATIONS

When I see the models that we are surrounded with, I see them as reflections of the fact that the space which I am in is also a model. (Eliasson, 2008a: np)

The SenseLab's emphasis on abstraction, apparent in the name of their series of events – 'Technologies of Lived Abstraction' – was not always evident in the previous chapter, in the face of the chapter's attention to technique and the generation of spaces for research-creation. However, I want to consider here how the construction of a particular form of abstraction, that of models, can be understood to entail and facilitate experiment.

Models are conventionally understood to function as ways to better understand or predict particular processes or phenomena. Modelling tends to be regarded with suspicion by human geographers, seldom reflected upon by physical geographers, and only considered within the sciences. Indeed, the practice of modelling – building, testing, comparing and revising – forms an important aspect of modern scientific endeavour (Frigg and Hartmann, 2009; Lane, 2011; Morgan and Morrison, 1999). Within physical geography, for example, a significant number of journal articles examine the introduction, application and interpretation of models. However, recent work across various disciplines has revalorised modelling through

the notion of metamodelling, in part because it suggests a more productive way of thinking about models. We might ask to what extent this really is a new way of thinking about modelling. To this end, the chapter poses the question: what is the relation between modelling practice and the process of experiment? Put differently, we might ask: to what extent are models and modelling concepts which can provide analytic purchase when considering aesthetic experiments? And what is the scope for thinking about models as certain kinds of abstractions that facilitate experimentation?

The chapter is structured as follows. Firstly, the chapter revisits conventional understandings of models and modelling in the social sciences, and draws out the tensions within geography concerning the status of models and their uses. Then and second, the chapter attends to the notion of metamodelling. A number of scholars have drawn upon Félix Guattari (1995; 1996a; 1996b; 2009a) who developed this concept, in order to untether modelling from both “its representational foundation and its mimetic reproduction” (Genosko and Murphie, 2008: np). As this work renders problematic the notion of models as simplifications, and further, contends that models always need to be re-invented, I explore what this means and how it might work in practice. This engagement with Guattari also involves a consideration of the sites and spaces where we might think through the aesthetic practices that he champions. Thirdly then, the chapter puts these ideas to the test through a series of encounters with a contemporary artist, Olafur Eliasson, who understands modelling as an on-going experimentation. I choose to focus on Eliasson in part because of the centrality of models in his own work, as he has suggested himself: “When I see the models that we are surrounded with, I see them as reflections of the fact that the

space which I am in is also a model” (Eliasson, 2008a: np). Throughout this substantive section, I draw on a variety of materials. These include readings of Eliasson’s writing, interviews with him and those who work at the studio, and a patchwork of ethnographic exposures in the form of field notes and images from my visits to Eliasson’s Institut für Raumexperimente [Institute for Spatial Experiments] as a ‘participant-guest’. By examining how models are thought and practised in this particular experimental context, I begin to complicate the division between modelling and metamodelling. My argument is that encounters with Eliasson, and the institute, contribute to a re-imagining of the relationship between modelling, experimentation, and space.

5.1. MODELS

Models increasingly underpin much of how we live. (Lane, 2011: 228)

Models are a widely used and important instrument of modern science (Frigg and Hartmann, 2009; Morgan and Morrison, 1999). Of course, it is not just within the natural sciences that models are important; social scientists also build, test, compare and revise models. Indeed, the perceived usefulness of models has seen them also become ubiquitous in public policy and corporate strategy (Sismondo, 1999). Whilst the term ‘model’ can be indiscriminate in its meanings (Goodman, 1968), models are typically understood within the social sciences as abstractions with which to better understand the world. Importantly, the continued use of models serves as a reminder of the notion of a social *science*; although modelling in this field can be “a parody of conventional scientific method” (Lane, 2011: 241). Occupying an “uneasy space between theory and experiment, between abstract and concrete” (Sismondo, 1999: 247), models are abstract in the sense that they are

simplifications or reductions. This process of simplification in modelling is like experimental work in that it is the behaviour of the model (or simulation) that is being investigated. Experimenting with models in this way might be performed through a series of small changes – to the parameters or initial conditions, for example – to see what happens. As Dowling (1999) notes, it is a case of tinkering with models and noticing the differences.

Dowling's claims for tinkering, or modelling as an experimental "playing around" (1999: 271), are similar to Lave and March's (1993) suggestion that modelling is a "basic style of speculation" (1993: vii). Yet these arguments are tempered each time: firstly, by understanding the experimental tinkering as an exploration of "the solution space" (Dowling, 1999: 269), and secondly by the description of models as *systematic* sets of conjectures about real world observations (Lave and March, 1993). Experimentation is not pre-figured but all the outcomes are given within the model. Thus, modelling selects a "fragment of reality ... foreclosing alternate possibilities" (Watson, 2009: 109). The idea that models are pre-figured is taken up by Gary Genosko and Andrew Murphie (2008), who argue that models operate largely by exclusion and reduction. Models, for them, lack ambiguity and uncertainty. This is because much modelling involves "petrified representations" and is often "no more than an exercise in tracing" (2008: np).

Although model-building has a long history in many sciences, its incorporation into geography has been relatively recent; modelling has "arguably become the most widespread and influential research practice in the discipline of geography" (Demeritt and Wainwright, 2005: 206). Indeed, modelling was widely celebrated during the heyday of the so-called 'quantitative revolution', partly as it promised to

provide a methodological foundation for unifying the discipline (see Chorley and Haggett, 1967; Harvey, 1969). However, these claims were contested and many geographers, particularly human geographers, were suspicious of models. The tension between these different positions hinges on the issue of the aims of geography and its status as a science. For example, Denis Cosgrove (1989), in a collection of texts called *Remodelling geography*, is critical of modelling, describing it as the quintessential expression of modernism, and incapable of responding to human geography's attention to difference. Peet and Thrift's (1989) approach, also within human geography, was instead to extend and transform the domain of models, bringing politico-economical and social-theoretical issues together in a book called *New models in geography*. Both approaches can be seen as responses to post-structural thinking, which called into question the separation between 'the real' and 'representation' (Dixon and Jones III, 1998).

In their review of models and geography, David Demeritt and Joel Wainwright suggest that a model is a "simplified representation or 'abstraction of reality'" (2005: 207). Indeed, the "role and status of models and modelling is an instantiation of a wider debate concerning representation" (Clifford, 2008: 675). Allied to these questions of representation and abstraction is a rejection of the underlying predictive ambition of modelling. In fact, modelling has become synonymous with computer-based techniques of numerical computation. However, models and modelling encompass a wide range of forms and a number of different sorts of models have been identified (see Frigg and Hartmann, 2009). As part of their review, Demeritt and Wainwright endeavour to provide a typology of models, which include: physical analogues and scale models; conceptual models; and

mathematical models. The first 'type' includes models which have a form or behaviour which is analogous to that which is of interest. For example, this might entail a reduced scale model of a system in a laboratory. The second 'type' is an abstract representation designed to articulate the processes which are operating. An example might be a schematic diagram of a process or system. The third 'type', mathematical, is further distinguished into empirical-statistical and deductive-deterministic models. It is this focus on models, and not the modelling process, which has tended to prevail in the geographical literature.

While there have been few pivotal texts on modelling (Chorley and Haggett, 1967; Macmillan, 1989), there have been recent attempts to re-examine the process. For example, O'Sullivan (2004) explores theories of complexity to describe models as narratives. He suggests that for modelling to become as "routine in human geography as in physical geography, model makers must start telling more interesting stories, so that a wider audience is willing and able to listen constructively" (2004: 292). Stuart Lane's (2011) autobiographical account of his modelling practice seems to be a response to this. Developing the claim that "both models and measurements are abstractions of reality" (2011: 229), he explores how models try to capture the essence of a phenomenon that is typically beyond measurement, yet remain heavily dependent on measurements for calibration. The process of calibration, vital for a model's validity, is problematised by Lane who argues that models are useful when they unsettle, when they "open up new possibilities for investigation and interpretation" (2011: 231). Indeed, he contends that it is precisely when models don't add up, that they can bring about new ways of thinking and researching.

This treatment of models as problematising is taken up in Lane's participation in a recent project which was committed to doing flood risk science differently (Lane *et al.*, 2011). This project attempted to counter the predominance of certain sorts of hydrological models and, in particular, the notion that these models are universal technologies: the model does not change, only the initial conditions (the local data). By cultivating different means of practising science, as the authors put it, a model was co-produced by the academics and the local residents who participated in the project. Those involved had initially expected to re-use an existing hydrological model to foreground upstream processes but the failure of these earlier modelling efforts meant that the project became concerned with developing its own model. Lane *et al.* argue that it was "not simply a case of translating local knowledge into a series of concepts and assumptions to inform model development" (2011: 28), challenging traditional claims regarding model-construction rationale. The co-produced model was not general, and was formulated specifically for the place in question. What this suggests is that it is not a model which should travel but the *process* of model-construction. Rather than have a ready-made model which is made to work everywhere, the project contends that models be developed for particular sites.

5.2.METAMODELS

Schizoanalysis does not ... choose one modelisation to the exclusion of another. (Guattari, 1995: 60-61)

Schizoanalysis, I repeat, is not an alternative modelization. It is meta-modelization. (Guattari, 1996a: 133)

Lane *et al.*'s work is useful for thinking modelling in geography, in part as it bridges physical and human concerns. However, we can turn to other sources of support

because they link more directly with the kinds of research practices and sites with which this thesis concerned. It is Félix Guattari who provides more purchase in re-imagining the relation between modelling and experimentation. Throughout much of Guattari's work, and in particular in his last book, *Chaosmosis*, he develops the neologism of 'metamodélisation' – often translated as metamodelling – through his notion of 'schizoanalysis'. By briefly introducing the project of schizoanalysis, I hone in on the process of on-going model construction.

Guattari developed the notion of schizoanalysis, both on his own and with Gilles Deleuze, out of "his frustration with what he saw as the shortcoming of Freudian and Lacanian psychoanalysis" (Watson, 2008: np). Schizoanalysis was a critique of psychoanalysis (see Deleuze and Guattari, 2004a), and this later became described as 'metamodelisation' (Guattari, 1996a: 122). However, Guattari had long been critical of the use of models in psychoanalytic treatment. He articulates his agenda clearly: the "*freedom of construction of new types of models relating to the analysis of the unconscious*" (Guattari and Rolnik, 2008: 299; original emphasis), rather than the proposition of "a global alternative to existing methods of analysing the unconscious" (Guattari, 1996a: 122). Whilst there is no need to examine in detail the notion of the unconscious, or psychoanalysis more broadly, what we can take from Guattari is that the imposition of standard models is oppressive.

Guattari understood the term 'model', which in French can also mean 'pattern', in at least three different ways:

In one sense, the model is a learned pattern of behavior inherited unquestioningly from family, institutions, and socio-political regimes, and which in the end functions as a prescriptive norm imposed by a dominant social order. In another sense, and in keeping with the social sciences, a model is a means of mapping processes and configurations. [...] I should perhaps add a third definition of model, that of repeated pattern or skeletal blueprint – in other words, as structure. (Watson, 2008: np)

Guattari sought instead to develop a new term: ‘metamodelisation’. As he put it, what distinguishes metamodelisation from modelisation is the way that it develops “possible openings onto the virtual and onto creative processuality” (Guattari, 1995: 31). Elsewhere, this is figured as a resistance to “modelisations which simplify the complex” (1995: 61). Instead, Guattari argued that

the more complex the models become, the less risk they run of using systems of reference that crush the sensibility to what happens. (Guattari and Rolnik, 2008: 312)

For this reason it is perhaps more interesting to consider why Guattari writes of metamodelisation rather than meta-modelling or re-modelling. An important point is relegated to a footnote in Janell Watson’s otherwise excellent article *Schizoanalysis as Metamodeling*. She notes that many translators “have rendered Guattari’s very ordinary French term *modélisation* as ‘modelisation’, which is a neologism in English” (2008: np.n.1). Watson proposes the use of ‘modelling’ as it “better reflects Guattari’s borrowing from standard social science terminology” (2008: np.n.1) but this is misleading. While Guattari is admittedly an ‘idea-thief’ (see Guattari, 2009a), adopting terms from a number of domains, there is a subtle difference between modelisation and modelling. Moreover, I want to accentuate the difference in order to re-think the relationship between modelling and experimentation. I read modelisation as the creation and construction of models, whereas modelling is the use of a model. Put differently, modelisation is the formation of a model, and modelling is the use of that model. Therefore, whilst Guattari notes that “the limit between a model and a meta-model does not always show up as a stable border” (Guattari, 2009a: 205), it is never a question of proposing an alternative model – as it may be equally oppressive – but of “trying to articulate alternative processes when they exist” (Guattari and Rolnik, 2008: 132).

The invocation of the prefix 'meta-' is unfortunate, as it could initially seem to be a model of all models, or instead of other models. However this is not what Guattari is working towards. Instead, we might consider 'meta-' in another etymological sense: *among* rather than *after*. In fact, Guattari says as much: "models will only be considered as one among others" (1996b: 197). Metamodelisation is a way of constructing models from within all other models; it is an immanent modelisation. Guattari is very pragmatic: no model is right, but you cannot step out of all modelling either. Metamodelisation draws on other models, and therefore retains the prefix 'meta-', but this is a 'meta-' from the *middle* rather than from above. It draws on aspects and components of models that are useful and discards those that are not needed:

I don't believe that there are any general models that can be applied. Either a model is useful for something ... or else it must be set aside. (Guattari and Rolnik, 2008: 185)

This borrowing of parts of models is experimental, bringing together different components for particular situations. Metamodelisation is "productive of a new kind of reality; it functions; forces things together" (Genosko and Murphie, 2008: np). Importantly, although Guattari "borrows many concepts and schemas from science and mathematics, he insists that his mapping and metamodelling are ethico-aesthetic and not scientific" (Watson, 2009: 97). This is not a question of dismissing science, but rather a critique of scientism, which Guattari understands as the search for scientific legitimation through the use of reductive models and general laws, at the expense of singularity and complexity. A model should "only be used once according to Guattari, because to reuse it would be to transform it into a general theoretical schematic" (2009: 114). This relentless reworking of models helps

Guattari ensure that metamodelling never became a general model (O'Sullivan, 2010).

How does metamodelling function in practice? And where might we find practices of metamodelling? We might follow Guattari when he explains that his perspective “involves shifting the human and social sciences from scientific paradigms towards ethico-aesthetic paradigms” (Guattari, 1995: 10). Guattari's ideas emerged from his encounters with an experimental therapeutic space, and later came to describe these not just as schizoanalysis, or metamodelling, but as an ethico-aesthetics. Treatment “is not a work of art, yet it must proceed from the same sort of creativity” (Guattari, 2009b: 192). Moreover, Guattari champions aesthetic practices in *Chaosmosis*, explaining that although art does not have a monopoly on creation: “it engenders unprecedented, unforeseen and unthinkable qualities of being” (1995: 106).

The remainder of the chapter therefore follows up on *where* Guattari asks us to look to find processes of metamodelling, and works through two questions. Firstly, to what extent is metamodelling qualitatively different from modelling or modelisation? By thinking about the use of models in experimental contexts, I want to complicate the rather clear division between models and metamodelling that we tend to find (see Genosko and Murphie, 2008). And secondly, how might metamodelling work in practice? Does it mean that a new modelisation always starts afresh, or are there components of the model that you have to hold on to? While the aim is singularity rather than standardisation – “entailing the appropriation from a multitude of models in order avoid being ‘stuck’” (Tinnell, 2012: 360) – is metamodelling so abstract that it is not instantiated in any

particular site or practice? What are the implications of always starting anew for thinking and doing experiment?

5.3. EXPERIMENTING WITH MODELS: INSTITUT FÜR RAUMEXPERIMENTE

I love models – paper models, models in wire, clay, on a computer. The possibilities are endless. But actually, I don't see a difference between the models we make at my studio and my finished works. An artwork is a model as well; it's just an idea or a suggestion of how we can experience the world. (Eliasson, nd.a: np)

I now want to put some of these notions of modelling to the test through a series of encounters with elements of Olafur Eliasson's artistic practice, who understands modelling as an on-going experimentation. I choose to focus on Eliasson, a contemporary artist currently working in Berlin, in part because of the centrality of the model in his own work, as well as his interest in thinking space as processual (see Lundø and Jørgensen, 2010; Massey, 2003b). He established Studio Olafur Eliasson in 1995 and has in the intervening years become internationally-renowned, particularly for large installations. Having met Eliasson at a gathering of geographers in late 2008 and been interested in his plans for an experimental school, I made a number of visits to his studio during 2010 and 2011. Drawing on these visits, as well as the numerous essays Eliasson has written, I foreground the importance of models in his work and examine what a revalorisation of modelling offers us.

Eliasson is clearly aware of some of the literature on models, arguing in his essay *Models are real* that we are witnessing a shift in the traditional relationship between reality and representation: "we no longer progress from model to reality, but from model to model while acknowledging that both models are, in fact, real" (2007: 19).

This is an acknowledgement of how difficult it is to isolate models from the world.

Further, models exist in many different forms:

In my artistic practice I work both with analogue and digital models, models of thought and other experiments that add up to a model of a situation. Every model shows a different degree of representation, but all are real. (Eliasson, 2007: 19)

Eliasson's contention that the world consists of a composite of models, carries with it ethical and political potential, as it makes the renegotiation of our surroundings possible:

To emphasize the negotiability of my works—installations and larger spatial projects alike—I do not try to conceal the technical means on which they rely. I make the construction accessible to the visitors in order to heighten their awareness that each artwork is an option or *model*. Thus, the artworks are experimental set-ups. (Eliasson, 2007: 19, my emphasis)

What can we draw from this? Firstly, by equating models to experimental set-ups, Eliasson's approach offers a way to attend to the relation between experiments and models. Secondly, there is a link made between artworks and models which strikes a chord with Guattari's metamodelling. Indeed, one of the first things you may notice when entering Eliasson's studio, other than the sheer number of people working there, are the numerous models. They are everywhere: on shelves and desks, on sheets of paper, on posters on the wall. Along with his team of collaborators, Eliasson builds an array of models. It is the process of constructing these models that is of interest. Once made, the structures are not quite discarded – they are occasionally exhibited – but they are left to one side. These models do not appear to be of anything in particular. We might consider these abstract shapes as 'virtual constructions' (Rajchman, 1998), architectures of trajectories and movements.

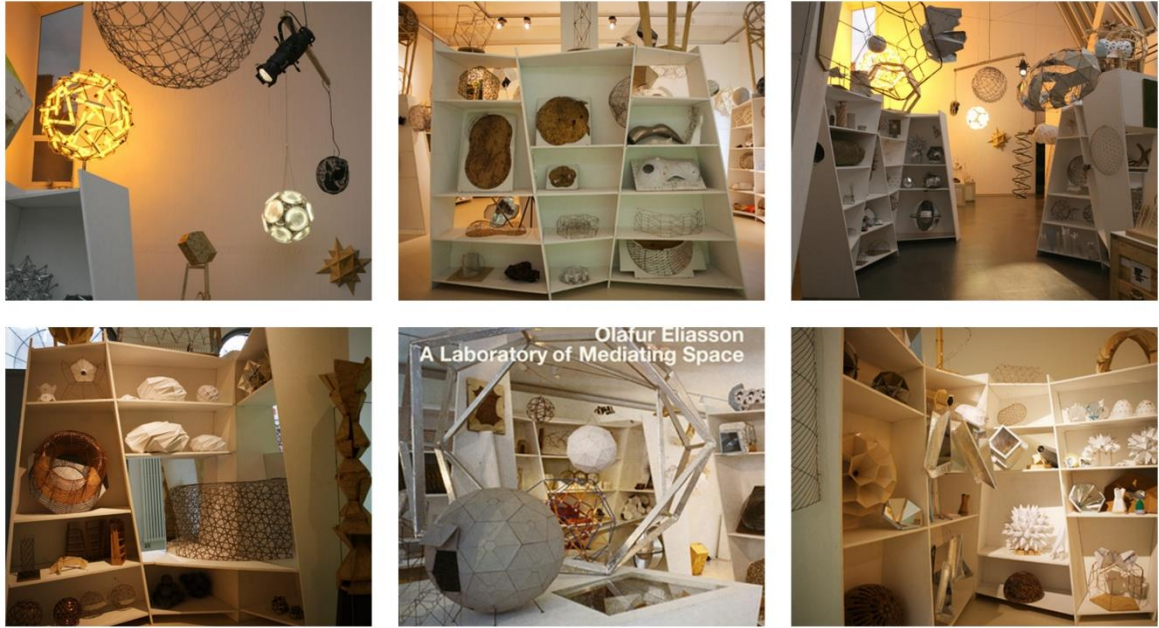


Figure 8: Eliasson's 'Model room' (2003) © Studio Olafur Eliasson

By attending to Eliasson's latest project, we can further explore this notion of virtual construction, and how a space can be constructed which does not set all the possibilities in advance. Moreover, it allows for an interrogation of the models Eliasson constructs and how this is done in practice.

I've increasingly started doing things such as small symposia and workshops in the studio. I think the next step will be a school – an art school, if you want to call it that. It will be a school for spatial experiments in close affiliation with the studio. (Eliasson with Obrist, 2008: 174)

The Institut für Raumexperimente [Institute for Spatial Experiments] is a school established by Eliasson alongside his studio in Berlin. Launched in early 2009, the institute will run for ten semesters, an allotted life-span dictated not only by funding but by design. Here, then, is an interesting link with the life-span of the SenseLab; the notion that experiment must come to an end, that it cannot be the only mode of existence. Affiliated with the College of Fine Arts at the Berlin University of the Arts (UdK) and supported by the 'Senate for Education, Science and Research', the

institute operates as a semi-autonomous satellite, and provides a hybrid space, affording both close ties to a practising artist's studio as well as a place to do art and/or research. There is no curriculum or syllabus; instead there is a blueprint each semester – arranged around themes – which changes on a weekly, and daily, basis.

Described at its inception by the art critic and curator Daniel Birnbaum (2008) as an interesting platform for education, the institute is a space where people are trying to learn. The 'Life in Space' (LIS) series, organised by the studio, is often figured as a precursor for much of what happens at the school, informing how a school could be run or even imagined. The three LIS experiments were efforts at inviting around fifty guests to achieve a "sense of intimacy and hospitality" (Eliasson, 2008b: 09:42-09:48). For Eliasson, these events were "inclusive and co-productive act[s] of the artist's studio" and were at the heart of his idea of "the Studio as a laboratory" (2008b: 09:42-09:48). At the third of these events, in 2008, Eliasson opened the day-long experiment with a suggestion that there were new types of institutions emerging, and explained that he hoped his school would be one of these.



Figure 9: Inside the institute

The impetus for the institute is Eliasson's interest in testing models of learning, in experimenting with new approaches to teaching art. In particular, he is interested in the cultivation of experimental formats to encourage the participants to develop critical tools with which to push their artistic work further while being aware of its broader social context. Eliasson provides a sense of what he hopes to achieve with the institute, arguing that not only is the institute engaged with experimenting but is, in itself, an experiment.

The blueprint for each semester focuses on "spatial practices and problems in the fine arts and their intersection with architecture as well as their relationship to the humanities and natural sciences" (nd.b: np). Put simply, it is concerned with trying

to make connections between disciplines, philosophies, and practices. As the semesters are loosely planned, there is room to respond to invited speakers and other visiting academics or artists. The institute is therefore composed of eclectic 'blocks' of events. These blocks, or semesters, are typically organised over a four-month period. Towards the end of my second trip to Berlin, Eliasson listed a number of activities over the past semester:

... a trip to Tokyo in the break, a lecture on Japanese gardens and Gestalt theory, a series of 'walk-days' and a Space Activism marathon, a short trip to Iceland mid-semester, the development and editing of a class book, a workshop on presenting yourself as an artist, a roundtable discussion together with Chantal Mouffe (a political theorist) and a number of curators, an all-night-long film-night, a visit from a well-known artist, a number of exams for some of the participants, a visit to a local museum for the opening of Eliasson's new exhibition, a day-long workshop on the history of emotions, a series of 'parachute' student presentations, the publication and launch of a set of posters related to an earlier trip to Zagreb as well as two class exhibitions. (field notes, July 2010)

The excerpt demonstrates the variety of events that are organised by the institute. Trajectories are constructed, connections are followed up on, and themes emerge. By engaging in experimentation, the institute is always 'in the making':

Experimentation as a method not only informs my school, but also forms the core of my artworks and my Berlin-based studio. In my understanding, an artwork is fundamentally tied to its surroundings [...] thereby examining the world in which we live – and by doing so, it can ultimately change the world. It also seems relevant to examine the pragmatics involved in the organisation of my studio, its randomness and roundabout ways. This reveals a structure that continuously invents the model according to which it proceeds. (Eliasson, nd.b: np)

The institute is portrayed as a model to facilitate ‘becoming-experimental’. Whilst Eliasson describes his studio as a structure which continuously invents the model according to which it proceeds, this is also the case for the institute. To be sure, the institute is not modelled on another class, school or institute. However, Eliasson is open about those historical examples which he finds interesting, inspiring even. This resonates with Guattari’s invocation to appropriate parts of models that work. Developing an experimental school is hardly a novel proposal. Take John Dewey’s Laboratory School, for example. Dewey felt that his writings on pedagogy, and in particular classroom discussions, were *models* best used as provocations for reform (see Kosnoski, 2005). As Dewey explained, he did not expect other schools to literally imitate what he had been doing at his Laboratory School: a “working model is not something to be copied; it is to afford a demonstration of the feasibility of the principle, and of the methods which make it feasible” (Dewey, 1900: np). Another notable example is the collection of schools initiated by the anthropologist Rudolph Steiner, designed around an arts-based curriculum (see Uhrmacher, 1995).

We might consider the institute to be a working model, in the sense that Dewey proposed. Like Dewey’s Laboratory School, there is no syllabus as such and this uncertainty is generative of renegotiations, of re-evaluations. To reiterate, for Eliasson the institute is a “structure that continuously invents the model according to which it proceeds” (Eliasson, nd.b: np).

I would like to reinvent the idea of teaching. I want to explore different ways of conveying knowledge, especially outside of a formal academic context. I’ve been dealing with this for some time now, but have been struggling to find an appropriate structure to bring it into being. (Eliasson with Obrist, 2008: 74)

The difficulties associated with this ambition are perhaps why Eliasson struggled to find an appropriate ‘structure’. When introducing one event at the institute, Eliasson

portrayed it as an attempt to have a picnic together. Drawing on the art historian and theorist, Sarat Maharaj (see Maharaj, 2009), Eliasson described it as an attempt, an experiment, to co-create an event which would have the feel of a picnic. Maharaj had visited the institute during the course of a previous semester, and had talked about different sites of knowledge production, contrasting the picnic with the idea of a laboratory. Sceptical of the proliferation of extra-scientific labs – although presumably not Eliasson’s studio-laboratory – Maharaj finds the idea of a picnic far more interesting: an open-ended, haphazard nature of assembly which is more casual and informal. Whilst interesting, this formulation neglects the work involved in preparing the food and finding a suitable location, and runs counter to the notion of metamodelisation, which is never about replacing a model (the laboratory) with an alternative (the picnic). And yet Eliasson’s affirmation of the picnic indicates his keenness to embrace the unpredictable, and might be understood as an attempt to allow encounters to shape and inform the way that the institute functions. Therefore much of the work done by the institute is to generate encounters between bodies, ideas, and spaces.

This generation of encounters may be seen as part of the encouragement of a welcoming and generous stance, what Eliasson has called a “sense of intimacy and hospitality” (Eliasson, 2008b: 09:42-09:48). As Felicity Scott (2008) argues, there is a distinction to be made between an institution and instituting. The latter is a “gesture of opening up, instead of being – as institutionalisation is traditionally defined – a figure of the status quo” (2008: 16:00-16:03). This gesture of opening up, of an institutional structure becoming open to transformation, takes seriously the notion of generating encounters. Generating encounters is about the

“institutional milieu and how creative processes function; how one triggers interesting processes, lets things in through an active openness” (Birnbaum, 2008: 13:18-13:24). How might we think these encounters? What might a ‘good’ encounter look or, rather, feel like? Important to the generation of these encounters – good or bad – are the models that are developed and taken up at the Institut.

5.3.1. ENCOUNTERING MODELS

Whilst there have been a number of fairly recent engagements with the encounter across geography (Laurier and Philo, 2006; Valentine, 2008), Nigel Thrift’s (2003) imagining of spaces of encounter perhaps offers more purchase, and is related to Spinoza’s ethics; more specifically our capacity to affect and to be affected. Affect is a property of the encounter and “takes the form of an increase or decrease in the ability of the body and mind alike to act” (2003: 112). How we evaluate an encounter depends on whether we feel joy or sorrow; good and bad become relative values, derived from bodily transitions. In other words, an encounter alters the capacity, or power, to affect and to be affected. We might turn to Gilles Deleuze, another reader of Spinoza, who provides an example of a bad encounter: that of poison and the body. The poison clashes with the body and decomposes parts of it; as the body attempts to extract itself from this state, the body’s capacity to affect is rigidified and its power is decreased (see Deleuze, 1981). Therefore, “the power of acting or force of existing increases or diminishes, since the power of the other mode is added to it, or on the contrary is withdrawn from it, immobilizing and restraining it” (Deleuze, 1988: 50). A good encounter is where our force of existing increases; it is a joyful encounter.

The institute blueprint might be considered a working model for generating encounters, which help construct a contingent experimental space. Likewise, these encounters re-form the working model. The polyphonic encounters that the blueprint allows for resonate with Eliasson's own approach to working. When discussing his recent exhibition 'Innen Stadt Außen' [Inner City Out], he contended that it is the meeting, or the encounter, that is the art. As part of this commitment to generating encounters, it was important for him to not only exhibit in a museum; indeed, a whole host of his works can be found elsewhere in the city, and include temporary ice pavilions, forsaken driftwood, and abandoned bikes. Rather than go out into the city in search of the driftwood, for example, the hope was that you might stumble upon it. Enabling the institute to be unpredictable allows for meetings to happen. The loosely structured blueprint – referred to as a 'soft' blueprint – features a panoply of different activities. The institute multiplies the modes, or formats, of encounters as part of its experimental ethos. Foregrounding two particular formats which form part of the blueprint – marathons and parachute presentations – develops the notion of the working model, and problematises the distinction between models and metamodels.

'Marathons' are attempts at bringing a large number of guests to bear on a particular topic, such as the recent 'Architecture and Space Activism' marathon. What sets the marathons apart from more orthodox seminars and conferences is the sheer number of presentations over a limited period. These events perhaps take their cue from the recent marathons organised by the curator Hans Ulrich Obrist at the Serpentine Gallery in London, such as the 'Experiment Marathon' (2007), 'Manifesto Marathon' (2008), and 'Poetry Marathon' (2009). Here, what we see is

that the marathon model does not operate as a template but as something which is always being made anew. In other words, the marathons are not simply rehearsals of past events but are experimental responses and mutations. Indeed, “repetition is not generality” (Deleuze, 2004: 1). As a member of the institute explained, this is “a model that seems to be working and we’ll keep changing it but we’ll probably keep doing until it just doesn’t work!” (field notes, July, 2010). Crucially, the marathons make palpable how difficult it is to differentiate between modelling, modelisation and metamodelisation. This is because although the marathons are being tweaked, in terms of their topics, they are also being reformed in terms of their format. In other words, the institute are running the experiment (modelling), but they are also building the marathon as they go (modelisation) and choosing elements from other models (metamodelisation).

A more condensed form of the marathon has been a series of ‘parachute presentations’ organised by the participants of the institute to provide short introductions to their work. These parachute presentations last exactly ten minutes, at which point an airgun is fired and the next person is asked to share what they have been working on. For the twenty-odd presentations in ‘free fall’, the content and form is open-ended. The time constraint works to provide a set of appetizers and enables the whole class to present projects, previous exhibitions and interests in one day (first ‘jump’ at 10:00; last person ‘on the ground’ before 18:00).

The class falls silent. A participant steps forward and announces they are going to be using the time to produce a concrete sculpture. Swiftly, he builds a wooden mould, pauses, then asks for help with creating the cement. A bucket appears and soon the mixture is starting to set. There is a gentle hum of anticipation. Everyone has either

leaned forward or left their seats to get closer to the action. As he works, the participant lets us know that the concrete sculpture is just part of his presentation. Another pause; this time for dramatic effect perhaps. And a parachute is unveiled from his rucksack. It's spread out across the floor and we are asked to step under it. The class huddles together, someone giggles and again, there is a hush as our eyes adapt to the darkness, the musty parachute gently resting on our heads. (field notes, July 2010)

The parachute presentations undoubtedly took inspiration from the marathons. The parachute presentations as a model appropriated components of the marathon, such as the large number of participants and the long hours, but transformed them. This example also draws attention to the difficulties in clarifying the distinction between modelling and modelisation. The parachutes are a form of modelling; they would have use the same model – the same components and structure – and change the conditions (i.e. the parameters), such as the participants, the theme, or the time to present. But the parachutes are also an instance of iteration, the next version of working model that is always being constructed. The ethos and techniques of the parachutes set it apart from the marathons. It is both more convivial (a sharing of work in progress) and more frenetic (with gun shots being fired regularly), and these serve as opportunities for the participants to receive feedback on their endeavours, rather than listening to new ideas. At the same time, there is a sense that the parachutes hold on to something of the intensity of the marathons.

5.4.CONCLUSION: TOWARDS EXPERIMENTAL MODELISATIONS

What can the material drawn from encountering this institute offer geographical engagements with modelling? Firstly, it makes a case for the revalorisation of

modelling. Human geographers have long been sceptical of models and modelling. And yet if they were more willing to accept models as particular kinds of abstractions, as virtual constructions, they might instead explore what these are generative of. Furthermore, foregrounding the process of model-construction rather than the application of models opens up new possibilities for investigation. Importantly, this draws attention to the relation between modelling and experimentation. The ethos of 'becoming-experimental' of the institute is facilitated by its on-going re-making. With no syllabus or end-point, what is experimental is never settled or attained. This also speaks to work on alternative and creative pedagogies in geography (see Askins, 2008; Cook, 2000) which draw attention to spaces of learning. How then might we develop structures, or proto-structures, which continually invent the model according to which it proceeds?

Secondly, the encounter with the institute has served to complicate the distinction between modelling and metamodelling. By introducing Guattari's concept of metamodelling as a counterpoint to the idea of models as simplifications or reductions, there was a suggestion that geographers might find more conceptual purchase here. Throughout the substantive section then, there has been a tension between the notion of modelling and metamodelling, and how these work in practice. This tension results from the need to hold on to something of a model, and the need for newness. Guattari's claims that there is no pre-given model, that it must always be constructed anew, are vaguely heroic in their incessant demand for newness. Always operating at the edge, avant-garde in style, the notion of metamodelling is anti-conservative. If the model always has to be made anew, how are certain aspects conserved? Therefore, whilst I would argue that Guattari's

work here has done much to encourage re-thinking of models, it is perhaps impossible to perform in practice.

The notion of iteration, or of iterative models, offers a way to hold on to parts of models. Iterations of experimental practices, such as the mutation of the institute's marathons to parachute presentations, are close to the idea of modelisation. While I want to avoid positing modelisation as a synthesis of modelling and metamodelisation, what it does is foreground the construction of models. Sometimes there are some components of the model that work well; sometimes it is necessary to hold on to certain parts. It is not always about creating a model afresh. Models are neither static templates, nor ever-changing forms. Eliasson's models must be remade, as with Guattari's, but they are informed and inflected by what has gone before. Therefore models, like the institute's blueprint are an always on-going construction: it is not known in advance how a model will develop. What is particular about the institute's modelisations is that they are geared towards generating encounters. Its semesters are a collection of event-encounters. Furthermore, the institute does not just generate encounters but is co-created by these encounters. Likewise, the institute may be a model to experiment with, but the model is itself re-configured by these experiments.

Re-thinking the relation between modelling and the process of experiment offers important contributions for geographers. Félix Guattari's concept of metamodelisation calls attention to the processuality of modelling. The foregrounding of the construction of models – the process of modelisation – is an encouragement to explore how models might be specifically developed for particular sites or situations. Furthermore, re-thinking this relation allows for an

examination of modelling in ethico-aesthetic fields. This emphasis on modelling allows one to be more affirmative about abstractions of different kinds (McCormack, 2012). Yet, I also offer a gentle counterpoint to Guattari's incessant search for the 'new' through the notion of iteration, which enables a consideration of how to hold on to particular components of models.

6

TOPOLOGICAL SENSIBILITIES

A pile of A3 paper is on my floor. It just sits there. I don't really know what to do with it. I know I don't want to throw it away. But I also know I can't make sense of what is scribbled on the sheets. They're from a workshop I was invited to, up in Aberdeen. They are a memento, perhaps. The invitation proposed that I join a discussion on 'Morphogenesis and Cultural Dynamics'.⁵⁷ Resonating with my interests in thinking about topology, space and experimentation, the event was appealing. Once I got to Aberdeen though, months after a trip to a 'topological media lab', a familiar feeling of confusion returned. The confusion is not lessened by returning to these notes. On the sheets of paper there are lines drawn in all sorts of directions, black, green, felt-tip; orange and purple chalk too. There are some equations; there are some notes. I look at the sheets of paper more closely at my desk, slowly leafing through them, turning them over, and carefully inspecting them. I'm not sure what I'm looking for. The pace picks up, papers fall to the floor once looked at. More notes: "topological space", a symbol, then "continuous". Another sheet: a purple rhombus. The chalk dust settles on my desk. None of this seems to help. Some squiggles, then a series of words; not quite a sentence,

⁵⁷ This was a presentation-workshop on topology in May 2011, at the Centre for Modern Thought, University of Aberdeen (<http://abdn.ac.uk/modern/node/220>).

a list perhaps. Open set; map; continuity; connectedness. Field/flow; dynamics; morphogenesis; topology.

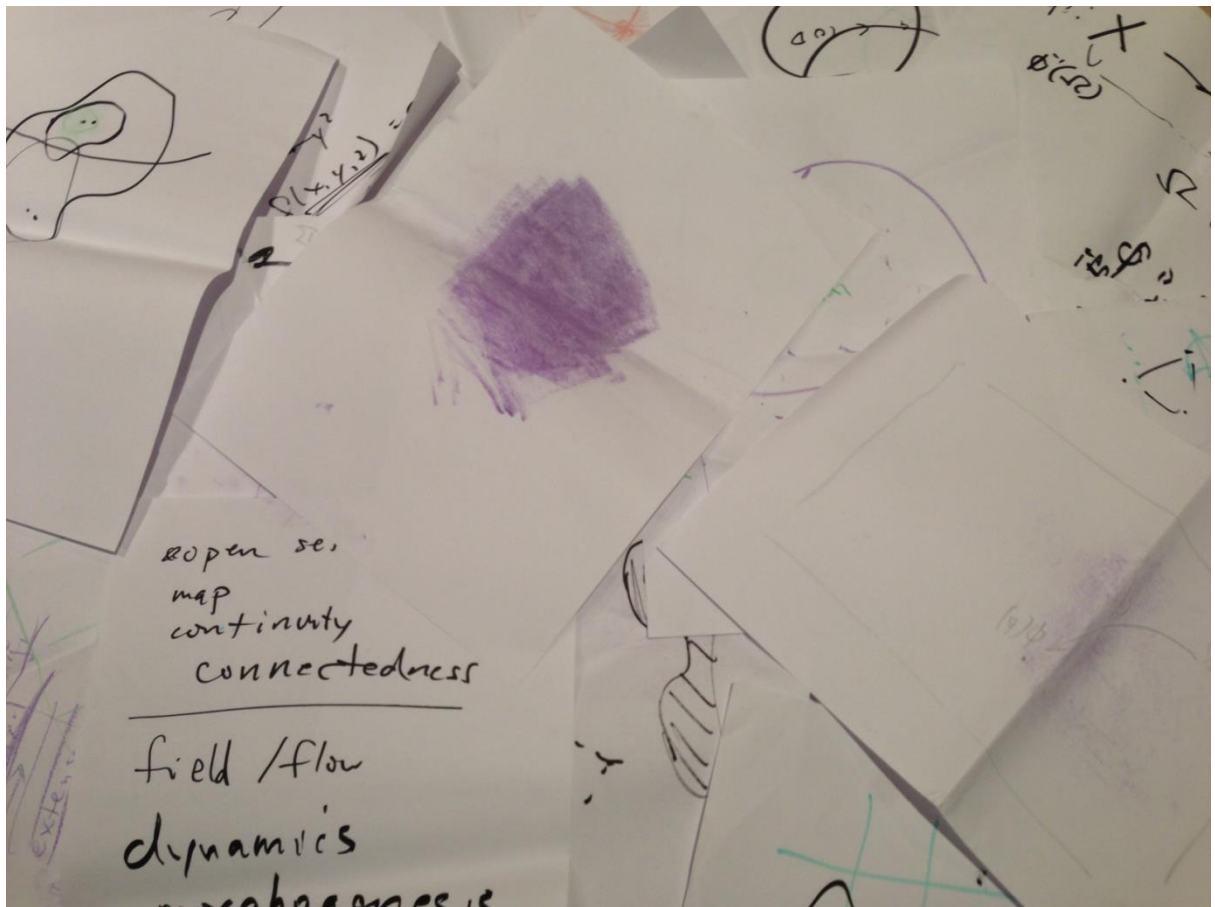


Figure 10: A pile of A3 paper

Topology is one of those words that, since finding a place in the discipline's vocabulary, has hovered over debates rather than been central to them. (Allen, 2011: 283)

Much contemporary geographical theory and writing rests explicitly or implicitly upon topological axioms and metaphors. (Rose and Wylie, 2006: 475)

While topology is a concept that has been employed within geography, it has tended not to be too closely investigated. The term has been used across a range of fields in the discipline, from urban geography (Amin, 2004; Amin and Thrift, 2002; Smith, 2003) to political geography (Allen, 2003; Gregory, 2004), and from biogeographies (Hinchliffe *et al.*, 2005; Whatmore, 2002) to re-considerations of the nature of space (Belcher *et al.*, 2008; Jones, 2009; Woodward *et al.*, 2010). What has been described as a “displacement of topographical with topological thinking” (Jones, 2009: 492), has seen the proliferation of terms such as “connectivity, network, assemblage, mobility, and in particular, relationality” (Rose and Wylie, 2006: 475). This ‘topological sensibility’ is perhaps indicative of the uptake of poststructuralist theorists within geography, notably the work of Gilles Deleuze (2006a) on ‘the fold’, but also various thinkers who have been grouped under the label of ‘actor-network theory’. The topic is particularly timely, given the publication of two special journal issues – one in *Dialogues in Human Geography*, the other forthcoming in *Theory, Culture & Society* – and a series of talks at the Tate Modern, all of which examine topology and how to make use of it.⁵⁸ These various engagements form the background context to the question I want to pose in this chapter: to what extent does topology prompt us to re-think space and spacings? In other words, what ‘shock to thought’ (Massumi, 2002b) does topology offer?

⁵⁸ The first special issue, in *Dialogues in Human Geography*, features a series of responses to a paper by John Allen. The second special issue, in *TCS*, is a result of a large project which goes by the acronym ATACD (A Topological Approach to Cultural Dynamics) (<http://www.atacd.net>). For further details of the Tate Modern's series of events on topology, see: <http://www.tate.org.uk/whats-on/tate-modern/eventseries/topology>.

This chapter pursues answers to these questions through interrogating human geography's topological sensibility. My concern here is with the price of admission for geographers, as social scientists, who might want to develop this sensibility. In particular I want to explore – through details drawn from an empirical context – how topological experiment demands the cultivation of forms of expertise that challenge some of the taken-for-granted reference points of geographical research. The first part of the chapter is a review of the literature on topology, and considers how geographers mobilise the term, and more precisely, what the term might do for our ways of understanding the space-times of experiment. This review suggests that topology has been part of a 'relational turn' within the discipline and that the term has primarily reached the discipline via philosophy, rather than mathematics. For this reason, the second part of the chapter turns to an engagement with mathematics, and point set topology. More specifically, this part of the chapter asks how topology is mobilised by the Topological Media Lab (TML), an 'atelier-laboratory' which hosts "philosophical, ethico-aesthetic experiments" (Sha, 2011: 121). Here I undertake a close reading of a paper on topology and morphogenesis by the TML's director (Sha, 2012).⁵⁹ This allows for an investigation of the juncture of mathematical, philosophical, and geographical concepts and practices, as well as an exploration of the relation between proof, proposition and abstraction. The third part of the chapter attends to the tension that is found between the metaphorical and the mathematical renderings of topology by drawing attention not only to how concepts are used and practised, but how they transform as they move across disciplines. To conclude, I briefly examine to what extent geographers have

⁵⁹ This article appears in the special issue of TCS and will also appear as a chapter in Sha's forthcoming book, *Poiesis and Enchantment in Topological Matter* (Sha, forthcoming).

developed a tendency for ‘shameless poaching’ (Massumi, 2002a) of concepts, or the ad hoc citation of isolated mathematical terms. Moreover, the chapter investigates to what extent topology is a useful concept for the social sciences, and specifically geography.

6.1.GEOGRAPHY AND TOPOLOGY

As both epigraphs make clear, topology is a term which has found a place in the discipline’s vocabulary. The appeal of topology, it has been argued, is its “looser, less rigid approach to space and time”, a “relief from the more fixed spatial trappings of ... geometry” (Allen, 2011: 283). That topology has not been investigated within geography is perhaps not altogether surprising. There are at least two reasons. Firstly, it requires an engagement with mathematics which remains uncommon within human geography (although see Abrahamsson, 2012; Elden, 2008). Secondly, it touches upon the thorny question of how concepts make their way from the sciences to the humanities and/or social sciences. Which mathematical concepts are taken up, deployed, rendered, and become part of particular vocabularies within human geography? Yet as Guattari (1995) notes, it is never simply a matter of vocabulary:

Conceptual tools open and close fields of the possible ... Their pragmatic fallout is often unforeseeable, distant and different. Who knows what will be taken up by others, for other uses, or what bifurcations they will lead to! (1995: 126)

To be sure, there is no straightforward relation between geography and topology; indeed the discipline’s engagement with the term has been rather piecemeal. Notwithstanding this, there are two points which cut across the various engagements. Firstly, topology’s resurgence has coincided with what has come to be

known as the 'relational turn' (Jones, 2009; Massey, 2004; Sheppard, 2008). Secondly, geography's engagement with the concept of topology has come through a reading of philosophy, rather than mathematics, and as such has tended to be metaphorical.

6.1.1. A 'RELATIONAL TURN'

Recent years have witnessed a burgeoning of work on 'thinking space relationally'. (Jones, 2009: 487)

It's all about relations, I think we can agree on this. (Harrison, 2011: 158)

Topology has been a feature of what has come to be termed the 'relational turn' within geography and beyond (Massey *et al.*, 1999; Massey, 2004; Murdoch, 2006). As Thrift (2008a) notes, relations have been the touchstone of much recent work in human geography. It is hard to deny that thinking space relationally has become something of a 'mantra' (Jones, 2009). The topological has been mobilised in many cases as a way of getting purchase on the notion of relations and relational space. Here I outline this turn to the relational and foreground what is at stake, before addressing more explicitly the topological.

To answer this, we might briefly look at how geographers have understood what space is. This has tended to be characterised and categorised into absolute, relative and relational space. Firstly: absolute space. When space emerged as a specific category of (Western) thought, it tended to be considered in a way that has come to be characterised as 'absolute' (Elden, 2009a). This is "space as fixed, as a container, as something in which all things happen" (2009a: 264). In other words, absolute space is a "condition in which space exists independently of any object(s) or relations" (Jones, 2009: 489) or an "unchanging box within which objects exist and

events occur” (Gregory, 2009: 708). Space in this sense can be represented as a grid, where each point is effectively the same. Absolute space then, is understandable through measurement and calculation. This is the view of space which underpins classical physics and is often termed Euclidean.⁶⁰ Secondly: relative space. In contrast to absolute space which figures space as an external coordinate system, relative space is defined between objects and events and “thereby made relative to the objects and events that constituted a spatial system or spatial structure” (Gregory, 2009: 708). According to this view, space and our experience of it is relative to other things, such as time, economic factors, or our perception. Thirdly: relational space. This is distinctive from absolute and relative understandings in that space does not exist as an entity in and of itself (see Jones, 2009). Instead, space is understood as a product of interrelations; space is ‘relationally constituted’. Stuart Elden notes that whilst the differences between relational and relative space are perhaps ‘overdrawn’, he suggests that this is because relative space remains “too close to the understandings of spatial science, and the stress on the relational allows [geographers] to escape from more narrowly conceived ideas of the relative” (2009a: 265). By understanding everything from places to identities as ‘relationally constituted’, there is a strong sense that these are open, provisional achievements.

In this regard, Doreen Massey’s (2005) celebrated monograph, *For Space*, reiterates the arguments for relational space. Indeed, Massey’s opening proposition, which she acknowledges “will come as no surprise at all to those who have been reading recent Anglophone geographical literature”, is simply that space is the “product of interrelations” (2005: 9). What is important here is her claim that thinking the

⁶⁰ Although Elden (2009a) notes that the term ‘Euclidean space’ is somewhat misleading, as Greek did not contain a word that was the equivalent of space. However, this space would be in line with Euclid’s postulates and axioms (see also, Elden, 2011: 305).

spatial this way can ‘shake up’ the ways in which political questions are formulated. Rather than engaging in an individualistic liberalism or identity politics, where identities are always already constituted, Massey’s anti-essentialist approach focuses on the very constitution of these identities and the relations through which they are constructed. It follows, then, that space is also a product of relations: space “does not exist prior to identities/entities and their relations” (2005: 10). Further, for there “to be relations there must of necessity be spacing” (2005: 39).⁶¹

6.1.2. THEORISING TOPOLOGY

The brief overview of how relational space is important as this style of thinking has become entrenched in the social sciences and human geography. Indeed, it is evident in:

science and technology writings (Latour, 1988; 1993; Law and Mol, 2001), human/non-human – nature hybridities (Thrift, 1994; Whatmore, 2002), accounts based in actor-network theory (Thrift, 1996; 2004; Hetherington and Law, 2000; Latour, 2005), world-city networks and topologies (Smith, 2003a; 2003b), cities more generally (Amin and Thrift, 2002), research on mobile objects (Laurier and Philo, 2003), Bergson-inspired approaches to the nature of time (compare Deleuze, 1988; Prigogine, 1997; Massey, 2005), discussions on political subjectivities and identity (Mouffe, 1993; 1995), new theories of local and regional development (Storper, 1997; Amin, 2004a; 2004b), and critiques of scale (Marston et al., 2005; Jones et al., 2007) ... the list goes on. (Jones, 2009: 492)

This is quite a list. While there has been much work on the notion of relational space, then, there has been much less critical engagement with how concepts have been used to get a purchase on this. What is particularly interesting is that where

⁶¹ Much more could be said on the topic of relations and there are “many emerging questions and unresolved tensions in geography’s treatment of ‘relations’ and ‘relationality’” (Anderson and Harrison, 2010: 15). It could be argued, though, that relations themselves have not been adequately explored thus far in human geography, especially with regards the work of William James or Gilbert Simondon (although see Debaise, 2012; Massumi, 2002a; 2011). This chapter, however, is more concerned with the concept and spatial imaginary of *topology* than relations.

the notion of topology has been used to describe or consider space as relational, it has been *informed not by mathematics, but by philosophy*.

Topology is a major field of mathematics but has a “long, but often unrecognized, roots in social science” (Paasi, 2011: 300); indeed, these roots go at least as far back as the 1930s (see Lundberg, 1939). During the zenith of positivist thinking, geometry was understood as the language of geography (Bunge, 1962) and David Harvey (1969) discussed the role of topology as part of his canonical book, *Explanation in Geography*. The “efforts to make sense of what ‘space’ is led Anglophonic geographers to look at the texts written by philosophers, physicists and cosmologists” (Paasi, 2011: 300). Indeed, in addition to Paasi, several other geographers have recently noted that topology is nothing new (Allen, 2011; Coleman, 2011; Latham, 2011). Current interest in topology marks a revival of efforts to make sense of or think space in a relational register and is sparked by the uptake of writings by post-structuralist thinkers (see Murdoch, 2006). Perhaps most notable in this regard has been the work of the philosopher Gilles Deleuze, who conceptualized relations as exterior and irreducible to their terms. As he puts it, the key point is that beginning from relations – that is to say, thinking relationally – opens up “a world in which the conjunction ‘and’ dethrones the interiority of the verb ‘is’” (Deleuze, 2001: 38). Crucially, Deleuze develops the concept of ‘the fold’ through his work on Leibniz (Deleuze, 2006a) and Foucault (Deleuze, 2006b), writing that:

To think is to fold, to double the outside with a coextensive inside. The general topology of thought, which had already begun ‘in the neighbourhood’, of the particular features, now ends up in the folding of the outside into the inside. (2006b: 97)

Here, Deleuze problematises the dualism of interiority and exteriority, suggesting instead that the inside is nothing more, nor less, than a fold of the outside (see also O'Sullivan, 2005: 103; Stivale, 2008). This argument complicates how we might consider space and is presented by thinking through topology. Why topology? Earlier in the same book, Deleuze draws from Foucault the idea that power is not located in a "privileged place, and can no longer accept a limited localization" (2006b: 24). As such, it is necessary to re-think space in terms of neighbourhoods. It is for this reason, then, that the second half of the book is entitled 'Topology: Thinking Otherwise'.

Many of these ideas are now found in the work of geographers, although they are not always explicitly acknowledged. For example, Ash Amin (Amin, 2002; 2004a; 2004b; 2007) has sought to grapple with variegated processes of spatial stretching. For Amin, the world is composed of heterogeneous spatial arrangements, differing in shape, reach, influence and duration. His relational reading of cities and regions is, he contends,

neither a-spatial (i.e. where the local is reduced to a mere stage) nor territorial (i.e. where the geographical local is all), but *topological* (i.e. where the local brings together different scales of practice/social action...) (2004a: 38, my emphasis)

In keeping with earlier writing, Amin hopes to signal the "possibility of a different insight (not a superior one) to scalar thinking" (2002: 386). Much like Deleuze, Amin suggests that topology is a way of thinking otherwise. The topological for Amin is contrasted to scalar (or territorial) logic. While the latter conceives of places as "sites of geographically proximate links or as territorial units" (2002: 386), the former understands space as "co-constituted, folded together, produced through practices, situated, multiple, and mobile" (2002: 389). Likewise, Richard Smith's

(2003) paper, *World city topologies*, develops “ideas from poststructuralism, actor-network theory, non-representational theory and complexity theory to begin to produce a topological consideration of cities in global networks” (2003: 561). Smith examines how various performances and practices *fold* the space-times of cities in ways that question the privileging of geometrical space. Here we find that the point of departure for Smith’s discussion is the work of Gilles Deleuze and the idea of space (or space-time) as folded. Everything is folding, unfolding, refolding; this is a world where boundaries, scales and territories are always temporary.⁶²

It is not only the philosophical writing of Deleuze which has informed contemporary human geography. For instance Michel Serres, another French philosopher, has also received interest in his rendering of topology. Indeed, Serres’ work has been taken up by a number of actor-network theorists (see Latour, 1993; Hetherington and Law, 2000; Serres with Latour, 1995) to consider spatial configurations. Take, for example, Serres’ oft-quoted passage from his fascinating series of conversations with Bruno Latour:

If you take a handkerchief and spread it out in order to iron it, you can see in it certain fixed distances and proximities. If you sketch a circle in one area, you can mark out nearby points and measure far-off distances. Then take the same handkerchief and crumple it, by putting it in your pocket. Two distant points suddenly are close, even superimposed. If, further, you tear it in certain places, two points that were close can become very distant. This science of nearness and rifts is called topology, while the science of stable and well-defined distances is called metrical geometry. (Serres with Latour, 1995: 60)

Echoing Deleuze⁶³, Serres calls attention to the foldings, unfoldings, and refoldings of space, rather than the coordinates of distance and proximity. What is particularly

⁶² John Mullarkey describes it thus: “As a topological concept, the fold is a complication of surfaces that offsets any temptation to step beyond the wholly immanent plane” (2006: 23).

⁶³ Indeed, on one of the very few occasions he acknowledges the work of a contemporary philosopher, Serres (1994) notes that “everything is folding, as Gilles Deleuze has rightly said” (Serres, 1994: 49; see also Connor, 2004).

interesting is how Serres' notion of topology has arrived at geography through encounters with actor-network theory. Indeed, even prior to *Conversations on Science, Culture, and Time*, Latour had argued that

Most of the difficulties we have in understanding science and technology proceed from our belief that space and time exist independently as an unshakeable reference *inside which* events and place would occur. (1987b: 228)

The implication here is that it is all too common to think in terms of absolute space and that to get a better purchase on science and technology, along with the rest of the world, it would be more productive to think space and time differently. Actor-network theory, such as it is, usefully collapses taken-for-granted notions of 'far' and 'close' by highlighting that "I can be one metre away from someone in the next telephone booth, and be nevertheless more closely connected to my mother 6000 miles away" (Latour, 1996: 371). An important paper in this regard, certainly for geographers, is John Law and Annemarie Mol's (2001) *Situating technoscience: an inquiry into spatialities*. Although there are more-or-less subtle differences in approach between Latour, Law and Mol, they all look to address similar questions, not just on how science happens but *where*. For Law and Mol

More complicated visions of spatiality are required. The challenge, then, is to inquire into the possibility of other, non-Euclidean, non-network, spatialities. (2001: 613)

They, too, are drawn to topology, which they contend "invents space by thinking up different rules for defining the circumstances in which shapes will change their form or not" (2001: 612). As Smith succinctly puts it, from reading Law and Mol, but also Latour, Serres or Deleuze, we learn "not only that space does not add up ... but that space is also rather messy, complex, juxtaposed, or perhaps that there are many kinds of space" (2003: 566). Sarah Whatmore's (2002) book *Hybrid Geographies* is an excellent example of how these various theorists have been engaged with in

geography. In attempting to think through how the “flux of worldly becomings takes, holds and changes shape” (2002: 5), Whatmore develops a number of conceptual shifts. Of particular interest here is her shift from geometries to topologies as a ‘spatial register’:

In place of the geometric habits that reiterate the world as a single grid-like surface ... hybrid mappings are necessarily topological, emphasizing the multiplicity of space-times generated in/by the movements and rhythms of heterogeneous association. (2002: 6)

The topological for Whatmore is a spatial vernacular which serves to “confound conventional cartographies” (2002: 162), to unsettle the coordinates of distance and proximity, the local and global, and the inside and outside. She uses topology to re-think wildlife, disrupting the space-times of the wild by juxtaposing remote configurations of ‘wildlife’. In so doing, Whatmore calls into question the spatial imaginary of wildlife as exterior, “reconfiguring the wild on the ‘inside’” (2002: 34). Elsewhere, John Allen (2003; 2004; 2011) has written in favour of considering power as a ‘topological arrangement’, that is to say “a relational effect of social interaction where there are no predefined distances or simple proximities to speak of” (2004: 19). Allen characterizes a ‘topology of power relations’ as the “ability to draw distant others within close reach or construct the close at hand at a distance” and is an attempt to imagine the geography of power differently (2004: 31). Importantly, Allen suggests a *tendency* for thinking topologically within geography (2004: 19).

While this is a somewhat brief discussion of various entry points for human geographers to consider topology, it is clear that there are many.⁶⁴ However, these varied readings of topology have been anti-essentialist. That is to say, topology has helped problematise conventional understandings of space. Indeed, as Alan Latham has recently argued

one of the principal attractions of topologically informed theorizations of space-time ... is precisely the way it places into question the very notion that we already know our basic spatiotemporal coordinates. (2011: 314)

So while all these differently-informed theorisations of topology, and in rethinking near/far, local/global, micro/macro (and a whole host of other dualisms), have come to have an important influence within human geography, it is worth reiterating that this makes its way from philosophy rather than mathematics. Moreover, some theorists do not seem to have recourse to mathematics at all: Law and Mol's (2001) paper features not one mathematician in their references.⁶⁵ What can seem rather strange, then, is that geographers have engaged with topology, a putatively mathematical concept, in a way that eschews mathematics. Put differently, topology as a concept or sensibility does not make its way from mathematics to geography in any simple fashion. Instead, topology as it figures in geography is at one remove from mathematics, translated and refigured through the work of various philosophers.

⁶⁴I am hesitant to discuss Jacques Lacan's (1901-1981) work in this regard, partly because geographers have tended not to theorise topology through his writings (although see Kingsbury, 2007). However, Lacan's interest in the concept was apparent throughout his seminars. As Ragland and Milanovic (2004: xiii) note "during the 1950s and 1960s he developed the topology of surfaces (torus, Möbius strip, Klein bottle, cross-cap), [and] from 1972 on he was to develop the topology of knots (Borromean, *le sinthome*)."

⁶⁵This point is echoed by Christian Abrahamsson, who notes that many of these "readings of the topological exclude, tout court, mathematics" (2012: 316).

If topology has made its way to human geographical thought through engagements with philosophy, it has also been deployed in a metaphorical sense. What this means is that topology has primarily *featured as a spatial metaphor*. If we return to Guattari once more and his consideration of the pragmatic fallout of concepts, this might be approached in a number of ways. Of course, fallout has to do with effects, with results. Yet what if we were to take it more literally, as fall-out? By this I mean: what does a concept lose in its movement from one domain to another, what is lost in translation? It is perhaps this that prompts Guattari to proclaim his distrust of pseudo-scientific terms; here he mentions topology, alongside thermodynamics, information theory, systems theory and linguistics. He argues that “we need to rid ourselves of all scientific references and metaphors in order to forge new paradigms that are instead ethico-aesthetic in inspiration” (Guattari, 2008: 25). Although it is left unclear as to why scientific references must be jettisoned (rather than reformulated), reading Guattari foregrounds the borrowings of terms from the ‘hard sciences’. We find a similar concern presented within geography by Paasi (2011) who asks if we need to ‘lean on’ geometric vocabularies.

Yet if we turn to Crang and Thrift’s (2000) collection *Thinking Space*, the editors note that they hope to explore how geographical concepts and metaphors are being used to think about the world. If we recall, human geographers have been attracted to philosophical thought in the hope that it allows for the re-imagination of space. Indeed, as Sarah Whatmore has it, the promise here is of engaging “new spatial metaphors, like networks, topologies and folds [which] attempt to hold on to the situatedness of social practices and relationships” (2002: 35). Is there, then, perhaps “a risk of ‘geometric fetishism’ when we use [geometric vocabularies] as

analogies, metaphors or even metonyms?” (Passi, 2011: 301). This could be taken further: to what extent do we need topology to get a purchase on thinking space? The geographer Martin Jones (2009), for example, is sceptical about what he describes as a ‘spatial project’ to replace topography with a topological understanding of space, place and politics. Jones contends that topology is not as open-ended as it has been inferred by geographers to be:

Relational thinking rarely questions whether ‘topology’ – a concept from mathematics that described the geometry of relations whose qualitative structure is robust to various kinds of transformation or ‘folding’ – has certain properties that ensure that its relational constituents and coordinates return to their spatial form. (2009: 495)⁶⁶

Is it the case that, as Stuart Elden has put it, “the precision of terminological formulations [of topology] tends to be lacking” (2011: 305)? What does this do to the kinds of theory we use, and how we approach theory?

6.2.TML AND TOPOLOGY

We might turn to attempts to put topological forms of thinking into practice in contexts designed and configured explicitly as experimental. Accordingly, the chapter now turns to the Topological Media Lab (TML) in Montreal which I visited for a few months in late 2009. Like the SenseLab, the TML is one of a series of laboratories established to explore the theoretico-practical implications of research-creation. Originally initiated in 2001 at the ‘Graphics, Visualization and Usability Center’ at Georgia Institute of Technology in Atlanta, the TML moved to Concordia and the Hexagram network in Montreal in 2005. The lab director, Sha Xin Wei, describes the space as a “hybrid of ... collective art atelier, a theatre company, and

⁶⁶ Jones does, however, note that the rare exception to this is Sarah Whatmore’s (2002) *Hybrid Geographies* (see Jones, 2009: 495).

an engineering lab” (2011: 63). This self-styled atelier-lab⁶⁷ has been home to around sixty graduate students, artists and scholars since its establishment at Concordia. The members, or affiliates, of the lab come from a diverse range of practices and disciplines. Furthermore, there have been a number of researchers with an ethnographic interest in the TML’s ecology of practices⁶⁸, and with good reason: this ‘hybrid’ lab is a fascinating place.



Figure 11: The TML © TML

There are artefacts from previous experiments lying on the floor or attached to the wall, boards covered with what look like notes or drawings, and a metallic grid above has leads and lights hanging haphazardly from it. A scaffolding of sorts. Occasionally, when it gets too much, there is a clean-out. There are lots of windows, looking out over the city and towards the river, yet the room still feels dark. There are, perhaps, a handful of people in the lab, often found working at the jumble of computers dotted around the large rectangular room, all with their own name.

Attracted not only to the name of the lab but by the hunch that there was some interesting philosophical-cum-mathematical-cum-artistic work being done, I

⁶⁷ Earlier descriptions of the TML include ‘atelier-studio-lab’ and ‘studio-laboratory’ (see Sha, 2007: 615).

⁶⁸ These include Lina Dib (Rice University) and Georgina Born (University of Oxford).

wanted to explore what a more thorough – theoretical or otherwise – engagement with topology might offer. It was shortly before visiting the TML that a message sent over the mailing list reaffirmed this conviction.⁶⁹ Addressed to the ‘TMLabbers’, the email pulled no punches.

Ad hoc citation of isolated signifiers* from mathematics has lent many theories their aura over the past hundred years, with subsequent warranted but unfortunately exaggerated corrections (viz. Lacan, Levi-Strauss, Deleuze, Thom, and perhaps Badiou is in for it next).

I scanned the rest of the message in search of the asterisk, finding it right at the end.

* terms like space, time, network, state, topology, dynamic, system, metastable, random, noise. etc. that obscure more than they explicate, when used thoughtlessly (not to speak of fractal and self-similar, which thankfully seem to be finally fading out of usage, because of their trivial content).

It was all rather worrying. It wasn’t that I disagreed; rather it was the suggested reading to curb this tendency to ad hoc citation. A mathematics textbook: Garrity’s (2002) *All the Mathematics You Missed: But Need to Know for Graduate School*. This textbook, the email made clear, was the single best volume on mathematics, the ‘real stuff’. Armed with this book, or rather having read this book, I would become familiar with “a fair swath of mathematical knowledge rather than a few isolated terms* that are used entirely out of proportion to their significance to the rest of mathematics”. Yes, the asterisk had been used again. More was to follow. This textbook was *friendly*. Yes, it was italicized. It also turned out that there was a specialized introduction to topology to read. This second book would “make a lot of sense if read after Garrity, and before Milles Plateaux”!⁷⁰

⁶⁹ The TML List <tml-active@concordia.ca>; email sent 27/09/09.

⁷⁰ This second book is Klaus Jänich’s (1980) *Topology*. The book *Milles Plateaux* is more commonly known as *A Thousand Plateaus* by Gilles Deleuze and Félix Guattari (2004).

I think that there are two points that are worth calling attention to here. Firstly, that those working at the TML are expected to be well-versed in mathematics. This might not seem terribly important; after all the name indicates that the lab might have something to do with maths. And yet it is not so common to find a laboratory of/for mathematics. This raises a series of questions. What does the TML do? What does it produce? What does it research? Moreover, why does it need mathematics? Secondly, the email suggests, somewhat surprisingly, that to understand the work of Deleuze (and Guattari) it might be necessary to have a good understanding of mathematics. The implication here is that my claim in the preceding section – that geographers have engaged with topology through philosophy rather than mathematics – might become difficult to maintain. What I mean by this is that the sort of philosophy which has been read by geographers has itself been informed by mathematics.

The following section is in three parts. It opens with a brief sketch of the TML and introduces the notion of topological media. Next, it works through point set topology and how this differs from other contemporary mathematical-philosophical approaches, such as set theory. Finally, the chapter considers how proofs operate by propositional logic.

6.2.1. THE TML

What of topology in all this? After all, it seems that this atelier-lab is concerned with processes of subjectivation, agency and materiality.⁷¹ There are no equations up on

⁷¹ “The Topological Media Lab provides a locus for studying subjectivation, agency and materiality from phenomenological, social and computational perspectives.” This was the opening line from the TML’s previous build of its website, and is now part of the current ‘About’ page (<http://topologicalmedialab.net/about>) This chapter does not, however, attend to the TML’s

a blackboard and few books, let alone mathematics books lying around the lab. Topology is vital, however. In order for those at the TML to experimentally explore these themes, they study and invent *topological media*. Topological media are understood as “physical and computational matter, image or sound evolving as continuous substances under continuous action”.⁷² In practice this means that to develop topological media is about exploring – in the setting of media arts and performance – the aesthetic and ethical consequences of ‘topologically’ creating performative events and computational media (Sha, forthcoming). To create topologically, in this view, is about proposing that mathematics could be used “not as an instrument or measure, or a replacement for God, but as a poetic articulation, or perhaps in less artful manner, a stammered experimental approach to cultural dynamics” (Sha, 2012: 220). The TML, therefore, starts with

the simplest symbolic substances that respect the lifeworld’s continuous dynamism, change, temporality, unbounded transformation, morphogenesis, superposability, continuity, density, and value, and yet are free of or at least agnostic with respect to measure, metric, counting, finitude, formal logic, syntax, grammar, digitality, and computability, in short free of the formal structures that would put a cage over all of the lifeworld. I call these substances *topological media*. (Sha, 2012: 220)

We can take from this that topological media both respect change and are free of, or agnostic to, formal structures. This is important for those at the TML, who note that

The motivation for this work is that topology furnishes us with concepts well-adapted for ... articulating the world as plenum stuff rather than objects with an *a priori* schema. Topology is a more primordial mode of articulation than number or geometry. With care, it may provide a fruitful approach to morphogenesis and cultural dynamics that is [not] reductive... (Sha, 2012: 222)

Putting to one side the somewhat bemusing term primordial, rarely used in the social sciences, what is appealing about this exposition of topology is that it is

phenomenological leanings, although these are certainly an important aspect, particularly in terms of reading groups.

⁷² See <http://topologicalmedialab.net/research>.

understood as a mode of articulation.⁷³ Further, the injunction – the ‘with care’ – seems crucial. What does this entail? How could topology be deployed as a mode of articulation? And what does this add to the way in which geography and the social sciences have taken up the concept? What I want to do here is to suggest that an encounter with the TML can make a difference to contemporary geographical thinking about topology.

6.2.2. POINT-SET TOPOLOGY

Topology as mathematicians have developed it over the past hundred years comprises an enormous range of spaces, mappings, properties and concepts (Sha, 2012: 225).

... point-set topology makes accessible to our spatial imagination a great number of problems (Jänich, 1984: 2)

Point-set topology emerged during the nineteenth century, at a time when the concept of geometry was being radically rethought. Much as with geography’s shift in interest from absolute space to more relational understandings, mathematicians jettisoned the idea that geometry was the “mathematical theory of real physical space that surrounds us” and began to consider how it could be “made to work in abstract ‘space’, such as n -dimensional manifolds, projective space, Riemann surfaces, function spaces etc” (Jänich, 1984: 3). Point-set topology is also known as general topology or set-theoretic topology and consists of “developing a convenient language to talk about when various points in a space are near to one another and about the notion of continuity” (Garrity, 2002: 63). Furthermore, point-set topology allows one to provide articulations of various notions, such as neighbourhood or connectedness, *without relying on numerical measure or metric*. Topology

⁷³ It is left unspecified how articulation may differ from description, although at one point in the paper Sha argues that descriptions *are* articulations.

“articulates what exceeds number and metrized geometry” (Sha, 2005: 82) which is vital as it is not always possible to know a phenomenon metrically.

As the name suggests, the notion of sets is important. However, there are differences from set theory. The basic axioms of set theory include the notion of inclusion (or membership), subset, intersection and union. As Sha (2012) notes, what is powerful about this is that there is no restriction on how a set may be defined. Indeed, “it is set theory’s lack of structure ... that makes it such an ample notion: anything can be in a set” (2012: 229).⁷⁴ However, Sha’s concern “is not to explicate or repair set theory, but to pass on to fields richer than bare sets” (2012: 229). Intriguingly, point-set topology is rendered as “one step up from bare set theory”: it is the next sparsest set of concepts in mathematics but has “the barest whiff of structure” (2012: 229). What is sparse about set theory though? After all, Alain Badiou has made set theory the formal framework for his ontology (see Badiou, 2005; 2006; Hallward, 2003).⁷⁵ Sha’s retort is that set theory is too sparse “to accommodate being in the world without severe distortions of our felt experience” (2012: 229). This sounds rather vague but, put simply, he contends that set theory requires too much work to be worthwhile.⁷⁶ All the same, this rejection of set theory seems strange given that it informs point-set topology. To be sure, the key notion is that of the open set.

The open set is the most basic notion in point-set topology, but a set is never definable as open in itself; it is always defined relative to a topology, which is a set X of which U is a subset, together with a family of the subsets of X that are declared to be open. (Sha, 2012: 231)

⁷⁴ Set theory’s “great flexibility” is also noted by Oliver Feltham and Justin Clemens (2005: 13) in their brief yet illuminating introduction to Alain Badiou’s philosophy.

⁷⁵ On why Badiou works with set theory, see Feltham (2008: 91-94).

⁷⁶ Here he points to Whitehead and Russell’s *Principia Mathematica*, where they prove that $1+1=2$ after 1000 pages or so (Sha, 2012).

These subsets must satisfy the following definition (see Garrity, 2002: 63-64):

Let X be a set of points. A collection of subsets $U = \{U_\alpha\}$ forms a topology on X if

1. Any arbitrary union of the U_α is another set in the collection U .
2. The intersection of any finite number of sets U_α in the collection U is another set in U .
3. Both the empty set Φ and the whole space X must be in U .

The pair (X, U) is called a *topological space*.

What to make of this definition? It is all too tempting to skip over this. First of all, for social scientists this presents a disconcerting change of address: let X be a set of points. Then there is the difficulty of understanding what is being defined. Moreover, there is the nagging feeling that when you read that point set topology was developed to 'better understand' notions such as continuity and dimension, it is as if there are *correct* definitions of these terms. Of course there needs to be an initial investment (the textbook informs me), in learning the basic terms. Much of point set topology consists in developing a 'convenient language' to talk about when various points in space are near to one another and about the notion of continuity. But when the textbook announces that it "should not be at all apparent why this definition would be useful, much less important" (2002: 64), it is difficult to persevere with this investment.

6.2.3. PROOFS AND PROPOSITIONS

On a number of occasions in Sha's own writing he pauses to reflect on precisely this issue, what he describes as the level of detail needed for the reader. I am left pondering his own question: how to "offer the reader the conceptual grit and grip needed to make his or her own concepts, but not too much to obscure the essential

ideas” (Sha, 2012: 225). His argument is that proofs “advance and thicken the argument, rather than demonstrate the truth and force of a theorem” (Sha, 2012: 225). Yet as soon as I encounter a definition, or a proposition or lemma, let alone a proof, I struggle to read through it. A haunting line: “It should not be at all apparent why this definition would be useful, much less important”. I could not agree more.⁷⁷

I try to brush up on my maths. I read a few textbooks, or at least chapters of textbooks, even long after visiting the TML. Another email catches my attention on the mailing list: there is to be a series of maths class at the atelier-lab for those interested. It seems that it is not only me who is struggling; perhaps this is what happens when different forms of expertise rub up against one another. What’s more, the email notes that “it would be great if you can follow a proof and understand some of the process of propositional adventures to which Stengers gestured”.⁷⁸

Based on some primordial concepts ... we have built up a miniature theory that allows us to describe phenomena in qualitative terms and make definite statements about them. These statements, being axioms and theorems, hold in all situations where we have checked that the three basic conditions for a topology are satisfied. They are propositional in Isabelle Stengers’ sense. (Sha, 2012: 242)

What then is a proposition? Moreover, how can proofs be propositional? To begin to get at this, I want to suggest that we first need to consider proofs as forms of abstraction. If we turn to Stengers, as Sha suggests, we find that she is drawing on the work of Alfred North Whitehead.

Abstractions, for Whitehead, are not ‘abstract forms’ that determine what we feel, perceive and think, nor are they ‘abstracted from’ something more concrete, and, finally, they are not generalizations. (Stengers, 2008a: 95-96)

⁷⁷ It did not help to read that “[n]o one can learn topology merely by poring over the definitions, theorems, and examples that are worked out in the text.” (Munkres, 2000: xi)

⁷⁸ The TML List <tml-active@concordia.ca>; email sent 14/06/10.

Stengers continues:

Whitehead was a mathematician, and no mathematician would endorse such definitions. But most of them would endorse Whitehead's idea that abstractions act as 'lures', luring attention toward 'something that matters', vectorizing concrete experience. Just think of the difference between the mute perplexity and disarray of anybody who faces a mathematical proposition or equation as a meaningless sequence of signs, as opposed to someone who looks at this same sequence and immediately knows how to deal with it, or is passionately aware that a new possibility for doing mathematics may be present. (Stengers, 2008a: 96)

The mute perplexity and disarray of anybody who faces a mathematical proposition sounds familiar. So too does the idea that proofs, abstractions, can lure attention towards something that matters, although it is not quite clear what this is with topology. With Whitehead, then, we can conceive the aim of abstraction as not being "to produce new definitions of what we consensually perceive and name, but to induce empirically felt variations in the way our experience matters" (Stengers, 2008a: 96). Given this brief discussion of abstraction, it is now possible to understand propositions anew. Propositions, one of the major inventions of Whitehead's philosophy – so Stengers claims (2011b: 396) – cannot in themselves be said to be true or false (2011b: 413). Whitehead prefers to speak of propositions rather than judgement. Judgement tends to imply that the function of theory "is to be judged as to their truth or falsehood", whereas any proposition that is admitted into thought is felt (Whitehead, 1978: 185; see also Shaviro, 2009: 3).

One might as well be talking to a stone! This is the desperate exclamation of a mathematics teacher when a student does not produce the 'I get it' that signals the entertainment of the propositional feeling required by mathematical definitions, even though they appear fully explicit to the teacher. (Stengers, 2011b: 416)

What Sha is arguing, then, is that a proof may well thicken and advance an argument as a lure for feeling. The question that remains is to what extent these lures for feeling *work*. This also highlights the immense work of translation that topology has

had to undergo from mathematics, through philosophy, and on to the humanities, social sciences and geography. Characterised as a tension between conceptual fidelity and experimentation, I now turn to how the concepts move and mutate, with particular attention to topology.

6.3. FIDELITY AND EXPERIMENTATION

How do concepts make their way from the sciences to the humanities and/or social sciences? To what extent is it necessary to be faithful to a concept's original usage? There is, as Brian Massumi has noted, a certain touchiness surrounding the matter of 'theft' from science for the humanities. In his witty and provocative style, Massumi sets the scene:

It's not science anymore, they say, once those silly humanities people get their hands on it. It's all 'wrong'. As well it should. Getting it 'right' could only mean one thing: applying the results of science to the humanities. (Massumi, 2002a: 19)

Presenting somewhat of a caricature, Massumi goes on to describe the way in which the humanities or social sciences

isolate an attractive scientific or mathematical concept and add it to the repertoire of their own disciplinary system, like an exotic pet. Scientist might rightly object that the concept has ceased to have anything remotely scientific about it and is just functioning as a metaphor. (2002a: 19)

How might this criticism be avoided, or refuted?

The optimal situation would be to take a scientific concept and use it in such a way that it ceases to be systematically scientific but doesn't end up tamed, a metaphorical exhibit in someone else's menagerie. (2002a: 20)

The trick, Massumi suggests, is not to make the social sciences (or geography) scientific, but to borrow from science in order to make a difference in the social sciences. Besides, scientists should not feel threatened by 'respectful betrayals' as

poaching a scientific concept in no way prevents it from continuing to function in its home environment. It's not a zero-sum game. It's additive. (2002a: 21)

We find something consonant with this additive ethos when reading Sha. After all, he claims to introduce both more and less than what mathematicians call topology. More, as he refers to fields of articulation and shared experience; and less, as he engages with “the intuitive essences of the concepts and their derivations, which in mathematics take the form of logical (but not formally mechanized) proof” (Sha, 2012: 222). Crucially, Sha writes that mathematicians will “note that for the sake of concision I am using these terms *mildly but responsibly loosened* from the contexts in which they traditionally have been defined” (Sha, 2012: 222; my emphasis). A respectful betrayal perhaps.

6.3.1. RE-THINKING METAPHORS: ANEXACT

Topology has primarily featured in the social sciences and in geography as a spatial metaphor, which seems at odds with how it is understood within mathematics as a mode of articulation. There is a sense that metaphorical usage of the term topology is not adequate, that to mention it briefly does not add much to an understanding of space. Perhaps topology is indeed “a metaphorical exhibit in someone else’s menagerie.” It is this tension between whether topology is to be understood as concept or in terms of metaphor that I want to address here.⁷⁹ What is particularly interesting about this is that those philosophers who have been important in developing an interest in the topological within the discipline, in particular Deleuze and Serres, have had strong views on metaphors.

⁷⁹ Interestingly, when discussing the work of Foucault, the geographer Chris Philo settles on the term ‘conceptual-metaphorical’ devices (Philo, 1992).

Deleuze is notoriously hostile to metaphor. Deleuze's apparent rejection of metaphor is due to it being used as signification or designation, or, more simply, representation.⁸⁰ Indeed, this view is perhaps best expressed in Deleuze and Guattari's (1986) reading of Kafka. There they cite an entry of his diary: "Metaphors are one of the things that make me despair of literature" (1986: 22; see Kafka, 1988). And yet, Jean-Jacques Lecercle argues that

this enemy of metaphor [Deleuze] is as fine and prolific a creator, or importer, of metaphors as the most figuratively inclined of poets could wish for. [...] The deliberately inexact transfer of a word from its original field into another is, of course, a reformulation of the standard definition of metaphor. (Lecercle, 2002: 26)

An unlikely ally for Lecercle is Alain Badiou, who forthrightly observes in the preface to his book on Deleuze, *The Clamor of Being* that "Deleuze's preferences were for differential calculus and Riemannian manifolds, from which he drew powerful metaphors (and yes, I do mean metaphors)" (Badiou, 2000: 1).⁸¹ Tellingly, Badiou's vicious reiteration is precisely because Deleuze so emphatically rejected metaphor. In response to this, we might simply point to the differences in type of mathematics each thinker prefers (see Smith, 2003). We might also let Deleuze reply, from beyond the grave, via an interview where he is accused of something similar. Deleuze's retort is that

there are two sorts of scientific notions ... There are notions that are exact in nature, quantitative, defined by equations, and whose very meaning lies in their exactness: a philosopher or writer can use these only metaphorically, and that's quite wrong, because they belong to exact science. But there are also essentially inexact yet completely rigorous notions that scientists can't do without, which belong equally to scientists, philosophers and artists. (1995: 29)

⁸⁰ "What Deleuze objects to in metaphor ... is the twin structure of truth and representation that the concept carries with it" (Lecercle, 2002: 27).

⁸¹ Badiou explains that he prefers "algebra and sets" (2000: 1). However, Constantinou (2009) has written on Badiou's topological ethics.

This is put somewhat more straightforwardly in *A Thousand Plateaus*. Here Deleuze and Guattari use the phrase “anexact yet rigorous”, explaining that this is “essentially and not accidentally inexact” (Deleuze and Guattari, 2004b: 405). Once more, we are left considering Massumi’s ‘respectful betrayals’. The point here is not to become more scientific, but to borrow from science in order to make a difference in the humanities or social sciences (Massumi, 2002a). Note, incidentally, the turn of phrase, anexact yet rigorous, is borrowed from Michel Serres (see Deleuze and Guattari, 2004b: 618n.32). Serres, however, is less concerned with abandoning the metaphor than reformulating it.

Metaphor, in fact, means ‘transport’. That’s Hermes’s very method: he exports and imports; thus, he traverses. He invents and can be mistaken – because of analogies which are dangerous and even forbidden – but we know of no other route to invention. The messenger’s impression of foreignness comes from this contribution: that transport is the best and worst thing, the clearest and the most obscure, the craziest and the most certain. (Serres and Latour, 1995: 66)

Serres cogently argues that metaphor has everything to do with transport, with the exporting and importing of terms. It could be argued, then, that Deleuze, and Deleuze and Guattari, are indeed working with metaphors, but not in the sense that Badiou or Lecerclé suggest. Instead, Deleuze and Guattari develop Serrean metaphors which are all about the movement of concepts, untethering them from particular fields, domains or disciplines and putting them to work elsewhere, making them resonate or echo.

In considering the work of metaphor, we might follow up on Sha’s reference to Gilles Châtelet’s (2000) *Figuring Space: Philosophy, Mathematics and Physics*.⁸² Whilst the title is in itself intriguing for geographers, it is the way in which

⁸² Gilles Châtelet (1944-1989) was a French mathematician and philosopher who remains rather obscure (see Galloway, 2011).

metaphor is conceived that is my concern. The introduction announces not only that the book marks a significant moment in the re-examination of the practice of mathematics but that

Châtelet's discussion and use of metaphor shows that he thinks of metaphor as a form of technology and perhaps even more precisely as a kind of conceptual scaffolding. (Knoespel, 2000: xx)

Once more, we find that metaphor can be rethought; in this instance as a kind of conceptual scaffolding.⁸³ Here, "science, art and philosophy brush against one another without merging" (Châtelet, 2000: 53). For Châtelet as much as for Sha, metaphor is a vehicle for thought and for altering the way in which one thinks.

6.4. CONCLUSION: WHITHER TOPOLOGY?

Geographers have had a long-standing concern with rethinking theoretical approaches to space, appropriating ideas from a range of disciplines, such as anthropology, art, literary studies, economics, performance, philosophy, physics and political theory (Merriman *et al.*, 2012). Recently, a number of papers have suggested that human geography is showing increasing renewal of interest in mathematics (Abrahamsson, 2012; Elden, 2008). Much of this interest has been fuelled by the translation and uptake of Alain Badiou's polemical works (see Dewsbury, 2007; Doel, 2009; Saldanha, 2007). This renewal of interest has not been limited to Badiou, however, as can be seen in the recent issue of *Environment and Planning D* on Mathematics and Space (see MacKenzie, 2012, Meillasoux, 2012; Plotnitsky, 2012; Serres, 2012) and invites the question: what can mathematics do?

⁸³ This is a term which permeates Sha's (2012) writing on topology.

As Stuart Elden puts, “what does this embrace of ... other branches of mathematics ... allow us to do that we could not do otherwise?” (2008: 2646).

Yet, as I have argued, topology has reached the discipline not through mathematics but rather through philosophy. Therefore, to claim that there has been an interest in mathematics and space is not quite accurate; rather, there has been an interest in mathematical terms and geography. In this regard, topology is not the only mathematical term. Here we might think of multiplicity, singularity and transversal, to name but a few. These terms are crucial because the very style of thought is “oriented by spatial relations, the way in which we imagine what to think” (Colebrook, 2005: 190). In other words, what kind of mathematical terms for what kind of experimental geography?

As a particular mathematical term, topology was developed in the early twentieth century, yet it is in the last decade or so that it has emerged as a potentially powerful heuristic tool in the arts, social sciences and humanities. Indeed, topology has been taken up in a variety of ways by different disciplines, chiefly as a way of thinking invariance and continuity. The focus has been on topology because although there has been a *tendency* for thinking topologically within human geography (see Allen, 2004) this has received little in the way of scrutiny. As a non-metric mathematics of relations, topology is productive for thinking space in a way that foregrounds transformative properties and the dynamic nature of relations. Indeed, the use of the term has coincided and resonated with an emphasis on relations in the discipline, and has contributed to complicating the thinking space of human geography.

What, then, does this encounter with the TML tell us about the opportunities and difficulties associated with thinking topologically as part of the process of experimenting? Let me begin with the difficulties. My original concern was that to develop a topological sensibility required a great deal of mathematical understanding. To be sure, the TML demanded a certain level of expertise that proved challenging for a social scientist. The encounter illustrates that even the most basic notions of topology require an engagement with a different style of thinking, that of 'proofs' and 'definite statements'. Despite this, Sha's (2012) insistence on understanding proof as a propositional adventure affirms that mathematics has much to do with abstractions which can act as lures (Stengers, 2008a). Precisely because these lures are not known in advance, they arise in the thinking-feeling, a tension between conceptual fidelity and experimentation can develop.

Rather than argue that there is a correct definition or understanding to topology, I affirm that there are different versions or takes of the same term. For example, in an earlier paper by Sha (2002), we find a brief methodological note: he uses topology "in its full *but not exclusively* mathematical sense" (2002: 460, my emphasis). However, there is something to be said for exploring what these translational experiments, or experimental translations produce (Plotnitsky, 2012). The polymath, Arkady Plotnitsky, speculates that we "need rigorous experimentation in which rigor, too, can be experimented with" (2012: 363).

This chapter can be understood as a specific entry point for considering the interpenetration of mathematics and space (see Abrahamsson, 2012):⁸⁴ it is an inquiry into how to make sense of topology. The chapter can also be read as an exploration of the movement and mutation of a concept as it roves across different domains. Here it has much to do with an experimental translation (Plotnitsky, 2012) of the term and topology can be understood to function as an anexact metaphor in much of social scientific and geographical thought. It is in this sense of rigorous experimental translations that I read both Massumi's (2002a) respectful betrayals, and Deleuze (and Deleuze and Guattari's) use of the anexact. Just as proofs can be read as propositions, with Stengers and Whitehead, so too can these experimental translations. Neither true nor false, these translations, metaphors or betrayals, problematise an easy division between fidelity (to a concept's original domain or field) and experimentation (in using a concept to make a difference elsewhere). As the chapter indicates, this movement and mutation of the concept, as it has made its way from mathematics does not render it wrong or fruitless. Consequently, topology as a concept, or a particular style of thinking, does not necessarily require greater conceptual precision if it is to be used by geographers.

Far from seeking more clarity in its dealings with topological thinking, human geographers should keep experimenting with exactly those kinds of metaphorical proliferation ... What is more, such a proliferation does not represent a loosening of rigour. It rather represents a vital attempt to enliven and enlarge human geography's spatial imagination. (Latham, 2011: 315)

⁸⁴ There are a number of texts which can be considered to form part of a wider history about the role of mathematics in geography (see Cole, 1969; Harvey, 1969; Sack, 1972).

7

EXPERIMENTAL ECOLOGIES

The labs are back. This claim, found right at the start of a booklet I stumble across during fieldwork while rummaging through the library at the FoAM lab, strikes a chord because after a period of interest in the 1970s and 1980s, labs have only recently attracted renewed interest by geographers. Labs are back on the agenda, in the spotlight, under investigation. What does this renaissance entail? There has been an astounding proliferation of different forms of labs, ranging from experimental labs to mobile labs, from labs in the city to labs in academia, and from finance labs to artist-run labs. Echoing the burgeoning interest in the entanglements of geographies and experimentation that has been foregrounded heretofore, this chapter examines the contention that it is impossible to offer a single definition of these labs (Broeckmann, 2010; Hörtner, 2010; Plohman, 2010) but that there may also be ways of grasping and gathering together a sense of what give these spaces a certain consistency.⁸⁵ Indeed, it has been claimed that the strength of these labs “lies in their otherness, their difference, their complex ecology and diversity of ecologies, their variety and differences” (Rackham, 2010: 18).

⁸⁵ Much of the work referenced here focuses on the notion of the ‘media lab’. For those involved, defining what a media lab is, or does, is impossible. It is for precisely this reason that it is necessary to develop ways of thinking these alternative spaces or hybrid fora (Callon *et al.*, 2009).

While geographers and social scientists have been interested in sites of experimentation, they have also attended to how experimental practices tend to exceed these sites, variously described as a condition of ‘experimentality’ (Szerszynski, 2009), ‘experimental society’ (Davies, 2010), and the ‘laboratization of society’ (Callon *et al.*, 2009). This last term “does not mean that society is reduced to one huge laboratory” but that “new spaces of action [are] opened up by the installation of new laboratories” (Callon *et al.*, 2009: 67). If experimentation is exceeding particular sites, then it is crucial to attend to where they are taking place. Moreover, if new laboratories are being established which open up new spaces of action, it seems vital to examine what sorts of actions, or practices, are made possible and performed. This, then, is an attempt not only to expand the notion of the contemporary laboratory, but to elaborate upon how these extra-scientific labs operate. Specifically, I want to consider what it might mean to think of this emerging sense of experimentalism in terms of the emergence of a kind of ecology. Accordingly, the opening section of the chapter examines this relation between ecology and experiment, principally through Isabelle Stengers’ notion of ‘ecology of practices’. It matters that we think of experiment in terms of an ‘ecology of practices’ for several reasons for this. Firstly, it is an attempt to avoid a kind of reductionism, where experiment is understood to be site-specific. Secondly, I argue that an ecology of practices provides a way of holding onto the specificity of situations and how these situations make a difference to thinking. Thirdly, I also invoke ecology in order to suggest some sense of a shared set of approaches or dispositions.

What might this ecological model look like? In the second section, the chapter suggests that we might find possible answers to these questions by examining the transdisciplinary laboratory, FoAM. The lab motto, to 'grow your own worlds', at once echoes the theoretical elaborations on the installation of new spaces of experiment and troubles the notion of a singular lab. FoAM presents a number of difficulties as it is neither a scientific lab, nor a media lab, nor another recognizable type of lab; perhaps more importantly, it is distributed. FoAM as a lab is figured across a number of different spaces, such as the studio, the retreat, the field and the kitchen. By examining these different spaces and their relation to other sorts of workspaces, such as the studio and the scientific laboratory, the chapter problematises the notion of a coherent lab-space and puts to the test the proposition that we might best understand this emerging geography of experiment in terms of what Stengers call an 'ecology of practices'.

Following on from the different spaces of experiment, the third section of the chapter interrogates what kinds of experiment take place as part of FoAM. FoAM's description of their experiments range from 'small' to 'strange', from 'transdisciplinary' to 'public', but these terms do not allow for much purchase on the varied activities. Instead, the chapter puts to work Stengers' ecology of practices to consider which experimental techniques are practised. The chapter therefore works through two case-events, a retreat and a public experiment, to empirically consider the relation between ecology and experiment. The chapter concludes by way of Félix Guattari's ecosophy and reflects on how an 'ecology of practices' can be put to a kind of test, rather than applied.

7.1. EXPERIMENT AND ECOLOGY

I want to propose that we think of this emerging sense of experimentalism in terms of a kind of ecology. This is an ecology which is understood as “an interconnected series of parts, but ... not a fixed order of parts” (Bennett, 2010: 97). This chapter identifies a series of resonances between ecology and experiment, drawing on Isabelle Stengers’ notion of an ‘ecology of practices’ (2005a; 2005b; 2010; 2011a; 2011c), as well as the work of Jane Bennett (2010) and Félix Guattari (2008). As such, it develops a vocabulary for theorising experimentation. However, this is a particular kind of theorising, where concepts are propositions for thinking within the world, rather than part of a framework for understanding experiment.

Stengers is adamant that hers is an ecological point of view and consistently engages with both the notion of ecology and the work of ecologists.⁸⁶ Moreover, we might see her following Guattari’s dictum that ecology “must stop being associated with the image of a small nature-loving minority or with qualified specialists” (2008: 35). Indeed, she is quick to outline that

Whatever the interdependence among populations of living beings may be, it can be called ‘ecological’ in the scientific sense by its association with the concerns and research practices of scientific ecology. By analogy we can characterize the population of our practices, as such, as an ecological situation ... (Stengers, 2010: 32)

It follows, then, that Stengers makes a case for there being no “substantive difference between the ecological situations studied by ecologists and those that strive to bring into existence the struggles conducted in the name of ‘ecological values’” (2010: 33), which we might consider as political ecology. In so doing, she draws attention to ecology’s dual meaning, both scientific and political.

⁸⁶ Indeed, she is very clear about this ecological approach when she writes: “an ecological point of view, which is my point of view” (Stengers, 2010: 88).

Stengers describes her seven-tome project *Cosmopolitics*, itself both scientific and political, as an attempt to “bring into existence the question of an ‘ecology of practices’, not as a solution but as a learning process” (Stengers, 2011a: 407). Echoing her cosmopolitical proposal, to ‘slow down’ reasoning and “create an opportunity to arouse a slightly different awareness of the problems and situations mobilizing us” (Stengers, 2005a: 994), Stengers introduces the notion of an ecology of practices to emphasise how particular practices impinge upon, and relate to, other practices that exist simultaneously. For any particular practice, Stengers’ notion asks what particular requirements are made by the practice and what particular obligations the practice imposes upon those who practice, make use of, or get affected by, it.⁸⁷ Thus practices are “sites of attachment, force and transformation” (Gabrys and Yusoff, 2012: 6) that may have the capacity to “answer challenges and experiment changes” (Stengers, 2005a: 195). How to engage with these practices? Stengers uses ecology as a transversal category to consider situations⁸⁸ that relate heterogeneous protagonists:

Situations in natural ecology induce naturalists to define their subject matter not in general terms, but rather in the quite specific terms of how the *ethos* — that is, the needs, behaviors, habits, and crucial concerns — of each protagonist diverges positively (and not from the others). Using the term *ecology* is meant to indicate as well that practices should be characterized in terms that do not dissociate the *ethos* of a practice from its *oikos* — the way it defines its environment (including other envioning practices). (Stengers, 2011c: 59)

One of the reasons that Stengers has recourse to ecology is that “it has no point of contact with the ideal of harmony, peace, and goodwill (in which all parties are asked to bow down to some general interest)” (2011c: 60). In other words, ecology

⁸⁷ Requirement “reflects the normative and risky dimension of dependence on a milieu, that is, on what may or may not fulfil needs and demands. Any practice or living being depends simultaneously on diverse milieus” (2010: 54). Obligation “refers to the fact that a practice imposes upon *its participants* certain risks and challenges that create the value of their activity. (2010: 55).

⁸⁸ Her term for these situations is ‘relational heterogeneity’ (see Stengers, 2011c).

is incompatible with neutrality. Thus Stengers argues that in an ecological situation, there is no neutral position; instead, attachments determine “what matters for each practice, what motivates its practitioners to think, feel, and (if need be) resist” (2011c: 60). However, ecology is also about “connecting-events ... that positively relate heterogeneous terms even as the terms diverge” (2011c: 60). Using symbiosis as an example, Stengers explains that symbiotically related beings define, in their own manner, what matters for them.

Symbiosis means that these beings are related by common interests, but *common* does not mean having the same interest in common, only that diverging interests now need each other. Symbiotic events are a matter of opportunity, of partial connection, not of harmony. (2011c: 60)

Stengers makes much the same point, when she argues that ecology does not “understand consensus but, at most, symbiosis, in which every protagonist is interested in the success of the other for its own reasons” (2010: 35). Stengers characterises this ‘symbiotic agreement’ as the production of “new, immanent modes of existence, and not the recognition of a more powerful interest before which divergent particular interests would have to bow down” (2010: 35). Thus, what is appealing to Stengers about ecology is “the many kinds of rapport that symbiosis may bring about” (2011c: 60). Moreover, she is able to make a claim for the importance of symbiosis by drawing on William James’ (1996b) notion of a pluralistic universe.

Unsatisfied with the choice on offer in metaphysics between, on the one hand, a *universe*, with its ready-made oneness, justifying efforts at overcoming discordance, and, on the other hand, a *multiverse*, made of disconnected parts indifferent to each other, James proposed that the world is a *pluriverse* in the making. Connections are in the making, breaking indifference but bringing no encompassing unity. Plurality means divergences that communicate, but partially, always partially. (Stengers, 2011c: 60-61, original emphasis)

What she calls the creation of a ‘rapport’, and here we might think of this as an experimental rapport, participates in James’ pluriverse in-the-making.⁸⁹ Accordingly, Stengers emphasises that an ecology of practices should not be confused with the practice of gardening. As she puts it, the gardener

is free to select her plants, to arrange them as she pleases, to prune them as needed, and to try to get rid of whatever she considers weeds. She has the power to judge and to select. But at the opposite extreme, it is not a question of creating some ideal ‘vivarium’, where different species are left on their own, some disappearing, others surviving, others proliferating. [...] Unlike the garden and the vivarium, the ecology of practices is defined first and foremost by the fact that the way those practices are introduced and justified, the way they define their requirements and obligations, the way they are described, the way they attract interest... (Stengers, 2010: 56)

This can be read as an experimental ecology, at once pragmatic and speculative (see Pignarre and Stengers, 2011).⁹⁰ The ecology of practices is “intended to make present in their singularity the requirements and obligations of different knowledge-producing practices [and] can also question certain practices because of what they require” (Stengers, 2010: 69). Having introduced Stengers’ notion of an ‘ecology of practices’ and her recourse to ecology, I want to put her ideas to the test. For instance, to what extent does ecology provide a way of giving consistency to a distributed set of experimental practices? If we follow Stengers in understanding that an ecology of practices is not about selecting, sorting and eliminating but rather to do with producing active propositions, an encounter with these practices can, and must, be affirmative.⁹¹

⁸⁹ Stengers makes her own rapport here to Donna Haraway’s (1988) idea of ‘situated knowledge’, “in which each standpoint, in situating itself, becomes able to assert the legitimacy of other diverging standpoints” (Stengers, 2011b: 61).

⁹⁰ It is worth noting that ‘experimental ecology’ is a term used by Nigel Thrift in his (2008a) paper on invention, but he does not elaborate.

⁹¹ For Stengers, these propositions offer “practitioners the possibility of presenting themselves in a ‘here’ that resonates with the ‘elsewhere’ of other practices” (Stengers, 2010: 73), without defining a practice as “like any other” (Stengers, 2005: 184).

Rather than critical reflexivity, our answering requires that, collectively, we learn the art of situating knowledge, which involves learning how to pay due attention to situations and consequences. (Stengers, 2011c: 62)

Therefore the following engagement with FoAM allows for this ecological approach to be examined, which attends to particular spaces and situations. In other words then, the chapter continues to address the relation between experiment and ecology by examining the production of rapports, understood as the affective structure of relation which provides the condition for an experimental ecology.

7.2.FOAM

How does ecology as a concept, or way of thinking, provide purchase for considering experimental practices? More specifically, to what extent is it possible to mobilise Stengers' ecology of practices? We might find possible answers to these questions by examining the transdisciplinary laboratory FoAM. Accordingly, I experiment with the concept of ecologies of practice to generate productive resonances and frictions with FoAM's 'luminous green' activities. Indeed, the lab motto, to 'grow your own worlds', at once echoes the theoretical elaborations on the installation of new spaces of experiment, and troubles the notion of a locatable lab. Equally important in this context is that FoAM is neither a scientific lab, nor a media lab, nor any other recognizable kind of lab. What is more, FoAM is distributed across a variety of different spaces, such as the studio, the retreat, the field and the kitchen. A recent invite to an event explains that the doors will

open onto a rarity cabinet of people and experiments: a lively display of human-plant hybrids, tasty table conversations, crisis-proof clothing and other curios in their natural habitat – the FoAM lab.⁹²

⁹² Email received 10/05/2012. The invitation was to an Open House event across Brussels (<http://www.openhousebrussels.be/>).



Figure 12: The FoAM Lab on display

FoAM is at once “a collective, an organisation, a network”.⁹³ Its focus is culture, variously understood as holistic, speculative and resilient, and its motto asks that you ‘grow your own worlds’. FoAM's members include artists, scientists, technologists, coaches, cooks, architects, designers, gardeners and describe themselves as a dynamic entity: “a transdisciplinary organisation in the morning, a tightly knit family at lunchtime, a learning facility in the afternoon, a loose bunch of philosophers in the evening and a dedicated designers’ collective by night”.⁹⁴ Originating in the late 1990s, FoAM hoped to mediate between the artistic and

⁹³ FoAM is a bacronym, where words can be fitted to the letters. Examples provided by FoAM range from the descriptive (‘Foundation of Augmented Media’) to the comical (‘Foundation of Affordable Mysticism’), as well as outlandish (‘Fungus on Applicable Marmalade’) (see FoAM, 2006: 143). The quote is from <http://fo.am/about>.

⁹⁴ This is from FoAM’s previous website, which remains available at <http://delta.fo.am/about>.

scientific worlds and between individuals and institutions. In its first iteration, FoAM was a department within the privately-funded and bankruptcy-doomed research-institute-cum-think-tank Starlab.⁹⁵ FoAM became an independent association shortly after Starlab was forced to shut down, in 2001. The plan was to operate as a network, with a series of ‘cells’, in the hope that the association would not grow into a sedentary institution. In other words, FoAM is organised as a distributed laboratory with bases in Brussels (bxl), Amsterdam (ams) and Stockholm (nordica). Today it exists as a “proto- or para-institution, slightly out of sync with the institutions around it” (Gaffney, 2010: 75) and explores “various fields of inquiry, which generally abide in between disciplinary boundaries” (FoAM, 2006: 143).

As Georgina Born and Andrew Barry (2010) argue, there is need for greater attention to be paid to these boundaries and the diversity of more-than-disciplinary forms. Their particular focus is on ‘art-science’, which

poses definitional and conceptual challenges since, while it exists as a practical, intentional category for artists and scientists, cultural institutions and funding bodies, it forms part of a larger, heterogeneous space of overlapping interdisciplinary practices at the intersection of the arts, sciences and technologies (2010: 104)

While there is much activity there has been little systematisation; accordingly, ‘art-science’ “amounts to a pool of shifting practices and categories that are ... relational and in formation” (Born and Barry, 2010: 104). It is for this reason that they propose that art-science be understood as a multiplicity. To quote them once more,

certain art-science initiatives are concerned less with making art or science accountable or innovative than with altering existing ways of thinking about the nature of art and science, as well as with transforming the relations between artists and scientists and their objects and publics (Born and Barry, 2010: 105)

⁹⁵ <http://www.space-time.info/starlab/StarlabArchive.html>.

Already in this chapter, the terms multiple, multiplicity and multiverse have all made an appearance.⁹⁶ It is perhaps, then, worth examining why that is the case and how it is understood here. This chapter attends to FoAM which is not easily locatable, existing in a number of forms across a range of sites. It is tempting to describe it as a laboratory multiple, to follow Annemarie Mol's empirical philosophy. Her monograph, *The Body Multiple*, tells the reader that "no object, no body, no disease, is singular" (Mol, 2002: 6). Instead, reality is multiple. What does this mean though? For her, the term multiple conveys "that there is manyfoldedness, but not pluralism" (Mol, 2002: 84). To paraphrase Mol, a lab may be multiple without shifting into pluralism. Instead of tracing gaps, an ethnography of a lab can be understood as a study into the coexistence of multiple entities that go by the same name. "In its turn, coexistence comes in varieties and takes different shapes" (Mol, 2002: 151).

Much of this, from both Mol (2002) and Born and Barry (2010), however seems to be at odds with Stengers' ecology of practices and pluriverse. Mol is convinced that everything, indeed reality itself, is multiple. And yet this claim is rarely elaborated upon. Early on, she writes that "multiple objects tend to hang together somehow" (Mol, 2002: 5). How do multiple objects hold together though? How does the multiple cohere? Moreover, is there a substantive difference between the terms plural and multiple? For example, Born and Barry note that having "indicated the plural genealogies of art-science" they do not attempt "definitively to map the multiplicity of the field" (2010: 111). For the remainder of this chapter I navigate this tension between plurality and multiplicity, questioning how FoAM as a lab

⁹⁶ I do not here investigate other philosophical engagements with multiplicity (such as the work of Badiou, Bergson, or Deleuze) as I want to foreground what I understand to be a tension between Mol and Stengers, and its relation to an ecology of practices.

coheres. To this end, I focus on two particular aspects of FoAM, its luminous green retreats and its food experiments, as ways of thinking through an ecology of practices.

7.3.LUMINOUS GREEN RETREAT

In mid-2010, almost a month after having been in touch with FoAM about the possibility of fieldwork, I am invited to participate in a 'luminous green' retreat. Described as an "an exceptional occasion", for FoAM the retreat is a place to learn about, and from, others who attend.⁹⁷ In the process, participants attempt to jointly explore questions related to the theme of the retreat: the notion of resilience. Prior to the retreat, a little investigation reveals that within geography there has been little written in the way of work on retreats. David Conradson's (2007; 2010) work is an exception in this regard, with a focus on the spaces of retreat and their relation to spirituality and stillness. Along with this preliminary reading, FoAM issues me with their own work pack of key readings, frequently asked questions and, rather troublingly, a list of 'Survival Kit'.⁹⁸

This pack of readings explains that the aim of the retreat will be to stimulate discussions and collaborations between people from all walks of life: artists, scientists, designers, academics, gardeners, activists, social entrepreneurs, cooks and policy-makers. As such, the retreat has been designed to encourage the interaction and commitment of everyone involved, through the use of what FoAM termed 'participatory facilitation techniques'. These would include the cryptically-

⁹⁷ See http://fo.am/lg_2010/.

⁹⁸ This 'Survival Kit' included both mundane items (comfortable clothing, walking shoes, swimming gear, toiletries) and 'props' for the event (item of local food or drink, a sample from your work and life, accessories for morning practice).

named 'Open Space', 'Appreciative Inquiry' and 'Collaborative Prototyping' to generate conversations, in order to consider resilience beyond conservation and/or sustainability.

A luminous green world is a place that FoAM is committed to cultivating, through our various activities. The gathering in which you are participating is one of these activities, inviting a diverse group of people to briefly step out of their daily maelstroms and help us look at what's around us today, as well as thinking about various paths that we could take, to make our lives more luminous ...⁹⁹

Why luminous green? Without wanting to simply rehearse FoAM's proposition, it has much to do with their vision of a thriving future for the planet. A future that is green, fresh, lush and flourishing. In this vision, humans live in symbiosis with the rest of the planet. As for the first part, it is luminous green to suggest that this future is illuminated (enlightened), electrified (energetic) and imaginative.¹⁰⁰ The purpose of the retreat, then, would be to explore ways of growing a luminous green world. Or to put it differently, it would investigate how to cultivate a resilient world for turbulent times. How can problems such as environmental catastrophes or economic downturns, typically understood as obstacles, become opportunities to increase luminosity? The event, according to the pack, has attracted a range of participants. Only a handful are attending because they are passionate about saving the world; there are others who are more interested in taking a break from their work routine, some who are thinking about how to make money from future eco-design projects, and still others who are simply out to make a name for themselves.

⁹⁹ The email which was sent out is archived at http://libarynth.org/luminous/retreat_2010. The following excerpts are also taken from here.

¹⁰⁰ This is developed further when FoAM write: "Illuminated in the sense of enlightened, where we can act from a place of considered reflection and awareness of the reality around us. Electrified as in sparkling, energetic and vigorous, as well as literally producing and consuming electricity to feed an open, connected and clean technological development. Finally, a human world becomes truly luminous & radiant by drawing upon the imagination of everyone involved" (http://libarynth.org/luminous/retreat_2010).

As much as I am curious to discover who attends this sort of event and what the activities will entail (along with the participatory facilitation techniques, which are almost as ominous as the survival kit), the question that keeps bubbling up is: what would FoAM like to get out of this retreat? On this they are less forthcoming, although FoAM did make clear that they hoped that luminous green would offer an opportunity to broaden their views and question their assumptions. More importantly, they were interested in having good documentation of the event. Indeed, shortly after receiving my invite, a straightforward internet search threw up an intriguing find. Although the page was restricted, the search engine had still managed to scrape off a fragment:

... I just received a bio of Thomas, who is very keen to participate in Luminous Green. He/she might be a good harvester as well ...

Hot on the heels of mysterious techniques and survival kits, to find that I have potential as a harvester is both amusing and slightly worrying! A good harvester, it later transpires, is someone who is able to document and 'harvest' findings from the event. Alongside questioning resilience, an important motivation for FoAM was to be able to document the retreat or gathering. A less tangible outcome for FoAM was the hope that participants would take something away with them.

What that something is, we can't say in advance. In the past, this has included ideas for new projects, new friendships, and new directions.

Following a warm welcome, which includes ice-breaking games and home-made aperitivo at a make-shift bazaar on the night of arrival, the retreat begins with an introductory session mid-morning the following day. This serves to outline both the

theme and the structure of the event from one of the founders of FoAM.¹⁰¹ Rather than trace the history of luminous green the day opened with a statement of intent: the tired concepts of conservation and sustainability are to be discarded in favour of resilience.¹⁰² The plan is to have an open and participatory structure, where there will be a collection of hosts (and not facilitators).

In an open space event the key thing to remember is that you are responsible for your own experience. We expect you to be yourself – curious, open-minded and motivated. We encourage you to explore both common and uncommon grounds. Hope to be surprised and be unafraid of being challenged by your fellow participants, regardless of their background and experience.

This structure will enable different modes, and different speeds, breaking the normal pattern of daily rhythms. As a group, you draw up a set of ground-rules and are told that you have been chosen to attend – there has been no open call – based on your views and approaches to the world as well as shared interests or characteristics with (at least two) other people at the event. As such, the group is engineered to remain flexible and robust, and is characteristic of new modes of collaborative organization and eventing.¹⁰³

The first session gets underway. You are asked to arrive in the room and focus. To become aware of yourself for a moment. To sit comfortably. You are invited to notice

¹⁰¹ This was Maja Kuzmanovic; she is co-founder of FoAM alongside Nik Gaffney (<http://fo.am/people/>).

¹⁰² Of course, resilience has an interesting genealogy itself.

¹⁰³ The issue of how the group was put together is a sensitive one. A mistakenly addressed email which came my way (meant for another Thomas) made this clear: “Pl[ea]s[e] don’t use the term ‘social engineering’ - this has quite negative connotations outside of our informal conversation of a few years ago... I think we used the term jokingly...” The email continued: “In our mappings of media-art organisations we learned how FoAM approached the question of who to invite to their workshops. In some of the ‘Luminous Green’ workshops the participants were invited based on their skills and knowledge, but also on the type of personality, or social role. Groups were selected carefully: FoAM specifically took into account that each person had two other people with whom they shared knowledge or interests. The workshop designers then looked which roles were needed to form a dynamic group (having people who are influencers, others who are keen followers, connectors, or disruptors). Although a substantial amount of time was spent on selecting the participants, [it] proved beneficial for the flow and the social dynamic of the workshop, as well as impacts the long term friendships and collaborations.” (email, received 18/10/2011).

that you are sitting. To feel the sensations in your feet, in your legs, in your spine. As you are sitting, in a circle, you are told that you might notice continuous movement in your body, your breathing, your heart beating. Much travelling, planning, emailing. You'll go back to that soon, try to let go. There is nothing here that you need to do. Breathing slowly, you hear some questions. You do not need to try to answer but just notice. Who are you when you stop moving? How are you when you stop moving? Just notice the questions, then return to your breathing, your place in the room, open your eyes, and stretch out a bit.



Figure 13: Offered a mint leaf

You are offered a mint leaf, and asked to imagine you had never seen one before, to take one leaf and hold it in your hands. To look at it, to really look at it, to notice the leaf. What do you see? You don't have to answer. Everyone laughs, somewhat

nervously. Try and touch it. Take it to your nose and smell it. Put it on your tongue, between your teeth. Chew it. What does it taste like? Now swallow it. And so you do, feeling the dry crumpled leaf catch in your throat. Perhaps you have postponed judgement? Become a little more patient? It is in this spirit that you are invited to take part in the workshop: openness, curiosity, and non-judgement. To be fully present.

Paying attention in this particular way is a sort of ‘meditative mindfulness’. This is a mindfulness thoroughly imbued by Buddhism, although a Buddhism which has been absorbed into a culture of self-help (Lea *et al.*, forthcoming). Important here are notions of ‘undoing’ and ‘disinhibiting’ and focusing on the present. Mindfulness in this sense is a way of life, or an art of living. Resonances with the work of Isabelle Stengers can be detected not only in the way in which luminous green invokes the notion of symbiosis, but in this particular practice of non-judgement. In conversation with Mary Zournazi, Stengers rephrases her ecology of practices as a hope that “practices stop ignoring each other, stop creating practitioners judging away what escapes their questions” (Stengers with Zournazi, 2002: 262). Zournazi responds that for Stengers this is about “the realm of nonjudgmental forms of thinking. I mean, you are not imposing a judgment right from the beginning – you are open to the relation between often disparate knowledges” (Stengers with Zournazi, 2002: 262). The meditative practices not only operate to increase awareness of different senses (sitting, breathing, tasting) but functioned in a way that cultivated a form of non-judgement. *You do not need to try to answer but just notice.* In much the same way, the retreat had no action points or particular goals, except the hope that participants would make a meaningful connection of some kind. For some, this could be a connection between and across practices.

These moments of non-judgement are rare, however. When they do occur, they are more as punctuations between other sessions than the main activity of the retreat. Accordingly, the session moves swiftly on to the following activity: 'Purpose Café'. We are told to get into groups of four or five around tables, and are to share some of the topics and themes that we had brought with us, and what sort of questions we had. For example, if resilience is dealing with uncertainty, how and why do you want to be resilient? At the tables, a large blank sheet of paper is provided, along with plenty of felt-tip pens, play-doh and string. Together we are to try to come up with, or select, a set of 'juicy' questions, questions which are energising and/or stimulating, which we would like to think about over the following day or so. In the first group, you discuss generating futures and developing luminous techniques. Soon we are told to split up and change tables (with one person remaining, as a sort of 'table-holder'), so as to share your juicy questions with other people. At the second table, I try to embrace this task, partly because this group is particularly intent on asking questions. You repeat the mantra: *You do not need to try to answer but just notice*. This requires participants to render the world problematic by elaborating questions (Thrift, 2008a).

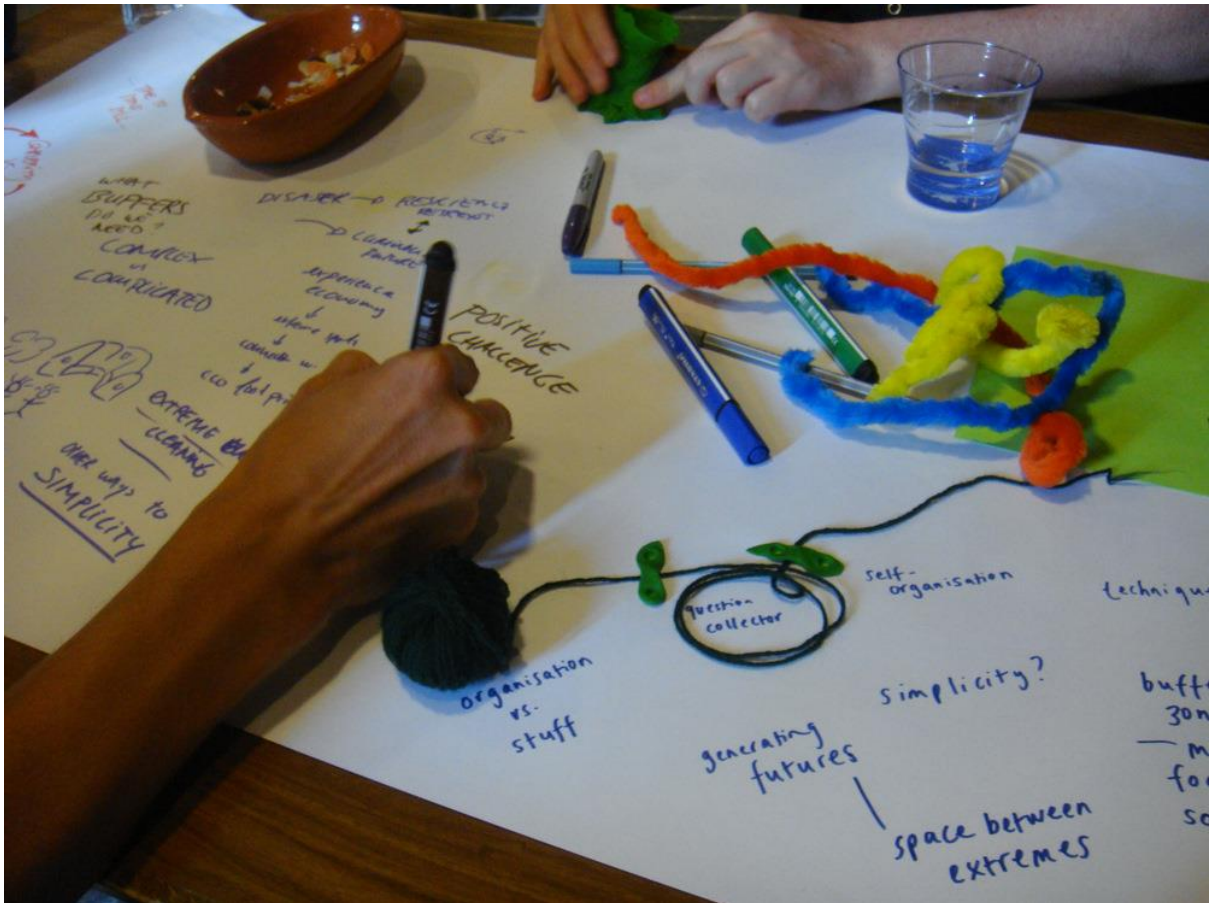


Figure 14: Juicy questions at the Purpose Café

Before these questions are sifted through or taken up, another session is underway, foregrounding the idea of ‘Open Space’.¹⁰⁴ This is presented as a self-organising mode, based around the question: what do we want to explore now together, that is at the edge of our current knowledge and experience? There are four different roles:

1. as a host, you choose a question or theme and a location;
2. as a participant, you attend and engage with the session;
3. as a ‘bumble-bee’, you move from one session to another and in doing so cross-fertilise; and
4. as a ‘butterfly’, you might choose to find a place on your own for a while.

¹⁰⁴ This idea dates back to the mid-1980s, when Open Space Technology (OST) gave this meeting system a name (see Harrison, 2008).

And there are four different principles:

1. when it starts, it starts;
2. whoever comes are the right people;
3. whatever happens is the only thing that could have happened; and
4. when it's over, it's over.

Furthermore, there is a 'law of two feet' which states that it is rude to stay where you cannot contribute or learn; indeed, it is perfectly acceptable to get up and leave a session if it just isn't interesting you. Although it is described as self-organisation, there is still a fair amount of supervision and those who want to be hosts have to justify the session they are planning. With the rules out of the way, the Open Space is divided into three parts, of forty-five minutes each. The first two parts are for Open Space sessions and the third serves as a way to generate feedback. Session titles included: 'Tactics for intervention', 'Making a food installation', 'Systems Maps', as well as 'How do we give up being what we are to continue being?' It is tempting to flit between groups, partly because there is so much going on. Perhaps it also had much to do with wanting to try out the law of two feet. These sessions do not lend themselves to feedback though, which is mainly a way of letting those who are unable (or choose not) to attend to find out what has been happening elsewhere.

Indeed, the feedback sessions do not seem to chime very well with the practice of non-judgement. At times, they tend to be rather reductive exercises which do not add much to the group discussion. For example, following a late lunch at around 16:00, the group comes together to discuss what new seeds of connections, ideas, or projects you are finding. We are all to go our separate ways, in silence, and think

about these questions before sharing your thoughts. Up until then, we have been encouraged to develop questions so it feels like a long thirty minutes or so to spend on my own thinking about the day after so many group activities. When it is my turn to talk in the circle, indicated by holding a figurine of a witch that is passed around, I speak of the cultivation of thinking-spaces and the various rhythms at play in the format of the retreat. Shortly after my comments, another person in the circle argues that these events are more than research projects, with a fixed look in my direction. Perhaps this is because I have strayed from the topic in hand, resilience, offering reflections on the retreat itself. To be sure, the format does not encourage non-judgemental responses. Yet, this is not necessarily at odds with an ecology of practices. After all, Stengers reminds us that an ecology of practices is not about consensus.¹⁰⁵ Rather it is “at most, symbiosis, in which every protagonist is interested in the success of the other for its own reasons” (2010: 35).

The luminous green retreat was made up of a wide range of activities, many of which were exploratory. Although there was little explicit discussion of the environment or ecology, there was nevertheless an overwhelming interest in improving the world, be it through small changes, such as the development of particular rituals, or much larger ones, like developing responses to future scenarios. As such, it is questionable as to whether a kind environmentalism remains the best way to frame these activities. The discourse of environmentalism, often associated with protection and management of particular ecosystems, has raised important political questions – such as the relationship between environmental protection and capitalist markets – but it overlooks “the public

¹⁰⁵ This is very much in keeping with Guattari who when writing about ecology predicts that “it will be a question in the future of cultivating a *dissensus* and the singular production of existence” (2008: 33).

activities, affects and effects of non-humans” (Bennett, 2010: 111). How might we think of the agentic assemblages we are composed of? These kinds of issues surfaced at the retreat and they illustrate a way of thinking about how the world is “traversed by heterogeneities that are continually doing things” (2010: 122). This is not specific to FoAM’s retreat, however, and it is for this reason that the chapter now turns to FoAM’s activities of foraging and preparing food.

7.4.KITCHEN: FORAGING AND HOSTING

For many people involved, FoAM equals food. Indeed, they incorporate food into everything they do:

from transdisciplinary team-building, to thematic food events and weekly meetings. We start in the wild, move onto farmers' markets, build relationships with co-ops around the world, or ‘fabricate our own’ in kitchen-style chemistry labs. We then proceed with meticulous food experiments; whether working with the forgotten tastes of wild plants, exploring ‘time-based’ textures, pairing flavours based on their chemical constituents, or mixing food and digital media.¹⁰⁶

They are self-confessed ‘food geeks’ and their interests include food gathering as performance art, preparation as design-science, consumption as a social celebration and distribution as participatory economics. The focus here is on how FoAM investigate the possibilities of foraging for food and sharing this produce with various publics. Interestingly, foraging has received no attention within geography and the social sciences (although see Hinterberger, 2012). This section examines how food is reclaimed from the city, prepared and then presented as a public experiment, cutting “across distinctions between scientific and artistic experimentation (Born and Barry, 2010: 113).

¹⁰⁶ From <http://delta.fo.am/feeding>.

You arrive at FoAM for your first stay at the lab, and find that you have been tasked to spend the afternoon foraging. Bags still by the entrance, a large map is spread out across the table and a nearby area of wasteland highlighted. You head out, armed only with a plastic bag and the aforementioned map. You pass a large shopping centre which advertises 'An Urban Experience!' before circling round and seeing a flat, brownish, open space. It looks like an abandoned building site.



Figure 15: Foraging in the city

The guide points out plants that you might collect and you set about foraging for edibles. Behind you now, the guide curses that she has forgotten to bring a trowel or scissors. You come across a strange small metallic structure which unscrews, and fashion it into two digging tools. Watching carefully, you help those who seem to know which plants are safe. Soon you try yourself, noticing patches of the same plants. You

collect plants you had not even heard of before: evening primrose, rosehip, carrot flowers and a few plums. Several hours later, back at FoAM, an open newspaper explains that the next few days will see the Brussels Festival Kanal. As part of this, FoAM are presenting 'Kanal Labs: Triangulated', along with the labs OKNO and Irma Firma. You, the reader, are invited by three Brussels labs to "nibble on FoAM's detoxifying treats to help you fight urban afflictions, spiced up with plants from the Kanal area".¹⁰⁷

The "various urban gardens alongside the canal" mentioned in the newspaper are not quite what you might have imagined had you not been part of the foraging expedition. This sort of foraging has been described as urban cannibalism or urbanilism (Maas and Pasquinelli, 2012).¹⁰⁸ The argument is that, living in urban surroundings many people have forgotten that roofs, walls, basements and more can become edible landscapes.

Instead of manicuring 'sustainable gardens', urban cannibalism celebrates the spontaneous surplus of the city's life. There are no interstices and no in-betweens: everything grows against everything else. The city is a place of excess. (2012: 2)

This is not a straightforward anything goes. Indeed, the manifesto for urbanilism contends that, unlike situationism, it is not a vagabond consumption. It is *dévournement* not *détournement*.

¹⁰⁷ See http://fo.am/kanal_labs/.

¹⁰⁸ This 'Manifesto of Urban Cannibalism (Amsterdam declaration)' is an interesting read which draws on a wide range of thinkers. However, its tendency to oversimplify confuses its message at times, such as when Latour is accused of rehearsing the modern constitution: "Urban cannibalism does not recognise the Parliament of Things, nor any 'ecological institution' that fragments the city into abstract entities and binary relations" (Maas and Pasquinelli, 2012: 3).



Figure 16: Back from the field

Looking up from the newspaper, you take a moment to look around the studio-lab, which resembles an open-plan office. The rustic loft conversion, complete with wooden beams, metal girders and brickwork, is striking. Colourful post-it notes up on the wall serve as reminders for projects. A neatly drawn diagram outlining a book-in-progress takes up much of a long blackboard. There are a few tables with paperwork on and a handful of chairs clustered around these. An indoor glass wall separates these tables and chairs from a pair of swings which hang down from one of the girders with beanbags beneath. There is a library of books and materials hidden away at the back, along with a few bedrooms upstairs for those on residencies.¹⁰⁹ Someone shouts that preparations for the cooking are about to get started. You step into a fairly ordinary-

¹⁰⁹ For example, my trip to FoAM was considered a residency (<http://fo.am/residency-thomas-jellis/>).

looking kitchen, somewhat expectantly. You are told what you have just read, that FoAM will be serving detoxifying appetizers with plants from the canal zone. The kitchen is to a space of experiments, unexpected combinations, and collective work. Tasked with mundane chopping and stirring, it does not really feel very experimental. But you help where you can, occasionally stopping to take a photo, sometimes of others who are documenting the event.



Figure 17: Studio-lab-office?

Members or affiliates of FoAM continue to arrive as the afternoon turns into evening, and two of them dress up as 'food doctors'. Their uniform: a white lab-coat with a mouth-mask around the neck. You are struck by the rehearsal of familiar imaginations of (royal) science and watch them closely, almost suspiciously, and poke your head out of the window to watch them. As people start to show up, these food doctors provide a

sort of ad-hoc clinic on the terrace. You witness a brief consultation, then a filling in of forms, before these are sent up in a basket to FoAM several floors above. A few minutes later, the basket is returned with a particular edible-treatment, a curative appetizer.



Figure 18: Clinic below and basket above

In an introduction to a special issue on the topic of ‘materials and devices of the public’, Nortje Marres and Javier Lezaun note that objects can “acquire a capacity to provoke public issues in a distinctively experimental manner; but experiments also provide a format for making objects and actions public” (2011: 502). Although the emphasis has been on the processes involved in such an event, it is nonetheless important to consider how the foraged food has provoked, or catalysed, an array of issues. These ingredients were from a part of the city which was abandoned and not

normally considered edible. The motley ingredients presented in this experimental format can make urban food more visible, more public.



Figure 19: Public food?

Bennett's vital materialism helps us to think about this set of experiments (foraging, cooking, presenting). Her vital materialism has much to do with on-going processes of "the becoming otherwise of things in motion as they enter into strange conjunction with one another" (Bennett, 2010: 118). Of course, it is hard to discern the vitality of matter. And yet the excitement of foraging, of cooking, and of sharing the food with an emergent public of sorts is hard to deny. It could be argued that to turn to excitement is to return to the human, ignoring the radical aspects of Bennett's thesis. However, this would ignore her attempt to rewrite the grammar of agency, which "assigns activity to people and passivity to things" (2010: 119). What

if it is the very stuff of foraging that calls out to be foraged? After all, we are much better at admitting that humans affect nature than we are at saying the opposite. Even when Marres and Lezaun (2011) argue that objects *may* acquire the capacity, the focus is still on how particular configurations, experiments, facilitate this.

7.5.CONCLUSION: ECOSOPHICAL EXPERIMENTS

We cannot fully ascertain who runs these experiments, who participates, who monitors, or who intervenes if the experiment goes awry. These are experiments that are neither defined nor controlled, but rather contingent. (Gabrys and Yusoff, 2012: 12)

This chapter has examined the emerging sense of experimentalism in terms of the emergence of a kind of ecology. It has done this by examining the relation between ecology and experiment, and in particular, the notion of an ecology of practices. More specifically, the chapter has considered a transdisciplinary laboratory and its experimental ecologies. Not only are those at FoAM interested in ecology, and the environment more broadly, they also cultivate specific ecologies of and for experimentation. The chapter examines two such ecologies, a retreat and a public food experiment. While geographers and social scientists have been interested in sites of experimentation, there have also been studies of how experimental practices tend to exceed particular sites (Callon *et al.*, 2009; Davies, 2010; Szerszynski, 2009). The notion of an experimental ecology undermines the centrality of site as an organising motif, foregrounding instead the practices and techniques of experimentation. This is not at odds with an examination of emerging spaces of experimentation; indeed, it is precisely concerned with the spaces of experimental practices without necessarily locating these at sites.

Ecology provides purchase for considering experimental practices as it offers a way of getting away from sites, by understanding experiments as “an interconnected

series of parts, but ... not a fixed order of parts" (Bennett, 2010: 97). Yet an important point that is developed through the chapter is that ecology, as much as experiment, needs to be reconsidered. To this end, Félix Guattari's use of the term is worth considering. Like Bennett, this ecology is a conjugation of heterogeneous forms (see Genosko, 2009). Although he writes of *three* ecologies (environmental, social and mental), it is only to indicate that there are notions of ecology which do need to be associated with a "small nature-loving minority or with qualified specialists" (Guattari, 2008: 35). Furthermore, these plural ecologies are not be thought of as a separate but rather related in what he terms ecosophy.¹¹⁰

To what extent is it possible to mobilise these ideas of ecology, or ecosophy to think experiment? Stengers' notion of an ecology of practices goes some way towards this. Examining the transdisciplinary laboratory as an ecology of practices is not to impose an analytical framework but rather to provide purchase for considering the related heterogeneous practices. The luminous green retreat provides a case-event for examining an ecology of practices, which operated around ideas of hosting, gathering and exploring. Thinking through the retreat and its practices, rhythms and spaces in terms of an ecology of practices drew attention to how practices are introduced and justified. Moreover, it offers a way of examining how practices are described and how they operate to attract interest. Towards the end of this case-event, Bennett's notion of vital materialism was put forward as a way to thinking about ecology and agency to discuss foraging.

FoAM's food foraging and presenting can be understood as a type of public experiment which, to some extent, generates its own public; indeed publics may be

¹¹⁰ As Genosko notes, these ecologies are "Levels, types, views, visions, lenses, registers – Guattari shifts his descriptors throughout his book" (2009: 76).

enfolded into experiments (Szerszynski, 2005). This is a form of experimentation in which it is far from clear who or what participates in the experiment (Gabrys and Yusoff, 2012). Not conforming to positivist understanding of a controlled experiment, it is instead a *contingent* experimentation where what is foraged, prepared or eaten is never established beforehand. What is quite remarkable about this experimentation is that while contingent, it is also rather mundane. Cooking, after all, has always been something of an experiment; so too has foraging. What sets it apart from the weekly shop or sit-down meal is its ethico-political ideals. It is for this reason that Guattari can be read profitably with regards to ecology: it is impossible to consider environmental issues from those which might be termed social or mental. For instance, social ecosophy consists of “developing specific practices that will modify and reinvent the ways in which we live” (2008: 24), and mental ecosophy embraces similar notions of reinventing relations, “to the body, to phantasm, to the passage of time...” (2008: 24). Only by thinking of these three ecologies as related can effective practices of experimentation be developed. Both the retreat and the food clinic can be understood as ecosophical experiments, that is to say, experiments which operate across different ecological registers.

8

GEO-EXPERIMENTS

Questions in geography concerning the making, practice and reception of experiment ... have not figured as importantly as they might. (Withers, 2011: 45)

The status of experiment within geography is troubling, and for at least two reasons. Firstly, it is troubling because as experiment has become more ubiquitous, so it has become harder to assess the value of the term. Indeed, the notion of experiment has attracted a certain cachet and a whole host of events, practices and spaces are being described as experimental. There is a danger that given how often experiment is invoked, and with little attention to the specificity of the term, that it will begin to lose its purchase. What is not experimental? Put differently, as I have been trying to demonstrate here, what is troubling is the value of experiment, and particularly so when its currency is in danger of being devalued through its proliferation. Secondly, experiment has the potential to be disruptive of repertoires of practices and of modes of thinking. Investigating the particular ways in which experiment is mobilised has implications both for how the social sciences and geography proceeds methodologically and for how thinking might be understood as a form or practice of experiment. These two facets are at the heart of my concern for experiment and relate to the questions that the thesis opened with. How is what counts as an

experiment transforming across a range of sites? And how can encounters with these experimental sites, events and techniques augment the capacity for an experimental geography?

As I have argued, experiment has been a rather neglected concept and practice within geography. As Charles Withers (2011) has noted, this lacuna is noteworthy for at least three reasons: the insistence on 'lab work' in certain forms of (physical) geographical inquiry; the importance of fieldwork as a form of 'experiential culture' in geography; and that experiment and the laboratory have been key terms in the history and philosophy of science. Indeed, as I have already explored, there has been considerable historico-philosophical attention paid to experiment (Galison, 1987; Hacking, 1983; Gooding *et al.*, 1989; Shapin and Schaffer, 1985) and the laboratory (Collins, 1985; Knorr Cetina, 1981; Latour, 1987; Latour and Woolgar, 1979; Lynch, 1985), although these engagements did not stray from the sciences, and especially physics. While experimenting is now an established epistemic culture in geography, it remains unclear as to "when we may first properly talk of experiments ... so it is hard to date geography's presence in the laboratory with any precision and to know when geographical curricula regularly incorporated lab work" (Withers, 2011: 46). What is more certain is that experiment has been invoked within the discipline since its inception (Balchin and Richards, 1952; Dingwall, 1910; Merriman, 1936; Morrow and Lambert, 1913).¹¹¹ Experiment, therefore, demands our attention as it has been an important aspect of doing geography. As we have seen, however, this is not a history of laboratory experimentation in geography but a re-examination of the current status of experiment in the discipline.

¹¹¹ The titles of these texts are, respectively: *Practical and Experimental Geography*, *Experimental Geography*, *Experimental Geography: Book I*, and *A Practical and Experimental Geography*.

This final chapter recalls and reflects upon the preceding substantive chapters, and in so doing, aims to speculate upon an agenda for the burgeoning 'experimental turn' within geography (Thrift, 2011: 22). This is as much an agenda for the social sciences as it is for geography; an agenda which takes seriously experiment, yet questions the persistent injunctions to experiment. Accordingly, I draw things together to make a series of wider points in order to develop this agenda. The chapter is in two parts. In light of the chapters that have gone before, the first reiterates the need to attend to new geographies of experiment. I make the case for examining experiments which are not exclusive to the domain of the sciences, nor a narrow range of avant-garde aesthetic practices. These experiments are markedly different; these differences are considered in terms of their logics and sites of experiment. The second part expounds an experimental geography that takes seriously the propositions outlined earlier in the thesis while also being inflected by the research encounters in the previous chapters. In particular, I outline the value of an experimentalist 'orientation' (Thrift, 2011) or 'imperative' (Whatmore, 2006). While acknowledging that this value is far from certain, the urgency and purpose of such an orientation is in danger of subsiding given how often experiment is invoked. This requires, most particularly, an understanding of experiment's specificity. Drawing on concepts introduced in previous chapters, I consider how it is possible to gain purchase on experiment without reducing its potential for being taken up in new and unexpected ways within the social sciences and geography. The chapter concludes by revisiting the related notions of recuperation and reclamation as it looks to future geo-experiments. What is at stake here, then, is developing a stronger sense of what is distinctive about this experimental imperative.

8.1.GEOGRAPHIES OF EXPERIMENT

...the boundaries of what an experiment is are fuzzy. (Muniesa and Callon, 2007: 164)

In this thesis I contend that much of the burgeoning experimental turn has been to do with the proliferation of new kinds of experiments, which are neither limited to the scientific nor to the avant-garde. As such, this thesis has been working towards the following argument: that there are *new* spaces of experiment that have been under-examined but which are worthy of such examination as part of a renewal of experimentation within geographical thinking. This section outlines what is distinctive about these experiments by considering the logics and ecologies of experiment.

8.1.1. LOGICS OF EXPERIMENT

The flurry of historico-philosophical work on experiment during the 1980s remains an important resource in developing a geography of experiment. However, it is not sufficient. It foregrounds the neglect of experiment in the sciences – something which was arguably addressed – but it does not gesture to other modes of experiment beyond the sciences which are also worthy of attention. Following Gross and Krohn (2005), I argue that a notion of experiment which is not based on that of the natural sciences is possible. Although there have been considerations of experiment which extend beyond the sciences, in areas as varied as art, sociology, political theory, and economics, once the definition of experimentation is extended beyond the sciences, there are “many other kinds of action that could be regarded as ‘experimental’ in some sense” (Leonard and Fontaine, 2005: 1). The upshot of this is that the use of the term experiment has proliferated, to a pervasive extent, and has become nebulous. This thesis has worked through a set of loosely related

experimental sites which are symptomatic of an emergence of new experiments. Furthermore, these demonstrate an array of modes of experiment, which range across philosophy, art, new media and foraging. Part of attending to this wave of experimentalism entails bringing precision to the logics of experiment. Attending to the logics of these experiments affirms their difference. What then, are the logics of this mode of extra-scientific experiment?¹¹²

Firstly, the logic of extra-scientific experiments is *exploratory*. This mode of experiment does not obey the conventional logics of scientific experimentation: they are not actions undertaken to test a hypothesis. Moreover, these experiments do not share the features of a scientific experiment, such as the “artificial set-up of an experimental system, the inducement of changes by external control of certain parameters and the measurements of observable effects” (Gross and Krohn, 2005: 64). Instead, these experiments have little to do with testing. Experiment here is about exploring concepts and techniques. This does not mean that anything goes, nor is it to claim that there is no rigour. Think of the preparation that goes into the SenseLab or Luminous Green events. The experimental apparatus may be altogether different, a circle of chairs, a mint leaf, a concept, but there is much work that goes into facilitating experiment as exploration. And it is important to remember that this is not unguided exploration: there is often a theme, or generative constraint, at hand which informs and guides experimentation. What is it to generate the impossible? How to make topological media? Interestingly, the notion of testing has not been completely abandoned. For instance Olafur Eliasson continues to talk of his interest in testing models of learning and in experimenting with new approaches to

¹¹² I am wary of the term logic, due to the danger of it being understood as something generalizable, but have opted for it given that tendency is rather tentative.

teaching art. But when pressed on what constitutes an experiment and how it might differ from a test, the latter emerges as reductive process. Testing is “something you do to save time, and experimenting is something to extend time” (Olafur Eliasson, interview). To experiment is to extend, to amplify, to multiply.

Secondly, and relatedly, the logic of experiment is *processual*; there is rarely an end result or product. This follows from the previous point that experiment is understood as exploratory, and additive. As experiment is not about testing and rather about exploring, it is always unclear where or when an experiment ends. Accordingly, experiment may be understood as on-going or as process. This claim chimes with much of the literature that has been assembled here, in particular the work of William James, John Dewey and Félix Guattari. Although this risks coming across as an uncritical reading of empirical encounters with experimental sites, it is not altogether surprising given that those encountered were familiar with the same set of literatures. There are, however, differences. For example, the Institut für Raumexperimente does appear to have an end date; as a project it is due to run for five years. And yet this end date is arbitrary: it is the date at which the Institut is planned to end but this does not mean that it will not continue in some form. And even if the Institut were not to continue, it would inform and inflect future experimentation.¹¹³

Thirdly and consequently, the success of experiment is *ambiguous*. Given the associated logics of exploration and process, it is necessarily the case that these experiments are rarely understood in terms of success or failure. As Olafur Eliasson

¹¹³ There are some interesting similarities to what Ben Anderson (2002) draws from Ernst Bloch's notion of the 'not-yet'. Anderson incorporates this notion to explore a “deliberately speculative experimental theoretical-empirical practice that takes as its starting point the plenitude of ... excess in an open, processual world” (2002: 225).

has noted, there are no particular rules about extra-scientific experiments. Accordingly, one feature of this mode of experiments is their different relation to *failure* compared to the sciences. To what extent can a SenseLab event fail? Can Eliasson's Institut fall short? How would an atelier-lab, which does not aim to produce anything, not succeed? And what are the criteria for assessing the success of a public food experiment? This vexed question of success and failure arises occasionally at these experiments yet it is not prominent. This is in large part because it is quite simply very difficult for this mode of experiment to fail. As there is no hypothesis being tested and no theory to (dis)prove, experiment is exploratory, processual and indefinite. Importantly for geographers, this relates to the critique of non-representational theory as a philosophy of plenitude in which there is no real failure. For instance, Paul Harrison's (2007) critique of the concept of the relational and its association with forms of non-representational theory draws attention to failure, figured as the non-relational, notes that "few have been asking about breaks and gaps, interruptions and intervals, caesuras and tears" (2007: 592). Harrison's astute observation is not in question but these breaks, gaps or interruptions are not considered to be criteria for failure for this mode of experiment. Indeed, there are no criteria. Instead every experiment adds to the world, although what is added is not prefigured.

8.1.2. ECOLOGIES OF EXPERIMENT

As much as there are now different logics of experiment, these experiments are taking-place at different sites. There is a need for a new geography of experiment as these sites are proliferating and far exceed the conventional setting of the scientific laboratory. Experiment is invoked everywhere but there are some sites in particular

which have become associated with extra-scientific experiment. Examining experiment and experimentation beyond the lab is not a particularly new idea. To be sure, even within the history and philosophy of science, there has been much attention paid to scientific activity outside the laboratory. This has tended to focus on field experiments. These first emerged in agricultural field trials in the eighteenth century (Schaffer, 2003) but developments in statistical techniques coupled with increasing sophistication in the understanding of experimental design, facilitated the widespread adoption of field experiments (Powell, 2007a). For Kohler (2002), a whole litany of field practices, or 'practices of place', have been developed in order to maintain the credibility of the field sciences. For example, while many laboratory instruments were too fragile and precise for field use, they could be adapted, and suitable places found for their deployment. Such practices may also include attempts by fieldworkers simply to find field-sites where a single environmental variable changes while others are constant. In this way, Kohler argues, waiting for "the appropriate time and the right place to observe in nature is no less active than fixing conditions in a lab" (2002: 200). In other words, this requires the transformation of "the world outside the laboratory so that it better resembles the laboratory" (Mackenzie *et al.*, 2007: 11).

The sites investigated during extended periods of fieldwork were not attempting to make the 'world outside' resemble a laboratory. Rather, they were trying to develop and explore what an experimental space might feel like in various ways. What might we call these spaces then? The literature on the studio as a site of experimentation is minimal, focusing instead on the studio as a critical theme in the art of the second half of the twentieth century (Davidts and Paice, 2009). As yet, the artist's studio has

not received the full consideration that it deserves.¹¹⁴ Likewise, the atelier has not been the subject of much research. One exception is Sha's consideration of the TML which he directs; he characterises it as an 'atelier-lab'. This is a site for the production of knowledge, but with a twist: "it meets disciplines not in a point, but thickly" and "it provides a place for its affiliates to re-orient their approach to their production of art and knowledge" (2012: 64). This can make the atelier (or atelier-lab) sound rather exciting. However it was, at times, fairly ordinary; much like the SenseLab's reading room, or the Institut's mini studios for students. At other times, they approximated the scientific lab. For instance, much of the TML's work was in the (theatrical) black box, quite separate from the atelier-lab, as well as from the outside world. Indeed, all the experimental sites I engaged with required a lot of work to gain entry, much like scientific laboratories.

And yet, as I argue in **Experimental ecologies**, the notion of a coherent experimental space is problematic across these 'field-sites'. The best way of understanding this emerging geography of experiment is in terms of what Stengers calls an 'ecology of practice'. Put differently, the notion of an ecology of practices provides a way of grasping the multiplicity of experimental sites. By this, Stengers means to emphasise how particular practices impinge upon, and relate to, other practices that exist simultaneously. For any particular practice, Stengers' notion asks what particular requirements are made by the practice and what particular obligations the practice imposes upon those who practice, make use of, or get affected by, it. The experimental practices themselves are sites of attachment, force and transformation.

¹¹⁴ As Alex Coles (2012: 13) notes, "almost the entire bibliography on the studio revolves around it either as a trope or a thematic".

But I want to develop this idea further by advancing the notion of experimental ecologies rather than sites of experiment. Throughout the thesis I have been arguing for the necessity of paying close attention to the precise ways in which ecologies of experiment cohere. It is Stengers, then, who presents the best way of understanding these sets of experimental practices, without necessarily reducing them to site, nor to some overarching tendency within popular or scholarly practice. Thinking in terms of ecology does not face the same kind of limits as a site-based approach or ontology (Woodward *et al.*, 2010), which foreground location. To think experiment ecologically is to attend to the ways in which experiment always escapes particular sites. Put otherwise, an ecology of practices is not to impose an analytical framework but rather provides purchase for considering the related heterogeneous practices while avoiding a kind of reductionism that could result from understanding the lab as site-specific. Further, using the notion ecologies of experiments elides the temptation to figure these experiments as extra-scientific, positioning everything in relation to science. Put differently, to talk of ecologies of experiment avoids making a distinction between science and art.

It is by attending to the precise make up of these experimental practices that you can tease out their different ecologies. The ways in which these ecologies are organised has implications for their duration and the kinds of relations of which they are composed. For instance, there is a very strong gravitational centre in at least two of the ecologies – at the SenseLab and the Institut – whereas there is something about the spatio-temporality of FoAM which is more distributed. This could be in part because there is no ‘celebrity’ figure as such, and a greater number of ecological ‘nodes’. These experimental ecologies can reproduce quite a traditional

model of science, with their overt focus on their 'lab-group', but they also develop and cultivate certain kinds of organisational atmospheres (Borch, 2010). The organisation of these ecologies might not always be apparent but they can become explicit, such as when someone says that they don't want to talk about a particular topic (with a witch in hand).

8.2. EXPERIMENTAL GEOGRAPHIES

We need ... to invent an art of experiment which can up the methodological ante. (Thrift, 2011: 8)

The implications of this mode of experiment are manifold. Experiment understood as exploratory, processual and ambiguous challenges conventional renderings of the term. Indeed, this stretching of the notion of experiment has implications for experimenting in geography. Just as certain concepts within geography have become "sprinkled through many recent writings, often adding nothing much more than a mere cultural frisson" (Thrift, 2008a: 221), so too has experiment. It has been invoked in a range of ways, not all of which have been productive. For instance, experiment has been invoked in sometimes uncritical ways which suggest a certain heroism or novelty. However, this does not mean that a focus on experiment and the experimental can be dismissed as a 'passing intellectual fad' for it raises crucial questions about fundamental understandings of what constitutes doing geography. For instance, what does attending to experiment mean for geography? And, more specifically, what does it mean to say that the mantra of non-representational theories is "to experiment in thought with what constitutes the world" (Dewsbury, 2010: 157)?

My interest then, is not only in trying to answer questions like ‘What is distinctive about new geographies of experiment?’ but ‘How should geographers experiment?’ More specifically, my concern here has been with how experiment is a “searching for a new way of going on” (Thrift, 2008a: 223). This search for a new way of going on has compelled Nigel Thrift to explore an “experimental rather than a representational approach to the social sciences and humanities” (Thrift, 2008a: i). And yet, while this style is ‘avowedly experimental’, it is tentative. Thrift’s defence that “too much in the way clarity should not necessarily be counted as a good thing” (2008a: viii) is fair but overwhelmingly cautious. Moreover, his reference to William Connolly here that “running the experiment may be the best way to test the claims” (Connolly, 2005: 166), is equally provisional. What experiment is Connolly referring to? Moreover, experiment need not be about testing.

This tentativeness pervades many recent injunctions to experiment. For instance, while Sarah Whatmore notes cultural geography’s “rich tradition of experimentation” (2006: 606), she does not elaborate. In her account which engages with the clamour for more-than-disciplinary collaborations, experimentation provides a ‘valuable resource’ for resisting pressures on geography to mediate between publics and scientists. This does not go far enough; more needs to be said about both this tradition of experimentation and why experiment can be a valuable resource. What is at stake here is how to *expand* the notion of experiment while maintaining its *specificity*. Put differently, the challenge is to provide purchase on experiment without being reductive. To what extent is it possible to hold on to experiment’s specificity? If you use any term enough, it begins to lose its currency. The same is the case for experiment. After all, what is no longer experimental?

Arguably part of what makes experiment productive and interesting is that the term has proliferated to such an extent. Yet, if it is so pervasive, what does the term still offer? More specifically, what does it offer for doing geography? The need for an agenda for experimental geography, therefore, is pronounced.

As I begin this agenda setting, I am mindful that there has been a quasi-manifesto for experimental geography established by Trevor Paglen, which could be understood as “a new lens to interpret a growing body of culturally inspired work that deals with human interaction with the land” (Thompson, 2009: 13).¹¹⁵ Although this is not very specific, what is interesting is how Paglen has traced historical antecedents for an experimental geographic practice; this revolves predominantly around the work of Guy Debord and Henri Lefebvre. Paglen’s use of the term experimental affirms the “modernist notion that things can be better” yet comes “without guarantees” (Paglen, 2009: 31). The task of experimental geography then, is

to seize the opportunities that present themselves in the spatial practices of culture. To move beyond critical reflection, critique alone, and political ‘attitudes’, into the realm of practice. To experiment with creating new spaces, new ways of being. (Paglen, 2009: 32)

To some extent then, the vision for an experimental geography offered here is laudable; it is hard to disagree with his propositions. However, what sets my approach apart from Paglen’s is a careful engagement with contemporary geographical thinking. Although geographers do not have ownership over the term geography, Paglen’s work, and that of his collaborators, suggests a fairly limited engagement with much of contemporary (human) geography. For example, when

¹¹⁵ Elsewhere, Thompson notes that experimental geography “might bring to mind landscapes, laboratories, obscure cartographies, or a didactic analysis of a remote region of the world. And, ultimately, experimental geography is all these things” (Thompson, 2009: 13).

noting the art world's romance with 'theory', it is argued that artists and thinkers would find succour in an approach which is grounded in real sites with real histories. The suggestion that the "postmodern critical appraisal might find comfort in the arms of contemporary geography" (Thompson, 2009: 21) would have it that human geography has been immune to recent theoretical debates and discussions. This is a somewhat misguided assessment.

This agenda is also a response to a recent set of reviews on emerging experimental and collaborative forms of working within the discipline (Davies and Dwyer, 2007; 2008; Dwyer and Davies, 2010). The reviews note that while there have been "innovative forms of methodological experimentation" the insights from these experiments have not been documented; there is a "need to consolidate outputs from this growing methodological repertoire, as well as to remain open to the ongoing uncertainties of the research encounter" (Dwyer and Davies, 2010: 95). Accordingly, I try to consolidate some of the concepts and techniques for experimentation examined in the substantive chapters and how these can animate an experimental geography. These are injunctions to the experimental that can make a difference to geography.

8.2.1. RESEARCH-CREATION

The notion of 'research-creation' needs to be an important touchstone for experimental geography. While recent 'geography-art' workshops, sessions and collaborations have attended to experiment, they have tended to emphasise creative practices and how these can animate and inflect geographical methods. Far less seems to be written about what sensitivity to space, and spatial imaginaries, could enable in these collaborations. For instance, in 2006 there was a day-long

symposium in Edinburgh titled 'Emerging Affinities? Art and Geography?' The flyer for the event noted that "geographers and artists are keener than ever to do work and make things together" but developed a certain distinction between theory and practice. Geographers, it was suggested, might help artists reconfigure their critical practice by engaging with theory, and artists could aid geographers in a search for more imaginative responses to the complexities of the world. Further, by suggesting the entwining of research and creative sensibilities, both research and creation are kept separate even if the two modes are rendered closer to each other than is often the case.

The relationships between geography and artistic practices have a long history and, as Kate Foster and Hayden Lorimer (2007) remind us, this 'fusion' has taken diverse forms. What I want to argue though, is that geography-art can be considered a form of research-creation. As we have seen in chapter four, this is a term that has gained currency particularly in the Canadian context, although it remains vaguely defined. What it offers us here, is an opportunity to re-consider research and creation, or geography and art, as not necessarily opposed to one another. I want to point to the SenseLab's suggestion that making is already a thinking-in-action, and that conceptualisation is a practice in its own right. The simple hyphen, or dash, between research and creation, might leave one wondering how to move from one to the other. One way is to put theory and practice on the same creative plane.

Another way might be to think, as Marilyn Strathern suggested, through "complex trajectories rather than blurred genres" (1999: 25). Likewise, Doreen Massey (2005) writes that trajectories are both temporal and spatial, although without fixed coordinates. Experimental collaboration might then be re-imagined as

temporarily shared trajectories. What is at stake with this re-imagining? I contend that shared trajectories rather than fusions, give rise to a different question. Instead of asking what is collaboration, it attends to the how and where of collaboration. It also problematises the figure of the experimenter (or the 'geographer-artist'); rather than a new category within disciplines, they indicate tendencies or becomings.

8.2.2. MODELS

Ecologies where theory is experimented should force us to re-evaluate the role that abstractions play in thinking. It is for precisely this reason that human geography needs to be less sceptical of modelling. Indeed, it would do well to revisit notions of modelling to rethink what it is to experiment. In chapter five I examined various notions of modelling. The one I remain most drawn to, given its anticonservatism, is that of meta-modelling. Rather than think of methodology as a model or a template, we might instead think of it as a metamodel. Meta in the (etymological) sense of 'among' rather than the on-high of the ideal: the "spontaneous re-mingling of acquired regularities of practice with the emergence-level chance and indeterminacy from which they evolved" (Massumi, 2011: 103). To metamodel is to propagate "precariousness, uncertainty and creativity [over] fixity, structure and universality" (Genosko, 2002: 27). However, the encounter with the Institut für Raumexperimente complicates the distinction between modelling and metamodelling. For instance, if there is no pre-given model – it must always be constructed anew – how are certain aspects conserved?

As such, while Guattari's work on metamodels has done much to encourage re-thinking of models, it is perhaps impossible to perform in practice. Therefore, I

suggest that experimental geography make more of the notion of iteration, or of iterative models. There are two good reasons for this. The first is that modelisation does not fetishize the new. Sometimes there are some components of the model that work well; sometimes it is necessary to hold on to certain parts. It is not always about creating a model afresh. Models are neither static templates, nor ever-changing forms. Eliasson's models must be remade, as with Guattari's, but they are informed and inflected by what has gone before. Therefore models, like the Institut's blueprint are an always on-going construction: it is not known in advance how a model will develop. The second is that modelisation foregrounds the *construction* of models. This draws attention to the process itself: how might specific models be developed for particular sites or situations? The methodological ramifications are vast. If approaches need to be adapted to each singular situation – without necessarily starting from scratch – there is no one-size-fits-all methodology.

8.2.3. CONCEPT POACHING

Much experimental geography engages with concepts which are not commonly associated with the discipline. Of course, this is not limited to experimental geography but it raises the question: how do concepts make their way from the sciences to the humanities and/or social sciences? To what extent is it necessary to be faithful to a concept's original usage? In chapter six, I examined the touchiness surrounding the matter of 'theft' from science for the humanities. Drawing on Brian Massumi, I proposed that the trick is not to use a scientific concept in a scientific manner; rather, 'poaching' a concept is to borrow in order to make a difference. Characterising this as a respectful betrayal – as it is additive – I also want to suggest that using terms metaphorically may not necessarily be problematic. Although non-

representational theory's distrust of metaphor is understandable, Michel Serres argues that metaphor has everything to do with transport, with the exporting and importing of terms. As such, metaphors – anexact yet rigorous – are all about the movement of concepts, untethering them from particular fields, domains or disciplines and putting them to work elsewhere, in order to make them resonate or echo.

My encounter with the TML helps to foreground that topology can be used “in its full *but not exclusively* mathematical sense” (Sha, 2002: 460, my emphasis). While I encourage these experimental translations of the term, it is nevertheless important to consider the trajectories of terms and their histories. As I have already examined, the movement and mutation of a concept – such as topology – does not render it wrong or fruitless. Consequently, I argue that topology as a concept, or a particular style of thinking, does not necessarily require greater conceptual precision if it is to be used by geographers. What this means, then, is that experimental geography should embrace terms from beyond the discipline. The caveat is that the term needs to make a difference.

8.3. RECLAIMING EXPERIMENT

To get anywhere with [a] concept, you have to retain the manyness of its forms. It's not something that can be reduced to one thing. (Massumi, 2009: 1)

Massumi's (2009) discussion of conceptual 'manyess' is on the topic of affect. However, he could also be writing of experiment. To get anywhere with experiment requires a sensitivity to the manyess of its forms. It has been important to examine this manyess of experiment because the injunction to be experimental has recently become one of the defining refrains of contemporary research in the social sciences

and humanities, including geography. As I have argued, experiment has conventionally been understood to be associated with the sciences or, on occasion, the avant-garde.

Following Isabelle Stengers, I have adopted the notion of reclamation (see Stengers, 2008a; Pignarre and Stengers, 2011), as a way of trying to think through the proliferation of new experimental spaces, events and practices. To return to her quote,

reclaiming is an adventure, both empirical and pragmatic, because it does not primarily mean taking back what was confiscated, but rather learning what it takes to inhabit again. (2008a: 58)

This reclaiming is not necessarily synonymous with recuperating, as it is not altogether clear that we need to recover experiment. This reclaiming, then, is instead a matter of reactivating.¹¹⁶ Reactivating the notion and practice of the experiment and experimentation has been an important aspect not just of the experimental spaces I have been engaging with, but also of my own work. What is more, encountering and inhabiting a loose constellation of experimental ecologies foregrounds the necessity of reactivating experiment as an ongoing ethos; an ethos that needs careful tending and cultivation. I find myself agreeing with Nigel Thrift:

My inclination is to change the ethos of engagement. My inclination, in other words, is to find other styles of proceeding that can make the world more porous and so open to more questions. (Thrift, 2004a: 82)

¹¹⁶ Pignarre and Stengers (2011) remark that “It is perhaps the word reclaim that Guattari was missing when he spoke of ‘reconquest’. Far from the sense of reconquista as a crusade against the forces of evil, this word associates irreducibly to cure and to reappropriate, to learn again and to struggle. Not to say ‘it is ours’...” (2011: 137).

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