

# 1. Beginnings

## Setting Out

But certainly, for us who understand life, figures are a matter of indifference. I should have liked to begin this story in the fashion of the fairy tales. I should have liked to say: “Once upon a time there was little prince who lived on a planet that was scarcely any bigger than himself and who had need of a friend”

“The Little Prince”, by Antoine de Saint-Exupery<sup>1</sup>

I would like to be able to start this PhD in the fashion of fairy tales. I would like to introduce myself to you as a prince living once upon a time on a planet scarcely less fragile than myself. I would like to ask who needs a friend? But I cannot begin this way. Such a start might bear false hopes of a neat tale about to unfold toward a princely conclusion. Sadly this is no such tale - at times it is not a tale at all. It is a messy, complex story about trying to tell messy and complex stories in an engaging and useful way. And figures and fact are not a matter of indifference, as we shall see. But fairy tales start with ‘once upon a time’ to indicate to the listener or reader that it is time to settle and prepare for what is to come. So I set out in this way, to ask you to prepare because though this is not a story it shares some of a story’s spirit. And though this is a PhD dissertation, in places it might not look like one.

## The Storyline

From September 2006 until March 2009 I worked closely with seven local government organisations in the UK and engaged with several others. The purpose of this was to explore how learning from breakthrough carbon reduction projects might be drawn out in a way that would not only be of value to those involved but that also would inspire and evoke change initiatives elsewhere. The approach I took was based on an action research method called “learning history”. In the course of the detailed practice of my

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<sup>1</sup> **Acknowledgement:** my daughter Isabel (9) casually read this aloud to me on the way to swimming classes yesterday (June 22<sup>nd</sup>, 2008). I was only half listening. But when she read it I asked her to repeat it 3 times and smiled. This would be the start. Thank you Isabel.

research I developed a new version of it that I called “learning history in an open system”. This was a version that paid particular attention to creating a connection with the everyday mythic in our modern accounts of change. The learning histories that were created I called tales of vision, chance and determination though they included plenty of hard technological facts as well. These histories lie at the heart of the research and my work with them contributes a complementary view to current case studies and theoretical models of change and technological transition that are part of the global discourse on climate change. This then is a theoretical and a practical perspective, on the experience of riding the ongoing, unknowable transition which society finds itself navigating today.

In this opening chapter the process of arriving at the above storyline is described now. It starts with the context, both global and personal of the research.

## The Context

At the start of the millennium the debate about climate change was shifting. Arguments over whether it was occurring at all, whether it was manmade and whether it would have devastating effects started to dwindle. The words ‘scientific consensus’ started to be whispered first and then pronounced more clearly. The UK government set a target of a 60% cut in carbon emissions on 1990 levels by 2050. It seemed an ambitious target at the time. As scientific reports have become ever starker (ACIA 2005; IPCC 2007), there have been recent calls to increase this target to between 80% and 90% in order to avoid a temperature increase of 2°C or above (Bows, Mander et al. 2006). Whatever the exact figures, the message is unequivocal: a rapid decarbonisation of our society needs to occur.

However decarbonisation is not occurring in step with the increased awareness and understanding of the problem. Technologies that can reduce carbon are available, yet they are not being as widely used as they could be. In 2006 the Lowcarbonworks project was set up to better understand this anomaly and, through action research, in some way to address it. Lowcarbonworks was a public funded 3-year research program that brought together action researchers from the Centre for Action Research in Professional Practice (CARPP) at Bath with economists from Manchester University and partners from industry. The project rested on the assumption that the barriers to carbon reduction

cannot be viewed as purely technological; rather they result instead from a combination of sociological, organisational and psychological factors set within the context of objective realities that include economics, policy, legal frameworks and technology itself.

Action research is well placed both ideologically and practically to engage with big issues like climate change. It is an orientation of research that concentrates on issues of practical significance within a wider aspiration to contribute to both the well-being of humankind and '*the wider ecology of the planet of which we are an intrinsic part*' (Reason and Bradbury 2008b p.4). However action research that grapples directly with problems such as climate change is less prevalent in the literature than one might expect. The recent 2<sup>nd</sup> handbook of action research brings together several perspectives on action research. There the emphasis can be seen to be more on the development of new processes, practices and knowledge that challenge and re-vision the world as we know it today. However with growing concerns about the state of our world, the action research community has recently challenged itself to engage more directly with the '*big issues of our time*' of which climate change is one (Reason and Bradbury 2008a p. 695). The Lowcarbonworks project was set up in 2006 in part as a response to that challenge.

In 2006 I was just completing my MSc in Responsibility and Business practice at the University of Bath. The course had marked a significant turning point in my personal history. I had spent my adult life developing a career as a technologist whilst sensing all the while something was missing. I had grown up, the fifth of a middle-class family of six children in rural Ireland and at the age of eleven had gone to a convent boarding school. I had loved sports and mathematics when I was a child. I was a tomboy. At university, I took the practical option of engineering though my heart was with mathematics. In 1988 I graduated with an MSc in Microelectronics and was harbouring an unfulfilled interest in spirituality and philosophy. I emigrated immediately and lived in the Netherlands, France and Germany for eight years learning languages and soaking up European culture before moving to the UK in the mid-90s where I met my husband Andy and started a serious career in microprocessor design. This took me to Silicon Valley in the US for a year and into a very rewarding spell in design and cross-cultural project management. In 1999 I had my first child, Isabel. I continued working and in 2001 had my second child Alex. At work I was promoted further up the management chain after each maternity leave, but in 2002 the company I was in needed to downsize and as manager I had to

make most of the team I had carefully built up redundant. I found this traumatic. The work increasingly lost meaning for me from this point. In 2004 I came to Bath to take the MSc and by 2006 my eyes had been keenly and sometimes painfully opened to the 'big issues' of our time of which climate change was one. I knew by then that for my work to have meaning, I had to stay engaged with these issues.

So when a position for doctoral research came up on Lowcarbonworks I was interested. The project offered an opportunity, as I saw it, of doing action research at the boundary between hard technology and the social world. And it was in service to the bigger issue of climate change. It offered the possibility to integrate my eclectic mix of interests and skills as a technologist turned action researcher with my more emotionally based impulse to do something – anything –that might help our fragile planet. I signed up for the PhD studentship that was part of the Lowcarbonworks project and within that context carved out the inquiry that is the subject of this thesis.

## Arriving at the Start

In this section I will present a potted history of the early inquiry process that resulted. This description, that refers mainly to the first year of the research, will lead then to a starting statement in the next section of what the research is about and an overview of its main elements that were deepened over the subsequent 18 months. The purpose here is to help the reader place what comes next as well as start to get a feel for the chronology of the inquiry. It will necessarily be forward referencing into various sections deeper in the thesis. In laying out the writing I have been mindful that a reader should at most be asked just once or twice to place his or her thumb in one place and leaf to another. In this section particularly I seek to run it before you as a preview or, to use a culinary metaphor, an appetiser to be enjoyed without thumbs.

Starting with the wide remit of the project goals my starting questions were regarding the shape of my research within that. What would my research questions be? How would they be bounded? How might I arrive at them? The process of moving forward from this starting point was complex. I can see now that it was a parallel movement into theory, practice and inquiry.

# Theory

The project brief had set out a desire to explore the social, organisational and psychological factors (and we now often add economic and political factors to that) that stood in the way of low or zero carbon technologies being adopted. I started to look at various literatures that might be helpful. Organisational change theory might often be set against a goal of achieving an economically successful company for example, but surely some of its theories might translate to some of the questions we sought to address even if returned shareholder value was not our goal? The broad area of science and technology studies included several streams that looked at the interaction between technology and the societal context of which it was a part. There were streams too that offered retrospective analyses of how previous sociotechnological shifts had taken place. More will be said of these theories later. Here I want to give a sense that a theoretical canvas was being painted that helped me formulate and deepen questions about change, society's relationship with technology and the manner in which sociotechnical transformation takes place.

# Practice

This was an action research PhD however. I was not going to derive its basis solely in the library and I embraced and indeed orchestrated some encounters in the hope that these too might play a part in guiding me forward. Project meetings, coffee-time conversations, formal lectures, seminars – these and other experiences of the time created a hum of thoughts and experiences that sometimes developed and other times fizzled. In conversation with my supervisor, Peter, we explored how we might align my own purposes and interests with those of the project and what we called 'the wider agenda'. These early conversations weren't so much about what exactly I'd do, but more about finding a few principles to tether my inquiry so that it would have the freedom to unfold and deepen. From early on I articulated a desire to bring in some content to the project, possibly some cases studies, that would be illuminate the main project themes. And a rough framework of naturalistic inquiry (Lincoln and Guba 1986) as a means of going forward started to take shape.

Many different encounters then helped my thinking as to what these cases should be

and what would be the basis for gathering them. In a project meeting while discussing a low carbon technology called ‘aircycle’<sup>2</sup> I became struck not by the usual question of why this emerging technology was not being used to save carbon, but rather why, in certain unusual cases such as in German trains, it was. The theories of organisational change I was reading were helping to develop a notion that though ‘business-as-usual’ as a response to climate change was lamentable, the nature of organisational routines and human patterns of decision making meant it was a response to be expected. Questions quickly formed around seeing new technology related carbon reduction as an anomalous breakthrough to be celebrated. What led to such anomalies occurring? How might we learn from them? What existing approaches are there for learning from them? Are these working? And where should I locate the study? After a process of gathering possible examples of breakthroughs across the public and private sector I honed in on local government where my provisional research had revealed a series of innovative projects that were worthy of study. In particular I had kept hearing about an iconic project in the London Borough of Woking where, using different low carbon technologies and a local energy network, the local authority had slashed their carbon emissions.

Another meeting led me in the direction of the approach to take. In a semi-formal lunch meeting a colleague and I met with a corporate social responsibility director (MB) to explore a potential university collaboration. Toward the end of our conversation I had noticed a marked shift in tone that interested me. MB was describing to us, in a matter of fact fashion, how x% of his delivery fleet had been converted to biofuel. Interested, I probed a bit more about what was behind this switch. With that he had suddenly sat back, and with a glint in his eye and a glance at his watch he had said: *“let me tell you how things really happen”*. The mood changed palpably as he went on to describe phonecalls, scribbles on envelopes, gentle coercion and, finally, victory. His eyes were alight as he told this rehearsed tale with humour and familiarity. I’d heard many stories like it before. But here I was primed by the search for some ‘angle’ to take with the appreciative stories I was seeking. So I really noticed the shift in mood and imagery when we went from the official to the behind the scenes story. I noticed too my easy enjoyment of it and his readiness to tell. With the cases in my study I wondered, how

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<sup>2</sup> A technology that uses air at different pressures to achieve efficient heating and cooling across a wide range of temperatures.

might I start to elucidate the 'real' stories like this? Surely these would bring alive the experiences of those involved in an engaging way?

Another chance contact and conversation gave me the chance to find out. Just six months after I started my research, I visited a local government office in the London Borough of Merton ostensibly to find out more about Woking. There I met a man who himself had played a key part in the success of an unusual and groundbreaking piece of low carbon planning policy. What was to be an exploratory interview turned out to be pivotal for the research and it provided me with my first case. With what I knew to be an excellent interview on tape, I now had the question: what approach will keep this account intact and do it justice? After some methodological handwringing, which I will describe in detail in my later chapter on method, I settled on an action research approach called learning history.

Learning history might be termed, simplistically, as action research's answer to case study. Researchers in the US have developed it with a specific view to enabling learning from experience as opposed to learning from fact and analysis (Kleiner and Roth 1997; Roth and Bradbury 2008). Whereas case study will analyse an event in an objective way, learning history revels in the messy human story of that event. So it charts an event or occurrence of significance from the perspectives and experiences of those who have been involved. Researchers and participants engage together to tell a jointly told tale (Van Maanen 1998) and through the reflective process there is potential for learning for those involved and as well as for others who might relate to the experiences that are described.

## **Inquiry**

The strands of theory and practice are described above as though they were separate. The encounters sound perhaps haphazard; the choice of naming just one or two of them here is ad-hoc and to be taken as representative rather than comprehensive. My journal in which I regularly recorded thoughts, reflections and stories relating to my work and to my life in general describes several other such encounters. And I have described an evolution of questions without really explaining what guided this progression. Here I can say that all this was knitted together by various processes of personal inquiry that were

helping to guide my actions and decisions. Some of this process will be described in later sections and the reader will see that this was itself neither a fixed nor a perfect process, but it was always there and constantly under review. Reflection, by myself or in conversation with Peter and others, played a key role in helping me to making sense of what was happening. Theoretical links guided the areas of interest whilst experience brought some of these to life and reflecting on that helped me to decide what was significant. Constant telling and re-telling about my research, and then listening back or reflecting on it, helped me start to shape a 'story' of my research. By the end of the first year then I had an early development of ideas, strands of inquiry as well as preliminary interview material with which to work.



# Overview of the Research

## Starting statement – the research focus

From that starting interview and early development of ideas, I was able to launch forward into the inquiry that is at the centre of this work. This is an exploration and development of the learning history approach as a means to:

- Accelerate learning inside and between organisations that are working within the same institutional framework.
- Contribute overall to an understanding of how to respond to the challenge of climate change within and beyond the institutional setting in which the study is located.

And more generally to:

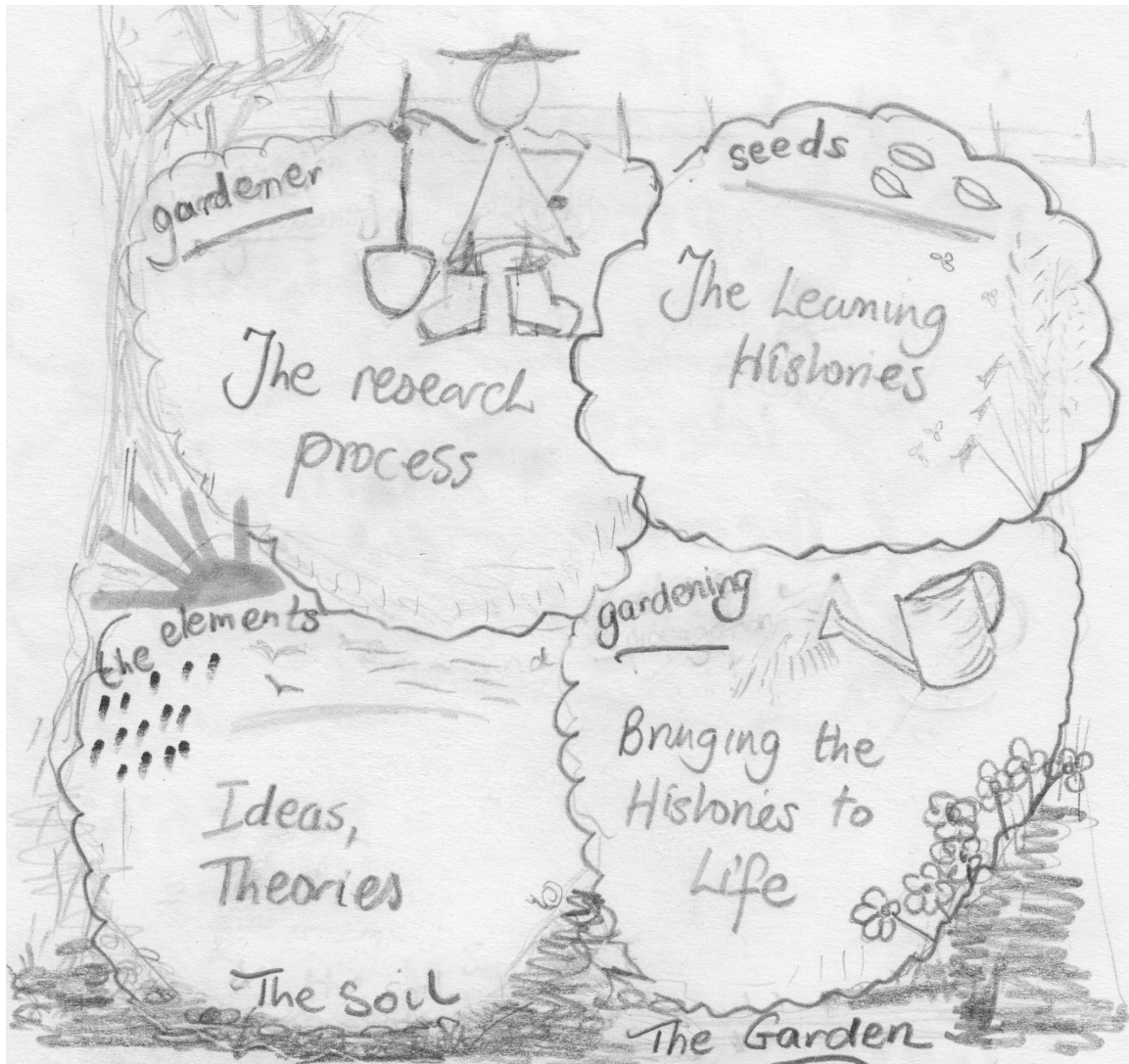
- Increase understanding of the processes for innovation (in this case for carbon reduction)

In the next two subsections I propose two different ways of looking at the research. The purpose of this is to draw two different maps of the research that will be discussed in this thesis. The first is a map based on a metaphor; the second is a chronological map.

Together they delineate the territory of the inquiry. When, as inevitably I must, the linear map of the thesis is laid out, it is hoped the reader will be primed against any sense that this inquiry simply unfolded as one thing after another.

## Map 1: Research as garden

Tasked to describe my research in a workshop recently I found myself sketching it all out according to a gardening metaphor. With a warning that it is not to be taken too literally, I have decided to use this metaphor to sketch out the different areas of inquiry and to illustrate, using a handwritten font, the kinds of questions that concerned me.



**Figure 2: A sketch of my research - using a loose gardening metaphor**

## **The Seeds**

The research has involved the creation of a set of learning histories that describe five very different innovative projects in local authorities. These learning histories are artefacts. They are small booklets that, in a particular way, describe something that happened from the perspective of one or two people close to the project. Those perspectives are, like DNA is codified in a seed, written into the histories. I liken the histories to seeds because they are distinct and they contain the potential to flourish in different ways and under different conditions.

Inquiries relating to the set of learning histories have been relating to the processes of codification, for example:

*How might I craft this history in a way that has the potential for it to flourish in all kinds of settings?*

*How might I do justice to the stories that have been told and the individuals who have told them?*

And the integrity of the histories that result:

*How do I avoid collusion with just one prevailing narrative of a project?*

*How do I do justice to the stories that have not been told?*

## Gardening

Early in the research I grappled with how to distinguish the process of learning history from the artefacts created by that process. The name 'learning history' suggests it as a fixed object – a written or oral record of something. In its reduced form that is indeed what it is: a written document. However it is also much more than that – it is a process of learning involving the creation of an object and the subsequent work with it. This was a potential I wanted to explore in some detail. So likening the process of learning history research to the activity of gardening I paid particular attention to the question:

*How might I enliven the learning histories – in different places, with different audiences and at different times?*

The metaphor is one of germinating the seeds, possibly incubating them and exploring how they might be sown in different places where their progress and growth is then evaluated. And it maps onto inquiry questions of scope as well as validity:

*What kind of value is to be found in learning histories and for whom?*

*Where and how might that value be sought – for different people, in different places with different agendas?*

## The Gardener

The research process has involved a series of decisions and these are highly relevant to the exploration of methodology and development of ideas being set out in this thesis. On the other hand this series of decisions make up a story – one of hapless twists, turns and moments of insight pitched against days of mundane graft and effort. Where insights

have sometimes flourished they have at other times withered away. And teeth-gritting brave efforts have been rewarded sometimes but by no means always.

So I liken my role in the research process to that of the gardener who tends the particular garden she is in and works as best she can. She decides what seeds to gather and where to sow them. She waters them and tends to them in certain ways and makes decisions on how to respond to the elements. The inquiry questions relating to the gardener relate to decision-making and processes of inquiry:

*How do I make decisions?*

*How do I develop inquiry questions - how do they lead to action?*

But the warm sun on her back may wither her plants as quickly as it might make her smile. And the rain that merges with tears on her face might nourish the garden. She is human.

*How does who I am impact on this research?*

*When might the human experiences of my research process be helpful?*

*How might I ensure the quality of my work?*

The gardener also looks from time to time at the garden she's in. Sometimes she loves it and sometimes she is quite dispassionately critical of it. But this is where she is and it is helpful sometimes to look at the earth on which she stands.

*On what kind of ground is this research located? What are its strengths, its weaknesses? How do I see that ground?*

## **The Elements**

The sun shines light on growing seeds, the wind helps blow them and the rain helps nourish them. The elements give life to the garden and without them it would not grow. Likewise theories and ideas give life to an inquiry. Just as the elements determine the growth and nature of a garden, so have theories and ideas shaped what I have done.

*What does theory say about organisational change processes and innovation for carbon reduction?*

*What does theory say about learning history methodology?*

The gardener needs to attend to the elements and develop a sense of discernment when it comes to noticing and responding to them. Though she may work on come rain, hail or shine, the shape of the garden will reflect how she has attended to the elements. In the course of the inquiry certain ideas have recurred at a point of intersection between theoretical ideas and the practice of the research for example:

*Theories place technology as part of seamless social web of human interaction? How am I experiencing that in practice?*

Other ideas have developed where my past interests and experiences have met my research evidence and the literature: For example:

*Taking a (post)feminist stance, how might I build a non-heroic picture of innovation for carbon reduction?*

This question alludes to postfeminist strands in my MSc that are now being re-set in a new inquiry. And as this write-up will to show, other ideas have evolved as the research has proceeded and these ideas have driven the direction of some of my theorising.

## The Soil

The gardener needs to work with the soil of the garden. She needs to familiarise herself with it and its qualities. Is it acidic, damp, sandy? What are its qualities and what will that mean for the work she hopes to do. She has chosen this site for the garden, but can only get to know it properly as she gets to work. Similarly I have had to get to know something of the local government space in which I located the research.

*What is the nature of the local authority institutional field?*

*How might I adjust the research process to work best with it?*

I am aware too that the garden fence does not bound the soil. There are different fields in which some of the seeds from this garden might flourish.

*In what different settings might this research have influence?*

*How might the research be designed to cater to these different settings?*

## The Garden

The overall sight of the garden on a particular day a few years after the work has started might be likened to some of the outcomes and findings of the research presented in this

thesis. And in much the same way as a garden can look different at different times, the 'findings' have a property of contingency about them. They are presented 'as they look now' with the caution that they may look different on other days and the hope that in time they might mature and evolve. Also they indicate that subset of the research outcomes that can be claimed or proposed as having been found out. Action research is a participative process that seeks repercussion via a network of participants known and unknown. As such, findings returned by action research are often confined to the participative processes such as they can be 'found out' or generalised for further use. Here the learning history approach, with its combination of narrative and analysis, does offer the potential to theorise around the content of what is being studied as well as around the methodology.

*What common themes come out of this research regarding innovation for carbon reduction in local authorities?*

*How might that be generalised?*

I might say then that the findings relate to the overall sight of the garden in summer but won't include the cross-pollinating seeds carried by the winds, the cuttings shared with neighbouring gardeners or the travellers who might pause to simply enjoy a momentary scent or who, catching sight of the gardener in the course of her toils, have reflected a moment before continuing with the toils of their own. The garden has many purposes, many audiences.

*Who is this research for?*

And the metaphor sizes the research – this is but one garden of many - and that helps me to assess it objectively. For example a persistent inquiry question has been this:

*Just how important is learning history as an action research approach to enable change? How important are these 'things' for starting conversations and processes of change? Are they merely placebos? Or do they truly carry a special meaning that can flourish?*

In other words, the gardener opens her fist, looks at the seeds and wonders first if she needed to work so hard at getting these particular seeds and second with what attention they really need to be scattered?

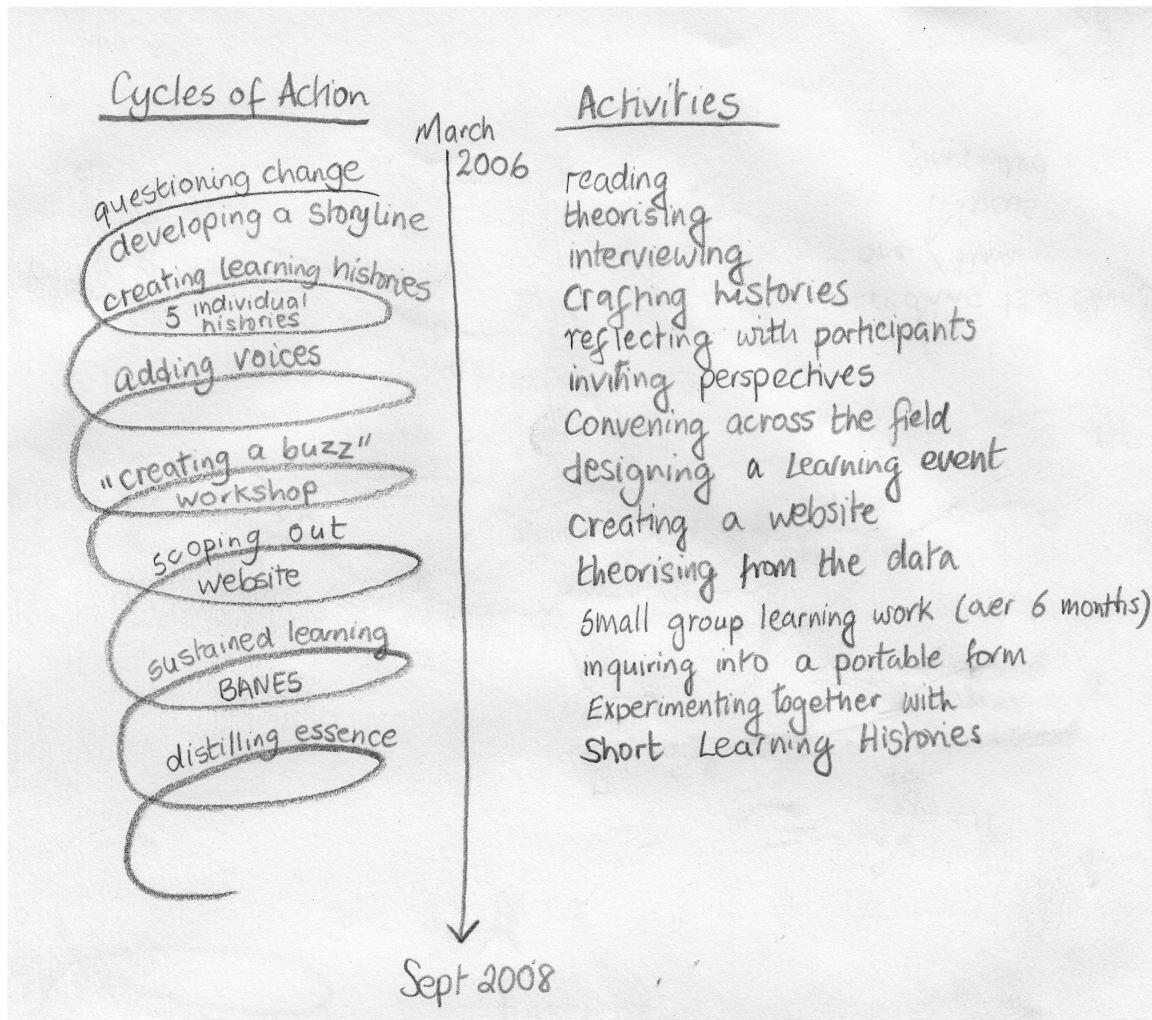
## Using the gardening metaphor

A loose gardening metaphor has been offered to help give an early overview of the scope of research described in this thesis. By expanding on the metaphor it has been possible to illustrate the different kinds of inquiry questions that have been important. Some of these questions will be addressed directly and in much more depth as the thesis unfolds, others will be more implicitly discussed. The metaphor puts in place a means to distinguish different facets of the research later on. However I don't intend it to be taken too literally. A light push and it falls down in places. The gardener appearing as the only person, and identified so closely with the researcher conveys the wrong emphasis for example. Or the organisation of theories as an element blowing in rather than the territory on which the research is grown might jar with common views of how academic knowledge is created. However I use the metaphor to start to locate the different layers of the research without stifling it for now. It is setting the scope for the work.



## Map 2: Research as chronological flow of action

The second map, shown in Figure 2 below, depicts the research as a chronological flow of action cycles over a period of nearly three years. In reality these action cycles overlapped more than represented here but the diagram conveys well how the emphasis of the inquiry shifted over time in terms of its purpose and its scope. This shifting emphasis was reflected too in how the participants in the study changed over time.



**Figure 3 The research as a chronological flow of action**

The first cycle of action involved my exploration of various theories from which I mounted an argument for conducting learning history at the institutional level. Over time I developed a 'storyline' for the learning history work I would do. I would chart "the story of how innovation for carbon reduction is occurring in the field of local government". The



next action cycle involved the crafting of a set of learning histories, drawn from across that field. By field I mean the institutional field of local government and connected organisations. I draw on Di Maggio and Powell's definition of an organisational field:

By organisational field, we mean those organisations that, in the **aggregate**, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organisations that produce similar services or products

(DiMaggio and Powell 1983 p. 186)

The next action cycle, "adding voices", involved the process of reflecting with original participants on what had been written as well as starting to gradually open the histories up for participation. This started by inviting in some of the voices of others who were involved in some way in what had been written.

This scope then started to widen out further to the institutional level in the next action cycle where quite deliberately I started to 'create a buzz' around the histories by inviting those from across the field and beyond to engage with them. The central event in this cycle was a 'learning history workshop' that took place in February 2008. This step was oriented particularly at the previously stated purpose of accelerating an overall response to climate change by increasing the potential for learning between organisations as well as within them. From this 'buzz' around the five individual histories came new stories, new voices and new perspectives from across the field. These enriched the original storyline of the research and, in the next action cycle, these richer, multi-voiced perspectives were knitted together to create a joint learning history, not as a further document but as a live interactive website<sup>3</sup>. The joint learning history then was itself one site of experimentation with broadening the scope of the work out into the wider system. The participants were now further away –sitting in larger audiences or linking to the work via a website. This cycle of action then has involved an exploration of ways to promulgate the work outwards into the system of others with consequences that cannot be known.

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<sup>3</sup> [http://academicmum.typepad.com/lcw\\_learning\\_history\\_inno/](http://academicmum.typepad.com/lcw_learning_history_inno/)

A further site of experimentation is shown in the next action cycle: “sustained learning”. This was at my local council of Bath and NE Somerset (B&NES) who were just beginning to get to grips with the climate change agenda. Together we were interested to explore how the learning histories might help them to build capacity and overall a culture of innovation. Over a period of six months a sustained inquiry took place. This also provided a site where the emerging thematic findings from the research could be tested.

Finally, as the experimentation in the institutional field was finishing, “a buzz” started to develop in our own research community about learning history. Inquiries into form, portability and development of the approach started to blossom and these questions began to find homes in new research projects as well as on Lowcarbonworks. From these questions came experimentation that is ongoing. One such experiment – where a learning history exercise over just three days was devised and run at an action research conference – helped us to collaboratively explore what is the ‘essence of a learning history’ against a backdrop of fresh (and for some painful!) experience.

The chronological action map gives a sense of what was done and relates these actions to the research focus that was described in the starting statement. However it doesn’t explain why the action moved in this way. This will unfold as the dissertation draws from across these action cycles to illustrate a set of inquiries that deepened and developed over time. Having a chronological map will help the reader place the illustrations in time. And the map is also the start of the proposal of what is original here. A learning history project is shown as a continual process of engagement and widening scope within an open system and so the map already distinguishes this work from other interpretations of Learning history in a number of ways.

## **Ending statement – the broader thesis**

The statement at the start of this section set out the research as an exploration and development of the learning history approach as a means to accelerate learning between organisations as to how to innovate to reduce carbon at the institutional level of local government. This is the narrow focus of the study. The use of the gardening metaphor to span the research has highlighted many questions that lie outside that focus

that have been addressed in the course of that study. This dissertation is predominantly a learning journey that has meaning at different levels. This does not preclude there being a central thesis but merely cautions that the idea of a central thesis is at odds with the thesis itself. To explain: I will argue that innovating - in this case in some way to reduce carbon – is an evolutionary process that paradoxically we cannot afford to let just happen. I will propose that new ways of learning between sites of innovation across a field are necessary to accelerate learning in a meaningful way. I will suggest that my version of learning history in an open system, which draws particularly on the narrative lineage of learning history and puts it together with participative action research processes offer one way of doing this. I will pose my work as itself a process of innovation that echoes with the substantive innovative examples that are featured. By allowing these to intertwine and relating them too to current theories of sociotechnical change I will comment more generally on processes of innovation. This will lead to some insights – part theoretical, part practical - into what ‘intervention’ or ‘action’ in an evolutionary process looks, feels and seems like. I challenge some of the archetypical myths and ideas about heroism and reach for a more postheroic interpretation of this ‘action’. So my thesis is drawn from the process of putting a method, a problem and a context together. These are not being enclosed to find a solution. Rather I am suggesting that it is the process of putting them together that is itself innovative and informative at a fundamental level.

# Main Contributions

There are two main contributions. The first contribution is on method. A large part of this thesis, (from Chapters 4 to 9), is dedicated to the working in some detail of a learning history method that is geared at enabling learning at the inter-organisational level. From this working – which goes into the nitty-gritty practice of learning history - comes a development of existing theory, a new proposal of method and insights about the practice of it in a wider field. The resultant ‘learning history in an open-system’ is proposed as an ongoing practice of celebration, inspiration and amplification. Also through the discussion I make claims as to what makes up the essence of learning history and how its connection to the mythic orientation is difficult but essential if it is to work as a vehicle for learning and developing new understandings. This research has also something to say more generally to the field of action research. The nature of quality in action research is discussed from the point of view of guiding practice rather than assessing it. Criteria are developed that are process *and* outcome oriented and these are shown in action through the thesis. The inclusion of modernism in action research is discussed throughout and particularly in relation to finding a place for technology that is neither exalted nor excluded altogether. I conclude that it is only through expanding conversations in practice that such a place can be found. Finally this research contributes to the recent debate in the field about how action research might address the challenge of being limited in its scope to individual projects and interventions. With its inter-organisational situation and its deliberate practice of widening participation in this research I claim that the open system learning history proposed here can reach a wider scope though to do so requires a different kind of practice, attention and energy.

A second contribution of the thesis is what it says about processes of technology-related innovation and change in the context of climate change. This is mostly covered in Chapter 3 and in the later Chapters 10 through to 14. Theories of organisational change are found to be wanting in their suggestion of change as being a controllable and purely social process, whereas conceptualisations of innovation are less controlled but tend to be technology-centric. Current government policy reflects this polarisation by concentrating either on user behaviour or on technological innovation where innovation stops at the point of invention. Though current sociotechnical theory goes some way to

address this dichotomy I will suggest that a meta-theory such as this, however expanded it might be, can never fully colour in the human experiences of change the way that stories can. The learning history method presented here proposes an analytical lens that generalises about processes of innovation whilst retaining the particularity of the experience. The resultant analysis in this research suggests that, far from being strategically, politically or technologically driven, innovative projects erupt dynamically when contextual factors meet capable coalitions that exhibit certain complex qualities, that include: actors' attitudes to risk, the flow of knowledge and trust and the ability to build capacity against shifting agendas. Hence the suggestion is that individuals, groups and even our society is part of an evolutionary process that is undergoing transition. Though where this transition will lead is inherently unknowable, this thesis explores through its tales of vision, chance and determination what meaningful action within such an evolutionary process might look and feel like from a personal, theoretical and practical point of view.

Aside from these contributions I'd claim too there is a contribution in the way I tell this story. The writing is trying to catch something of the mood of my learning journey and to reflect in its form the content that is being discussed. If this works then there will be unexpected contributions that are multi-layered and personal to each individual reader. The next section sets out the presentational form that I have used to support this aspiration.

# The presentational form

In choosing the presentational form of this dissertation I faced various challenges of balance. How might I show you some of what the research was like – some of the messy ‘real story’ of it – whilst also telling you something more measured that links motives, action and findings together in some, inevitably rationalised but meaningful way? There is the story of what I have done and what happened and then there is the meaning that goes with it. And how might I layer the sense I make now with the sense I made earlier? Do I privilege the writer now from the field researcher of a year ago? Surely not. So there are choices of time and representation.

## Questions of time: where am I now?

I have decided to place myself quite firmly, here, now, in late 2008 reflecting on what has happened while I write. I will take forays across the timeline into some of the earlier action showing it, or sometimes telling it like it was at the time. But I’ll return to the point where I am now trying to derive a new layer of understanding from across the several cycles of action. To this end the writing will be organised as a series of explorations of themes that cut across time and action. In this way I will be able to chart these thematic inquiries, writing into them and searching for a deeper understanding as I go.

And then there is you: the reader. What is your involvement? Some readers I know and can imagine and others I don’t. Some will read to assess this work whilst others will read perhaps out of interest or duty or love. All of you will read for your own reasons and from the unique position of your own experience at that moment. Honouring the unique position of the reader has been an important aspect of the learning history work. I will describe later how participating readers were invited to reflect and derive their own meanings in relation to the history rather than being expected to accept a certain received account. So it is in this thesis. The French literary scholar Barthes’ distinction of “a writerly text” from “a readerly text” is relevant here (Barthes 2001). Whereas the “readerly text” offers fixed meanings to be received by the passive reader, the “writerly text” offers ambiguity and mess that is open to multiple interpretations involving the reader in an active process of co-production. This dissertation is offered as a “writerly text” where:

Unlike the readerly text, the writerly text is less predictable. It does not attempt to control the reader; he or she must make his or her own connection between images, events and settings that are presented by the author.

(Sumara and Luce-Kapler 1993 p. 390)

Can a thesis be a 'writerly' text? My intention is that it has at least some of that quality.

## **Questions of representation**

As may be already apparent, questions of presentational form have been important in this work. So, at the start of writing-up I paused a long time to think over what form I wanted it to take. To help me, my second supervisor Geoff Mead asked me to think what qualities I wanted it to have. I thought some more and could identify two qualities that were important to me in the way I presented the writing: elegance and congruence. These qualities are important for my practice as well as my presentation. I present them here as distinct from, if sometimes overlapping with, the quality criteria I will introduce later for the practice of the research.

## **Elegance**

Elegance is the first quality I aspire to in the writing and in the design of the research. Here I am building not on a theoretical idea but on my personal experiences as a microprocessor designer as I will briefly describe.

Microprocessor designs need to be able to execute commands called instructions. The simplest example is the 'addition' instruction. This requires the processor to take two numbers from locations in memory, add them and put them back into another place in memory. The challenge is that with dozens of instructions and an endless number of things that might be in memory there are an infinite number of things that can happen with any stream of instructions. As a designer, you're creating units that can best fit to all these scenarios but that you can't possibly anticipate all of them. Often as not when you test your first design some unexpected condition is triggered. So you return to it and you might add in some special piece of design to cater for that case. And so it goes on. By

the end, the design can be an incomprehensible rat's nest of adjuncts, caveats and codicils added in throughout the testing process as esoteric conditions trigger and necessitate quick fixes. As a designer gains experience, he or she learns to anticipate better what the design will need to do and can do so with a minimum description that is not effusive.

Elegant design (which is manifested in a coded language) is written in a way that not only anticipates well what might be required of it, but can sometimes handle the unanticipated as well. It does this by striking just the right balance between the general and the particular. Design that is too particular becomes unwieldy and over-descriptive, as it needs to enumerate all the different cases. Design that is too general doesn't have sufficient depth to meet the diverse needs of the different programs it has to run. There is a real art in elegant design from the choices and classifications the designer makes, to the way they present their code. One can tell just by looking at a piece of code if it seems elegant, and, by running tests, one can test just how elegant it is.

The above analogy connects with my aspiration of producing a text that is not only aesthetically pleasing, but balanced between the general and the particular, is capable of conveying something without saying it explicitly and has a coherence that emerges rather than is forced by logic. The aesthetic quality of elegance connotes clean lines, minimalism and clarity of tone and is one that will be in tension with the 'messy' learning history quality I seek in the service of the second quality of presentation which is congruence.



## Congruence of practice

Congruence has been important to me in my practice as an action researcher for some years now. The idea of congruence fits with one of the tenets of action science as put forth by Argyris and Schon. Their theory of action suggests learning comes about when we reflect on the differences between our 'espoused theory' and our 'theory-in-use' (Argyris and Schon 1976). So if I espouse ideas about innovation for example, I will learn more about the ideas if I observe how I am actually embodying these ideas in practice. If not, then I might ask if I should adjust my 'espoused theory' or my 'theory-in-use' or, indeed whether this incongruence matters really. So this quality of congruence is sought gently and with tolerance for it not being completely attained.

I was not always so forgiving. During my MSc I explored the 'theory-in-use' of my personal action inquiry process as well as that of a number of action research groups of which I was a part. Inevitably I found our practices to be incongruent with the theory of action inquiry we were espousing. At first I judged this as a failure either of practice or of theory. Over time though my attitude gradually shifted. I started to reconceive action inquiry not as a dogma to be transgressed but as a constant process of learning, an iterative cycle of *"incubating, inventing and reinventing"*.

When gaps occur between theory and practice, as inevitably they must, I have learnt that the answer must not be to scream indignantly, but rather to question the theory, the practice and indeed whether, in this case, the difference between them really matters.

(Gearty 2006 p.38)

Resulting from this inquiry was a picture of the theory-in-use of my personal inquiry processes and as I entered into a new cycle of inquiry on the PhD this became the basis of my espoused theory of personal inquiry. As the new work unfolded, I could ask once again how congruent my practice was with this claimed theory of personal inquiry.

## Congruence of presentation

This quality of congruence is of particular importance in the area of presentation. Action research theory sets out the extended epistemology of multiple ways of knowing the world (Heron and Reason 2001). This extended epistemology is defined as starting with (1) the experiential knowing that comes through encounter with the world (2) The presentational knowing that is an expression of our multiple ways of knowing and so draws on multiple representational forms that such as dance, story or imagery (3) the propositional knowing that occurs through abstract thought, the development of concepts and ideas that can include scientific knowledge and finally (4) the practical knowing that arises from doing and learning in practice. These are not independent of each other. For example experiential knowing is conveyed through presentational knowing which in turn can enable a move to the abstract meanings of propositional knowing that can then inform knowing in practice. Furthermore the argument is put forth convincingly that all these ways of knowing are equally valid with none privileged over the other (Reason and Bradbury 2006 p. xxv). In action research, the practical learning and change that is left residing with participants in the field is argued to be as important as theoretical findings (Toulmin and Gustavsen 1996). Though this is intuitively a welcome and sensible argument the equality of the extended epistemology is in fact notoriously difficult to enact in an academic institution that is founded on the principle of privilege of propositional knowledge. Institutional processes, artefacts and systems of reward all act to reinforce this principle. Enacting the extended epistemology is then the source of much incongruence and rightful self-challenge within the action research community who constantly catch themselves out and self-recriminate. Why is this paper on action research so densely written? Why can't I submit my MSc thesis as a piece of drumming? Why have we just sat in an action research meeting and talked conceptually the whole way through without once seeking recourse in other ways of knowing? These are all questions I have asked or heard others ask and I understand them now not as a critique but as a nod towards more generative questions. It is particularly on the subject of presentation that practitioners have been pushing toward more congruent descriptions of their work. Judi Marshall for example advocates finding form in the writing where form, content and thematic contribution are analogically congruent

(Marshall 2008 p.682).

And other pioneers at CARPP have submitted doctoral work that, by its very presentation, is an epistemological statement in its own right and one that is acceptable to the academy (Seely 2007; Morton 2008).

It is following in the tracks of these and other colleagues' work that I define the congruence I am seeking in my writing here. Put simply I hope with the writing to do what I claim to be important. This thesis is about the development of a learning history approach. It is also about innovation. Later I will draw out some of the features of learning history as I've worked with it – for example it is realistically messy, it is human, it is located in time, it is plausible and so on. And of innovation I will describe it as a 'different move'. Though this write-up is not a learning history, I hope it to be congruent with some of its principles as described: it will be messy, it will be human, and it will blend analysis and story. And though this write-up is not an innovation, I hope it will in some way be innovative – a 'different move' of sorts. And though this write-up is in fact not my PhD, I hope that the quality of congruence will help paint a fair picture of the work that was done.



**Figure 4 Magritte's Pipe: "This is not a pipe"**

I conclude this section on congruence noting wryly how I have written in plain language about how I 'want' to be congruent. Perhaps I should start now. With thanks to Geoff for his evocation of the image of Magritte's pipe which catches visually what I've just discussed. Magritte cautions 'this is not a pipe' – it is a picture of one. And I add, it looks pleasingly like a pipe! When I'm finished I'll look at this write-up and say: though this thesis is not a learning history, does it look like one?

## Introducing a key for congruence

To work toward this congruence I plan to distinguish different perspectives in the writing of this dissertation in a way that is similar to how I have distinguished the analytical, reflective and narrative voices in the learning histories themselves. These elements will be spread through the dissertation. Narrative blooms will expand into story in places providing another way of presenting what is being discussed. Reflective pauses will change the tone and add a different layer. Dated occurrences will locate the action in time and again expand the discussion to include a messier picture of 'what it was like at the time'. Findings will in places summarise and distil. The use of these elements has been an experiment. I have had to try to balance them and have played around with how to introduce them. Sometimes however they might still interrupt, delay or confuse. Overall they are intended to provide texture. It will be through these textures that I will also introduce myself as participant in the research. In the later chapter on method I will explain that I will be presenting the relevant rather than the whole me in this writing. It will be through the textures that I will present that relevant me.

This key is shown on the next page. Each different perspective has an associated image, a little story to go with it.

## Key



### **A narrative bloom....**

This will be a passage described more in storied form. I call it a narrative bloom. It comes directly from the garden of the research. It will be added to bring to life and enrich what is being described.

**Choice of image:** I wanted to use a bloom to represent the flowery nature of narrative which I expect will contrast the dryer descriptive tone needed for much of the text. I use a picture of a sunflower grown by my son Alex (7). It grew taller than him and stood outside our front door last summer (2007).



### **A reflective pause....**

This will be a passage that introduces an idea or a reflection and is intended as a pause or a break from the main text that is breathable and will be unbroken by interpretation.

**Choice of image:** When I need space in my head I often look up at the sky. On still summer days balloons fly huffing and puffing over Bath. When they do we all look up and often photograph them. This is one that flew over our house last summer.



### **Dated occurrence in time**

This will be a passage that brings in evidence from the research pretty much unchanged. It may be a taped conversation, field notes or part of a journal entry. It will be dated and located according to when it occurred.

**Choice of image:** The image I chose is my hand-written moleskine journal. Though I actually write most of my journal online, I write in this when I'm travelling and love the tactile nature of the journal.



### **Finding or insight from the research**

This will be an emerging insight or finding from the research. It may summarise a key learning point or proposed conclusion from a foregoing description.

**Choice of image:** In France in 2005 my children spent days colouring in mandelas. This is one they did. The mandela is colourful like a flower. But with its symmetry and ordered pattern it is unlike anything natural from a garden. I choose this image to represent findings because they are at a step removed from the garden of the research. Like abstracted flowers.

## Laying out the thesis

In this chapter I have introduced the research giving a brief history of how I arrived at the starting statement of what it is addressing. Then, using two different lenses - one metaphorical, the other of chronological action – I have given an overview of the process of the research, its breadth and the kinds of questions it is addressing. From there I summarised a statement of what this thesis is setting out to say. And I have then set out some of the qualities that will guide how I am going to say it. The overall purpose of this chapter has been to build a rich but accessible map of what is to come so that you, the reader, can start to engage quickly without fears of being led into a confusion out of which you may not emerge.

When it came to the final choice of laying out the thesis in a linear fashion I became quite stuck. I suspect I am not the only researcher to have harboured the fear that in the moment of choice, many other appropriate and beautiful ways of describing the work are excluded. I got quite stuck trying to decide how best to structure this report. Gently introducing a flavour of what is to come in this dissertation, I introduce here a small story that came to mind and helped me out of this dilemma.



**October 10<sup>th</sup>, 2007**

### **Buying Sweeties – Choice is not a zero sum game**

We're in the village shop. Alex, my 7-year-old son has 50p to spend. We've whittled his choices down to Polo-mints, Maltesers and a pack of Werther's originals. The volunteer behind the counter, Keith, is good-naturedly waiting – there's no pressure. An old man, normally grumpy, is smiling at the adjacent coffee table. "I know I'd have the Werthers", he says. It's the first time I've seen him smile. We're all in the drama. "Look – just get the Polos", says his older sister Isabel testily. She knows what he should do. Alex paws the

Polos as if to take them but then changes his mind at the last minute. The wait continues. It's agonising. Finally I get a moment of clarity..."Look Alex, the thing is, they're all lovely, they're all tasty, whatever you choose will be lovely", he looks at me, and he gets it. He snatches the Maltesers. There's a loud cheer, a breath of collective relief. He reaches up to the counter, proffers his 50p and pays. "There you go young man", say Keith and off we go.

## **The thesis: signposts**

Thinking of this story I realised that there were many good ways to structure the thesis and that what I had to say would come out one way or another. By looking at the two maps I had drawn of the research I could see that the questions from the metaphorical description had interwoven their way through the chronological action cycles. These had coalesced into a number of thematic inquiry streams and it is in this way that I decided to organise the writing which has resulted in a layout of one learning history and 14 chapters (including this one). This section will describe the flow.

## Structural flow

You are invited into the dissertation via a **Gateway of Experience** which is the Merton learning history. I would like you to start with a direct experience of learning history, rather than by building logically up to it. So you are presented with the first history that was written - Merton - much as it has been offered to participants – with an invitation to engage and record your reactions. The thesis then unfurls from this illustration with a series of thematic explorations that relate to it. By building on the illustration of the Merton history to draw in the broader questions of the research I hope to be relating also to the your experiences and questions. These thematic sections divide into three parts that loosely connect to the timeline of the research over the 3 years.

*Part I The Field of Action and Inquiry* sets the context for the research. It marks out the extent of the work and its setting in local government. It presents a working of the theoretical and methodological ideas that underpin the research and it then gets into the practice of it with the learning history workshop and a discussion of the questions of scope and quality in action research.

*Part II Reflecting in the Field* reflects in some detail on the learning history process being presented here – in terms of method, practice and form. What it is to do this kind of learning history is explored in some detail. This section contributes particularly on questions of responsibility, power and narrative in learning history.

*Part III Analysing from the Field* marks a move to the more analytical aspect of the research and to the later cycles of research. Here I return to the substantive issues and explore the analytical insights from the research on questions of innovation and change for low carbon. The practical application of this analysis back in the field is discussed. Its implication for theory is developed and the thesis concludes with a reflection on what this means for meaningful action in these unknowable times.

It is best to start with reading the Merton learning history. From here the reader could follow the methodological strand covered largely in parts I and II (Chapter 2,4-9) or the more theoretical strand that discusses more about the change and processes of innovation. This is covered more in part III (Chapter 2,3 and 10-14).



## Chapter overviews

### *Opening*

**Chapter 1: Beginnings** (This Chapter)

**Gateway of Experience** - The Merton learning history

### *Part I: The field of inquiry & action*

**Chapter 2: Bridging into the Field** describes the context in which the research is set. It gives an overview of local government in the UK and describes the seven organisations that were sites of inquiry in the research. The remaining learning histories featured in the research are summarised together with a description of the process of gathering them.

**Chapter 3: Questions of Theory and Purpose:** Underpinning theories of the research are described. Theories of 'change' and 'innovation' are explored in the context of the purposes of the research. The Dutch school of sociotechnical theory is introduced as highly relevant to the discussion.

**Chapter 4: Questions of Method:** Proposes a development of 'learning history is an open system' as an aide to joined-up, systemic learning at the inter-organisational level. Sets up three key areas of inquiry in the field of action research: scope, modernity and the direction of inquiry.

**Chapter 5: Questions of Scope and Form:** Describes how scope and broadening participation with the research was sought with the learning history workshop. Discusses the enduring consequences of this and the further inquiries into the essence of learning history form that resulted.

**Chapter 6: Questions of Quality:** Sets out the quality criteria I have worked to and situates these in relation to the literature. Proposes these are personal, and oriented from practice. Argues the importance of elements of modernity in these.

*Part II – Reflecting in the field: story, form and method*

**Chapter 7: Questions of Participation and Perspective:** Explores issues of voice, power and participation in this kind of approach to learning history – leads to a detailed guide to responsible practice for a learning historian.

**Chapter 8: Questions of Learning History: Wittgenstein's Ladder or Trojan Horse**  
Explores the question of just what is the learning history. Proposes it as an enabling device that works by moving participants safely from a familiar modernist world to a less familiar, complex, multi-truthed world where deeper understandings and conversations can occur.

**Chapter 9: Questions of Myth and Form:** Sets out the importance of the mythic in learning history. Proposes how a mythic quality might be created in learning history and explains why this was difficult but important to me. Discusses the implications this has for the form of the learning history.

### *Part III - Analysing from the field: theory, innovation and learning*

**Chapter 10: Bridging from Story to Analysis:** A bridging chapter that marks the shift from a methodological, narratively oriented part of the thesis to the more analytical, content-related part.

**Chapter 11: Questions about Innovation:** Draws on the analysis across the learning histories as to what enabled different breakthrough projects to occur. Presents 6 meta-themes that this research has found to be relevant to the experience of innovating to reduce carbon in local authority. Introduces learning questions to help resituate this theory back in the field.

**Chapter 12: Questions about Theory in Practice:** Describes one final cycle of inquiry – the small group at B&NES – where learnings and insights from the research generally and from the thematic work specifically were tested back in the field. In this way the scope of the research and its value for practice was being concluded.

**Chapter 13: Questions about Theory in Theory:** Revisits the sociotechnical theory of Chapter 3 in the light of what has now been discussed. Claims that these theories fall short in that they do not make the step into human experience as the learning history approach taken here allows. Offers the thematic findings as complementary to existing theory but proposes these only go so far and that at some point theory needs to be put fully aside.

**Chapter 14: Questions about the Postheroine:** Puts theory aside and explores, from a personal point of view, notions of myth and heroism that recur through the work. Characterises the human beyond the postheroine seeking implications and learning for how to play my part in an evolutionary process. Concludes that meaningful action can only be reflected in moments of elegance that represent possibility rather than results.

### *Closing*

#### **Endings**

