RICE UNIVERSITY

Memory as Concept and Design in Digital Recording Devices

by

Lina Dib

THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE

Doctor of Philosophy

APPROVED, THESIS COMMITTEE:

James Faubion,
Professor Anthropology, Chair

Dominic Boyer,
Associate Professor Anthropology

Cary Wolfe,
Professor English

HOUSTON, TEXAS
APRIL 2013

Abstract

Memory as Concept and Design in Digital Recording Devices

by

Lina Dib

This thesis focuses on scientists and technologies brought together around the desire to improve fallible human memory. Based on extended ethnographic fieldwork, it considers interdisciplinary collaborations among experts who design recording and archiving technologies that seek to maintain, extend, and commemorate life. How are everyday experiences translated as information, and for what purpose? How are our habits of drinking tea, talking on the phone, driving to work, and reminiscing with old photographs, turned into something that can be stored, analyzed and acted upon? How might information be used in real time to supplement the living in a recursive feedback loop? By addressing these questions, I reveal how these memory banks are inherently tied to logics of capital, of stock and storage, and to logics of the technological where, when it comes to memory, more is more.

The first sections that make up this dissertation shift in scale from the micro to the macro: from historical national endeavors that turned ordinary citizens into a sensors and collectors of the mundane, to contemporary computational projects designed to store, organize and retrieve vast amounts of information. The second half of this dissertation focuses on two extreme cases of lifelogging that make use of prototypical recording technologies: Gordon Bell, who is on a quest to record his life for the sake of increased

objectivity, productivity, and digital posterity, and Mrs. B, a woman who suffers from amnesia and records her life in the hopes of leading a normal life in which she can share the past with loved ones. Through these case studies, I show how new recording technologies are both a symptom of, and a cure for, anxieties about time.

By focusing on the design of new objects and by addressing contemporary debates on the intentions that govern the making of recording machines, I examine how technologies take shape, and how they inform understandings of memory and the self as well as notions of human disability and enhancement. In short, I show that the past, as well as the present and the future, are always discursively, practically, and technologically informed.

Acknowledgements

This project would have been impossible were it not for countless people, some of whom may not even be aware of their significant contributions. Here, I will attempt to list a few. But as I said, there are countless contributors and participants that merit a heartfelt thank you. So like the scientists I discuss in this dissertation, the ones who long to capture memories and all their particularities, my attempt is already somewhat futile. I know that I will remember some that may in turn help me remember others. I also know that I will forget many. Excuse the shape of these acknowledgements for its lack of proper prose. Lists versus developed sentences and paragraphs are the appropriate form for certain things. This is one of them. Consider this an endless rough list, one to be added to as this project continues in its different iterations.

First, I would like to thank my advisor from the Université de Montreal, Dr. Mariella Pandolfi for introducing me to the delights of contemporary theory and for encouraging my forays into unknown lands. It is thanks to her that I ventured south to Texas and thanks to her that I delved deeper into concepts than I ever thought possible. At Rice, I found the perfect intellectual home away from home. I want to thank my advisor Dr. James D. Faubion for being there throughout, from beginning to end. Conversations with Jim always seem to help give the world shape, which in turn helps me write. Dr. Dominic Boyer has been a valuable interlocutor whether in his office or on the steps of one of my sound installations. He and Dr. Chris Kelty helped me embrace the prototype, both as object and conceptual project. I thank Dr. Cary Wolfe for being my outside reader. I look forward to ongoing work and conversations. I'd like to thank Dr.

Nia Georges for her warmth and her great grant writing advice and Dr. Susan Macintosh for organizing the Scientia lectures on Memory. It was good to bring some of the field home.

I was fortunate enough to have come to Rice in time to get to know and be deeply influenced by Dr. Julie Taylor, Dr. Stephen A. Tyler, Dr. George Marcus (who left to Irvine when I arrived, but not before some great chats. I wrote much of what follows surrounded by his old books in a musty office at Rice). Dr. Christopher Kelty and Dr. Hannah Landecker cannot be thanked enough. I am eternally grateful for their support and for introducing me to a wealth of beautiful literature. I could not have lead my double life as an academic and artist were it not for the support of Dr. Tarek Elhaik and Dr. Fiamma Montezemolo who helped me feel less schizophrenic, and better yet, on to something. Dr. Charles Dove offered me a job at the Rice Media Center. It quickly became one of my favorite places in Houston. Thank you. Carole Speranza made filling out paperwork a challenge that I looked forward to. You are missed. I am grateful to Altha Rodgers and Joanne Carpenter for supporting me through all kinds of bureaucracy, and more importantly, for making it easy and pleasant. My fellow students also made Rice fun and stimulating. Thank you Nahal Naficy, Elise McCarthy, Tish Stringer, Ayla Samli, Dan White, Valerie Olson, Elitza Ranova, Micheal Kriz, Ala Alazzeh, Laura Jones, Brian Clarke, Stacey Pereira, Nicki Carelock, Than Valachos, Marcel Laflamme, Ethan Wilensky-Lanford and Jing Wang. They have made the department a great place to be and to come back to. I am incredibly grateful to Maria Vidart for being there in more ways than I can count. She is a terrific interlocutor and I look forward to more. Andrew Alexander Klein, my words and I have grown from our friendship.

Sha Xin Wei and the people at the Topological Media lab in Montreal have been an ongoing source of inspiration. TX/RX labs in Houston have offered me a wonderful space for making.

The people I engaged with over the course of fieldwork cannot be thanked enough. This project is a result of their generosity and openness. I have learned more than I could have imagined about the worlds of information and design and about the different ways we construct memory.

This dissertation project was also made possible with the support of the Humanities Research Center at Rice, the Social Sciences and Humanities Research Council of Canada (Award number: 752-2007-0766), and the AMIDA research grant.

Many other friends and dearest colleagues have helped shape this project and my life in Houston. To list how would be to write another dissertation. So I will stop at names (many of which will be missing). Gaelle Jaunay, Georges Haddad, Richard Poejo, Craig Campbell, Abinadi Meza, Karen Armour, Mike Griffiths, Harbeer Sandhu, Kelly O'Brien, Craig Schuetze, Jofish Kaye, Vincent Lopez, Sarah Hoffman, Jared Scheffer, Domokos Benczédi, Lori Childers, and the garden.

Lastly, I am grateful to the members of my family for their ongoing support throughout. They are bastions in my life. And I am eager to share new adventures with them.

Table of Contents

Remembering or forgetting is doing gardener's work, selecting, pruning. Memories are like plants: there are those that need to be quickly eliminated in order to help the others burgeon, transform, flower. - Marc Augé

Introduction: Cosmopolitical Networks

This introductory and methodological chapter presents the topics at hand, and the technologies and scientists who are brought together around the notion of memory. It considers the nature of interdisciplinary collaboration between experts brought together around common problems and "boundary objects," and points to the different ways interests converge and diverge in the elaboration of new forms of knowledge and in the creation of new technological objects.

Memory Machines:

Today we gained an hour. We must have paid for it with the daylight we diligently saved last summer. It seems appropriate that we would "spring forward" in spring, not merely because of the redundant words but also because of the prelude that spring implies. After all, why not impatiently jump toward all that is already coming? Conversely, "falling back" into a pile of dead leaves and resting under a blanket of cool night that comes over us an hour earlier also feels right.[1] What if we were to indulge in two hours instead of one? What if we decided to keep spending rather than annually saving and buying the same amount of time? Could we get a credit on time? What would be time's return on investment? Should we have a savings plan for when old age forces us to retire from time?

[1] Suggested at the end of the eighteenth century and formally adopted during World War I in Europe and the United States, the practice of shifting clocks an hour forward in the summer is meant to increase the number of waking and working hours spent in daylight rather than sleeping the day away (Prerau 2005).

Microsoft, the public multinational computing corporation, is developing technologies to help us do just that: save time, manage time, and share time, where time takes the shape of digital memories. By accumulating innumerable data about how we spend our time, Microsoft researchers hope to assist us in spending it more wisely in the future. In short, their prototypes specialize in stockpiling information about our past for future use. At Microsoft Research in California, a database system called MyLifeBits is currently being designed to house and manage all the material that can be digitized over one's lifetime, such as texts, photos, sounds, webpages, notes, pulse rates, temperature, and GPS (Global Positioning System) readings (Bell and Gemmell 2009; Gemmell et al. 2006). Microsoft claims that with this technology "users will eventually be able to keep every document they read, every picture they view, all the audio they hear, and a good portion of what they see," allowing fragments of memory to be retraced and indexed in a personalized presentation.[2] In Gordon Bell and Jim Gemmell's book-length manifesto titled *Total Recall*, Bell, senior researcher at Microsoft laments and predicts:

> each day that passes I forget more and remember less. [...] Yes, each day I'm losing a little bit more of my mind. [...] What if you could overcome this fate? [...] Soon, you will be able to. You will have the capacity for Total Recall. You will be able to summon up everything you have ever seen, heard, or done. And you will be in total control (Bell and Gemmell 2009: 3).

To capture what the user sees, as well as environmental cues, Microsoft Research in Cambridge, United Kingdom, has designed the SenseCam: a wearable camera (typically worn around the neck) equipped with infra-red light, temperature, and accelerometer sensors, about the size of a pack of cigarettes. Preprogrammed, and relying on the sensors, the wearable device determines when to take a picture and record information

[2] April 10, 2005, http://research.microsoft.com/barc/mediapresence/MyLifeBits.aspx.

(Hodges et al. 2006). This new technology promises not only to extend human memories – here seen as images – but also to enhance them by recording bodily and environmental cues and activities not even perceived by humans, such as one's pulse, eating habits, and GPS coordinates.

Critical of the ambition to indiscriminately record too much information, other scientists who are part of a project called Memoir at the University of Sheffield design tools to help reduce the complexity of recorded information. They have been steadily developing the ChittyChatty, a prototypical "prosthetic memory" device that allows for the annotation of recorded speech with written notes. Their work looks at how the device operates in conjunction with test users' "organic memory" (Kalnikaite and Whittaker 2007).

Microsoft's research with the SenseCam as well as the University of Sheffield's Memoir project take place in the larger context of a United Kingdom national initiative where various disciplines are brought together to collaborate on a "grand challenge" referred to as "Memories for Life." [3] Commissioned by the United Kingdom Computing Research Committee (UKCRC), this challenge brings together different scientists to address the problem of storing information about the past. Memories for Life defines itself as "a cluster of research projects" focused on the need to understand human memory and to "augment it with technological support" in a seamless interaction between humans and machines (O'Hara, et al. 2006: 361). The network is an assemblage of psychologists, neuroscientists, mathematicians, engineers, and computer scientists from

[3] November 10, 2006, http://www.memoriesforlife.org

institutions such as the Oxford Internet Institute, the British Library, Microsoft Research in Cambridge, Dublin City University, and the University of Sheffield.[4] The opening page on the Memories for Life website asserts that "[w]e are our memories. Our memories underpin every thought we have, every fact we learn and every skill we acquire." Starting with the assumption that memory and temporality are the fabric from which both individuals and societies are cut, researchers seek to redress the fallible nature of human memory. Whether through the use of wearable cameras and sensors or the creation of timelines and lifelines, Memories for Life scientists seek to create more robust pneumatic textures that will serve as the custodians of our life's memories.

To the question that is undoubtedly raised sooner or later: Why the UK? I can only reply that I happened to come across this group of researchers when I began wondering about the archive fever I felt around me in Canada, and in the US. I am not a specialist in UK history or culture, nor is the UK, per se, the topic of this dissertation, but I can venture to say that although all societies, in some form or another, pay attention to and shape their relation to their past, the UK, and especially Britain, continues to stand out. From the safeguard of its national museums and libraries, to extensive collected oral histories of its ordinary citizens, to the development of DNA banks, to the ways in which it literally watches over its population, Britain has persistently worked to preserve its past; not just its glorious past as a powerful player on the international and colonial stage, but also the heterogeneous pasts of its workers, and of those elsewhere whom they saw

[4] These institutions and companies are just a few of the many invested in preserving the past. In the fall 2012, Facebook added a new feature to its site called Timeline that lets users select key posts, photos, and comments to bring to the fore in a personalized presentation, "collect[ing] all your best moments in a single place" (Lessin 2011).

disappearing as a result of their quest to civilize. Many of the scientists involved in the UK nationally funded Memories for Life initiative also work with interlocutors in the US, at Microsoft in the Bay Area and at MIT for example. While this UK initiative serves as the basis for this investigation, it is rooted in worldwide technological advances, many of which are the results of collaborations between American and British researchers in the fields of mathematics and computing during World War II. Over 18 months of ethnographic fieldwork, the various projects within the Memories for Life initiative have provided arenas through which memory could be examined both as a negotiated concept and as a working design. Throughout this dissertation I elaborate on some distinctly British historical documentary endeavors, as well as on different contemporary projects (some of which involve American researchers) that form the Memories for Life initiative, which I have only gestured at here. It is possible, even likely, that the researchers involved in the projects addressed herein have experienced what anthropologist George Marcus refers to as "the documentary impulse," which he pairs with a general atmosphere of "hyperawareness of great changes at work in the world" (1993: 2). In *Public Culture: Globalization*, Andreas Huyssen portrays memory as a primary concern in the western world (2001: 57). He associates modernity with the notion of "'self-musealization' by video recorder [...] confessional literature; [and] the rise of autobiography [...] with its uneasy negotiation between fact and fiction." Accordingly, he wonders whether we are witnessing "an archivist's fantasy gone mad" (2001: 61). Has the West become culturally obsessed with notions of the eternal, of memory and of forgetting?

With devices such as Microsoft's MyLifeBits and SenseCam, individuals are thought to achieve comprehensive memories that lead to greater self-understanding and, ultimately, to greater self-management, that imperative of neoliberal times (Rose 2007). Recording technologies are ubiquitous and a growing number of individuals express anxiety when separated from their cameras, blogs, Facebook profiles and voice recorders, devices that grant them the capacity to capture, to document, and to publish online. Hewlett Packard advertisements entice us to create and to share our memories. As their slogan says: "document your life… now! Anything is possible!" Flickr hosts a group called "a day in the life of …" where users post and share pictures that document their life on a specific day. Since 2004, scientists have gathered at a yearly event cleverly entitled CARPE, a symposium centered on the "Capture, Archival and Retrieval of Personal Experiences," where they discuss digital computer systems and wearable sensors that are currently being developed with the hope that they will expand and supplement the limits of biological human memory.[5] In today's context of ever expanding digital space, deleting becomes an almost obsolete act and archival technologies are created in order to manage the saturation of recorded information.

Collectively, the objective is to make an encyclopedia of the everyday, a catalog of the mundane, perfunctory, even banal moments, which seen in a different light, or a different moment, may yield the fruits of well-being and progress. Yet this utopian enterprise is based on two assumptions: that memories are something to be captured,

[5] The last couple of years have seen a plethora of recording technologies made public and marketed as memory tools. An example is the new Memoto camera: "A tiny, automatic camera and app that gives you a searchable and shareable photographic memory." Jan. 10. 2013, http://memoto.com

stored, and shared; and that one can build useful tools based on specific conceptions of memories and selves. As Memories for Life scientists state in their "Road Map," "lives are defined by time" (2008: 3). These scientists perceive memories to be the fount of social and cultural identities, but this fount or wellspring can go dry or, worse, get contaminated with fictions. In a review of their initiative, Memories for Life scientists claim that digital memories can help create the basis for social and political identity formation. They point to the "ability of individuals to construct narratives of their past out of diverse materials" while drawing on technology's power "to avoid mythmaking" (O'Hara et al. 2006: 357). The goal is, then, to create reservoirs, standing reserves of memories that can mitigate their unreliable tendencies. Along the way, experiences are made to matter, they are made material, and in storing them, they are made valuable.

In a response to emergent technologies for remembering, Viktor Mayer-Schönberger, researcher of public policy at the National University of Singapore and at Harvard, published a book called Delete, in which he outlines what he calls "the virtue of forgetting in the digital age" (2009: 130). He warns that digital technologies such as those designed by Memories for Life scientists may create a world that doesn't allow us to forget. This entrapment in our past and distrust in our own memories, he claims, might create "a future that is forever unforgiving because it is unforgetting" (5). He points out that Google, with its stored thirty billion search queries a month, which can be traced back to specific IP (Internet Protocol) addresses, "knows more about us than we can remember ourselves" (7). And that "as more and more information is added to digital memory, digital remembering confuses human decision-making by overloading us with

information we are better off to have forgotten" (164). To counter the problem of too much information, he proposes means to increase technological forgetting, such as expiration dates on digital documents.

Mayer-Schönberger raises important questions as to whether the plethora of information created by such technologies actually helps improve our human condition. But in doing so, he reifies the binaries of remembering and forgetting while neglecting the ways in which these concepts are drawn upon in the first place. Although I am tempted - like Mayer-Schonberger - to dwell on whether these new technologies actually help improve our human condition, and I long to bring up Plato's *Pheadrus* and his warning against the conflation of writing and memory, or Borges' *Funes the Memorious* who, because of his infallible memory is plagued with the impossibility of generalizing and therefore acting in the world, I first wish to complicate this very notion of memory that fuels the kind of technological work I've examined. [6] I wish to navigate between extreme imaginaries of utopianist futures where a perfect memory allows for greater sociality, better health, safer living, and of a paranoid panopticon where our most private thoughts are constantly monitored, regulated and never forgotten.

Indeed, remembering and forgetting are the constitutive limits of one another. Forgetting defines remembering by its very negation (Augé 2004). However, philosopher of science Isabelle Stengers, in dialogue with sociologist of science Bruno Latour, proposes ways of examining scientific practices by calling into question dualistic concepts such as the ones these memory practices depend on (Latour 2005; Stengers

[6] I will indulge in some of these critiques, or odes to forgetting, in the following chapters.

2005b). In her "Cosmopolitical Proposal," she calls for the co-existence of converging and opposing discourses rather than the settlement of either/or dichotomies. Stengers argues that in order to address the contemporary world, one must not look to sort things based on existing concepts and theories (such as memory and forgetting), but rather to let things provoke thoughts and contingent formulations of them.[7] For instance, how might we think beyond the given human need and interest in perfect memory that often acts as the starting point for the invention of these devices? How might these emergent memory machines be turned into a cause for considering the practices around which they are built? How, then, might the production of memory tools operate "in a mode that gives the issue around which they are gathered the power to activate thinking, a thinking that belongs to no one, in which no one is right" (Stengers 2005b: 1001)? Following Stengers' 'cosmopolitical proposal,' I wonder if it is possible to frame my study in a way that might not imply the either/or dichotomies of remembering and forgetting, or of remembering *accurately*, versus in that fuzzy, faulty, dreamlike way we remember before being faced with the task of recording every moment of our waking lives. How do these prototypical recording machines bring with them the obligation to rethink the divide that their makers draw between the fantasy of total recall and the fear of complete amnesia? In other words, as sites of contention and convergence, how might the design of new recording technologies offer possibilities for recoding experiences of remembering that are not "besieged by dramatic either/or alternatives that slice up our imaginations"

[7] Stengers refers to "cosmopolitics" as that which is concerned with the particularities of an event or situation such that the problems at hand are what oblige researchers to think and theorize. Moreover, cosmopolitics implies that researchers are "required to construct and present what they know in a mode that makes them 'politically active,' engaged in the experimentation of the difference that what they know can make in the formulation of the issue and its envisaged solutions" (2005b: 998). In her constructivist approach to studying science, Stengers seeks not to address science's claims per se but rather to examine how truth is made through practice. She focuses on how claims are produced and processed and on how objects are made to have lives, actions, and consequences of their own.

(1002)? Were we to think with Stengers and follow a cosmopolitical approach, rather than characterizing wearable cameras and archival software with well-established neurological or mechanical conceptions of memory and forgetting, the stage would be set for a productive amnesia or suspension of memory as we know it. In other words, in their encounter with the world, these unfinished technological objects might raise new polyphonic formulations of the very concept of memory, allowing it to burst beyond the private and corporeal bounds we usually attribute to it.

Generally, my use of the term *memory* refers to an intersubjective, materially and spatially informed awareness of language, events, or anything else identifiable from the past. Although a survey of the many divergent and convergent theoretical ways memory has been defined is beyond the scope of this dissertation, I would like to outline, however briefly, how a few thinkers have engaged with the vast, even immeasurable, topic of memory. Memory is a concept that has long been addressed in the social sciences and humanities (Boyarin 1994; Boym 2001; Carruthers 1997; Connerton 1989; Derrida 1996; Halbwachs 1992), and many new media theorists speculate on the implications of bytes being stored in ever increasing amounts within ever decreasing spaces (Mayer-Schonberger 2009; Van Djick 2007). Autobiographical memories have been referred to, literally and metaphorically, across disciplines as reservoirs and scaffolds for a sense of identity and continuity. As we will discuss further in chapter 3, Michel Foucault attributes the emergence of the Western concept of self to the adoption of a kind of mnemonic technology. He examines the widespread use in antiquity of *hypomnemata*, or notebooks, in which an individual would collect written notes of personal thoughts and

activities, as well as things seen and heard. After a process of selecting and editing, the individual's notes would be used as raw material for correspondence. Through correspondence and the documentation of autobiographical memory, Foucault outlines the emergence of an ethical Western subject.[8]

Media theorist José Van Dijck maintains that mediated memories, whether through photographs, home movies, or shared narratives, allow for the construction of a sense of self by helping individuals give meaning to their past and envision their future. Reflecting on the relationship between media and temporality, historian Andreas Huyssen contends that although memories will no doubt continue to be shaped by new technologies, they are in no way reducible to them. He argues that the separation between the "virtual" and the "real" is quixotic in that "anything remembered - whether by lived or imagined memory - is itself virtual. Memory is always transitory, notoriously unreliable, and haunted by forgetting - in short, human and social" (2001: 76). Science studies scholar Geoffrey Bowker circumscribes the problematic most succinctly when he asks: "What is memory, that a person may practice one" (2005: 8)? Remembering is more than the occurrence of bringing knowledge to mind. It is a set of practices through which we frame identities and temporalities, "practices that permit both the creation of a continuous, useful past and the transmission sub rosa of information, stories, and practices from our wild, discontinuous, ever-changing past" (Bowker 2005: 9). Foucault,

[8] In chapters three and four, I treat more thoroughly the emergence of intermingled concepts of memory and identity. Using Foucault's genealogy of the Western subject and his understandings of an ethics of self-making that begins in antiquity, I explore personal archival practices and show how technology designs are shaped by - and help shape - conceptions of identity that have long been tied to ideas of authenticity and memory (Foucault 1986).

Van Dijck, Huyssen, and Bowker all highlight, in various ways and across various disciplines, the relationships between matter, memory, and identity. But more importantly, these thinkers remind us that memory isn't simply an amorphous entity that resides in our heads, but rather an intimate and social phenomenon that occurs through objects, technologies, people and places. As such, I consider memory as both natural and cultural objects, experiences and practices.

Although the topic of this dissertation may appear timely, even futuristic, what the authors mentioned above show is that questions concerning memory and temporality raised by new and emerging tools are in fact longstanding. Various actors and actants with differing ends and shifting sociocultural and historical conditions shape the concepts of remembering and forgetting.[9] They underwrite, and are constantly being redefined in, contexts of technological innovation - from notebooks to robotic companions that prompt reminiscence, to new imaging devices that bring researchers to "see" memory at work. It is worth noting however, that none of these authors (apart from Foucault) attempt to articulate their inquiries within the realm of technology *production*. Most social studies of technology are centered on the history and on the effects of tools once they have already become integral parts of how we interact with the world (Benjamin 1978, Kittler 1999, Sontag 1978). In contrast, this dissertation examines the different actors and actants involved in the *creation* of what Latour calls "black boxes" (1987), that is to say

[9] Bruno Latour's notion of actants (1987) and Michel Callon's actor network theory (1986) extend the usual notion of a human actor to that of an actant, human or nonhuman, in a network. Within networks, humans come to speak for nonhuman actants, enrolling them in their fluid processes of translation and mobilization of interests. In this case, recording technologies as actants are called upon to add to the polyphonic conceptions of memory.

closed objects that receive "inputs" and emit "outputs," the mechanisms and consequences of which remain hidden and often unquestioned.

Recording practices made easier with the SenseCam and other new digital memory tools raise numerous pressing ethical questions concerning notions of selfhood, agency and privacy to name but a few. For instance, as commodities, whom do the so-called captured memories belong to? Once "freed" from the body, can they be considered social memories, part of public history 2.0?" In what a researcher from Memories for Life calls "an era of pervasive electronic recording of all human activity [… will] the collective have the right to subpoena individuals' memories?" (O'Hara, et al. 2006: 360). We need to examine the social and ethical consequences of producing, reproducing and owning memories in the forms of images, documents, sounds and video. Shifting notions of property, memory and agency need to be addressed *while* new mobile recording technologies are being developed. This said, as a researcher, I am invested in the formation of good questions rather than their clear often temporary and half-hearted resolutions. I do not care to say the world is this way or that, but rather to question its contingent becomings. Technology moves quickly; social commentary lags. As a response to this lag in social theory this research project thinks through emergent objects and distances itself from many classics in Media and Science and Technology Studies that seek to study the belated 'impact' of technology on society (Kittler 1999, McLuhan 1964). Paradoxically, the slow moving discipline of anthropology is well placed to respond to such a lag. With its signature practice of long term fieldwork, it can create what b calls a "space of hesitation," where one experiences a slowing down of science in

favor of thinking about its effects as well as its very own modes of knowledge production. Such a practice can "slow down the construction of this common world, to create a space for hesitation regarding what it means to say [that something is] 'good'" (Stengers 2005b: 994). The slowing down occurs for the anthropologist as well as her informants as they make sense of their own practices. The result is a science that is inseparable from ethics, a place where epistemology and ontology intra-act (Stengers 2005b; Barad 2003). Another way of putting it might be to say that anthropology is good at being in the midst, in the middle of, where it seeks to be attuned to the effects and affects that surround its object and to which it is connected. From the field, scientific practices and the objects they generate may be viewed "as a scene of immanent force, rather than [...] dead effects imposed on an innocent world" (Stewart 2007: 1). It is the very practice of being *in the midst* that makes the task of writing ethnography, of *museifying* what is always already changing, so difficult.

Memories for Life is the only challenge of its kind, and presents unparalleled opportunities to slow down and to watch technological designs unfold. Drawing on my experiences with the various scientists involved, I look at how the production of personal and wearable recording machines redefines what counts as remembering. Here science is a social endeavor. It seeks to understand, and even improve, memory and our relationship to the past through a certain technologization of everyday life, itself the result of particular scientific trajectories. As such, historical inquiries help form this project in which we examine the dialectic between the epistemic and the technical.[10] By

[10] The epistemic and the technical can be considered distinct realms with objects that may also be distinct in character. Moreover, it may be that science drives technology, and that technology in turn drives science.

focusing on the design of new objects and by addressing contemporary debates on the intentions that govern the making of recording machines, I examine how technologies take shape, and how they inform understandings of memory and the self as well as notions of human disability and enhancement. Above I have offered brief delimitations of what the term *memory* might imply; however, one of the goals of this dissertation is to show how memory and its related notions of self and temporality are far from being transparent referents. With this in mind, I examine how Memories for Life scientists deploy the concept of memory as dependent upon specific notions of individuality, of interiority and exteriority, and of temporality and matter. I look at how these categories are being constructed and how they are also constructing technologies as objects and subjects.

The Field:

If you want to understand what a science is you should look in the first instance not at its theories or it findings, and certainly not what its apologists say about it; you should look at what the practitioners of it do. - Clifford Geertz

This dissertation is based on ongoing ethnographic research that started in 2006, eighteen months of which took place in the United Kingdom with various labs that are part of the Memories for Life network. As an intern, interviewer, workshop and conference participant, and test user of various prototypes, I immersed myself in what Stengers calls

---

Or, that technological advances do not allow for radical epistemic shifts that define the advancement of science and should thus be approached as radically different realms. Without disregarding the important questions raised by these various approaches to what is often now called *technoscience*, for the purpose of this project however, science and technology are at times conflated by the practitioners of these memory projects as well as in the discussions that follow below.

"ecologies of practices."[11] I examined how interdisciplinary understandings of memory were brought together to create tools with the purpose of extending our fragile human memories. In what follows, I hope not merely to show how the projects that make up Memories for Life rely on a separation of matter and memory, and of objectivity and subjectivity (in rendering the past "as it was" in contrast to how we remember it), but also to ask how these machines might be turned into a cause for considering the discourses and practices around which they operate. How might we understand the presumed human need and interest in perfect memory that often acts as the starting point for the invention of these devices? What kind of "ecology" creates the ripe environment for memory to become what Stengers and Latour call a "matter of concern"? Fieldwork across various Memories for Life sites has led me to examine the scientific practices that occur alongside the narratives and objects they generate. I have had the privilege of considering the social behind the technical. Or better yet, as Bruno Latour advocates (1987), I have had the opportunity to see myriad ways that sociality and technicality do not and cannot exist separately from one another. Nor does one preconceive the other. Throughout this project, I have sought to avoid a kind of technical determinism in order to propose a more circular view of the relationship between what we deem as social and technical.

[11] Stenger's "ecologies of practices" are worlds in which different understandings and different disciplines coexist without necessary consensus. "One aspect of the cosmopolitical proposal is thus to accentuate our own rather frightening particularity among the people of the world with whom we have to compromise" (2005b: 999). Refusing a transcendental birds-eye view or the adoption of concepts that rely on simplistic binary oppositions, her ecological approach takes the form of an immanent critique while looking at what a particular practice "demands" from its practitioners and from others within and across disciplines (2010: 56).

In order to study the ecology of the production of recording technologies, three simultaneous modes of social investigation have provided rich forms of insight: participant observation, interviews and textual research. Firstly, I have gained valuable forms of tacit knowledge by attending Memories for Life and related seminars, conferences and workshops; participating in test uses of Microsoft's SenseCam, and other devices such as Sheffield University's ChittyChatty; and through my internship as an ethnographer with the University of Sheffield's *Memoir* team. Taking part in conceptual group discussions in the lab, and in user studies outside of the lab has allowed me to experience the production, the testing and the consumption of technologies first hand.[12]

[12] There are many ways anthropologists have described our famed mode of operation we call participant observation. Harvey Russell Bernard draws on sociologist Herbert Gans to elaborate on our technique: "Once the field worker has gained entry, people tend to forget he is there, and let down their guard, but he does not; however much he *seems* to participate, *he is really there to observe* and even to watch what happens when people let down their guard" (Gans, 1968:314, emphasis mine, quoted in Bernard 1994: 136). But this quote makes us sound more like deceptive spies than researchers, let alone collaborators. It certainly highlights the importance of the observation that occurs in participant observation. However, in today's complex terrains for fieldwork, and as was the case during my research, many anthropologists actively participate in and even work for, the groups and institutions they study. Moreover, the rise of 'anthropology at home' has changed our relationship with the very acts of observation and brought us closer towards what we could call full-fledged participation. As Bernard also notes, participant observation "involves establishing a rapport in a new community; learning to act so that people go about their business as usual when you show up; and removing yourself every day from cultural immersion so you can intellectualize what you've learned, put it in perspective, and write about it convincingly" (Bernard 1994: 137). So the process is one of moving in and out of a community so as to become part of it and then step back from it, review your notes, and reflect at the end of the day or later on in a moment of escape (from the community or institution you work in). Bernard gives interesting examples to outline the difference between what he considers fieldwork (which doesn't always include participant observation. For ex: door to door, or short interviews), participant observation (which is always considered fieldwork), or just plain observation (which doesn't include the process of really getting in there that makes it participant, it's more like the fly-on-the-wall technique). In general participant observation means sharing the lifestyle (pace, food, climate, schedule, etc.) as the community you are studying. Shadowing an informant is a way to make sure you share many parts of the day with them. Participant observation doesn't necessarily mean that we need to become pharmacists, journalists, computer scientists, or use medications. Rather, it is an attempt to share the same space and to *be present,* while the activities you wish to observe occur around you. Bernard emphasizes something important: to be ethical in your participant observation (to not be the deceptive spy Gans' earlier quote alludes to) it is important to tell the people who share your field that you are an anthropologist (some anthropologist have varying opinions about this necessary disclosure). Participant observation can be done through short or rapid fieldwork sessions, but more often involves several months of getting into the field, learning the language (or technical lingo) and hanging out. It involves engaging in discussions, asking questions, getting guided tours by your informants, listening to their stories, letting them teach you things, etc. The advantages of participant observation are that by being there, you can witness events and reactions first hand, and get familiar with the people you will interview,

Secondly, structured, semi-structured and open-ended interviews with over 20 researchers and lab directors have revealed issues encountered in the convergence of languages about memory. Extensive oral histories of projects related to Memories for Life have been sought in order to elucidate the different facets of this complex multidisciplinary enterprise. Thirdly, textual research has included articles written by the scientists about the tools being built and about their previous projects, as well as publications resulting from our collaborations. I have followed correspondence between researchers across and within institutional boundaries and kept daily logs and fieldnotes on my observations, conversations, interactions and readings. In addition, I have been given access to Sheffield researchers' video documentation of their workshops and test-user interactions.[13] These complementary modes of ethnographic investigation form the basis of this project and have allowed me to follow the concept of memory as it drives the design of new subjects and objects.

From this research I have come to know first hand what it means to attempt to collect the past by observing and recording, and to drown as a result of one's own archive fever. As I write this, I suffer from information overload (surely there must soon be a disorder in the DSM, something akin to hoarding, ADHD (Attention Deficit Hyperactivity Disorder), or the catatonia suffered by Borges' Funes the Memorious to whom we will return later). In order to communicate, to give meaning, we must

---

allowing them to be more open. Importantly, participant observation is a great opportunity to rethink and reformulate your research questions. It helps you to give meaning to your data. Much has been written on the topic of ethnographic fieldwork in anthropology over the last several decades. See, Faubion and Marcus 2009, Marcus 1998, Sanjek 1990, and Stocking 1983.

[13] Most scientists I interviewed and/or worked with chose not to remain anonymous for the purpose of this research. Many have spent decades in the field, publishing their work and presenting at public venues. I have changes the names and scrambled identifying information for those who preferred to remain anonymous either for the entire course of the study or during a specific encounter or conversation.

generalize and sometimes omit, delete, forget. But faced with a deluge of audio video files, printed and digital articles, saved websites, typed notes, scribbled notebooks, sketchbooks, napkins and sticky notes (so many sticky notes), it is easy to stumble endlessly on the particular. To do anthropology, one must group things, concepts and people, and follow traces between them. The task then is to take the reader for a ride through these logics of association between ways (bundles) of being. This task is at the heart of what Marcus terms "multi-sited" research:

> Multi-sited research is designed around chains, paths, threads, conjunctions, or juxtapositions of locations in which the ethnographer establishes some form of literal, physical presence, with an explicit, posited logic of association or connection among sites that in fact defines the argument of ethnography (Marcus 1998: 90).

This multi-sited ethnography is of diasporic tendency. It is an act of tying threads through things and offers the contextualization of objects in motion.

Before I continue, I would like to offer a few preliminary notes concerning the objects, settings and people I encountered during this period of fieldwork. The objects imagined and designed by Memories for Life scientists live in the complex overarching fields of research and development and have only recently begun to reach the mass market. This is to say that these object are prototypes that are sometimes clunky and fragile at best. For instance, when I tested the SenseCam, besides noting my roommates' initial protests, legitimate claims to privacy invasion, and both our eventual and somewhat disturbing habituation to the device, I noticed how fragile the object really was. It broke on the last day of my two-week trial. When I first went in to labs such as Microsoft Research, I expected to find engineers tinkering on computers, robots, and

various other tabletop and touch screen interfaces. While I did find these things, what struck me was that their work environment looked more like the university settings I was used to: Small offices lined with books, populated by researchers writing papers for their next conference. The worlds of research and market development were much more distinct than I had anticipated. Moreover, most of the researchers' claims about how these tools helped improve memory were based on user studies using very minimal technological innovation - the SenseCam itself is made of a few simple sensors that trigger a very low quality camera - much like the one we have in our cell phones. The point to their work, I was told, was to produce papers and claims about what objects might do, rather than actually programming the devices to a marketable standard. Spending time tweaking devices so that they might be robust and reliable was an entirely different story, one I was told, that belongs to developers, not PhD granted researchers. Domains of practice differ. Incompleteness is a norm for the researchers I was working with. The polished object is not the end goal but rather the production of knowledge. Prototypes are thus tools to think with. And as we will see in more detail in the concluding chapter of this dissertation, prototypes exist in in-between states as particular and telling objects. They represent at once the idealization of what is to be built as well as the rudimentary, necessarily incomplete experimental processes in which such building occurs. It is through user experiments that scientists make their claims, and as we will see, it is through trials, tests and errors that they also rethink some of their initial concepts. In short, through use - even test uses - devices get hacked and sometimes used for other purposes that those intended. Testing fragile prototypes and participating in research with my informants helped me grasp various forms of tacit knowledge that

would have eluded me had I simply referred to these scientists' many publications and/or conferences. I returned to Rice shouting the merits of fieldwork, of being there, of taking time, of being with and nearby.

The networks I engaged in over the course of my fieldwork can be said to exist within various realms of expertise (engineering, social, computational, neurological), where an expert is, as anthropologist Dominic Boyer puts it: "an actor who has developed skills in, semiotic-epistemic competence for, and attentional concern with, some sphere of practical activity" (2008: 39). But Boyer's definition, because of its very openness, allows for the question to remain as to what counts as an expert, seeing as almost *anyone* can be an expert in *something* (from juggling to law). In his article, "Thinking Through the anthropology of Experts," Boyer outlines a brief history of anthropological research on the figure of 'the expert'. In the 50s and 60s, anthropologists called on this nearly unquestioned character to designate a kind of source for religious or ritual knowledge (Boyer 2008). The expert as a socio-historically configured role, drawing theoretical anthropological interest on the basis of his very expertise, has only gained prominence over the last decade, not least with the boom in science and technology studies (Born 1995, Fischer 2003, Fortun 2001, Helmreich 2000, Kelty 2008, Latour 1987, Rabinow 1996). This said, and as Boyer's work shows, who or what counts as 'expert' remains elusive. His definition highlights the existing tensions between regimes of expertise, whether performative or institutional, between "skilled doing" and "skilled knowing." He refers to an expert who exercises the latter as an intellectual, a professional "knowledge specialist," and designates most anthropological work on experts as taking place in this

domain. Indeed, then, it is surprising that more work hasn't addressed not only how we've come to define expertise, but how, as anthropologist experts in social theory and representation, we haven't questioned how we might "meaningfully engage the social experience of another culture of expertise without calling into question, at some level, precisely that expertise that is the ostensible locus of their social practice and 'culture'" (2008: 40)? How then might different kinds of expertise interact, coexist and call each other into question?

Boyer draws on Holmes and Marcus' notion of para-ethnography (2005), where different kinds of experts (anthropologists included) are brought together around matters of common concern. "These are realms in which the traditional informants of ethnography must be rethought as counterparts rather than 'others' - as both subjects and intellectual partners in inquiry" (Holmes and Marcus 2005: 236 cited in Boyer 2008). While studying the networks of experts enrolled in the endeavor to better remember, I was invited to collaborate with them on the design of staged encounters between users and technologies (voice recorders, gps devices, maps and photo browsers). I was asked to think not only 'about,' but also 'with' these experts, and to produce a kind of ethnographic knowledge that might prove pertinent in the design of future tools. In fact, it was my interlocutors' familiarity with, and enthusiasm for, ethnographic methods that facilitated my entry into the worlds of information science and technology design: "The anthropologist becomes one kind of cultural producer among others, some of whom at least were traditionally identified as merely subjects or 'informants'" (Marcus1998: 17).

Since the 1980s, the field now known as Human Computer Interaction (HCI) has maintained that understanding, and designing for, peoples' relationship to technology is primordial. As Thierry Bardini states in the preface to his book *Bootstrapping*, on the origins of personal computing, "if the computing technology is new [...] the interest for its human users is even newer" (2000: xii). Initially based on the intersections of psychology and computer science, HCI studies now generally include a social research component. Moreover, a related domain, Computer-Supported Cooperative Work (CSCW), is dedicated to the social interactions *between* humans with and around technology. Researchers in these fields are geared towards accounting for users' social and cultural contexts while outlining what they call "implications for design," the title of nearly all the concluding remarks of papers published in these fields. In their desire to incorporate the needs and particularities of those using the designs, researchers in HCI turn to anthropology. Generally speaking, this has translated into the implementation of ethnographic studies of the often mundane and everyday ways people engage technology, leading to suggestions of what is needed to make technology more efficient and more meaningful for users, hence the "implications for design" (Dourish 2006). Computer scientists Paul Dourish and ethnomethodologist Graham Button go so far as to argue for the use of the term "technomethodology" to designate the collaboration between computer science and ethnomethodology in which no particular discipline grafts on to the other, but rather both come together to produce new forms of knowledge (1998).

In the UK, upon meeting the researchers who would become my informants and collaborators, I was quickly invited to join the workshops and ongoing design discussions

centered on the problem of memory. My training in anthropology was seen as a necessary asset among networks that consisted mostly of engineers, computer scientists, psychologists and neuroscientists. When I explained that my interests lay more in the *makings* of technology, in understanding how such memory tools were imagined and then built, I was playfully urged to come 'study them' by working with them and by participating in different research projects (they often joked, calling themselves my "natives"). I was granted permission to examine "the interactions between scientists in the pursuit of their goals" (Latour and Woolgar 1986: 11), and moreover, to join in that pursuit. In a recent article, Marcus describes this colliding of subject and researcher, and even the interchanging roles these actors play:

> The very parties who are the primary audiences of such research are also its subjects. Thus ethnography in its most classic inclination to make 'subjects' of all of its interlocutors must develop the methodological practice today of making colleagues, fellow experts, frames of analytic discourse ethnographic subjects themselves in designing the multi-sited terrains of its research projects. Much ethnography shifts today from the study of culture or cultures to the study of knowledge-making processes, broadly conceived and diversely located, and in which its own expertise participates (Marcus 2010).

This is not to say that my relationship with my informants wasn't fraught with questions of interdisciplinarity, expertise, and to put it simply, different ways of imagining what it means to do ethnography and to produce design suggestions based on user studies. Dourish and Button's "technomethodology" and Marcus' migrations of expertise aren't as seamless as they might at first appear.

Despite the enthusiasm with which my informants greeted me based on my disciplinary expertise, my relationships with them brought into question what it means to

do ethnography and/or to design digital tools. The modes of work in design (here I mean to include HCI, CSCW, and a number of projects coming out of Information Studies and Computer science) and in anthropology are fundamentally different.[14] My migration across this disciplinary divide meant that I needed to reorient my approach. Coming from a highly theoretical and philosophical background, I had to learn to speak and write in more quantitative ways that the other researchers could understand as directly leading to design suggestions. My newfound interlocutors preferred a style of writing that was stripped from the veneer of poetics and self-reflection that my particular training in anthropology at Rice had cultivated. They tended to take the social as a given upon which to build science and design. Anthropology would be its path to what it considered the nature of the social. As it became clear throughout my collaborations with various designers of digital memory tools, whether they came from HCI, computer science, or information science, was that they had not been stirred by a critical reflexive turn the way anthropology had (and continues to be) especially at Rice since the 1980s. The researchers I worked with embraced an anthropology that makes use of what James Faubion calls "purely referential conceptual apparatuses" - ones that "are marked by and intimately compatible with statistical methods of representation and statistical inference. They give pride of place to the epistemic virtue of reliability - of empirical determinacy and empirically confirmable replicability" (Faubion 2011: 272). For the researchers I worked with, anthropology was considered a sound scientific method of producing results in the shapes of tables, numbers and suggested design implications, a far cry from my

[14] The former might be considered traditionally more speculative, the latter more analytical, although these approaches are shifting in contemporary fieldwork design, subject matter and types of collaboration where the task is sometimes to invent concepts in order to make visible what is emerging (Faubion 2011, Faubion and Marcus 2009, Fortun 2001, Marcus 1998, Rabinow 2003).

more ambiguous and exploratory style of ethnographic writing and media making I have nurtured over the years. By becoming an anthropologist among designers, "I learned of anthropology anew: of the "classic model" and all it was expected to produce, and of 'how the authority of the discipline as craft comes to live on' [...] almost in spite of the discipline itself" (Reddy 2009: 90). Moreover, anthropology, deeply engaged in post-colonial critiques since the 70s and 80s, has tended to tread critically and cautiously when considering modes of intervention in the world, both during and after fieldwork.[15] On the other hand, design seeks to intervene, to change our relationship with our environment, with each other and with things. As Boyer puts it: "one often finds the anthropology of expertise both fascinated and repulsed by the expertise of its subjects, not least because of our inability to feel entirely 'at home' in another epistemic jurisdiction," even if that jurisdiction is ethnographic fieldwork itself (2008: 42). Temporalities between design and anthropology's modes of thinking and doing are also different (Hunt 2007). While ethnography is firmly grounded in the present (and often the past), design speculates on possible futures. Both, however, rest on the possibility of being so attuned to one's surroundings that one might find the ordinary unfamiliar.[16] I am pleased to say that my fieldwork experience has polluted the ways I imagine ethnography, leaving more room for the future (even while speaking about memory), and more room for conjectural "what ifs."

[15] One need only to pay attention to the various schools of thought and debates within anthropology between more theoretically and conceptually grounded approaches and more positivistic and moralistically applied ones. See Faubion 2011 for an articulate overview of the distinctive modes of theory making in anthropology.

[16] We will elaborate on these modes of making the familiar strange and the strange familiar when we discuss relationships between surrealism and anthropology in the 1930s in the following chapter.

In the vignette that follows, I expand on how intersections between different modes of expertise, and methodological debates within disciplines prove to be productive sights for unearthing the ways we imagine and construct the notion of memory. I turn to an example of an "ecology of practices," to include objects, organic, and mechanical, as well as desires and obligations belonging to various scientific discourses that have been brought together in the design of recording devices. It describes a setting, an "ecology" within and across disciplines, that helps create the ripe environment for memory to become a "matter of concern."

In December 2006, I attended workshops and conferences held in London as part of the *Memories for Life* initiative.[17] Judging by the extensive media attention, these scientists were addressing what seemed to be a hot topic: the future of our past. With approximately fifty participants coming from different backgrounds, one might wonder how big concepts such as memory and forgetting were rendered commensurable. How did neuropsychologists, for example, discuss the making of recording technologies with computer scientists? For starters, they each have different disciplinary attitudes towards the phenomenon of forgetting. Socially and biologically, forgetting is seen as a necessity for keeping order in an otherwise messy accumulation of information. But in computing, forgetting is seen as a failure of hardware or software. In an attempt to bridge disciplinary gaps, some of the questions addressed by the *Memories for Life* initiative were described as centered on the idea of biologically inspired computing (O'Hara et al. 2006: 354). By attending to the problem of biological memory *in* the brain, these

[17] Four previous workshops were held since 2004 as part of this network initiative to identify and to map out potential research areas.

researchers sought to improve the development of tools used in the storing of information *outside* of the body.

Participating in this ecology were the different demands and obligations brought on by biology, neuropsychology, and computer science. But the objects and concepts these scientists produced were fluid and flexible, and leaked in and out of the porous walls of their disciplines. Neuroscience examined the way memory works in terms of frames per second, and the web was compared to networks of neurons. The importance of FMRI and finding the place of memory in the brain, the development of schemas that point to the compartmentalization of memory - one for places, one for faces - found analogues in the design of GPS devices, wearable cameras and external hard drives. Yet it isn't that these different fields had similar methodological definitions of their object. And as Stengers points out, what differs communicates. So each field created modes in which a relationship with another field, whether explicit or implicit, was seen as promising.

At one workshop, a Mathematician from Lancaster announced that "if Moore's Law continues to hold [… in 70 years] it would be possible to store a continuous record of life on a grain of sand" (Dix 2002; O'Hara et al. 2006: 352).[18] During his talk, this same mathematician referred to Roland Barthes' *Camera Lucida* and emphasized the importance of affect in remembering. In his famous text, Barthes describes his unique relationship to an old picture of his deceased mother. For him, the medium-specificity of

[18] Moore's law in industry refers to an increase in memory and processing power while circuit, chip and transistor sizes decrease, thus allowing for faster, smaller computers. Performance is famously said to double every two years.

the photograph, its imposition of the undeniable fact that "*the thing has been there*" confuses the concepts of real and alive, and thus creates a particular élan of emotion in the viewer (1981: 58). The subject photographed, according to Barthes, "has been" and continues "to be" through its unique luminous rays captured on the chemical emulsion that is the photograph. But what does it mean to capture and to preserve light long after the object or subject has gone? In Barthes' words, a "sort of umbilical cord links the body of the photographed thing to [the viewer's] gaze: light, though impalpable, is here a carnal medium" (1981: 60). As though speaking about cell lines, where "the substance of the human body is now routinely maintained alive outside the body," information scientists described memories as entities to be captured, cloned and shared (Landecker 2007: 3). No longer bound to the organism or moment itself, memories and identities are to be sustained in artificial environments to be later used to extend the finite life of the person from which they came.

Most researchers affiliated to the Memories for Life initiative shared an interest, and justification, in the domains of health and in the therapeutic uses of memory tools. Yorick Wilks, computer scientists and a specialist in Artificial Intelligence and language from the University of Sheffield presented projects aimed at improving health and longevity through the development of mobile, electronic "life companions." Also referred to as "personal agents," these scientists are designing robots as furry and cuddly friends, not as the metallic and rigid R2D2 companion we've all grown up to imagine.[19] Referring to the fact that "people with pets live longer than people without pets," the builders of these companions consider their research a significant contribution toward

[19] March 29, 2007, http://nlp.shef.ac.uk.

happier, healthier and longer lives for humans, (although one might wonder what a life of old age accompanied by furry robots might actually entail). As a senior companion, the furry robot could remind one to take his medications and more importantly, stimulate a conversation, thus combating loneliness. According to these scientists, these pet robots might allow anyone to become a kind of autobiographer. They could be spurred to ask the user questions about his or her life and in turn record and document the responses and narratives. Wilks gave the example of a lonely and forgetful elderly woman who could reminisce and view old photographs with her companion. Based on previous conversations, the robot would have learnt about this woman and thus be in the position to help her tell stories about the photographs being viewed. Should the woman become confused about who is in the photograph, the companion could correct her and steer her towards more accurate recollections of her past, producing a kind of hyper-reality for the forgetful subject. In this case, recorded memories appear as positive historical facts. In what Jean Baudrillard would call "the restitution of an absolute simulacrum," the memories of the forgetful subject are said to conform to the data. Reminiscence is characterized by a "performative and demonstrative logic [...an] obsession with historical fidelity [or...] a perfect rendering" (1994: 47). The woman's actual memories come second, cued and enhanced by the captured images prompted by her electronic pet. Is this the other side of Stengers' and Latour's 'humans representing things' where robots come to speak for humans?

Discussions about how to best design recording devices were colored by the different ways memory was imagined in the first place. Not all researchers present were

comfortable with equating captured 1s and 0s with the experience of memory - and this distinction was for them primordial in what they considered good design. To quote Stengers: "Approaching a practice [...] means approaching it as it diverges, that is feeling its borders, experimenting the questions which practitioners may accept as relevant, even if they are not their own questions [...]" (Stengers 2005b: 2). Outlining the theoretical and practical tensions involved in the design of memory tools, Abigail Sellen and Emma Berry, A Human Computer Interaction psychologist and a neuropsychologist from another Microsoft Research campus, presented studies using the SenseCam as a support for memory for a patient who suffers from amnesia (Hodges, et al. 2006). Their results appeared hopeful; after reviewing the images captured by the SenseCam, the patient seemed to show a better recollection of past events. However, these researchers raised questions as to what exactly was being captured and stored. They argued against the general discourse held by Wilks, researcher behind the companions project, and other Microsoft researchers such as Gordon Bell and Jim Gemmell working on MyLifeBits software and additional SenseCam research (to which we will return in the following chapters). Rejecting the bifurcation of nature implied in Wilks, Bell and Gemmell's distinction between a seamless "objective" digital memory, and a fallible "subjective" organic one, Sellen and Berry argued that these new recording devices were capturing series of memory "cues." One could not talk of capturing "memory" or "experience," let alone a "person." Doing so would be simply misleading and unproductive. Rather, they suggested researchers concern themselves with figuring out what these devices are actually good for and in which context. This might help further understandings of what specific kind of memory aid these machines actually provide.

What these debates highlight is that even when it comes to human memory "a problem is always a practical problem, never an universal problem mattering for everybody" (Stengers 2005b: 7). The ecological perspective that Stengers challenges us to adopt remains precisely grounded around specific issues at hand, while including humans, machines, and furry robot companions. In other words, the memory devices built by these scientists are what Science Studies scholars Susan Leigh Star and James R. Griesemer term "boundary objects" (1999). Boundary objects are scientific objects common to several interacting worlds. They are

> both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. [...] Such objects have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting communities (Bowker and Star 1999, 297).

As such, various entanglements, converging and diverging discourses around the design of memory tools, affect the practices of building recording devices, of testing their uses, and of conceiving how and where they might be inserted as part of the social, and as part of the body as prosthesis. This dissertation considers the nature of interdisciplinary collaboration between experts brought together around common problems and "boundary objects," and points to the different ways interests converge and diverge in the elaboration of new forms of knowledge and in the creation of new technological objects.

Memory Cues:

The chapters that follow provide different cues as to how we might examine the concept of memory at work in the making of prototypical recording devices. In doing so, this dissertation tracks how information scientists create new physical objects, as well as new cultural conceptions and experiences of what we call memory. In other words, the research networks addressed in this dissertation are sites in which the objects of recording devices - memories - are conceptualized, materialized and reconfigured in various, and at times contentious, ways. As we have seen in the previous vignette, at issue are technologies, but also narratives - scientific and personal - about what it means to remember.

The first two chapters reflect on our relationship with information through the use of recording and archiving technologies that seek to maintain, extend, and commemorate life. While the projects examined in the first chapter might be considered more ethnographic-artistic, and the ones in the second more techno-scientific, they all attempt in some way to answer the following questions: How are everyday experiences translated as information, and for what purpose? How are our habits of drinking tea, talking on the phone, driving to work, and reminiscing with old photographs, turned into something that can be stored, analyzed and acted upon? How might information be used in real time to supplement the living in a recursive feedback loop?

The first chapter, "Sensors and Satellites," tracks the concept of memory back to a time before ubiquitous digital recording devices. It examines the significance of the

archive as it grapples with the notion of what it means to know our selves through practices of observation and recording. First, we will see how Britain's Mass-Observation Project, a nation-wide documentary endeavor that took place between 1937-1950, was defined by practices of omnivorous collecting. We will examine how, in the hopes of creating an archive of daily musings of ordinary citizens, this project brought to light a number of problems associated with capturing the infinitely particular. Held in constant tension between its identity as a work of art and a work of science, between its surrealist roots and statistical demise, the Mass-Observation Project sat at the intersection of poetry and pattern. The sections that make up this chapter shift in scale from the micro to the macro: from the citizen sensor and collector of the mundane, to the satellite view of the social offered by the sheer mass of information gathered and made available over the course of this documentary endeavor. We then review various critiques of this ambitious project and consider surrealistic, ethnographic and cybernetic processes of observation as ways to navigate this immense archive (Harrison et al. 1937; Highmore 2002; Hubble 2006; Luhmann 1998; MacClancy 1995; Malinowski 1922, Marcus 2001).[20] The aim of this chapter is to offer an important historical interdisciplinary case study to think with that address the desire to know ourselves through practices of systematic observation, recording and archiving (Adorno 1980; Benjamin 1999: Luhmann 1998, Stocking 1983).

The second chapter, "Systems Emerge from Noise," is also in part historical. The practices addressed herein examine how architectures of memory and technological conditions of knowledge about ourselves are imagined and created. While not embarking

[20]This section is based on archival research conducted at the Mass Observation Archive housed at the University of Sussex, UK in 2007.

on a linear history of recording devices, this first half of this chapter examines the history of cybernetics and computing. It considers the formalization of matter and meaning into pure information, and charts how, over the course of particular historical moments, the past has been turned into digital 0s and 1s. The second half of this chapter presents certain projects and practices of interdisciplinary scientists who are part Memories for Life. These scientists develop information-mining technologies in order to improve human memory and knowledge about our selves. The juxtaposition of these two sections - of the history of cybernetics and computing, and various Memories for Life projects - might enable a kind of montage thinking, a formal response to the practices examined, an enactment of the problems of gathering the particular and of collecting things in bits and pieces while gesturing to something larger at stake: the ways we attempt to look at our selves.

The third and fourth chapters focus on two extreme cases of lifelogging that make use of prototypical recording technologies designed by Memories for Life scientists: Gordon Bell, a senior researcher at Microsoft, who is on a quest to record his life for the sake of increased objectivity, productivity, and digital posterity (chapter three); and Mrs. B, a woman who suffers from amnesia and wears the SenseCam in the hope of leading a normal life in which she can share the past with loved ones (chapter four).[21] Through

[21] Although much of the work I address in this article comes out of Microsoft, a multimillion dollar and multinational corporation, my goal here is not to embark on a corporate and institutional ethnography but rather to look at the MyLifeBits and SenseCam projects as exemplary of the many endeavors that are part of the larger UK Memories for Life project.

these case studies, I show how new recording technologies are both a symptom of, and a cure for, anxieties about time.

More specifically, in chapter three, "Against Oblivion," I reveal how these memory banks are inherently tied to logics of capital, of stock and storage, and to logics of the technological where, when it comes to memory, more is more. Both remembering and forgetting operate in the economic, possessive discourse of time: losing time/finding time, wasting time/saving time. While not abandoning these terms, I show through the case study of Gordon Bell, that the past, as well as the present and the future, are always discursively, practically, and technologically informed. The fear of oblivion that drives Bell's "archive fever" (Derrida 1996; Nora 1995) relies on the assumption that one is able to record the past and one's self *as they were* and subsequently leaves one at risk of drowning in a sea of information (Plato 1973; Borges 1962). I end this chapter by reflecting on Foucault's genealogy of the western subject and by posing the question of how to tolerate so much information (Foucault 1986; Dreyfus and Rabinow 1983).

In chapter four, " Prosthesis and Anamnesis," instead of asking whether or not these technologies mirror reality or the past, through the case study of Mrs. B, I prefer to ask how they act, what they do, and whom they speak for. Throughout, this chapter proposes a shift from a representationalist argument about the bifurcation of nature (in this case, the objective reality of the ticking past and our subjective recollection of it) to a consideration of the ecologies of memories that we build and how they perform specific cuts through time (Barad 2003; Stengers 2010). For the amnesiac Mrs. B the problem of

too much information is experienced quite differently than for Bell. The noisiness created by the plethora of recorded memories is what allows her to un-forget, to experience a kind of anamnesis. She exists in time through her experience of what Proust has called involuntary memory. While Bell's desire to remember suggests that the past is out there, as a given, ready to be recorded, sorted, and subsequently tapped into whenever the need arises, Mrs. B's experience of involuntary memory suggests that the past is always only within the present. By focusing on a posthumanist cyborg subject who longs to share the past with loved ones, I show how these new digital tools do not merely belong to the world of objects and representations (Faubion 2011; Haraway 2000; Hayles 1999; Wolfe 2010). They participate in a care of the self (a kind of poetic self-making) that occurs though one's relationship with one's self and with machines, but also with one's past, and as Faubion emphasizes, "with others, who themselves demand care, consideration, acknowledgment [...]" (2011: 75). As such, these technologies are open to, and participate in, redefining concepts, subjectivities and temporalities. I end by calling for an agential-realist account of intra-active memory, where intra-action, as defined by philosopher of science Karen Barad, presupposes no preexisting entities (or even temporalities) prior to relationships (2003).[22] In the case of memory, intra-action means emphasizing not only the fluid relationships between individuals and machines, actors and actants, but also between the past, present, and future.

[22] Like Stengers' cosmopolitical approach, Barad's agential realist account "acknowledge[s] nature, the body, and materiality in the fullness of their becoming without resorting to the optics of transparency or opacity, [or] the geometries of absolute exteriority or interiority" (2003: 812).

In guise of a conclusion, the last chapter draws on the tropes of the prototype and the parasite in order to *think with* Memories for Life's emergent recording technologies. Parasites, as philosopher Michel Serres reminds us, disturb systems (Serres 2007; Wolfe 2007). They create noise. As parasites, prototypical recording technologies disturb our concepts of memory and forgetting. Rather than merely representing the past, these technologies also help shape our present and future. As such, they are performative rather than just representational or constative. They help create subjects along with new concepts and temporalities. Beyond their purely useful, or instrumental qualities, prototypical and parasitical technologies become tools to think with. They help create what Marcus has termed para-sites: spaces "where anthropologists and their interlocutors come together to discuss matters of common concern" (Kirksey and Helmreich 2010). They are spaces in which to perform horizontal collaborations in a transforming world (Marcus 2000). In a sense, parasites (disturbers of systems) help produce para-sites (places in which to reflect on the possible disturbances that occur within these systems). Seen in this light, this dissertation in its attempt to evoke, depict and reconfigure old concepts might be considered a kind of parasitical prototype, a working tool to think with, to test ideas, and to generate new para-sites.

1- Sensors and Satellites:

This chapter tracks the concept of memory back to a time before ubiquitous digital recording devices. It examines the significance of the archive as it grapples with the notion of what it means to know our selves through practices of observation and recording. First, we will see how Britain's Mass-Observation Project, a nation-wide documentary endeavor that took place between 1937-1950, was defined by practices of omnivorous collecting. We will examine how, in the hopes of creating an archive of daily musings of ordinary citizens, this project brought to light a number of problems associated with capturing the infinitely particular. Held in constant tension between its identity as a work of art and a work of science, between its surrealist roots and statistical demise, the Mass-Observation Project sat at the intersection of poetry and pattern. The sections that make up this chapter shift in scale from the micro to the macro: from the citizen sensor and collector of the mundane, to the satellite view of the social offered by the sheer mass of information gathered and made available over the course of this documentary endeavor. We then review various critiques of this ambitious project and consider surrealistic, ethnographic and cybernetic processes of observation as ways to navigate this immense archive (Harrison et al. 1937; Highmore 2002; Hubble 2006; Luhmann 1998; MacClancy 1995; Malinowski 1922, 1954; Marcus 2001).[23] The aim of this chapter is to offer an important historical interdisciplinary case study to think with that address the desire to know ourselves through practices of systematic observation, recording and archiving (Adorno 1980; Benjamin 1999; Luhmann 1998; Stocking 1983).

[23]This section is based on archival research conducted at the Mass Observation Archive housed at the University of Sussex, UK in 2007.

Mass-Observation and the Collection of Everyday Life

On the night of November 30th, 1936, the Crystal Palace in London, home of the 1851 Great Exhibition and a symbol of Victorian capitalism, burnt down. The smoke rising from that iron and glass building could be seen for miles. Charles Madge (1912-96), a poet and journalist who had befriended England's Surrealists, sought meaning in this incident, and wondered whether such events might help reveal some of society's underlying myths and fantasies. This burning of the Crystal Palace – as well as the abdication crisis over King Edward VIII's love for an American divorcée – propelled Madge and a group of friends, including Humphrey Jennings (1907-50), a Surrealist painter, set designer and documentary filmmaker, to discuss the possibility of an "anthropology of our own people" (Madge 1937: 12).

On January 2nd, 1937, Madge wrote a letter to the *New Statesman and Nation* on behalf of this group, calling for a social investigation into the "Crystal Palace-Abdication symbolic situation." Madge envisioned an exploration of public consciousness – examined through its coincidences and its idiosyncrasies. This vision was to be achieved through the enrolment of "real observers" who were "the millions of people […] irretrievably involved in the public events" (Madge 1937: 12). He outlined and area of fieldwork focused on Britain's social imagination, and summarized his vision by stating that: "only mass observations can create mass science" (Madge 1937: 12).

Tom Harrisson (1911-76), a renegade ornithologist turned anthropologist, described as "being more at home with cannibals than with academics," was living in Bolton and experimenting with some local fieldwork of his own through odd jobs as a truck driver or ice-cream man (Crain 2006: 1). His poem about his latest exploration in the New Hebrides, "Coconut Moon," was published on the same page as Madge's letter in the *New Statesman and Nation* and, intrigued by this call for an anthropology of Britain, he went to London to meet Madge and his friends.

On January 30th, 1937, Harrisson, Madge and Jennings announced, in a new letter to the *New Statesman and Nation* entitled "Anthropology at Home," the launch of a project with the goal to document everyday life in Britain. Seeking to go beyond the classic study of "primitives and abnormals" by a lone and foreign anthropologist away in the field, the project sought "to work with a mass of observers" who would "provide the points from which can be plotted weather-maps of public feeling" (Harrisson et al. 1937: 155). More of a campaign for a social movement than the description of an independent intellectual project, the letter called for the study of contemporary life through the observations of "behavior of people at war memorials, shouts and gestures of motorists [...] beards, armpits, eyebrows, anti-semitism [...] funerals and undertakers [... and] the private lives of midwives," among many other things (Harrisson et al. 1937: 155). These observations were to be rigorously noted and exposed "in simple terms to all observers, so that their environment may be understood and thus constantly transformed" (Harrisson et al. 1937: 155). This letter was the first of many publications by the group that came to be known as Mass-Observation; and London and Bolton soon became hubs for the study

of everyday life. From the very beginning the founding trio's collaboration was a difficult one, "never even agreeing whether their group's name meant observation of the masses or by them" (Crain 2006: 1). They nonetheless managed to enlist thousands of volunteer observers and received countless reports of their daily lives.

Surrealist Tactics and Juxtapositions

Not much has been written about Mass-Observation in Anthropology, aside from a footnote in James Clifford's text "On Ethnographic Surrealism" (1988: 143). If it weren't for a few books and articles by a few British cultural theorists (Highmore 2002; Hubble 2006; MacClancy 1995; Marcus 2001), one can say that the movement itself has been largely neglected within the social sciences and the humanities. In fact, even in George Stocking's *Observers Observed*, in which he looks at the history of British Anthropology and proposes to examine "the systematic study of human unity-in-diversity, against the background of historical experience and cultural assumption that has provoked and constrained it," there is no mention of the project (Stocking 1983: 6). This is perhaps due to Mass-Observation's position at the borders of both academia and the arts. Never quite fitting with any larger group or discipline, the project played with the very dichotomies that can be used to reflect on it today: familiar and strange, art and science, or observer and observed.

While Clifford's text focuses on French anthropology's influence on Surrealism between the two wars, it offers valuable insight into a time when ethnography was still

taking shape as a discipline, and when Surrealism was being defined as a practice rather than as a historical moment in art history. It is this context of beginnings and possibilities that is important to keep in mind when considering Mass-Observation and its place in the history of the avant-garde and early social science in Britain. It follows that ethnography and Surrealism are not fixed modes of thought, and that my discussion of them here cannot be considered the simple comparison between two different stable traditions.

An awkward movement to categorize, Mass-Observation situated itself at the intersection of many disciplines such as psychology, sociology, anthropology, art and poetry. In the founders' words, "the artist and the scientist, each compelled by historical necessity out of their artificial exclusiveness, [were] at last joining forces and turning back towards the mass from which they had detached themselves" (Harrisson et al. 1937: 155). In February of that year, in the journal *New Verse*, the group stated that in "taking up the role of the observer, each person becomes like Courbet at his easel, Cuvier with his cadaver, and Humbolt with his continent" (quoted in Crain 2006: 1). The group wanted to free prose and poetry from professionals and to create it by and for the people.

Again, founded by Madge a poet, Harrisson an anthropologist, and Jennings who had helped organize the International Surrealist Exhibition with Andre Breton, Mass-Observation formed a collective version of an ethnography aimed at making the familiar strange through its gathering and laying out of facts and opinions 'at home.' Adopting a Surrealist attitude, Mass-Observation looked for meaning in accidents and coincidences. As scientists, they explored "familiar aspects of everyday life as if they were part of an

unfamiliar culture" (Marcus 2001: 16). Through the collage and juxtaposition of jarring and disparate elements, the group hoped to subvert the 'natural' understanding of the current state of affairs (the burning down of the crystal palace, the abdication crisis, the impending war, and the advancement of modern technology) and to reveal public myths and assumptions. In their introductory pamphlet Mass-Observation elaborated on its desire to bring to light old superstitions and to reveal the problematic process of their adaptation to modern technological conditions. As I will be discussing in the following sections, this is a reemerging theme in the later works of Jennings and also a reoccurring concern in the collecting practices of philosopher Walter Benjamin.

> The more recent acquisitions – electricity, the aeroplane, the radio – are so new that the process of adaption [*sic*] to them is still going on. It is within the scope of the science of Mass-Observation to watch the process taking place – perhaps to play some part in determining the adaption of old superstitions to new conditions. These forces are so new and so terrific that they are commonly thought of as kinds of magic power that can only be wielded by a few men, the technicians. Hence there is a widespread fatalism among the mass about present and future effects of science, and a tendency to leave them alone as beyond the scope of the intervention of the common man. The technician on the other hand, is not concerned with the implications of his activity or its effect on the masses (Harrisson and Madge 1937: 16).

Mass-Observation set out to perform a kind of social diagnosis, with omnivorous collecting and juxtaposition as their main lab practices. As Highmore points out, the "use of the term 'science' in Mass-Observation [was] insistent, but [...] also precarious and open to a wide range of meanings" (Highmore 2002: 83). For early Surrealism, scientific language and reference to lab work was a way of emphasizing its role as a practice rather than as a static art movement. Not only did the first wave of Surrealists including Andre Breton come from medical backgrounds, but also the first journal of Surrealism in

France, *La Revolution Surrealiste* (1924-9), mimicked the journal *La Nature*. The journal solicited submissions, which were to be sent to the *Bureau de Recherches Surrealistes*. Inspired by the ethnographic collection of foreign artifacts, Surrealism sought to change normative outlooks and behaviors and framed their work as a kind of scientific 'knowledge making' (Clifford 1988). But these new forms of knowledge consisted in the destruction of what was already in place without necessarily proposing an alternative. Surrealism's scientific practice consisted in leaving its objects in a state of unresolved suspense.

Similarly, of all of Mass-Observation's identity problems, the one that is called out the most is its double claim as both an artistic and scientific venture (Hubble 2006; Marcus 2001). Mass-Observation negotiated emerging disciplinary boundaries, struggled with them, and highlighted the tensions and the possibilities resulting from their interplay. What Mass-Observation produced, according to cultural theorist Laura Marcus, was "an interface between documentary realism and surrealism" (2001: 9). The differences between the two views, scientific and artistic, attributed to Harrisson and Jennings respectively, are most often characterized as problematic to begin with. And Nick Hubble points out that what is interesting in fact, is not so much the eventual dissolution of the project "split along these predestined lines, but that it was ever able to transcend such fundamental difference" (2006: 6). But the fundamental difference between artistic and scientific endeavors is somewhat ironic and complex, and its transcendence at the time is perhaps less surprising than Highmore and Hubble and convey in their accounts of Mass-Observation. European anthropologists and Surrealists

in the 1920s and 30s were, in a sense, playing the same game, only reversed. Where anthropologists looked to the exotic in order to make it familiar, Surrealists turned their gaze toward their own environment and framed it in such a way as to make it strange. After having witnessed the unthinkable catastrophes of the First World War, artists and social scientists in Europe sought to capture human nature in all its apparent absurdity. They were fueled by a desire to see and to question the culture in which they found themselves, and to juxtapose it with other, at times startling, possibilities. Ethnography in France sent observers on its Mission Dakar-Djibouti (1931-33) with expectations that they would return with a heap of foreign facts and objects; and "the surrealists frequented the Marché aux Puces, the vast flea market of Paris, where one could rediscover the artifacts of culture, scrambled and rearranged," out of context like a Duchamp 'ready-made' (Clifford 1988: 121). Both could be said to have been seeking alternatives to the established and taken for granted cultural order.

Meanwhile, Mass-Observation developed its own way of rediscovering British culture; and its method of collecting data left a lot of room for surprises and chance in the discovery of hidden meaning. Alongside the regular diary entries and responses to questionnaires, the data collected by the group included "day surveys" which were filled out by volunteers on the twelfth of each month. These culminated in the publication of what was perhaps the most experimental and poetic book by Mass-Observation, *May the Twelfth: Mass-Observation Day Surveys 1937 by Over Two Hundred Observers.* In this collection of observations, people recounted their whereabouts, activities, thoughts and remarks on the day of George VI's coronation. "The group collected forty-three day-

surveys, seventy-seven people answered written questionnaires, and a squad of twelve anonymous observers covered the coronation like reporters – or, rather, like cameras" (Crain 2006: 3). Jennings edited the book with a certain aesthetic attitude that was not geared toward a linear 'scientific analysis' per se. Rather, it was designed as a kind of montage, where one could read first-person descriptions of the day, survey and questionnaire responses, and observers' accounts of what they had witnessed and eavesdropped. The narratives could be perused in any order one wished. Thus, as the editors explained, different kinds of focus were obtained, "close-up and long shot, detail and ensemble" (Jennings and Madge 1937: 90). But reading the accounts in *May the Twelfth* could be somewhat tedious. The book provided close looks – one could easily call it a voyeuristic gaze – at the everyday (even during this exceptional event), written up in multiple ways by ordinary citizens. Transcripts of bystanders' cheery dialogue preceded detailed, almost technical, accounts of a photographers attempt to capture the scene. For example:

> [...] Women behind: 'Isn't she lovely.' 'Isn't
> she wonderful.'
> Cheers for Princess Royal, Princesses and Queen Mary.
> Cheers for mounted officers.
> Gold coach: 'Isn't it lovely.' 'Isn't it gorgeous.'
>
> 76. (CM.I.) (Apsley Gate.) 3.14. A huge burst of cheers.
> G.B. camera man focuses – turns over the lens-turret – gets
> his eye to the viewfinder, and his left hand on the panning
> handle. Shoots. He turns the turret over again, looks through,
> turns back. Shoots. Next unscrews the telephoto lens. A band
> in the procession comes playing down the drive. He turns
> over again, has a look, pans to a new position. There is a
> rush of people forward and cheering [...] (Jennings and Madge 1937: 142).

Also included in the book were newspaper articles, editorials, "press-cuttings" and reports of worker strikes and riots that took place in the lead up to this national event. As MacClancy suggests, the inclusion of these various accounts was Mass-Observation's way of "lay[ing] bare the tensions of organizing a nationwide celebration of unity in a country where equality is not the rule" (1995: 500). The presentation of replies to questions about what people thought of the coronation created an a times caustic montage of official and public attitudes toward the event. Observers were asked to briefly document their own feelings or opinions, as well as their neighbors':

OWN VIEW	NEIGHBOURS' VIEW
CL.50. No desire to see.	Neighbours indifferent or considered too much fuss was made
CL.60. Very keen: saw Procession with Womens' Institute ticket.	Neighbours keen. 'Children all eager to put their flags up.'
CL.66. 'As a spectacle, yes; as an enthusiastic, cheering participant, no.'	'Some were quite keen, but many were apathetic.'

Despite the work's style of raw juxtaposition and montage, and the significant absence of commentary on the editors' part, at the end of the book Mass-Observation reiterated its desire to be:

> more than journalism or film documentary, because it ha[d] the aim in view not only of presenting, but of classifying and analysing, the immediate human world. By publishing this book at this stage [they were] fulfilling another of the tasks of MASS-OBSERVATION, that of inviting observers and potential observers to contribute both to the analysis of material here presented and also to the future construction of MASS-OBSERVATION on a truly democratic basis (Jennings and Madge 1937: 414).

The group invited the public to take part in constructing an image of itself. It pulled authority away from the single observer by multiplying the number of people involved in the production and analysis of the raw material. Cultural theorist Ben Highmore points out that the importance of recording the everyday – and especially the diversity to be found in the everyday – and between individuals on the same given day (the twelfth of the month for example) needs to be examined in the historical context leading up to WWII. Mass-Observation responded to "the image of a society where diversity was being brutally and systematically eradicated (Nazi Germany) [... through] the practice of promoting a 'totality of fragments', of a society 'united' by a heterogeneous everyday, a commodity of diversity" (2002: 92). Mass-Observation's *May the Twelfth*, was an exercise in the re-contextualization of multiple and multi-vocal facts and narratives. In the play between Surrealism and ethnography, "the 'will to order' of anthropology [was] seriously undermined, while at the same time Surrealism's tendency to revel in mythic individualism [was] effectively countered" (Highmore 2002: 82). The 'artist-scientist' was called upon to extend his subject matter to that of the masses, and his generalizations and realizations were to be collective rather than singular and individual.

The book, by and for the mass, did not sell well, perhaps due to its ironically high cost.[24] Disagreeing with the editorial approach, Harrisson had not taken part in the production of *May the Twelfth*. Tension between the founders escalated, and with other creative experiments in mind Jennings left Mass-Observation later that year to work as a documentary filmmaker. Although he left Mass-Observation, Jennings continued to

[24]Mass-Observation's later book *Britain* was much more popular with the general public. Over 100 000 copies sold within 10 days publication.

work on some of its ideas. He started to collect writings about the history of technological change. He gathered thousands of articles, minutes from meetings of the Royal Society, prose by writers such as Darwin and Wordsworth among many, many more. He named his anthology *Pandaemonium*. Edited after his death by his daughter Mary-Lou Jennings, and by Charles Madge, *Pandaemonium 1660-1886: The Coming of the Machine as Seen by Contemporary Observers* represents selections from Jennings collection of texts from the 17th, 18th and 19th centuries. As a proponent of Surrealism and collective expression, he preferred to speak of 'images' as public representations rather than speaking of 'symbols,' which he considered private: "An image was not to be thought up by a gifted person but rather, to be sought out in the external world, in literature, or in the past" (MacClancy 1995: 497). The passages Jennings amassed were ones that marked England's imagination, documenting the Industrial Revolution onward. In the process of editing the volume, Madge grouped the different texts in a thematic index, an idea proposed by Jennings in the notes that accompanied his selections. With headings like THE MAN OF SCIENCE, DAEMONS AT WORK and MINERS, the index lends, according to Madge, added depth and dimension to the collection. For instance, as Madge explains in his introduction to the book, the heading "MAN-ANIMAL-MACHINE, includes images in which animals are viewed as machines, and machines are viewed as animals, and goes somewhat beyond this to cover images of Man and Robot, and Man as Animal" (Madge 1985, xx). *Pandaemonium* was not meant to be an accurate description, nor an extended analysis of the periods of history it addresses. Rather, it was intended as a 'presentation' in which the 'rough cuts' between the raw data

were to remain apparent, where delicate traces and pictures representing the human condition were to be imagined.

In 1938 Jennings did a series of talks on the radio elaborating on his poetic approach and his desire to collect relics from the past.

> Poetry he said, enabled man to deal with himself: to protect and arm himself. He spoke of Apollinaire who said that the poet must stand with his back to the future because he was unable to see it: it was in the past that he would discover who he was and how he had come to be (Jennings, M. 1985, x-xi).

It was Guillaume Apollinaire who coined the term Surrealism in 1917. The movement, as he saw it, was imbued with an air of antiquity. For the Surrealists, even the newest fashion had to be somewhat 'outmoded.' In a sense Surrealism emerged at the intersections of novelty and antiquity. Philosopher Walter Benjamin would become extremely wary of Surrealism's combination of innovative, radical discourse and the commoditization of the old. Instead of a transformative practice, what the Surrealists reinforced for Benjamin was a fetish for the object and for random meaningless collections. In fact, Benjamin was critical of the European avant-garde, especially the Surrealists, for not living up to their intended revolutionary project. He condemned them for their tendency to leave their decontextualized objects in a state of suspense, which had little transformative effect and simply reaffirmed its condition as a commodity. Without a revolutionary purpose, art became "the corollary to the frivolity that glorifies commodity" (Benjamin 1978: 158). For Benjamin, there is no such thing as aesthetics without politics. If art does not take part in re-shaping the social and technological customs it seeks to subvert, it is liable to be absorbed by them. That is why he was

critical of the Dadaist and Surrealist movements of the 1920s and 30s. Against art being sold for profit, artists promoted the idea of "art for art." But by attempting to detach themselves from the social, they became a mirror of what they aimed to criticize. Artists promoted their own objects as isolated and freed from norms, politics and commerce; a move, Benjamin argued, would leave their work to become just that, a trend-setting tool in the hands of capitalism. For Benjamin, Surrealism's aesthetic technique of accumulation and irony through juxtaposition did not translate into a political practice. The Surrealist method for him was something of a "trick" which substituted "a political for a historical view of the past" (Benjamin 1978: 182). His initial reading of the Surrealists was permeated by a certain anticipation of the re-ordering of a world that they had helped put into question. But the movement fell short and Benjamin was left waiting for the revolution.

Clutter and consumption

Right from the start the great collector is struck by confusion, by the scatter, in which the things of the world are found. - Walter Benjamin

Benjamin's critiques of Surrealism resound when thinking through the problem of Mass-Observation, especially when considering the eventual fate of the project as a market research firm, which we will get to below. Attracted by its revolutionary and intuitively Marxist beginnings, Benjamin found promise in Surrealism. But the movement failed to follow its initial political preoccupations, and Benjamin condemned what he considered to be their bourgeois attitude. Benjamin attacked Surrealism for being too all encompassing, and thus ridding itself of the possibility of creating meaning.

> Everything with which it came into contact was integrated. Life only seemed worth living where the threshold between waking and sleeping was worn away in everyone as by the steps of multitudinous images flooding back and forth, language only seemed itself where sound and image, image and sound interpenetrated with automatic precision and such felicity that no drink was left for the penny-in-the-slot called "meaning." Image and language take precedence (Benjamin 1978: 178-179).

In its own attempt at being all-inclusive, Mass-Observation ended up with an unmanageable collection of contemporary photographs, pamphlets and writings. Their intended project was in a sense so vast that "rather than commenting on the everyday, it would become coterminous with it" (Highmore 2002: 83). It would become as impractical as Jorge Luis Borges' 1:1 map of the world in *Exactitude in Science* (1998). Bogged down by the endless empiricism of the everyday, a step back toward generalization was nearly impossible. Mass-Observation published only a fraction of the material it intended to circulate. Catalogued boxes lined the walls of the archive (and in Sussex, they still do), ready to be made into a kind of usable past.

Benjamin would surely have been disappointed in Mass-Observation. The project's initial aims for social transformation may have captured him at first, but he would have likely criticized the project's lack of distinction between lived experience (*Erlebnis*) and discourse of/about experience (*Erfahrung*). A major problem he associated with modernity was that discourse about experience was not turned into knowledge. Experience remained at a level of mere accumulation and distraction: "What we are left with is 'experience' that doesn't enter into meaningfulness, can't be reflected on, and so is unavailable for criticism" (Highmore 2002: 67). But in his writings Benjamin proposes a solution to this modern form of alienation and information

overload: to use similar techniques of montage and distraction. Unlike most readings of his famous essay "The Work of Art in the Age of Mechanical Reproduction," I argue that Benjamin was not mourning the status of art with respect to technology. Rather, what he suggested was for the artist to make use of modern technology and its effects. If he was to be useful, the artist had to stay abreast of the specializations that create social divides. And the artist for Benjamin must remain useful. In "The Author as Producer," Benjamin emphasizes the need to wrench things from "modish commerce" and to give them "revolutionary useful value" (Benjamin 1978: 230). He uses the example of the photograph and encourages the author to master its technical specialization so that his production may be politically useful. "[...] the barriers imposed by specialization must be breached jointly by the productive forces that they were set up to divide" (Benjamin 1978: 230). Thus for Benjamin, distraction, collection and montage became techniques to be used to bring to light the disruptions brought on by a distracting and divisive modernity.

But Benjamin's critiques of modernity and the Surrealists are just a few of the many ways of looking at Mass-Observation. His collecting practice is another. During the course of thirteen years Benjamin amassed an innumerable amount of writing and citations that documented the development of modernity through capitalism's quintessential exhibition space, the Paris arcades, or the early mall. Put together in a style that mimics the walk of a Flâneur through a maze of ready-made goods, Benjamin's voluminous and ambiguous work, *The Arcades Project*, was fascinated at once with new technology and with junk. His methods, much like the Surrealists he criticized, consisted

in assembly and juxtaposition. In the introduction to *The Arcades Project* the translators describe Benjamin's preferred objects as well as his technique:

> [...] it was not the great men and celebrated events of traditional historiography but rather the "refuse" and "detritus" of history, the half-concealed, variegated traces of the daily life of "the collective," that was to be the object of study, and with the aid of methods more akin – above all, in their dependence on chance – to the methods of the nineteenth-century collector of antiquities and curiosities, or indeed to the methods of the nineteenth-century ragpicker, than to those of the modern historian (Benjamin 1999: ix).

The project could be seen as a structural argument. Like Mass-Observation's *May the Twelfth*, or Jennings' *Pandaemonium*, *The Arcades Project* could be navigated in many different ways. Not composed as a classic book to be read from a-z, the collection included "blinks" or key words meant to act as hyperlinks. Benjamin was constructing a miniature city where one could get lost and wander, swaying to the familiar rhythms of modernity – distraction and accumulation. For Benjamin, history was just that: an incessant accumulation. He describe this in his famous passage on the angel of history:

> This is how one pictures the angel of history. His face is turned toward the past. Where we perceive a chain of events, he sees one single catastrophe which keeps piling wreckage upon wreckage and hurls it in front of his feet. The angel would like to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing from Paradise; it has got caught in his wings with such violence that the angel can no longer close them. This storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. The storm is what we call progress (Benjamin 1968: 258).

Benjamin's way of laying out modernity's 'wreckage' was through his own process of gathering. He invented his own technique that involved emulating the surreal characteristics he criticized. That is to say he adopted the alienating techniques he was suspicious of as a way if bringing them to light. But later Adorno would disagree with

Benjamin's way of bringing modernity out of dream and into history by simple accumulation and juxtaposition. He argued against the simple presentation of facts and quotes. For him, Benjamin's study was "located at the crossroads of magic and positivism. That spot [was] bewitched [and only] theory could break the spell" (1980: 129). He accused Benjamin of remaining at the historical level of the mere collection of experience (*Erlebnis*) and of not moving towards a politics and theory (*Erfahrung*).

And what about Mass-Observation – can the project be seen as a kind of structural comment on modernity? Like Benjamin, Mass-Observation created a platform in which their political views met their aesthetic concerns. The group at once struggled with and embraced its gathering and representation of a shear plethora of voices speaking at once. The Mass-Observation project, like *Pandaemonium*, and *The Arcades Project* was a work of citations, an explosion of the grand-narrative of history into its multiple fragmented parts. This fragmentation became an end in itself. And like the process of modernity they attempt to represent, these three documentary projects could potentially have gone on forever. In fact, *Pandaemonium* and *The Arcades Project* were reconstructed out of the materials found in suitcases belonging to Jennings and Benjamin respectively. The works were both edited based on notes and discussions left by their deceased master collectors. "As far as the collector is concerned, his collection is never complete; for let him discover just a single piece missing, and everything he's collected remains a patchwork" (Benjamin 1999: [H4a, 1] 211). An endless sea of noise and information formed the very material for these projects; and indeed the colossal works appear unfinished.

Observations and Critiques: the Ethnographer Sensor

[...] behaviour is a fact, a relevant fact, and one that can be recorded. And foolish indeed and short-sighted would be the man of science who would pass by a whole class of phenomena, ready to be garnered, and leave them to waste, even though he did not see at the moment to what theoretical use they might be put! - Bronislaw Malinowski

Humphrey Jennings' departure from Mass-Observation signals a shift for those who have studied the movement and its history. Mass-Observation's subsequent work was much more statistically argued and contained much less raw or poetic material from overheard conversations and observations. Without Jennings, Harrisson and Madge continued the project, aided by groups of hired and voluntary observers, and topics continued to range from politics and smoking, to astrology and pub going. It is unclear as to how some observers were paid during this period, but Harrisson, a fairly public figure, was able to obtain some funding through radio appearances where he would discuss either his latest expeditions overseas or his groups' observations of British behavior and opinion.

Although Surrealism helped define Mass-Observation in Britain, the project explicitly aimed for a certain kind of scientific rigor; and the founders sought to draw, however problematically, conclusions about the mass. Moreover, in spite of their goal to create an archive of the everyday made *for* the people *by* the people, Mass-Observation looked for legitimacy within intellectual and academic spheres. They eventually created an Advisory Panel, which included biologist Dr. Julian Huxley, theologian Canon F. R. Barry, social anthropologist Professor Bronislaw Malinowski, and H. G. Wells, among others.

In the forward to a Mass-Observation pamphlet handed out earlier that year, evolutionary biologist Julian Huxley endorsed the project of studying the English. For him knowledge was the only way to "obtain any efficient measure of control." And this was to be done by methods akin to "bird-watching and natural history observation." By inviting the public to notice things they had previously taken for granted about their own society, Mass-Observers could, according to Huxley, "put many orthodox scientists to shame in their simplicity, clearness and objectivity" (Huxley 1937: 6). His emphasis on the scientific and empirical nature of the project was, however, significantly toned down at the end of his short forward, where he noted the possibility of a wider social artistic outlet: "Nothing could well be more valuable than to contribute towards ending the present divorce between the artist and society at large, and towards initiating a period of truly socialized art" (Huxley 1937: 7). As I have noted above, this push and pull between the rigorous nature of bird-watching and the affective nature of a social art form is key to understanding the complex history of Mass-Observation and the diversity of those involved. It is also characteristic of the context in which the project was founded, that is to say a milieu in which art was becoming more politically and psychologically subversive, and in which social inquiry was gaining recognition as a worthwhile scientific endeavor.

The group subsequently printed the book *Mass-Observation: First Year's Work 1937-8*, where they once again outlined their goals of "social recording" and of making "invisible forces visible." Armed with the desire to continue their experiment, they urged for the study of "the beliefs and behaviour of the British Islanders" (Madge and Harrisson

1938: 8). Anthropologist Bronislaw Malinowski wrote the afterward to this book in which he outlined an encouraging critique of Mass-Observation. In his own widely celebrated work, *Argonauts of the Western Pacific* Malinowski elaborated on the importance of being present among the Trobriand Islanders whose way of life he depicted (1922). Throughout he described how he feverishly kept notes on the minutiae of everyday life while in the field. In so doing, he could fulfill one of the outlined goals of his ethnographic fieldwork: To create a "collection of ethnographic statements, characteristic narratives, typical utterances, [...] to be given as a corpus inscriptionum, as documents of native mentality" (Malinowski 1922: 24). As part of what was, since the late 19th century, a collective effort both in the US and in Europe to preserve what was considered the disappearing remnants of our human past, anthropologist were urged to go out and record indigenous cultures. "Alas! the time is short for Ethnology, and will this truth of its real meaning and importance dawn before it is too late?" (Malinowski 1922, 518). A romanticizing of the discipline, and a concern with historicity, flirted with a form of nostalgia or regret for past custom (Stocking 1983). In his large and detailed accounts of cultural groups in New Guinea, Northwester Melanesia, the Trobriand Islands, as well as in Australia, the US and Mexico, Malinowski fluctuated between evocative romantic descriptions and the elaboration of his functionalist theory. He maintained that by attending to the wider context of Culture, the anthropological fielworker would be in the best position to genuinely contribute to "the study of man" of which psychology, sociology, economics, linguistics, history and other social sciences and humanities were also part. Although Malinowski sought to refute the popular evolutionary hypotheses of the late 19th and early 20th centuries (Morgan 1985; Stocking

1983), he remained positivist in his desire to capture fleeting moments in time that could lend insight into the "rules and regularities of tribal life" (1922, 11). His

> principles of method can be grouped under three main headings; first of all naturally, the [researcher] must possess real scientific aims, and know the values and criteria of modern ethnography. Secondly, he ought to put himself in good conditions of work, that is, in the main, to live without other white men, right among the natives. Finally he has to apply a number of special methods of collecting, manipulating and fixing his evidence (Malinowksi 1922, 6).

Malinowski took hundreds of photographs and collected innumerous amounts of notes; documenting proof of what he argued was the secret of successful fieldwork - *being there*. Since, Malinowski is often thought of as the archetypical ethnographic fieldworker, and despite the epistemological concerns evident in his writings, he has come to be associated with the creation of a certain mystique behind fieldwork and its methods (1922, 1954, 1960). For Malinowski, the people he studied were a source of "crude data" that could later be turned into a true "Scientific Theory of Culture" (1960). Fieldnotes were an empirical step in the kind of magic that led one from the field to social theory.

In his afterward to *Mass-Observation*, Malinowski welcomed the organization and described himself as a proponent of 'anthropology at home,' especially for its political value in helping to avoid totalitarianism through widespread knowledge rather than ignorance. But he was critical of Mass-Observation's methodology. In order to become what he called "an instrument of social scientific research," Mass-Observation would have to be more theoretical, methodological, and rigorous. They would also need to explain their choices of observations. In his 1916 essay "Baloma; The Spirits of the

Dead," Malinowski attempted to outline his method for dealing with the "chaos of diversity and multiplicity" encountered in the field by reducing it to "simpler data" (1954: 241). But his argument was somewhat contradictory. In one instance he seemed to suggest that data must be "recorded in a scientifically useful form," (237) and that collecting is in and of itself an act of choosing and therefore generalizing. In another, he argued for the gathering of as many "cultural facts" as possible, leaving the parsing and theorizing to later. In other words, he asserted on the one hand that without prior interpretation about what constituted relevant cultural information, "all scientific work in the field must degenerate into pure "collectioneering" of data;" and on the other that "one of the main rules with which [he] set out on [his] field work was 'to gather pure facts, to keep the facts and interpretations apart'" (Malinowski 1954: 237). In the same essay, he argued against what he called the "cult of 'pure fact'" and proposed that one know what one is looking for and why. In that sense, "every ethnological document" he insisted, "is itself a generalization" or step toward theory (Malinowski 1954: 238). As he stated in another essay:

> [t]here is no such thing as description completely devoid of theory [...] which declares that some facts are relevant and others adventitious, that some factors determine the course of events and others are merely accidental by-play [...] To observe means to select, to classify, to isolate on the basis of theory (Malinowski 1960: 7-12).

The process then appears to be two-fold for Malinowski: the elaboration of a theory is based on empirical observations that subsequently determine what observed cultural factors are relevant towards the discovery of general sociological laws. So a process of induction (achieved through the documentation of observed cultural manners in the field)

orients one's later observations; and derived theories can then find confirmation or doubt through further empirical proof.

One need not look too far to discover the formulation of rules and regulations. According to Malinowski, the scientific method is intrinsic to the every day, or to human nature writ large. Science is natural, even innate, and proof of this is culture itself. Human's use of words and concepts illustrated for Malinowski the presence of an underlying scientific method. Science for him was implicit in all things. Even those who rely on intuition can be thought in this sense as relying on a scientific method, since all action is based on passed experiences in the hopes of predicting future outcomes. This definition of science, as a reliance on the past through observation and generalizations for the sake of the future, was for Malinowski at the heart of culture and "must be assumed as having been at work from the very beginning of mankind, ever since the species started on its career as *homo faber*, as *homo sapiens*, and as *homo politicus*." (Malinowski 1960: 10). The scientific approach that underlies human action is transmitted through example and through the elaboration of what we have come to understand as traditions and institutions. For Malinowski's functionalist theory, culture is thus based on this implicit act of prediction, and all action comes to be understood as "a means to an end" (Malinowski 1960: 7). Thus his definition of science derived from a pragmatic execution of a response to basic human needs. Theory and its application were inseparable. Seen in this light, Mass-Observation's vast collection of everyday words and actions could indeed have provided fertile ground for inductive theoretical fodder, à la Malinowski.

But Malinowski warned Mass-Observation against the possible confusion between ethnographer and informant. He highlighted inherent problems he saw between objective and subjective collection of data, arguing that there must remain a distance – an existential difference – between observers and observed. He clarified that what was now technically called a "Mass-Observer" was really what anthropologists called an informant: "An informant is a member of the community observed who comments on happenings and takes part in them, who supplies the motives and feelings which account for his fellow-tribesmen's behaviour" (Malinowski 1938: 118). Informants, for Malinowski, needed to be addressed as such, that is to say contextualized in terms of economic, social and cultural conditions. The goal of an observation by the masses, of the masses, for the masses was thus seen as fundamentally flawed at the outset, since Mass-Observation deliberately confused the roles of the native informant and that of the trained and more objective ethnographer. Finally, Malinowski suggested the group mix more with other social sciences and academia in general.[25]

In spite of Malinowski's critique, Mass-Observation continued to blur the lines between scientists and objects, between poets and muses. Echoing French writer Michel Leiris' recent work *L'Afrique Fantôme* (1981) – in which he narrated his travels on the

[25] Raymond Firth, anthropologist at the London School of Economics, was not as indulgent in his critique as Huxley or Malinowski. He argued that Mass-Observation was not original, that there had been previous observers of British working class life. He also pointed to the lack of cohesiveness among the amassed 'facts.' He considered them decentered and disconnected, and as such, the undigested information was of little social scientific value. About the observers, he thought they claimed too much (MacClancy 1995). He attacked mass-Observation and their latest book Britain (1939) for unrepresentative statistics in a lecture that was later published in the journal Sociological Review. His critique was no surprise given the fact that British social anthropology was claiming its ground as a professional discipline of trained observers, while Mass-Observation's practices implied that anyone was fit for the job. Everything from Mass-Observation was collectively written, rather than presented as the product of individualistic fieldwork such as that which was being established by the discipline in the 1930s.

Mission Dakar-Djibouti in a style that courted both autobiography and anthropology – the writings by Mass-Observation were a kind of self-ethnography that disdained the distinction between objective and subjective.[26] Predicated on the idea that the mass was both the one to observe and to be observed, the group encouraged a kind of self-examination and suspicion of the ethnographer's authority that anticipated anthropology's postmodern reflexive turn in the 1980s. But Mass-Observation went a step further: It sought to be demotic and revolutionary by creating documents for, by, and about, the people. Cultural theorist Ben Highmore in his work on the everyday argues that the movement

> is most productive, as an approach to everyday life, when it treats 'natives' as the ethnographers. In doing so [...] Mass-Observation can be seen as generating a radically democratic project. It is here that Mass-Observation can be seen to fulfill the promise of Surrealist ethnography: the potential for everyone (academic ethnographers, capitalist industrialists, working men and women, and so on) to become 'natives' (Highmore 2002: 87).

In fact, many have looked to the project as a practice that exemplified philosopher Michel DeCerteau's notions of resistance and agency through writing. Authors Dorothy Sheridan, Brian Street and David Bloom have addressed self-writing as the carving out of a space for oneself where one can resist dominant social structures and meanings. They have praised Mass-Observation for valuing the 'ordinary' narratives that get left out of official histories (Sheridan et al. 2000). A kind of precursor to the study of the *subaltern*, the project has been hailed for paying attention to the history told by those most often marginalized from it, such as women, minorities and the working-class.

[26] Georges Bataille, an anthropologist writing in France around that same time, is also considered a primary figure in the blurring of genres such as poetry and scientific writing, autobiography and fiction. His journal *Documents* (1929-30), in which both anthropologists and artists published, used ironic montage to critique the artificial assemblages of acquired knowledge. For a discussion of this journal, see Clifford (1988).

When war was declared by Britain, mass observers kept diaries and records detailing such things as reactions to propaganda and feelings about the blackouts. Led by a frustration with the representation of the public in the press, Mass-Observation took on the task of mapping the social unconscious and of tracking public opinion. This resulted in the publication of the book *War Begins at Home* (1940). The Ministry of Information took interested in their study and hired the group for its insight on morale. But Madge disagreed with Mass-Observation's involvement with government, and in July 1940, he left the group, later becoming professor of sociology at the University of Birmingham. As for Harrisson, he continued to write reports for the Ministry of Information. By 1945, in order to stay afloat financially, Mass-Observation's focus shifted from governmental to commercial work. Harrisson soon left the organization and then became director of the national museum of Brunei. By 1950, Mass-Observation Ltd. was an independent market research firm.

The Mass-Observation Archive, which includes an enormous collection of notes and reports written between 1937 and 1950, was given by Harrisson to the University of Sussex special collections, where it is now held. It has since become a resource for historians looking to study wartime Britain and for cultural theorist focusing on the study of the everyday. The idea of Mass-Observation was re-launched in 1981 so that reactions to the Royal Wedding and life under the Thatcher Government could be documented; and historians and archivists, who manage the collection at Sussex, continue to issue questionnaires to a panel of about 500 observers whose replies are also made available as

part of the current archive. Over twelve years ago, there were "over three thousand File Reports and over a thousand boxes of raw material, each box containing at least five hundred sheets" (Jeffery 1999: 51). The boxes can be looked through while in a glass room at the University of Sussex library, where a stopped clock on the wall in the shape of an eye reminds the curious researcher of the complex relations between viewer and viewed embodied in the archive.

Second Orders of Observation

What Malinowski is proposing in his critique of Mass-Observation when he emphasizes the distinction between ethnographer and informant is what German sociologist Niklas Luhmann might have later considered a markedly modern second order of observation, or as Faubion puts it, the capability "of observing observers observing" (2011: 111). The problem for both Malinowski and Luhmann is a methodological and epistemological one.[27] In fact, Malinowski's search for the decoding of rule-based functionalist systems might find affinities with Luhmann's later theorizing of functionally differentiated communicative and organizational systems (Luhmann 1998). Luhmann's systems theory, its analytic divide between organized self-reproducing processes and their environment, and its reliance on the closure of these organized systems with respect to their environment are not unproblematic, but visiting them might offer a different way of looking at the problem of clutter and too much information that Mass-Observation and other grand collection endeavors face. They may, moreover,

[27] To be more precise, for Luhmann the epistemological problem is indistinguishable from an ontological one. How we come to know and observe the world is part and parcel of that world (or system to be exact).

allow for the unearthing of cybernetic and information theoretic sensibilities that were brewing in many disciplines in Europe and in the US towards the end of WWII and on which Luhmann's model theoretic project is based.[28] These information theoretic sensibilities have directly lead to the development of documentary technologies such as those currently produced by Memories for Life scientists, and would have undoubtedly fueled Mass-Observation's as well as Malinowski's inductivist and empiricist quest.

Perhaps too succinctly put, Luhmann's systems, whether living, psychic/experiential, or social, exist within environments that nurture and/or irritate the systems (1998). They are systems, and subsystems (whether economic, legal or political) that are based on this very divide between themselves and their complex environment.[29] Within these systems is communication. There, environmental complexity is reduced and information is parsed according to meaning that is grounded in binary semantic distinctions proper to each autonomous system. Any communication that brings into a system other codes that do not directly contribute to the maintenance of that system produces what is essentially considered noise. When the parsing of information and the communication of meaning fail to maintain the system it dissolves back into its environment. Seen in this light, Mass-Observation's difficulty is one of a failure to reduce complexity. Some principle of selection must operate in any engagement with immediate experience; otherwise, the sheer complexity of experience remains (cognitively and perhaps also affectively) overwhelming. One has the system-theoretic

[28] Faubion outlines different kinds of programmatic inquiries of which the model theoretic is but one kind (well exemplified by Luhmann). See Faubion 2011.
[29] The separations between subsystems are themselves the result of the differentiation made by and within a larger social system. As Luhmann explains: "subsystems of a social system [...] acquire their own form from this system's form of differentiation" (1998: 17).

right as a consequence to declare any such approach "incoherent," which Malinowski seems to come quite close to doing. Despite his at times contradictory explanation of how to go about doing fieldwork and collecting data, Malinowski's methodological arguments for a trained anthropologist collector, as opposed to any lay observer and documenter, is based on his presumed professional ability to parse information and to reduce complexity.

For Luhmann, the social emerges from the interactions and communications that occur between psychic/experiential systems. Individual actors exist but are distinct from these systems. They constitute in a sense systems' environment. Not unlike Malinowski's institutions, each independent system (or subsystem) serves a function that contributes to the overall maintenance of the larger social system (although subject to their own codes, the subsystems don't intentionally contribute to anything but themselves). But unlike Malinowski's or Mass-Observations' focus on subjects, whether the Trobriand Islanders or the British, Luhmann focuses on the structure and semantics of particular systems. In doing so, the object Luhmann emphasizes is communication itself rather than the communicating subject. As James Faubion and Cary Wolfe point out, this allows for multiple subject positions as well as composite (and cyborg subjects) to co-exist (2011; 2010).

Indebted to Humberto Maturana and Francisco Varela's, who are in turn indebted to Heinz von Foerster's, biological notion of autopoeisis (self-reproduction or self-making), Luhmann's systems theory postulates that the "modern or functionally

differentiated social system depends for its ongoing autopoeisis on the capacity of its subsystems to 'recognize themselves' in terms of binary codes that are specific to each of them" (Faubion 2011: 108). Luhmann's concern with observation is part of a second wave of cybernetic thinking, which we will address further below. Of interest here however is less an expose of Luhmann's argument for a functionally differentiated systemic modernity than the second order observations his modernity rests on. For now: more than a simple distinction between observers and observed (first order), a second order observation implies the ability to observe oneself observing. Based on an epistemic questioning - how we come to know the world - the second order takes the first order as its object. For Malinowski, who seeks to formulate a more detached and objective science of man, the privileged position from which to know the world is that of the reflexive and methodologically trained ethnographer's (versus lay Mass-Observers observing themselves, which he would likely consider merely capable of first order observation had he made use of such concepts); whereas for Luhmann, it would seem that the ethnographer is able to see insofar as the systemic organization of which he is part allows him to. Luhmann posits from the start that "there is no common (correct, objective) approach to a preexisting world" (1998: 10). There are no external observers. Everything operates within a system. In short, what Luhmann proposes is "a reflection on the forms of [...] a system's own self-observations and self-descriptions. These must be submitted within the system in a process that must in turn be observed and described" (1998: ix). So, although Malinowski still seeks to situate himself (the observer) outside the observed system (an impossibility for Luhmann), his emphasis on the observer's role in observing how he (the observer) is parsing social information might be considered a

form of second order observation. In short, of interest is no longer the world out there, but the process of observation itself.

Systems Emerge From Noise:

This chapter is also in part historical. The practices addressed herein examine how architectures of memory and technological conditions of knowledge about ourselves are imagined and created. While not embarking on a linear history of recording devices, this first half of this chapter examines the history of cybernetics and computing. It considers the formalization of matter and meaning into pure information, and charts how, over the course of particular historical moments, the past has been turned into digital 0s and 1s. The second half of this chapter presents certain projects and practices of interdisciplinary scientists who are part Memories for Life. These scientists develop information-mining technologies in order to improve human memory and knowledge about our selves. The juxtaposition of these two sections - of the history of cybernetics and computing, and various Memories for Life projects - might enable a kind of montage thinking, a formal response to the practices examined, an enactment of the problems of gathering the particular and of collecting things in bits and pieces while gesturing to something larger at stake: the ways we attempt to look at our selves.

A Brief History of Cybernetics and Computing

Here we have the basis for a character profile of a technical civilization: if hypochondria is an obsession with the circulation of substances and the functioning of the primary organs, we might well describe modern man, the cybernetician, as a mental hypochondiac, as someone obsessed with the perfect circulation of messages. - Jean Baudrillard

In the introductory chapter, we have seen how Memories for Life scientists make time and memories matter, that is, render them something to be captured, stored and shared.

In the second chapter, we have examined Mass-Observation's project to document the everyday life of the British and the project's resulting struggle in dealing with too much unfiltered information. We have since visited Luhmann's notion of second order observation that allows for the parsing of complex information in the making of autonomous systems. Luhmann essentially marks a passage in modernity from a concern with language (as representational) to a concern with code (as productive and inventive of distinctions). The cybernetic or information theoretic sensibilities that characterize modernity for Luhmann are inherent in the conceptualization of certain projects that are part of Memories for Life, including those that seek, like Mass-Observation did, to provide a wide-angle view of the social and its memories as well as to provide elements that might contribute to the management of information in general. Had Mass-Observation sought ways to reduce the complexity of the information it indiscriminately collected, it may have struggled less (or a least differently) in its attempts to provide a portrait of the British. In the section below, we will briefly expand on the history of cybernetics that Luhmann is but a part of. A turn to the history of cybernetics and the related history of computing will help us examine how the emphasis on information and communication (as opposed to communicating subjects) is what allows for the disembodied notion of memory to thrive as something that can be recorded and subsequently tapped into. In other words, by attending to this historical moment, we may better understand how we have come to observe, parse, communicate, and store information in the digital shape of 0s and 1s.

WWII played a significant role in the development of new forms of acquisition and organization of information, the Mass Observation Project being but one example. Around the same time that the Mass Observation Project gained popularity in Britain, researchers there and in the U.S. were busy developing tools that would, decades later, promise to achieve many of the same goals: the creation of social knowledge through the mass documentation of everyday life. Dubbed by historian of science George Dyson as the "big bang of the digital universe," this moment in the mid 20th century, saw the birth of what have arguably become two of the world's most commanding technologies: the atom bomb, and computing (2012). Although the history of the Manhattan project is fairly well documented, the history of computing, invented at the same time, by the same people, remains somewhat more obscure.

Dyson considers this "big bang" the dawn of a new kind of species that he calls digital organisms. "Digital organisms, while not necessarily any more *alive* than a phone book, are strings of code that replicate and evolve over time. Digital codes are strings of binary digits - bits" (Dyson 2012). He describes the world, including movies, software, and viruses, in terms of these binary codes, which get replicated, much like genetic codes of organisms more commonly considered "living," through simple ways like the copying of cds, or Internet links. Though he doesn't consider these sequences of code life per se, he likens them nonetheless to nucleotide sequences that might one day lead to life. He compares operating systems to species of fauna and software applications to microbes, while Facebook and Amazon represent multicellular giants in our now digital universe. But as Dyson and James Gleick, author of *The Information*, remind us, we've been

inscribing and copying codes for centuries, keeping track of things, messages and transactions, long before the so called "digital big bang" of the 1950s (Gleick 2011). What's changed is the speed at which the transfer and the inscription of codes take place. "Like our own universe at the beginning, it's more exploding than expanding [...] expanding at the rate of 5 trillion bits per second in storage and 2 trillion transistors per second on the processing side" (Dyson 2012). But as we will see below, over the last century, certain modes of thinking as well as technological developments coalesced in complex ways to form the field of cybernetics that the universe Dyson describes relies on.

Over time the word digital has come to mean much more than its literal and albeit defining characteristic of discrete (fingerlike) numericality. It has come to represent a way of seeing the world, a way of thinking. Anthropologist Dominic Boyer calls this epistemic approach that "has informed entire theoretical paradigms and analytical styles," "digital reason," not the least of which informs the work of the scientists I address in this dissertation (2013: 298). To start with, and following Boyer, by digital, I mean the range of what we've come to refer to as virtual, instantaneous, and ubiquitous. As such, digital is a *qualifier* for media, for communications and for objects. In the final sections of his book on contemporary news journalism, *The Life Informatic*, Boyer addresses what he calls "a parallel legacy of digital mediation and digital thinking in anthropology" (2013: 296). As he points out, although digital media is a relatively new object in anthropological research, but "thinking digitally," in anthropology and in other sciences, has a much longer history. Distinguishing the emergence of "digital reason" from digital

media proper, he maps out an ecology, rich with interdisciplinary exchanges in which technological advances permeate epistemological histories across the human sciences.

Starting with Freud's models of energy and current in the psyche, Boyer shows how an "electric sensibility" flowed through late 19th and early 20th century reasoning. Sparking urban landscapes and social imaginaries, "electricity offered [...] a *method of understanding*" the world (2013: 303). Following these reflections on our early electric sensibilities Boyer turns to electronic computation, although, as he states, computation and mechanization were around long before the advent of electricity. From Pascal's 17th century calculators, to Jacquard's famous 19th century punch-card loom, to Babbage and Lovelace's mid-19th century analytical engine, to Hollerith's turn of the 20th century tabulation machine, computation became a means for managing large amounts of data. By the early 20th century, with the emergence of major tabulating companies and the "industrialization and institutionalization of electro-mechanical computation," data processing became an industry (Boyer 2013: 305). It was not until the 1930s however that these electric analogue computers were used to perform complex calculations in areas from the design of buildings, to gunnery systems, to more complex government and military operations.

In the mid 1930s, Alan Turing, British mathematician and cryptanalyst, conceptualized the first stored program computer that contained both instructions and data. Turing's mathematical work showed that it was possible to code for unpredictability; computers could be given a set of rules and numbers, but those rules

couldn't predict how a system would behave, nor what numbers would be subsequently generated. A few years later, Claude Shannon, another wartime cryptographic researcher, introduced the Boolean binary 0s and 1s as a way of converting and transmitting data (Dyson 2012; Gleick 2011; Hayles 1999).[30] This process of conversion into 0s and 1s marked a new form of digital computation, based on filtering discrete signals from continuous noise. True and relevant "information" extracted through a series of questions was transmitted, leaving behind spectrums of what was considered insignificant static perturbations. As media historian Friedrich Kittler reminds us in his history of the gramophone, film and typewriter,

> cybernetics, the theory of self-guidance and feedback loops, is a theory of the Second World War. [...] During the war, a whole organization emerged for the purpose of delivering the results of fully automatized cryptoanalysis in coded form to the commanding officers at the front. (1999: 259-261).

Wartime research continued to fuel innovations in information management, and the 1940s saw the appearance of the first programmable digital computers.[31]

[30] In his old age, Claude Shannon developed Alzheimer's disease. Because of this disease, he died without ever being fully aware of the digital revolution spurred by his research.

[31] In line with and inspired by Foucault's archeology of knowledge and understanding of technology as tools which guide discourse and practice, Kittler seeks to map out discourse networks, which include a number of agents such as the technologies themselves and the institutions involved in the production, selection and storage of data which in turn becomes knowledge. Kittler's also Latourian approach to technology places importance not solely on the object's invention, circulation or overall influence, but also on the making of socio-technical networks through the mobilization of historically contingent agents. In *Gramophone, Film, Typewriter*, Kittler emphasizes the epochal change that came with Edison's prototype of the phonograph (1877), which marked the debut of the storing of sensory data. Edison's phonograph, Kittler recounts, was a by-product of other inventions such as Willis' machine (1829), which related sound to speed and Scott's phonautograph (1857), which rendered sound visible. He explains that before the phonograph, time could not be recorded except through what Lacan terms the symbolic means of writing. Here Kittler uses Lacan's notion of the symbolic to denote the discontinuity of signifiers involved in writing. Streams of data (without noise) are transformed into letters with the monopoly of writing; and meaning emerges from a material finite set of Saussurian signifiers. The symbolic is thus a structural grid. With the phonograph "the real takes the place of the symbolic" (1999: 24). Romantic symbolic language is replaced by noise.

Of interest and relevance to us in this compact history are not only the technologies being built, but also those being imagined. One such technology is Vannevar Bush's Memex. In his famous article, "As We May Think" (1945), Bush, head of the United States Office of Scientific Research and Development during World War II, introduced the concept of the Memex, or "Memory Extender," a device now considered to be the prototypical hypermedia machine. It would have allowed an individual to store all his books, records and communications so that they might be consulted with ease and speed. Theoretically, the Memex would have consisted of a desk that would display microfilms of entered data such as books, articles and photographs. The data would be associated by threads of key words and saved links, and later retrieved using a kind of code, much like the World Wide Web, Wikipedia, or desktop searches today. Bush described it as "an enlarged intimate supplement to [a user's] memory" (1945). Bush's Memex was never built. Nevertheless, the ideas behind this memory device have spawned numerous current technologies, which allow for the capture, archival, and retrieval of large amounts of data. Microsoft Research's prototypical database system MyLifeBits that allows for the storage and management of a person's entire collection of digital media, including text documents, images, sounds, and video discussed in the introduction (and which will be elaborated on in the following chapter) is directly inspired by Bush's Memex (Gemmell et al. 2006).

Following literary critic N. Katherine Hayles and her work on *How We Became Posthuman*, by briefly reviewing some of the history of computing, I hope to counter the teleological view that technological progress *inevitably* leads us to become, or to be seen

as, bodiless information. Instead, I hope to show that the freestanding concept of information, or of memory as information, is the result of specific arguments and negotiations among a group of people from several different, and at times intersecting, fields. In fact, many of these ideas can be traced back to the foundations of cybernetics as a discipline, which itself can be traced back to the annual Macy Conferences held between 1943 and 1954 where researchers were brought together to "formulate the central concepts that, in their high expectations, would coalesce into a theory of communication and control applying equally to animals, humans, and machines" (Hayles 1999: 7). Sponsored by the Josiah Macy Foundation, these meetings brought together researchers from diverse backgrounds, from mathematics, to computer science, biology, psychology and anthropology (including figures such as Gregory Bateson and Margaret Mead).[32] The interdisciplinary Macy conferences were designed as discussions rather than the presentation of finished papers per se. Like the Memories for Life network, the aim of these gatherings was to bring together many different fields. And much like the way the concepts of "networks," neurons and the World Wide Web have been drawn from to explain one another during M4L meetings, the concept of information, that "may have begun as a model of a particular physical system came to have broader significance, acting simultaneously as mechanism and metaphor" (Hayles 1999: 51). As such, concepts became constellations, embracing much more than their initial significance. At the Macy Conferences, von Neumann's self-reproducing binary coded computers,

[32] The history of cybernetics is a complex and at times tangled narrative that, for our purposes, we will only gesture at here. In the 1940s, many disciplines converged to create the field known as cybernetics, and over the next few decades this way of thinking would in turn influence many disciplines from mathematics and computing, to biology, physiology, philosophy and literature. For a more detailed account of the foundational Macy Conferences, see Hayles' *How We Became Posthuman*. More on the history of cybernetics can also be found on the American Society for Cybernetics website, March 21, 2013, http://www.asc-cybernetics.org/foundations/history.htm.

neurophysiologist Warren McCulloch's work on information-processing neural networks, Shannon's information theory, and mathematician Norbert Weiner's grand visions for feedback, communication and control were brought together in the formulation of a new informatic paradigm.

The first meetings set the tone for what is now considered the first wave of cybernetics. They focused on notions of circularity, feedback, and homeostasis. Biologically, systems were known to maintain states of homeostasis with respect to their changing environments for example. Mechanically, feedback loops had been used in systems ranging from floatation devices, to clocks, oil lamps and the steam engine. Hayles describes three fronts along which arguments about information were developed: "The first was concerned with the construction of information as a theoretical entity; the second, with the construction of (human) neural structures so that they were seen as flows of information; the third, with the construction of artifacts that translated information flows into observable operations, thereby making the flows 'real.'" (1999: 50). Cybernetics, from the Greek term *kybernetike*, meaning to govern or to steer, emerged out of the meeting of these notions of feedback and self-control with those of information and communication.

Starting in the mid 1940s, mathematician and computer scientists John von Neumann implemented Turing's vision of coded unpredictability: "[an] address matrix, which stored strings of bits at randomly accessible coordinates as if they were locations on a chessboard" (Dyson 2012). Soon after computers generated numbers based on sets

of rules, which in turn generated more numbers, ad infinitum. According to Dyson, "Turing and von Neumann both believed the future belonged to nondeterministic computation and statistical, probabilistic codes" (Dyson 2012). Other than their use in the design of weapons, these machines capable of producing unpredictable numbers were also used to help predict erratic phenomena like weather. In 1948 Shannon published "A Mathematical Theory of Communication" in which he examined the problem of encoding information using Weiner's work in probability theory, essentially founding the field of information theory. As summed up by Hayles: "Shannon's theory defines information as a probability function with no dimensions, no materiality, and no necessary connection with meaning. It is a pattern, not a presence" (1999: 18). These developments drove the formalization of a message (content) into 0s and 1s. As Boyer puts it, Shannon's epistemic innovation "instantiated a content/form divide in communication and declared only the latter a relevant design problem" (2013: 308). Meaning per se was no longer deemed relevant in the quest for pure information. In fact, "the safety [of communication] came in no small part from draining the words of meaning" (Gleick 2010: 165). Freed from the vagueness of meaning, from its material support, and from context in general, information could become free-floating. Information in the shape of 0s and 1s could be quantified, extracted and manipulated. Information was considered a signal on a medium that granted it a material texture. Claude Shannon defined information as a function of probability, regardless of meaning and materiality. Weiner's notion of feedback in cybernetics also helped separate information from that which carried it. Both Weiner and Shannon saw information as a series of choices made from a possibility of choices, or of message elements. 0s and 1s are then possible responses to

those choices, narrowed down by probability. In a double move, the notion of information was pulled apart from the message it carried and from the medium on which it rested. Digital coding greatly improved the efficiency of data processing. More information could be created, transmitted and stored, with significantly less time, room and effort. Advances in electronics in the 1950s lead to increased processing power that allowed for the later development of a wide range of computers, including the personal computers and networks we are familiar with today (Boyer 2013: 309).

This first wave of cybernetics, however, did not account, within its self-referential homeostatic systems, for the presence of an observer. The observer was always located outside of the bounded mechanism it observed. But when dealing with feedback loops, information had to travel through an "observer" before being reintroduced into the system, thus making him part of the system. To include him, however, meant including the risk, as Hayles points out, of a recursive reflexivity, an endless self-absorbing loop of observers observing observers who are also observing (1999). While not addressing this problem directly over the course of the Macy Conferences, this first wave of cybernetics highlighted the shifting boundaries between observer and system.

The second wave cybernetics emerged from 1960 onward out of the desire to further understand the structure of systems and to account for the observer. Elaborating on what he called a "second-order cybernetics" in a series of essays, biophysicist Heinz von Foerster (who had attended the sixth Macy Conference and was appointed editor of the conference proceedings) sought to consider the observer, or cybernetician, as a

system. Based on biological models, and following von Foerster's footsteps, Maturana and Varela formulated a view of the world composed of informationally closed self-organizing and autopoeitic (self-making) systems. These systems parse information from their environments in ways that perpetuate their existence and organization.

Luhmann's systems theory emerged out of this second wave cybernetics. For Luhmann, the processes being observed, or operations, as he likes to call them, are those that mark the distinctions between self-reference and external reference. Systems are subject to internal and external information. Self-reference is itself "a systems-internal distinction that can be seen as a consequence of the differentiation and operative closure of the system" (Luhmann 1998:13). The environment is necessary for self-reference and self-organization to occur. In other words, self-reference is only possible in such that it can be distinguished from external reference. Luhmann further distinguishes between reference and coding. Both are binary: self-reference and external reference, and positive code values and negative code values.[33] Positive/negative (or true/false) code values then operate on those two (self-reference/external reference) levels. Through second order observation, all knowledge can be made subject to this code before being integrated into the system, further distinguishing the system from its environment. "Observations of the second order are the *operative* basis for the structural differentiation of certain social functions systems" (Luhmann 1998: 57). Observations are operations that *choose* to distinguish systems from their environment. Observations can themselves be observed,

[33] This distinction between reference and coding allows him to move past semiotic debates over the truth of meaning and the correspondence between signifier and signified that have long troubled "realist" versus "constructivist" arguments. Instead, Luhmann replaces what he calls the "analytic" (stability of meaning) paradigm with what he considers "self-reference," and replaces the "synthetic" (constructivist) one with "external reference."

as they remain independent of the distinctions they choose. As a result of this second order observation Luhmann can pose the question "of what an observer can and cannot see with his distinctions," thus exposing a kind of blind spot within the system. Throughout, again, there is no god's-eye-view, no all-encompassing objective vision: "What is construed as reality is in the final analysis guaranteed by the observability of observations" (1998:19).[34] The distinctions that result from *choices*, or operations of observation, highlight the importance of contingency in systems theory. Because observations result from choices, it follows that what is of concern is that which "is neither necessary nor impossible," given that those characteristics would leave no other choice (1998:45). Contingency is the third undeterminable value added to those of being/non-being, or positive/negative, marked/un-marked. Contingency is what creates meaning, in light of all other possible meanings to choose from. Contingency is in fact a "defining attribute" of modern society for Luhmann. Choosing one form of information from the complex environment over other possible forms of information, in other words, choosing certain distinctions over others will always have consequences. Contingency (and therefore modernity for Luhmann) always entails risk. Information is a binary distinction, a choice, and followed to its ultimate logic it becomes matter itself.

Hayles outlines a third wave cybernetics that "swelled into existence when self-organization began to be understood not merely as the (re)production of internal organization but as the springboard to emergence" (1999: 11). As part of this third wave, researchers, in new fields such as artificial life, design codes intended to evolve in unpredictable ways. Notions of emergent behavior, artificial life, self-organizing systems

[34] In other words, there is no all-encompassing view from which everything can be seen as contingent.

and the evolution of complexity in a computational universe mark this moment. With this wave, Hayles claims, *We Became Posthuman*. Code, information, and life have become synonymous. Creatures emerge; digital organisms form out of Dyson's "Big Bang." For many, this digital universe isn't merely another layer added onto our already existing universe, it *is* the universe. From cells to computers to quantum mechanics, binary information *is* reality's underlying structure. Physicists such as Craig Hogan at the University of Chicago are designing machines (he calls it a Holometer) to test for the noisy informational fabric of the universe (Moyer 2012). Hogan wants to know if the universe is composed of bits (0s and 1s).[35]

But we need not look to physics, or giant particle colliders to find "digital reason" at work. As Hayles points out, all sorts of technical artifacts, from ATMs to movie making technologies to precise medical instruments "help make an information theoretic view a part of everyday life" (1999: 19). These technologies participate in the creation of a future that is posthuman (in Hayles' sense) in that they lead us to imagine the body as but one possible material substrate for information.[36] Life no longer belongs to bodies, or to the living for that matter. Machines are made to think and evolve. When the emphasis is on information rather than embodiment, seamlessly integrated bodies and machines become imaginable, even foreseeable for many. The notion of pure information insures the maintenance of something we call consciousness, selfhood or memories, regardless of

[35] There are many other important figures in the history of cybernetics and computing, Warren McCulloch, Douglas Engelbart Theodor Nelson and J.C.R. Licklider among others. See Thierry Bardini's book *Bootstrapping*, in which he discusses "Engelbart's crusade for the augmentation of human intellect" and Nelson's development of hypertext systems (2000); and M. Mitchell Waldrop's *The Dream Machine* for the history of personal computing as it relates to Licklider's notions of interaction (2001).

[36] In chapter four we will discuss in more detail, referring to the work of Wolfe (2010) and Luhmann (1998), the ways in which Hayles' notion of posthumanism rests on and reproduces the problematic distinction between information and matter (1999).

its material support. This separation between mind and body can be seen as the continued elaboration of a self-possessed liberal humanist subject: a mind freely governing a separate body. It differs from it however by raising possibilities for collective digital subjectivities, for several minds sharing one body. A mind unhinged from its body can be seen as one step closer to the dream of tapping into a kind of collective consciousness, a kind of *Matrix* if you will. The disembodiment of information is what allows dreams of uploaded brains and teleportation à la *Star Trek* to thrive. These narratives rely on the premise that information can be extracted from one's head or that the constitution of a body is pure information; and that thoughts and bodies can be disassembled and subsequently reassembled somewhere else without a change in the constitution of one's consciousness, sense of self, or material consistency. As Hayles puts it:

> "Stripped of context, [information] becomes a mathematical quantity weightless as sunshine, moving in a rarefied realm of pure probability, not tied down to bodies or material instantiations. The price it pays for this universality is its divorce from representation. [On the other hand] when information is made representational [...] it is conceptualized as an action rather than a thing. Verblike, it becomes a process that someone enacts, and thus it necessarily implies context and embodiment. The price it pays for embodiment is difficulty of quantification and loss of universality." (1999: 56).

When pattern is emphasized over presence, universal and transferable information becomes more important than matter (or embodiment) itself, a view that is brought to the fore in the Memories for Life scientists' quest to augment our memory.

The view of a world made up of information combined with the technical possibilities for pattern recognition now fuel a growing mode of inquiry that has come to

be known as Big Data. Many fields as diverse as astronomy, epidemiology, genomics, environmental research, finance, the social sciences and more are now praising the production of new forms of knowledge that come from mining large datasets. The computation of Big Data is thought to produce a bigger picture of phenomena by letting numbers speak for themselves. Initially, Big Data meant large datasets that required the use of super computers to mine and somehow analyze information. Today, much data mining and number crunching can be done on regular desktop computers, thus raising the question of what counts as "Big." Today, information that was once only available to researchers and scientists is often readily accessible and even made public. Governments all over the world and at various levels (international, national, municipal), other institutions and companies help gather and publish the world's information (who does what, where, when, etc.). Individuals, whether knowingly or not, leave traces that accumulate to form large amounts of minable data concerning one's (or a population's) health, wealth, genetic makeup, cultural habits and preferences, evidently, the list goes on. People hail our current time as the age of information in which we live in a "new data ecosystem" (boyd and Crawford 2012; Manovich 2011; Mayer-Schönberger and Cukier 2013). Social theorist Brian Massumi's critique of Negroponte's utopic *Being Digital* describes a world "rolled up in data, its now digitized mass threatening to suffocate the unprotected body, swamped by a downpour of pure availability" (1995). Someone, or something must filter the bombardment of information. In March 2012, The White House committed over $200 million toward a "Big Data Initiative" to fuel efforts to develop strategies for dealing with and visualizing the mammoth amounts of information we record and produce.

As we have seen with older, pre-digital projects that involve the recording and collecting of large amounts of data - the Mass-Observation Project or Malinowski's ethnographic project for example - issues of objectivity, accuracy, and more importantly questions of how to care for and curate amassed information are inseparable from the ways data is imagined in the first place. In other words, data, whether big or small, isn't all about data; it's about ways of thinking about research, information and knowledge production itself. Although quite different in terms of technology, scale and aesthetic, the projects we've examined so far, and the ones discussed in the section below, often rest on the assumptions that more data is better data. Big Data epitomizes this belief to the fullest. With their recently published provocations for thinking critically about Big Data, boyd and Crawford seek to question "the widespread belief that large data sets offer a higher form of intelligence and knowledge that can generate insights that were previously impossible, with the aura of truth, objectivity, and accuracy" (2012: 663). They raise questions of ethics, and questions as to what counts as data, and what is to be done with data. This problematic turn to numbers, they argue, may deepen the divide between qualitative humanistic research often considered subjective and quantitative scientific methods often deemed more objective, a divide well exemplified in the fate of the Mass-Observation project. It is as though Big Data were considered neutral data. What Boyd and Crawford remind us is that collection and interpretation are far from neutral and that numbers do not fall from the sky. They are the results of particular forms of measurements that are themselves the outcome of contingent methodological processes. Moreover, as important as why or how you collect data is, of course, what you do with

your data. Geoffrey Bowker insists: "Raw data is both an oxymoron and a bad idea; to the contrary, data should be cooked with care" (2005: 184). Part of the process of cooking with care involves paying attention to context. But as we have just noted above, in the quest for clarity of signal, information is often separated from its material substrate and from its noisy context and meaning. This stripping of context comes with the risk of considering all data equal and of separating data from the research process itself. Bowker and Star go so far as to argue that the very notion of information is inseparable from that of context:

> [...] the context of information shifts in spite of its continuities; and this shift in context imparts heterogeneity to the information itself. [...] One of the interesting features of communication is that, broadly speaking, to be perceived, information *must* reside in more than one context. [...] A radical statement of this would be that information is only information when there are *multiple* interpretations. (2000: 290-291)

The information theoretic sensibilities evident in the notion of Big Data are themselves the result of specific contexts, historical narratives, negotiations and decisions, and not just the outcome of a certain technological determinism. The take home point in this brief history of cybernetics and the related history of personal computing is that there is a reciprocal (although not necessarily symmetrical) relationship between the ways we think epistemologically and the artifacts we think with. These informatic ways of thinking come with implications about how we conceive of what can and should be built. And as we have noted with Malinowski's critique of Mass-Observation and his elaboration of fieldwork methods: what matters one place may matter less in another; and with Luhmann's second orders of observation: the observer (researcher) is always already part of the system observed.

Painting the Big Picture Bit by Bit

Elegant. My airy mood returned. I was advancing in consciousness. I watched myself take each separate step. With each separate step, I became aware of processes, components, things relating to other things. Water fell to the earth in drops. I saw things new. - Don DeLillo

They meet in a gray room at the university of Sheffield, one with gray carpeting, just like the others. They talk about "gray matters": a computer interface that creates "a zone" they define as between remembering and forgetting. It's a place to store digital files that haven't been consulted over a certain period of time. The gray zone is an archive where nearly deleted documents are allowed to rest. It offers a kind of a purgatory instead of the extremes of awareness or oblivion. The computer scientists discuss how to best rank images according the how many times they've been viewed, how to allow for less distraction and how to highlight the "important information." They determine the relevance of the data by counting users' actions (how many times a file has been opened); and they consider different ways users might be called upon to rank documents. This calculation of users' actions and decisions, this combination of various algorithms, changes the way things look on the screen. They worry about the difference between user-generated relevancies and automatically generated ones. "What would your stuff look like if you used different metrics?" one asks. "What's the threshold for the gray area?"

Later that afternoon, in another room, some of the same researchers start to map out the design implications of a recent study about personal sound recording practices.

They want to know how and when people record sounds, and the kinds of sounds they capture. They want to know so they might design useful digital tools. I took part in this study. As the designated ethnographer on the project, I was called upon to meet with participating families, to give them sound recorders to take with them while on holiday, and to later go back to talk with them about what we called their "sonic souvenirs."[37] The director of this research group has explained that he is hoping to unearth underlying relationships between sounds and memories. His goal is less to test how people use recording devices than to discover clues to fundamental "human habits." Once, after having just attended a design research conference, I asked him whether his research group had considered creating their own sonic recording and playing device (like an interactive sound pad, or sonic trinkets) and seeing what kind of insight that might lend to the design process. I remind him that we humans not only have the ability to make tools, but to also be transformed by them. Media is not simply a disinterested tool to be used *in-between* (or as a medium for) social relations, rather it helps *create* and *determine* these relations. Media is never a simple carrier of meaning; it shapes messages and in doing so shapes the very relationships and practices in which it is embedded. I repeat Kittler's favorite quote by Nietzsche: "Our writing tools are also working on our thoughts" (1999: 210). Gesturing to the work of certain researchers at other universities and art institutes, the director tells me that he doesn't like "bizarre" design ideas. Were we to make a strange sock drawer, he explains, the user would just say "oh my! What a strange sock drawer." He would rather spend time understanding how people store and

[37] Two articles about this study have since been published in collaboration with these researchers. For more details about the study see Dib, et al. 2010 and Petrelli, et al. 2010.

organize their socks in the first place. He insists that there are fundamental human habits that must inform design.

During this meeting, I point to the different types of sounds participants recorded and to the difficulty of generalizing them. The sounds ranged from mock interviews of other passengers in a train, family conversations, giggles, pseudo radio shows, commentary about the day's activities, to the ambient sounds of insects heard while on a walk. A few participants recorded verbal diaries or more abstract reflections about their trip, speaking into the recorder about their favorite parts of the holiday, and what they were looking forward to on their way back home. Many recordings involved the combination of different types of sounds, i.e. diary-like observations followed by dialogue or ambient sounds. Now, guided by our participants' sonic souvenirs and the ways they spoke about them, we elaborate on our findings through a series of apparent paradoxes to do with sound: the temporal and at times ambiguous nature of the recorded sounds made them both pleasurable and frustrating to listen to. The sounds evoked other related memories but they also constrained the listeners to a certain pace of remembrance. Participants sought to document the events as they actually happened, but they also recorded staged performances and fictional narratives. We compare sounds to photographs. As opposed to photographs, sound physically hits and penetrates. Unlike sight, sound is immersive and simultaneous. It requires and even creates our presence, such that we are not *in front of* something, but *within* it. In philosopher Jean-Luc Nancy's words, "Sound has no hidden face; it is all in front, in back, and outside inside, *inside-out"* (2007: 13). The conversation shifts to the tension between qualitative concept work,

and the need for numbers to back up our claims, whatever they may be. I remember Adorno's critique of Benjamin and struggle with my need to schematize. I am afraid to betray the exceptions. We are unclear as to how to achieve some sort of analysis rather than a mere presentation of a diverse array of facts. The conversation shifts again, this time to how one of the researchers is trying to clean and organize his office and can't seem to throw anything out.

On another campus, in Dublin, computer scientists funded by Microsoft work to devise algorithms that might determine people's habits. They do this by searching for redundancies in the photographs taken with the SenseCam and correlate these with GPS (Geographical Positioning Systems) readings. Image recognition has advanced significantly over the past decade, but the problem remains as to how to annotate these images. They look for patterns.

A researcher from the Online Computing Library Center visits and gives a talk. The OCLC is a non-profit cooperative that began in Ohio, US, in 1967. They compile worldwide bibliographic information and provide it to the public. Serving over 70 000 libraries internationally, they work to "further public access to the world's information." OCLC and the libraries it works with produce WorldCat, the largest online public access catalogue (OPAC) in the world. In addition to books and articles, WorldCat includes over 3.8 million sound recordings and visuals. The speaker tells us that "what libraries suffer is their disaggregation on the web." OCLC looks to bring them together in a centralized place. When someone looks for a book for example, the catalogue points him

to the nearest library holding that book. He explains that their mission is to bring libraries to the people. To share the load of cataloguing all the publications amassed in this central online location, many of the libraries now share a way of indexing their data. In other words, metadata needs to be standardized. The speaker is here to talk with information scientists about data mining. He raises questions of relevancies and recommendations: Is it better to give the user a mildly relevant response to his search query but that points to a book located at a nearby library, or to produce a directly relevant bibliography for a book located far away?

At a Memories for Life workshop in London I meet someone from the UK Web Archive, also part of the British Library. The Archive focuses on storing web pages since 2004. Within this archive, one can "observe the unfolding history of a spectrum of UK activities represented online. Sites that no longer exist elsewhere are found here."[38] Some of these websites form collections organized by librarians or specialists in a field. They are curated according to themes or events such as the July 7th 2005 London terrorist attacks, or the credit crunch. They form assemblages of news and commentary, public information and weblogs. They call a "historical version of a web resource" a Memento. They mine these old webpages from different international online archives. Their site offers, like the OCLC, a centralized place to find things. Later that evening I look up their Memento of Google. It contains 4394 snapshots of the webpage taken between 1999 and 2012. The Web Archive offers to add a bookmark to my browser so that from now on, when I browse the web and hit a 404 Not Found error, I can click on the bookmark and get an older version of the page. I decide to give it a try and type the URL

[38] March 21, 2013, http://www.webarchive.org.uk/ukwa/

for my website. I click on the "Find Mementos" link at the top of my browser and am startled by an old picture of myself pointing a camera to the viewer. I follow the links on the 7 year old webpage and find an old abstract I wrote about documentary web practices such as blogging and how they represent a kind of two-tiered challenge to anthropology: to write about people who write about themselves. I hadn't read Luhmann yet. Things just felt recursive. I worry about what else might be online. Viktor Mayer-Schönberger is right, the future is unforgetting. I remember Charles Babbage, the 19th century computing pioneer who invented the analytical engine. In his Ninth Bridgewater Treatise, chapter IX, he considers the possibility of retrieving words long uttered from the air:[39]

> What a strange chaos is this wide atmosphere we breathe! … The air itself is one vast library, on whose pages are forever written all that man has ever said or woman whispered. There, in their mutable but unerring characters, mixed with the earliest, as well as the latest sighs of mortality, stand for ever recorded, vows unredeemed, promises unfulfilled, perpetuating in the united movements of each particle, the testimony of man's changeful will (1838: 111-112).

I feel a certain loss of control, and a sudden desire to be very quiet, lest my words echo for years to come.[40]

---

[39] An interesting fact in light of our discussion on memory and the desire to preserve one's past: half of Babbage's brain is on display in the Science Museum, London.

[40] In *Gramophone, Film, Typewriter*, Kittler includes Salomo Friedlaender's "Goethe speaks into the phonograph" (1916). Friedlaender's short story is about finding Goethe's dissipating sound waves in his office, and combing them with a wax model of his larynx and a phonograph in order to hear his long gone voice. To build the mold of his larynx, they dig up Goethe's skull from his grave. This fairytale, which hints that one "could listen to antiquity and the Middle Ages and determine the correct pronunciation of old idioms" (1999: 67), transports the reader from the age of Goethe when "writing functioned as the general medium" (36) to an age in which recording technologies allow the very notion of time and mortality to dissipate. "In the phonographic realm of the dead, spirits are always present - as sound amplitudes […]" (72). With the Web Archive, there is no need to unearth a skull or mine the air in order to tap into traces long thought gone.

Collecting and cataloguing large sets of information is *the* recurrent theme across the Memories for Life network. A representative from the British Library's Oral History Society elaborates on a project they call National Life Stories whose mission is: "To record first-hand experiences of as wide a cross-section of society as possible, to preserve the recordings, to make them publicly available and encourage their use."[41] They collect datasets and interviews relating to different themes such as the oral history of British theatre design, the oral history of the water industry, or the British Press. Although they catalogue these sound files according to various professions, they insist, when referring to artists for example, that "it is important that they are life stories, rooting the speakers in the society which formed them rather than isolating them solely within the art world." They are creating what they call a memory bank of how people in Britain think, act and feel; and these digitized narratives might lend a bigger, historical picture of society as a whole. They wonder about the impact of new social networking technologies on the traditional gatekeepers of collective memory like museums, national archives, and libraries.

In Southampton, a PhD student in computer science collects information about people who use social media sites like Flickr, Delicious, Twitter, and Facebook. He aggregates this information and correlates it with other freely available data, such as the weather and the news, to create detailed stories about these people, about where they've been, what they've done. He asks me if I think that once people learn about all the traces they leave they will continue to post all this information about themselves? I assume they already know. But I take note of his question. My credit card knows I am in

[41] March 21, 2013, http://www.bl.uk/reshelp/findhelprestype/sound/ohist/ohnls/nationallifestories.html

England and that I have bought train tickets from Sheffield to London to Southampton to Oxford, and back again; and his knows that he is eating a sandwich right now. He tells me the story of a guy in the US with an Arabic sounding name who was suspected of relations with terrorist groups. This man used his computer, a camera, a GPS and any other recording devices he could get his hands on and proved his innocence by tracking himself 24/7. He recalls another researcher who is part of the Memories for Life network. He develops tools to tell if an image or document has been doctored. He figures it will be useful in court. Another student joins us. He is part of the same research group at the University. He works on what they call "provenance," tracking where a document has been, when it was used, and what other documents were used at the same time. I ask them if they've encountered privacy concerns over the course of their research. They laugh and remind me that we are in the country with the world's second largest DNA database and the most CCTVs. They tell me it's important to be systematic and to separate concerns such as privacy, usability, data collection and security. One of the students is working for a startup that specializes in online security. The company mines the web for information about you, and anytime someone online claims to be you, it notifies you. It keeps watch on your identity.

Yorick Wilks, a specialist in artificial intelligence and language who shares his time between the Oxford Internet Institute and the University of Sheffield's computer science department, is also working on technology that will help keep watch on a person's identity. As part of the Companions project, he predicts a future where robots (although he sometimes doesn't like to call them that) will act as long-term digital confidants. He

works to develop language recognition tools to help create what he calls "conversational agents" that will provide companionship and comfort to its owners. "Human dialogue, human conversation is the very heart of us," he tells me. He seeks to relegate to companions the problems of remembering and sifting information through their ability to understand speech. The interesting question however isn't so much, as Cary Wolfe reminds us, whether or not these robots "can talk," or even "think," but rather how these companions ask us to reconsider the relationship between humans and their automated and information laden environments (2010). But by reconfiguring anxieties about forgetting by relegating to companions the responsibility of inscription and retrieval, Wilks reaffirms our said humanness through language and memory, or language about language and memory, reproducing representational notions of human consciousness and thought.

Wilks wants to create something that understands its user. He envisions a device or robot companion that might "build a life narrative of the owner, eliciting over a long period a structure of the owner's life, perhaps at a level of detail that even their relatives might not recognize, or know about" (Wilks 2010: xi). He argues that the elderly and the very young will be the ones who will most desire or need such companionship. These entities could be used as navigators of the World Wide Web, or as tracking and communication devices. Like Negroponte's utopian "digital butlers," companions will be "delegates in the infosphere. They will brave the chaotic waters of availability to search, sort, select, and process" (Massumi 1995).[42] Wilks explains that the companion can

[42] Brian Massumi accuses Negroponte of being overly Cartesian in his elaboration of a digital future that creates "a directional self esconced [sic] in a problematic body which it overcomes with the aid of

actually take the shape of a furry pillow or backpack.[43] The point is that they can help navigate the wealth of information found online, as well as one's own personal archives (photos, medical records, music, emails). In fact, when it comes to helping sort one's "digital life," he describes the companion as a step toward "democratising the art of autobiography" (2010: 14). When the user dies, Wilks imagines a companion that would imitate its deceased owner's voice and recount stories and memoires to love ones.

I meet again with one of the researchers working on the Sonic Souvenirs project. She tells me about her previous work that involved asking families about various personal mementos in their homes. She examined the meaning invested in things, and now she wants to find ways to map those meanings onto digital artifacts. She raises issues of what she calls "distillation," or selection. When people have too many digital files, they don't really look at them, she explains. She distinguishes design from information retrieval as a way of relieving the user of the feeling of being overwhelmed by a kind of digital hoarding. "Design," she says, "is about meaning construction, not just search and find." In the households she studied, mementos were kept in different places, from the kitchen, to the mantel, to the bedside drawer. We agree that it's a shame you can't bump into digital objects. Whether sounds, or photos, or children's drawings, digital objects all seem to occupy the same space: the screen. The digital puts everything on the same plane. It doesn't allow for different levels of intimacy or for the integration

---

programming and technology in a way that spiritualizes matter, and all space, by conforming them to its will." (Massumi 1995). See also Negroponte (1995).

[43] The arguments across Memories for Life research seem to have shifted from old AI (Artificial Intelligence) concerns from the 1980s, of whether machines can think and act like humans, to new interests that focus on how machines behave, regardless of their physical or human-like attributes. This said, the emphasis is still on recording human life in order to help improve human memory.

of various digital objects into everyday life besides the possibility of storing files into different folders, or making a picture publicly viewable on one's desktop or social media site. In Kittler's words: ""The general digitization of channels and information erases the differences among individual media. Sound and image, voice and text are reduced to surface effects, known to consumers as interface" (1999: 1). The very concept of medium is erased. It is as though something is missing.

3- Against Oblivion:

This third chapter focuses on an extreme case of lifelogging that makes use of prototypical recording technologies designed by Memories for Life scientists: Gordon Bell, a senior researcher at Microsoft, who is on a quest to record his life for the sake of increased objectivity, productivity, and digital posterity. Through this case study, I show how new recording technologies are both a symptom of, and a cure for, anxieties about time. More specifically, I reveal how these memory banks are inherently tied to logics of capital, of stock and storage, and to logics of the technological where, when it comes to memory, more is more. Both remembering and forgetting operate in the economic, possessive discourse of time: losing time/finding time, wasting time/saving time. While not abandoning these terms, I show through the case study of Bell, that the past, as well as the present and the future, are always discursively, practically, and technologically informed. The fear of oblivion that drives Bell's "archive fever" relies on the assumption that one is able to record the past and one's self *as they were* and subsequently leaves one at risk of drowning in a sea of information. I end this chapter by reflecting on Foucault's genealogy of the western subject and by posing the question of how to tolerate so much information.

Total Recall

"I'm losing my mind [...], by the way, so are you." - Gordon Bell

Senior researcher at Microsoft Gordon Bell, the author of one of the epigraphs of this chapter—the one losing his mind, and reminding us that we are losing ours—centers his work on the possibility that, in time, we can overcome our impending absentminded fate (as quoted in the Introduction):

> [E]ach day that passes I forget more and remember less. [...] Yes, each day I'm losing a little bit more of my mind. [...] What if you could overcome this fate? [...] Soon, you will be able to. You will have the capacity for Total Recall. You will be able to summon up everything you have ever seen, heard, or done. And you will be in total control (Bell and Gemmell 2009: 3).

Bell has volunteered to become the main guinea pig for MyLifeBits and the SenseCam, the data management software and wearable camera designed by Microsoft. As discussed in the Introduction, the SenseCam is usually worn around the neck and takes pictures automatically, either when various sensors are set off (accelerometer, light meter, and thermometer) or at various intervals (usually 30 seconds). In 1998, Bell decided to go paperless and digitized all the yellowing documents in his possession. An extreme lifelogger, he has since digitized just about everything he can: business and Christmas cards, drawings, bills, quilts, as well as recordings of all his conversations, every webpage he visits, gps coordinates of his whereabouts, and the list goes on. He insists, however, on the difference between lifelogging and lifeblogging, since the latter involves making public one's lifelogs. He is not a lifeblogger.

In September 2009, Gordon Bell and Jim Gemmell, the principal Microsoft researcher working on MyLifeBits, published a corporate manifesto in the shape of a book, which embraces and celebrates the future of digital memory. They aptly named the

book *Total Recall.* In it they paint the portrait of a world where what they call Total Recall, or the "e-memory revolution," will make us better citizens, better workers, better lovers, and better ancestors.

> E-memories will provide every person who embraces them with a different sense of their whole lives. It won't erase human nature's capacity for self-deception, but it will surely make the truth of what we did and what happened around us more available, clearer, and less obscured by nostalgic make-believe (Bell and Gemmell 2009: 8).

Armed with tools like the SenseCam and MyLifeBits, Bell and Gemmell claim the ability, and the necessity, to create an objective and comprehensive perspective of the world. As such, they bring to the fore what Stengers would call an important bifurcation: one separating the world as it is and the world as we experience it - or remember it (2010). The papers and books written by these researchers all begin with the premise that our memory is fallible and can and should be improved by the help of technology (Bell and Gemmell 2009; Hodges et al. 2006; O'Hara 2006, Wilks 2010).

Bell disciplines his past and present for the sake of the future. In case he may one day need a given document or photograph, as either proof or memory cue, he feels it is safer to keep everything. The art of archiving involves a kind of promise for tomorrow, for "that one day" Bell might need to recall that certain something he put aside and that has now become consequential.

> I'd hung on to those hundreds of pounds of yellowing paper not because I wanted to help found a thriving community of silverfish in my home, but because I knew that someday, for some reason, I would certainly need to refind at least one old item. [...] So I'd felt trapped into keeping all of them (Bell and Gemmell 2009: 29).

One cannot predict how valuable any given archive will be. One might find out later, or one might never know. As Jacques Derrida's *Archive Fever* reminds us: "A spectral messianicity is at work in the concept of the archive and ties it, like religion, like history, like science itself, to a very singular experience of promise" (1996: 36). Thus Bell spends time archiving his life to obtain a purchase on time - future time. Archiving technologies create a kind of anachronism, as though the present becomes disjointed in its obsession with the past and constant capturing, clicking gaze toward the future.

When I think of Bell tracking, shadowing himself, I imagine him walking on a sunny Californian sidewalk, followed by a trail of snapping devices documenting his every step. There is a second figure of him a few steps behind his trail of devices, taking notes, ingesting the information being spat out by his arsenal of recorders. From the back, this second figure begins to draw a third figure, a faint sketch of his future self at the front of the pack. The artist Sophie Calle once did a piece that involved shadowing someone. Baudrillard writes about this piece and the strange reversal that occurs when one is obsessively tracking another (even if in the case of Bell, that other is himself).

> To shadow another is to give him, in fact, a double life, a parallel existence. Any commonplace existence can be transfigured (without one's knowledge), any exceptional existence can be made commonplace. It is this effect of doubling that makes the object surreal in its banality and weaves around it the strange (eventually dangerous?) web of seduction (Calle and Baudrillard 1988: 79).

To sum up: Sophie Calle did a piece called Suite Venitienne in which she tracks down a man she met in Paris who told her he was going to Venice. She follows/shadows him

around Venice without his knowledge and photographs the places he's been. Baudrillard reflects on this act of shadowing in which someone is trying to uncover something about the other, but complicates this relationship by posing the question of who is actually following whom? Calle herself appears to eventually believe that she (the shadow) may in fact be leading the subject. Following the man may well be what gives him that aura of secrecy, and it becomes unclear as to what comes first, the secrets or their discoveries, his actions, or her photography. And what if the man is actually aware of her following him? What if in the course of her game she becomes the one who is examined and controlled by her subject? Perhaps the secret she will uncover is that he is playing her. "[…] like a cornered beast. The system reverses itself immediately, and the follower becomes the followed […] shadowing implies this surprise. The possibility of reversal is necessary to it. One must follow in order to be followed" (Calle and Baudrillard 1988: 81). It is a question of obedience, seduction and disappearance while risking losing oneself into the other. A strange game of puppetry and shadows emerges between the two actors. With Bell, these two actors are him; and it is no longer clear who comes first, his present self, or his past self. He shapes his life according to his detailed records of existence. His future bends under the weight of his archived past.

In 1999, after Bell began digitizing his entire paper trail, he was struck by the sheer amount of labor his project involved. He sought out a personal assistant. Vicki Rozycki, Bell's assistant, has spent most of her time transforming two and three-dimensional objects, from paintings, sculptures, puppets, and mugs, into retrievable, annotated bits of information. Together, Bell and Rozycki have exhausted years scanning

and saving documents from Bell's "pre-digital" era. It is impossible to calculate the amount of lived time that they have committed to recovering recallable time - that is, the amount of present that they have paid down to withdraw Bell's past. Beyond things proper - objects, images, and documents - Bell and Gemmell have also been capturing all kinds of actions, from the number of mouse clicks on Bell's computer, to the record of how many times documents have been opened, to his music playback history. Bell describes the task at hand as the following:

> Building my own e-memory became a three-pronged effort. First, I had to make digital copies of everything from my past. Second, I had to start recording everything I saw, heard, and did from that point forward. Then, third, I had to figure out how to organize the information in my digital corpus (Bell and Gemmell 2009: 29).

This last organizational task is what led to the development of the MyLifeBits software. The utter volume of the ever-growing archive made it hard to parse pertinent information and retrieve it on demand. Without proper annotation, or an extremely sophisticated filing system, Bell's e-memory was a black hole: things could go in but might never come out. Like Plato's Pharmakon, which has the potential to heal and also be poisonous, Bell's attempt to master the past rendered his present, and possible futures, unmanageable (Stengers 2010: 29-31). So he teamed up with Gemmell and brainstormed possible solutions to the problem of clutter.

While reviewing published literature on previous computerized organizational systems, Bell and Gemmell came across Vannevar Bush's famous 1945 essay in the *Atlantic Monthly* titled "As We May Think." As discussed briefly in the previous

chapter, in this essay, Bush, head of the United States Office of Scientific Research and Development during World War II, outlines ideas for a prosthetic memory device called a "memex," for "memory extender." He describes this imagined extension: "The memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory" (106). Physically, the memex would resemble a desk that would hold microfilms of notes, photographs, and other forms of memoranda. The top of the desk would serve as a scanner and display. Annotations and hyperlinks between documents would allow a user to navigate the heaps of information. Furthermore, the memex would never run out of space, enabling the user to gather material freely without worrying about having to discard any of it.

Bush also imagined the user to be wearing a camera that would document additional pertinent information and feed it into the memex.

> The camera hound of the future wears on his forehead a lump a little larger than a walnut. It takes pictures [...]. As the scientist of the future moves across the laboratory or the field, every time he looks at something worthy of the record, he trips the shutter and in it goes, without even an audible click (1945: 102).

Bush's memory extender was never built, but Bell at Microsoft has announced proudly that the time for the memex has arrived. It is now feasible and affordable. As for the walnut-sized camera - the SenseCam - as the story goes, it was invented one morning when Lyndsay Williams, a researcher for Microsoft research in Cambridge, misplaced her keys and dreamed up something that would remind her of where she had left them.

So she designed the wearable SenseCam that takes about three thousand pictures a day without the push of a button. Bell has been wearing a SenseCam since 2003, and his mantra is "[c]apture everything, discard nothing" (Bell and Gemmell 2009: 46).

Investing in Time

Around the fish-eye lens of the SenseCam, the shapes and the meanings of pasts, presents, and futures vary according to particular affective, economic, and technological moments that are always, as Karen Barad would put it, intra-actively becoming. In 1983, Bell suffered a cardiac arrest and spent ten days in a coma followed by double bypass surgery. He refers to this moment as a decisive one, after which he decided to take his health more seriously. For him, this involved "record keeping and self-monitoring" (Bell and Gemmell 2009: 101). He claims it was part of what fueled his interest in a system like MyLifeBits. Twenty-seven years after his cardiac arrest, now considering the possibilities of forgetfulness in old age - he is seventy-seven years old - Bell stresses that it's "very real, and very scary" (52). In an effort to forestall time, forgetfulness, and even his own disappearance, Bell takes care of chronicling his life. "The fear of oblivion before death," he notes,

> is big enough to drive a $4.2 billion industry in medicinal herbs and supple- ments for memory enhancement. [...] For all I know, ginko biloba and the Brain Fitness Program will indeed improve your bio-memory. But the world of Total Recall promises something broader: a revolution (52–53).

By revolution, what Bell is emphasizing is the radical difference between biological memory and "e-memory." The latter, he claims, will prove much more useful and infinitely more accurate. "[S]ubjective, patchy, emotion-tinged, ego-filtered" biological memory is continuously drifting and morphing, shaping the past into different narrative twists and turns, whereas e-memories are unalterable, indisputable, and "unforgivingly accurate" (56). Instead of "blurry bio-memories," discussions will be based on facts (83). Moreover, these facts no longer need to be stored in your brain "as long as they are at your fingertip via your smartphone" (115). No facts seem worthy to commit to mere human memory. Total Recall can manage them all.

Bell's e-memory project does not just rest in the realms of the utopic. As his work with Gemmell on the MyLifeBits software has shown - despite his use of visionary and absolutist language when he refers to a "complete record" of life - Bell is grappling with the contemporary concrete technological and organizational challenges that such a venture implies. In chapter 9 of *Total Recall*, Bell grounds his futuristic mission by addressing both laypeople and other scientists, offering specific directives as to how they might proceed in helping to bring about the e-memory revolution. This chapter, titled "Getting Started," suggests different ways one might enhance memory with the help of existing devices and software, from having a smart phone, a scanner, a digital camera, and gps unit, to digitizing one's life one medium at a time, from photographs to music to family recipes. Here, Bell offers detailed examples of the kind of recording equipment he owns and how he likes to make use of it. For instance, he advises getting a digital camera that allows for the recording of video so as to better "capture the ambience of a moment"

(Bell and Gemmell 2009: 188). He also suggests collecting personal and family-related medical information in one central document, keeping track of immunizations, allergies, illnesses, and test results so that one can achieve what he calls "quantitative health" (189). Moreover, Bell discusses the limitations that scanning one's paper documents might entail if not properly organized and annotated to facilitate later retrieval. Therefore, he suggests taking the time to create a personally relevant hierarchy of folders with detailed file names for all digital documents. But despite the tangible discussion he offers as to how one might go about lifelogging, many of his recommendations rest on the promise of future technological developments that he asserts will "rapidly improve in quality convenience in the next few years" (189). The e-memory revolution does not just specialize in managing pasts; it holds many stakes in how researchers envision the future. These researchers develop models for the plausible (read as radically different from the "impossible") based on a past that is shaped so as to point to a probable future. As such, the promise of future technological developments orients MyLifeBits and Memories for Life scientists' current research and prototype designs.

Despite his enormous digital collection, Bell claims that with less paper around, he feels much less cluttered. Moreover, he predicts that his e-memory will never be overwhelmed. In the future, with proper software, keeping everything will not be cumbersome or tedious at all. Accordingly, Memories for Life scientists suggest archiving everything starting now, because digital memory and processing power will accrue and accelerate faster than memories accumulate. These scientists speculate within a teleological framework offered by Moore's law that predicts an increase in memory and

processing power and a decrease in circuit, chip, and transistor sizes, allowing for faster and smaller computers. Performance is famously said to double every two years. As mathematician Alan Dix announced at a Memories for Life workshop, in seventy years, "we will be able to store a person's entire life record on a grain of sand." Memories for Life scientists' past experiences become the ground for making inferences as to what is desirable and possible in the future.[44] They rely on the same assumptions as those raised by anthropologist Christopher Kelty in his reflections on futurology, "that the absolute fact of technological acceleration - this knowing glance into the future - should order the kinds of interventions that occur in the present" (2008: 89). Thus, these scientists feel confident imagining the future and working toward it. In their future, they will never run out of digital space. Technological matter and virtual space appear as infinite, whereas time, the thing to be managed, stored, and extended, is treated as finite.[45]

To get the most out of time, now seen as finite, Bell must measure and control it. In order to manage his time, to keep track of how he should save and spend it, the devices he imagines and experiments with also specialize in supporting his *prospective* memory. "With a detailed e-memory of what I do, my computer is my personal time-management consultant" (Bell and Gemmell 2009: 81). Monitoring how he does and should spend his

[44] Memories for Life scientists' projects fit into a historical trajectory of future-making described by anthropologists Susan Harding and Daniel Rosenberg in their edited collection *Histories of the Future.* For Harding and Rosenberg, "[T]he future is not so much underdetermined as overdetermined. Our lives are constructed around knowledges of the future that are as full (and flawed) as our knowledges of the past" (2005: 5).

[45] In contrast to what Nietzsche calls the eternal return, in which, because of the infinitude of time and the finitude of matter, everything (every possible combination of matter) will play itself out again and again, such memory-making technologies treat time as finite and matter (including digital space) as infinite. As such, the makers of these tools attempt to govern each moment in its finite particularity. On Nietzsche's understanding of temporality and his concept of eternal return, see Grosz (2004: 143).

time, receiving reminders at the right moments, as well as being able to set them on demand, is crucial to the design of Bell's e-memory. This implies that the system be on hand at any given point, a concept now exemplified with the arrival of cloud computing, which allows users to keep large amounts of data online, accessible at all times from any terminal around the world. "When your mind is absent, your e-memory will always be there" (Bell and Gemmell 2009: 60). Standing in for an imperfect subjective memory and insufficient human capacity for time management is the promise of computational control over one's time. In *Picturing Personhood,* anthropologist Joseph Dumit describes the elimination of subjectivity by processes of computed automation. The positron emission tomography (pet) researchers Dumit studies seek to eliminate any opportunity for subjective or biased readings of scanned data in the name of neutral, consensus-forming understandings of brain images. "Every possibility of subjectivity *must* be eliminated to produce something reliable - that is, something real, something known. The hero in this story is automation" (Dumit 2004: 122). Similarly, the automatic monitoring of how Bell spends his time (reified in opposition to his subjective, and therefore possibly erroneous, memory) acts as a binding structure for his future self, for his future actions, and as a framework for future decision-making.[46] Embracing a neoliberal ideal of self-management and increased productivity, these technologies insure that he will never miss a constructive moment again. By creating a structure in which he can bank time for future use, "Total Recall will help get things done" (Bell and Gemmell 2009: 91).

[46] At the 2011 American Anthropological Association meeting, a panel titled "Anthropologies of the Automatic," organized by Nick Seaver and Marcel LaFlamme, was brought together around problems of human-machine interfaces and concepts of autonomous agency. Tracking new technological forms, from unmanned aircrafts to cloud computing and massive datasets, they examined how the automatic, qualified as "reliable, objective, or efficient," was brought to bear on human decision-making.

Memories for Life's future-oriented projects exemplify how "[d]iscursive practices produce, rather than merely describe, the 'subjects' and 'objects' of knowledge practices" (Barad 2003: 819). And as philosopher Michel Foucault has repeatedly demonstrated, discourse emerges from a set of historically situated possibilities that both constrain and allow for certain memory-making and knowledge-making practices (1971; 1986). Thus researchers' designs of time management devices depend not simply on what is said but also on what *can* be said at a given time. Discourses about computers as personal assistants, or "servants" as Bell puts it, are outcomes of processes of industrialization and standardization, where machines have come to work for humans in the name of increased productivity (Bell and Gemmell 2009: 196). But instead of being just production machines, new recording technologies are reproduction machines, where augmented memory means improved efficiency and longer-lasting lives and legacies.[47]

Recording technologies are designed to save us time by bringing the past into the present at just the right moment. In order to do that, time must be agreed upon. It must be standardized.[48] To share information, every computer must be part of a network of time machines. These machines act as servers communicating and agreeing on time across the globe over what is called Network Time Protocol (ntp), a set of time-sharing

[47] Quoting Benjamin Franklin, who reminds us that "time is money," Max Weber, writing at the turn of the twentieth century, observes in *The Protestant Ethic and the Spirit of Capitalism* an affinity between Protestant notions of salvation and capitalist ethics of work, investment, and accumulation (2003). Drawing from Weber's connections between moral virtues and the management of life and capital, sociologist Nikolas Rose, in his ruminations on genomics, neuroscience, and what he terms "the spirit of biocapital" titled *The Politics of Life Itself,* demonstrates that present-day bodies and time are optimized in a will to health and longevity that goes hand in hand with advanced liberal political rationality in the name of a productive and profitable future (2007).

[48] During the eighteenth century, the expansion of the British post office, and later the developments of railway systems, led to the adoption of standardized time on a supralocal level known as gmt (Greenwich Mean Time). For a history of standardized time and the instauration of local time zones, see Galison (2003) and Zerubavel (1982).

conventions that allow for synchronization and communication. Originally designed before the World Wide Web in 1985 by a University of Delaware professor, David L. Mills, ntp is one of the oldest Internet protocols. It works by connecting computers to a clock and then sending two bits of information between the connected parts: first, what time it is at the source, and second, how long it took to transmit the message from the source. Multiplied through a pyramidal scheme of connected computers, consensus emerges in the form of standardized time. The master clock that computers worldwide are connected to currently is the Cesium Fountain Atomic Clock at the National Institute of Standards and Technology laboratory in Boulder, Colorado. Based on the resonant frequency of the cesium atom, the time is considered accurate to within one second every sixty million years. Technological time, or more specifically atomic time, thus supplements and structures human biological time so that today's memory researchers can work toward the promise of a more productive, prosperous, and satisfying future.

The investments made by Bell and his fellow researchers are not just investments in time spent researching, recording, archiving, and synchronizing. They are also ongoing financial ventures in speculative technological markets. As Bell stated earlier, in the United States, there is a $4.2 billion industry involved in biological memory enhancement by way of vitamins and herbal supplements. And as Richard Doyle and Tiffany Romain's work shows, industries such as cryonics are predicated on a present economic investment for the promise of future returns in the form of life later on. Consumers of cryonics will typically pay between $28,000 and $150,000 to have either their heads or entire bodies frozen for later reanimation (Doyle 2003; Romain 2010).

Common in these endeavors is an increased purchase on time driven by a faith in continuing technological advances.

Bell, himself an angel investor (individuals who provide capital for start-up companies and research), encourages start-ups specializing in lifelogging and other forms of information management. He even concludes his book by stating that he is "ready to put [his] money where [his] mouth is and invest in start-ups that will take advantage of the e-memory revolution" (Bell and Gemmell 2009: 226). Besides being devoted to the future of his personal e-memory and his book-length manifesto for Total Recall, Bell is invested in a much larger memory market that has moved money and researchers across America and Europe. As philosopher Bernard Steigler maintains, memories have become "the privileged object of industrial investment" (2009: 97). In 2004, the United Kingdom Engineering and Physical Sciences Research Council initially granted Memories for Life £62,000 in funding, and named the project a Grand Challenge in Computing Research. The main goal of this ongoing challenge is described as "bringing together a diverse range of academics in a bid to understand how memory works and to develop the technologies to enhance it" (Memories for Life 2011). Additional private and public funding has fueled both the network at large and its individual research projects. In 2005, Memoir, a project coming out of the Information Studies Department at Sheffield University, received £470,000 as a Marie Curie Host Fellowship for the Transfer of Knowledge. Furthermore, Microsoft has invested over $550,000 in SenseCam research over the past six years, giving away cameras, software, and support to various clinics and university labs in the United Kingdom and the United States. In

2012 the SenseCam went from prototype to product. Production rights have been purchased by Vicon, a company specializing in motion capture. At £500 each, they mostly cater to academic and research markets. Vicon and Microsoft now host an annual SenseCam conference that brings together research on its possible applications. At Microsoft Research in Cambridge, it has been an ongoing project to involve neuroscientists from the Memory Clinic and Memory Aids Clinic at Addenbrooke's Hospital. I will return to a more detailed investigation of some of their studies in the following chapter. All these projects are investments. They are current mobilizations toward a future that contains and organizes the past.

In 2003, Bell and Gemmell were approached by the United States Defense Advanced Research Projects Agency (darpa) about the development of a research program they were starting called LifeLog. Sharing the hopes of a technologically enhanced future for memory, darpa wanted a system to capture and store a person's experience and interactions. They wanted the system to get to know the user (a soldier, for instance) and assist him in completing tasks. As a growing prototype, the MyLifeBits project could serve as an example. But as Bell and other researchers have recounted, the LifeLog project was publicly abandoned amid accusations of the Big Brother type. Following the September 11, 2001, attacks, darpa had launched an initiative called Total Information Awareness (tia) with the goal of creating a centralized database of information (transactions, communications, and movements) about every person, corporation, and institution in the nation, in the hopes of identifying terrorist patterns. Public outcry caused the tia project to be dismantled. When reflecting on these

abandoned projects, Bell expresses sincere disappointment in what he considers an ill-informed public; and he is proud to point out that darpa has since developed Advanced Soldier Sensor Information Systems Technology (assist). To explain the purpose of this system, Bell gives the example of a soldier in Iraq who could perform daily rounds while recording them to a video blog. In Bell's story, this recording could then allow an intelligence officer to spot a suspicious-looking vehicle (Bell and Gemmell 2009: 79). For Bell, these projects bring to the fore the advantages of lifelogging for both individuals and nations. But instead of *Big Brother,* he prefers the term *Little Brother* because the e-memory revolution is not just about a larger institution recording individuals, it's about millions of individuals recording themselves.

As we have seen in the previous chapter, other groups of researchers who have been actively invested in the future of lifelogs are historians, librarians, and sociologists. The last decade has seen a veritable explosion of original sources in the forms of micronarratives. When addressing this eruption of recorded first-person accounts, Bell goes so far as to claim: "We look back at the ages before the advent of writing as 'prehistory.' The next generation will look back on our era as pre–Total Recall" (Bell and Gemmell 2009: 226). Prompted by the proliferation of these chronicles of contemporary life, researchers from the British Library, core members of the Memories for Life network, are also looking for ways to archive these fragments of the past.

Whether for improved health, corporate interests, educational purposes, national security, or cultural heritage, these memory projects invest in a desire to enhance our

collective knowledge about ourselves. In so doing, these tools increase the gap described by Barad as dividing the external world from the internal one. This divide passes through the figure of the knowing subject and structures a representationalist triad of knower, knowledge, and known. We might borrow Michael Fischer's words in asserting that these recording and knowledge-making technologies allow "memory to be stored, externalized, and recalled for comparison, and analysis[; And that this remains, in fact,] the period of the rational, autonomous ego hypostatized by Descartes" (2003: 325). We could also go a step further and argue with Hayles, that

> Instead of the Cartesian subject who begins by cutting himself off from his environment and visualizing his thinking presence as the one thing he cannot doubt, the human who inhabits the information-rich environments of contemporary technological societies knows that the dynamic and fluctuating boundaries of her embodied cognitions develop in relation to other cognizing agents embedded throughout the environment, among which the most powerful are intelligent machines.
>
> In these views the impact of information technologies on the mindbody is always understood as a two-way relation, a feedback loop between biologically evolved capabilities and a richly engineered technological environment. Such feedback loops may be reaching new levels of intensity as our environments become smarter and more information-rich, but the basic dynamic is as old as humans" (Hayles 2002: 233).

In order to turn vast collected bits of information into retrievable data or knowledge, Memories for Life scientists attempt to draw signals from noise, meanings from the mundane. Bell and other researchers at Dublin City University, such as Gurrin Cathal and Alan Smeaton's team, are working to develop a system that recognizes near duplicates of documents and photographs in order to mark "events" and distinguish them from preceding or subsequent ones. Their software searches for novelty, which they equate with meaningfulness. Bell predicts that such software's ability to sort through data

and reduce redundancy will only improve as researchers begin acquiring the personal data of users, such as their pulse, breathing, tone of voice, and even brain waves to determine the importance of a particular moment. Pattern recognition is key to examining the archives. If history can help to avoid the mistakes of the past, then memory banks can help to avoid problems that scientists do not even understand yet, problems that exist only as patterns. In a desire for the oracular, scientists seek to turn patterns into predictions. In short, "[t]he more you record, the better," insists Bell (Bell and Gemmell: 62).

Collecting One's Self

> Theuth is the Egyptian god Toth, the 'scribe of the gods', to whom was attributed the invention of writing [...] When it came to writing, Theuth declared: 'Here is an accomplishment, my lord the king, which will improve both the wisdom and the memory of the Egyptians [...] The King replied [...] 'you, who are the father of writing, have out of fondness for your offspring attributed to it quite the opposite of its real function. Those who acquire it will cease to exercise their memory and become forgetful [...] What you have discovered is a receipt for recollection, not for memory.' - Plato

Bell enjoys reviewing his SenseCam images in rapid succession. "Talk about your life flashing before your eyes! It's an amazing feeling to see your life on fast-forward like that" (49). Experiencing firsthand what is said to happen to someone just before they die, seeing his life flash before his eyes, reminds Bell that he is still very much alive.

Figure 1
Images taken by Lina Dib using Microsoft's SenseCam.

For him, seeing his past in the form of images reassures him that he will not forget his life, and also that others will not forget him. In a fight against obsolescence, he imagines that his e-memory will help keep him alive even after he is dead.

> If we can have a complete record of the things about people that especially provoke meaning for us, what will we do with this complete record when they are gone? We will maintain the e-memory of that person as a treasured heirloom. And, someday, we will ask it questions. The e-memory will answer. You will have virtual immortality. (Bell and Gemmell 2009: 139).

An e-memory would allow Bell to surpass his biological limitations and interact with other humans beyond the death of his body. Whereas large portions of memories (nearly everything excluding paper-based records) previously had to die with their rememberers, memories now gain an extended life in which they become the spokesperson for the deceased, even, as we have also seen in the previous chapter with Wilks' Companion

project, answering questions that the deceased may have been unable, or unwilling, to answer in life. Indeed, the finite temporality of the human body and the desire to pass on a part of oneself to future generations underlies many Memories for Life projects. Like Wilks' "artificial companion," Bell's Total Recall would help its user create an autobiography by collating photographs and narratives collected over time. Imbued with e-memories, the archive, or companion, could then be passed on to the user's descendants, who would interact with it to learn more about the user and his life. Designs such as these express a longing for memories to add up, to make sense, and to provide a more complete picture of a person.

In an attempt to make something tangible out of time, these researchers seek to inscribe the recordable, storable passage of time as the constituents of a user's individuality, neatly packaging both temporality and personality in something that can be decontextualized and passed on for generations. Turning time into matter, grasping a moment in a photograph, is an attempt to conceive of life as something bounded, as being rather than becoming. For Bell, life has now taken a material form, which he can store, access, and manipulate, adjusting its speed and resolution. However, the ironic consequence of this turn toward materiality (and to the archive) is that it allows the very concept of a disembodied subject to thrive; reductive materiality is what allows for the construction of an interiority and exteriority via an assembled narrative continuity. For Bell, it is through the disciplining of matter, through the practice of building an archive, that an e-subject with an e-memory is constructed.

To address digital personal records as transposable selves highlights Bell and other Memories for Life researchers' underlying engagement in an important philosophical debate about what constitutes an authentic, objectified memory, and what some call a "digital me." Indeed, much has been written linking the notion of identity to that of memory and agency. Historically, one can return to the period in which the self as the locus of subjectivity is debated among such philosophers as Descartes, Locke and Hume. Looking back at the constitution of the very concept of self, Charles Taylor argues that the Cartesian objectification of the body and its activities, as separate from the mind that observes it, creates a form of "modern disengagement" (1989:175). Taylor's disengagement, coupled with the contemporary desire to capture experience, objectifies memory as separate from the self or mind in which it operates. It is the self representing and interpreting itself. J. Lenore Wright defends this Cartesian separation of knower and known in so much as it allows for self-knowledge and thus a kind of self-representation (2006:71). For Wright, the dialectical relation between the two is brought to the fore in processes of self-narration where the lines between the self who knows and the self who is objectified are paradoxically blurred.[49]

In his article "Space, Time, and the Politics of Memory," anthropologist Jonathan Boyarin argues that the creation and the experience of memories today occur differently than in the past. "[N]ew technologies of transportation and communication [...] have profoundly altered our sense of time and space [...] and the possibilities of reifying, and hence 'preserving' images of the past" (Boyarin 1994: 3) and in so doing, have altered the

[49] A great deal of work has been done on the concept of "self" in anthropology and social theory, from Carrithers et al. (1985), De Certeau (1990), Giddens (1991), Mauss (1985) Shweder and Levine (1984), to Pandolfi (1993) and Turkle (1984), to name but a few.

possibility of preserving images of ourselves. Boyarin reflects on how identity and memory are constantly confounded "insofar as consciousness, the ground of 'identity,' is constituted by the sum of all the impressions and imaginings retained in the brain" (1994: 23). But he complicates this reflection by pointing to the fact that memory is intersubjective, political and social. Philosopher Michel Foucault situates the western notion of subjectivity at this precise intersection between memory and intersubjectivity. It is through the use of external "memory tools," and through the sharing of selected memories he claims, that an ethical self is constructed. For the purpose of considering such added ethical dimensions of the self and its technologies, we will leap cavalierly over the millennia, from the Stoics to the present, and focus on Foucault's genealogy.

According to Foucault, the West's cherished notion of subjectivity developed in Antiquity through the very practice of collecting personal data. In his studies on the care of the self, he explores the role of ancient writing practices in the knowledge and the creation of the self. He inquires as to how, through a system of phenomena and historical processes that we now refer to as culture, the questions of truth and self-cultivation were generated (1982: 243). He argues that about 2000 years ago, with the Stoics and Epicureans, the western concept of self developed through the keeping of personal notebooks and through correspondence. In Foucauldean theory, the care of the self (referred to by the Ancient Greeks as *epimeleia heauto*) revolved around the reflections, the practices, and the experiences through which an individual catalyzed transformations that granted access to true self-knowledge. Foucault states that "around the care of the self, there developed an entire activity of speaking and writing in which the work of

oneself on oneself and communication with others were linked together" (1986: 51). In other words, Foucault describes what he terms technologies of the self, which were methods and techniques through which identity was composed, performed and monitored.

Foucault analyzes the historic notion of "knowing thyself" that was professed as an "art of living."[50] In antiquity, the acquisition of knowledge of oneself was put into practice through the widespread use of *hupomnêmata*, or personal notebooks. In these books their authors would jot down citations, fragments of reflections, sketches, examples and accounts of actions either witnessed or learned, creating an archive – described as a physical memory – available for future reference. They were "the meditations, the readings, the notes that one takes on books or on the conversations one has heard, notes that one reads again later, the recollection of truths that one knows already but that need to be more fully adapted to one's own life" (Foucault 1986: 51). These notebooks were also used to keep a kind of track record of one's mental, physical and spiritual health. Thus *hupomnêmata* were by their very nature continually unfinished, and in many ways intrinsically disorganized. Furthermore, they had to be available at a moment's notice. The possibility of using them spontaneously was one of their key characteristics. Discussing the impact of *hupomnêmata*, Foucault claims "this new technology was as disrupting as the introduction of the computer into private life today" (Dreyfus and Rabinow 1983: 245). As mentioned earlier, unlike intimate diaries

[50] Foucault contrasts the classic period with the later Christian period, which was founded on the renunciation of the self through confessional rituals. The classic form of care of the self was transformed with the rise of Christianity and became a religious necessity for achieving salvation rather than an "art of living."

that reveal unspoken secrets, these ancient notebooks were also used to capture the already said. So citational practices were common within *hupomnêmata*. The author constituted his own identity through a mass of writing that he would not only appropriate but also embody. More specifically, this practice pointed to a self that wasn't yet what it strove to become. Thus, rather than being considered merely archives, selected bits of the past were to be used in the making of one's future self.

This said, could the SenseCam, readily collecting the already seen, be considered contemporary *hupomnêmata*? Again, the intent in keeping these notebooks did not revolve around the simple practice of recording everything about the past per se, but rather around a practice of carefully collecting directed toward an ethical realization of a future self. On its own the omnipresent SenseCam does not seem to incorporate the act of selecting and editing, key in the constitution and elaboration of oneself for oneself.[51] However, the exercise of recording one's activities combined with the use of an archival technology, which would allow one to recognize, annotate, retrieve, and share only certain bits of recorded information, may indeed help one understand when and how to intervene in order to better their physical and mental health. Mnemonic technologies geared toward the enhancement of one's wellbeing could then be considered technologies

[51] If a popular contemporary digital practice was to be compared to that of keeping *hupomnêmata*, it might be blogging. As the blogger navigates the plethora of information on the web, he selects but certain ones to comment on, elaborate on, and return to. The choices he makes while collecting and exposing both his and others' thoughts may be constitutive of a kind of exercise on himself. Another such technology might be Microsoft's MyLifeBits. Ironically however, archival tools such as this one create the problem of remembering how and where things are stored in order to retrieve them efficiently. Designers of various information management technologies are actively addressing this challenge and trying to come up with ways of automatically annotating pictures, documents and videos in order to alleviate some of the difficulties related to the management of large amounts of data.

of the self in Foucault's sense. In other words, through the process of selection, editing and reviewing, (re)collection might be seen as a means towards a kind of self-fulfillment.

But the role of the interlocutor in Foucault's understanding of technologies of the self is also an important one. An interlocutor serves as a means to verify one's impressions and experiences of the world. The interlocutor acts as an outsider who can attest to one's pertinence and truthfulness. In fact, according to Foucault, western notions of subjectivity were developed further through correspondence rather than simply in the collection of words already said. In Seneca's letters with Lucilius and in Marcus Aurelius' letters with Fronto, Foucault locates narratives that he describes as an "account of one's relation to oneself" (1994: 217). The letters he examines consisted in reviewing and making accounts of one's entire day, in its quotidian banality, as a means of attending to oneself. Self-cultivation was then considered "not an exercise in solitude, but a true social practice" (1986: 51). Derrida's work examines the significance of the archive in terms that also mark the extension of the private into the public and vice versa. He describes the archive in terms of space: "*There is no archive without a place of consignation, without a technique of repetition, and without a certain exteriority. No archive without outside*" (1996: 11, emphasis in original).[52] Originating from the Greek word *arkheîon* - which means the house in which resided those who commanded and held political power - the archive was a lieu that marked the institutional path linking the private and the public.

[52] Memory shares these *topoi* in Arstotle's sense; memory must have a place and an image at the juncture of prosthesis.

Faubion also attests to this when he asserts that "Greek ethics is indeed personal, but unlike ethics grounded in a metaphysics of autonomy, of a radical and absolute freedom, it places ethical practice in the encompassing web of the house and polis [...]. Ethics and its domestic and political environment are thus entirely of a piece" (2011: 75). For Foucault, to write, to record oneself, was to exhibit oneself, to make oneself seen. Self-narration became a specific method of reflexive representation while simultaneously revealing oneself to others. In Antiquity, this form of correspondence regularly occurred between a master and a student. The student was told to record all his daily thoughts and activities and report them to the master who would act as an interlocutor. In the process of reviewing and narrating one's memories to another, one would be caring for oneself. Could Wilks' furry robot companions be considered contemporary master interlocutors?

The techniques practiced by Foucault's Stoics are neither governed by a concern for salvaging the self, nor by a concern for memory per se. Rather memory is a means by which one creates a guidebook for one's actions. One draws lessons from the past in order to better oneself. To what degree are today's technologies built on anxieties about memory rather than on the realization of an ethical self? Pervasive new recording technologies reflect a change in attitude and perhaps a change in the way we construct ourselves. The idea that if one records everything one will better know oneself is quite different from the practice of selection involved in the keeping of *hupomnêmata*. Both can be seen as a commitment to self-knowledge, but with ancient technologies of the self, it is not necessary to record everything, rather only bits and pieces relevant to oneself. With Foucault's Stoics, the emphasis is on a current process of becoming; with Bell,

memory acts as a safeguard against losing who he has been, or a mathematical mode of prediction for the future. For French historian Pierre Nora

> [m]odern memory is, above all, archival. It relies entirely on the materiality of the trace, the immediacy of the recording, the visibility of the image. What began as writing ends as high fidelity and tape recording. The less memory is experienced from the inside the more it exists only through its exterior scaffolding and outward signs - hence the obsession with the archive that marks our age, attempting at once the complete conservation of the present as well as the total preservation of the past. (1995: 636)

Seen in this light, Foucault's history of the concept of self in the West problematizes memory as a means to self-fashioning, whereas today's grounding of memory in authenticity promotes the *discovery* of an exterior omnipresent, recorded self.

Bell offers a transcendental account of the world to which he is granted mediated yet transparent access through his many automatic recording devices. Individuals, objective facts as well as experience are considered entities that are always already there waiting to be known and captured rather than something discursively created. In order to examine Bell's account, I turn to historian Joan Scott's "The Evidence of Experience," where she traces how the notion of experience has become inseparable from that of exterior evidence. Referring to Raymond Williams' genealogy of the term experience, she traces how its meaning has ranged from that of knowledge gleaned from past events, to a particular kind of consciousness, to a most truthful and immediate witnessing, to refer finally to something objective, something outside of the individual. In all cases, the notion of an individual - as either internalizing, or faced with "experience" - is considered

primordial. The (experiencing) individual thus becomes the unquestioned category. And yet, as Scott argues,

> [i]t is not individuals who have experience, but subjects who are constituted through experience. Experience in this definition then becomes not the origin of our explanation, not the authoritative (because seen or felt) evidence that grounds what is known, but rather that which we seek to explain, that about which knowledge is produced (1991, 779-780).

Barad's notion of "agential realism" also calls into question such a separation between our consciousness or experience, our discourse, and the empirical world. For Barad, it is not the empirical world that is at stake but rather its referent as pregiven material to which we have mediated access (Barad 2003). Instead, she considers the empirical world to be composed of phenomena, themselves emerging from the intra-activity, or what Stengers calls the "reciprocal capture" of matter and discursive practices (2010: 219). The past is neither simply there to be inscribed, nor is it the sheer product of human agency. But Bell's Total Recall project is not concerned with the material-discursive becoming of the past. Rather, the processes by which Bell's e-memory creates indisputable evidence goes unremarked. What matters is the fact that evidence is being gathered. Memory, as Nora puts it, has been seized by history. "Memory has been wholly absorbed by its meticulous reconstitution. Its new vocation is to record; delegating to the archive the responsibility of remembering, it sheds its signs upon depositing them there, as a snake sheds its skin" (Nora 1995: 636). The result: a plethora of archives.

So are we really preserving the memory of our time? The SenseCam shows us a great deal that we may have otherwise forgotten, and with it Bell reifies the notion that *because we can* record everything, *we must*. What Bell doesn't do however, is question how SenseCam images, come to constitute what we call memories. Paradoxically, as Plato points out in the epigraph to this section, documenting may also make us forget (Plato 1973). We place our confidence in these collection bins and in doing so imagine that we are making room for other things. In preserving the traces of our era, in actively creating the archeology of the future, are we compromising our own memory, that of the present? Recording everything may actually have the opposite effect than that desired. So far, sifting through test users' collected sound and video, let alone innumerable photographs, has proved challenging, such that, in the words of anthropologists Susan Harding and Daniel Rosenberg, our futures appear as "junkyards of memories we have not yet had" (2005: 5).

In a short story by Jorge Luis Borges, a character named Funes falls off a horse and loses consciousness. Upon awakening, he finds "the present [...] almost intolerable it [is] so rich and bright; the same [is] true of the most ancient and most trivial memories" (1962: 112). Funes discovers that he is crippled but that his perception and memory have become “infallible.” He describes his immense power of recollection: "*I have more memories in myself alone than all men have had since the world was a world* [...] *My memory, sir, is like a garbage disposal*" (1962: 112, emphasis in original). Overwhelmed by details and the particular, Funes becomes incapable of formulating thoughts and generalities. He spends his days in the dark, enumerating the different memories that

come to mind, each one as important as the last. Rather than enhancing the human through a so-called 'memory extender,' might we become like Borges' Funes, who because of his incredible memory is plagued with the impossibility of discerning? Would knowledge be replaced by 'pure data'? An information overload renders all things equal and the self, overwhelmed and incapable of action, becomes catatonic. Like Borges' narrator who interacts with "Funes, the memorious," we might become "benumbed by the fear of multiplying superfluous gestures" (1962: 115). These researchers' collections have become so vast that "rather than commenting on the everyday, [they have] become coterminous with it" (Highmore 2002: 83). They have become as impractical as Funes' memory, or as Borges describes in another short story, a one-to-one map of the world. Bogged down by the endless empiricism of the everyday, a step back toward generalization appears nearly impossible. Bell in fact recognizes the importance of a classification system. "My data is entangled," he admits. A Total Recall system for him must involve the ability to organize, classify, and annotate one's material. "[Y]ou don't really have a grasp of your material until you have built a mental model, a structure, such as a taxonomy or mind-map, under which you classify the information being absorbed" (Bell and Gemmell 2009: 134). Without classification, all you have is noise.[53]

[53] In short, Foucault argues that without processes of selection following moments of collection, one cannot "make one's self" into an ethical subject (Foucault 1986*)*. See also Faubion's *An Anthropology of Ethics* (2011).

4- Prosthesis and Anamnesis:

With this chapter, instead of asking whether or not these technologies mirror reality or the past, through the case study of Mrs. B, a woman who suffers from amnesia and wears the SenseCam in the hope of leading a normal life in which she can share the past with loved ones, I prefer to ask how they act, what they do, and whom they speak for. Throughout, this chapter proposes a shift from a representationalist argument about the bifurcation of nature (in this case, the objective reality of the ticking past and our subjective recollection of it) to a consideration of the ecologies of memories that we build and how they perform specific cuts through time (Barad 2003; Stengers 2010). For the amnesiac Mrs. B the problem of too much information is experienced quite differently than for Bell. The noisiness created by the plethora of recorded memories is what allows her to un-forget, to experience a kind of anamnesis. She exists in time through her experience of what Proust has called involuntary memory. While Bell's desire to remember suggests that the past is out there, as a given, ready to be recorded, sorted, and subsequently tapped into whenever the need arises, Mrs. B's experience of involuntary memory suggests that the past is always only within the present. By focusing on a posthumanist cyborg subject who longs to share the past with loved ones, I show how these new digital tools do not merely belong to the world of objects and representations (Faubion 2011; Haraway 1999; Hayles 1999; Wolfe 2010). They participate in a care of the self (a kind of poetic self-making) that occurs though one's relationship with one's self and with machines, but also with one's past, and as Faubion emphasizes, "with others, who themselves demand care, consideration, acknowledgment [...]" (2011, 75). As such,

these technologies are open to, and participate in, redefining concepts, subjectivities and temporalities. I end by calling for an agential-realist account of intra-active memory, where intra-action, as defined by philosopher of science Karen Barad, presupposes no preexisting entities (or even temporalities) prior to relationships (2003).[54] In the case of memory, intra-action means emphasizing not only the fluid relationships between individuals and machines, actors and actants, but also between the past, present, and future.

The Noise of Memory

Brooding at the end of the world on my island of Sal in the company of my prancing dogs I remember that month of January in Tokyo, or rather I remember the images I filmed of the month of January in Tokyo. They have substituted themselves for my memory. They are my memory. I wonder how people remember things who don't film, don't photograph, don't tape. How has mankind managed to remember? I know: it wrote the Bible. The new Bible will be an eternal magnetic tape of a time that will have to reread itself constantly just to know it existed. - Chris Marker

Bell's ambitious project of digital taxonomies and virtual immortality discussed in the previous chapter talks around, rather than about, certain very real problems of living and remembering in the present. For people with memory impairments such as amnesia, the problems of recording the past, of information overload, and of noise are experienced quite differently. Unlike with other participants in the e-memory revolution, the noise and unpredictability created by their collection of images are actually what allow them to occasionally remember their past. Because of amnesiacs' general inability to remember the past, they cannot plan for the future. They are, in a sense, caught in the present.

[54] Like Stengers' cosmopolitical approach, Barad's agential realist account "acknowledge[s] nature, the body, and materiality in the fullness of their becoming without resorting to the optics of transparency or opacity, [or] the geometries of absolute exteriority or interiority" (2003: 812).

Instead of keeping objective, standardized, and productive time, these exceptional users of recording technologies rely on their devices to give them a sense of temporality, of the subjective passage of time.

In an ongoing study performed by researchers at Microsoft and Addenbrooke's Hospital in Cambridge, Mrs. B, a woman with amnesia, wears a SenseCam to help her recall events in her life. While this study shares Bell's representationalist framework, which assumes that Sense- Cam images are irrefutable proof of the past, Mrs. B is not concerned with organization and posterity. She is not involved in a utopian scheme of living "better than well" (Elliott 2003). Rather, she is trying to perform everyday actions such as caring for herself and remembering her loved ones. When considering the promise of an e-memory like one described by Bell, Emma Berry, the neuropsychologist working with Mrs. B, explained that she does not care about what we call the system, or even its intended function per se.[55] She said she cares about rehabilitation and about her patients who are suffering from Alzheimer's disease and amnesia. Berry emphasizes that, far from being a blissful forgetting, Alzheimer's creeps up slowly in a painful process that leaves its sufferers with no memory of who they are or how to do basic tasks. Moreover, amnesiacs do not record things in order to store them "out of mind"; their minds have essentially left them.

Berry came to Microsoft Research to test whether some of their newly developed tools such as the SenseCam would help the patients she was working with who suffered

[55] References to and quotations from Berry are from semistructured interviews, workshops, and informal meetings conducted in person by the author over the course of fieldwork research between 2006 and 2008.

from different forms of dementia. She hoped these tools would help patients regain a sense of normalcy and self through what she terms autobiographical memory, in short, the kind of memory related to past events in one's life. "SenseCam might help people remember what they did three weeks ago at that wedding. [...] [O]r they might remember the birth of their child. Or, they might remember the last holiday they took." Berry explained that Mrs. B is a patient in her sixties who had limbic encephalitis, a viral infection of the brain. She now has a damaged hippocampus, an important structure involved in remembering, located in the medial temporal lobe of the brain. Subsequently, she has a very poor memory. "We got evidence that after five days, she entirely forgets something that happened that was very significant." Berry continued, "But actually, in reality, it's the next day," she whispered, although no one else was in her office.

Berry recounted a visit to Mrs. B and her husband's home. Mrs. B had cooked a lovely meal for her. With three courses and bottles of wine, she had clearly gone through a lot of trouble. Berry had stayed with the couple until about midnight before going back to her hotel close by. By 8:30 the next morning, Berry reported that Mrs. B had "no recollection of the previous evening whatsoever." Mrs. B said she knew who Berry was on a semantic basis, so she knew that her name was Emma, and that she worked with her memory. But that was all. In 2005, Berry and her team asked Mrs. B to wear a SenseCam. She has been wearing one ever since. Over the course of several studies, they have found that SenseCam does in fact help her to remember. When she wears it, months later she has what appear to be detailed recollections of past events (Hodges et al. 2006). Berry elaborated on the experimental process: the researchers ask Mrs. B to wear

the SenseCam if she is doing something she deems interesting or meaningful, such as going to the theater with her husband. Then, starting the next day, and every other day for two weeks following this event, Mrs. B and her husband review the images and discuss them. What the researchers are trying to encourage is a reencoding of memories. Every time someone remembers, Berry explained, they create new pathways that allow them to retrieve their memories. So the more one goes back and recalls events, the more traces one creates to follow later on. "So if you go back and remember your last holiday, it's like you're encoding those memories again [...]. If I get you to keep remembering your holiday, you're more likely to remember it in ten years than if you don't go back to that." Like a snake eating its tail, I imagined Mrs. B eventually watching images of herself watching images in a recursive feedback loop.

Berry performed a similar SenseCam experiment with a patient who has multiple sclerosis. Again she noted that "events, images that [the patient] was not able to recall initially, seem to have become permanent memories now." She remarked on the blurring distinction between the events and their evidence in images. "I'm not sure whether we are creating new memories from the pictures or whether she is remembering the events following a trigger from the pictures [...]. But either way, it seems to be working." In Joan Scott's reflection on the nature of evidence, she considers how the primacy of the visual allows one to "claim [...] legitimacy on the authority of experience" and to communicate this legitimacy to others as knowledge (1991: 776). But Scott complicates this attributed legitimacy to evidence by pointing to evidence's double bind: on the one hand, it can be said that narratives determine the structure and pertinence of evidence,

much like the present determines how one reads the past. On the other hand, evidence is considered as evidence on the basis of its freestanding qualities. It is evidence because it is real, no matter what. Seen from this perspective, this patient's experience of viewing the SenseCam images (and being told that they are images from her life) causes her to recognize moments of her past. She comes to notice elements of her past that reside in the image as she is carried beyond the image into the nebulous realms of recollection. The images at once create and trigger a memory.

As Scott points out, when evidence is based on experience, one cannot argue with the account of one's own past. The problem she raises however is that when experience is used for pointing to evidence, it leaves aside the ways in which the seeing subject comes to see evidence, and the ways in which this evidence operates.

> [T]he project of making experience visible precludes critical examination of the workings of the ideological system itself, its categories of representation [...], its premises about what these categories mean and how they operate, and of its notions of subject, origin, and cause (Scott 1991: 778).

In this case, what needs to be addressed is how the researchers, users, and images construct each other as well as notions of the past, present and future.

> The evidence of experience works as a foundation providing both a starting point and a conclusive kind of explanation, beyond which few questions can or need to be asked. And yet it is precisely the questions precluded - questions about discourse, difference, and subjectivity, as well as about what counts as experience and who gets to make that determination - that would enable us to historicize experience, and to reflect critically on the history we write about it, rather than to premise our history on it (Scott 1991: 790).

The SenseCam might point to evidence of a past that is forgotten, but what it does not point to is how the resulting images operate, how they have become something through which a subject remembers in the first place.

Berry quickly emphasized the importance of regarding the images as triggers, as memory *cues*. She declared the need for them to be treated as what they are: images, and not a neat serial form of an inaccessible past. Like filmmaker Chris Marker in his narrative of *Sans Soleil* - a fictional documentary that evokes philosophical questions around memory, documentary, and the act of recording - Berry prefers when things "proclaim themselves to be what they are: images, not the portable and compact form of an already inaccessible reality" (Marker 1982). Berry's view differs from the way many researchers in the Memories for Life network speak about digital memory, that is, as a receptacle that one tosses the past into, to later pull out again. At a Memories for Life workshop I had attended the previous year, Berry argued that the term *capturing memory* gives a misleading picture of what SenseCam does.[56] SenseCam is not a black box of life. In fact, she and her team prefer to focus on the effects that recollections, as subjective and perhaps inaccurate as they might be, have on a patient.

Berry gave me another example: she and Mrs. B were reviewing over two hundred images, when an image, "just an ugly image, just a knee bending over the boot of [her] car, and [...] her glove," prompted her to remember the wind. It was fiercely

[56] In *Archive Fever* Derrida distinguishes the archive from memory. He argues that the archive "will never be either memory or anamnesis as spontaneous, alive and internal experience" (1996: 11). Derrida points to the paradoxical quality of the archive as the stabilized place of memory that destroys memory itself. The materialization of the past in the form of the archive must not be confused with the unstructured, extemporaneous experience of memory.

windy the day the photograph was taken. And beyond the gloves and the car - beyond the image - were the buildings. Mrs. B remembered wondering why two identical buildings were different shades of gray. "And that triggered - 'That's it! We went to the theater, and we went to a restaurant, we did this and we did that, and we had this pizza, and I remember I drank wine and I spilt it.' It all came back to her." Berry explained that, out of all the SenseCam images taken every thirty seconds or so, one was bound to be powerful. She was describing the power of involuntary memory - how in one instant something could trigger a flood of memories.

Memory is not merely perspectival and intra-subjective, it is quixotic, idiosyncratic, and capricious. Herein lies the logic of the SenseCam: Mrs. B's memory is not only beyond her occasional ability to conjure; it is beyond her ability to predict. Berry asserts that the "objective passive capturing" performed by the SenseCam creates opportunities for involuntary memories. For example, were we to take a staged picture of the London Eye, or of Big Ben ("active" as opposed to "passive capture"), the chances of those images triggering a memory for Mrs. B are quite slim, compared to the multiple "here, there, and everywhere" pictures taken by the SenseCam. Although the sheer number of photographs passively captured by the camera (approximately three thousand per day) is daunting and creates an enormous amount of noise to sift through, it is the very randomness of the images that allows for one of them to provoke the experience of memory. In short, noise makes un-forgetting, or anamnesis, possible; an analytics or automated interpretation would be illegible to Mrs. B. This use of noise takes advantage of the very individual and situated ways memory works. Whereas I might remember

someone's brightly colored socks on the train, another rememberer might not have noticed them. Instead, she remembers the smear of landscape across the window, the map arching over the door. And images of the landscape, or the map, are what allow her to recall her trip to London. Memory is of course synesthetic rather than strictly visual, and even visual cues can evoke memories of sounds, smells, or textures. The muggy morning smell, the cold metal armrests, the flat, distant voice of the conductor across the speaker could be evoked by a picture of fog, the seats, or the speaker.

Memory, like breathing, is both voluntary and involuntary, or in biomedical terms, controlled by the sympathetic and parasympathetic regions of the brain. Indeed, memory is perhaps one of the most ineluctable of involuntary processes; while it is not uncommon to stop oneself from laughing, yawning, or sleeping, the past comes rushing in whether we want it to or not. Though many have read involuntary memory to be quintessentially transcendental (a moment breaking free from its past to enter the present like the spirit infusing the flesh), involuntary memory is, in fact, eminently immanent. As Gilles Deleuze shows in his reading of Proust's *À la recherche du temps perdu,* involuntary memory is about neither identity nor resemblance but rather the confrontation between two moments and the incongruities that this friction produces. Discrepancies, dissimilitudes, and dissemblances rather than similarities, representations, and affinities provide the ingredients that evoke the familiar flavor of an involuntary memory. "[I]nvoluntary memory [is] the analogue of a metaphor: it takes 'two different objects,' the madeleine with its flavor, Combray with its qualities of color and temperature; it envelops the one in the other, and makes their relation into something internal" (Deleuze

2000: 60). An immanent notion of involuntary memory, what Deleuze citing Proust calls a "morsel of time in the pure state" (61), is localized in friction, situated in alterity, emplaced in difference.

Frictions between the past and the present are continuously being negotiated. Barad's notion of agential cuts offers another way of addressing these apparitions of difference. Whereas Deleuze's involuntary memory invokes differences brought together within an instant, Barad's agential cuts invoke togetherness (the fabric of time) pulled apart, creating a relationship, in this case between the past and the present or between the object of the photograph and the moment it purports to represent. Agential cuts are moments of friction that both result in, and are the result of, intra-actions (rather than predetermined interactions). "It is through specific agential intra-actions that the boundaries and properties of the 'components' of phenomena become determinate and that particular embodied concepts become meaningful" (Barad 2003: 815). In her reading of physicist Niels Bohr's understanding of the concepts of "position" and "momentum," Barad explains that these concepts are always particular to the phenomena at hand. In doing so, she shows that agential cuts are also in a sense immanent: they occur within ontologically indeterminate phenomena, enacting "agential *separability* - the local condition of *exteriority-within-phenomena"* (815). As for the SenseCam images, in a state of friction with the past, they create agential cuts through time that enable the phenomenon of remembering. In other words, for Mrs. B, the past exists in intra-action with the present, through the spark of involuntary memory triggered by her SenseCam image.

The Evidence of Memory

Generally speaking, if the events amnesiac patients claim to remember bear resemblance to the evidence in the SenseCam photographs and to their partners' narratives, then Berry and her team consider the patients' recollections genuine. Based on this, they conclude that the SenseCam helps users remember the past. But many other researchers, engineers, psychologists, and computer scientists at Microsoft and Memories for Life workshops and meetings have doubts as to whether Mrs. B is actually remembering when she reviews the images. Berry, along with these researchers, have raised the possibility that Mrs. B, and other amnesiacs using a SenseCam, might be misremembering, that the images might be changing their memories. But Berry admits: "Personally I get mixed up between memories and dreams. I can't remember what's real and what's not. And we all change our memories to fit [...] with our identity [...]. We all reconstruct our past, don't we?" Memories, like dreams, do not merely visit us while we are slumbering through our days and nights, respectively; rather, their intra-actions create memoryscapes and dreamscapes. For Mrs. B, the past does not exist until she enters in relation with it through the SenseCam images, creating her presentscape within which the past occurs. Borrowing from Donna Haraway, Barad proposes the notion of "diffraction" rather than reflection. "[D]iffraction patterns illuminat[e] the indefinite nature of boundaries" (Barad 2003: 803). Instead of demarcating the real from its reflected image, the notion of diffraction might highlight the indefinite boundaries between the past and the present, between the SenseCam images and one's memories.

But Berry is interested more in pragmatic than epistemological questions, emphasizing that for amnesiacs, the sense of normalcy created by the experience of remembering is what matters. She compares amnesia to more visible pathologies, arguing that amnesiacs should be treated with no more skepticism than migraine sufferers who report getting relief from painkillers. In a sense, Berry is insisting on a move toward what Barad has described as "performative alternatives to representationalism [that shift] the focus from questions of correspondence between descriptions and reality [...] to matters of practices/doings/actions" (2003: 802). For Berry, the therapeutic effects of SenseCam images - or, more specifically, the therapeutic effects of believing that one is remembering - are more important: "Mrs. B tells us that SenseCam not only helps her memory but it makes her feel better. [...] She's less anxious because she's got a device to help her remember - because it's pretty bloody terrifying, actually, to be living in a world where you haven't got a memory." Again, for Berry, it is a matter of rehabilitation. She explained that her job is to help her patients achieve their goals. Mrs. B's goals are to be able to remember past events and to recognize her friends. Mrs. B's husband's goals are to share experiences with his wife. What Berry is concerned with is the personal wellbeing of her patients, as opposed to "empirical proof" of whether or not they are remembering accurately. Whether Mrs. B's recollections reflect past events or not, Berry underscores the importance of how Mrs. B and her husband are affected in their daily lives by their memory-supporting device.

Nonetheless, researchers at Microsoft, including Berry and her team, have been very enthusiastic about cognitive science research using SenseCam that would support their findings. Berry grunted as she sifted through numerous e-mails on her desktop, looking for a specific paper that reported on a recent imaging study. She eventually gave up trying to find the paper and proceeded to sum up the investigation: Berry acknowledged that SenseCam offers an "evidence-based way of reviewing" the past and that the spaced rehearsals seem to offer a way of continuously re-encoding it. But researchers sought to distinguish the kind of memory that was being triggered through the use of the device. Was the experience of remembering for the amnesiac an experiential one (what computer scientists and psychologists term episodic memory), or was it a factual one (what they call semantic memory) (Hodges, et al. 2006)? In other words did the patient remember after viewing images of her day, or did she simply know what activities she had done? The autobiographical memory with which one constructs a sense of subjectivity through the recollection of past events seems to differ from the functional memory involved in finding one's car keys for example. And this points to yet another problem, does one need to represent the actual experience in order to support its recollection? By what means does data evoke the experiential? And what kind of evidence is there for remembering?

To answer some of these questions, and to figure out whether Mrs. B was simply learning the images or genuinely remembering, the scientists turned to functional magnetic resonance imaging (fmri). They designed a study in which Mrs. B was asked to wear a SenseCam over the course of three different trips. Each trip was a two-day stay

away from home to a place she had not been before, staying in a hotel overnight. Following the first trip, Mrs. B was asked not to look at any of the SenseCam images, and her husband was asked not to talk much about the event. After the second trip, she was asked to review those pictures every two days over the course of two weeks. During the third trip, she was asked to keep a written diary that she subsequently reviewed every day for two weeks. The experimenters then scrambled all the images, adding some from a trip that she had not been on. In the scanner, Mrs. B was asked to review the images and press a button when she recollected the event, another button when an image looked familiar, and another when she had no recollection whatsoever.

The results showed that the novel images, the ones that belonged to someone else, were completely unfamiliar to her, as were the images from her first trip. Moreover, she showed much better recollection with the SenseCam images she had studied than with her written diary. When the researchers looked at the scans, they found that the SenseCam images activated parts of the brain thought to be involved in autobiographical memory. Having now collected "more objective evidence" that Mrs. B does not remember events unless she uses the SenseCam and studies the resulting images, Berry and her team felt able to make the claim: "SenseCam does support memory." To further qualify this evidence, Berry explained that the parts that were activated in the brain were those associated with episodic memory (associated to past events), and not semantic memory (associated to knowing the name of the president, for example), proving that Mrs. B was not just "learning" the images.

But, asking Mrs. B whether she recognizes her own past in images of her past reifies what Barad sees as the "ontological distinction between representations and that which they purport to represent" (2003: 804), the ontological distinctions that Wolfe's posthumanism proposes we move beyond. These memory scientists' approach leads to concerns about the accuracy of representations, and in doing so reifies the boundaries from which these questions emerge.[57] The fact that one proves the efficacy of image-based SenseCam with imaging devices such as fmri is of course not only tautologically representational, it is part of what Regula Valérie Burri calls the "visio-technoscientific" regime that seeks to make bodies predictable, stable, fixed, and productive vessels of biomedical knowledge (2007). SenseCam images are made to instantiate biomedical power through the accumulation of fmri images of remembering human brains.

Posthumanist Assemblages

[...] so here artificial memory operates by means of a creation of spaces that will be filled by a process of selection and retention, disjunction and re*place*ment. [...] for it is such a process of disjunction and replacement that defines the artificial or prosthetic. - David Wills

In the previous chapter, through Bell's quest for a self-governed productive life brought about by devices such as the SenseCam, we have noted how certain technological memory practices help reproduce a liberal free-thinking humanist subject (Rose 2007). But these networks of machines and humans might bring us closer to what Hayles considers properly posthuman through a displacement

> by technoscientific articulations of [...] autonomy, free will, rationality, individual agency, and the identification of consciousness as the seat of identity. The posthuman, whether understood as a biological organism or a cyborg seamlessly joined with intelligent machines, is seen as a

[57] In other words, so far, we are still very representational.

> construction that participates in distributed cognition dispersed throughout the body and the environment (Hayles 2005: 245).

This distributed cognition Hayles describes occurs with the help of the SenseCam for Mrs. B, and through the use of biomedical technologies such as fmri for the scientists who seek to see memory at work. But I'd venture to say that rather than displacing the human, Hayles' notion of posthumanism still rests on the human's ontological distinction from, and extension through, technology and its environment. Instead, how might we approach this prosthetic distribution as a mode of intra-actively becoming, a mode that leaves room for immanent distinctions between the human and its environment (Barad 2003, Luhmann 1998)?[58] As Donna Haraway describes with her anticipated cyborgs, "any objects or persons can be reasonably thought of in terms of disassembly and reassembly; no 'natural' architectures constrain system design" (2000: 365). The documenting cyborg represents the breaking of boundaries between self and other, or self and environment. Nature becomes a synthetic domain and the prosthetic is presented neither as a supplement, nor as an extension of the organic human body, but rather, the prosthetic as human body.

By examining the case of Mrs. B, I acknowledge that prosthetic technologies are inexorably linked to an ontology of the normal versus the pathological. But more importantly, in what may seem at first glance paradoxical, through the case of this amnesiac, I want to expand the perspective that we are condemned to ontological reversals that simply reveal the constructedness of our pathologized bodies, naturalizing

[58] As Chris Kelty once told me: "it seems that part of the implicit ethical imperative behind this work is that we have to care as much about the human-machine as we do about either humans or machines. It's cyborg science."

(in utopian and enthusiastic fashion) the prosthetic in the process.[59] By thinking of memory as an immanent response to noise, or complexity (Luhmann 1998), I want to offer a formulation of the prosthetic, or of technologies of enhancement, that are not initially, nor markedly, grounded in the 'pathological,' but rather in the ways we conceive of things (our bodies and machines, the past and the present) as coming together. This demands a certain rethinking of the posthuman and the prosthetic that goes beyond the extension of the human body (and beyond Hayles' notion of distributed cognition). Wolfe's work on posthumanism offers such a rethinking. He suggests that in order to attend to our said humanness, we must first acknowledge that the human "is fundamentally a prosthetic creature that has coevolved with various forms of technicity and materiality, forms that are radically 'not human' and yet have nevertheless made the human what it is" (2010: xxv). And as he rightly points out, this rethinking has profound ethical implications in how we construe our relationships with, and toward, non-humans.

To start, let us distinguish posthumanism from transhumanism, as these two currents are often confounded but have radically different implications. On the one hand, transhumanism is a movement engaged in the augmentation of human capabilities, often seeking to transcend material and bodily limitations. Or as Kelty puts it, a movement "that despises the present for its intolerably slow descent into the future of immortality and superhuman enhancement" (Kelty 2008: 93). This enhancement is premised on the promise of technological advancements. On the other hand, posthumanism remains more or less ambivalent toward technological gains per se as a means to utopian progress.

[59] Tarek Elhaik has offered timely and pointed provocations for rethinking the pathological in light of new media and experimental cinema (2008, 2011).

Often mistaken for posthumanism (or another meaning of posthumanism than the one I am getting at here), transhumanism can be seen as deriving from the industrial revolution, spurred by shifting relationships between humans and machines that have led both humans and machines to be construed as parts of larger mechanical modes of production. Andy Miah, researcher in the fields of ethics and emergent technologies, sees Darwin's "biological humanism" as also having "allowed the human to be reduced to a level of mechanics, a view that pervades contemporary understanding about being human" (Miah 2007: 13). Going further back still, Wolfe considers this mode of thought as stemming "directly from ideals of human perfectability, rationality, and agency inherited from Renaissance humanism and the Enlightenment" (Wolfe 2010: xiii). Transhumanism might in this case be considered an extension of humanism.[60]

As they seek, through technology, to enable an all-knowing, all-remembering subject that transcends the realms of materiality and embodiment, several of the Memories for Life researchers we have discussed, such as Bell and Wilks, situate themselves squarely within these transhuman realms. While Hayles' criticizes (as we have seen in chapter two) this abandonment of matter and the body, Wolfe's elaboration of posthumanism doesn't rest at nostalgia for an embodied subject. Rather than framing posthumanism through questions of embodiment proper, through the work of Derrida and Luhmann, Wolfe emphasizes the role of difference (Derrida 1976) and information (Luhmann 1995, 1998) in the elaboration of a posthumanist subject. As we have seen in

[60] For Chris Kelty, however, transhumanism "is a radically *anti*humanist position in which human agency or will - if it even exists - is not ontologically distinct from the agency of machines and animals and life itself" (2008: 93). It is transhumanism's depiction of the inevitability of technological progress (despite humans themselves) that brings Kelty to characterize this movement as antihumanist.

previous chapters, information for Luhmann is the functional emergence of distinctions that occur in the parsing of complexity.[61] In a critique of Hayles' reliance on historicity in the articulation of a *post*something, Wolfe refuses to situate posthumanism as something that simply comes *after* the human (2010: 121). Instead, posthumanism represents a way of rethinking, both immanent and noisy, about the very distinctions humanism relies on. This immanent view can be achieved when one understands that the distinctions between the self (observer) and the outside world (reality), or between humans and machines, are in fact the products of self-reference (Luhmann 1998).

Mrs. B's experience of involuntary memory can offer such a perspective. The event of memory for her is the moment when the SenseCam images separate the past from the present. For Luhmann, events "occur only once and only in the briefest period necessary for their appearance (the 'spacious present')" (1995: 67 quoted in Wolfe 2010:10). It is the moment when things take shape. "[I]nformation is nothing more than an event that brings about a connection between differences" (Luhmann 1995: 75). This said, the period, or event, "has a conferred, not an ontological character" (48). Following Luhmann's pull away from the question of the ontological, what I am arguing for is not a view that says that the past, or historical objective facts don't exist. Rather, that they can only be gleaned from within the (spacious) present. It is at the moment of the event that we may locate these distinctions. In David Wills words, artificial memory opens up a space in which "a process of selection and retention, disjunction and re*place*ment" takes

[61] We might argue then, à la Derrida, that we became posthuman with the invention of language; or à la Latour, that we have never been human.

place (Wills 1995: 230). Wills locates the prosthesis precisely at that this disjuncture, this threshold, this event:

> [P]rosthesis treats of whatever arises out of that relation, and of the relation itself, of the sense and functioning of articulations between matters of two putatively distinct orders: father/son, flesh/steel, theory/fiction, translation/quotation, literal/figurative. familiar/academic, rhetoric/medicine, rhetoric/cybernetics, French/English, nature/artifice, public/private (Wills 1995: 10).

To this list I would add humans/machines, presents/pasts, memories/images.

The relationship between posthumanism and notions of pathology or enhancement is, then, not about the history of technology, nor about moralizing opinions about how to use technology as therapy per se (although these debates are invariably shaped by the ways we have come to distinguish the human from animals and from non-living entities).[62] Instead, this relationship, and these technologies, bring to the fore the contingent ways we construct the very notions of transformation, plasticity, otherness and humanness. In sum, these technical objects, and our relationships with them, point to the instability of what we consider *natural*. It is in this sense that Wolfe argues that "*persons aren't persons*" (2010: 119). Political scientist Francis Fukuyama, once a member of the United States President's Council on Bioethics, argues that changes in what we consider human nature will invariably "change democracy and the nature of politics itself" (2002: 7). He subsequently argues for a more stable concept of the human (a concept that posthumanism in fact threatens). Instead of questioning the distinctions that the very notions of enhancement are based on, Fukuyama's "use of the word posthumanism is

[62] Fukuyama (2002), Graham (2002), Miah (2007) and Stock (2002) have addressed more directly, in more detail, and along different respective lines, policy questions relating to bioethics and human enhancement.

expected to do the work of establishing what is immoral about human enhancement" (Miah 2007: 5). But posthumanism is interesting for what it has to offer methodologically, not morally. I'd like to argue that a destabilization of what we consider "human nature" is precisely what needs to occur. In other words, the interesting questions aren't so much whether recording technologies allow for more objective and enhanced views of ourselves, of our memories or of the past, nor whether they will help us achieve immortality, nor whether these are good or bad occurrences. Of interest is how these technologies help us see prosthesis, or in Luhmann's terms, *conferred, functional and immanent* distinctions, to begin with. And as Faubion points out, it is

> anthropologically imperative and in good accord with Foucault's precedent not to conceive of the subject position within a mechanical model whose variables are finite and definite and whose systematic transformations are strictly determinable [... Foucault] rather gives a privileged place to change, and especially to change generated through processes of problematization, of putting into question the taken for granted, including what the subject might unreflectively take for granted about itself (2011: 45, 46).

Again, as we have noted in the previous chapter, Foucault's elaboration of Greek technologies of the self can be seen as a form of "self-intervention, of autopoiesis, of the self's production of itself." As such, he brings forth a "'practice-oriented' nature of ancient ethics" (Faubion 2011: 48). Despite the fact that "the coding of ethical value does not license the reduction of the ethical subject to its or her or his practice [... or] to the circumstances of [a value's] use," we might do well to look less at whether these technologies mirror the past, and focus more on the problematization of what they actually do, on their operational value (in relation to complexity), as Berry seems to be getting at (we will focus more on the implications of such a shift in the following

concluding chapter) (Faubion 2011: 103). By focusing on what these tools do, Berry and her team come closer to creating memories *for* life, rather than memories *of* life.[63]

The Experience of Memory

I want to end this chapter by asking what it would mean to move beyond discussions about having a memory (memory as ontology) to discussions about experiencing memory (memory as practice, or memory as an event)? In 2006, a psychology professor at Rice told me that without the use of medical imaging, his research was not deemed scientific or publishable. Regrettably, he explained, he did not view imaging as a proof-producing apparatus. He considered it a metaphor. "Other researchers see memory as a box and you shove things into it. I don't even conceptualize where it is. *It's a state of mind*," he announced. For him, memory was about experience rather than a place in the brain. He then reminded me that if he took my heart out, my memory would stop as well.

[63] Nietzsche, in a pull away from the modernist predicaments that allow an inner self to be externalized and objectified, situates the person as a *tabla raza* to be constructed using building blocks of memory. Thus, he warns against the uses and abuses of history and memory in the shaping of man. In a near glorification of amnesia, Nietzsche puts forth the idea of history *for* life which would replace the assumption that one can know the past scientifically and objectively and from it draw laws for life. Rather, (and perhaps too eagerly), he prefers the "unhistorical" in order to accommodate the plasticity of man in the service of life. History must be at the service of life "and only if history can endure to be transformed into a work of art will it perhaps be able to preserve instincts if even evoke them [...]" (1997: 96). With a will to power, to become a creator, Nietzsche assigns man the power to ascribe meaning to the past in the present. That is to say that the self is created by ascribing a timeless quality to past events, as though they were to recur eternally. Nietzsche's famous notion of eternal return discussed in several of his texts concerns the rejection of a chronological view on life for one in which past, present and future collapse into a single eternal moment. For Nietzsche, this perhaps paralyzing idea becomes acceptable in the rejection of certainty and absolute knowledge. For Nietzsche, the idea of a self, unified, by memory and history, is abandoned in favor of a de-centered self who actively forgets and rebuilds himself.

Rather than approach Memories for Life technologies - from MyLifeBits software, to SenseCams, to fmris - as determined inscription devices, we might consider them as what Barad terms *apparatuses:* "neither natural probes of the natural world nor structures that deterministically impose some particular outcome" (2003: 816). As part of an "apparatus of observation," memory remains flexible in its becoming (815). A memory enacted, or memory as event, is then no longer seen as a discreet whole but rather as constantly shifting in its boundaries. It rests upon a notion of emergence or event (and here I include the emergence of temporality) that is ongoing and immanent. Once more, as with Proust's madeleine, memory is synesthetic, involving an intertwining of visual, aural, haptic, and even olfactory senses in measurement and treatment. It is part of a cyborg body, wherein the boundary between flesh, technology, and time is permeable.

As we have just seen, researchers who make up the Memories for Life network are working on different projects ranging from Total Recall, to historical archiving of first-person accounts, to helping amnesiacs share meaningful moments with their loved ones. All of these projects share a common premise: that memory is fallible and that it can and should be improved by the help of technology. Although some of these projects clearly stand in excess of what technology can currently do, they offer a technological cure for forgetting on both individual and social scales. In attending to our finitude, new memory technologies offer the dream of immortality. In attending to our goals of hyperproductivity, they offer "personal time-consultants." Finally, in attending to our inability to recognize places and faces, they offer gps tracking devices and SenseCams.

But in doing so, these recording technologies create a new symptom for scientists to cure, that is, the accumulation of too much information. This resulting problem of noise, however, is experienced differently depending on the various ways that memory is enacted. Separating the knower from the known, Bell's e-memory seeks to organize time as searchable and retrievable matter. For Mrs. B, however, the overwhelming amounts of collected information in the form of images insure that, amid the noise, something unexpected and unpredictable is bound to spark recollection. Noise, then, the logical conclusion of unregulated growth in information, is both the symptom and the cure for anxieties about losing the past.

Through Mrs. B's experience of involuntary memory, we can begin to articulate an account of remembering that does not take for granted transcendental access to matters of the past. This does not mean there is no possibility for objective remembrance but simply that exteriority can only exist within phenomena. While Bell's Total Recall project suggests that the past is out there, as a given, ready to be recorded, sorted, and subsequently tapped into whenever the need arises, Mrs. B's experience suggests that the past is always only within the present. In philosopher David Hoy's words: "If voluntary memory breaks the past and the present into separate domains, involuntary memory shows their more primordial immanence" (2009: 192). The experience of memory is not so much a bringing of the past into the present as "the making of spacetime itself" (Barad 2003: 817). Ultimately, then, Memories for Life scientists can still account for the objectivity of the data produced by their prototypical apparatuses such as the SenseCam,

while creating unpredictable agential cuts through which memory comes to exist materiodiscursively in the present.

So, instead of asking whether or not these technologies mirror reality or the past, I prefer to ask how they act, what they do, and whom they speak for. Memory technologies do not merely belong to the world of objects and representations. They are open to, and participate in, the distinction of concepts and affects while proposing new forms of temporality. I would like, then, to propose a shift from a representationalist argument about the bifurcation of nature (in this case, the objective reality of the ticking past and our subjective recollection of it) to a consideration of the ecologies of evidences we build and how they perform specific cuts through time (Barad 2033; Stengers 2010). We will examine in the next concluding chapter how instead of building tools with the purpose of reifying our existing concepts of subjectivity and temporality, we might let go of the problem of memory altogether. We will see how the distinctions objects create bring forth questions of emergence, contingency and creativity. We might also consider our own performative practices of writing as creating agential cuts, in this case, between two extreme temporalities, or modes of remembering and forgetting: Total Recall and complete amnesia.

5- Conclusions - Prototypes and Parasites:

In guise of a conclusion, this last chapter draws on the tropes of the prototype and the parasite in order to *think with* Memories for Life's emergent recording technologies. Parasites, as philosopher Michel Serres reminds us, disturb systems (Serres 2007, Wolfe 2007). They create noise. As parasites, prototypical recording technologies disturb our concepts of memory and forgetting. Rather than merely representing the past, these technologies also help shape our present and future. As such, they are performative rather than just representational or constative. They help create subjects along with new concepts and temporalities. Beyond their purely useful, or instrumental qualities, prototypical and parasitical technologies become tools to think with. They help create what Marcus has termed para-sites: spaces "where anthropologists and their interlocutors come together to discuss matters of common concern" (Kirksey and Helmreich 2010). They are spaces in which to perform horizontal collaborations in a transforming world (Marcus 2000). In a sense, parasites (disturbers of systems) help produce para-sites (places in which to reflect on the possible disturbances that occur within these systems). Seen in this light, this dissertation, in its attempt to evoke, depict and reconfigure old concepts might be considered a kind of parasitical prototype, a working tool to think with, to test ideas, and to generate new para-sites.

On the Uses and Ab-uses of Technologies for Memory

It's just we wanted, we needed something for the deployment which would kind of work in a general way. [...] So there were problems with it, it's not a kind of definitive answer, but it certainly found its uses. - Microsoft researcher

As noted in the introduction to this dissertation, since the 1980s, the field of design has placed a great deal of importance on the development of its user-centered approaches. Anthropologists, armed with their prized and precious fieldwork methods, have since become cherished additions to many design research teams. Fast moving engineers engage with the slow pace of anthropology so as to justify and make sense of their designs. With the help of Anthropology, they hope to gain insight into how to make more functional, useable, user-friendly objects, interfaces and spaces. It is in this context of coveted knowledge about the user that I, as a representative of the ethnographic trade, find myself with teams of computer scientists, engineers, designers, and psychologists. And as we have seen, throughout this dissertation I focus on research and design groups based in the UK. These interdisciplinary scientists come together as part of a nationally funded research project called Memories for Life. As part of this initiative, these researchers look to build better tools for human remembering (cameras, sound recorders, furry robots, and operating systems). I approach them because I want to know more about the makers of such memory tools. I want to unpack what happens when we come to realize that objects do not fall from the sky. They approach me because I can help them decipher the ubiquitous user.

While user-centered design has its many merits, over the course of fieldwork I began to wonder what would happen if we were to stray from this conventional notion of use. Would anthropology lose relevance? Has anthropology, embraced by user-centered design, become too timid to suggest anything other than *use* as a primary design concern? Or, that may be the wrong way of wording the question. What if the word *use* could be

made to mean more than a certain mode of employment or habit? Its etymology also suggests new ways of using use: use as practice, use as performance rather than instrumentality. What follows is an attempt to find another way of talking about design and anthropology's *use*ful attraction to each other. This chapter and dissertation end in a rough sketch that has come out of this thinking about use value. What I start to outline in conclusion to this conclusion is a certain refusal to conclude or to settle on our objects and concepts. This refusal comes in the shape of a prototype for a manifesto, an attempt to stray to the edges of usefulness, to step away from our *usual* task of being nuanced in order to adopt a more extreme position, because sometimes anthropology's job is to ask questions, to stir habits, to provoke.

**

As this dissertation has shown, we record and build objects to better know ourselves, and to make better use of our time and space, which we then fill with recordings, communications, and more objects. We design computing machines to make us more efficient. We connect them to a grid of standardized time in order to transmit our codes and move our bodies across vast distances.

This desire to better know ourselves is nothing new, as we have seen in the first chapter with the large-scale UK documentary endeavor the Mass-Observation Project that took place between 1937-1950. But as we have also noted by examining philosopher Walter Benjamin's Arcades Project, collecting comes with the problems of sorting and of

making sense of the things amassed. Held in constant tension between its identity as a work of art and a work of science, between its surrealist roots and statistical demise, the Mass-Observation Project, as well as the Arcades Project, sat at the intersection of poetry and pattern. The critiques of both these project we've examined, either on the part of philosopher Theodor Adorno toward Benjamin's "archive fever," or especially on the part of anthropologist Bronislaw Malinowski toward Mass-Observation, raise important questions as to how to situate one's self as observer and collector of everyday life. Here Luhmann with his cybernetic modes of observation begins to provide angles (informatic filters if you will) though which to begin to sort the overwhelming complexity we are faced with when capturing the infinitely particular.

By looking at the history of cybernetics and computing in chapter two, we have charted the formalization of matter and meaning into pure information, and how, over the course of particular historical moments, the past has become something to be turned into digital 0s and 1s. Through various Memories for Life projects, we have noted how everything around us is getting 'faster and smarter.' We couple with machines in the hopes of finding patterns, diagnoses, cures. We record everything our machines sense, lest any important clues fall outside of the archive, into an abyss of forgetfulness, or complete obliteration. We build nets to catch it all, all the information that can be kept, just in case: we trap sounds, distances traversed, books written and read, money spent, calories ingested, sentimental Kodak moments with loved ones, for later... always for later.

Gordon Bell from Microsoft captures everything he owns, everything sees, hears and says. We have discussed in more detail in chapter three Bell's ambition to spur the e-memory revolution using tools such as Microsoft Research's SenseCam, the wearable badge-sized camera equipped with light, temperature, and position sensors. Based on the sensors, this prototype determines when to take a picture and record information. This prototype has generated a tremendous buzz; capturing the public's imagination as the penultimate tool to seamlessly and ubiquitously (one doesn't even have to push a button to take a picture) upgrade our often dubious memories. *Never forget a place or face again!*

Memories for Life: A Future Commercial
When your wetware wears out,
or your Oliver Sacksed in an accident,
it won't be the end of the game.
You'll reload this blackboxed prosthetic memory,
restore everything as far as your last saved brain.
- AF Harold (bbc4 – Oct 04, 2007)

The SenseCam is also being used (among other things) to help people with memory loss such as Alzheimer's or amnesia. Chapter four focused on this other SenseCam user, Mrs B., an amnesiac who forgets events after about two days. While Bell from Microsoft is not an amnesiac, nor has Alzheimer's, both he and Mrs. B. share the desire for a better, more perfect memory. By logging every moment of their different lives with the SenseCam, they both hope to be more efficient people. Bell wants a flawless memory so that he can be a healthier more productive human being. He also hopes that his archive will become a sort of treasure chest for his children and grandchildren to sift through. As for Mrs. B, she simply wants to be able to share memories of past events that she can no longer recall with her loved ones. Through Foucault's work on technologies of the self,

Luhmann's emphasis on information as necessary functional distinctions that help us deal with complexity, Faubion's attention to the ethics of subject formation, as well as Wolfe's elaboration of posthumanism as a mode of thought, the case studies of Bell and Mrs. B have allowed us to reflect on problems of identity, temporality, clutter and noise. More importantly however, these thinkers and these technological prototypes have helped us consider how concepts such as these are never still.

Of interest here, is not to engage with the promise of perfect memory or of the possibility of storing our "selves," but to examine the ways prototypes embody ideas and hopes; and how they in turn debunk, complicate or reinforce those very ideas. In doing so, they often act as catalysts for fresh ones. There is an iterative quality to the prototype that implies intrinsic plasticity and rapid exchange between the world of concepts and the world of things, a rhythmic and temporal flux that separates it from mass-produced artifacts. Prototypes are tools to think with. They are particular and telling objects in that they represent at once the idealization of what is to be built as well as the rudimentary, necessarily incomplete experimental processes in which such building occurs. How might prototypes help us apprehend ways of knowing through making? Might crafting itself become a means for reflection, a way to elaborate further social, epistemological, and ethical issues? To address these questions, we turn to apparent design failures. We examine studies that involve lending the SenseCam to everyday users (ie: people who aren't necessarily inclined to pursue an e-memory revolution, nor that require the use of tools to remember their immediate past); and we look at the example of another Microsoft prototype that also specializes in storing the past.

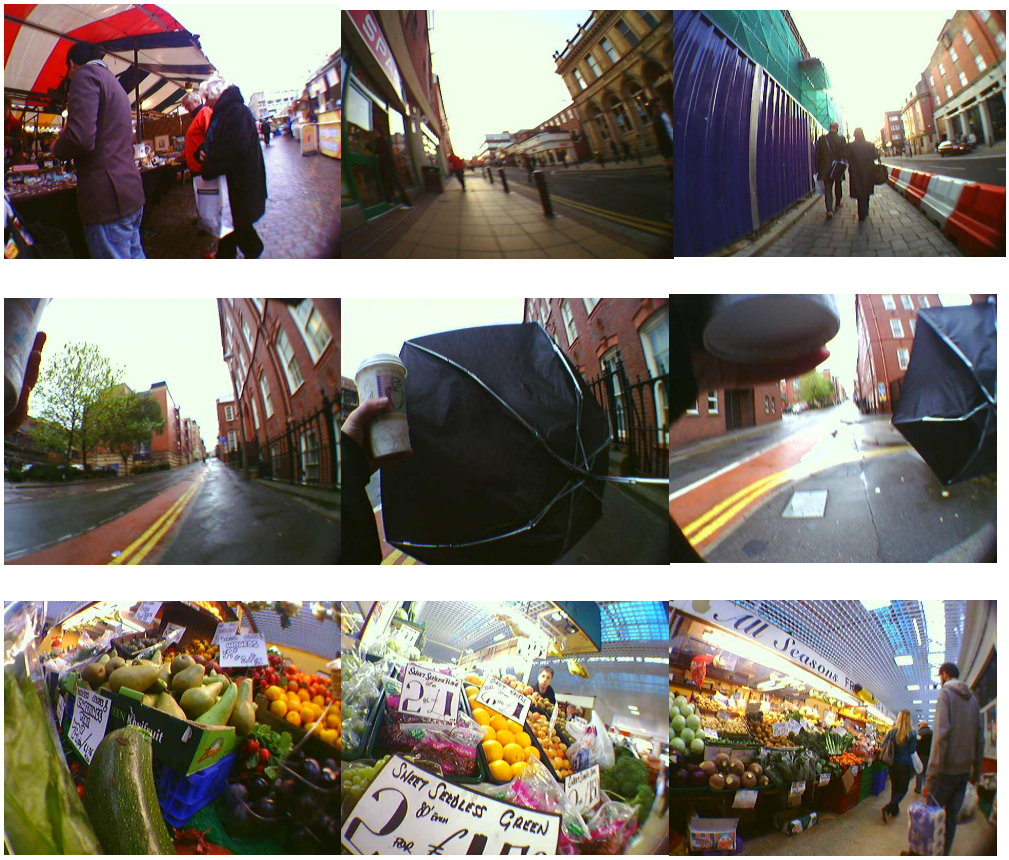

Figure 2
Images taken by Lina Dib using Microsoft's *SenseCam*.

As we have seen with the case of Mrs. B (chapter four), in several studies, Microsoft has shown that reviewing SenseCam pictures does help support patients with memory loss (Hodge et al. 2006). Yet, these memory-producing prototypes display certain conceptual contradictions. The term prototype connotes speculation and the future; prototype as prelude, as anthropologist Marilyn Strathern suggests (2010: 16). But these up-and-coming objects specialize in generating a retrievable past. They are in a sense constructing the archeology of the future. The irony however comes with the problem of organizing and contextualizing the innumerable images captured by the

device. Faced with so much information, one wonders whether it would be less tedious to simply forget.

Since my participation in test uses of the SenseCam, I have never looked at my pictures in order to remember something I did or ate in the past (note: I'm not clinically amnesiac). However, I have enjoyed the aesthetic serial qualities of sequencing the images, and have occasionally indulged in revisiting random days from my past. The astounding volume of photographs makes it virtually impossible to predict which historical moment I will stumble upon. It feels like a little surprise every time I click on a file.

While the researchers behind the SenseCam conduct ethnographic studies, psychological questionnaires, and magnetic resonance imaging to claim that capturing thousands of images a day does indeed improve one's memory, I want to propose using ethnographic tactics to unearth other potential uses of such devices, uses that might stray from their initial design as prosthetic memory tools:

To start, let us play with this concept of *use*, or is it about intention?
Let us bring anthropology to design as a mode of attunement, a kind of listening and toying, rather than an instrumentalist justification (Nancy 2007; Stewart 2007). To be clear, I am not arguing for a pure return to form. What I want to emphasize is the generative, productive ambiguity of the object. It is *use*ful to quote Baudrillard:

> Functional perfection exercises a cold seduction, the functional

> satisfaction of a demonstration and an algebra. It has nothing to do with pleasure, with beauty (or horror), whose nature is conversely to rescue us from the demands of rationality and plunge us once more into an absolute childhood (not into an ideal transparency, but into the illegible ambivalence of desire) (1981, 188-189).

We are going adrift - for a moment allow us to *dérive*... Let us go back to the object before it became an object. Let us go further back than its justification in perfect memory. Let us pause at a prototypical moment where, just then and there, it could have been otherwise. Let us sit in the place of noise, where design is never still, where it can always be otherwise. Street signs that borrow from Jonathan Olivares' "Useless" exhibition chapters punctuate this noisy place (2011). They read: "Useless by Design" and "Useless is Up to the User." We find these street signs useful. It is at the intersection of "Useless by Design" and "Useless is Up to the User" - between design's intentions and design's appropriations - that the makers of the SenseCam teamed up with a professor of sociology from Manchester and the BBC Wales. These researchers decided to give the camera to ordinary (and not especially forgetful) users.

For a moment, a rich one in the research process, designers stepped beyond SenseCam's intended objective of providing a more functional human with a more perfect memory. Instead of naming the object a 'recollection tool' and testing for its efficiency, these designers took a more performative and playful approach. They left possibilities open for the SenseCam to enact other things than total recall and found that their device could be one that spurred creativity and made the familiar strange and poetic. Through the SenseCam images, people told stories about how they noticed their own lives and the world around them in ways they hadn't before. The designers took note of "how

conceptual frameworks and technological shifts can alter a perceived trajectory of some new device or set of devices [...] in new and exciting ways" (Harper et al. 2008). In fact, instead of creating digital traces that were analogous to users' memories,

> SenseCam data presented a picture of daily lives which was at once different to the one recollected by participants and yet brought a sense of wonder, depth and felt-life that was strangely enriching; furthermore, SenseCam data enabled participants to create artistic and evocative stories about prosaic activities that would not normally merit being recounted" (Harper et al. 2008).

Some even did so in non-linear ways, re-mixing images of the past based on aesthetics and story-lines rather than on the past "as it had occurred." Like a Surrealist practice of "tapping into the unrealized possibilities harboured by [...] ordinary life [...]" the familiar became strange and the mundane whimsical when framed behind the fish-eye lens of the camera (Sheringham 2006: 66). Others even tried tying the unit to a dog, and discovered the possibilities of seeing the world in new ways. The act of recording became "performative rather than merely constative" (82). Instead of attending to a preexisting cognitive framework where memory is stuff (or pictures) contained in the head (or laptop) and where more is always more, forgetting about memory as a driving concept, or design goal, helped SenseCam designers move from purely instrumentalist to more poetic and inventive approaches. When objects stray from their intended use, they become tools to think with rather than containers for pre-existing concepts. As Sherry Turkle puts it in her edited volume *Evocative Objects*, things can become "provocations to thought"(2007: 5).

Drawing on the analogy of a box filled with mementos, stored under the bed, or in the attic, Microsoft Research has also developed and tested a prototype they termed the Family Archive. The archive as a unit looked like a small wooden desk and consisted of an interactive touch interface, which was part screen, part scanner, and part digital storage for the scanned images. Using the family archive, test users could upload pictures and scan images of objects around their home for later retrieval. The system was intended to act as a practical tool to organize and archive family memories in a digital age. However, test users did not use the archive for organizing their photos into neat little digital boxes. They found the modes of ordering that the device offered were messy and hard to work with. But as French philosopher Michel Serres reminds us, "systems work because they do not work. Nonfunctioning remains essential for functioning" (2007: 79). Instead they played with it as an interactive tabletop for scrapbooking and storytelling, cutting, pasting and compositing images.

A function of these prototypes is to allow a kind of *dérive* (drifting) as encouraged by the Situationists. In the mid twentieth century, the Situationists International, an influential group of artists, thinkers and activists, promoted the deliberate construction of what they called a moment of life in which one might allow oneself to go off track, to "[...] drop their usual motives for movement and action, their relations, their work and leisure activities, and let themselves be drawn by the attractions of the terrain and the encounters they find there" (Debord 1996: 22). As such - and following Cary Wolfe's reading of the word "abuse", where "ab" signifies "away" - prototypes are technologies that can be readily "ab-used" not in the pejorative sense of mistreated, but treated rather

as vectors that move "away-from," tangential to, their preconceived outcomes (Wolfe 2007, xx).

What the makers of both the SenseCam and the Family Archive discovered through test uses was that they were supporting more than mere collection and recollection. They discovered that while they might be addressing practices in certain contexts (recording practices in contexts of forgetting), those same practices could also be generative of new contexts (recording practices in contexts of play and creativity). Their detailed field studies revealed that they had created instruments that touched on the generational obligations of organizing the past, the desire to store things out of sight, the possibilities for making art, for telling stories, and for surprising oneself and others. Although built with a specific purpose in mind - supporting memory and providing a solution to the problem of forgetting - these prototypes' were nonetheless imbued with possibilities. Untethered from their original function, prototypes are more like receptacles for potentialities than resolute objects in the world. When treated as receptacles, they foster innovation, imagination and creativity. To quote Serres: "Inventive thinking is unstable, it is undetermined, it is undifferentiated, it is as little singular in its function as is our hand" (1995: 34). Like Serres' hand, prototypes have the opportunity to become what they grasp. Thus the promise of the prototype is not so much that it does what it was built to do, but rather that it breaks free of its intended function while fostering a conjectural quality and embracing multiple futures.

One could liken prototypes to pesky parasites, in that they derange systems, they bring on noise. The parasite, the arrival of the third, disrupts organized dichotomies (in this case remembering and forgetting). And, beyond immaterial ideas, but shy of being finished products, these objects in becoming create productive para-sites for unleashing devices from intended results. Para-sites, as George Marcus describes them, are spaces of hyperaware horizontal collaborations in a transforming world (2000). The difference between *parasites* and *para-sites* is a productive and performative one. In a sense, *parasites* - disturbers of the system - help produce *para-sites* - places in which to reflect on the possible disturbances that occur within the system. Seen in this light, this dissertation in its attempt to evoke, depict and reconfigure old concepts might be considered a kind of parasitical prototype, a working tool to think with, to test ideas, and to generate new para-sites.

In 2010 the SenseCam can be said to have gone from prototype to product. Production rights have been purchased by Vicon, a company specializing in motion capture.[64] At 500£ each, they cater to academic and research markets. Vicon and Microsoft now host an annual SenseCam conference that brings together research on its applications. In doing so, they might be embracing what Jimenez and Estalell refer to as a "prototyping culture [...] where the experimental [...] shifts from knowledge-site to social process."[65] They might be creating a more 'seamful' approach to their designs,

[64] https://www.viconrevue.com/home.html
[65] In 2010 Christopher Kelty invited me to participate in a publication entitled *Prototyping Prototyping* in which many of these ideas were initially fleshed out. Unusually, this publication was designed to *precede* a conference in Madrid entitled *Prototyping Cultures: Social Experimentation, Do-It-Yourself Science and Beta-Knowledge*, organized by Alberto Corsín Jiménez & Adolfo Estalell and the Spanish National Research Council.

encouraging others to engage the device, propose modifications, and proactively spur on its evolution (Chalmers and MacColl 2003).[66] To adopt Serres' term prototypes are kinds of "quasi-objects," and iteration is key. With SenseCams being continually appropriated for reasons ranging from the construction of reliable, viewable histories for amnesiacs, to the creation of poetic visual narratives, the users may be taking a leading role in elaborating their eventual incarnations.

Prototype for a Manifesto

As "provocations to thought," and based on the discussion above, I will end this dissertation with ten design principles that I find useful in order to continuously and productively stray from *use* itself, that is to say that these are principles meant to stop us from stuffing things with preconceived concepts and outcomes, to instead let things fill us with new forms of life and thinking:

- **Design to provoke rather than to illustrate thought.**

  Do not design something "useable for an interpretative framework already established" (Highmore 2011: 167). In other words, instead of a design grounded in given practices of consumption, design to accommodate new practices.
- **Embrace objects not as things of your own making but as things that also make you.**

[66] Nerea Calvillo states it clearly: "P is often referred to as a singular and first item. But as everything comes out of a context and is an interpretation of previous elements, a P could be understood in plural, as a collection of tests, as a research process, and whose goal is not the production of an object but the production of knowledge" (2010: 38).

Design as a mode of *detournement*, a reorientation away from function.

Drift, drift and drift some more. Follow the Situationists and promote the deliberate construction of a moment of life in which you might go off track, "[...] drop [your] usual motives for movement and action, [your] relations, [your] work and leisure activities, and let [your]selves be drawn by the attractions of the terrain and the encounters [you] find there" (Debord 1996: 22)

- **Be artful.**

  Adopt a skateboarder's gaze and turn ramps, surfaces, railings and bumps in the road into challenging and enchanting obstacles on which to perform.

  Instead of justifying new objects with old habits, create news ways of looking. When Duchamp imported his objects into the art world, he blurred the boundaries between useful things and art, between everyday things and concepts, between things in one context and things in another. It is at this blurry junction that designers must make.

- **Be suspicious of neutrality and expertise.**

  Be ware of sticky habits and concepts.

  Never stick to design principles.

  "*[O]bjects are active life presences*" (Turkle 2007: 9 emphasis in original). As such, they should shift as contexts shift. **Even rocks shift. So too must design!**

- **T(h)inker with objects in processual ways.**

  Mine the everyday for moving rocks and build bridges with them.

  Like Levi-Strauss' bricoleur, arrange and re-arrange different contexts for use. As he reminds us, objects are both *goods* and *good* to think with (Turkle 2007).

- **Be critical, playful, open-ended, multilayered and ambiguous.**

Embrace John Cage's 'purposeless play' and Surrealisms renewal of seeing.

Don't make excuses. Just make.

Let the user break the object and remake it otherwise. Always look for how it can be otherwise.

- **Design for appropriation and seamfulness**

  Seams bring to the fore edges and gaps, but also overlays and connections between users and designs, and between purposes and unintended outcomes (Chalmers and MacColl 2003). Objects and their uses come into being through what Barad terms intra-actions. "Boundaries do not sit still," she writes. "It is through specific intra-actions that a differential sense of being is enacted in the ongoing ebb and flow of agency" (2003: 817).

- **Embrace prototypes as unfinished quasi-objects whose boundaries are never still.**

  Untethered from their original function, prototypes are more like receptacles for potentialities than resolute objects in the world. When treated as receptacles, they foster innovation, imagination and creativity. "Inventive thinking is unstable, it is undetermined, it is undifferentiated, it is as little singular in its function as is our hand" (Serres 1995: 34). Like Serres' hand, prototypes have the opportunity to become what they grasp. Thus the promise of the prototype is not so much that it does what it was built to do, but rather that it breaks free of its intended function while fostering a conjectural quality and embracing multiple futures.

- **Objects should be readily "ab-*use*d"**

  - not in the pejorative sense of mistreated, but following Cary Wolfe's reading of the word "ab*use*," where "ab" signifies "away," treated rather as vectors that move

"away-from," tangential to, their preconceived outcomes (2010: xx) .

- **Embrace DIY and hacker culture.**

  Applaud the user who put a SenseCam on his dog or on a kite, just to see what would happen. He saw the world in a new light.

  From now on, the user will also be known as the maker.

Bibliography:

Adorno, Theodor et al.
1980 Aesthetics and Politics. London: Verso.

Augé, Marc
2004 Oblivion. Trans. Marjolijn de Jager. Minneapolis: University of Minnesota.

Babbage, Charles
1838 Ninth Bridgwater Treatise, ch. IX. http://darwin-online.org.uk/converted/Ancillary/1838_Bridgewater_A25/1838_Bridgewater_A25.html, accessed March 10, 2013.

Barad, Karen.
2003 Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter. Signs: Journal of Women in Culture and Society 28(3): 801–31.

Bardini, Thierry
2000 Bootstrapping: Douglas Engelbart, Coevolution, and the Origins of Personal Computing. Stanford: Stanford University Press.

Barthes, Roland
1981 Camera Lucida: Reflections on Photography. New York: Hill and Wang.

Baudrillard, Jean
1994 Simulacra and Simulation. Ann Arbor: The University of Michigan Press.
1981 For a Critique of the Political Economy of the Sign. St. Louis: Telos Press.
2002 Structures of Interior Design (1968). *In* The Everyday Life Reader. Ben Highmore, ed. New York: Routledge.

Bell, Gordon, and Jim Gemmell
2009 Total Recall. New York: Dutton.

Benjamin, Walter
1968 Illuminations. Trans. Harry Zohn. Hannah Arendt, ed. New York: Schocken Books.
1978 Reflections. Trans. Edmund Jephcott. Peter Demetz, ed. New York: Schocken Books.
1999 The Arcades Project. Cambridge: First Harvard Press.

Bernard, H. Russell
1994 Research Methods in Anthropology: Qualitative and Quantitative Approaches. Walnut Creek, CA: AltaMira Press.

Borges, Jorge Luis
1962 Funes, The Memorious. *In* Ficciones. New York: Grove Press.

1998 Exactitude in Science. *In* Collected Fictions. New York: Viking Penguin.

Born, Georgina
1995 Rationalizing Culture: IRCAM, Boulez, and the Institutionalization of the Musical Avant-Garde. Berkeley: University of California Press.

Bowker, Geoffrey
2005 Memory Practices in the Sciences. Cambridge, MA: MIT Press.

Bowker, Geoffrey., and Star, Susan Leigh.
2000 Sorting Things Out: Classification and Its Consequences. Cambridge, MA: MIT Press.

Boyarin, Jonathan
1994 Space, Time, and the Politics of Memory. *In* Remapping Memory: the Politics of Timespace. Jonathan Boyarin, ed. Minneapolis: University of Minnesota Press.

boyd, Dannah and Kate Crawford
2012 Critical Questions for Big Data. Information, Communication and Society 15(5): 662-679.

Boyer, Dominic
2013 The Life Informatic: Newsmaking in the Digital Era. Ithaca: Cornell University Press.
2008 Thinking Through the Anthropology of Experts. Anthropology in Action. http://www.ingentaconnect.com/content/berghahn/antiac/2008/00000015/00000002/art00004.

Boym, Svetlana
2001 The Future of Nostalgia. New York: Basic Books.

Burri, Regula Valérie.
2007 Sociotechnical Anatomy: Technology, Space, and Body in the mri Unit. *In* Biomedicine as Culture: Instrumental Practices, Technoscientific Knowledge, and New Modes of Life. Regula Valérie Burri and Joseph Dumit, eds. New York: Routledge, 2007.

Bush, Vannevar
1945 As We May Think. Atlantic Monthly 176(1): 101–8.

Callon, Michel.
1986 Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay. *In* The Science Studies Reader. Mario Biagioli, ed. New York: Routledge.

Calle, Sophie and Jean Baudrillard
1988 Suite Venitienne/Please Follow Me. Seattle: Bay Press.

Calvillo, Nerea
2010 Infra(proto)types in the air. *In* Prototyping Prototyping. Christopher M. Kelty, ed. http://limn.it/issue/00/, accessed 26 Nov. 2011.

Carrithers, Michael, Steven Collins and Steven Lukes
1985 The Category of the Person: Anthropology, Philosophy, History. Cambridge UK: Cambridge University Press.

Carruthers, Mary
1997 Reading with Attutide, Remembering the Book. *In* The Book and the Body. Dolores Warwick Frese and Katherine O'Brien O'Keeffe, eds. Notre Dame: University of Notre Dame Press.

Chalmers, Matthew and Ian MacColl
2003 Seamful and Seamless Design in Ubiquitous Computing. *In* Proceedings of Workshop At the Crossroads: The Interaction of HCI and Systems Issues in UbiComp. 2003.

Clifford, James
1988 The Predicament of Culture: Twentieth-century ethnography, literature, and art. Cambridge MA: Harvard University Press.

Companions Project
2007 http://nlp.shef.ac.uk, accessed March 29, 2007.

Connerton, Paul
1989 How Societies Remember. Cambridge, UK: Cambridge University Press.

Crain, Caleb
2006 Surveillance Society: The Mass-Observation movement and the meaning of everyday life. The New Yorker. Sept 11.

De Certeau, Michel
1990 L'invention du Quotidien. Paris: Gallimard.

Guy Debord
1996 Theory of the Derive (1956). In Theory of the Derive and Other Situationist Writings on the City, Museu d'Art Contemporani de Barcelona, ACTAR Barcelona.

Deleuze, Gilles.
2000 Proust and Signs. Trans. Richard Howard. Minneapolis: University of Minnesota Press.

Delillo, Don

1986 White Noise. New York. Penguin Books.

Derrida, Jacques
1976 Of Grammatology. Trans. Gayatri Chakravorty Spivak. Baltimore: Johns Hopkins University Press.
1996 Archive Fever: A Freudian Impression. Trans. Eric Prenowitz. Chicago: University of Chicago Press.

Dib, Lina
2010 Of Promises and Prototypes: The Archeology of the Future. *In* Prototyping Prototyping. Christopher M. Kelty, ed. http://limn.it/issue/00/, accessed 26 Nov. 2011.

Dib, Lina, Steve Whittaker and Daniella Petrelli
2010 Sonic Souvenirs: Exploring the Paradoxes of Recorded Sound for Family Remembering," In Computer Supported Cooperative Work, ACM Press: 391-400.

Dix, Alan
2002 The Ultimate Interface and the Sums of Life? Interfaces 50: 16.

Dourish, Paul
2006 Implications for Design. Computer Human Interaction proceedings. ACM, Human Factors in Computing Systems.

Dourish, Paul and Graham Button
1998 On 'Technomethodology': Foundational Relationship between Ethnomethodology and System Design. Human-Computer Interaction, 13(4): 395-432.

Doyle, Richard
2003 Wetwares: Experiments in Postvital Living. Minneapolis: University of Minnesota Press.

Dreyfus, Hubert L. and Paul Rabinow
1983 Michel Foucault: Beyond Structuralism and Hermeneutics. Chicago: University of Chicago Press.

Dumit, Joseph
2004 Picturing Personhood: Brain Scans and Biomedical Identity. Princeton, NJ: Princeton University Press.

Dyson, George
2012 Q&A: Hacker Historian George Dyson Sits Down With Wired's Kevin Kelly. http://www.wired.com/magazine/2012/02/ff_dysonqa/all/1, accessed March 21, 2013.

Elhaik, Tarek
2008 Mutual Intrusions: Metalogue with Roger Bartra. Revista de Antropologia Social, University of Madrid, 18: 45-64.

2011 Ceci N'est Pas de L'Ethnographie: Errance des Formes de Vie Chez Renee Green / This is Not Ethnography: Errancy of life-Forms in the work of artist Renee Green. Routes-Roots: Studies in Visual Culture (1). http://www.roots-routes.org/?p=2182 accessed March 21, 2013.

Elliott, Carl
2003 Better Than Well: American Medicine Meets the American Dream. New York: Norton.

Faubion, James D.
2011 An Anthropology of Ethics. New York: Cambridge University Press.

Faubion, James D. and George E. Marcus
2009 Fieldwork Is Not What It Used to Be: Learning Anthropology's Method in a Time of Transition. Ithaca: Cornell University Press.

Firth, Raymond
1939 An Anthropologist's view of Mass-Observation. Sociological Review 31: 166-193.

Fischer, Michael M. J.
2003 Emergent Forms of Life and the Anthropological Voice. Durham, NC: Duke University Press.

Flickr
2007 http://www.flickr.com/groups/adayinthelife, accessed March 15, 2007.

Fortune, Kim
2001 Advocacy After Bhopal. Chicago: University of Chicago Press.

Foucault, Michel
1971 L'ordre du discours. Paris: Gallimard.
1982 L'Herméneutique du Sujet: Résumé du Cours au Collège de France. Paris: Ecole des Hautes Etudes en Sciences Socials / Seuil.
1986 The Care of the Self: The History of Sexuality. Vol. 3. New York: Random House.
Foucault, Michel
1994 Self-Writing (1982). *In* Michel Foucault: Ethics, Subjectivity and Truth. Paul Rabinow, ed. New York: The New Press.

Fukuyama, Francis
2002 Our Posthuman Future: Consequences of the Biotechnology Revolution. New York: Picador.

Galison, Peter
2003 Einstein's Clocks, Poincaré's Maps: Empires of Time. New York: Norton.

Gareau, Joel. Radical Evolution: The Promise and Peril of Enhancing Our Minds, Bodies - and What it Means to Be Human. New York: Random House. 2005.

Gemmell, Jim, Gordon Bell, and Roger Lueder
2006 MyLifeBits: A Personal Database for Everything. Communications of the Association for Computing Machinery 49(1): 88-95.

Geertz, Clifford
1973 Thick Description: Toward an Interpretative Theory of Culture. *In* The Interpretation of Cultures. New York: Basic Books.

Giddens, Anthony
1991 Modernity and Self-Identity. Self and Society in the Late Modern Age. Cambridge: Polity.

Gleick, James
2011 The Information: A History, A Theory, A Flood. New York: Pantheon Books.

Grosz, Elizabeth
2004 The Nick of Time: Politics, Evolution, and the Untimely. Durham, NC: Duke University Press.

Graham, Elain L.
2002 Representations of the Post/human: Monsters, Aliens and Others in Popular Culture. Manchester: Manchester University Press.

Halbwachs, Maurice
1992 On Collective Memory. Trans. Lewis A. Coser. Chicago: University of Chicago Press.

Haraway, Donna
1999 Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective (1988). *In* The Science Studies Reader, Mario Biagioli, ed. New York: Routledge.
2000 A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century (1985). *In* Feminist Theory Reader. Wendy Kolman and Frances Bartowski, eds. Mountain View: Mayfield Publishing Co.

Harding, Susan, and Daniel Rosenberg
2005 Introduction. *In* Histories of the Future. Harding, Susan, and Daniel Rosenberg, eds. Durham, NC: Duke University Press.

Harper, Richard, David Randall, Nicky Smyth et al.
2008 The Past is a Different Place: They Do Things Differently There. Proceedings for Designing Interactive Systems. ACM Press.

Harrisson, Tom, Humphrey Jennings and Charles Madge
1937 Anthropology at Home. The New Statesman and Nation. Jan 30.

Hayles, Katherine N.
1999 How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics. Chicago: University of Chicago Press.
2004 Flesh and Metal: Reconfiguring the Mindbody in Virtual Environments. *In* Data Made Flesh. Robert Mitchell and Phillip Thurtle, eds. New York: Routledge.

Highmore, Ben
2002 Everyday Life and Cultural Theory. New York: Routledge.
2011 Ordinary Lives: Studies in the Everyday. New York: Routledge.

Hubble, Nick
2006 Mass-Observation and Everyday Life: Culture, History, Theory. New York: Palgrave Macmillan.

Helmreich, Stefan
2000 Silicon Second Nature: Culturing Artificial Life in a Digital World. Berkeley: University of California Press.

Highmore, Ben. *Everyday Life and Cultural Theory.* New York: Routledge, 2002.

Hodges, Steve, Lyndsay Williams, Emma Berry et al.
SenseCam: A Retrospective Memory Aid. *In* Eighth International Conference on Ubicomp. 16–19 Sept. 2006. Orange County, CA.

Holmes, Douglas and George E. Marcus
2005 Cultures of Expertise and the Management of Globalization: Toward the Re-Functioning of Ethnography, *In* Global Assemblages. A. Ong and S. J. Collier, eds. Oxford: Blackwell.

Hoy, David Couzens.
2009 The Time of Our Lives: A Critical History of Temporality. Cambridge, MA: MIT Press.

Hunt, Jamer
2011 Prototyping the Social: Temporality and Speculative Futures at the Intersection of Design and Culture. *In* Design Anthropology: Object Culture in the 21st Century. New York: SpringerWien.

Huxley, Julian
1937 Forward. *In* Mass-Observation. Madge, Charles and Tom Harrisson, eds. London: Frederick Muller.

Huyssen, Andreas

2001 Present Pasts: Media, Politics and Amnesia. *In* Globalization. Arjun Appadurai, ed. Durham, NC: Duke University Press.

Hyman, Anthony (1985). Charles Babbage: Pioneer of the Computer. Princeton University Press. pp. 136–142.

Jeffery, Tom
1999 Mass Observation: A Short History. Mass-Observation Archive Occasional Paper 10. University of Sussex Library.

Jennings, Humphrey
1985 Pandaemonium 1660-1886: The Coming of the Machine as seen by contemporary observers. Jennings, Mary-Lou and Charles Madge, eds. London: Andre Deutsch

Jennings, Humphrey and Charles Madge (eds.)
1937 May the Twelfth: Mass-Observation Day Surveys 1937 by Over Two Hundred Observers. London: Faber and Faber

Jennings, Mary-Lou
1985 Humphrey Jennings and This Book. *In* Pandaemonium 1660-1886: The Coming of the Machine as seen by contemporary observers. Jennings, Mary-Lou and Charles Madge, eds. London: Andre Deutsch

Kalnikaité, Vaiva and Steve Whittaker
2007 Software or Wetware?: Discovering When and Why People Use Digital Prosthetic Memory. *In* Computer Human Interaction.

Kelty, Christopher
2008 Two Bits: The Cultural Significance of Free Software. Durham, NC: Duke University Press.

Kirksey, Eben and Stefan Helmreich
2010 The Emergence of Multispecies Ethnography. Cultural Anthropology 25(4): 545-576.

Kittler, Friedrich A.
1999 Gramophone, Film, Typewriter. Trans. Geoffrey Winthrop-Young and Michael Wutz. Stanford: Stanford University Press.

Landecker, Hannah
2007 Culturing Life: How Cells Became Technologies. Cambridge: Harvard University Press.

Latour, Bruno
1987 Science in Action: How to Follow Scientists and Engineers through Society. Cambridge, MA: Harvard University Press.

2005 From Realpolitik to Dingpolitik or How to Make Things Public. *In* Making Things Public: Atmospheres of Democracy. Bruno Latour and Peter Weibel, eds. Cambridge, MA: MIT Press.

Latour, Bruno, and Steve Woolgar
1986 Laboratory Life: The Construction of Scientific Facts. Princeton, N.J.: Princeton University Press.

Leiris, Michel
1981 L'Afrique Fantome (1934). Paris: Gallimard

Lessin, Samuel
2011 The Facebook Blog. "Tell Your Story with Timeline." 22 Sept. 2011. http://www.facebook.com/blog.php?post=10150289612087131.

Luhmann, Niklas
1995 Social Systems. Trans. John Bednarz Jr. and Dirk Baecker. Stanford: Stanford University Press.
1998 Observations on Modernity. Stanford: Stanford University Press.

MacClancy, Jeremy
1995 Brief Encounter: The Meeting, in Mass-Observation of British Surrealism and Popular Anthropology. Journal of the Royal Anthropological Institute, 1(3): 495-512.

Madge, Charles
1937 Letter to The New Statesman and Nation, Jan 2.
1985 Editorial Tasks and Methods. *In* Pandaemonium 1660-1886: The Coming of the Machine as seen by contemporary observers. Jennings, Mary-Lou and Charles Madge, eds. London: Andre Deutsch

Madge, Charles and Tom Harrisson
1937 Mass-Observation. London: Frederick Muller.
1938 First Year's Work 1937-8. London: Lindsay Drummond.
1939 Britain by Mass-Observation. Harmondsworth Middlesex: Penguin Book Limited

Malinowski, Bronislaw
1922 Argonauts of the Western Pacific. London: G. Routledge & Sons, ltd.
1938 Afterward. *In* First Year's Work 1937-8. Madge, Charles and Tom Harrisson, eds. London: Lindsay Drummond.
1954 Baloma: the Spirits of the Dead (1916). *In* Magic, Science and Religion and Other Essays. New York: Doubleday Anchor Books.
1960 A Scientific Theory of Culture (1944). *In* A Scientific Theory of Culture and Other Essays. New York: Oxford University Press.

Manovich, Lev
2011 Trending: the promises and the challenges of big social data. *In* Debates in the

Digital Humanities. M. K. Gold, ed. Minneapolis: The University of Minnesota Press. http://www.manovich. net/DOCS/Manovich_trending_paper.pdf , accessed March 21, 2013.

Marcus, George E.
1993 Introduction. *In* Perilous States: Conversations on Culture, Politics, and Nation. George. E. Marcus, ed. Chicago: University of Chicago Press.
1998 Ethnography Through Thick and Thin. Princeton, NJ: Princeton University Press.
2000 Para-site: a Casebook Against Cynical Reason. George. E. Marcus, ed. Chicago: University of Chicago Press.
2010 Para-site: a Prototyping Culture of Method. *In* Prototyping Prototyping. Christopher M. Kelty, ed. http://limn.it/issue/00/, accessed 26 Nov. 2011.

Marcus, Laura
2001 Introduction: The Project of Mass-Observation. New Formations 44: 5-19.

Marker, Chris
1982 Sans-Soleil. 99min. Argos Films.

Mass-Observation
1940 War Begins at Home. London: Chatto and Windus

Massumi, Brian
1995 Interface and Active Space. *In* the Proceedings of the Sixth International Symposium on Electronic Art, Montreal. http://www.anu.edu.au/hrc/first_and_last/works/interface.htm, accessed March 21, 2013.

Mauss, Marcel
1985 A Category of the Human Mind (1938). Trans. W.D. Halls. *In* The Category of the Person: Anthropology, Philosophy, History. Carrithers, Michael, et al., eds. Cambridge UK: Cambridge University Press.

Mayer-Schönberger, Viktor
2009 Delete: The Virtue of Forgetting in the Digital Age. Princeton, NJ: Princeton University Press.

Mayer-Schönberger, Viktor and Kenneth Cukier
2013 Big Data. London: Hodder & Stoughton.

Moyer, Michael
2012 Is Space Digital? Scientific American, Feb 2012.

McLuhan, Marshall
1964 Understanding Media: The Extensions of Man. Vol. 1. New York: McGraw-Hill.

Memories for Life

2008 Road Map for Memories for Life Research, 1st January, 2008. http://www .memoriesforlife.org/downloads/M4L_ROAD_MAP_2008.pdf, accessed 3 Jan. 2012.
2011 http://www.memoriesforlife.org, accessed Nov. 26. 2011

MyLifeBits
2005 http://research.microsoft.com/barc/mediapresence/MyLifeBits.a spx, accessed April 10.

Miah, Andy
2007 Posthumanism: A Critical History. In Medical Enhancements and Posthumanity, Bert Gorgijn and Ruth Chadwick, eds. New York: Routledge.

Morgan, Lewis Henry
1985 Ancient Society (1877). Tucson: University of Arizona Press.

MyLifeBits. http://research.microsoft.com/barc/mediapresence/MyLifeBits.aspx (accessed 26 Nov. 2011).

Nancy, Jean-Luc
2007 Listening. New York: Fordham University Press.

Negroponte, Nicholas
1995 Being Digital. New York: Alfred A. Knopf.

Nietzsche, Friedrich.
1997 Untimely Meditations. Trans. R. J. Hollingdale. Cambridge, UK: Cambridge University Press.

Nora, Pierre
1995 Between Memory and History: *Les Lieux de Mémoire*. *In* Histories: French Constructions of the Past. New York: The New Press.

O'Hara, Keiron, Richard Morris, Nigel Shadbolt, et al.
2006 Memories for Life: A Review of the Science and Technology." Journal of the Royal Society Interface 3(8): 351–65.
Olivares, Jonathan
2011 Useless: An Exploded View. Portuguese Design Biennial EXD'11/Lisboa & MUDE

Pandolfi, Mariella
1993 Le Self, le corps, la 'crise de la présence.' Anthropologie et Sociétés 17(1-2): 57-77.

Petrelli, Daniella., Villar, Nicolas., Kalnikaite, Vaiva., et al.
2010 FM Radio: Family Interplay with Sonic Mementos. Computer Human Interaction,

ACM Press: 2371-2380

Plato
1973 Phaedrus and Letters VII-VIII. New York: Penguin.

Prerau, David
2005 Seize the Daylight: The Curious and Contentious Story of Daylight Savings Time. New York: Thunder's Mouth.

Rabinow, Paul
1996 Making PCR: A Story of Biotechnology. Chicago: University of Chicago Press.
2003 Anthropos Today: Reflections on Modern Equipment. Princeton, NJ: Princeton University Press.

Reddy, Deepa S.
2009 In Fieldwork Is Not What It Used to Be: Learning Anthropology's Method in a Time of Transition. Faubion, James D. and George E. Marcus, eds. Ithaca: Cornell University Press.

Rose, Nikolas.
2007 The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century. Princeton, NJ: Princeton University Press.

Romain, Tiffany
2010 Extreme Life Extension: Investing in Cryonics for the Long, Long Term. Medical Anthropology 29(2): 194–215.

Sanjek, Roger
1990 Fieldnotes : the makings of anthropology. Ithaca: Cornell University Press.

Scott, Joan
1991 The Evidence of Experience. Critical Inquiry 17(4): 773-797

Serres, Michel
1995 Genesis. Ann Arbor: University of Michigan Press.
2007 The Parasite. Trans. Lawrence R. Schehr. Minnesota: University of Minnesota Press.

Sheridan, Dorothy, with Brian Street and David Bloome
2000 Writing Ourselves, Mass-Observation and literacy practices. New Jersey: Hampton Press

Sheringham, Michael
2006 Everyday Life: Theories and Practices from Surrealism to the Present. Oxford: Oxford University Press.

Shweder, Richard A. and Robert A. Levine
1984 Culture Theory: Essays on Mind, Self, and Emotion. Cambridge: Cambridge University Press.

Sontag, Susan
1978 On Photography. New York: Dell Publishing.

Star, Susan Leigh, and James R. Griesemer
1999 Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39 (1989). *In* Science Studies Reader. Mario Biagioli, ed. New York: Rouledge.

Steigler, Bernard
2009 Technics and Time, 2: Disorientation. Stanford: Stanford University Press.

Stelarc
2000 From Psycho-Body to Cyber-Systems: Images as Post-Human Entities. *In* The Cybercultures Reader. David Bell and Barbara Kennedy, eds. London: Routledge.

Stengers, Isabelle
2005a Ecology of Practices and Technology of Belonging.
http://www.imbroglio.be/site/spip.php?article43, accessed April 28, 2008.
2005b Cosmopolitical Proposal. *In* Making Things Public: Atmospheres of Democracy.
Bruno
Latour and Peter Weibel, eds. Cambridge, MA: MIT Press.
2010 Cosmopolitics. Trans. Robert Bononno. Minneapolis: University of Minnesota Press.

Stevens, Wallace. The Collected Poem of Wallace Stevens. New York: Random House. 1990.

Stewart Kathleen
2007 Ordinary Affects. Durham, NC: Duke University Press.

Stock, Greg
2002 Redesigning Humans: Our Inevitable Genetic Future. New York: Houghton Mifflin.

Stocking, George W.
1983 The Ethnographer’s Magic: Fieldwork in British Anthropology from Tylor to Malinowski *In* Observers Observed. George W. Stocking, ed. Wisconsin: University of Wisconsin Press.

Strathern, Marilyn
2010 If I Were the Ethnographer. *In* Prototyping Prototyping. Christopher M. Kelty, ed.
http://limn.it/issue/00/, accessed 26 Nov. 2011.

Taylor, Charles
1989 Source of the Self: The Making of Modern Identity. Cambridge, MA: Harvard University Press.

Turkle, Sherry
1984 The Second Self: Computers and the Human Spirit. New York: Simon & Schuster.
2007 Evocative Objects: Things We Think With. Cambridge, MA: MIT Press.

Van Dijck, José
2007 Mediated Memories in the Digital Age. Palo Alto, CA: Stanford University Press.

Vicon. Homepage
2011 https://www.viconrevue.com/home.html, accessed 26 Nov. 2011.

Waldrop, M. Mitchell
2001 The Dream Machine: J.C.R. Licklider and the Revolution That Made Computing Personal. New York: Penguin Books.

Weber, Max
2003 The Protestant Ethic and the Spirit of Capitalism. Trans. Talcott Parsons. Mineola, NY: Dover.

Wilks, Yorick
2010 Close Engagements with Artificial Companions. Philadelphia: John Benjamins.

Wills, David
1995 Prosthesis. Stanford: Stanford University Press.

wills, david, "Jaded in America'" in Matchbook: Essays in Deconstruction. Stanford, California: Stanford U press. 2005.

Wolfe, Cary
2007 Introduction. *In* Michel Serres, The Parasite. Trans. Lawrence R. Schehr. Minnesota: University of Minnesota Press.
2010 What is Posthumanism? Minneapolis: University of Minnesota Press.

Wright, J. Lenore
2006 The Philosopher's "I." Albany: State University of New York Press.

Zerubavel, Eviatar
1982 The Standardization of Time: A Sociohistorical Perspective. American Journal of Sociology 88(1): 1–23.