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'What's in a List?' Cultural Techniques, Logistics, Poeisis

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Media Studies
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'WHAT'S IN A LIST?' CULTURAL TECHNIQUES, LOGISTICS, *POEISIS*

(Thesis format: Monograph)

by

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Abstract

This research explores the list as a cultural and communicative form. Inspired by the ubiquity of rankings, bullet points and registries in contemporary 'list culture,' and by Jack Goody's famous question 'What's in a list?' (1977), I ask: how can this seemingly innocuous form be studied? What does its analysis tell us about historical and contemporary media environments and logistical networks? What can studying this unconventional object bring to media studies?

I offer four intersecting arguments. The first proposes that media studies benefits from the incorporation of approaches and concepts that I group together as 'media materialism.' Approaches such as media archaeology, associated theories of cultural techniques, actor-network theory and logistical media studies give a more accurate account of media environments because they address more than the institutions, texts and audiences that are the traditional foci of North American media studies. The second argument presents the list as an example of what media materialism makes available. I position listing as a cultural technique that processes distinctions foundational to concepts and categories of social and imaginative life. The third argument proposes that lists cannot be easily dismissed or endorsed. Their complicated and often contradictory operations demand a precise tracing of how they function. The fourth argues that lists endure in our thoughts, texts, and programs because they negotiate tensions and paradoxes that have beguiled humans for centuries, e.g. between entropy and order or wonder and horror.

These arguments are developed in four chapters. The first traces the list as a format that structures knowledge in popular music. The second maps listing as a cultural technique of administration in Nazi Germany. I show the Nazi census to be a limit case of a way of seeing and doing, what I term a 'logistical worldview,' that can be traced to fifteenth century double-entry bookkeeping. The third explores algorithmic lists of code and protocol in digital culture. These function not only administratively but also in ways that reveal a poetic capacity. The latter is the focus of the final chapter, which

uses the words of Jorge Luis Borges and the images of Chris Marker to show the list as an imaginative form that clears a space for Heideggerian *poeisis*.

Keywords

Acknowledgments

A dissertation is a strange document. It emerges from a period of intense solitude that, if one is really lucky, has been preceded by a period rich with dialogue, collaboration and conviviality. It makes for a jarring transition, but I am grateful to have been so lucky. To all those below (and those I've overlooked) I extend my most sincere gratitude. Your words of encouragement and critique pushed me to be a better writer and thinker. Your love and support helped me to be a better friend and colleague.

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Table of Contents

List of Figures

1. Introduction – List Cultures[1]

*"Bare lists of words are found suggestive
to an imaginative and excited mind."*
        – Ralph Waldo Emerson

"We like lists because we do not want to die."
        – Umberto Eco

I begin with three lists from recent headlines:

March 2014—the governments of the United States and Russia engage in a tête-à-tête over Crimea that revolves, largely, around lists. An executive order from US President Barack Obama 'black lists' eleven officials of the Russian government as well as "any individual or entity that operates in the Russian arms industry, and any designated individual or entity that acts on behalf of, or that provides material or other support to, any senior Russian government official" (Carney 2014). In response, Russia releases a list of Americans no longer welcome in Russia for business, diplomatic or leisure purposes. Neither list proves effective in addressing the immediate issue of Russia's annexation of Crimea, but both are economical nuggets of information easily digested by the 24-hour news cycle.

April 2014—changes to the *Canadian Navigable Waters Protection Act* (NWPA), proposed by Stephen Harper's Conservative government in the 2012 omnibus budget bill C-45, take effect. The NWPA—an Act in which the default status for Canadian waterways was environmental protection under common law[2]— becomes the *Navigation Protection Act.* Waterway protection is reconfigured under the new act around economic interests and enforced by a new 'List of Scheduled

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[1] Aspects of this chapter are published in Young (2013a).
[2] The supreme court of Canada argued, for instance, that the Act is "aimed directly at biophysical environmental concerns that affect navigation" and that "the NWPA has [an] expansive environmental dimension, given the common law context in which it was enacted." (Supreme Court of Canada 1992, paras. 88-89.)

Waters.' This list denies protection to 99.7 percent of Canada's lakes and 99.9 percent of its rivers. Notable exclusions are the Kitimat and Upper Fraser Rivers, which lay along the path of the proposed Northern Gateway Pipeline. Notable inclusions for protection are cottage country lakes in BC and Ontario, where "powerboat owners will maintain unfettered navigation protections" (Ecojustice 2012, p. 7). Protection is now the exception. The crucial operator in this picture is the "List of Scheduled Waters."

October 2014—author Shaun Usher releases a new book, *Lists of Note,* that speaks to the "depth of [hu]mankind's obsession with lists" (Usher 2014). The book contains poetic and quotidian lists from historical figures both prominent and obscure. Some notable inclusions: Albert Einstein's list of conditions for the prolonging of his marriage to Mileva Maric (1914); Galileo's 1609 shopping list; a list of obejctions to his voyage aboard the HMS Beagle given to Charles Darwin by his father (1831); Johnny Cash's whimsical to-do list, most likely a love letter sent to June Carter-Cash (figure 1).

Figure 1: Johnny Cash's to-do list, date unknown (Julien's Auctions Beverly Hills, 2012).

These examples demonstrate how lists and rankings proliferate at every turn: online and offline; at work and at play; in politics and art; in 'high' culture and 'low' culture; in conversation and print. To-do lists, shopping lists, reading lists, bucket lists, no-fly lists; as Werbin says, "in lists we are" (2008, p. 1). Particularly in the cultural arena, recent years have seen an expansion of countdowns, rankings, and "best of the all-time" collections as the list has (re)emerged as a communicative device *par excellence*. Top-ten lists, listverse.com, amazon.com's "listmania," the *Listography* book series—and on and on and on...

Observing contemporary list culture begs the questions: why this explosion of lists, and why now? One's first instinct is to suggest it might have something to do with huge increases in the volume and velocity of data flows concomitant with the rise of digital culture, which seem to facilitate a shift toward the list as a mode of managing 'information overload.'[3] Certainly, both producers and consumers have turned to the list—the former to quickly communicate information, the latter to help navigate a perceived information deluge. In such a context, the list has proven an effective device by which to reduce noise in the communicative channel—the most important condition for any successful communicative act according to Shannon and Weaver (1949). Terranova (2004) demonstrates that such streamlined forms of communication have political implications, in that political action both rests upon and is delineated by the communicative forms and processes available to citizens. In networked society, she argues, the complexity of the world is broken down into what Baudrillard (1993 pp. 50-87) describes as 'the code'—a series of resolvable probabilities (yes/no, good/bad, us/them, important/unimportant, etc.), which are contained in and delivered by communicative forms such as the list. The list appears as perhaps the paradigmatic form of neoliberalism—the agent by which the logic of

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[3] Good examples of the ubiquity of the concept of 'information overload' can be found on its Wikipedia page (http://en.wikipedia.org/wiki/Information_overload). The popularization of the term is there attributed to Alvin Toffler's 1970 book *Future Shock,* in which the bulk of contemporary social problems are attributed to the psychological effects of information overload.

'programmability,' a term of Chun's (2011), structures and polices identities, selves, institutions, economies and governments alike through the measure, enumeration, and analysis of Big Data. Indeed, it appears that the list is, in Innisian language, a technique of knowing that facilitates the monopolization of knowledge and maintains the status quo.

Then again 'information overload' is not a phenomenon unique to digital or network cultures. As Blair (2011) points out, we have been complaining that there is 'too much to know' since at least the early modern period, but more probably since antiquity. "There are so many books that we lack even the time to read the titles," Italian bibliographer Anton Francesco Doni noted in 1550 (quoted in Krajewski 2011, p. 9). Nor is the administration of bodies by lists new, as the horrors of the Holocaust and the French Terror remind us. And the list itself is certainly not a new form—in fact the earliest surviving examples of writing are administrative lists inscribed on clay tablets by ancient Sumerians. These were both administrative (facilitating trade and other economic activity), and mnemonic (storing useful information about transactions and inventories). Such lists arose, according to Gelb (1952), as a result of the needs of public economy and administration.

Over time, more sophisticated uses for lists cropped up as societies of antiquity began to collect large numbers of texts in libraries such as Alexandria. Specifically, Blair shows, reference tools such as the *Pinakes* were developed which "built on preexisting practices of list making (including Aristotle's *pinakes* of poets), sorting (such as Theophrastus's doxographies sorted topically and chronologically), and alphabetizing" (2011, pp. 16-17). Later came the *florilegia* of medieval scholars— a note-taking technique that involved compiling notable excerpts from other texts— as a direct response to the early modern lament that there was 'too much to know.' In 1548, Konrad Gessner describes a technique of cutting up pieces of information on paper so as to re-arrange them, probably "the earliest account of conveniently generating extensive lists in alphabetical order" (Krajewski 2011, p. 4). Listing as a

technique and the list as a form show up in every bureacratic apparatus conjured by the moderns to address the needs of emergent institutions like the state, and later the corporation, and the list haunts the work of every great thinker of bureacracy and administration, from Weber to Latour.

Indeed, Blair (2011) and Goody (1977), among others (see LeGoff 1992; Werbin 2008; Eco 2009; Krajewski 2011), show us that the list stands alongside almost every new media technology and its corresponding 'flood' of information— from ancient administrative writing, through early modern manuscript culture, modern print culture, the analog world of gramophone, film, typewriter, and into the digital code of contemporary network society, where lists are not only ubiquitous at the interface level of web aesthetics, but also in giving form to protocols and algorithms. This being the case, the above preliminary hypotheses that regard the list as either a corollary of network society's so-called 'information overload,' or as a surreptitious agent of capital, are obviously not sophisticated enough to do justice to a form that exists in, or alongside, almost every inscription system on record.

How might we develop an approach that is more sympathetic to the historical persistence and malleability of the list? Even prior to this, how to bring a form such as the list into view as an object of analysis in the first place? Further, why bother? What can analysis of such a form bring to the field of media studies? I address these and other questions in what follows: an archaeology of the list form that traces its often contradictary operations in human socieities and technologies. I intend, at a disciplinary level, to offer a corrective to modes of analysis in media studies that conflate the multifaceted layers of form, content, technique, practice, and habit under totalizing categories such as 'media.' The list is not a medium, but travels amongst and through various media objects and ecologies. As such it offers a lens by which to observe many of the above factors that are black-boxed in conventional accounts of media.

More specific questions that guide this inquiry and illuminate the issues at stake include: how has the list functioned in different historical societies, and how can we understand its ability to survive multiple epistemological shifts? By collecting and materializing information, are lists constitutive of certain fields of knowledge? How do lists act upon such fields; that is, what kind of agency can be attributed to them? What are the ethics of the list, a form that has been complicit in the administration of human populations and in the rationalization of society more generally? Does list-making offer possibilities for cultural production and practice that can counter hegemonic systems of classification or ways of knowing? What is the role of the list in digital media environments, or in human artistic expression? Prior to all of these questions, however, stands a common refrain provoked by this research: what *is* a list?

What is a list, or, are we asking the right question?

The list is not easy to pin down. It is of course a communicative device, but can also be conceived as a cultural form, an operational mode of writing, a storage or archival device, a poetic form, and a mediator. It can be past, present, or future oriented; that is, retroactive, administrative, or prescriptive. Lists are sometimes registers that index, and other times metrics that rank and compare. Robert Belknap (2004) offers a useful preliminary definition: "At their most simple, lists are frameworks that hold separate and disparate items together. Lists are plastic, flexible structures in which an array of constituent units coheres through specific relations generated by specific forces of attraction" (p. 2). But even this definition, if we are trying to pin down what exactly a list *is,* seems hopelessly open-ended, inclusive of formats as diverse as taxonomies, recipes, rankings, inventories, catalogues, lexicons, etc. Belknap addresses this problem by making a distinction between *pragmatic* and *literary* lists. The former are quotidian lists of the everyday, enumerative containers that are concerned with the storage and retrieval of information and so do not mean

anything, at least in literary terms. Literary lists, on the other hand, "appeal for different reasons. [In them] we do not hunt for a specific piece of information but rather receive the information the writer wishes to communicate to us" (Belknap 2004, p. 7).

Streamlining definitional criteria in this way allows Belknap to offer a convincing case for what literary lists are and what they mean. But by limiting his focus to the literary, Belknap turns away from the majority of lists we encounter every day. The question remains of how to account for lists in administration, a realm where they have dwelled for thousands of years. We can adopt another of Belknap's strategies to do so. Just as he looks first at what lists *do* in literature before speculating about what they are or mean, so too must any project wishing to incororate pragmatic lists look toward function. In my view, starting with an essentialized definition of what a list is or means—or even using these as animating questions—shuts down the generative potential of analysis. It locks the researcher into a trajectory that in its quest for scientific accuracy leads only toward negation— the list is *not* that, the list is *only* this and never that. Consequently, I propose a more generative approach that starts not with the question of what a list is or means, but rather looks at what it does—how it functions in communication, administration, data processing and storage, and knowledge formation.[4] But prior to elaborating the theoretical and methodological frameworks of such an approach, it will be useful to survey the ways in which other thinkers have set about exploring lists and listing.

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[4] I am here taking up Bernd Frohmann's (2009) call for generative, experimental approaches toward documents and documentation "which have as their aims not so much the precision and accuracy of a scientific representation of what documents and documentation might be, but forging concepts in a Deleuzian spirit, seeking to enhance their power and force, with more concern for what they do than for what they mean or represent. The benefits of extending the concepts of document and documentation are located here, and with a closely associated aim, that of multiplying these concepts and seeking ways of also extending an encouraging hospitality to many different areas of their application" (p. 301). Adopting this approach necessarily implies that the category of "list" is inclusive of a broad range of formats.

1.1   State of Research

A cursory glance at the small but insightful literature on lists suggests they simply re-entrench existing configurations of power, dictating not just how and who may judge, but the very ontology of discussion; as Werbin (2008) notes, the list *serves*. Much work on the subject addresses this basic issue (e.g. LeGoff 1992; Bourdieu 1998; Sharkey 1997). Certain research, however, counters this view. Some point to self-generated lists as a site of emergent possible identities and subjectivities (Berube 2000; Poletti 2008). Goody (1977), meanwhile, points to a dialectic dimension of the list in its simultaneous challenge to extant knowledge bases and implicit creation of new ones. His chapter, 'What's in a list?', is the most sustained analysis on the formal dimensions of the list, and as such deserves an extended commentary.

List dialectics

Goody traces the impact of lists on pre-alphabetic (and thus pre-narrative) societies, arguing for their direct and profound effects on the shaping of 'modes of consciousness' and knowledge formation, and thus on the organization of both social life and cognitive systems (1977, p. 76). Goody distinguishes three kinds of early lists: first, *retrospective* lists that are a kind of inventory of persons, objects, or events, such as a king-list. This kind of list can both sort and store data in the long or short term. Second are *prescriptive* lists such as shopping lists that serve as a plan for future action. These lists deal with information that is not often stored long-term. Third are *lexical* lists, specifically those of the ancient Sumerians, which comprise "a kind of inventory of concepts, a proto-dictionary or embryonic encyclopedia" (p. 80). Each of these demonstrates that lists are, essentially, *not oral*, which is the main thrust of Goody's argument. Lists are not simply a representation of speech, but are rather an entirely different manner of collecting, storing, presenting, and thinking about data. As he notes, "the materialization of the speech act in writing enables it

to be inspected, manipulated and re-ordered in a variety of ways" (Goody 1977, p. 76). Because it materializes words and things visually—an ancestor of today's much-ballyhooed data visualization—Goody sees the list as an inscription technique that distances itself and its users from earlier oral traditions and conventions. In other words, the list as a form facilitates 'modes of thought' and techniques of information processing, storage, and transmission that do not abide by the structures that govern the oral tradition. He argues:

> these written forms were not simply by-products of the interaction between writing and say, the economy, filling some hitherto hidden 'need,' but ... they represented a significant change not only in the nature of transactions, but also in the 'modes of thought' that accompanied them ... in terms of the formal, cognitive and linguistic operations which this new technology of the intellect opened up (1977, p. 81).

While writing as storage "permits communication over time and space, and provides man with a marking mnemonic and recording device," there is an equally important second function of such writing, "which shifts language from the aural to the visual domain, and makes possible a different kind of inspection, the re-ordering and refining not only of sentences, but of individual words" (Goody 1977, pp. 76-81). Ancient administrative lists are thereby non-narrative, rejecting conventions like prose and syntax. They decontextualize words and things from speech, and, in later cultures, from narrative, affording new configurations in the visual realm. "Speech has no spatial aspect but writing has. With the introduction of writing existing knowledge may be put into other formats which may have considerable heuristic value" (Velhuis 1997, p. 140). The writing down of a word allows it to be contemplated and manipulated in ways not possible in orality. Such a process enables the communication of a certain kind of knowledge over space and time, knowledge that has been *classified.* It also opens up more generally new capacities

for words, information, knowledge, and cognition, and for the relations between them. In this context lists function as epistemological operators (a thread pursued in more detail in chapter two). Goody's dialectical understanding of the relationship between speech, writing, and cognition shows that lists do not arise simply to fulfill the instrumental needs of human beings, but are active material agents in processes of writing, thinking, and acting.

Goody sees lists as an intellectual technology that affects both the organization of social life and human cognitive systems. LeGoff (1992) concurs but goes further, pointing to lists in such societies as not simply intellectual technologies, but inaugurators of new technologies of power. "We must go further and resituate this expansion of lists within the establishment of monarchical power. Memorization by inventory, the hierarchized list, is not only an activity of organizing knowledge in a new way, but also an aspect of the organization of new power" (LeGoff 1992, p. 62). Vismann (2008) offers a more expansive analysis of lists as a technology of power, pointing toward the imperial registries of thirteenth-century Europe as "more than nifty administrative techniques designed to economize on reading and writing; they were nothing less than the media technology for a state as a permanent entity" (pp. 81-82).

These thinkers each suggest that the crucial role of administrative lists in arrangements of power/knowledge is related to the fact that while such lists are not oral, they are not a simple example of *writing* as conventionally understood, either. Their emphasis on the visual dimension of lists is crucial to understanding the way the form emerges as an epistemological operator. Such insight resonates with recent developments in the German media studies *milieu*. This quality of writing is what Sybille Krämer (following Wolfgang Raible) calls "ideography," which "visualize[s] aspects of the content that have no equivalents in the sphere of sound" (Raible quoted in Krämer 2003, p. 521). Krämer conceives of such writing as possessing a "notational iconicity," a "fundamentally visual-iconographic dimension" that

enables it to be *operative* rather than semiotic or narrative (pp. 518-519). As ideographic forms, lists unloosen the knot that binds words to speech, visualizing words and things in a new way that allows them to be contemplated and re-ordered. When placed in a list, entries become data that can be manipulated—processed—in real time. Further, the putting of words and things in relation to one another in a list allows for connections to be made that did not exist prior to the act of listing. The upshot is that lists simultaneously challenge extant knowledge formations but also create new ones by inscribing new modes of organization and classification (which amount to new ways of seeing and doing).

Because lists are neither oral nor purely literate, they (along with other forms of ideography) illuminate the extent to which the conventional orality-literacy polarity, theorized by Ong (1983) and others (see also Goody & Watt 1963; Havelock 1963; McLuhan 1962; Parry 1971), does not hold. Primarily at issue is that the polarity rests on an idea of *meaning* that lays behind or within language in both its spoken and written forms. Pragmatic or operative lists do not "mean" in this way. They possess neither an inherent narrative function nor semiological units to be decoded. Further, meaning in lists does not arise from grammatical structures of language because the latter do not factor in the construction of a list, which instead adheres to a different, non-grammatical structure. Certain visual and graphic qualities govern the creation of most lists—columns, rows, and techniques of ordering determine its form and the manner by which a list is written, or better, the way it is *filled in.* But these structures do not produce meaning, at least not in a phenomenological or hermeneutic sense.

Because ancient lists of the kind described by Goody were primarily administrative, the only "meaning" we may be able to attribute to them is in their operational and indexical capacities. Lists function to facilitate various forms of interaction between human beings (economic, social, political, etc.), as Goody demonstrates, while also standing as a record or index of the occurrence of this

interaction. Lists make things happen while also registering items and transactions. Each administrative list of the Ancient Sumerians stands as a record of an event (the economic transaction), while its contents correspond to an item involved in the transaction (whether a chicken, a tool, a person, etc.). But there is no narrative here, nor are there syntactical rules inherited from speech governing the list as a written formation. As a result, for a long time these lists remained unread, or, more precisely, unreadable: because of a tacit assumption in early-twentieth-century archaeology that the Babylonian lists of the third millennium BCE were bits of narrative text, the significance of their administrative functionality was overlooked. Once such assumptions were dropped, a window onto an entire world of non-narrative grammatology was opened (Vismann 2008). In this case, the format was the message.

Listenwissenschaft

Thus was born *Listenwissenschaft,* or, the 'science of lists,' a term introduced by famous Assyriologist Wolfram Van Soden in 1936 to describe a "typically Sumerian psychological trait: *Ordnungswille.* [will-to-order]" (Veldhuis 1997, p. 137). This 'will-to-order' manifested itself, according to van Soden, in the creation of lexical lists that mirrored the order of the world as it was established by the Sumerian gods. Since these lists were never codified into coherent doctrines or arguments, as later (Western) traditions of writing would be, Veldhuis argues that the scholarship of van Soden and the other *Listenwissenschaftlichers* never went beyond "the level of the lists" (p. 137). Most of van Soden's *Listenwissenschaft* theorizations have since been shown to be highly anachronistic, with his analysis of Sumerian *Ordnungswille* less a discovery of an ancient cosmology manifested in cultural techniques of order than a reflection of the preoccupation of modern thinkers like van Soden with ordering systems.

Still, van Soden's *Listenwissenschaft* offered a preliminary framework through which to theorize an entire field of non-narrative writing, that, as Guillory (2004) convincingly demonstrates, the modern mind still consistently ignores. Guillory argues that the bulk of modern writing occurs in the field of 'informational' writing, compiling e.g. memos and lists, which stands in contrast to the way the moderns think of themselves and their writing as always being either literary, or scholarly/scientific (Guillory 2004). This modern tendency to gloss over the banal realm of administration is reflected in the conventional orality-literacy polarity relied upon by Ong and others. This polarity cannot properly account for administrative forms of writing such as lists (but also tables, charts, diagrams, etc., see Latour 1987; Krämer 2003; Guillory 2004; Rotman 2008) because it does not account for any form of writing that is not simply a duplication or representation of speech. The speech bias in orality-literacy scholarship, particularly in the Toronto School of Innis, McLuhan, Ong, and Havelock, stems from its romantic elevation of either antiquity's pristine oral tradition, or a preoccupation of the purity of the Word in the Catholic tradition.

Written forms such as lists—variously called ideographic, operative, pragmatic, or administrative—undercut this bias because they literally *bring into view* an alternative, non-narrative syntax that runs parallel to, and is in constant tension with, conventional syntaxes (grammar, narrative, etc.). Until relatively recently such writing has often been mistakenly reduced to non-meaningful noise in the channel. But as Kittler (1999) teaches, noise is often as crucial to understanding the dynamics of a media discourse network as any other factor.

Administration

Often, lists administer. They are deployed in order *to order*: lists make sense of the world, they facilitate the development of knowledges and discourses, they organize

experience. But such functions can be deeply contradictory. Illuminating the wider political and historical implications of the list addresses the extent to which it can and has served power interests, both in the acquisition of power, and its retention. Ben Kafka shows, for instance, that lists were a privileged form mobilized in the name of the French Revolution—witness Condorcet's assurance to provincial administrators that "[e]ach hour that you consecrate to this work, each line that you inscribe in the register, is a step forward for the Revolution…" (quoted in Kafka 2012, p. 56)—but also in the name of its subsequent terror—witness chief of the General Police Bureau Augustin Lejeune, who when asked by Robespierre to draw up a list of accusations against those notables deemed "good for the guillotine" by the local *sans-culotte* militants, wrote, "I shuddered reading this list, I brought it home with me, I lifted up a paving stone, and buried it, determined to perish rather than allow it to reach its destination" (quoted in Kafka 2012, p. 67). While Lejeune's act of destruction may in this instance have saved lives, Kafka shows that more often than not such lists—which categorized citizens of the Republic as "moderate," "aristocrat," or "counterrevolutionary"—had bloody consequences (p. 65).

These examples show the list to be particularly amenable to the control of populations. Lists establish (or at least reaffirm) social categories and relations by placing human subjects next to one another, thereby inscribing or creating relations between diverse subjects. Lists are important to regimes of Foucault's (1990) *biopower*. This concept describes the way in which life itself came to be the subject of power; as Hacking (1982) describes, "it was not simply individual living persons who might be subjected to the orders of the sovereign, but Life itself, the life of the species, the size of the population, the modes of procreation" (p. 279). Foucault points to the emergence, in the late seventeenth century, of an entire matrix of administration devoted to the observation, collection, calculation, and analysis of data about 'populations' and 'territories' (themselves a new categories): demography, evaluations of relations between resources and inhabitants, analysis of wealth and its circulations, and so on. Biopower, in short, "designate[s] what

brought life and its mechanisms into the realm of explicit calculation and made knowledge-power an agent of transformation of human life" (Foucault 1990, p. 143). To study biopower, Foucault proposes an 'ascending' analysis that looks first at "infinitesimal mechanisms." By starting with these mechanisms "which each have their own history, their own trajectory, their own techniques and tactics," we can then "see how [they] have been—and continue to be—invested, colonized, utilized, involuted, transformed, displaced, extended, etc., by ever more general mechanisms and by forms of global domination…" (Foucault 1980, p. 99). As such an "infinitesimal mechanism," the list's role in the administration of populations demands attention. This topic is the focus of chapter three; for now, I can offer only a few introductory remarks.

Although historically many forms of rule have made use of census taking and other population administration tactics, clearly the most hyperbolic and macabre extension of such processes occurred with the proliferation of census techniques in Nazi Germany. By reducing human beings to an entry in a registry and abstracting bare life into numbers and figures, such tactics served ultimately not only to dehumanize subjects, but also to "transport them to a new reality—namely, death" (Aly & Roth 2004, p. 1). Werbin (2008) argues that the integral role of the list in the Nazi installation of what he calls "massively organized information" cannot be understated, that with the onset of Nazi governmentality, lists were redeployed as "critical support technologies of juridical-disciplinary mechanisms." These ultimately

> came to constitute a unique new way of seeing and doing in their own
> right: involving fracturing 'threatening populations' from 'healthy
> populations.' The list was at the heart of these schisms that marked
> modern Nazi governmentality—healthy || diseased; Aryan || Jew; us ||
> them—serving the delimitation and policing of abnormal cases in
> populations; installing *caesuric* social fractures. (2008, p. 44)

The crucial point is that because the list is so flexible, so innocuously woven into the fabric of the world that we hardly pay it any notice, it is a form that is very easy to mobilize for political ends. Its *caesuras* surreptitiously delineate populations so they may be administered and policed. In this way lists are Hannah Arendt's (2006) 'banality of evil' materialized: crucial components of a system of administrative protocol that prevents any 'conscientious functionary' from being able to act, even if they wanted to. At least, so they are wont to claim whilst on trial: "You might ask why … we signed in this way documents with which we were not familiar. I respond: By absolute necessity, by the physical impossibility of doing otherwise[,]" claimed Carnot, deputy of the Terror's infamous Committee of Public Safety, a full 165 years before Eichmann in Jerusalem (quoted in Kafka 2012, p. 63).

This ethical dimension raises a whole host of questions that have been given careful treatment by others (Agamben 1998; Aly & Roth 2004; Black 2001; Werbin 2008), and which will be pursued at more length in chapter three. Suffice it here to say that highlighting the ethics of the list demonstrates the extent to which it is a form that is deeply implicated in rationalism. Lists can quite clearly be a friend to the bureaucratic apparatus sketched out by Weber (1958), the instrumental reason so vehemently attacked by Adorno and Horkheimer (2002), or the mechanization of knowledge feared by Innis (1995). This connection is also made clear by Vismann (2008), whose genealogy of the law through files we turn to now because it tells us more important things about the historic administrative capacities of the list.

For Vismann, lists in the domain of the law "do not communicate, they control transfer operations … [I]ndividual items are not put down in writing for the sake of memorizing spoken words, but in order to regulate goods, things, or people. Lists sort and engender circulation" (2008, p. 6). In this view the list is strictly a medium of transfer; its storage capacity is only ever temporary because there is no need, nor any desire to preserve a list once the act or event that it facilitates has occurred. Therefore its orientation is always toward the present. At the same time, Vismann

notes, "files are governed by lists. … Lists with tasks to be performed govern the inside of the file world, from their initial compilation to their final storage" (p. 7). Which is to say, lists prefigure files: the latter are process-generated algorithmic entities, and the process generators are "list-shaped control signs" (p. 7). Lists prescribe any file's movement through space and time: file notes issue commands for the next movement or event of a file's existence—to where or to whom the file should travel, at what time, by which means, etc. Each executed command triggers the next. Over time these notes accumulate, one after the other, to form a list that preserves a record of a file's 'life.' There is a triple function here: lists do not simply administer but also *archive* and *prescribe.* They are not simply present based, but can record the past and program the future. Lists are here algorithmic, anticipating the operational writing of digital computation, a thread to be explored further in chapter four.

While Vismann's emphasis remains trained on the extent to which lists and files take on a machine-like character, her rejection of the list's capacity for storage is problematic. Though in facilitating the movement of files through the spaces of administration lists express an obvious space-bias (to borrow Innis' language), we must also be mindful that the list's archival capacities express a time-bias in recording these events. Bibliographic lists, for instance, are perhaps the most important document in early modern libraries, providing not only a register of a library's contents, but also a means of orienting visitors (Krajewski 2011, pp. 9-13). Further, registers—whether of books or files—ascribe *addresses* to material items in the world, a practice "designed to account for units that threaten to disappear among countless masses" (p. 31). Such practices are undertaken explicitly with the future in mind: "detailed and exact written procedures are needed to guarantee the logistical architecture of the library beyond the fluctuations of a term of office" (p. 32). Krajewski demonstrates that written lists are not quite flexible enough for the registration needs of an ever-changing library collection—erasability is a necessary precondition for an up-to-date register, and so various techniques are developed to

better equip registries for absorbing new entries, such as the cut up method and later the card catalogue system (pp. 27-35). Keeping the capacity of lists for storage and address in focus can ensure an analysis of the list does not stray into a mode of critique too fixated on its tendency to be co-opted by forces of rationalization, and thus on whether lists are good or bad.

All of this suggests that lists simultaneously carve out knowledge, erecting its barriers through inclusion or exclusion according to specific criteria. But, as Goody emphasizes, there is also embedded within a list a challenge to the resultant knowledge formation. This challenge is implicit in the list's constant display of its exclusionary nature, observable in its inscribed, formal attributes. As he notes,

> the list … has a clear-cut beginning and a precise end, that is, a boundary, an edge, like a piece of cloth … it encourages the ordering of the items, by numbers, by initial sound, by category, etc. And the existence of boundaries, external and internal, brings greater visibility to categories, at the same time as making them more abstract (1977, p. 81).

Through its visible borders, the list wears its principles of organization as an exoskeleton, always observable but often unnoticed. The list's ability to create relations that would not otherwise have existed is revealed. Lists always involve choices, which are imminent in form and beg us to question them: "because the list structure may absorb any kind of component, readers can imagine their own conceptual alternatives adjacent to it and wonder, 'why was such-an-such an item included? Why not substitute this one?'" (Belknap 2004, p. 19). And the very fact that we are aware that any list (but especially those explicitly hierarchical or ranked) has included certain things invites the reader to ponder its criteria of inclusion and exclusion, its logic, its authority, his or her ability to agree or disagree, and so on.

Interpellation and poetics

Observing the degree to which lists are interpellative, it is not enough to say simply that they determine what counts as knowledge, nor that their authority to do so is always unquestioned. Certain thinkers have explored this tendency, primarily in the aesthetic realm, as a 'poetics' of the list (Belknap 2004; Eco 2009; Doležalová et al. 2009). Eco in particular sees the list as possessing a unique capacity to collect the world; it is suggestive of what he calls the 'topes of ineffability,' which is a certain aesthetic gesture toward the infinite, the unknowable, or the not-yet-known, offered as a means by which to stimulate the beholder's imagination (2009, p. 49). John Durham Peters (2011) is also fond of this disseminative capacity of lists. He describes their function in his own writing as both a "battle against [his] own finitude" and a futile attempt to "catch the cosmos" (p. 45). A recent exhibition on lists at New York's Morgan Museum suggests this dimension of lists and listmaking has continuing resonance in artworlds (Kerwin 2011). Foucault (2009) too, while primarily interested in the role of forms like lists in the distancing of natural science from mysticism during the classical period, points to a poetics of the list in literature (specifically in Borges). This poetics is observable in the list's capacity to materialize and stimulate thinking, via its ever-present formal exoskeleton, about the very limits of thought in any *episteme* (pp. xvi-xxvi).

Poetic lists will be the subject of chapter five. For now, we can point to related takes on the unique capacity of the list to probe the horizons of thought and existence that have begun to appear in contemporary debates concerning the 'new materialist' or 'nonhuman' turn(s) in the humanities. Matthew Fuller, for instance, points toward the capacity for lists to connect, noting that "[t]he accretion [in a list] of minute elements of signification into crowds, arrays, and clusters allows a reverberation of these cultural particles between them and together, the connotations of one into flying off the lick of another" (2005, p. 14). The list is especially crucial for Fuller, since any media ecology (in his theorization) must start

with a listing of the stuff of which it is made. Such a breaking down into constituent parts allows for the generative exploration of resonances, connections, and becomings between and amongst these parts. Put another way, a list offers to a media ecology something similar to what an exploded-view diagram of an object offers to its observer.[5]

Ian Bogost offers a counterpoint, seeing instead a unique capacity of lists for foregrounding the inherent *dis*continuity of the world. Lists for Bogost are the simplest approach to 'ontography,' a "general inscriptive strategy ... that uncovers the repleteness of units and their interobjectivity" and which "involves the revelation of object relationships without necessarily offering clarification or description of any kind" (2012, p. 38). Following Francis Spufford (1989), Bogost argues that ontographic forms such as lists disrupt the linearity of representation, serving to foreground objects or things in their alien, isolated strangeness. The list is an intruder, to the literary ear its "off-pitch sound ... only emphasizes [its] real purpose: disjunction instead of flow. Lists remind us that no matter how fluidly a system may operate, its members nevertheless remain utterly isolated, mutual aliens" (Bogost 2012, p. 40). Bogost suggests that lists can do real philosophical work, a point I discuss further in chapter five.

The fulcrum of such debates is what Eco isolates as a constitutive tension in the list between a poetics of 'everything included' and of 'etcetera' (2009, p. 7). This tension manifests itself both between and within these varying conceptions of lists. For instance, while Bogost seems more compelled to grasp toward the infinite, via the particular and absolute singularity of alien objects, Fuller strives toward a picture of everything included via the relationality of a closed system. Investigating further the implications of this tension between the finite and the infinite, evident at every

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[5] The connection of the list and the exploded-view diagram is Ian Bogost's (*Alien Phenomenology*, 51-2); my contribution is to suggest that the list for Fuller does the same kind of work in understanding any given media ecology.

site where lists function, will be an overarching question pursued in this thesis, with particular attention being paid to its operation in the aesthetic realm.

I will end this section with a very brief overview of certain gaps in the above literature on lists that this project seeks to fill. First, there is a tendency to emphasize *either* the list's administrative *or* its aesthetic capacities. Vismann, for instance, prefers not to address the extent to which an ostensibly bureaucratic form is mobilized in the texts of the very literary figures she cites in *Files*, such as Melville, who, as Bogost (2012, p. 42) and Belknap (2004, pp. 120-167) point out, uses lists and inventories throughout his *oeuvre*. Given that Vismann is interested in using literature to demonstrate the extent to which files cannot be reduced only to their dominant, administrative capacities (but rather that they also structure the medial imagination), it is reasonable to extend this same courtesy to lists as a form themselves. Werbin makes no mention of the list's poetic capacity, choosing instead to view it as a complicit 'critical support technology,' a site of micro-power through and upon which Nazi and other governmentalities are articulated. Werbin also limits his analysis to lists of *people,* which misses the crucial fact that most lists—whether literary or pragmatic—are of words and things. The majority of lists in Goody's analysis are of such, but he also elects not to describe the poetics of lists. Though he develops a dialectic approach to understanding the list's complicated epistemological operations, Goody does not offer such an understanding of the list's complex oscillation between the administrative and aesthetic registers. As discussed briefly above, there is a tendency in some of these thinkers of administration to over-emphasize the list's orientation toward the present at the expense of the important work it does in relation to the past and the future— conflating all lists as present-based denies that lists have an important archival capacity and act as a kind of memory support. Belknap reminds us that even those lists that may not have been meant for posterity do persist. They "can be captivating as well as serviceable. How inviting to the imagination they can be, and how personal as well. How often have we found ourselves reading someone else's

grocery list, left behind in a shopping cart?" (Belknap 2004, p. xiii). Even if not narrative or conventionally 'historical' information, lists still transmit something toward the future, be it modes of classification, the spatial organization of an inscription surface, techniques of bookkeeping and commerce, what a person shopped for, and so on.

These latter 'memory' aspects of lists are more accurately accounted for in the poetic or literary stream of literature on lists. However, this realm suffers from the reverse problem: thinkers such as Eco seem perhaps too quick to poeticize certain lists that *do* function primarily as present-based transfer operators, while Belknap seems always to project a literariness onto pragmatic lists he finds in literature.[6] This is to say nothing of the fact that the bulk of Belknap's analysis—sophisticated as it may be—relies entirely on the virtuosity of his own abilities as a critic. Meanwhile, Bogost's compelling account of lists focuses only on horizontal lists, tied together by the "gentle knot of the comma" (2012, p. 38), which leads to a de-emphasis of vertical lists and their tendency toward hierarchical information organization. Granting that no work can be definitive and that these thinkers were pursuing research agendas divergent from my own, I would still make the case that in order for the literature on contemporary *Listenwissenschaft* to offer a truly comprehensive treatment, such gaps need to be identified and filled. This thesis contributes to this broader project.

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[6] See for instance his reading of an inventory from *Moby Dick* as a means by which Melville develops Ishmael's tendency for "further digressions down unforeseen avenues of thought" that are paradigmatic of a larger project of the novel, in which "[t]he search for truth...is carried out, ultimately, not through scientific investigation but through the creative literary power of the imagination" (2004, 12-13). This reading contrasts significantly from Bogost's take on a similar register in the novel, as a form deployed specifically to disrupt such narrative and thematic considerations (Bogost 2012, p. 42).

1.2   Proposed Intervention & Theoretical Framework

How to fill these gaps and give an account of a form that so defies classification? As mentioned above, focusing on what the list *is* may be less useful than focusing on what it *does*—how it functions in relation to techniques of inscription and representation, historical constellations of power/knowledge, and media-technical conditions of processing, storage, and transmission; or even what the list means— not in Ong's sense of the term described above, but rather regarding the extent that within any list are encoded certain modes of practice and ways of seeing or thinking which carry political and ethical implications.[7]

Media materialism offers the tools required to pursue such a functional history or genealogy. At a micro level this subfield of media studies is interested in objects and texts not in terms of interpretation, meaning, or content, but rather in terms of the physical properties of their surfaces and the techniques of inscription, transmission, and reception that structure them. At a macro level, media materialism is interested in the historically specific arrangements of spatial and temporal factors related to knowledge systems and information flows—what Harold Innis (2002) first understood with the concepts of space- and time-bias. My broader contention is that media materialism fills the gaps in the currently dominant paradigms of what is called 'media studies' in North America. These are, very generally, cultural studies, with its emphasis on textuality and audience, on the one hand, and political economy, with its emphasis on systemic and institutional factors, on the other (see Babe 2010). I invoke this crudely drawn binary as a heuristic only, with full knowledge of its limitations. It is useful in providing a preliminary orientation to this thesis, which will show how media materialism can be made to travel amongst and through these differing approaches, filling in their gaps and blind spots.

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[7] This understanding of meanig is adopted from Sterne's usage of the term in *MP3: The meaning of a format* (see pp. 1-31).

From media archaeology to form(at) theory

This project on the list takes up and extends two primary planes of media materialism—the intersecting histories of inscription and compression. As a result, the emergent subfield of media archaeology is a logical framework by which to orient the project. Media archaeology re-emphasizes the historical and material dimensions of media that are often glossed over by conventional approaches to 'new media.' Though there is "no general agreement about either the principles or the terminology of media archaeology" (Huhtamo and Parikka 2011, p. 2), Huhtamo stresses both its cyclical nature and its concern with "the 'excavation' of the ways in which [various] discursive traditions and formulations have been 'imprinted' on specific media machines and systems in different historical contexts, contributing to their identity in terms of socially and ideologically specific webs of signification" (1997, p. 223). According to Wolfgang Ernst (2013), media archaeology is a kind of "epistemological reverse-engineering" (p. 55) that "makes us aware of discontinuities in media cultures as opposed to the reconciling narratives of cultural history" (p. 25). Media archaeology de-emphasizes the human subject as central figure of historical and technical change, seeking instead to unearth the "nondiscursive infrastructure and (hidden) programs of media" (Ernst 2013 p. 59) that structure what it is possible for humans to think and do. Following Kittler (1990; 1999; 2010), Ernst argues that the contours of these infrastructures are shaped by the media-technical conditions of possibility that obtain in any given historical moment; these are, namely, the means by which data is processed, stored, and transmitted. While thinkers such as McLuhan (1962) and Virilio (1989) have convincingly demonstrated the extent to which such medial conditions structure perception, Ernst goes a step further in arguing that they also delineate *cultural* data such as history, memory, and so on. Because media measure, process, and so structure *time*, they are the true archivists of pasts both human and non.

But media archaeology has its limits, and they should be acknowledged as such. Critiques of the 'cold gaze' and hard-core technicism of anti-human thinkers such as Ernst and Kittler are well documented.[8] The crux of this critique is that certain strands of media archaeology fetishize, or at least mistakenly elevate, mechanism, machine, and code at the expense of the equally material received knowledges and embodied techniques—practical, philosophical, institutional— which inform the technical development of media. That is, media archaeology may have been too quick to adopt the Kittlerian model (adapted from Foucault) of analyzing technical development in terms of sudden rupture, rather than slow sedimentation. Beyond this, too often the media devices and objects of media archaeological analysis seem simply to drop from the sky; as Parikka (in Ernst 2013) notes, they "might be important to give us history (as conditions of knowledge) [but] seem themselves surprisingly without history and outside time" (p. 11). Conceiving of media as the *a priori* of history denies that such objects are developed in very specific institutional, political, industrial, socio-economic, cultural, and technical constellations, as for instance Sterne (2012) shows. Gitelman offers a similar critique of the German *milieu* from which media archaeology sprang, noting its tendency to sacrifice empirical and historical specificity in the name of grand theories of everything (Gitelman 2006, pp. 3-5). She urges media analysis to resist the urge to frame media objects or systems in such general terms—to speak not simply of "the telephone" or "the computer" but *specifically* about e.g. telephones in the 1890 rural United States, or tablet computers in 2012 (2006, p. 8). Beyond these critiques, we must note the lack, to this point, of any sustained attempts to incorporate historical materialism and/or political economic analysis into media archaeology. Parikka (2014) has advocated that such a synthesis is urgently needed in the field. Certain research is currently underway toward such ends (see Kjøsen and Manzerolle 2012).

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[8] As Geoffrey Winthrop-Young (Kittler's main translator/importer into the English speaking world) quips: "Kittler is controversial. That, probably, is the only uncontroversial thing that can be said about him" Winthrop-Young, *Kittler and the Media,* (Cambridge UK: Polity, 2011), 120.

Finally, the dubious politics of media archaeology's father figure, Friedrich Kittler, are well documented if overblown (see Winthrop-Young 2011). Still, a tendency in media archaeology to bracket politics and humans at the expense of machine and code is a very real hazard.

However, those limitations are not the primary obstacles in adopting a media-archaeological approach for a project on lists. The issue is rather that one runs up against significant conceptual and methodological barriers when thinking about lists with the tools and terminology of media archaeology. Namely, given that so much of media archaeology is about tinkering and taking apart—going 'under the hood' of media to understand the technical processes and mechanisms that make them work—one is left to ask: how to go under the hood of a list? When one excavates, for instance, a digital computer or a radio, one finds a whole host of complex mechanisms and entities at work (minute inscription tools, silicon chips, circuit boards, electric cables, wheels, fans, etc.), each of which has a very complex developmental history in and of itself.[9] But is it possible to similarly 'excavate' a list? If so, what do we find? One is struck immediately by the fact that in order even to address this question we first have to acknowledge that every list is contained within some medium, in an echo of McLuhan's famous dictum. Taking a paper list as an example, we see that its constitutive elements are not necessarily mechanisms or 'things in the world,' but inscriptions, indexical marks, traces of handedness, practices of writing, ways of framing and organizing data; we find lines, boxes, words, and numbers that have been inscribed on the medium of paper through various techniques, and by various writing utensils. These things are material, but they are quite different from the types of mechanisms unearthed in much of the more radically mechanistic media archaeology. We come to notice that the constitutive elements of such a list are not necessarily *operative in time* as those in digital and

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[9] See Matthew Kirschenbaum's (2008) rigorous discussion of the processing and computational mechanisms in a digital computer.

analog media are, but rather are spatially oriented in relation to whatever media in which they are written. Put another way, a paper list is a series of marks that materialize as a particular logic of spatially organized data on paper. These elements do not move through time nor space on their own (as, for instance, a spinning mechanism does) but only via other media (a list never exists outside the medium in which it dwells). This is to say that it is not the list that moves through an office, but the paper on which it is written. Might it be more correct to say that the list is itself an entity that comes to be excavated by a media archaeology of paper? In other words, instead of thinking of the list as a medium, how can we think of it as something that moves in, through, and across various media, as something which gives us a sense of the 'mediality'[10] of any given medium or media environment? Jonathan Sterne describes such operations in his discussion of formats. I follow Sterne in developing an archaeology not primarily concerned with media as such, but with formats and their more general precursor: forms.

Forms and Formats

According to Sterne, a format

> denotes a whole range of decisions that affect the look, feel,
> experience and workings of a medium. It also names a set of rules
> according to which a technology can operate ... This specification
> operates as a code—whether in software, policy, or instructions for
> manufacture and use—that conditions the experience of a medium
> and its processing protocols (2012, p. 7).

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[10] Sterne uses the term mediality "to evoke a quality of or pertaining to media and the complex ways in which communication technologies refer to one another in form or content...the mediality of the medium lies not simply in the hardware, but in its articulation with particular practices, ways of doing things, institutions, and even in some cases belief systems." (Sterne 2012, pp. 9-10).

Format is a precise term that describes a form or a mode that has been institutionally or technically standardized. Sterne, for instance, traces the long history of experimentation with and failure of various forms and modes of audio compression that prefigure the appearance of the standardized MP3 format. Lists in administration, such as described above, are typically formats. Lists in art and literature, however, are forms. The necessity of this distinction will become evident in later chapters; I point it out here to remind us that a given format is but one possible instantiation of a form. By fashioning an approach to the list at the level of form and format, I hope to carve out on the terrain of writing a similar path to the one Sterne does using MP3 on the terrain of sound formats and technologies.

This research also takes up a call Sterne makes to establish a 'general history of compression,' which, though he explores it exclusively in relation to audition, is not limited to this domain: "[c]ompression history could easily extend back to the invention of the point and the number zero, the codex and the scroll form of the book, the wheel, and perhaps even some kinds of ancient writing and number systems" (2012, p. 6). My project picks up this suggestive thread, tracing back to the advent of writing the role of the list in a general history of compression. The list has played a crucial role in this history, since "[a]s people and institutions have developed new media and new forms of representation, they have also sought out ways to build additional efficiencies into channels and to economize communication in the service of facilitating greater mobility" (2012, p. 5). What are ancient Sumerian grain inventories, 1960s *Billboard* charts, or everyday shopping lists (whether on paper or smartphone) other than attempts to streamline and economize, to remove redundant data from a channel or medium—in short, to compress? Indeed, there may be no other mode of inscription—or at least, of writing—that has performed this function more consistently and robustly than the list. Fashioning such an approach to the study of lists involves thinking in broad strokes about writing as a medium, envisioning its inscription surfaces (such as paper) as a kind of channel, with a limited bandwidth, that serves primarily to transmit data over space and time. In this

view the list is a format that functions to compress data and maximize the efficiency of paper's bandwidth, and thus of the communicative channel more broadly.

Following the list at the level of form and format also opens up horizons upon which to think the mediality of 'new' and 'old' media in various constellations, which allows for a more expansive understanding of the relation between any medium and its constitutive elements. Specifically, Sterne's 'format theory' helps us move away from the emphasis in media studies on those media that possess physical, 'tinkerable' time-biased mechanisms (such as those privileged by e.g. Ernst and Kittler). Thinking of a list as a medial format can re-integrate into the understanding of a medium such as writing the spatial elements like lines, boxes, headings, and categories, as well as the inscription, classificatory, and ordering techniques which they both condition and are conditioned by. As Sterne argues, conventional thinking about media misguidedly conflates under the category of 'medium' a vast array of processes, mechanisms, formats, techniques, practices, etc., each of which are operative at distinct 'layers' of any given medium (be these layers spatial, temporal, institutional, or imaginary). Sterne seeks to probe these layers and understand what smaller, constitutive elements tell us about media and mediality. By integrating format theory as an analytical tool into the history of writing and representation we can develop a better understanding of writing in its various modalities and forms than conventional approaches that conflate them under the rubric of 'writing.' What is particularly attractive about format theory is that it refuses any prior hierarchy of formations of any given medium (Sterne 2012, p. 11)—so, in the context of writing, it allows us to escape the constant privileging of prose over administrative writing. Importantly, though, the format theory intervention is methodological, not philosophical or ontological. Sterne is not seeking to replace media studies with 'format studies,' only to address the erroneous conflation of such layers, to more properly understand the sedimentation of both individual media, and medial environments.

Format theory's imperative to "focus on the stuff beneath, beyond, and behind the boxes our media come in" (Sterne 2012, p. 11) is one it shares with media archaeology. But contra some strands of the latter, Sterne does not limit his analytic lens to those mechanisms or time-critical processes observable in the thing itself. Format theory understands that *practice* and received techniques, knowledges, desires, and so on inform each and every mechanism or process. These tell us not just of mechanisms and hardware, but also of knowledge, power, truth, history, memory, etc. Tracing the mediality of a format can bring such factors into view:

> [f]ormat theory would ask us to modulate the scale of our analysis of media somewhat differently. Mediality happens on multiple scales and time frames. Studying formats highlights registers like software, operating standards, and codes, as well as larger infrastructures, international corporate consortia, and whole technical systems (2012, p. 11).

Further, "Cross-media formats" like MP3—and in our case, the list—"operate like catacombs under the conceptual, practical, and institutional edifices of media" (p. 16).

Media archaeology and format theory have a family resemblance. They are two related though often divergent streams of media materialism that have emerged from the Foucauldian archaeological imperative. Looking beyond and inside the black boxes of media leads, logically, toward both the 'cold gaze' technicism of radical media materialists like Ernst and Kittler, and also the 'other side' of German media analysis—with which Sterne's format theory resonates strongly—an approach focused around the concept of *cultural techniques.*[11] I will now suggest some

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[11] Geoffrey Winthrop-Young (2012) has described these poles—Ernst & Kittler's hard-core technicism and the cultural techniques approach of Siegert and Vismann—as the 'right-wing' and 'left-wing,' respectively, of German media analysis. He also notes this is a crude heuristic useful for comparison but unlikely to hold up after rigourous critique.

connections between these approaches that this research seeks to productively forge.

Cultural Techniques

Theories of cultural techniques emerged around the turn of the millennium in response to Friedrich Kittler's (1990; 1999) controversial project of establishing media as the technical *a priori* of the human sciences, which replaced Foucault's (1972; 2009) conception of the archive as historical *a priori*. To sum up this move in one sentence: Kittler went a layer deeper than Foucault's archaeologies did or could, showing the archive and discourse to be themselves structured by media technologies. This was something Foucault, who Kittler called "the last historian or first archaeologist" (1999, p. 5) could not grasp: No discourse without pens and paper and typewriters, no archives without recording media and address systems, no governmentality without files.

In Kittler's wake, the concept of media proliferated, eventually becoming both over-extended and totalizing. Surveying the landscape, post-Kittler, theorists like Bernhard Siegert and Cornelia Vismann were troubled by the fact that important considerations about what precedes media devices and networks, even media as a concept, had been pushed aside in the fevered dream of 1980s media analysis, with its proclivity for lost media stories, devices, and white male engineers. Their claim was that too much baby had been thrown out with the bathwater in the rush to, in Siegert's (2013) words, replace the Critique of Reason with a Critique of Media. So Siegert. Vismann, and others like Thomas Macho, Sybille Krämer—even Kittler himself—sought a way to escape this blind alley, to un-black box the concept of media and unloosen the problematic knot it had become. They did so by rediscovering an old agricultural concept, *Kulturtechniken* ('cultural techniques'). This term emerged in the late 19th century to describe agricultural procedures like

irrigation and draining, straightening river beds, or constructing water reservoirs (Winthrop-Young 2013, p. 4-5; also described by Williams 1976, pp. 87-89). Already we can see the *Kultur* in *Kulturtechniken* is a very far cry from the 'culture' we are used to using in North America to describe either the 'best that has been thought and said' (Arnold) or a 'whole way of life' (Williams). The *culture* in cultural techniques has to do with cultivation, nurturing, or rendering habitable. These are, after all, the etymological roots of the word (the Latin *colere* means: to tend, guard, cultivate, or till). So this is culture in the sense of doing, handling, working; it has to do with hands and bodies, tools, and the way these things converge to draw borders and process distinctions.

Imported from agricultural science into media theory, cultural techniques are, according to Siegert, "conceived as operative chains that precede the media concepts they generate" (2013, p. 58). This approach starts not with totalizing concepts like 'media,' 'network,' or 'power,' but instead

> places at the basis of changes in cultural and intellectual history
> inconspicuous techniques of knowledge like card indexes, media of
> pedagogy like the slate, discourse operators like quotation marks,
> uses of the phonograph in phonetics, or techniques of forming the
> individual like practices of teaching to read and write (Siegert 2011, p.
> 14).

Theories of cultural techniques hold that these techniques—in which tool, body, and act converge—delineate and assemble the broader spatio-temporal infrastructures of societies. This approach is therefore less interested in emphasizing devices, objects, or systems (in the way that early German media analysis did) than on observing the *ontic operations* which process the distinctions at the core of any society, such as those between inside and outside, subject and object, nature and culture, matter and form, etc. (Siegert 2008; 2013). As Vismann puts it, "[c]ultural techniques define the agency of media and things. If media theory were, or had, a grammar, that

agency would find its expression in objects claiming the grammatical subject position and cultural techniques standing in for verbs" (2013, p. 83).

Theories of cultural techniques focus on operators like doors, abacuses, musical instruments, lists, maps, and index cards, which precede, and indeed generate concepts like inside and outside, number, tone, or territory (Siegert 2010). The study of cultural techniques holds that operators are not simply passive objects to be used or activated according to the whim of an acting (human) subject. Media and things supply their own rules of execution—we do not choose how to open or close a door, it does not present us with an open horizon of possibility. We *must* act according to the rules set out for us by the door: push or pull, open or close. The door has agency in that it delineates what is possible for praxis. Thinking of a door in this way also shows that the picture of agency we usually work with, as reserved for acting human subjects is insufficient. Because, as Vismann reminds us, in an echo of Latour (2005), "[c]ertain actions cannot be attributed to a person; and yet they are somehow still performed" (2013, p. 84).

Another famous example from the literature on cultural techniques is the plough that draws a furrow in the earth to mark the threshold of a city that will be built. Inside this delineated space there will be order, law, custom, exchange; outside will be chaos and barbarism. The furrow, and the door or gate that will eventually replace it, is a cultural technique of hominization: inside is the space of the human, outside the space of the beast (see Vismann 2013; Siegert 2012; 2013). Entire moral, political, ethical worldviews are built upon such distinctions; they are the fabric with which social orders are woven. According to Vismann: "the agricultural tool determines the political act; and the operation itself produces the subject, who will then claim mastery over both the tool and the action associated with it. Thus, the *Imperium Romanum* is the result of drawing a line – a gesture which, not accidentally, was held sacred in Roman Law" (Vismann 2013, p. 84). Property still works like this. Ownership only comes to exist after the drawing of a

boundary, a line on a map. In this way Vismann can claim the furrow of the plough as the cultural technique not just of property or ownership, but also of sovereignty itself.

This tradition is not interested in the content or meaning of media or things, historically the focus of North American media and cultural studies, only in ways of doing—counting, measuring, collecting, observing, playing, confessing, listing—because these ways of doing engender systems of knowing and modes of social organization. 'Media' as we understand them (things like gramophones, telegraphs, and computers) communicate and order by encoding non-sense into sense (and vice versa) through the recording or transmission of signals, or the translating of data into alphanumeric characters. Cultural techniques are the parasitic third, neither sense nor non-sense, but that which engenders the distinctions and operations required for media to do their communicative and ordering work. As we have seen above, listing is a cultural technique that precedes a whole host of media networks, from Ancient Sumerian clay tablets to contemporary computer code. A border is drawn around certain items, inscribing an order on a field of possible data. What is included in a list vs. what is excluded is a basic distinction upon which rests all kinds of second-order operations, speculations, and actions that comprise media networks of trade and circulation, whether in Ancient Sumeria or on Wall St. in 2014. Listing engenders a proto-binary code: included is to one and yes as excluded is to zero and no. Once the distinction is drawn, it goes out in the world, it becomes encoded in media objects and protocols, which cannot function without this basic distinction. There are major political stakes in such operations, which will be explored at length below: the form of the protocol determines how computation unfolds; how a person is listed can determine their fate.

Similar conceptual innovations are being pursued in North American communication studies, though they have not yet coalesced as a coherent theoretical 'movement.' In addition to Sterne's work on formats, John Durham Peters

has identified a number of what he calls 'logistical media,' like calendars, clocks, and towers, which "arrange people and property into time and space" (Peters 2013, p. 40). These are "prior to and form the grid in which messages are sent … Logistical media establish the zero points of orientation, the convergence of the x and y axis" (p. 40). Even though he uses the term 'media,' Peters actually identifies a moment *prior* to media, wherein certain devices and techniques process logistical distinctions that establish concepts like time, space and being.

Cultural techniques and logistical media share Canadian roots. Both exist within what Peters sees as a fourth, minor tradition of media studies that gained prominence in the 1950s and 60s via the so-called 'Toronto school' of communication. This tradition, which "ponders the civilizational stakes of media as a cultural complex" (2008a, p. 4), has received less emphasis in the last 30 years than the dominant streams of media and communication research, which Peters schematizes as: 1) textual and interpretive, 2) social and explanatory, and 3) historical and institutional. These form a "media studies triangle" of text, audience, and industry (2008a, p. 4-5) The more elusive fourth stream has to do with understanding the way that the biases of dominant media shape the character of civilizations, marshalling social, political, and institutional life toward certain tendencies: spatial conquest, as with Rome and its parchment administration, or temporal endurance, as with the religions of the papyrus book (see Innis 2002; 2007).[12] The fourth, 'civilizational' tradition offers us tools to grapple with issues of infrastructure and logistics, which is where most of the above approaches brush up against one another. I position this thesis firmly within such debates.

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[12] Innis is the great political superego of this tradition, with his insistence that the key to peace and prosperity is *balance* amongst the biases of communication (as opposed to religiously dogmatic societies that overemphasize time, or militaristic ones that overemphasize space). There are strong political stakes here, though they are not the familiar ones of identity or class we Anglo-Americans are used to working with.

I contend that the 'fourth way' can provide a way out of entrenched battle lines that dominate North American media and cultural studies. Theories of cultural techniques, for instance, argue against the common practice of beginning analysis by deploying a pre-existing framework, such as "cultural studies," "semiotics," or "political economy," in order to unmask the world of illusions. Rather, it would look at such frameworks themselves as historically contingent knowledge formations, constituted through specific ways of seeing and doing that are related to the way the world is measured, collected, recorded and observed. This is not to suggest that such approaches have no merit, only that their epistemological and discursive contours can and should be subjected to the same analysis and critique as their objects of study. As Latour (1987; 2005) teaches, concepts, like technologies, often function as black boxes. Theories of cultural techniques teach us to ask: what are the core categories and concepts that enable cultural studies, or political economic analysis? What are ontic operations at the heart of concepts like identity, imagination, subjectivity, representation, or the body? On what distinctions and material surfaces do they rest? From the other side, what are the cultural techniques of exchange, circulation, value, commodification, or class? How would it change our analysis if we did not start with these concepts but looked first at their material histories? While there is a rich philological tradition, for instance, in twentieth century Marxist literary analysis—with figures like Lukács (1967) and Williams (1976) doing much to clarify Marxian concepts and prepare the ground for their widespread adoption (for better or worse) in Anglo-American cultural studies—this work demonstrates a medial blind spot. Williams, for instance, offers no consideration of the inscription techniques, tools, and archives that prefigure and enable the etymological histories he writes in *Keywords*. Surely the means by which these concepts were inscribed and circulated on paper was as important to their lives as their usage in oral culture. Neither is there any sustained study of political economic categories (e.g. class) as classificatory inscriptions, which themselves inscribe, on paper, certain social categories and relations. As will be demonstrated, particularly

in chapter three, inscription techniques and material forms such as lists process the distinctions at the heart of such categorizations, and can teach us not only about 'knowledge' in the abstract, but also about the theoretical presuppositions of our own disciplines and approaches.

To summarize, this thesis is an attempt to develop a theoretical and methodological approach that can give an account of material forms, such as the list, that have not received much scholarly attention. To do so, I develop four case studies (outlined below) that trace the function of lists in a variety of registers: communicative, cultural, historical, epistemological, political, aesthetic, technical, etc. The above streams of media materialism orient these case studies; specifically, I conceive of listing as a *cultural technique* that produces historically specific *forms* and *formats*, upon which concepts and institutions are built. To buttress the tools of media archaeology, format theory, and cultural techniques, I also draw from Bruno Latour's (1987; 1999; 2005) Actor-Network Theory, which offers a rich set of conceptual tools that aid in understanding the materiality of administration and knowledge. Latour's work receives sustained attention in chapter two. I also draw from Martin Heidegger's (1993) late career writings on technology, borrowing his diagnosis of the modern world as, essentially, an 'enframing' (*Gestell*) of human beings and technology. This diagnosis helps throw into relief two aspects of lists: first, their complicity in the 'sway of *Gestell'*; second, their capacity to clear a space wherein Heidegger's 'saving power' might be revealed. Heidegger's diagnosis is addressed in chapter three, his discussion of the saving power in chapter five.

1.3   Arguments & Methodological Notes

This thesis offers four intersecting arguments: the first is disciplinary and methodological. It proposes that contemporary media studies would benefit greatly from the importation of the constellation of approaches and concepts that I group

under the rubric 'media materialism.' These approaches can, I argue, give a more accurate account of media networks and environments, contemporary and historical, because they take into account more than devices, institutions, texts, and audiences. Media materialism 'un-black boxes' the usual objects of media studies to illuminate the forms, formats, techniques, protocols, programs, etc. that play crucial roles in the establishment and functioning of media networks, but which are too often typically conflated under broad concepts like 'media' and 'network.'

The second argument presents the list as a concrete example of what media materialism makes available to analysis, positioning listing as a cultural technique that performs ontic operations that inscribe epistemological structures (concepts and categories) upon which social institutions and relations are built. Such categories and concepts go on to become standardized and institutionalized. As a form that is constitutive of certain kinds of knowledge, and as an epistemological operator, the list can tell us much about the material circumstances in which human beings enact thought and action.

The third and fourth arguments are about lists themselves. Argument (3) is that lists cannot be easily dismissed or endorsed. It is not enough to say lists are good or bad. Their complicated and sometimes contradictory operations—observed throughout this thesis—demand a precise tracing of how they function. Argument (4) proposes that the enduring presence of the list in our thoughts, texts, and programs arises from its unique capacity to negotiate tensions and paradoxes that have beguiled humans for centuries. Such tensions include those between fear and desire, wonder and horror, entropy and order. The latter tension, which Eco (2009) describes as 'etcetera' vs. 'everything-included,' is particularly important to this thesis. I will show that, on the one hand, the list's tendency toward 'everything included' (i.e. the drawing of borders) has led it to be harnessed in the modern period by forces of rationality and governmentality that categorize and administer people, words, and things (see chapters two, three, and four). Yet, on the other

hand, the list also contains within itself the capacity to negate such forces and establish a space for thinking *other*. The poetics of etcetera can challenge the logic of everything-included; the paradigmatic AND, AND, AND of the infinite can displace the syntagmatic IF/THEN of the finite; the list can intrude on the monopoly of narrative (see chapter five). This double function resonates with the dialectic Goody sketches above (in which lists challenge the boundaries of knowledge that their borders materialize), and with Heidegger's understanding of the relationship between art and technology, wherein the 'saving power' exists precisely where the 'danger' is most imminent. These four arguments run parallel and often intersect.

Methodological Notes

Because it is both ubiquitous and seemingly innocuous, it is difficult to bring the list into focus as an object of study. It is so woven into the fabric of our medial and informatic environments that we do not often notice its presence. The list is part of what McLuhan called the 'ground,' the challenge for this study is to make it a 'figure.' I argue the most effective way to do so is to trace it through the world, to see what the list tells us and shows us when its operations are probed in various contexts. Therefore, rather than isolating one major argument about the list and selecting case studies which would allow for the repeated emphasis of this argument, I believe a more productive approach is to weave each of the four arguments identified above through a series of case studies that delve into the realms, respectively, 1) knowledge and classification; 2) administration; 3) logistics and computation; 4) poetics.

It is important to clarify that the arguments and case studies do not simply map onto one another in a one-to-one ratio. I will not be arguing that the list functions only as a format in administration, nor that its poetic tension is observable solely in the aesthetic realm. The four arguments will weave their way through each

case study, but their emphasis and arrangement will differ. Some tendencies of the list are more evident in certain contexts than in others. By foregrounding such differences I will be able to more clearly demonstrate that the list cannot be reduced to any single thing. Again, this is why the attempt is to study what lists do, rather than what they are.

This approach can allow the analysis to escape the trap of having inscribe a value judgment on the list—as either good or bad, this or that, here or there—and thus to move beyond stock ideological critique. Such an approach, and the binary categories it relies upon, is not very helpful in thinking about a form that has been in constant use for five thousand years. Of course there are ideological dimensions to lists—such an adaptable form of organizing and communicating information can and has been mobilized for various ends. However, such a critique would place too much emphasis on the content of lists at the expense of their operations. Looking at the latter, at the material structures and functions of lists, can tell us both what they actually do, and how they do it. I therefore seek to follow Latour's first rule of method: instead of black-boxing the technical or material aspects of the list and then looking for social influences and biases, I seek to "be there *before* the box closes and becomes black" (1987, p. 21). Put another way, the goal is to clear space for examining the "infinitesimal mechanisms" from which Foucault's "ascending" analysis of power (mentioned above) can be elaborated.

1.4   Chapter Outlines

In chapter two I analyze the function of lists and listing in establishing the epistemological structures of popular culture and mass media. Building on the concepts of Bruno Latour, I detail the use of lists in the popular music field and offer a close analysis of Bob Mersereau's *Top 100 Canadian Singles*. The chapter shows

the list as a standardized format that is constitutive of the production, circulation, and reception of knowledge in popular music.

Chapter three shifts focus from the role of lists in making knowledge to their role in what Hacking (1989) calls "making up people." We move from lists of words and things to those of number and human beings. I examine the role of listing in the Nazi administrative apparatus (which I describe metonymically as 'the Nazi census'), but build on the extant literature by placing the Nazi census within a much longer trajectory of modernity. I do this by isolating listing as a cultural technique shared by both the Nazi census and fifteenth century Italian double entry bookkeeping. Luca Paciolli's technique, a series of interconnected lists, establishes new categories of economy in a similar way to how Nazi registers materialize new categories of personhood. I end the chapter by arguing that this connection allows us to understand the emergence, ca. 1500, of what I call the 'logistical worldview.' The latter views the earth and its inhabitants as material to be ordered according to human ends. The Nazi census is an extreme limit case of this worldview.

Chapter four explores how the logistical worldview has shaped the trajectory of recent technological development and conditioned our relationship to culture, using the list as a lens into understanding what Virilio (2006) calls 'logistical modernity.' I examine first how the list is encoded in programming activities before embarking on a broader discussion of 'Big Data' as a cultural expression of the logistical worldview. The list's unique capacity to operate in real time makes it a privileged operator at both code and interface level. Its 'time-criticality' also opens up a surprising connection to ancient, non-narrative modes of relaying data.

Chapter five picks up this thread, exploring the poetic and aesthetic capacities of lists, offering a close reading of the list form in literature (specifically Jorge Luis Borges *Fictiones*) and film (Chris Marker's *La Jetée* and *Sans Soleil)*. This chapter is a final provocation that frames the list as an imaginative form that resists

the monopoly of modern narrative and therefore offers a unique space for Heideggerian *poeisis* and even utopian thinking.

This collection of divergent and seemingly arbitrary case studies has been compiled precisely because it demonstrates the list's ability to materialize connections, previously invisible, between realms, worlds, and historical moments. Lists make visible a Benjaminian "world of secret affinities" (1998, p. x). I also take inspiration from Zielinski (2006) and Huhtamo (2011), who provide tools to fashion this text as an 'anarchaeological wandering': a litany of examples, commentary, analysis and quotations regarding lists that bristles against narrative reductionism. "To write history … means to quote history,"[13] wrote Walter Benjamin (1989, p. 67), the first media archaeologist. Through quotation and enumeration we interrupt the continuum of history, and it is in the spirit of Benjamin's listed scraps of observations, analysis, and quotation that the following is offered. Let us now probe the poetics and functionality of a form that has resonated for over five thousand years in our programs and our imaginations, which are usually not so different.

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[13] Howard Eiland and Kevin McLaughlin discuss Benjamin's use of quotation in their foreword to *The Arcades Project:* "The transcendence of the conventional book form would go together, in this case, with the blasting apart of pragmatic historicism … Citation and commentary might then be perceived as intersecting at a thousand different angles, setting up vibrations across the epochs of recent history … all this would unfold through the medium of hints or 'blinks' – a discontinuous presentation deliberately opposed to traditional modes of argument." ("Translator's Foreword" in Walter Benjamin, *The Arcades Project,* trans. Howard Eiland & Kevin McLaughlin, Cambridge, MA: Harvard University Press, 1999, xi).

PART I: SPACE

Introduction

Part I focuses on lists in written media environments that are best understood in terms of their relationship to space. We will observe administrative lists as collectors of written matter, the inscribed borders and circulation of which have material effects on the world. These lists are written by human hands and organize data spatially, on the page, in particular ways. They are not exclusively spatial but are *biased,* to use a famous Innisian concept. This means that such lists' propensity to operate spatially and to facilitate spatially oriented activity usually exceeds their capacity to function temporally.

The lists described in Part I are *formats* in which the list form congeals as standardized charts and rankings (chapter two) and registries (chapter three). Both typically strive to achieve the impossible goal of 'everything included.' Part II will focus on lists that are more easily understood in terms of time.

2. Lists, Knowledge, Classification

"I've been around the world several times;
now, only banality still interests me."
        – Chris Marker (Sans Soleil, 1983)

"I percieve value, I create value, I confer value,
I even create – or guarantee – existence.
Hence my conpulsion to make 'lists.'"
        – Susan Sontag (1967)[14]

This chapter[15] examines the function of the list form as an epistemological operator[16] in popular culture and mass media. The chapter's animating question is: how does the list structure the production, circulation, and reception of cultural knowledge and information? The goal is to demonstrate that lists are constitutive of fields of knowledge, and as such delimit communication and social action in and around these fields.

2.1   What is the relationship between lists and knowledge?

Any list forges connections between its contents—even if just the basic fact of being placed together—that did not exist prior to the act of listing. This can be for the purposes of suggesting the infinite in a poetics of 'etcetera,' as Eco (2009) and Peters (2011) show us through primarily aesthetic lists, but it can also be for more pragmatic purposes, such as in the documentation of science, knowledge, and so-

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[14] Sontag quoted in Schmidt and Ardam (2014).

[15] Aspects of this chapter are published in Young (2013a).

[16] I use the term 'operator' as a substitute term for what "in a more subject-centered vocabulary are called agents" (Bennett 2010, p. 9). I'm relying here on connections drawn by Jane Bennett between Deleuze's 'quasi-causal operator,' "that which, by virtue of its particular location in an assemblage and the fortuity of being in the right place at the right time, makes the difference, makes things happen, becomes the decisive force catalyzing an event" (Bennet 2010, p. 9), and Latour's 'actant,' which is "neither an object nor a subject but an 'intervener'" (p. 9).

called 'everyday life.' In both cases, the list is aimed at reducing entropy, allowing us to help combat or even "become superior to that which is greater than us" (Latour 1999, p. 65). 'Utilitarian' lists, as Belknap (2004) calls them, are more about doing than showing, but it would be a mistake to write them off as essentially less complex than lists used for aesthetic purposes.

Focusing on utilitarian lists can show us the role of interstitial forms of writing in historical shifts in ways of knowing and acting in human societies. Such forms of writing are typically overlooked, even though they are crucial operators in media-technological networks. They enter into relations with other nodes in such networks (whether human or non-human) that have implications for knowledge production and dissemination. Latour and Serres (1995) suggest that the goal of analysis should be to trace these relations. An example is Goody's (1977) account of the prescription, a form that emerged via the writing down of medical 'recipes' in the third millennium BCE. Prescriptions arise as a simple storage problem – a wish to preserve and share information. Once put down on paper, however, a process of trial-and-error is enacted on the information over space and time, as subsequent users of the prescription can add or subtract to it as deemed necessary. Such a process enhances knowledge about the human body and its treatment, Goody suggests, and he points to it as a kind of proto-scientific method (1977 pp. 136-38; also p. 90-93). The key point is that administrative forms of writing, which arise out of very practical, everyday problems of storing and sharing information, inaugurate processes that affect the trajectory of human thought and action. They are not simply administrative, but have a kind of agency—they do not merely facilitate, but actively contribute to such processes. Such epistemological factors only come into view when we broaden our understanding of writing beyond the grammatical, semiological, or conventionally historical to encompass operational and interstitial entities.

Goody's analysis of the prescription shows an understanding of human knowledge, society, and history that is not about inventions, inventors, nations, or spirits of ages determining the unfolding of history; rather, he foregrounds the unintended consequences or implications of the material documents and documentation of everyday life. An important point emerges: the repetition of such acts of administrative writing (in lists, prescriptions, recipes, experiments, transactions, etc.) comes to influence the way written statements are conceived and documented. Put another way, such acts of writing come to be future-oriented in their preservation of data or information to be used later, and therefore this form of writing allows ancient societies to break free from the perpetual-presentness of homeostasis (see Goody and Watt 1963). This is achieved via not only the capacity to preserve the past (as might be conventionally thought) but also to affect the future. In this last point, connections between Goody's analysis and Bruno Latour early work become clear.

Latour (1987) discusses the ability of those who possess knowledge or information about the world to affect the future in relation to his concept *centres of calculation*. Historic centres of calculation such as the eighteenth century empires of the European continent emerge, Latour argues, after cycles of accumulation bring, in addition to material wealth, information about the world back to a certain point. The latter becomes a centre of calculation, Latour argues, when this information allows those who occupy it to act on the world from a distance (in space, and in time). Cartography, for instance, as a technology of knowledge primarily concerned with the collection of information, enabled empires of conquest to first *know* the world and then to act on it from a distance in future expeditions. Latour's example is the French explorer Laperouse, who collected information about the East Pacific and transported it back, first to his ship, then to Versailles. This information in turn allowed future expeditions to know what to expect of the area in question, thus freeing them up to collect different kinds of knowledge beneficial to the King. Fewer material resources and less intellectual labour needed to be devoted to cartography

by subsequent expeditions. Latour's point is that we do not often examine the means invented to transport data from field to centre, which he calls 'immutable mobiles' (1987 pp. 215-224). Goody's is just such an inscription technique: information from the outside world is collected, listed, and stored within it. The prescription then allows whoever possesses it to act on the world and affect the future; it preserves this knowledge, and carries it forward through time.

The purpose of this brief example is to show that Latour's extensive work (1987; 1990; 1999; 2005) on the material means by which institutional information and knowledge emerge is of use in broadening our understanding of how utilitarian lists participate in such processes. Using Latour's language, lists *draw things together* and put them in relation to one another—as visual forms of information, they tell us things that were previously unavailable. Connections are forged and relations become traceable. Lists help to accelerate and make more efficient the collection of information in cycles of accumulation, thereby facilitating the ability of any point to become a centre of calculation. Lists are part of the stuff from which the social, the cultural, the political, the economic, etc. is assembled and preserved. And by turning our analytic eye toward them, we begin to see that they are not simple forms after all. Lists may *black box* certain features, such as its criteria of inclusion and exclusion. Such factors are often taken for granted even though they structure how and what the list communicates. Latour also allows us to understand a list's *context of citation*, the way it mobilizes many voices within the text in order to strengthen its case. But above all, Latour helps us to understand the list as a material form of information that mobilizes, stabilizes, and combines data, crystallizing it as information.

In performing such operations, lists help constitute fields of knowledge. This capacity resonates with Foucault's meticulous tracing of emergent modes of observation and classification that in the classical period helped distance natural history from the ways of knowing that preceded it (Foucault 2009, p. 136-79). In that

case, forms such as lists, tables, diagrams, etc. organize observations and render words and things as data points or sets that can be classified in new ways. As mentioned in chapter one, lists serve a similar function in the florilegia of the Middle Ages. While this mode of information organization emerged initially as a personal list of things worth remembering about a text, Blair notes that authors of florilegia very quickly began to share and disseminate their lists, which served to establish and spread awareness of a canon in any given field (Blair 2011, p. 34-5). Blair's work shows that such canons arise not simply because of the way lists formally organize information, but also because the lists produced circulated easily. More than mere summaries, florilegia stood as concise value judgments about a text in which the 'best' or 'most important' passages were isolated and emphasized. These hierarchized lists of individual judgments circulated as authoritative documents regarding important sources and passages. They rested on the authority and erudition of their authors, who used the list form to do the labourious work of institutionalizing and legitimating knowledge. Frohmann (2004) demonstrates that such documentary practices do stabilizing work, preceding and enabling concepts such as 'information.' Documents become 'informing' only once they acquire the cache of the "social and pedagogical disciplines that maintai[n] them" (p. 400). Frohmann argues we should not understand information as an ontological 'substance' to be sought, gathered, and translated into meaning (i.e. knowledge) by the human mind. Information instead emerges as the end result of documentary practices. Put another way, information as a concept that engenders knowledge arises out of cultural techniques of documentation.

Florilegia show lists as epistemological operators on emergent fields of knowledge and discourse communities during the Middle Ages. Those practices cannot be simply imported to a contemporary *milieu*, since "[d]ifferent times and different places exhibit different kinds of documentary practices and different kinds of institutions" (Frohmann 2004, p. 402). However florilegia do share a family resemblance with contemporary practices of cultural listmaking, the focus of this

chapter's section 2.2. There, the analysis of lists in popular music demonstrates how lists congeal as 'knowledge' the various components of a field, wherein songs, artists, moments, and memories are abstracted as data in a variety of lists that function in field-specific ways. Through this form, collective archives and canons emerge, commodity circulation is measured, taste is made, and mastery of knowledge is performed. The process of knowledge formation arises from the exceptionally hard work of coordinating and stabilizing many networks of observation, experimentation, commentary, citation, classification, and the like (aside from Frohmann 2004, see Latour 1987; 1999; Hacking 1975). Science studies is the scholarly field that examines, in meticulous detail, this process of slow sedimentation. As this is a work of media studies, a direct engagement with the myriad debates of science studies lay beyond the scope of my project.[17] My purpose here is to explore what certain tools from science studies can bring to a work of media studies. I hope the reader will grant me license to do so.

2.2   Popular Music

There is a long-standing relationship between popular music and lists. First, over the course of the twentieth century, sales charts and year-end top 10s came to structure the field in a variety of ways: as a summary of industrial and market tendencies; a snapshot of musical preferences and taste; a marketing device; a communicative format linking producers, critics, and consumers; and an active archive of social musical experience. Such list functions are an important yet often overlooked component in the documentation of popular music history (see Sanjek 1988; Hakanen 1998; Parker 1991; Huber 2010). Second, playlists—both user and algorithmically generated—have emerged over the past decade as perhaps the

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[17] I do, however, engage directly with three major figures of the field: Bruno Latour (chapter two), Ian Hacking (chapter three), and Mary Poovey (chapter three).

dominant mediator of contemporary musical experience (see Quiñones 2007; Henderson 2008). Third, emergent forms of collaborative knowledge projects such as *Wikipedia* increasingly enable and encourage the unquestioned use of lists to prop up aesthetic claims. Finally, an abundance of lists with an overtly historicist tenor has emerged in recent critical and populist musical discourse, more experientially ambitious than traditional sales charts or top 10s. Examples include *Rolling Stone's* 'Top 500 Albums of All-Time' or *Pitchfork* online magazine's 'P2K: The Decade in Music.'

By observing lists in this realm, several important considerations come to light. First, we can draw an important distinction between, on the one hand, lists as a format that does crucial epistemological work and, on the other, the act of listing as a cultural technique of comparison that structures and, to borrow Latour's term, *assembles* the social activity of the field. Put another way, this distinction is between operational lists—sales charts, top-10s, playlists, etc.—that materially measure, trace, and map the field (storing and processing its data), and what I will call 'memory' lists—subjective and collective lists that store and transmit socio-cultural information. The ubiquity and importance of the latter to contemporary popular music and culture—readily observable with every Web-browsing session— demonstrate that lists are not simply administrative, but rather are bound up in a much broader network of subjective and collective memory work. Lists process the distinctions and inscribe the categories by which what Williams described as the 'selective tradition' of culture is generated (2001, p. 66-76).

The goal of this section is to show that at both levels the list is constitutive— that by classifying and measuring, lists are essential operators in constructing a field's spaces of belonging and economies of reputation, as well as the epistemological materiality of that field itself. A case study from each realm, operational and memory, will be pursued. Sub-section 2.2.1 offers a history of institutionally-sanctioned charts, outlining the emergence of the latter as a

standardized communicative format. This history illuminates the role played by charts in establishing 'popular' as a category of music, and the list as a crucial intermediary through which economic and institutional discourse pass. The upshot of this constitutive function is that listing as a cultural technique comes to also structure social music experience. Sub-section 2.2.2 tests the proposition that such listing pratices can perform collective memory work that undercuts institutionally-sanctioned lists by analyzing Bob Mersereau's *Top 100 Canadian Singles*. Ultimately, I argue that this potential is severely limited by the fact that such memory work is determined (in Raymond Williams' sense, as delimitation) by the borders of the list format, and serves only to mimic the historicizing function of institutionally sanctioned lists.

2.2.1   How do institutional lists work?

A brief history of the charts[18]

The popular music chart that dominates the contemporary imagination is the '*Billboard* Hot-100' singles chart. *Billboard* originally had nothing to do with music. It was founded in 1894 as a trade paper for the bill posting industry. Within a few years of its inception, however, the paper began running advertisements for circuses, carnivals, vaudeville and other live entertainment. Coverage of motion pictures began in 1909, with radio to follow in 1920s. The magazine published the 'Network Song Census' in 1934, followed by a series of radio 'Hit Parade' programs from 1936 onward. In 1940 came what Parker (1991, p. 207) calls the "first fairly accurate tabulation of popular music sales." The Hot-100 congealed in its recognizable format

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[18] This section relies on extensive archival work done by Russell Sanjek (1988), and on the extention and elaboration of his work done by Parker (1991) and Hakanen (1998).

in 1958 and has since been the paradigmatic popular music list. Its prehistory, however, is murky. *Billboard* itself points to the first, unofficial 'chart' as its 1913 listings of 'Popular Songs Heard in Vaudevil [sic] Theatres Last Week' (Schlager 2006). This claim is contesed by scholarship on charts, which points variously to *Variety* magazine's amalgam of the publishers' charts (Hakenen 1998), or its monthly best-selling records chart (Sanjek 1988), both established in the 1920s, or to the *Melody Maker's* honours list from 1928 (Parker 1991). Ultimately, though, the question of origin is irrelevant. What matters is not just how quickly and broadly this technique and form spread, but also how universally it was accepted and how unquestioned it came to be as a metric and a communicative device.

What each of the above 'original' charts share is that they were adopted from pre-existing industry listing practices. Industry charts emerged with *fin-de-siecle* traveling road shows and vaudeville as a means by which sheet music publishers could promote their best-selling songs. These charts were alphabetical lists that publishers carried from show to show, using them to drum up interest from potential customers. It is often forgotten that publishers, not artists or composers, were at the centre of American popular music prior to phonograph and radio technology. The saleable music commodity was sheet music, and prior to recorded music and copyright, listed charts were one of the most effective ways to generate compensation and profit. The publishers' lists generated interest, competition, and artificial scarcity amongst their commodities. Such charts therefore allowed publishers to inscribe market parameters on paper. They also materialized the power of publishers over performers and composers; the only data points listed beside a song on these charts were title and publisher, nothing of performer or composer.

When these charts migrated into trade papers like *Billboard* (ca. late 1920s), whose tepid interest in music was hotting up, they were aimed not at consumers but industry insiders. The consumer appeal of charts was as yet undiscovered and thus unexploited. Hakanen (1998) and Ennis (1994) suggest that structural dynamics of

the popular music industry at the time led trade papers and publishers to believe there was little point in circulating charts to consumers. These structural factors were: 1) the dominant commodity being sheet music, which demanded musical proficiency and thus ensured a limited market size; 2) the tight control over the production, circulation, and distribution of the sheet music commodity by publishers, which resulted in, 3) songs being extremely slow, both to market and to circulate. A hit song would typically spend around three years on the industry charts. This slow turn-over rate enabled publishers to anticipate demand and maintain stock effectively (Hakanen 1998, p. 102-3).

In an ill-fated attempt to combat the rise of radio and phonography in the early 1930s and encourage more playing of their product, sheet music producers flooded their once tightly controlled market. This increase in the number of songs on the charts necessitated an increase in information per listing. Where once only the publisher and name of song had been listed, now both number of radio plugs and artist names were included. The latter helped audiences differentiate between songs and inscribed performers into the very fabric of the charts. 'Artist' became a category on paper as distinct from performers' previous status as invisible hired guns with no material presence on the charts whatsoever. With their increased stature and recognition came eminently reasonable demands from artists for compensation and proprietary rights. Broadcast Music Inc. (BMI) was established in 1939 by a consortium of independent radio stations as a lower cost alternative to the American Society of Composers, Authors, and Publishers (ASCAP), which had hitherto enjoyed a monopoly over license agreements.

Competition in copyright and performing rights pushed music publishers out. In addition to song title, artist, number of radio plugs, charts now included information about the copyright agency, rather than publisher. Competition amongst copyright agencies also offered artists an enhanced role in the industry, though this was not without its drawbacks. The accelerated turnover rate of hit songs led to a

new formal feature on charts: 'previous chart position.' This addition installed a backward-looking dimension to the charts that had previously not existed. Inscribed on the charts now was an imminent archive of performance, a new metric of status. The demand to chart high and long also established what Hakanen (1998) understands as a new valuation of music: star image of artist and recent performance of song over aesthetic quality or merit. The ranking system (previous charts had been alphabetical) framed the artist star-image as saleable commodity. The star-image continues to drive popular music business and artistry.

The expansion of music commodity metadata (title, artist, copyright, chart position, radio plugs, etc.), the acceleration of song turnover, and the emergence of the artist as saleable music commodity all occurred first on paper. Each of these factors contributed to the segmentation of audiences into categories themselves: "the music business began to conquer and divide audiences into manageable parts" (Hakenen 1998, p. 105). It did this on and through the charts.

The cultural techniques of categorization

The cultural technique of listing, adopted by traveling sheet music publishers for economic and administrative needs, establishes an epistemological framework in which the popular music field comes both to know itself and be known by its consumers. This framework's paradigmatic format is the chart. Even into the recorded music era, charts still served primarily business interets by providing emprical data to demonstrate the successes and failures of publishers and labels, acts, producers, etc. (Parker 1991, p. 208). Charts still provide an easy metric for industry decisions regarding investment and labour costs. "A huge amount of money is therefore spent in order that the industry can constantly feel its own pulse and test the market" (Parker 1991, p. 208).

Beyond the materialization of economic activity, Hakanen (1998) argues that the chart system of the pre-recorded music era established a category of 'popular' defined not by consumer choice or taste, but by publishers' dictum. What was popular on the early charts was what publishers said was popular—whether their lists of 'best sellers' were based on actual units sold or units they *wanted* to sell is impossible to say. What is certain is that the rules of the game were already set when charts congealed in their recognizable 'top-40' format and began to be targeted directly to consumers, ca. 1940-60. While the weekly top-40 charts *appeared* simply to represent consumer choices and taste, the prehistory sketched above shows how deeply encoded publisher interests are in the very format itself. For instance, when mass circulation of recorded music and radio began to alter the terrain of popular music, the shorter half-life of hits had more to do with the concerted (and doomed) attempt by publishers to flood the market and move more units of sheet music than with fickle consumer tastes arising from increased choice (see Hakenen 1998). More 'hit' songs on the sheet music charts established an accelerated turnover rate precedent that would survive into the more expanded, commercial chart system of the 1940s and 50s.

The widespread adoption of the term 'popular' to describe genre, style, and also a new category of fan, occurred via the charts. The shift in the 1930s toward a chart system more explicitly aimed at consumers was to a large degree the result of publishers coming to understand that their charts had inscribed a new taste community that was beginning to self-identify with the music contained therein. The 'low' culture of the proletariat existed on the charts in contradistinction to the 'high' culture of the bourgeois that went unlisted (Hakanen 1998, p. 103). Hakanen argues that these new categories established pillars by which the 'lonely crowd' of mid-century America attempted to categorize itself. 'Popular' comes to describe the audience as it delivers itself to the market." (p. 107). More than a mirror of an extant category, the charts are a separate construction of the *perception* of popularity. There is an intersection of two senses of the word 'popular' in its establishment as a

category of popular music. Whereas with the early sheet music charts the term was used to describe what was 'widely favoured' or 'well-liked' (even if this was not empirically verifiable), over time a second meaning was integrated. Widely favoured 'low' popular music literally *came into view* via the charts, establishing a set of shared visual markers with which a new taste community could imagine itself. In identifying itself with the popular music charts, this new proletarian taste community reclaimed the pejorative sense of popular as 'low' or 'base,' injecting back into the word a sense of 'folk' or 'of the people.' This was a restricted field of democratic cultural activity, the borders of which were defined by the charts. Hakenen (1998) points out that the charts channeled vectors of personal identification toward non-class based categories of genre and taste. It is beyond the scope of this chapter to pursue this question further, but the connection to class is suggestive.

Furthermore, when song metadata are abstracted and fitted to the templates of the charts, divergent musics and artists become standardized and thus more suitable for direct competition. Formal or generic distinctions disappear when songs appear on the pop chart, and the flattening of differences ensures songs and artists must compete with one another for chart, and thus market, supremacy. "Within the market-place there is only competition on the basis of assumed equivalence; any differences are reduced to differential calculations about exchange value" (Parker 1991, p. 211). The logic and values of capital are here imminent in structural attributes of the paradigmatic popular music format. "Exchange value of the object has become the relationship of a song to other songs" (Hakenen 1998, p. 107).

In an effort to create or maintain a competitive edge, insiders used the charts to establish new subgenres of music and consumer categories. *Billboard's* chart ecology has expanded continuously since the 'Hot-100' appeared in 1958. The majority of chart distinctions have usually been drawn according to generic and geographic borders. Today, in addition to its eight 'all-genre' charts, there are eight genre-based chart hubs: R&B/Hip Hop, Adult/Pop, Country, Rock, Dance, Latin,

Christian, and Jazz. These are in addition to nine international charts, over fifty-three album charts (also delineated primarily according to genre and geography), and one chart for ringtones. Particularly in the digital age, industry has attempted to push back against the imperialism of the pop charts through niche marketing. Hakenen (1998) argues that the distinctions drawn by these smaller 'sub'-charts created new spaces for contra-identification, for going against the grain of the pop charts. For instance, the 'Alternative' chart (a sub-chart of the Rock sub-chart) creates new value for the consumer by taking away the competition of the 'vulgar' conventional pop genres. Alternative songs are given their own space to compete amongst themselves, rather than against the crushing mass of vapid pop. Consumer identification via negation, and thus a new consumer profile, is here enabled by the distinction made by the charts between genres, and the borders drawn around style and brand. Consumers believe this to be an 'organic' distinction drawn by their tastes and preferences, in fact the category exists on the chart before anywhere else. The key point is that the logic of the charts persists; more charts only strengthen the hold they have on the field.

As new categories were established on the charts, new concepts were required to describe, for instance, 'crossover' songs that moved across genre and taste communities. Such marketing terms are cloaked in the veneer of objective description and rest on the assumption that the charts are extant ontological structures. What we have seen, however, is that while a song may move across lists or amongst categories, this activity is arbitrary rather than empirical, epistemological rather than ontological. When industry insiders draw borders of categories, any song or artist can be made to move to any chart or position. Such activity cannot be said to be anything other than furthering the economic interests of the gatekeepers that compile the lists or hold the copyrights. The marketing function of charts and their categories is also made obvious by the fact that, though music single sales (and music sales generally) have fallen precipitously over the last fifty years—to such a degree that RIAA sales thresholds had to be scaled back in 1989—the *Hot-100*

remains the most widely circulated and discussed music chart (Parker 1991). Finally, the marketing function of charts is expressed by the circular logic in which charts purport to communicate only empirical data about sales and radio play, yet radio playlists, and to a certain extent consumer choices, are derived from songs already on the charts (Parker 1991, p. 208).

The various practices of listing outlined so far show it to be a cultural technique that inscribes new categories for social, cultural, and economic life. Lists process the distinctions upon which categorizations that come to structure the popular music field are drawn. This structuring format, the chart, creates a focal point around which taste communities are articulated. Charts organize economic activity by allowing industry insiders to literally inscribe market parameters on paper, and to observe in almost real time consumer behaviour. The appearance of empirical objectivity masks the logic of the market; the interests of producers are baked into the format itself. Charts are a particular epistemological organization of popular music that is presented as normal, empirically verifiable, and true. Echoing Siegert's (2011) pithy phrase, 'the map *is* the territory,' we might say that the chart *is* the field.

Another rule of the game established by the charts is the frequency with which popular music information is circulated. Through charts, a spatial form, the field comes to organize itself around the week as the primary unit of time. Fans and industry alike are always looking to the next week, the next hit, the next chart. This constant updating of the charts survives to the present day. Though it is impossible to say conclusively, weekly charts likely emerged as the standard (as opposed to monthly or yearly charts) due to the aforementioned desire of industry insiders to have constant a finger on the pulse of the business. There is no evidence this had anything to do with consumer behaviour or preference (Parker 1991, p. 208). But whatever its origin, the weekly rhythm of charts imposes both a backward-looking archival impulse and a perpetual forward momentum on the field. Regarding the former, charts are a means by which the present is frozen for posterity, a current

snapshot of what is hot or not. As mentioned, the 'previous position' column frames this present as part of a longer trajectory, either rising or falling. Such a frame structures the reader's judgment of an artist and a song's performance, and elicits speculation about this entry's future trajectory—is it headed toward the summit of the #1 spot, or the abyss of the chart's bottom edge? In charts, many times converge and become standardized according to its logic of competition: collated pasts, anticipated futures, and what's hot now in Real Time. Charts freeze the present as part of an ongoing archiving of popular music history, creating what Hakenen (1998) calls a 'stockpile' of information that prescribes the future. Time is rendered spatial, materialized as data on a page. Insiders can base marketing decisions that affect future song performance on such data, while fans can rely on the charts to provide knowledge about music they have not directly experienced. "[C]harts seemingly allow for knowing about the music's performance, rather than knowing the performance of music" (Hakenen 1998, p. 106). At the same time, this archival impulse is in constant tension with the enduring ephemerality[19] of charts. The spectre of entropy and etcetera haunts any given chart. The essence of a chart is that it is finite and disposable; the next chart is always already on the horizon. The order a chart inscribes now will be exploded and replaced by Sunday. Charts go on, but *this* chart does not. In this way a chart is precisely the kind of 'information' Peters (1988, p. 19) describes, whose "value is given in relation to time (its freshness or staleness) and its accuracy. New 'information' does not enlarge or transform old

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[19] This is a term of Wendy Chun (2008), who develops it to describe 'the digital', by which she means the cycles of data processing, storage, and transmission that render the supposedly permanent into an 'enduring ephemeral' that constantly circulates: old e-mails, youtube videos, comment threads, erased files and the like are here today, gone tomorrow, back next week. This 'permanence' is of a new kind (this is what sustains the 'newness' of new media), not fixed in place, such as in an analog archive, or linearly degenerative, such as in human memory, but rather a peculiar mix of the two. By using the term, I am suggesting that popular music charts exist in a similar relation to time and history.

information, but makes it obsolete."[20] Charts fetishize newness because they never allow consumers to stop looking at the present in terms of the future. "Continual watchfulness [as] a precondition for the acquisition of valuable pop knowledge" (Parker 1991, p. 213).[21]

The constant negotiation of this tension between everything-included and etcetera accounts, I argue, for the enduring appeal of the charts. "Top 40 charts operate as an ordered, finite way of making sense of the vastness of mass culture" (Huber 2010, p. 149). A weekly chart draws a border around a matrix of actors, events, sounds, etc. that are in constant circulation and are impossible to empirically *know* as a totality. The borders of the chart create an informational format by which audiences and industry insiders can understand their field as a field—past, present, and future. 'Everything' is included, but of course this 'everything' is only some things. "Charts give value, channel, and select things that otherwise have none, that would float undifferentiated" (Attali 1989, p. 109). Categories and taste communities are articulated, economic decisions are made, and histories are written according to the borders a chart draws. The constellation of categories, concepts, metrics, social and economic activity all comprise the 'field' of popular music, among other objects, actors, and processes. The charts, and thus the list, are crucial to the articulation of this field.

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[20] Peters is here close to Benjamin's (1968) understanding of the term: "Information … lays claim to prompt verifiability. The prime requirement is that it appear 'understandable in itself' … it is indispensable for information to sound plausible" (p. 89) And later in the same essay: "The value of information does not survive the moment in which it was new. It lives only at that moment; it has to surrender to it completely and explain itself to it without losing any time" (p. 90). Much more is said about Benjamin in chapter four.
[21] There is a strong temporal orientation to these charts, challenging what I have described as their space bias; it is important to recall that 'bias' is a heuristic term that demonstrates tendencies, rather than hard and fast boundaries. Charts are not *only* spatial, but the latter often exceed the temporal functions described above.

Memory lists

The above history and analysis of the charts paints a fairly bleak picture of their function as an epistemological operator in the cultural field, with charts serving the interests of those with economic or cultural capital and perpetuating the status quo. Some research counters this view, arguing that it is not enough to dismiss charts as pure ideology. The general thrust of this argument is to counter a political-economic analysis of popular music lists by demonstrating the list's role in mediating subjectivity and agency. Parker (1991), for instance, views the charts as a space of play. In contrast to producers, who live and die by the economic stakes of the charts, consumers enjoy charts as they enjoy sports tables—as a form of bounded recreation. To play a game, you must accept its rules. And in fact this is precisely what Parker argues is attractive about charts, the fact that they have very clear structural and mythological rules within which participation and play can occur. Charts provide a shared reference point, "a terrain around which judgements can be made" (Parker 1991, p. 215), and so stand as a site of cultural meaning making. "[Charts] are a contested sign, but one that has a strong residue of preferred meanings that help to construct understandings of the music they contain" (p. 216). We might hospitably extend this argument by conceiving of listing as a cultural technique by which consumers can exert agency on the popular music field. Fans come to author their own lists in reaction to institutional lists such as the *Billboard* charts, or critics' top-10 lists. Michael Berube (2000) argues that such listing serves an important critical function that complicates conventional understandings of popular culture fandom. "Developing the faculty of discrimination is part of the fun of immersing oneself in the popular—which means, interestingly, that few fans of popular culture are wholly 'immersed' in it. To be a really knowledgeable fan, in other words, you usually have to be a keen critic" (p. B7). Anna Poletti (2008) adopts a similar understanding of listing in zine culture, as a format by which the self is performed: taste, life narratives, and cultural capital are articulated in personal lists that challenge hegemonic institutional culture. Poletti conceives of listing as the

deliberate deployment of the paradigmatic popular music format to subvert hegemonic culture and articulate one's outsider status.

Implicit in these more forgiving analyses of charts is that charts function as a means by which to negotiate the tension between chaos and order. Lists can function cartographically, helping to decrease the entropy of the popular music archive. By distilling and organizing much of this material, both listmaking and list reading serve as access points for fans into the musical conversation. Indeed, the will to history of many such lists seems to be precisely what Huyssen describes as "the turn toward memory [which] is subliminally energized by the desire to anchor ourselves in a world characterized by an increasing instability of time and the fracturing of lived space" (2003, p. 18). Furthermore, fans exercise their critical faculties and challenge the status quo by redrawing the borders of the field using the same format as official institutions. They carve out different histories, epistemologies and value judgements from the entropic archive of popular music. This kind of social activity has produced, as noted in the introduction of this section, a proliferation of lists and rankings with a more overtly historical tenor in both critical and popular music discourse. Such lists seek to archive, compare, and rank according to "importance" or "influence" not only various historical and/or contemporary songs, artists, or albums, but also urban scenes, genres, fashions, even actual historical moments.[22]

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[22] Examples of such include *Rolling Stone's* 'Icons: The Greatest 100 Artists,' or their 'Greatest 500 Songs of All Time' & 'Greatest 500 Albums of All Time' – collections which seek to offer a palatable, comprehensive survey of popular music history, and which in the process establish a definitive canon of artists, songs, and albums deemed to be of the utmost importance in the unfolding of what *Rolling Stone* has determined to be the canonical historical narrative of popular music. Functioning similarly, *Pitchfork* online magazine has an extensive list section (which has best album and/or song collections for each decade since 1960 and each year since 2000). Alan Cross's now-defunct radio show *The Ongoing History of New Music* broadcast numerous countdown shows, among them the 'Top 100 Moments in Alt Rock,' a list which seeks to compare and rank according to importance or influence not any specific musical object (such as on the *Rolling Stone* or *Pitchfork* lists), but rather actual historical moments.

We might see the overtness of the historical claims in these memory lists as symptomatic of a general shift away from traditional evaluative and comparative criteria, such as the aesthetic or empirical, and toward subjectively adjudicated significance. William Brooks conceives of this shift as being from taste to tastelessness:

> Surrounded as we are by vast amounts of musical debris, we can invent rules, screening procedures, to help us choose what to study. And by exercising a modicum of ingenuity, we can invent rules that leave our opinions out, rules that select and reject music automatically according to criteria which are peripheral to musical 'value'. By means of such rules, I might select, for instance, only those records that made *Billboard's* Top Ten lists between 1945 and 1955, or only the records owned by my grandfather, or all those issued in i960, 1970 and 1980 with pictures of women on the cover, or all 45s released last May whose titles begin with C, I or A. As long as the rules are inclusive and unambiguous, they will operate virtually autonomously; there will be no need for me tastefully to assess the musical content of each recording. To this extent such rules allow me to choose bits for my history 'objectively' - though 'arbitrarily' is probably a better word (Brooks 1982, p. 14).

Hakanen (1998) puts it more pithily: "Being eclectic or understanding of other tastes no longer requires knowing the actual cultural product, only its ranking system" (p. 107). These observations resonate with much research into the so-called 'archival turn' in contemporary culture. Pierre Nora, for instance, argues that modernity's annihilation of memory has resulted in a situation wherein everything becomes possible history: "since no one knows what the past will be made of next, anxiety turns everything into a trace, a possible indication, a hint of history that contaminates the innocence of all things" (Nora 1989, p. 17). Things are no longer

simply things; they are possible artifacts, potentially important to the historical record of the future. One never knows at what point an object might be important to the historical narrative, or 'worth' something in monetary, social, or cultural capital, because the historical narrative itself is always changing. The compulsion is therefore to seek credit for the ability to observe, predict and discern these changes over time. A popular music fan is especially prone to this compulsion, and comes to engage with popular music as Will Straw's (1997, p. 13) 'adventurous' consumer seeking to unearth the obscure and heretofore lost or ignored treasures of popular music history. By (re)discovering previously unacknowledged, 'essential' moments, the fan can receive credit—social and cultural capital—for expanding the collective understanding of this history. Such contributions are the means by which social mobility is possible in a taste community, and are vital in the enhancement of reputation. As a result, contemporary artists are subjected to this historicizing gaze. Fans point to current artists as important, projecting future historical importance onto them. The most accessible outlet for these related impulses of the music fan (adventurous consumption and the historicizing gaze) is canonization. The easiest format through which to do such memory work is the list. The music fan constantly seeks out new treasures to mark out his or her taste and fluency in musical discourse as distinct from other fans, displaying and performing this distinction by authoring his or her own year-end top 10 list. The list emerges here in a dialectical relationship to social activity: the multitude of lists provokes the act of listing; the act of listing contributes to the multitude of lists. Memory lists both validate taste and are an easy target for the contestation of the popular music canon—they interpolate us, always, to question the authority of their claims, and to respond with lists of our own.

John Frow (1997) suggests that such memory work occurs in an 'indeterminate' domain that "stands at the point of intersection of 'public' history and 'private' memory." (p. 244). Lists, such as those found in the popular music field, often find resonance with their readers in precisely their ability to occupy such

a space. Lists compile 'public' artifacts (the songs, artists, moments, etc. that together constitute some kind of shared popular music history) and at the same time encourage the music fan and list reader to pour over their own personal or private histories, histories *of* these musical objects and histories that occur *around* them. Put another way, lists encourage the reader to contemplate their own direct memories of the objects themselves (a memory of attending a performance, acquiring a record, etc.), as well as those memories that are accompanied by musical objects (the 'soundtrack' to the events of a life). One hears echoes of Benjamin in such a contemplative approach to thinking about the list. Like a collection, a list can inaugurate "[a] springtide of memories which surges toward any collector as he contemplates his possessions" (Benjamin 1968, p. 60). Frow helps to move this process of contemplation beyond the 'collector's' own personal archive, and to give an account of shared experience and memories of public artifacts, most notably, commodities. By distilling popular culture, and specifically popular music, to a manageable scope, lists help to create the kind of mass audiences Frow highlights, which cross both national and linguistic boundaries. Frow actually attributes such a function indirectly to the list: he sees, for instance, Georges Perec's *Je me souviens* ['I remember,' 1978], an extended list of personal-public memories, as rousing the reader to compose a similar list, "a technology so easy to use that the effect of the book is, irresistibly, to drive the reader to produce parallel sets of memories, to construct for themselves that public domain of private memories that the book sets in play" (1997, p. 246). For Frow, whether we like it or not, our shared collective experience occurs in, through, and around the objects ready to hand, be they in commodity form or otherwise. It has always been thus. Charts and lists function to collect and present the raw materials that ultimately compose a collective history.

Such accounts are, in my view, limited. Countering an institutional analysis of charts rooted in political economy with an analysis oriented around individual subjectivity misses the point that the material properties of lists perform the same

structuring functions in both subjective and institutional cases. As Scott (2013, p. 68), reading Hesmondhalgh (2006) suggests, "charts act as 'institutions of consecration; functioning as a template for comparing, valuing and ordering pop artists while simultaneously governing music industry agents in their struggles to move songs up places and thus signal their success." Charts set the rules of the game, thereby limiting what epistemological, commercial, and social activity can occur within the parameters they establish. Parker (1991), for instance, undercuts his own argument by admitting that the play engendered by charts is bounded by the homology between charts and the economic and social structures that surround and inform them. Charts embody the central values of consumer capitalism, in his words, and so whatever play charts may enable is ultimately superficial and solipsistic. We all play games of different kinds and find different ways to articulate identities; I am not sure what makes the list an especially notable form through which this activity is pursued. Further, the types of activity lists engender serve conservative functions, as Lovink (2011) describes in a more recent cultural context.

> How can comments, even if they are posted by the millions, escape
> the margins and become integrated into the source? … It is not enough
> to draw up lists of counter-classics in an attempt to resist national
> campaigns to canonize cultural and scientific heritage. The reactionary
> call for national canons, heard worldwide in so many different
> contexts, is a clear response to the unheard explosion of untamed
> commentary and the loss of authority of the artist formerly known as
> author (p.58)

Claims about the ability of lists to transgress exist in a vein of media studies scholarship that in reading human engagements with culture looks for items that 'subvert' the logic of X (where X could be capital, patriarchy, racism, technological determinism, etc). I do not dispute the need to oppose these and other evils in the world, but I don't believe participatory culture and semiotic *bricolage* get us very far

in such a project. In this case, even those charts that appear to be offering a unique site of identity construction are in fact abiding by the same structures of the institutional charts they seek to subvert. This has less to do with top-down ideology than it does with the way charts on paper draw distinctions and determine categorizations from the bottom up. The structuring function performed by the list format is, to my view, more notable than the social activity it engenders: *how* the list delimits the exercise of critical faculties, the authoring of life narratives, and play. It is not that charts are ideological, as ideology implies illusion or false consciousness. Rather, charts materialize the very conditions of possibility for subject positions and knowledge related to popular music. There is no pure realm of organic music fandom and culture that is corrupted by the charts. The very category 'popular' is an effect of the widespread adoption of the charts. Subject positions—even those that 'subvert' convention—are articulated using the raw material provided by the charts. We do not need to turn to concepts like play or counter-hegemony to 'save' the charts; we need to develop conceptual tools to understand how they operate and what they *do*. We need less about essence and meaning and more about function.

2.2.2   How does a memory list work?

The following analysis of Bob Mersereau's *Top 100 Canadian Singles* (2010) will allow us to understand more clearly how a contemporary cultural list functions. This phase of the argument rests on the contention that listing as a cultural technique became inscribed via administrative and economic purposes (as described above) before traveling out in the messier world of individual and collective memory work. Further, while these lists may appear to be less hegemonic, more open to play, in fact the material properties of the list format perform the same structuring functions on memory work as the institutional lists sketched out above. To more forcefully argue my point, this section turns away from officially sanctioned charts. It offers a close analysis of a memory list with a family resemblance to those described by

Berube, Poletti, and Parker, and which is embedded in wider networks of subjective and collective memory work. *Top 100 Canadian Singles*[23] is a collectively 'authored' archive of Canadian music, an alternative canon that offers a snapshot of what people 'really think.'

Context of citation

Mersereau's method in compiling the list consisted of first polling a committee of over 800 Canadians that he describes as follows:

> Many are directly involved in the daily creation, sales, promotion and broadcasting of Canadian music. There are famous musicians, well-known media people, managers, record company employees, reviewers, writers, deejays, retailers, roadies and club owners. And there are also lots of just plain fans who love Canadian music and make it a part of their daily life. (Mersereau 2010, pp. 8-9)

From each committee member he solicited a ranked top-10 list of singles defined as "songs that had been released as singles, whether to the public for sale or to

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[23] Notes on the book's material composition: it is presented in coffee-table book format with dimensions of 23.9 x 23.1 x 2.5 cm. It has 216 glossy pages with colour photographs throughout. There is an introduction by Mersereau of about 2000 words, after which are listed the top 100 singles (starting with #1). Each entry has an accompanying section of text that describes the song and attempts to contextualize it historically. Each of the first 10 entries has 3-4 pages devoted to them: 2-3 pages of text (of 800-900 words) and one full-page photo of the artist or group. Entries 11-50 are two pages each: one full-page picture, one page of text (400-500 words). Finally, entries 51-100 are one page each: the top half of the page devoted to small photo and song title/rank, the bottom half to text (300-400 words). Interviews were conducted for the song write-ups with artists 'or someone who was close to them at the time' in order to 'present clear and fresh perspectives on the works' (Mersereau, 2010, p. 9). Full-page or sidebar lists of celebrity jurors (such as John Roberts, Paul Quarrington, Denise Donlan, Rich Terfry, etc.) are dispersed throughout the text, breaking up the progression of the list occasionally. All of the jurors are listed in the back of the book, along with their occupation, institutional affiliation, and location. The book also contains an autonomous, unannotated list of the 'Top-100 French-Canadian singles' (pp. 78-79). Finally, the book contains a standard alphabetized index section.

broadcasters in some sort of medium for airplay" (2010, p. 10). Mersereau has not divulged exactly how the results were tallied or what formula or point system was used to amalgamate the individual lists, other than to suggest the results were run through a statistical formula (Dunphy, 2010). But importantly, this committee format allows the list to offer what Mersereau describes as a "consensus," rather than simply a subjective ranking of his own picks, or a critics' poll (Quill 2010). In this way, the critical environment by which a list is authored is reconfigured, away from the single author or publication, and toward an ostensibly more democratic "Canadian consensus."

We can see in this claim of consensus for *The Top 100 Canadian Singles* something Latour observes in scientific discourse: the process by which many voices are deployed to strengthen an argument or truth claim. Latour calls this the 'context of citation' of a given piece, the marshalling of voices in favour of an argument. Mobilizing an army of jurists allows Mersereau to avoid being critiqued for his own critical judgments (since his method does not incorporate them). No single person can be blamed or celebrated upon the reader's (dis)agreement, since blame or praise must be diffused over 800 jurists. Mersereau's method also makes the list appear not to be offering an argument or judgment. "It is just what the people think," he might say. However, an argument does exist and a truth claim is being presented, whatever Mersereau's opinion or intentions. The list appeals to the authority of 800 voices to make the argument that it represents or tells us something worth knowing: a snapshot of Canadians' opinion about their musical past. It is notable that Mersereau is explicit in his rejection of both his own status as authority and that of music critics; he sees strength in numbers rather than prestige. The list is thereby shielded, since as Latour (1987) shows, a paper with few sources is easily attacked, while a paper that draws on numerous voices is much more difficult to refute. Mersereau can claim his list's truth is in the numbers and statistics, and in order to challenge this claim the contrarian would need to examine each individual list to determine its meeting of proper criteria, the accuracy of the statistical methods of

amalgamation, etc. These data are anyway not available, but even if they were, the task would be monumentally time-consuming.

One might argue that the connection between such a list and the discursive process Latour describes in the scientific field is tenuous, since the individual lists Mersereau solicited are based strictly on opinion, and opinion is not forced to abide by any objective standard of truth. True enough. However, the key point is that Mersereau's description of the 800 jurists as a consensus obfuscates what the list actually does, how it acts on the field of which it is a part: it streamlines Canadian music; it incorporates certain artists, genres, and eras at the expense of others; it defines Canadian music *as* something; it inscribes the list itself as a viable or legitimate form through which to organize and communicate information about the field of Canadian music; and finally, it both enacts and demands a mode of engagement with music that is neither empirical (based on units sold, etc.) nor aesthetic (based on formal attributes or affect, etc.), but is based purely on comparison. Further, it is comparison according to a specific logic and a set of criteria that are dictated by Mersereau as the compiler of this list. For instance, the definition of Canadian music used—"the only real entry qualifications were that the performer had to be technically Canadian, no matter where he/she lives now or came from" (quoted in Quill 2010)—runs contra that of Canadian content (CanCon) laws[24] and therefore allows for the inclusion of works that might not meet the criteria of the latter (for example, much of Bryan Adams' work, a Canadian artist notoriously excluded by CanCon because of his songwriting partnerships with non-Canadians). These implicit criteria therefore affect the way we think about music, and specifically about Canadian music, because they reconfigure the epistemological terrain. The list

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[24] To qualify as Canadian content a musical selection has meet two of the following criteria: 1) the music is composed entirely by a Canadian; 2) the music is, or the lyrics are, performed principally by a Canadian; 3) the musical selection consists of a performance that is recorded wholly in Canada, or performed wholly in Canada and broadcast live in Canada; 4) the lyrics are written entirely by a Canadian (CRTC 2012).

constitutes a particular archive of Canadian music that is delineated by specific criteria of inclusion that are set out in advance.

While the list may initially spark debate about its method, legitimacy, or relevance, these factors may over time become black-boxed. If this were to happen, the list could be easily used in the future as a historical document, something that Mersereau has acknowledged hoping for. As he says, "The history of a lot of these songs just wasn't available in bookstores. … I was looking for a reference book and I guess, in the end, I just went 'Well, I guess I'm going to have to write it' " (quoted in Meany & Barber 2010). The list's context of citation (its assembled consensus) affords it a legitimacy based on the number of contributors, which may allow it to be used in the future as a historical document or at least as a signpost that frames the conversation around Canadian music. It might be used to establish a canon of Canadian music or provide the data drawn on by future conversers in debates about the field. Therefore a list that is ostensibly *present* oriented—shown by Mersereau's claim that it is a "snapshot" of how Canadians think about music at this particular moment (quoted in Quill 2010)—is also *past* oriented in its implicit historicizing ambition, yet also *future* oriented in that it seeks for itself legitimacy as a historical document to be used at some point in the future. The incorporation of many voices makes this list's ability to act as it does much stronger than if Mersereau had authored the list himself, or even with a small number of music critics.

Mersereau's attempt to construct a consensus in his list also functions to *popularize* the Canadian popular music field. Latour (1987) suggests, "If one wishes to increase the numbers of readers … one has to decrease the intensity of the controversy, and reduce the resources" (p. 57). This is exactly the strategy deployed by Mersereau in wrestling the authority to construct lists away from music critics and aficionados. Although he deploys many voices in the text, their input is limited,

consisting only of a list of 10 songs.[25] The intensity of the controversy is thereby
defused. This contrasts with much popular music criticism—a discourse community
often derided for being obscurantist and impenetrable for non-experts—which
abides by the same discursive trajectory as that of science, in which "the intensity of
the debates … slowly led from non-technical sentences, from large numbers of ill-
equipped verbal contestants to small numbers of well-equipped contestants who
write articles" (Latour 1987, p. 52). Mersereau's is a list 'for the people, by the
people,' he might say.

Mersereau takes pains not just in the introduction of his book but in virtually
every interview conducted while promoting it, to note, "none of you will completely
agree with the final one hundred chosen. Art is arbitrary—we knew that going into
the project" (Mersereau 2010, p. 7), or "[n]o list can be definitive … This is a
snapshot of tastes and preferences in 2009. The 2010 list would be substantially
different" (quoted in Quill 2010). Such statements anticipate readers' objections to
the list's contents in advance, a tactic common to all rhetoric, scientific or not:
"thanks to this procedure, the text is carefully aimed; it exhausts all potential
objections in advance and may very well leave the reader speechless since it can do
nothing else but take the statement up as a matter of fact" (Latour 1987, p. 53).
While Mersereau encourages disagreement with the list, his series of statements and
method of presentation effectively ensure that there is little dissent regarding the
decision to organize, frame, and communicate this information in such a *form*. His
readers are distracted by content and do not question the logic of the list—how it
frames their thinking about Canadian singles and prescribes a specific, hierarchized
path through the archive of all available Canadian music. That is to say, Mersereau's
list elicits the *captation* of the reader by exerting "subtle control of the objectors'
moves" (Latour 1987, p. 57).

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[25] A select few high-profile jurists' arguments or justifications are included in the final list, but the vast
majority of written material in the book consists of Mersereau's own write-ups.

Immutable mobiles

While readers are captive, objects—in this case musical objects—are dominated. Latour shows how objects and/as data come to be "dominated by sight," in that "at one point or another, [objects] all take the shape of a flat surface of paper that can be archived, pinned on a wall and combined with others" (1987, p. 227). Which is to say, collected objects come to be *stabilized, mobilized,* and *combined* in material, visual forms such as lists, tables, charts, or diagrams in order that they can better be controlled from a distance.

The Top 100 Canadian Singles is such a material form of information, which mobilizes, stabilizes, and combines data about Canadian music, crystallizing it as information and as history all in one place. In order to be placed in the list, musical objects must be translated into units or data that are not related to the formal, technical, or affective dimensions of music, allowing us to say that Mersereau's list is constituted by 100 data points that are definitively not musical. Musical objects— more specifically, songs—are transformed so they may be imported into a new medium. The singles are stabilized and mobilized by their collection and incorporation into the list, and combined together to become a new document. This document itself is also an immutable mobile. The book is a stable, unalterable medium; it is mobile and can be transported with great ease, or the actual list can be condensed down to simply 100 entries on 100 lines, reducing the noise in the channel; it is also combinable and comparable with other music lists—it may be placed in relation to Mersereau's (2007) *Top 100 Canadian Albums*, for example, or *Rolling Stone* magazine's (2003) "500 Greatest Songs of All Time."

Few other formats allow for such a seamless drawing together of many discrete units dispersed over time and space—the earliest entry (Hank Snow's "I'm Movin' On") is from 1950, the latest from 2007 (Feist's "1234" and Wintersleep's "Weighty Ghost"). Mersereau's list therefore can be seen as a visual form of information, its pages a series of two-dimensional inscriptions stacked on top of one

another, which creates what Latour describes as an "optical consistency" between divergent units (1990, p. 34). Such a visual form slices across traditional modes of classification (whether genre based, time based, etc.) and can tell us things about its objects or data that were previously not apparent—new connections can be forged between songs or artists that might not have previously been evident. One example might be that the list tells us that the 1970s is the decade with the highest number of songs (43) resonating in the cultural register of Mersereau's jury. We might then think about what this information tells us, i.e. try to ascertain how or why this is the case, perhaps drawing on historical events such as the enactment of CanCon rules in 1971. Such a process of visualization allows us to *do* certain things we could not do with this information previously—whether this is to debate the merits of the list or think about the hows and whys of certain patterns it contains.

So, on the one hand, Canadian music—the vast archive of music written, produced, and/or recorded in this country—is streamlined and made more manageable for the reader, i.e., the archive is made navigable. But on the other hand, by streamlining Canadian music in this way, Mersereau's list itself emerges as a potentially new kind of canon, out of which may emerge new connections or even narratives. Put another way: because the list cuts across traditional classification systems, the dominant narratives of Canadian popular music history (whether chronological, regional, genre based, etc.) become altered. A prescriptive path through a popular music archive is enacted by the list's material form, and how a reader navigates the list constitutes their processing of its information. Each of the constitutive elements of the list is transformed so all are of the same "optical consistency": time is condensed, regional differences are flattened, genre categorizations do not hold, and so on. Only the internal logic of the list obtains.

To sum up this section, a list such as *The Top 100 Canadian Singles* is not a neutral intermediary. As with other lists, it has a *constitutive* dimension that *acts* on the popular music field. Popular music lists such as this one serve to delimit the

terms in which the field can be thought, communicated, historicized, canonized, and by extension its relation to wider musical discourse and communities. All popular music lists draw things together to act on the field from a distance. In this example, Bob Mersereau's *Top 100 Canadian Singles* constructs an archive of Canadian music that makes a series of historical claims, most notably that the objects it contains should be privileged in the historical record of Canadian music, and that since this historical record is constantly being constructed and contested, this list is itself a viable historical document. Latour's conceptual tools have aided in clearing the ground for understanding the functionality of a list: how it comes to be, how it is made to circulate, what kinds of activity it enables or negates; in short: what it does.

Section 2.2 has offered a history of institutional charts and a close analysis of a collectively authored 'memory' list, demonstrating that the same structuring functions of the list are operative in each register. Listing is a cultural technique that inscribes categories, upon which are built concepts, and establishes a standardized format, through which all social and economic activity flows. In this way the cultural technique of listing precedes the field of popular music itself.

2.3   Conclusion

The chapter offered a history of institutional charts and a close analysis of a collectively authored 'memory' list, demonstrating that the same structuring functions of the list are operative in each register. Two key functions of lists were emphasized: 1) they inscribe borders that enact categorizations and modes of classification that structure epistemological fields, and thus social action that occurs around such fields; and 2) they black box the imperatives that feed into any list's creation (such as its criteria of inclusion/exclusion). The popular music case study was chosen because it is a relatively contingent, contested field. Its lists are worn as an exoskeleton, compelling us to question its categories and histories. Popular music is a field where it is relatively easy to observe the way listing as cultural

technique establishes syntactic, 'everything included' lists as a standardized format. The case study also brought into focus the operational capacity of lists, their proclivity for 'making things happen,' which will be further elaborated in chapters three and four.

To end this section with a generative thesis, as opposed to the diagnostic critque pursued above. Section 2.1 demonstrated that lists do facilitate social activity, even if these modes of practice are bounded by the borders draw by the list format. It is easy to dismiss 'bounded critique' as ultimately futile when it is viewed in isolation as in Section 2.1. However, bounded critique may serve a more productive function when exported to other realms wherein lists are less obviously contested. The critical engagement with lists in the cultural realm—however limited—acknowledges and makes use of the dialectic aspect of lists described by Goody (1977). By calling into question critics' lists, sales charts, or historicizing lists like Mersereau's, we reveal lists as structures that simultaneously erect borders around new knowledge formations and call into question the very borders they draw: the border as epistemological exoskeleton. Perhaps there are certain modes of engagement with the list format in the cultural realm that can be politically useful, at the very least in their ability to galvanize attention to the layer of seemingly banal paperwork that does so much work for political interests. My own interest in lists, and thus this entire research project, emerged in precisely this way. Formats and techniques matter, and we would do well to bring the same types of precise analysis that cultural lists garner to some of the less obvious instances in which governmentality is articulated on paper, such as those explored in subsequent chapters.

3. Lists, Administration, *Bestand*

"Theoretically, the collection of data for each person
can be so abundant, and even complete, that we can speak
at last of a paper human who represents the natural human."
  –Methorst and Lentz
    Directors of the Reich Inspectorate for the
    Population Register (1936)[26]

3.1   Introduction

In this chapter I want to show that lists are operative not only in the fields of knowledge related to cultural production, commodity circulation, and self-identification outlined in chapter two, but also in establishing administrative apparatuses that police and observe subjects. Whereas that chapter explored the role of lists in making knowledge, this chapter looks at their role in what Hacking (1986) calls 'making up people.' We therefore move from lists of words and things to lists of numbers and human beings, from a focus on cultural economies to governmental apparatuses and protocols. Listing is again conceived as a cultural technique of order and enumeration that processes the distinctions and *caesuras* by which modes of categorization and classification are established. However, my problematic expands from a focus on cultural knowledge to encompass broader political questions. This is done with an eye toward understanding the role enumerative listing plays in establishing new ways of seeing the world, and thus new arrangements of power/knowledge. Serious ethical and philosophical stakes emerge that demand investigation, particularly regarding the role of lists in controlling populations and subjecting human beings to power. Animating questions of this chapter are therefore: how does the list operate when human beings are its entries? How does one see the world through lists of people? More broadly, what is the relationship between listing and modernity?

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[26] Quoted in Aly and Roth (2004, p. 66).

In addressing such questions I develop a genealogy of the list as a cultural technique of 'logistical modernity.'[27] Circa 1500 a new way of approaching and understanding the world emerged. This worldview found extreme expression in the mid-twentieth century with the Nazi attempt at a totally administered society. I show this worldview to be *logistical.* Under its rubric fall three privileged processes associated with modernity: compression, calculation, and circulation. Certain goals and categories emerge in the modern period to facilitate these processes: rationality, efficiency, speed, and bureaucracy, to name a few. Thinking compression, calculation, and circulation together shows them to be a nest of mutually reinforcing processes that find expression in modern institutions (e.g. bureaucracy) and values (e.g. rationality). These institutions and values are, I argue, primarily about logistics. In pointing to these features of modernity as 'privileged,' I follow thinkers such as Ellul (1964), Mumford (1963), Berman (1982) and Harvey (1989). These thinkers outline in various ways how modern societies organize themselves around compression, calculation, and circulation. Harvey, for instance, talks about successive waves of 'time-space compression' (1989 pp. 240-242), Foucault of the shift in the role of government from disciplining subjects to facilitating new '*milieux* of circulation' (2007), Mumford of the fracturing of experiential time into discrete units that to be calculated and saved (1963, p. 12-18). While they focus on different modern phenomena—Harvey on the emergence and history of capitalism, Foucault on the emergence of 'governmentality' in the eighteenth century, Mumford on the rise of the machine as center of a new, "modern" society—each describes processes that are logistical. They are processes geared toward the movement of people, things and data through time and space.

My argument is that the cultural techniques of making modern people and institutions both inform and are informed by an understanding of the world in terms of compression, calculation, and circulation. Rather than a philosophy or ideology

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[27] A term Bratton (2006) uses to describe Virilio.

that sprang forth fully formed, the logistical worldview emerged through a long history of modern administration, information, and paperwork. These fields and concepts are not *a priori* historical constants, but emerged only through the adoption of certain cultural techniques of order, such as listing. I do not offer a deterministic argument about lists. They are one of many techniques in the matrix of administration conjured by modern minds and hands. Recall that cultural techniques are practices and processes that exist before the concepts and systems they generate, the 'verbs' in a grammar of media theory that operate on objects and people (see pp. 33-39). I have chosen the list as a lens into this matrix in order to understand how cultural techniques of order and enumeration establish categories and concepts that comprise the epistemological *a priori* of political and ideological worldviews.

Taking the Nazi administrative apparatus as a limit case study of the logistical worldview contributes to an extensive literature on Nazi administration that situates the latter within a long trajectory of modernity. This chapter adds a degree of granularity to broader projects that explore the relationship between Nazism and modernity at a philosophical level, such as those of the Frankfurt school (Adorno and Horkheimer 2002; Marcuse 1991; Fromm 1994), or more recently by Baumann (2001), and Herf (1984). Such studies connect Nazism specifically and fascism generally to certain modern modes of thinking (e.g. instrumental rationality) in order to ensure these events are not reduced to the status of historical anomaly. I offer a concrete case study that shows how such modern modes of thinking are articulated on paper and how they circulate. By extension, I show how ways of thinking become encoded into a logistical apparatus that reduces the world, as well as the objects and people which inhabit it, to what Martin Heidegger (1993) calls *Bestand*—a standing reserve of material to be ordered, exploited, and calculated at will.

I show how this worldview emerged from an epistemological arrangement that pre-dated Nazism by at least three hundred years. This arrangement privileged

calculation, compression, and eventually circulation. Within its conditions of possibility certain fields, concepts, and categories emerged to facilitate such processes: statistics, number, and induction among them. But these fields and categories did not emerge with epistemological authority fully formed, as if there were some *a priori* truth-value inherent in number or statistical calculations. They rest instead on an 'essential facticity' granted to them on the authority of what Mary Poovey (1997) calls the modern fact, which itself is a historically specific epistemological structure. What we find when we bore down to this granular level of facticity is nothing other than the list: the double-entry bookkeeping techniques and forms of fifteenth century Italian merchants.[28] Double-entry lists are a cultural technique that grafts trust and truth onto number thereby creating the modern fact. Lists are thus not simply the product or 'output' of the Nazi logistical worldview (e.g. deportation lists), but are also an architectonic form of the epistemological 'undergrowth' of Nazism. Put another way, the epistemological arrangement that produces the Nazi census rests on the authority produced by the cultural technique of listing. At the same time, the census produces a proliferation of lists that establish categories used to order the world and its inhabitants. The list here is a hidden operator that simultaneously produces and justifies the logistical worldview. From the latter emerge apparatuses of security that enable the logistical operations of the Nazi apparatus—the movement of the people and resources of the world (*Bestand*) through space and time as required by the regime.

The chapter proceeds as follows: in Section 3.2, I offer an abbreviated history of modern administration, in particular emphasizing the emergence of information and statistics as the 'lifeblood' of the modern state. Particular emphasis is given to the role of lists in the emergence of the modern fact, and the subsequent spread of

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[28] Bernhard Siegert explores double-entry bookkeeping as a cultural technique in his massive work *Passage des Digitalen* (2003). The lack of an English translation and my own linguistic shortcomings regrettably preclude a close engagement with this text.

empirical modes of knowing such as statistics. In Section 3.3, I consider the Nazi census as a radical expression of the logistical worldview. I explore how human beings are subjected to power via the list form, exploring how Nazi lists enacted *caesuras* and drew borders that engendered a logistical approach to the world. 'Everything-included' lists are here read as a paradigmatic form of such a worldview, which Heidegger described with the concept *Bestand*.

It is important to note that not all lists inevitably lead to fascism. The form also played a substantial role in *defeating* Nazism—it showed up as lists of Red Army divisions, of allied bomber targets, or of rations in Britain. The form also helped people flee the Reich, most notably in Oskar Schindler's famous lists. I take the totalizing lists of the Nazi census as a case study for two primary reasons: (1) Nazism was a comprehensive attempt at a totally administered society and because it used a lot of lists, the form is relatively easy to trace. Such limit cases are useful because in them we can easily spot phenomena and develop tools for its analysis. We can then export such tools to other *milieux*, where the object or phenomenon in question is more difficult to trace. (2) Limit cases are generative of controversies that push us to see what they miss; the question of 'counter-lists' only emerges in the shadow of an analysis of totalizing lists.

3.2   Administration

A plausible site to begin tracing the logistical worldview is the emergence of the modern state and with it the administrative apparatus we call 'bureaucracy.' I offer in this section a brief discussion of the relationship between the modern state and the administrative techniques and concepts we describe with the word 'bureaucracy.' I do not offer anything like a comprehensive treatment of this subject. My goal is simply to demonstrate that concepts and practices like 'information,' 'statistics,' and 'bureaucracy' did not drop from the sky fully formed alongside the modern state.

Their modalities and forms process the distinctions upon which the order of the state rests. These concepts and practices are the material expressions of a certain way of reckoning the world that we categorize as 'modern.'

Since at least Weber (1958), critics of the modern project have been vocal about the alienating and de-humanizing tendencies of bureaucracy. It is cliché by now to note that well-intentioned bureaucrats forge the bars of the Iron Cage. But there is nothing essentially modern about administration or bureaucracy. Human societies have administered themselves as far back as our inscription systems allow us to remember. As is usually the case, the techniques prefigure the concept, likely by several thousand years. The Latin *administrāre*, a word "in use throughout the ages," (Oxford Latin Dictionary) was a combination of *ad* (to; near) and *ministrare* (attend, serve, furnish). By the time Tertullian used it in the late second or early third century CE, the word carried a variety of meanings: "to be a helper, assist, to minister (to), to operate, work, to perform, carry out, conduct, to hold or perform the duties of (an office), to manage the affairs of, to manage (an estate), to bestow (on), to dispose of," also "to dispense (a sacrament)" in post-classical Latin (OLD). For hundreds if not thousands of years, 'administer' has been a flexible concept used to describe practices of management and order.

While administration is nothing new in language or habit, what did change in the modern period were the techniques, functions, and scales of administration— their elevation to the status of science, their migration into every aspect of human social life, and their largely unquestioned role as arbiters of truth. Administration in the modern period became synonymous with bureaucracy. The latter, crucially, became an object of study itself. "Bureaucracy, to be sure, is as old as civilization. Any large scale polity requires some kind of monitoring … But the scale and intensity of bureaucratic growth over the last two hundred years is quite unprecedented in human history" (Peters, 1988, p. 14). As we learned in chapter one, administrative forms such as the list stand at the very advent of writing. Early administrative lists

were conceived as present-based media of transfer, non-standardized administrative supports rather than objects to be administered, systematized, or studied themselves (Vismann 2008). Such lists were representative of the items they contained, the events they recorded, or the hands that inscribed them, but they were not a form to be studied on their own terms. Modernity is a story of the abstraction of such techniques and forms, the establishment of administration as a science that could be codified and disconnected from the world of its practice. A new field of administrative knowledge emerges floating cloud-like above the humans who perform its techniques and are contained in its form: bureaucracy. This abstraction has to do with two major factors: 1) the recalibration of time and space in the modern period, e.g. compression, and 2) the epistemological rise of number as a mode of what Mary Poovey calls "disinterested representation" (Poovey 1997, p. xix), e.g. calculation.

Thinkers from Mumford (1963) and McLuhan (1962; 1964) to Berman (1982) and Peters (1988; 2013) tell the story of modernity as one of space and time, previously sutured to Gods and monsters, emerging as experiential human categories to be mastered. Mumford (1963) argues, for instance, that the eternal time of the ancient mystics and the pre-Benedictine Christians—steadily eroded after the advent of calendars, clocks, and towers (Peters 2013)—is annihilated completely by the modern time of the clock. Meanwhile, the horizon of space expands in the modern period to such a degree that human perception of the world actually shrinks, a process pithily and famously described by McLuhan (1964) with his concept of the 'Global Village.' The world comes to be understood as something more abstract than what is available through the phenomenological experience of an individual human body (Peters 1988). Yet with the aid of modern techniques of order and representation it concomitantly becomes something fundamentally knowable. Continuing a process underway since the advent of writing (see Ong 1982; Goody 1977), new media technologies enable human communication and dissemination to break free from their physiological and existential constraints. David Harvey

understands the modern historical trajectory as a series of successive waves of time-space compression, "processes that so revolutionize the objective qualities of space and time that we are forced to alter, sometimes in quite radical ways, how we represent the world to ourselves" (Harvey, 1989, p. 240). The central paradox of modernity is that enhanced mastery of space and time brings equally intense feelings of instability. The 'conquering' of space and time results in a world that, lacking discernible experiential contours, feels ephemeral and strange. With order comes entropy. Robust techniques of measure bring an avalanche of numbers, and all that is solid melts into air.

> There is a mode of vital experience – experience of space and time, of the self and others, of life's possibilities and perils – that is shared by men and women all over the world today. I will call this body of experience 'modernity.' To be modern is to find ourselves in an environment that promises adventure, power, joy, growth, transformation of ourselves and the world – and, at the same time, that threatens to destroy everything we have, everything we know, everything we are. Modern environments and experiences cut across all boundaries of geography and ethnicity, of class and nationality, of religion and ideology; in this sense, modernity can be said to unite all mankind. But it is a paradoxical unity, a unity of disunity; it pours us all into a maelstrom of perpetual disintegration and renewal, of struggle and contradiction, of ambiguity and anguish. To be modern is to be part of a universe in which, as Marx said, 'all that is solid melts into air' (Berman 1982, p. 15).

There is a huge array of modern processes that produce the malaise Berman describes. My interest is in the tensions (and attempts at resolving those tensions) produced by the shift toward knowledge and experience as discrete, quantifiable units. This shift establishes an imaginative framework in which concepts and entities

previously thought whole become subject to human manipulation. Space and time are fractured from human bodies and broken down into constitutive units that can be counted, shuffled around, conquered, or lost. New dimensions of natural phenomena previously un-thought or black-boxed become knowable and manipulable. As Ian Hacking (2006) describes, following Herbert Butterfield, in the modern period Europeans 'put on a different kind of thinking cap.' The effects of that cognitive wardrobe change still structure our imaginative, conceptual, and argumentative framework. A new way of seeing the world and conceiving of our place in it emerged, premised on concepts and categories previously minor or non-existent: "truth, objectivity, evidence, information, probability, proof, experience, experiment, wonder, curiosity, ignorance, classification. These are the ideas with which we organize our reasoning" (Hacking 2006, p. xx).

To tell the story of how a quantifiable and calculable world became thinkable we need to look at the surfaces on which such abstractions occur. Modernity's compression of space-time is made possible not only by the array of new media technologies brought on through industrialization (i.e. the telegraph and railway) but also by innovations in paperwork. The latter has often been dismissed as ancillary to the great modern projects of literature and science, but recent scholarship has offered a much-needed corrective (Guillory 2004; B. Kafka 2012; Gitelman 2014). John Guillory convincingly demonstrates that the vast majority of modern thought occurs in and by not the modes of writing the moderns *think* themselves to be occupied by, the literary or scholarly/scientific, but in the banal genre he calls 'informational.'[29] Informational writing—memos, lists, diagrams, communiqués, etc.—is about administration. It allows modern people to get things done. Such modes of writing facilitate the movement of people and objects through space, the

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[29] Guillory describes this writing as a genre. I have at times added 'mode,' so as to preserve a sense of the processual aspect of writing as a technique, in which inscription surface, tool, hand, eye, mind, etc. converge to produce a document. Genre describes the latter perfectly well, but I wish to add an emphasis on the way techniques structure documentation, after which come documentary genres.

preservation in time of a written record of events, and the organization of institutions into hierarchies. Informational writing establishes a rhythm or order by which things unfold, programming future actions based on past results and present needs. Informational writing is therefore the paradigmatic mode of writing in modernity (2004, p. 126).

Informational modes of writing are about compression and efficiency in communication, which becomes more akin to processing. "The principle of an 'economy of attention,' … governs information technologies generally, and the documentary genres in particular" (Guillory 2004, p. 125). Guillory shows that the evolution of writing in modernity is a move from the *copia* and performative fireworks of rhetoric toward writing that breaks free from conventional syntax and narrative.

> When new genres of writing emerged with the aim of transmitting information, new techniques of economizing transmission were called forth by that aim. These genres did not rely only on a method of using fewer words to do the same job. The standardized form, for example, discarded the connective tissue of sentences and paragraphs altogether in order to transmit information in a new way: by dividing up the page into fields, by offering boxes to fill or check rather than sentences to write (Guillory 2004, p. 126).

Guillory sees such developments as degenerative. The modern imagination is colonized by a new discursive mode, exposition, which deals with science and information and is driven by a principle of economizing attention. This results in a regressive shift from argumentation to exposition, reason to number, wherein the logic of argument is displaced from *inventio* (the 'finding' of arguments) to *dispositio,* or arrangement. "Arrangement—organization itself—came to constitute the logic of transmission for expository writing" (p. 127). Arguments and conclusions are implicit in the order or presentation, i.e. those items at the top of the list are self-

evidently the most important. Bullet points fire 'self-evident' facts that require no elaboration or explanation.

Bracketing Guillory's judgment about the relative merits of classical rhetoric versus the perils of modern informational writing, the shift in emphasis toward the latter's privileging of exposition is indicative of modernity's space-bias. Critics of the period generally agree that modernity is marked by a transition from an era that focused on time—whether durational or serial—to one focused on space (see Innis 2002; Harvey 1989, Lefebve 1992, de Certeau 1988). The hands of the clock spatialize time itself, as Mumford (1963) famously demonstrated. Guillory's work is helpful because it allows us to map this 'spatial turn' at the level of paperwork. He shows that the relationship between paperwork and space is not limited to the way that forms such as lists facilitate the movement of people and things through spaces. There is also a spatial dimension in terms of the way that various techniques of order organize items on the page. The *format* in which data is compiled and presented shapes the way it is conceived and used.

The ubiquity of informational writing in modernity is related to a deep and arguably constitutive connection between such modes and the emergence of the modern state. The Peace of Westphalia (1648) is generally accepted as the foundational moment of the modern state system (Murphy 1996; Spruyt 1994). With its connection to maps, treaties, signatures and the drawing of borders, Westphalia might itself be considered something of an 'informational event.' We need not make such a broad claim. It is clear that in the wake of the Peace states turned inward. No longer at perpetual war they began to take internal account of themselves. New ideas emerged about the nature of the state, its subjects, and their relationship. As Ben Kafka writes, "[p]olitical society was founded by a speech act; the social contract was an oral one. Parchments and papers appeared once it became necessary to establish the specific modalities of subjection" (2012, p. 32). This new system produced new desires and needs for order and reference, which were not

minor matters. Kafka notes that a survey from 1770 estimated there were some 5700 document depositories across France, "most of them jealously guarded by feudal, monastic, and municipal authorities wary of the state's tendency to withdraw their privileges and then offer them back at a premium" (2012, p. 33). It was beginning to become apparent that 'strength in number' was a dictum applicable not only on the battlefield. The notion that power resided with control over archives, dormant since the Roman period (Vismann 2008, p. 57-8), re-emerged but with a crucial insight added that this was true only to the extent that archives had some semblance of order, some capacity for reference. A flowering of modern systems of reference and classification followed.[30] Clanchy (1993) shows that state power had been consolidated through the collection of numerical information as far back as the thirteenth and fourteenth centuries. However, this mode of power had been largely dormant until the end of the eighteenth century when its intensity was increased (Poovey 1997, p. 4). Thus came what Hacking (1991) describes as an 'avalanche' of numbers in the modern period. An effect of this avalanche with far reaching consequences was the increasing subjection of administration to reason and rationality in the pursuit of science. The systematization of administration was in large part an attempt to institutionalize number and calculation as "assurantial technologies" of the state (Hacking 1991). Statistics arose as a second-order realm of informational techniques to do just that.

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[30] Vismann (2008) offers a wide-ranging discussion of such systems and their predecessors that moves from the history of writing to modern literature; from Roman chanceries (and their study in the Renaissance), through the traveling archives and registries of monarchical power in middle ages, to the proto-bureaucracy of Maximilian I's imperial court chancery; from the bizarre world of baroque secretaries to the self-administration of the Prussian proto-state; from Goethe's personal archive to Nazi governmentality; from vertical files and binder technology to the Stasi surveillance state.

3.2.1   Statistics and number

Ian Hacking offers to my knowledge the most comprehensive analysis of statistics as an epistemological phenomenon. For Hacking,

> [s]tatistics has helped determine the form of laws about society and the character of social facts. It has engendered concepts and classifications within the human sciences. Moreover the collection of statistics has created, at the best, a great bureaucratic machinery. It may think of itself as providing only information, but it is itself part of the technology of power in a modern state (1991, p. 181).

Statistics become thinkable only in the context of what Hacking (1991) calls the "erosion of determinism and the taming of chance" (p. 189). Briefly stated, his claim is that between the end of the eighteenth century and the close of the nineteenth, 'chance' emerges as a legitimate category for understanding the world. For hundreds of years humans had lived in a determined world. The determinant agent may have changed from time to time, be it God, the past, or the laws of nature, but the fact of some great determinant arrow guiding human affairs was unquestioned. As determinism receded, chance—in the sense of indeterminacy, contingency, or unpredictability—filled the void, becoming an agent of history to be 'tamed.' Here again is the tension between order and chaos, everything included vs. etcetera. Chance, an undetermined world, was the foundational assumption of sciences and scholarship that sought to measure the contours of the world through number. Statistics emerged on this epistemological ground.

The role of listing in statistics is so taken-for-granted that it seems too trite to even mention. But the form is present from the beginning, such as with Charles Babbage's call in 1832 for the publication of books of numerical constants. "The learned societies of Paris, Berlin and London were to take turns, every two years, in producing a list of the numbers known to mankind" (Hacking 1991, p. 186). We see

here the list present at the onset of the "avalanche of numbers, the erosion of determinism and the taming of chance" (Hacking 1991, p. 189). These developments were commensurate with the establishment of measure as a basis of empirical knowledge (e.g. facts). The result was a world with "too many numbers to leave the Galilean and Newtonian world intact" (Hacking 1991, p. 190). Lists deliver statistics to eyes, but they are also a precondition for the processes of compiling and calculating numbers that result in statistical figures. They deliver the raw material from which statistics are forged.

Statistics is an 'assurantial' technology of power in that it provides stability to the social order. In order to legitimize its rule through surveillance, to function as a guarantor for capital investment and colonial risk-taking, and to ensure the overall health and docility of its subjects, the modern state needs a stash of gold under its mattress. That gold is statistics. But how and why do statistics enable the state to function in such a way? A short answer is that they do so by measuring its contours and announcing the state as a material entity to be policed and optimized. Peters (1988) recalls that in the eighteenth century statistics was "the name for the comparative (and often, competitive) study of *states.*" In relatively short order it became "the science of making imperceptible aggregates perceptible in numerical arrays" (p. 14). He connects the rise of this science to the expansion of the scale of modern nation states. As borders extend outward and populations swell, administrators and citizens alike are posed with the problem that the state is "out of sight and out of grasp" (p. 14). Statistics *compress* the state down into a visual entity that is more manageable both imaginatively and administratively. "And so, statistics arose as the study of something too large to be perceptible—states and their climates, their rates of birth, marriage, death, crime, their economies, and so on— and secondly, as a set of techniques for making those processes visible and interpretable" (Peters, 1988, p. 14). The 'cultural preparation' for statistics, to borrow Mumford's (1963) term, occurred with what Kafka (2012) identifies as the French Revolution's fundamental transformation of the "culture of paperwork." The latter

involved "the emergence of a radical new ethics of paperwork, one designed to sustain a state whose legitimacy was founded on the claim to represent, at every moment, every member of the nation" (2012, p. 21). The "personal state" of patronage and monarchy became the "personnel state" of bureaucracy and the Republic (2012, p. 32).

We have seen that there is a mutually constitutive relationship between statistics and the state. But how did this realm of knowledge come to achieve the empirical veracity and epistemological strength required to function as an assuriantial technology? If the authority of the state resides in its archives and the statistics they contain, where does the authority of statistics come from? It is, after all, not a field of knowledge that has always been with us. Nor did the field of statistics emerge fully formed as an arbiter of truth. Rather, statistics come to function as an assurantial technology not just because they materialize the contours of state, but also and primarily because they are considered *factual*. Statistics is the process of collecting, compiling, and calculating empirically verifiable facts. But what is a fact? Where do facts come from? Are they epistemological or ontological? Such questions are addressed by scholarship that sheds light on the degree to which the concept of the fact is itself historical specific (see Fleck 1979; Mumford 1963; Poovey 1997). To understand the authority of statistics and the state power they legitimize we must say a few words about the emergence of the modern fact.

3.2.2   Facts

We think of facts as if they have always been with us, that they are things out there in the world for human beings to discover and empirically verify. This is not so. Mary Poovey's (1997) *A History of the Modern Fact* offers a rigourous account of how this peculiar epistemological unit silently took hold over the modern inquisitive and imaginative mind. Facts became the unseen, unquestioned arbiter of truth and

knowledge in the modern period. Systematic knowledge, once the bastion of rhetoric and argumentation, became impossible without facts. The realm of facts is one dominated by numerical representation. Poovey is interested in the way that "numbers acquired the connotations of transparency and impartiality that have made them seem so perfectly suited to the epistemological work performed by the modern fact" (p. 5). Her work can aid in understanding the role played by cultural techniques and documentary formats in the emergence of the modern fact—the epistemological unit upon which statistics, informational writing, the modern state and its apparatuses of security all rest.

Poovey (1997) alters a conventional narrative about the history of science that associates a 'scientific revolution' from about 1500CE with Francis Bacon's scepticism. That narrative proposes that emergent modes and fields of inquiry focused on the observed and the particular eroded the authority of ancient and medieval approaches to studying the world. The reality of this epistemological shift is not so simple. Frohmann (2004, pp. 398-404), for instance, contrasts the modes of documentation employed by continental natural philosophers (based on "Aristotelian conventions for articulating natural knowledge"), on the one hand, and those employed by English members of the Royal Society (based on the Baconian "practice of building knowledge from the certified occurrence"), on the other. Continental natural philosophers adopted Aristotelian conventions such as the literary device of the geometrical *problema* (involving the presentation of empirical observations as axioms) and the technique of multiple repetition (the presentation of empirical observations as typical, as things 'everyone knows'). British modes of documentation instead involved an elaborate presentation "designed to put the reader on the scene, to have the reader perform a *virtual witnessing* of the event occurring the laboratory" (p. 403) as well as a modesty of presentation that spoke to both the gentlemanly manner of the experimenter and the "Baconian nondogmatic attitude appropriate to inductive and probabilistic, rather than demonstrative and axiomatic, assertions of natural science" (p. 403). Frohmann's presentation

participates in a refutation of the idea that there was any single rupture we can point to as a 'scientific revolution' or a specific figure upon whom to grant revolutionary status (see also Dear 1991 and 1995; Shapin 1984; Shapin and Shaffer 1985). He argues that epistemological changes are traceable only through modes of documentation.

Poovey adopts a similar approach. Instead of focusing on Bacon and the 'rupture' caused by his insights, she links the emergence of modern fact to double-entry bookkeeping. This was a cultural technique of documentation that existed well before the epistemological changes and discourse that came after Bacon. Double-entry bookkeeping was a "variant of the modern fact [that] appeared in a writing practice that did *not* participate in epistemology we associate with modernity" (p. 3, emphasis in original). Double entry was a technique of mercantile, informational writing—a 'low' cultural form established for both practical and symbolic purposes. As the conditions of possibility for trade and exchange expanded and the media of commercial exchange became increasingly abstracted into currencies, merchants needed a new technique of keeping track of their accounts. Double-entry bookkeeping was an ingenious solution to this practical problem. It compressed complex commercial transactions into numbers and letters organized in a systematic way on pages and in books. It established an indexical account that ostensibly corresponded the events, objects, and actors involved in exchange. Such an index allows merchants and purchasers to keep track of their capital reserves. The latter are abstracted by this technique into objects and cash, credits and debits. The fact of the event and the truth of one's holdings are materialized on the page through double-entry bookkeeping, which freezes the spaces and times of commerce. It is a cultural technique that processes distinctions and performs 'ontic operations': transactions, objects, events, and values are abstracted onto paper according to a new symbolic system that is not oriented to scientific inquiry or literary representation but to the administration of trade.

Double-entry bookkeeping was much more than an indexical mnemonic technique; these, as we have seen, are as old as writing itself (see pp. 10-15). Beyond addressing pragmatic needs, Poovey shows that merchants sought with double-entry to enhance the reputation of their trade by making their trust- and credit-worthiness imminent on the page. They did this by appealing to the authority of rhetoric, which had over the course of the centuries migrated from oral speech into writing.[31] Merchants sought to prove that their trade was not usurious but honest. The double-entry ledger made this case by "following certain stylistic conventions: its contents were concise, orderly, and systematic, and its details were (presumably) faithful to the facts" (Poovey 1997, p. 38). Clean lines and organizational prowess—displayed both by individual books, and by double-entry bookkeeping as a system—displayed and in a way programmed the moral rectitude of the merchants. The latter no longer had to prove themselves through rhetorical performance or even social reputation. The evidence of their honesty before God, a precondition for creditworthiness before wealth, was right there on the page.

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[31] See, for instance, Vismann's (2008, pp. 102-108) discussion of the importation into administrative practices and formats of conventions of rhetorical performance. Baroque secretaries, Vismann shows, did this, in order to preserve their monopoly of knowledge as the media environment shifted from oral-based to paper-based. John Guillory (2004, pp. 114-122) also discusses the withering of rhetoric as 'informational' genres replaced the art of persuasion with simple persuasion.

Figure 2: "Creditor" page in sample ledger book, from Richard Dafforne's Apprentices Time-Entertainer Accomptantly, 3rd ed. (London, 1670). Courtesy of Princeton University Library. Rare Books Division. Department of Rare Books and Special Collections.

Evidence of their trustworthiness rested on the apparent transparency, accuracy, and precision of their accounts, the truth of which could be easily calculated. If his books were balanced, it could be reliably assumed that the merchant in question embodied the same traits.

Beyond individual cases, double-entry bookkeeping was a system of writing that "produced effects that exceeded transcription and calculation" (Poovey 1997, p. 30). These effects were social, proclaiming the honesty of merchants as just described, and epistemological, "mak[ing] the formal precision of the double-entry system, which drew on the rule-bound system of arithmetic, *seem* to guarantee the accuracy of the details it recorded" (p. 30). The systematic nature of double entry is crucial here, Poovey emphasizes, because it establishes protocols for writing that de-hierarchize the economy of knowledge production and circulation that had hitherto enjoyed a monopoly. With standardized rules anyone can write in the ledger, whether merchant or an employee. At the same time, the necessity to follow protocol seems to guarantee the accuracy of all writing in the system. Writers become interchangeable relays—if the system is to function properly they cannot deviate from protocol.

We see with double-entry bookkeeping the process by which a cultural technique standardizes format and system. This process has significant epistemological consequences. Number is inscribed as a guarantor of accuracy and arbiter of truth. Furthermore, double-entry bookkeeping is framed and structured by the list format. We talk about bookkeeping in terms of *number* and 'the books.' These are important descriptors. However, to focus only on these aspects is to ignore the fact that these numbers stack up on top of one another to produce a larger structure, a list. 'The books' is a convenient placeholder to describe an ongoing series of mutually constitutive lists. In each of the four books that comprise an individual's double-entry system—inventory, memorial, journal, and ledger—the items, events, amounts, creditors, and debtors are listed according to some organizing principle (usually temporal). The final, authoritative *ledger* is a double list that stands as the arbiter of truth because of its ability to literally settle all accounts. Furthermore, double-entry bookkeeping displays the tendency toward *brevitas*— compression—that would become hegemonic in modernity (see Guillory 2004, p. 23). Through a complex series of transmissions—from the inventory, through the

memorial and journal, to the ledger—the information noted about an initial commercial exchange is steadily compressed down from prose into number (Poovey 1997, p 61-2). Details from the memorial's relatively complex initial entries deemed excessive are shed in each translation. They are compressed to a format more amenable to calculation. The final entry written in the ledger achieves brevity, simplicity, transparency, and equivalence. These categories acted as guarantors for the credibility and moral rectitude of the merchant—a format to make the beauty of God imminent on paper.[32]

Bookkeeping is essential to the emergence of the modern fact for Poovey because, though it sought legitimacy for itself according to the prevailing epistemological conditions of the fifteenth century—namely, God's determining will —it actually served to undercut those conditions. By doing so, double entry set the table for the emergence of a new kind of knowledge rooted in the transparency and 'disinteredness' of number. We see another instance of Goody's (1977) list dialectics, wherein the material form of the list calls into question the very limits of knowledge its borders enact. Poovey shows how double-entry bookkeeping stood as a model for natural philosophers of the eighteenth century of disinterested knowledge that was not beholden to the vicissitudes and pageantry of rhetoric. New ways of arbitrating the essential truth or falsehood of an event, a claim, or an object were established: observed particulars, numbers and the calculations they enabled, and so on. Hacking (2002, p. 12) argues that Poovey shows an "essential facticity" present in the new modes of commerce that pre-dates the operations of facts in new sciences of the seventeenth century. The latter period is most often where the relationship between the fact and trust is located (Schaffer and Shapin 1985). Poovey instead shows that trust was sutured to the modern fact well before the seventeenth century. Trust was the crucial element in the keeping of accounts and

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[32] The relationship between accounting practices and godliness has been further pursued by Quattrone's (2004) analysis of the sixteenth and seventeenth century accounting practices of the Society of Jesus.

the generating of their 'empirical facticity.' In double-entry bookkeeping the transparency of number enables trust in the merchant that keeps clean and ordered books. Variants aimed at achieving knowledge both systematic and 'true to nature' emerge from natural philosophy's emulation of double-entry bookkeeping's essential facticity (see Poovey pp. 175-197). These included experimental moral philosophy, conjectural history, political economy, and statistics. Each of these, but particularly statistics, was developed as "a technology for evading questions about induction in passing from facts to statesmanship" (Hacking 2006, p. xxi). For the purposes of this study we must bracket the philosophical problem of induction, which Hacking (2006) pursues with characteristic precision. It is enough to say here that (1) statistics are only possible in a world governed epistemologically by facts, and (2) statistics was a way of knowing the world that arose as a way to extrapolate knowledge from observed, measured particulars to generalizations based on probabilities. We can thus return to statistics proper, in order to discuss how the field congealed as a science of abstract measure with an intimate relationship to the modern state. This relationship offers a point of entry into conceiving of the logistical worldview and the Nazi limit case study more specifically.

Individual statistics appear as a species of Guillory's informational writing—observed particulars through which systematic knowledge and governmental policy can be built. They are more precise than rogue data points but still lack the requisite human interpretive schema to count as codified knowledge. By filling the gap between the particular and the systematic, the molecular and molar, statistics become installed as the connective tissue of the state as an abstract entity. Peculiarly, by filling such spaces-between statistics atomize people, abstracting them as 'units.' Statistics are a medium by which people are simultaneously drawn together—whether as a 'population,' 'income group,' or otherwise—and discretized into entries that can be shuffled. Before these new categories and facts take their place in the minds of politicians or on the pages of newspapers they are inscribed on paper in lists and charts.

Statistics are a symptom, for Peters (1988) of an emergent modern informational culture that is essentially alienating. The preliminary processes of collecting statistics and their later analysis and administration in a bureaucracy become both the means and the ends of the state. Statistics establish the contours of a state and its people, the categories by which they are able to conceive of themselves in relation to their 'imagined community' of the state (a concept Peters borrows from Anderson, 1983). They offer a new imaginative language rooted in empirical measurement and number, a mode of understanding very different from those rooted in religion, literature, or philosophy. In the space cleared by the rise of the modern fact, empirical data emerges as hegemonic, enabling statistics to 'make up people' and nations. Statistics profess to be apolitical and ahistorical, simply data waiting 'out there' to be uncovered and compiled. However, this claim masks the extent to which statistics and 'information' are epistemological units measured into existence by the bureaucratic institutions and machinations that require them to function. No bureaucracy without statistics, but no statistics without bureaucracy. This is one of the most essential feedback loops of the modern period. A bureaucracy collates, compiles, and analyzes statistics that are gathered as 'information,' producing yet more information that requires advanced ordering techniques and statistical methods of analysis. We begin to see why this administrative realm of bureaucracy, information, and statistics has been a site of so much consternation in modern literature and philosophy. "Benthan's Panoptiocn, Weber's Iron Cage, Kafka's Castle—since the beginning of the modern era, these buildings have darkened our skyline" (Kafka 2012, p. 9).

Peters argues that part of the reason statistics and, more broadly, information, are so alienating to the modern mind is precisely because they abstract experiential dimensions of space and time from the human body:

> People who, thanks to statistics, 'see' something intellectually they
> could not see sensually, are put in a curious position. They know

something that they can never experience for themselves. They have a kind of knowledge that no mortal can have. Statistics offer a kind of gnosis, a mystic transcendence of individuality, a tasting of the forbidden fruit of knowledge … This new kind of knowledge—knowledge that absolves individuals from the claims of *deixis*, of existing at one place and at one moment—is of course none other than information. Information is knowledge with the human body taken out of it (Peters 1988, p. 15).

Even though ostensibly about the observation of empirical particulars, statistics participate in the general tendency toward abstraction in the modern period. "One effect," Poovey writes, "of efforts to generate systematic knowledge was the production of a set of abstractions, which rapidly became the objects of these sciences. These abstractions, which include 'society,' the 'market system' (then 'the economy'), and 'poverty,' now constitute the characteristic objects of the modern social sciences, including the sciences of wealth and society" (1997, p. 15). We thus circle back to see the extent to which techniques of administration and paperwork contribute to the existential malaise of modernity identified at the outset of this section. The facticity of statistics is rooted in a practice, double-entry bookkeeping, that facilitates compression, calculation, and circulation. These are categories of value that emerge with modernity's recalibration of space and time. Such are the great desires of the modern mind, but as we shall see, their pursuit can have horrific consequences.

3.3   The Nazi Census

This section will explore the Nazi administrative apparatus as a limit case study of the modern trajectory traced above. We will see how various aspects of Nazi administration embody the modern compulsion for compression, calculation, and

circulation. This tripartite schema becomes the operative logic of the Third Reich and results in an orientation toward the world that is *logistical*. There are three texts that this section is heavily indebted to: Götz Aly and Karl Heinz Roth's *The Nazi Census* (2004), Edwin Black's *IBM and the Holocaust* (2001), and Kenneth C. Werbin's *The list serves* (2008). Each will receive a close reading in what follows.

With *The Nazi Census,* Aly and Roth shed light on a hidden administrative history of National Socialism that, they argue, had a direct and profound influence in shaping and implementing the Holocaust as a historical event. Their project addresses a blind spot in conventional histories of the Third Reich and its Final Solution, the fact that "hardly anyone has ever … questioned how people were reduced to an entry in a *registration,* or how bureaucratic abstraction de-humanized individuals and transported them to a new reality—namely, death" (p. 1). Statistics and other techniques of administration are not often addressed in histories of the Reich. When they are, these terms are typically used in a highly abstract way that relegates administration as secondary either to ideas in the minds that dreamed up the camps or to related ideological positions that materialized as Nazi state policy. In such cases, administration is either reduced to the status of a tool by which humans translate their ideas into reality, or dismissed as the detritus of a vast mythico-ideological apparatus articulated via more conventional, literary forms of writing and rhetoric (on the latter see Nancy and Lacoue-Labarthe 1990). The infrastructure of Nazi administration—including fields like statistics and forms like lists—are elided as a kind of noise in the archival channel from which conventional narrative and causal histories of the Third Reich are written. Edwin Black points to Raul Hilberg's *The Destruction of European Jewry* as a paradigmatic example that, though it does outline the bloodshed and violence mandated by bureaucrats, pays no mind to the specific practices, forms, and methodologies that structured such decisions. "In fact, the crucial minutiae of registration are barely mentioned in any of thousands of books on the Third Reich" (Black in Aly & Roth 2004, p. ix). Black (2001) further notes that there is no mention of the IBM Hollerith punch cards (the

object of his analysis) in any of the precise studies of the camps or the psychologies of their creators, such as *The Order of Terror: The Concentration Camp* (Softsky 1997), *The Roots of Nazi Psychology* (Gonen 2000), or *The Theory and Practice of Hell: The German concentration camps and the system behind them* (Kogon 1950).

Lists are everywhere in Nazi administration. A cursory survey of Aly and Roth's work shows that almost all enumerative and statistical data at some point passed through the bottleneck of the list form. Most obviously, the Nazis made extensive use of deportation lists in the transportation of Jews and other 'undesirables' to the camps. But they also had an elaborate system of lists built into census taking and statistical methods that served to establish subject positions—to make up people—that could be observed, calculated, and transported. Registration lists proliferate. These kept track of information about residency, previous convictions, motor vehicles, and immigration patterns of the population (Aly and Roth 2004, p. 40). Lists of those with hereditary illnesses appeared by 1934, followed by those of 'Jews in the Reich,' and 'Gypsies,' both in 1936. In 1939, both the Ministry of the Interior and the *Reichsführer-SS* urge that the compiling of lists of "names of foreigners, members with non-German ethnic backgrounds, Jews, and mixed Jews" to be the highest priority (p. 21). By 1939, there was even a list of "Jewish First Names." Those whose names were not on the list were required to sign their marriage licences as either 'Israel' or 'Sarah' (p. 80). Perhaps the most famous and macabre of all Nazi lists was the inventory included in the report prepared for Himmler in 1943 on the status of the "final solution of the Jewish question."

Der Inspekteur für Statistik
beim Reichsführer ᛋᛋ

Geheime Reichssache

NO-5194

27/III 13.

DIE ENDLÖSUNG DER EUROPÄISCHEN JUDENFRAGE

Statistischer Bericht

I n h a l t :

I. Vorbemerkung
II. Die Judenbilanz in Deutschland
III. Jüdische Volksschwäche
IV. Die Auswanderung der Juden aus Deutschland
V. Die Evakuierung der Juden
VI. Die Juden in den Ghettos
VII. Die Juden in den Konzentrationslagern
VIII. Juden in Justizvollzugsanstalten
IX. Der Arbeitseinsatz der Juden
X. Europäische Judenbilanz

Figure 3: Table of contents for "Statistical Report, Final Solution of the Jewish Question in Europe," sent by Korherr to Heinrich Himmler (1943). It estimates how many Jews had been sent to their deaths and how many remained in Europe. Image courtesy of United States National Archives, collection of World War II war crimes records (National Archives Identifier: 597047).

Antecedents of the Third Reich prepared the ground for the Nazi census, doing so primarily through the cultural technique of listing.

> Individual German states introduced censuses in the wake of post-Napoleonic administrative reforms. Prussia started counting in 1816 and the German Tariff Club began in 1833 ... The first general all-German census, conducted by the Imperial Office of Statistics, took place on December 1, 1871, shortly after the German Reich was founded (Aly and Roth 2004, p. 15-16).

Over time these techniques evolved beyond simple head counting. The counts of 1916, 1917, and 1919 were geared toward the administration of the war effort and the post-war period, focusing on food rations as well as employment and business registration. In 1925, an "economic and social-statistical evaluation" was conducted that relied heavily on the "household list," a questionnaire that identified members of a family and their relationship to the head of the household. In addition to previously used categories such as age, birthplace, gender, occupation, and place of residence, new categories were incorporated to identify the mentally and physically "fragile." The questionnaire for 1926's count was even more detailed (Aly and Roth 2004, p. 16-17). The new National Socialist government carried out in 1933 plans for a more comprehensive census that had been deferred since 1930. This census would serve an architectonic role in the establishment of the Nazis' unique administrative, juridico-legal, and security apparatuses over the next twelve years.

Most notable about the 1933 census is that it signals a shift in the way census data was conceived. The shift was from a diagnostic and cartographic orientation toward the past and present to a predictive and analytical orientation toward the future. Statistical data would now be used to calculate, for instance, optimal birth rates amongst populations of "biologically valuable" women.

> The meaning of this [family statistical] survey for the evaluation of marital fertility is of great importance … Old methods of population statistics are inadequate because they limit themselves to determining what 'was' and what 'is.' One has to move beyond answers of the past and present and adopt a biological perspective (Burgdörfer in Aly and Roth 2004, p. 17).

Later, in the run up to an even more expansive census planned for 1939, the Cologne edition of the official Nazi newspaper *Völkischer Beobachter* proclaimed "it is the duty of every fellow German (*Volksgenossen*) to answer every single question completely and truthfully. Each comrade has to be conscious of the fact that he will give the Führer and his colleagues the basis for future legislation for the next five to ten years" (quoted in Aly and Roth 2004, p. 19). The 1939 census was conceived as the "opening balance sheet for the Greater German Reich" (p. 20) and it included an additional card that was specifically geared toward identifying and registering "foreigners and persons of non-German ethnic backgrounds." Primary among these non-German persons were Jews. The information gleaned from this additional card enabled the Security Service to establish a "Reich file for Jews and mixed Jews," something it had been working toward for years with little success. The additional card also aided the military's goal of "optimiz[ing] the 'deployment of people' in the war [by putting] together a register of persons, categorized by occupations (those for which people had trained but which they did not necessarily practice), that would cover the entire Reich" (p. 22). We see in this re-conception of statistical data as oriented primarily toward the future, rather than the present or past—a stockpile of data to be analyzed and used later rather than an inventory or index of the past and present—the emergence of a worldview we might call logistical.

The 1939 census was geared toward producing the crucial item for the Nazi recalibration of the Reich, the *Volkskartei* ('register of the people'). "By establishing a people's registration (*Volkskartei*)," Göring proclaimed in 1938, "we will achieve

complete supervision of the entire German people" (Göring in Aly and Roth 2004, p. 44). This complete registry—a perfect, everything-included inventory of inhabitants in the Reich—would enable the optimal deployment of resources toward the goal of establishing the Thousand Year Reich.

> First, we would need to collect data and to scientifically examine and evaluate the conflicting material. Second, there would need to be a scientific analysis and evaluation to suit the practical considerations. This is necessary in order to get the most reliable and complete material for the purposes of resettlement and the strengthening of German culture (Korherr in Aly and Roth 2004, p. 31).

The proper location of resources in space and the most efficient circulation rates in time could be calculated using the data from the *Volkskartei*. We see here the familiar modern desire for total knowledge, recalling Peters' (1988) discussion of statistics as *gnosis*. Population and territory are abstracted to become a completely graspable and usable resource to be manipulated and re-ordered according to human desire.

> The registry will be of particular importance for the defense of the Reich, insofar as it registers not only military draftees but also the entire population. In the event of war, the population in its entirety can be mobilized, with every individual used according to his or her abilities, only if the *Volkskartei* provides incontestable proof of the existing age groups available for this purpose. The actual purpose of the registry is for registration. The goal is directly achieved if the registry has been established and the place of residence and changes in personal status are entered on an ongoing basis (Liebermann and Kääb in Aly and Roth, p. 45-46).

The human being transformed into a node in a network of action, an object to be calculated, compressed, and circulated.

The *Volkskartei* project was implemented all over Germany and its conquered territories. The card proved, until at least the end of the Blitzkrieg in the winter of 1941-2, "an excellent tool ... in peace or, above all, in war, for quickly and efficiently targeting particular groups of people on the basis of their abilities, and directing them to achieve specific goals" (*General Archive of Statistics* in Aly and Roth 2004, p. 51). Important to note about these more elaborate systems and structures of administration is that they had evolved from being primarily about indexing and measuring, as for instance the 1925 census had been, to being primarily about *retrieval*. Such systems are not simply about creating and guarding an archive but being able to put the archive to use, to release its data out into the world so that the latter can *make things happen*. We see here that the modern predilections for compression and calculation are being marshalled toward *circulation*, about which much more will be said below.

The Nazi census of 1938 and its antecedents demonstrate the development of an ever more sophisticated system of data collection and counting. It was a system that provided the raw data for second-order analysis and policymaking. A uniform Reich registration system was not enough. Individual registers were means, not ends. The goal was to create a system that was "more than an address book," which

> provided an indispensable foundation for the work of the numerous officials who worked in the Reich middle management staff in the cities and various regions; thus, ultimately, it provided a foundation for the entire Reich. The Reich Postal System, the Reich Office of Statistics, the Reich Office for Urban and Rural Planning and the Reich Family Office, the Criminal Police, and the Gestapo could not afford to work with incomplete data (Liebermann and Kääb in Aly and Roth 2004, p. 41-2).

As its creators liked to say, "the Reich Registration Order is a beginning, not an end" (ibid.). 'The end' would be pursued through the mobilization of this data in *statistical analysis*.

3.3.1   Calculation: Nazi statistics

National Socialism was as much an intellectual movement as it was military, political, or otherwise. Nazism involved an entire shift in worldview, a 're-wiring' (Elden 2006b, p. 755) or re-calibration of the imaginative, conceptual, and material life of Germany. "At the vanguard of Hitler's intellectual shock troops were the statisticians," argues Edwin Black (2001, p. 47). The field of statistics was conceived as an essential force in the "work of building Germany" according to Friedrich Zahn, then President of the German Statistical Society, "[i]n its very essence, statistics is very closely related to the National Socialist movement" (Zahn in Aly & Roth, p. 2). The field was an intellectual approach that corresponded to the militarism of Nazi cultural, political, and economic life. According to Zahn, "besides physical fitness, a firm character, and a rigorous approach to science, [Hitler] demands soldiers of politics, economics, and also of science" (p. 9). Zahn and the Statistical Society he presided over were only too happy to occupy this position.

> [Hitler's] regime demands clear results in a wide range of areas and great flexibility, which for the most part can only be provided by statistics. In using statistics, the government has the road map to move from knowledge to deeds, from advice to action, in order to succeed in its enormous task of building society (p. 9).

Reinhard Heydrich (chief of the Security Service, the Reich Criminal Police, and the Gestapo) encapsulates the crucial role of administration and statistics in the remaking the world in the Aryan image when he explains the "combat mission for the administrative sphere," the task of "securing the idea," was not something that

could be realized through "superficial scanning but rather by fundamentally grasping and registering reality" (Heydrich in Aly and Roth 2004, p. 52). The 'reality' to be grasped was rooted in long-standing racial prejudices given new life by the brazenness with which they were disseminated under National Socialism. For instance, the 'special count' of Jews in the census of 1933 (censuses of Jews and foreigners were conducted in addition to the general census of the rest of the population) materialized and thus, according to Aly and Roth, "objectified" all known prejudices. Data signalled that Jews were "primarily active in trade," as furriers, jewellers, etc., and also that they had a "predilection" for academic pursuits (2004, p. 61). The data collected by the special count emboldened the Bavarian Ministry of Economics to conclude that "Jews shy away from hard work or work that is not as profitable. They have also infiltrated the upper strata of economic and professional activities" (Aly and Roth, p. 61). Statistics act as a means by which to ground racist views about Jews and other persons, previously rooted in 'common sense,' as objective knowledge. Statistics' claim to objectivity is granted by the empirical facticity of the modern 'facts' contained in Nazi registries.

The tracking of Jews had been occurring in Germany for at least 60 years prior to the establishment and rise of National Socialism. Beginning in 1875-76, state registry offices had documented every change in an individual's marriage status and also his or her religion. These changes included 'Jewish baptisms' and 'mixed marriages.' These registers were reviewed starting in 1933 by the Nazi *Rechsstelle für Sippenforschung* (Reich Office for Family Research). The latter also began to systematize and collate church registers that went back even further. In 1936, "more than 150 work comrades" created a filing system for the Berlin Evangelical Community's baptismal books from the period 1800-1874. The result was the "largest church book registry in the world" that Aly and Roth argue

> provided a model for the overhauling of registry systems in churches in
> other urban areas that acted in the service of denouncing 'non-

Germans.' Without this type of registry, the state offices would have had a much more difficult time legitimating the terms 'race Jews' and 'mixed Jews' (2004, p. 74).

Cultural techniques of listing again precede the categories and distinctions upon which Nazi race policy and disciplinary structures are built and legitimized. When baptized in the waters of statistics data contained in church registries become 'indicative' of certain categorizations of Jews and undesirables. These data become numerically verifiable and thus the conclusions drawn from them can be considered factually true. Data visualizations soon followed, which further enhanced the truth claim of the categories created from Nazi statistical aggregates. There was a remarkable proliferation of charts, maps, tables, graphs, and lists as the Nazis found efficient means to create a stockpile of facts ready-to-hand and easy to deploy in rhetoric, writing and in policymaking. These data were disseminated internally to the party and externally to the public. Examples included a graph that compared the composition of the Jewish population with that of the *Gesamtbevölkerung* ('total population') in terms of employment categories (domestic services; holders of public office; trade and transportation; industry and manufacturing; agriculture and forestry) (Aly and Roth 2004, p. 63); or a map of the distribution of 'Jews' and 'mixed Jews' (*Die Juden und jüdischen Mischlinge*) culled from the 1939 census (p. 71).

As we have seen, statistics were not an invention of the Nazis. Since at least the seventeenth century debates around probability theory there had been robust and vibrant intellectual debates around statistical data and analysis. Nor is statistics as a field essentially evil. Hacking notes that statistics had been used to bring about tangible benefits for vast swaths of European populations. "One may suspect the ideology of the great Victorian social reformers and still grant that their great fight for sanitation, backed by statistical enquiries, was the most important single amelioration of the epoch" (1991, pp. 182-83). What also marked the Nazi statistical approach apart was that it developed and made extensive use of techniques that

isolated unique subsets of the population at both the group and individual levels. Previously, as Peters (1988) shows, statistics had been a matter of measuring the contours of a territorial totality under the rule of a sovereign. The field measured "states and their climates, their rates of birth, marriage, death, crime, their economies, and so on" (p. 14). It was incredibly difficult if not impossible to track an individual within the statistical totality. Any delineated sub-fields were based primarily around geographical space (regions or towns). Kafka (2012), for instance, describes the challenge in post-revolutionary France of integrating its atomized and jealously guarded regional archives. The Nazis changed this situation, incorporating techniques by which to first *identify* individuals, then *track*, and finally *move* them through space and time. As early as 1932, a new method for 'individual statistics' was appearing on the horizon. This new method would be taken up by the Nazis and exploited to the furthest extent.

> The method is based on the repeated statistical observation of the same objects while maintaining their individuality. What was overlooked in the past, namely, individual destinies, are now in the spotlight of the statistician … Instead of taking a ball out of the 'urn of nature' from time to time and then returning the ball to the urn with others, now those balls are marked before they are returned. After some time has elapsed, one can very carefully check to see how many of those marked balls are still there, how many have been destroyed in the mixing process, and how many have been added. One checks their weight increase and decrease, not just their color (Schwarz in Aly and Roth 2004, p. 54).

The human being was *made* as a calculable object. Schwartz's quote offers insight into the theory of individual tracking in statistics, but how was it enacted in practice? In short, through mechanization—an innovative use of the Hollerith punch card

system allowed Nazi statisticians to sort and reshuffle vast swaths of data in ways previously impractical or even impossible.

3.3.2   Compression: Hollerith punch cards

Nazi statisticians built upon the work of their predecessors in the Reich statistical office to develop techniques by which to more accurately and comprehensively measure the contours of the population in Germany and its territories. The goal was to find ways to more easily identify, differentiate, and track groups and individuals of various kinds. "The only way to eliminate any mistakes," wrote Dr. Karl Keller, "is the registration of the *entire* population. How is this to be done? The establishment of mandatory personal genetic-biographical forms … Nothing would hinder us from using these forms to enter any important information which can be used by race scientists" (quoted in Black 2001, p. 49). To do so, Reich statisticians turned to a machine developed by German expatriate Hermann Hollerith for the U.S. Census Bureau's 1890 U.S. census.

The Census Bureau was in a period of transition when Hollerith joined its ranks. The existing system of enumeration and compilation was slow, inefficient, and limited in scope. The system involved, first, distributing questionnaires that asked only very general questions—a glorified headcount more than a census proper. For archival and reference purposes, collected answers were transferred from questionnaire forms to small cards. These cards were then cross referenced and filed accordingly. Time-to-completion for census taking was extremely long, usually a decade or more. Given that census frequency had been established at ten years, typically preparations were well underway for the next census before counting the one previous had even been completed (Black 2001, p. 25). As America expanded in population, size of territory, and complexity of governance, improvements to this system were sorely needed. Thus Hollerith entered the U.S. Census Bureau during a

period of experimentation, innovation, and opportunity. He attacked these problems head on.

The Hollerith machine, which first appeared in 1894, improved on card-based census tabulation techniques by combining them with mechanical components found in automata such as French looms, music boxes, and player pianos. The latter all used punched holes on cards or rolls to automate gear mechanisms that produced motion or sound. Hollerith generated the idea for his machine after observing a train conductor who, in order to police against ticket re-use, would punch a unique pattern into each ticket corresponding to the appearance of each passenger. These holes noted physical characteristics such as height, hair colour, size of nose, and clothing.

> Hollerith's idea was a card with standardized holes, each representing
> a different trait: gender, nationality, occupation, and so forth. The card
> would then be fed into a 'reader.' By virtue of easily adjustable spring
> mechanisms and brief electrical brush contacts sensing for the holes,
> the cards could be 'read' as they raced through a mechanical feeder.
> The processed cards could then be sorted into stacks based on a
> specified series of punched holes (Black 2001, p. 25).

The cards established formal parameters of a classificatory system. Choices were made as to what criteria to include in the census questionnaire based on what could be punched into the card. Each card was limited in the number of hole-categories it could contain. A way to increase the bandwidth of the cards, however, was to encode information into numbers. Rather than having a rudimentary one-question-per-one-hole equivalence, "this code is based on the decimal system and translates terms such as persons, achievements, dates, and the like into numbers. The catalogue of possible answers is then calculated and the applicable identification number is punched in the card" (Aly & Roth 2004, p. 11). Rather than reducing the questionnaire to simple binary, yes || no, questions—as might be expected in a

rudimentary process of quantification—automating the compilation process preserved or even enhanced the complexity of questions, while reducing tabulation time by over eighty-five percent. A diverse array of answers contained in boxes across myriad census forms and cards are *compressed* onto a single surface. This surface has economized its bandwidth by encoding such data into a system of numbers and columns wherein difference is marked through the punching of holes.

The technology soon took off. Hollerith's machine proved a boon for both his personal fortune and growing American state desperate for information about its internal machinations and populace. Having convinced the U.S. government to enter into a license agreement (rather than a sale) and secured patents for both the machine and the specialized cards it required, Hollerith's company reaped considerable financial rewards. Hollerith's Tabulating Machine Company would eventually be sold to notorious adventure capitalist, war profiteer, and 'father of trusts,' Charles Flint (Black 2001, p. 30). Flint folded Hollerith's company in with three other seemingly unrelated manufacturing firms he had acquired: the International Time Recording Company (which manufactured time clocks to record worker hours), the Computing Scale Company (which sold retail scales with pricing charts attached, as well as a line of meat and cheese slicers), and Bundy Manufacturing (which produced small key-actuated time clocks) (Black 2001, p. 31). This assemblage was named the Computing-Tabulating-Recording company (CTR), and it gives us a glimpse into both the peculiarities of *fin-de-siecle* American capitalism, and also the increasing importance of proto-information technologies that were engineered toward problems of data processing, storage, and transmission. In other words, these were all what Peters (2013) calls *logistical media*: devices and techniques that serve to abstract, order, organize, and compute human space-time. Flint's combining these three seemingly divergent realms of manufactory—time clocks, retail scales and slicers—testifies to the convergence of the modern desires for compression, calculation, and circulation. These converge to

become logistical operations that involve the efficient movement of people, things, and data through spaces and times.

Eventually Flint would lose a power struggle in his own company to the man he hired to manage it, Thomas J. Watson. Watson re-christened CTR as 'International Business Machines,' a name change that would launch IBM toward its future as one of the most notorious corporations of the twentieth century. Watson and IBM were complicit in National Socialism, of this there is absolutely no doubt. He not only aggressively marketed the machines to the Reich, but also devoted significant resources to tailoring the punch card system so as to fulfill the Nazis' precise requirements (see Black 2001, p. 43-51). The Hollerith punch card machine was attractive to the Reich not simply because of Watson and IBM's willingness to fine-tune the system according to their needs, nor only because it streamlined and automated processes of enumeration (thus speeding up the rate at which humans could be counted) but also because it was a system capable of calculations and rudimentary data analysis. As Black notes, Hollerith's system could do more than count people.

> It could rapidly perform the most tedious accounting functions for any
> enterprise: from freight bills for the New York Central Railroad to
> actuarial and financial records for Prudential Insurance. Most
> importantly, the Hollerith system not only counted, it produced
> analysis. The clanging contraption could calculate in a few weeks the
> results that a man previously spent years correlating (2001, p. 26).

In Nazi usage this involved

> the awesome sorting and resorting process for twenty-five categories
> of information cross-indexed and filtered through as many as thirty-
> five separate operations—by profession, by residence, by national
> origin, and a myriad of other traits. It was all to be correlated with

> information from land registers, community lists, and church
> authorities to create a fantastic new database. What emerged was a
> profession-by-profession, city-by-city, and indeed a block-by-block
> revelation of the Jewish presence (Black 2001, p. 58)

Cultural techniques of data collection, collation, and analysis converge to produce a classification system by which individuals can be listed, sorted, and moved as logistical objects. Extant techniques of listing, such as found in church registries, were accelerated by technical innovations like the IBM Hollerith punch card system, and by the enhanced profile, mandate, and resources available to institutions like the Reich Office of Statistics. It is important to emphasize, again, that the robust administrative apparatus these elements combined to create did not appear out of the ether. The Nazi census, its lists, and IBM Hollerith punch card technology all had baked within them the logic of statistical methods developed during the nineteenth century. Such methods, as we have seen, rest on an epistemological framework derived from even older cultural techniques, the listing of double-entry bookkeeping. As a cultural technique that processes the 'ontic operations' that stand before modern facticity, the list is constitutive of Nazi statistical methods. The latter provided the enumerative and calculative infrastructure of the Nazis' attempted recalibration of the world in their image. The lists of the Nazi census not only embody the modern compulsion for compression, calculation and circulation, but also draw the distinctions and categories on which Nazi military and social policy was based. Such policy was increasingly fixated on the racial re-engineering of the population and the total logistical mobilization of the Reich. This epistemological framework, what I am calling the logistical worldview, materializes via a constellation of operations involving census lists, statistics, and Hollerith punch-card technology.

The work of Aly & Roth and Black on statistics and Hollerith technology, respectively, foregrounds the modern technologies and techniques of paperwork

that collect, compile, and analyze, and disseminate so-called facts and so-called knowledge that serve to justify ideological or political positions. In so doing, these thinkers correct a blind spot in histories of the Third Reich that gloss over the role of administration. They help us to see what is ignored by histories that focus only on people and their ideas—whether they are 'great men' of the Nazi leadership or the functionaries of its bureaucracy. Through they do not use the term, both projects show the Nazi administration to be a matrix of cultural techniques that process the regime's founding distinctions and categories. They focus not simply on the camps themselves, but show us the epistemological undergrowth that enables categories of 'undesirables' to be observed, policed, and administered. None of this occurs solely in the mind; without hands and paperwork, such a project could never have been attempted.

However, these works have blind spots of their own. Aly and Roth, for instance, discuss the 'rise of statistics' in the Third Reich, but they do not spend much time considering the much longer history of statistics as a field of knowledge. Statistics is not an invention of National Socialism. It had established a cache of empirical veracity for at least one hundred years prior to Hitler's rise as outlined in section 3.2. The danger of ignoring this longer history is that statistics begin to appear as either A) nothing more than a tool to be bent to the whims of a dominant power, or B) a determinant agent that will inevitably produce fascism. Neither of these positions is recommendable. To dismiss only the *use* of statistics by the Nazis denies the crucial structuring function that systems of thought have on human affairs and the unfolding of history—a mistake made all too often in the analysis of technology in general. But to wholly renounce statistics as a field of knowledge and inquiry is to ignore that their collection and analysis have yielded unquestionably positive results for a great many human beings in the modern period. Perhaps the reason that this inadequate binary emerges out of Aly and Roth's important work is because they conflate too much under the categories of 'statistics' and 'administration.' They use the term statistics to describe a loose constellation of

impulses, practices, techniques, and material forms that together comprise the Nazi administrative apparatus. But statistics is not simply the collection and compilation of information. It is far more than counting, as Hacking (1991) has shown and this analysis contends. Statistics is a particular series of epistemological claims that rest on concepts and categories derived from distinctions processed by cultural techniques.

Black's work adopts a similarly black-boxed concept of statistics, though his close analysis of the Hollerith machine does at least add a level of granularity that helpfully shows us more about how statistical information is compiled and sorted. His analysis, however, also lacks historical context. He offers a few preliminary remarks about the development of the Hollerith machine that predates the Nazis by about fifty years, but does not link the emergence of this machine within the broader intellectual *milieu* of modern thought. The latter is an essential component of the story because it was the intellectual and conceptual space within which the problems of 'statistics' emerged in the first place—what Hacking describes as the 'taming of chance' (2006). The modern nation—comprised of a citizenry (or at least a population), encompassing a spatial territory, operating according to new juridical-legal and economic orders—posed a fundamentally new set of administrative problems. Statistics were a *modern,* not necessarily fascistic, solution to these issues. The danger of missing this essentially modern dimension of Nazi administration is that texts such as *The Nazi Census* or *IBM and the Holocaust* will be read—undoubtedly against their authors' wishes—as framing Nazism as either a historical rupture that established a fundamentally new trajectory of 'post'-modern biopolitics or, worse, as simply an anomaly of history.

3.3.3   Circulation: Apparatuses of security

Kenneth Werbin intervenes in these debates to avoid precisely such a reading. He shows explicitly that fields of knowledge like statistics and technologies like punch cards rely upon other 'critical support technologies' like lists. For Werbin, the list *serves*. It is a "political technology that serves juridical-legal mechanisms, disciplinary mechanisms, and apparatuses of security" (p. 2) by exercising "force in the delimitation and policing of the movement of 'threatening elements' circulating in uncertain *milieus*" (p. 43). Werbin integrates the list form into histories of the Reich by showing them to stand

> not only [as] a way of *seeing* and *doing* law, discipline, circulation, and
> security under the Third Reich, but also a way of operationalizing the
> fracture of threatening populations from general populations in the
> constitution or regimes of truth about the battles between 'us' and
> 'them' (p. 3, emphasis in original).

By delimiting 'threatening' or 'diseased' populations to be policed, lists for Werbin enable the Nazis to first conceive of and later attempt to bring into being a healthy German *Volk* (p. 45).

This was not simply a program of classification, however. Werbin's analysis shows that 'juridical-disciplinary mechanisms' and 'apparatuses of security' that comprised Nazi governmentality—underpinned by lists, statistics, and proto-computational punch cards—established what Foucault (2007) calls a *milieu* of circulation. Foucault develops the latter concept to describe the shift in modern

power from sovereign, to disciplinary, to governmental.[33] The seventeenth and eighteenth century administration of towns is paradigmatic of this shift, an expression of Hacking's (2006) 'taming of chance,' given its tendency toward the reduction of uncertainty and unpredictability. With an infinite and indefinite series of events (plagues, famines, attacks, etc.) and an indefinite series of operators both fixed (homes, roads, city walls, etc.) and mobile (people, transportation technologies, goods, etc.), towns began to be conceived as delineated spaces within which activity needed to be controlled. This activity involved the circulation, convergence, divergence, etc. of operators. The reduction of uncertainty—the taming of chance—became the object and goal of state power. "Indeed, in the eighteenth century what emerged for the town was a need to organize circulation, not to enclose and prohibit spaces as sovereignty had long done through juridical-legal and disciplinary mechanisms, but rather to *let things happen,* to encourage 'good' circulation, and discourage 'bad'" (Werbin 2008, p. 20). Whereas sovereign power was externally wielded from above, imminent in the king's blade, and disciplinary power was internalized by self-regulating subjects haunted by the panoptic gaze, we see here with governmentality—and its attended conceptual infrastructure (security, territory, population)—a different kind of power articulation. "*[S]ecurity* began to attempt to install a *milieu* of circulation, in which elements and events (as well as probable elements and events) are regulated 'within a multivalent and transformable framework' that raised probabilities and populations as the major problem of government" (Werbin 2008, p. 20, emphasis in original). Govenmentality is about

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[33] Importantly, Foucault does not see this shift as a clean break—disciplinary societies have aspects of governmentality, and vice versa. It is rather a question of emphasis within the historical arrangement. "There is not the legal age, the disciplinary age, and then the age of security. Mechanisms of security do not replace disciplinary mechanisms, which would have replaced juridico-legal mechanisms. In reality you have a series of complex edifices in which, of course, the techniques themselves change and are perfected, or anyway become more complicated, but in which what above all changes is the dominant characteristic, or more exactly, the system of correlation between juridico-legal mechanisms, disciplinary mechanisms, and mechanisms of security" (Foucault 2007, p. 8).

establishing spaces or *milieux* within which things can happen. It is productive power, rather than oppressive. A space is delineated within which uncertain elements can circulate. The space then needs to be administered—observed, policed, and ordered—by certain ways of seeing and doing that can reduce uncertainty. Indeed, the fact of 'uncertainty' itself is a function of this the modern *milieu*. Again following Hacking (2006), the modern period is in part defined by a shift from determinate to indeterminate, from eternal Gods to precarious facts. Thus emerged statistics, induction, and calculation as new conjunctions of taming chance, solutions to the new problems of the governmental state.

Werbin's analysis shows that forms such as lists play a crucial role in delineating and administering *milieux* of circulation that comprise 'apparatuses of security' in governmental societies. It is within such a *milieu* that state power is produced and articulated. State power installs a *milieu* of circulation—via systems of knowledge and techniques of order—which establishes the borders of the field and the 'rules of the game,' and then polices those rules vigorously. Werbin lends a precision to Foucault's abstract theorization of this picture by inserting lists and other related support technologies, such as statistics and Hollerith punch cards, into a concrete case study, Nazi Germany. He shows, for instance, how lists enact *caesuras* within such *milieux* that delineate 'healthy' vs. 'diseased' elements of the population, which becomes under National Socialism conceived as a biological entity that requires maintenance and surgery. According to Werbin,

> the list served a Nazi *milieu* of circulation where the *naming* and *policing* of elements of abnormal populations, Jews and other, was installed as a way of *seeing* and *doing* a 'healthy' cultural body, in which elements circulate freely, but are distributed and regulated by apparatuses of security (2008, p. 45, emphasis in original).

This effect is obvious in the words of Heidinger, founder and major shareholder of *Deutsche Hollerith-Maschinen Gesellschaft mbH* (*Dehomag*), in 1934.

> The physician examines the human body and determines whether all
> organs are working to the benefit of the entire organism … We
> *[Dehomag]* are very much like the physician, in that we dissect, cell by
> cell, the German cultural body. We report every individual
> characteristic on a little card. These are not dead cards, quite the
> contrary, they prove later on that they come to life when the cards are
> sorted at a rate of 25,000 per hour according to certain characteristics.
> These characteristics are grouped like the organs of our cultural body,
> and they will be calculated and determined with the help of our
> tabulating machine. We are proud that we may assist in such a task, a
> task that provides our nation's physician [Hitler] with the material he
> needs for his examinations. (Heidinger in Black, 2001, p. 50-1).

But *caesuras* between healthy || diseased are not simply about establishing rules of permission or prohibition, such as they might have done in sovereign or disciplinary societies. Rather, in a governmental society, they are about optimization and efficiency, those modern virtues discussed at the outset of this chapter. According to Nazi ideology and policy, a healthy population was not simply one that was racially 'purified,' but also one that was operating at a maximum productive capacity. Human labour and vitality in undesirable or 'diseased' elements of the *Volk* were not simply discarded, but were *mobilized* until their productive power was used up. This program worked Jews to death. Gen. Oswald Pohl, head of the SS Economics Office that administered all concentration and work camps, created the 'Extermination by Labour' program on the basis that "expeditiously gassing Jews deprived the Reich of an important resource" (Black 2001, p. 21). As Black notes, "[o]nly after outliving their usefulness would they be deported to death camps for gassing" (p. 21). Even the racist, dehumanizing ideology of National Socialism was secondary to productive capacity. The thousand-year Reich could only be conjured through a total mobilization of all resources, human and non.

> Studies conducted by the Department of the People's (*Volks*) Health at
> the *Deutsche Arbeitsfront* deserve special recognition, as the
> questionnaires they developed serve to ensure the health and
> productivity of the present generation and the productivity of every
> individual into old age in working at the highest level of efficiency for
> the well-being of the ethnic German community (*Volksgemeinschaft*)
> (Zahn in Aly & Roth, p. 10).

Undesirable populations were isolated, observed, policed, and mobilized through cultural techniques such as listing, technologies such as the Hollerith machine, and attendant knowledge structures such as statistics. We therefore see that core values at the heart of Nationalism Socialism included efficiency and productivity, and all national policies of security and governmentality were engineered to facilitate effective and efficient circulation in this *milieu*. As Werbin shows, lists are a crucial constitutive form of this apparatus of security.

Werbin's conception of lists as 'critical support technologies of circulation' within *milieux* of uncertainty helpfully clears the way for an expansion of our conception of the way lists function in relation to administration. First, by tracing lists of people (rather than things), Werbin accounts for the way humans are subjected to Nazi power through such a form. Further, lists now cease to be about establishing epistemological boundaries of fields of knowledge, as discussed in chapter two, or even establishing practices upon which new conceptual categories are built, such as the discussion of double-entry bookkeeping above. 'Administrative', in the sense of organizational tool of order, ceases also to be an effective descriptor. Lists in relation to Nazi governmentality continue to function in such ways—facilitating compression and calculation—however, the third imperative of modernity, which has hovered in the background throughout this chapter, emerges as most prominent: circulation. This extension allows us to more clearly frame National Socialism, and its holocaust, as modern historical events. These

events involved an end game that Elden (2006b) describes as a wholesale recalibration of the world. This was, I contend, a logistical project.

I have shown so far in this chapter that the Nazi administrative apparatus, which Black (2001) argues has been historically overlooked by Holocaust and World War II scholarship, was a hyperbolic extension of an epistemological framework that can be traced back to early modern practices such as double-entry bookkeeping. The Nazi census must be conceived as an essentially modern event. This event embodied the modern tendencies to privilege compression, calculation, and circulation, which find expression in valuing speed, rationality, efficiency, and order above all else. I have demonstrated that the list is implicated in each of these practices. The list compresses language and communication away from ornate rhetoric and toward *brevitas*. Alongside Hollerith punch cards, lists accelerated and made more efficient processes of enumeration. In statistics and other calculative sciences the list form collects and structures the raw data to be calculated. Lists help establish modern *milieux* of circulation wherein probabilities and calculations are developed in order to 'let things happen.' In each case the list is a cultural technique that processes distinctions and inscribes borders upon which concepts and practices are built.

3.3.4   Logistics

The word 'logistics' has appeared frequently throughout this chapter and it is now worth spending some time clarifying my use of the term. First, I propose logistics to be a more accurate descriptor of modern processes that are variously described as 'administrative,' 'bureaucratic,' or 'informational.' I have used these other terms sporadically above, following other thinkers, but in truth find them each of them unwieldy and inadequate. 'Information' has become a bloated term that says too many things to too many people (see Frohmann 2004; Nunberg 1996), while

'administration' lacks the precision required to describe the way that measurement, institutional demands, and human social activity intersect in modern institutions. Bureaucracy, meanwhile, has become a convenient boogeyman invoked to denounce and bemoan any institutional encounter, particularly those involving public regulation and oversight. The issue, it seems to me, is that throughout the twentieth century these terms became increasingly folded in on one another to the point that they are now relatively interchangeable. And further, though each word possesses its own history and descriptive or conceptual strengths, individually each fails to describe the complex relations *between* these concepts. Relations between administration, bureaucracy, and information arise in the name of logistics. What is contemporary administration, whether in institutional bureaucracies or individual offices, other than the facilitation of logistical operations, i.e. the *calculation* of the most efficient means by which to move people, things, and information through space and time? Logistics also captures the interrelationships between calculation, circulation, and compression. Rationality in calculation + efficiency in compression + speed in circulation are the *modus operendi* of logistical modernity. These arise as the fundamental needs of the modern period. More operations in less time enhances the extraction of surplus value for the corporation, the entrenchment of the authority to rule for the state, and everything that happens in between these two paradigmatic modern institutions. More operations in less time is about *making things happen* and *getting things done,* or, logistics.

Recall that John Durham Peters uses 'logistical' to describe certain media technologies that serve to abstract, order, organize, and compute "basic coordinates of time and space" (2013, p. 16). Logistical media "stand alongside more obvious media that overcome time (recording) and space (transmission) and produce messages and text." Logistical media "establish the zero points of orientation, the convergence of the x and y axis. They often seem neutral and given—something which gives them extraordinary power" (p. 16). Peters writes of logistical *media,* but as a goal of this thesis is to integrate develop more precision regarding the layers of

media objects, networks, and processes, we should introduce a more granular distinction that can address logistical *formats* and even more generally *forms*. The case studies I have described above—from double-entry ledgers, to lists of the Nazi census, Hollerith punch cards, and modern statistical techniques—are all *logistical* in the sense that they are the forms, formats, and protocols by which people and objects are compressed, calculated, and made to circulate. They establish zero points of orientation. Encoded in each are cultural techniques like listing.

Having cleared out some of the terminological undergrowth that has been accumulating throughout this chapter, we will now address more specifically how the modern tripartite schema of compression, calculation, and circulation converges as a 'logistical worldview.' I will show the latter to be an orientation to the world that reduces its contents, living and non, to a standing-reserve of materials to be ordered, manipulated, and exploited according to those human desires, problems, and objectives emerging from the 'thinking cap' we call modern. This understanding is derived from Martin Heidegger's late work. Though he never uses the term, Heidegger's meditations on technology offer a robust conceptual vocabulary for describing logistical modernity.

3.4 Logistical worldview

Both the Reich Ministry of Agriculture and the Ministry of Farm Workers stressed the need to speed up the collecting of data for the residential populations according to sex and ages of children and older youth, as they will need estimates of future food production. Both the Ministry of the Interior and the *Reichsführer-SS* argued that it was extremely important to complete lists of names of foreigners, members with non-German ethnic backgrounds, Jews, and mixed Jews … After the completion of these items, the High Command of the German Military

and the Reich Ministry of Labor argued that the next step should be

the completion of the vocation census (vocations in connection with

the social structure). (Aly and Roth 2004, p. 21)

This passage, drawn from administrative minutes of a Nazi party meeting held on September 6, 1939, demonstrates the increasing convergence of calculation, compression, and circulation. Future food production depended on census data about population distribution and composition, number and location of foreigners and Jews, identification of vocational data. These items are marshalled in the service of a desire for the total mobilization of the Reich's resources. The latter comprised not simply natural resources or material wealth but also the Reich population, made up of heterogeneous objects called persons. Nazi statisticians, as we have seen, wished to use statistics to obtain a comprehensive numerical picture with which to visualize and optimize the Reich. Their goal was to calculate maximum productive capacities to feed, house, and arm the war effort; to compress transport times, administrative protocols, and communication backlogs; to circulate things, people and words at the rate required by the project of building a thousand year Reich. This was a project primarily of logistics, of re-calibrating the spaces, times, terrains, populations, networks, and history of Germany.

Stuart Elden (2006b) shows that the Nazis had a specific concept for this project, *Gleichschaltung*. The latter is usually translated as 'co-ordination' or 'synchronization,' but "has a sense of unification, of bringing into line or the elimination of opposition. Literally the word means 'same wiring' or 'connection', the bringing of things under a common measure, subordination" (Elden 2006b, p. 755). For instance, *Gleichschaltung* was the conceptual grounding upon which two 1933 laws reconfigured the state apparatus of Germany to become more homogenous. Regional governments (*Länder*) were remade in the image of the *Reichstag*, effectively neutering regional authority and further centralizing power in the capital. Universities were also *gleichgeschaltet*, with rectors being re-branded as 'Führers of

the Universities.' Innumerable other organizations were also remade, including associations of lawyers, doctors, etc. (Elden 2006b, p. 755). Black (2001) shows that Hollerith machines and their input-output lists provided the technical infrastructure by which social, economic, and administrative life in Germany was 'synchronized,'

> *Gleichschaltung* … demanded that endless accountings be submitted regularly to government bureaus, Nazified trade associations, and statistical agencies. *Kommissars* and government regulations required companies to install Hollerith machines to ensure prompt, uniform, up-to-the-minute reports that could be reprocessed and further tabulated" (p. 88).

According to Elden, *Gleichschaltung* emerges not simply from the idea that humans, groups, and organizations can be understood as either same or different, but in the notion that such difference can be rendered the same (pp. 755-6), that is, eradicated. *Gleichschaltung* is not a matter of delineating a relation of same and other, but is a concept that implicitly assumes that difference can be re-engineered, re-calibrated, altered and subjugated to sameness. Difference is not to be disciplined, or even policed, but is to be *made same.* The social order here becomes an engineering problem.[34]

Gleichschaltung was mobilized alongside concepts such as *Lebensraum* ('living-space'), *Blut und Boden* ('blood and soil') so as to effect this 'same-wiring' or recalibration of the Reich. Elden (2006a; 2006b) identifies this project as an expression of a "politics of calculation" underpinning Nazism. Heidegger's late-career mediations on the question concerning technology attempted to respond to

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[34] *Gleichschaltung* describes, in my view, a kind of proto-binary code, that elegant mathematical marker of difference, not in the superficial sense that it demarcates 1s from 0s, but because such units are the raw materials by which *new possibilities are engineered*. Binary code establishes a processing mechanism by which difference can be re-engineered and made same; a mode by which ontological breaks become epistemologically cohesive.

this ontological undergrowth. I read these insights to offer a sketch of Nazism as a radical expression of a worldview that was not simply 'calculable,' as Elden suggests, but logistical. I should note, briefly, that the problematic relationship between Heidegger and Nazism has been debated extensively for well over sixty years. This thesis is not a work of Heidegger scholarship, and can therefore add little to this debate. The question of Heidegger's fascism is not one I have set out to answer. My interest is solely in his postwar diagnoses of modern technology. I hope the reader will allow me this distance.

3.4.1   *Bestand*

In his later works Heidegger develops several concepts to address the famous 'question concerning technology.' These concepts are of use in understanding what I am calling Nazism's 'logistical worldview' as a limit case of modernity. Because this chapter is primarily descriptive and diagnostic, I make use here only of Heidegger's diagnostic concepts (most notably *Bestand, Gestell,* and *Gleichschaltung*). I am bracketing, for now, the more prescriptive and generative discussion of the 'saving power' that comes after Heidegger's diagnosis. This dimension of Heidegger's nest of concepts will be explored at length in chapter five's exploration of lists in art and poetry.

The most well known of the diagnostic concepts is *das Gestell*, or 'the frame,' which describes the transformative encounter between modern 'man' and what Heidegger calls "global technology." The philosopher conceives of this encounter as one in which man is held in "the sway of *Gestell*":

I see the essence of technology in what I call the frame [*das Ge-stell*]…The frame holding sway means: the essence of man is framed, claimed and challenged by a power which manifests itself in the

essence of technology, a power which man himself does not control (1991, p. 107).

We are structured and delineated by the 'frame' of technology, which is a kind of ontological grid that stands behind, within, underneath, around, and *as* the world. There is no outside of technology; the modern world, and man's relationship to it, is *essentially* technical. This is an understanding of technology that moves away from the trite, hubristic notion that technology is a tool that can ever be mastered by human beings. The scandal of modernity and its technical society, according to Heidegger, is that man elevates himself to the role of God. Blind to *Das Gestell*, man has sought to conquer the world, to bring forth a world under a common measure that is controllable, manipulable, calculable.

Heidegger describes this ontological orientation with the concept of *Bestand,* usually translated as 'standing-reserve'. *Bestand* describes the reduction of the world to a standing reserve of materials, resources, and energy to be extracted, mobilized, utilized, brought into order, synchronized, co-ordinated, and, ultimately, annihilated. The world is subordinated to man and his tools. Any connection to the world as *dwelling*—as rooted in tradition and home—has been severed. "Everything is functioning. This is exactly what is so uncanny, that everything is functioning and that the functioning drives us more and more to even further functioning, and that technology tears men loose from the earth and uproots them" (pp. 105-6). Such an understanding of the modern technical world was not unique to Heidegger. Contemporaries such as Oswald Spengler, for instance, characterized technologization as a Faustian phenomenon by which "man turned nature into a stockpile of raw materials whose only value lay in their usefulness for his titanic purposes" (quoted in Ihde 2010, p. 10). The world as *Bestand* is brought forth through the progressive subjugation of the world and its beings to systems of order. Lived, phenomenological experience is abstracted away. To live in the sway of *Gestell* is to misapprehend the world as *Bestand*.

By the mid-1930s, Heidegger had come to conceive of Nazism, a movement that previously received his enthusiastic support, as the limit case of *Machenschaft* ('machination'). This concept predates both *Gestell* and *Bestand*. "For Heidegger, machination depends upon a particular notion of metaphysics, a particular casting of being, that is, to be is to be calculable" (Elden 2006b, p. 756). The shift toward machination is a long one, dating back to the scientific changes of the sixteenth and seventeenth centuries, which Heidegger (1999) traces through figures such as Galileo, Descartes, Leibniz, and Newton. Elden reads Heidegger to understand that

> there are three ways in which the question of being—[Heidegger's] key
> concern—has come to be forgotten in the modern age. These are
> calculation [*die Berechnung*], massiveness [*Massenhaften*] and
> acceleration [*die Schnelligkeit*]. In all three we see interlinked themes
> of measure [*Maß*], and calculative thinking, grounded on a particular
> way of reckoning [*Rechnung*], based on number and the celebrative of
> quantitative enhancement (Elden 2006b, p. 756; see also Heidegger
> 1989, pp. 120-121).

National Socialism is the limit case of modernity's tendency toward calculation, massiveness, and acceleration because it recasts and attempts to re-engineer the world in such terms. All of these modern tendencies violently converge in and as the Nazi logistical worldview, which is a way of reckoning that reduces the world to *Bestand*. Logistics is both a solution to and a product of the increasing *massificaiton* of spaces and scales brought forth by human technical construction. One must overcome the challenges of moving people and things through a massive spatial territory by improving logistical operations. At the same time, enhanced logistical operations contribute to and enable us to construct projects of a scale previously impossible. Logistics involves the constant calculation of optimum rates of circulation and transport. These are problems of engineering spaces and times. The result of optimization is a tendency toward acceleration and compression. Put

another way, the Nazi desire for the re-calibration of the world, *Gleichschaltung,* is a logistical problem. Compression, calculation, and circulation are applied as solutions to it. Elden's careful reading of Heidegger brings the ontological conditions of Nazism to the surface: calculation, massiveness, acceleration, measure, number, quantification. These map directly onto the values and tendencies of modern administration explored above: compression, calculation, circulation, as made manifest in lists, statistics, and technologies like the Hollerith punch card.

Gleichschaltung is an expression of a logistical worldview. I propose this new category precisely because it ties together each of the three above categories, thus moving beyond Aly's and Roth's emphasis on Nazi efficiency (i.e. compression), Elden's focus on the 'politics of calculation,' or Werbin's on circulation. Focusing only on efficiency conflates the actual mechanisms by which administrative work was sped up (there is little in *The Nazi Census* on the Hollerith machine, for instance), and glosses over work that argues claims to Nazi efficiency are often exaggerated (Brozat 1981; Kershaw 2000). The *desire* for speed and efficiency are different than their actualization. To focus, on the other hand, only on calculation implies the latter to be an end rather than a means. Such a misdiagnosis misses the extent to which techniques of calculation were deployed alongside other techniques of order, circulation, and compression to create a vision of the world as something not just to be calculated but re-wired. Werbin's extension of Foucault's ideas regarding security and circulation, meanwhile, do not account for the fact that Jews and other such 'units' were not made to *circulate* so much as to move between two points. The distinction is important, since circulation implies continuous movement and regeneration, precisely what was denied to inhabitants in the camps. Their logistical mobilization was from point A, a home or ghetto, to point B, a camp, where they were made to produce, labour, and die so as to optimize circulation in the Reich from which they were excluded. They were literally walled off from the *milieu* of circulation—geographically by the fences of the camps, on paper by the borders of deportation or statistical lists. To wall off such external spaces and subject positions

became a thinkable proposition in the context of a logistical approach to the world that viewed it as *Bestand*: a standing-reserve of resources, objects, forces, etc. to be ordered and manipulated according to the desires and objectives of 'man.' In this way the administrative apparatus of National Socialism is the apotheosis of a modern trajectory toward logistics—total mobilization, everything calculable, pure speed, *Bestand* in motion.[35] This trajectory begins with the technique by which fifteenth century Italian merchants compressed their inventories and transactions, calculated their balances, and ensured the circulation of their goods and services: double-entry bookkeeping.

3.5   Conclusion

In this chapter I have sought to show how lists function as a cultural technique of logistical modernity. This technique is encoded in various epistemological frameworks, administrative formats, and media-technological systems that achieve hegemony in the modern period. My argument is not that lists are essentially evil, nor that they are a neutral form made evil by the thoughts and deeds of humans. More simply, certain lists are expressive of emergent worldviews. Lists are part of the matrix of cultural techniques that process the distinctions upon which concepts are built. They materialize assumptions and enable categorizations that follow. In this way, lists are constitutive, creating categories and subject positions for people and things, the easier to be calculated and circulated. Lists are also facilitative, a format by which policy directives are enacted. Their empirical veracity, their status as 'truthful,' grants Nazi lists authority as 'proof' of some fact. Their economy of

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[35] My thanks to Atle Kjøsen for first describing logistics as *'Bestand* in motion.'

presentation accelerates the rate at which lists can communicate such facts. Once extant they often acquire a momentum that is difficult to slow down.[36]

By analyzing historical events at the level of cultural techniques, we are able to see the systems and vectors that stand before the distinctions and categories upon which ideologies, policies, and worldviews are founded. This research has followed Aly and Roth (2004), Black (2001), and Werbin (2008) in addressing a tendency in holocaust and Nazi scholarship to gloss over the administrative dimensions of Nazi governmentality. Going further than these thinkers, I have sought also to show that listing is a cultural technique embedded in a much longer trajectory of modernity. Foucault schematizes this trajectory as a shift from societies of justice and sovereign power to those of administration and disciplinary power to those of circulation and governmental power. I have shown how this shift is enacted at the level of paperwork, wherein the modern compulsions for compression (rationality), calculation (number), and circulation (speed) are articulated in new fields of knowledge, such as statistics, and new technologies like Hollerith machine, which together establish a *milieu* of circulation. Within and before each of these stands the humble list form. Finally, this chapter has shown that the Nazi security apparatus to be a nightmarish expression of what I call a 'logistical worldview', in which the modern predilections for compression, calculation, and circulation converge. I have proposed logistics as a frame by which to understand modern technics because it encapsulates the dynamic interactions between these three individual categories.

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[36] Take Dr. Fritz Arlt's report on the ethno-biology of Leipzig, for instance, which included on its final page a list of places in Poland where "Jews presently living in Leipzig were born." Because the report offered insight not just into the concentration of Jewish populations in Poland, but also into the meaning of space and place for Jewish communities, "[t]he listing of such places can … be of interest to demographic researchers in the future." Isolated for particular emphasis on Dr. Arlt's list were the future centres for 'resettlement,' Warsaw, Lodz, and Auschwitz (Arlt in Aly and Roth 2004, p. 77).

Looking at the list, and the technologies and fields of knowledge with which it is intimately related, opens up a window through which to view an entire ecology of administration and counting. This ecology tells us not only about how the holocaust was made to happen but also how it rests on techniques, desires, and systems of thought that achieved hegemony from about 1500. Analyzing Nazi administration at the level of cultural techniques and formats allows us to see how the "administered society" (Adorno and Horkheimer 2002) actually operated. Rather than a purely ideological or philosophical program, Nazism is a limit case of a particular way of approaching the world that fetishizes *data* and *information*. The latter is a function of what Heidegger described with his late works on the 'essence' of modern technology. In this context, perhaps the philosopher's famous quote regarding Twentieth century modernity can be seen in a clearer light:

> Agriculture is now a motorized food industry—in essence, the same as the manufacturing of corpses in gas chambers and the extermination camps, the same as the blockading and starving of nations, the same as the manufacture of atom bombs.[37]

Postscript

The logistical worldview did not disappear after the Russians took Berlin. It was not wiped away by Hiroshima and Nagasaki. In fact, the strength and influence of the logistical worldview only accelerated and expanded—as logistical operations usually do—in the postwar period. This will be the topic of chapter four.

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[37] These remarks were offered in a 1949 lecture series regarding *das Gestell,* on which the famous 'Question Concerning Technology' essay was based. The quotation used can be found in Caputo (1993, p. 132)

PART II: **TIME**

Introduction

Part I focused on lists in written media environments that demonstrated a primarily spatial bias. We observed administrative lists as collectors of written matter that congeal as knowledge of various kinds, and which have material effects on the world. These were lists that attempted to achieve 'everything included.' They were standardized *formats* that froze the form of the list into registries, charts, and rankings. Part II focuses on different kinds of lists, those that are operative in time. These lists are better understood as *forms* that are inherently more flexible than formats. That is, as lists of 'etcetera' that have not yet been standardized.

4. Lists, logistics, computation

"Times are more interesting than people."[38]
    –Honoré de Balzac

I noted at the end of chapter three that what I call the 'logistical worldview' has become more widespread over the last fifty years. The Third Reich and its Nazi Census were horrific and extreme manifestations of a 'thinking cap' with a long historical trajectory. The logistical worldview, underpinned by cultural techniques such as listing, reduces the world and its inhabitants to a standing reserve of material to be manipulated and exploited for human ends. How does this worldview manifest in contemporary digital culture? How has the logistical worldview shaped the trajectory of recent technological development, and how does it condition our relationship to culture? The list will again be our lens into these questions. Just as we observed them to be operative 'hardware' of the Nazi census, so too will we see lists operating within the hard and software of digital culture. I begin the chapter with a specific discussion of lists in computation before moving out to explore broader cultural trends they help shape. The purpose of the chapter is to give a more precise theorization of the function of lists in what Bratton (2006), following Virilio, calls 'logistical modernity.'

4.1   Lists and computation[39]

The logic of the list is integral to the world of computing in data structures such as arrays, queues, stacks, and databases, as Vismann (2008), Manovich (2001), and Adam (2008) all highlight. Adam defines 'List' in computing as "a data structure that is an ordered group of entities" (2008, p. 174). This structure can be either *static* or

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[38] Quoted in Benjamin (2002, p. 456).
[39] Parts of this presentation are taken from Young (2013b).

dynamic. The former allows only observation and enumeration of elements, the latter allows for manipulation – the insertion, replacement, or deletion of elements. The programming language Lisp (short for List Processor) is the second oldest high-level computing language still in use and is an instructive example in this regard. The constitutive data type of Lisp is, of course, the list, out of which almost all other entities are constructed.[40] Echoing Vismann's description of algorithmic file-notes, Adam points out a double function of lists in Lisp that both program *and* store data: a list is sent first as a *command*, the latter is then *processed* via the list form, after which the data sent and processed stands as a listed *record* of what has occurred (Adam 2008, p. 177).

Lisp accommodates the mixing of data types (a data type is any type of thing) within the same list. In Lisp, "a variable can hold values of any type and the values carry type information that can be used to check types at runtime" (Siebel 2005, p. 265). That is, you may enumerate within the same list trees, cars, a cat, and bandages without declaring them to be any single type:

(7 TREES 4 CARS 1 CAT 2 BANDAGES)

Lisp does not require a programmer to declare data types in advance according to any guiding principle in order for them to be processed. This runs contra to programming languages such as C++ and Java. The latter require at the outset a declaration regarding what type of object each variable can hold (and if an object does not match the value assigned it cannot be processed). Because they do not require a human programmer to establish their criteria, lists in Lisp are 'self-typing' and thereby inherently more flexible.

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[40] See Derek Robinson, "Function," in *Software Studies,* p. 104. While this is true for the original Lisp language designed by John McCarthy, it is important to note that contemporary iterations, such as 'Common Lisp,' incorporate other data types such as vectors and hash tables.

Lisp arises from an alternate *a priori* than most conventional programming languages. Solomon (2013) shows that Lisp was designed around the principles of Alonzo Church's Lambda calculus rather than those of Alan Turing's famous machine (itself based on Charles Babbage's 'Difference Engine'). Turing's Machine and Babbage's engine rest on an IF/THEN logic of conditional branching, which is "the construct within a computer program that allows it to alter its flow of instructions based on the result of some other calculation" (Solomon 2013). Conditional branching is described by Kittler in this way: "IF a preprogrammed condition is missing, data processing continues according to the conventions of numbered commands, but IF somewhere an intermediate result fulfills the condition, THEN the program itself determines successive commands, that is, its future" (Kittler 1999, p. 258). In contrast, the Lambda calculus "is based purely on the ability to define functions (subroutines) and for these functions to be able to call each other in an arbitrarily nested or recursive way" (Solomon 2013). Solomon, a computer programmer, argues that both the Turing machine and the Lambda calculus are equally powerful though they implement conditional branching in different ways. Lisp, using Lambda calculus principles, implements recursively callable functions using a structure called a functional call stack. "Using this structure, the computer stores the state of the current function being evaluated, and if that function calls another function, it will "push" everything down and repeat, so that when the latter function returns, it will "pop" off the top and return back to the prior function" (Solomon 2013). A functional call stack is a flexible, temporally operational list of functions.[41] The list form provides the required flexibility for the push-pop processes of recursively callable functions; it provides the 'nest' within which functions can call one another. Rather than a series of function checks and processes set out in advance by a programmer (IF x occurs THEN y follows; IF x does not occur THEN z,

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[41] See also Bratton (2015, forthcoming) on the stack.

etc.), functions in Lisp recursively call each other and move up and down the list as required. The flexibility inherent in the list form ensures this freedom of movement.

Furthermore, Adam shows, lists provide a structure that allows Lisp to process symbols rather than simply numbers. According to Lisp creator John McCarthy, developing a programming language capable of moving beyond 'number crunching' and toward reasoning about the world would involve

> representing information about the world by sentences in a suitable
> formal language and a reasoning program that would decide what to
> do by making logical inferences. Representing sentences by list
> structure seemed appropriate—it still is—and a list processing
> language also seemed appropriate for programming the operations
> involved in deduction—it still is (McCarthy 1996).

Adam (2008) suggests that the list has proven attractive to AI researchers. Lists provide an elegant data structure, not limited by pre-existing abilities, that can both absorb and potentially *reason* through (rather than simply process), a significant amount of data. As a "programmable programming language," Lisp very easily absorbs paradigm shifts in programming and will likely continue to do so (Siebel 2005). Thus because its constitutive form is adaptable and can create its own processes, Lisp has survived epistemic shifts in programming better than other languages.

This brief overview of Lisp is meant to show one example in which the list is formally operative in the digital realm. Others can be found, such as ArrayLists in Java or linked lists in C (similarly open-ended data structures). 'List' was one of the thirteen original HTML tags designed by Tim Berners-Lee, and lists have always been a major component of the Graphic User Interface (Guillory 2004). Early programmers will no doubt recall 'program listing' printouts that stored pages upon pages of line-

by-line code on fan-fold paper.[42] Algorithms, essential operators in digital computation, are finite lists of instructions that enable the calculation of functions. An algorithm without a database to operate on is useless, as is a database without an algorithm to extract and structure its data. "The possibility of abstracting useful knowledge from the end user of a website, for example, is dependent upon the extent to which data is structured" (Fuller and Goffey in Parikka and Sampson 2009). Lists give *form* to such protocols, and in its algorithmic capacities the list discloses itself as a building block of digital computation's operational infrastructure. As Ernst describes, "[c]omputer programming, the cultural force of today, is non-narrative; its algorithmic forms of writing – alternative forms of minimal, serial time-writing … are close to the paradigm of computing itself" (Ernst in Parikka & Huhtamo 2012, p. 252). Algorithmic lists in computation are present-based processing forms, lists of 'etcetera' that are inherently open, flexible and able to operate in real time as required by the computational networks of which they are a part.

Lists are part of the operational infrastructure of networks and databases, which are paradigmatic forms of a digital culture increasingly oriented around logistics: the movement of people, things, and data through space and time. The next section will explore aspects of logistical modernity that are outgrowths of list capacities at the heart of programming activities.

4.2   Logistics 2.0

The concept of logistics is rooted in the military imaginary, war being the mother of technical invention as Kittler (1999) and Virilio (1989; 1997) teach. It is generally accepted that the term logistics comes to us from the French *logistique*, a late

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[42] Program listings stand as an interesting bridge between digital computation and Vismann's (2008) analog world of files. Program listings testify to a moment in which the storage and transmission capacities of computation had not yet caught up to processing capacity; or perhaps they betray the last vestiges of the archive fever of the Gutenberg galaxy.

nineteenth-century word used to describe the "art of moving and quartering troops" (Athenaeum 1898, quoted in *Oxford English Dictionary*), though the activities involved have occurred since at least antiquity (Bratton 2006, p. 11). But 'logistics' as a concept has spread rapidly over the last twenty years as technical solutions to military problems were imported into civilian spheres such as economics and transportation. The migration of the term logistics from the military to civilian realms runs concomitant to a change in what I have been calling the 'logistical worldview' wherein the latter morphs from an unspoken logic underpinning certain techniques, practices, and machines to become a fully articulated concept and field called 'Logistics.' Business practices and literature have zeroed in on this concept; efficiency and efficacy in logistics have become perhaps the supreme desiderata in twenty-first century capitalism. Unsurprisingly, an entire field of study focused on logistics and supply chain management has sprung up to provide companies with a competitive edge. The Council of Supply Chain Management (née Logistics Management) proposes the following definition:

> Logistics: The process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including services, and related information, from the point of origin to the point of consumption for the purpose of conforming to customer requirements. This definition includes inbound, outbound, internal, and external movements (2013).

Business owners and operators are encouraged to streamline and compress the flow of goods and information within their logistical channel. Such compression involves the calculation of best practices—standard operating procedures (SOP)—that optimize the movement of material, goods, and labour. Such definitions, as used the Business and Management subfield of Supply Chain and Logistics Studies (see Martin 2013), specify the extent to which logistical operations involve a complex network of heterogeneous actors and forces that establish parameters within which

things can happen. Put another way, logistical procedures and operations establish what Foucault (2007) calls a *milieu* of circulation. 'Logistics' describes not circulation itself, but rather the fields of study, practice, and policy that establish the parameters within which circulation can occur and the setting of the 'rules of the game.' Contemporary logistics is therefore not simply a problem of *economy* but of *governmentality*, as defined by Foucault (2007). Logistics is governmental in the sense that it contributes to a prevailing logic of order geared toward circulation, an order that has 'economy' and 'security' as basic categories (see Foucault 2007, pp. 95-6). This worldview is not new, as we have seen. Recall that Foucault (2007) sees governmentality beginning in earnest after Machiavelli, emerging as

> a completely different problem that is no longer that of fixing and
> demarcating the territory, but of allowing circulations to take place, of
> controlling them, sifting the good and the bad, ensuring that things
> are always in movement, constantly moving around, continually going
> from one point to another, but in such a way that the inherent dangers
> of this circulation are cancelled out (p. 65).

Where once power was about the delineation of territory, now it is about establishing parameters within which circulation—of people, things and, I would add, data—can circulate. For what purposes this circulation occurs is largely irrelevant. What is relevant is that it *does* occur; 'security' is the maintenance of the equilibrium required for efficient and effective circulation. With the onset of digital technology the speed and scale of contemporary networks of circulation exceed earlier analog networks by a massive degree. From algorithmic trading to the just-in-time logic of global supply chains, new spaces and times have emerged with corresponding techniques of order and metrics of measure that we are only beginning to understand. As shown in section 4.1, lists give form to protocols baked into the code and data structures that enable logistical operations.

Logistics is not only the practice, but also the science and study of the means by which people, things, and data are mobilized, made to circulate, measured, and analyzed. Logistical media, as discussed earlier (chapter three, pp. 127-129), are the devices, protocols, and structures that establish the parameters within which movement occurs. Design—whether architectural, infrastructural, computational, or otherwise—produces "logistical media for mobilization and its administration, technologies that consolidate territory into logistical field and enable a Modern governance based on the abstracted calculation over omnidirectional spaces and surfaces, from open oceans to shared spreadsheets" (Bratton 2006, p. 8). The contemporary city, the primary locus of circulation in logistical modernity according to Virilio (2006) and Rossiter (2014), offers a window onto the way logistical media and design have reshaped space and time. Rossiter's 'logistical city' is "a new urban form [that] stitches together diverse cities and regions across the global north and south, continuously reconfiguring connections according to just-in-time demands of supply chains and contingencies that disrupt their smooth operation" (2014, p. 64). Logistical capitalism is 'omnidirectional' in the sense that distributed computation enables operations to be synchronized in time and distributed over space. Operations occur simultaneously in real time rather than sequentially.[43] In this regard coordinated informational and logistical environments seek to emulate the frictionless "oceanic vectors from which [logistics] is born" (Bratton 2006, p. 12; see also Virilio 2007).

Human subjects, once administered by the written formats discussed in chapter three, have become *users* administered by digital algorithms and code. In both cases lists structure such administration. The cultural expression of the this situation is what we currently call 'Big Data.' The story of Big Data is now familiar. With social media and so-called Web 2.0, the amount of user data created, tracked,

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[43] For a discussion of distributed computing, see Rotman (2008).

mined, analyzed, bought, sold, and horded is staggering. IBM estimates that users create 2.5 quintillion bytes of data per day. According to Facebook,

> [e]very day, there are more than 4.75 billion content items shared on Facebook (including status updates, wall posts, photos, videos and comments), more than 4.5 billion "Likes," and more than 10 billion messages sent. More than 250 billion photos have been uploaded to Facebook, and more than 350 million photos are uploaded every day on average (Facebook 2013, p. 6).

Media theorist Lev Manovich (2012) describes 'big social data' this way:

> [f]or the first time, we can follow [the] imaginations, opinions, ideas, and feelings of hundreds of millions of people. We can see the images and the videos they create and comment on, monitor the conversations they are engaged in, read their blog posts and tweets, navigate their maps, listen to their track lists, and follow their trajectories in physical space. (p. 461)

This occurs not just in the cultural and corporate commercial sectors, but also in the realm of state governance. The year 2013 threw into relief just how indiscernible these two sectors actually are. The exposure of the NSA's top-secret PRISM program brought to light the collusion of Silicon Valley giants like Google, Apple, Facebook, Amazon, and others with the intelligence arm of the American state. The program was, essentially, Silicon Valley's acquiescing to the NSA's request that they build in secret 'back doors' by which the latter could mine user data without consent. The scale of this and other projects is still very much an open question and the political and philosophical stakes are only beginning to emerge.[44]

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[44] The shrewdest analysis of PRISM and the NSA surveillence state in recent years is that of journalist Grenn Greenwald, writing first for *The Guardian,* and later for his own publication *The Intercept.*

The result is a society of 'infopersons,' an apt term coined by philosopher Colin Koopman (2014). Though we have always been such—the development of systems that observe, measure, identify, track, and archive persons has been an essential part of modernity, as demonstrated in chapter three—the sheer *amount* of data generated about the modern subject, and the range of tools available to amalgamate and analyze it, is unprecedented. A new cadre of intermediaries has developed software and programming that can harvest, analyze, and distribute such data for profit: Big Data as Big Business. Data generated by users in their engagements with various digital devices, our 'digital footprints,' pass after collection through a series of algorithms and databases that output statistics and metrics around which commercial producers reconfigure their operations. Not only are public relations and marketing efforts shaped in response to Big Data analytics, but also cycles of production and circulation. Recall the famous example of a Minnesota teenager whose purchasing behaviour led Target's marketing algorithm to (correctly) guess that she was pregnant, much to the surprise of her parents. Our behaviour as consumers is continuously marshalled by computational processes that we cannot see and often do not understand. Lists of Amazon or Netflix recommendations arise out of one's browsing, viewing, or purchasing history; each search, click, and order is tracked. Proprietary, black-boxed algorithms usher us toward certain products but not others. Consumers, meanwhile, seem only too happy to sacrifice their anonymity, privacy, and choice in the name of convenience.

> Users embrace the world and start making lists. We are honored to be
> invited by the Machine to submit our opinions and preferences. How
> do you categorize yourself? There must at least be some 'good-value'
> content out there as a reward, after we feed the databases … What is
> fascinating is not so much the flux of opinions, as Jean Baudrillard
> once described democracy in the media age, but the ability to indulge
> in similarity with others. We are invited to create reading lists, rank

music, and evaluate the products we consumed. User bees working for queen Google (Lovink 2011, p. 25).

Big Data is now the orienting principle in everything from city planning ("smart cities") and political campaigning ("data consultants") to counterterrorism ("predictive policing"). That Big Data can provide certain efficiencies and solve certain problems is beyond question. What should be open to question are the *kind* of problems we use it to solve, though these are typically glossed over by advocates of the 'Big Data Revolution.' Evgeny Morozov (2013), one of the sharpest critics of Silicon Valley's 'solutionist' ideology, argues that the problems addressed by Big Data are typically trivial indulgences of consumption ("smart" garbage cans), or gross simplifications of complex issues ("solving" world hunger through Big Data), rather than systemic social problems of collective society. Morozov may romanticize a vague public sphere of 'informed debate,' but his point is well taken: right now Big Data analytics has currency in policy circles, where it crowds out voices that propose less tech-savvy solutions to social problems, or which argue the need to address an entirely different set of problems in the first place.

Big Data should be understood as the cultural expression of the logistical worldview recast in a digital environment. It reduces people and things to a standing reserve of data to be collected, compiled, and analyzed. Big Data proposes technological solutions to systemic problems that create more problems for it to solve, echoing Ellul's (1964) *la technique*. 'Big Data' as a marketing term masks the convergence of the military and economic spheres with Silicon Valley's peculiar brand of libertarianism—the attempt by the former to enclose the 'hacktivist' spirit of the latter so that it might be marshalled toward the surveillance needs of the state and the corporation. The keynote address and recruitment efforts of former head of the NSA, Gen. Keith Alexander, at the popular hacker conference Defcon 2012, are testament to this convergence. "The most advanced forms of surveillance and data analysis used by intelligence agencies are now equally indispensable to the

marketing strategies of large businesses" (Crary 2013, p. 48). I argue that these sectors are converging around the problem of logistics: the movement of people, things, and data efficiently and effectively. Logistical operations pose problems that technological devices seek to fix, while the new spaces and times opened up by those devices and processes encourage the extension and acceleration of logistics as a field of study, practice, and theory. This situation is often described from the human perspective as 'information overload' (we should again recall that we have complained that there is 'too much to know' since the early modern period, see Blair 2011). Crary makes a key point about the contemporary user's existential malaise.

> The only consistent factor connecting the otherwise desultory succession of consumer products and services is the intensifying integration of one's time and activity into the parameters of electronic exchange. Billions of dollars are spent every year researching how to reduce decision-making time, how to eliminate the useless time of reflection and contemplation (Crary 2013, p. 40).

What Crary understands is that this malaise has to do with time. Specifically, it has to do with the clash between human, experiential time and new times 'invented,' or at least conjured, by modern computation. I would therefore like to say a few words about time as logistical object.

4.2.1   The return of time

It is by now a cliché to say that technological development and its digital culture are endlessly accelerating. Superficial as this may seem, there is much at stake, both philosophically and materially, in the rise of what Ernst and Parikka (2013) call 'time-criticality.' Time is critical, for instance, for a worker in an Amazon distribution centre, as a recent plethora of stories documenting working conditions inside such centres teach us. These conditions stretch the principles of Taylor and Gilbreth's

Time-Motion studies almost to (human) breaking point. One of the more memorable stories to document the working conditions inside a distribution centre is by journalist Mac McClelland (2012), and is worth quoting at length.

> The place is immense. Cold, cavernous. Silent, despite thousands of people quietly doing their picking, or standing along the conveyors quietly packing or box-taping, nothing noisy but the occasional whir of a passing forklift. My scanner tells me in what exact section—there are nine merchandise sections, so sprawling that there's a map attached to my ID badge—of vast shelving systems the item I'm supposed to find resides. It also tells me how many seconds it thinks I should take to get there. Dallas sector, section yellow, row H34, bin 22, level D: wearable blanket. Battery-operated flour sifter. Twenty seconds. I count how many steps it takes me to speed-walk to my destination: 20. At 5-foot-9, I've got a decently long stride, and I only cover the 20 steps *and* locate the exact shelving unit in the allotted time if I don't hesitate for one second or get lost or take a drink of water before heading in the right direction as fast as I can walk or even occasionally jog … Often as not, I miss my time target … Plenty of things can hurt my goals. The programs for our scanners are designed with the assumption that we disposable employees don't know what we're doing. Find a Rob Zombie Voodoo Doll in the blue section of the Rockies sector in the third bin of the A-level in row Z42, my scanner tells me. But if I punch into my scanner that it's not there, I have to prove it by scanning every single other item in the bin, though I swear on my life there's no Rob Zombie Voodoo Doll in this pile of 30 individually wrapped and bar-coded batteries that take me quite a while to beep one by one. It could be five minutes before I can move on to, and make it to, and find, my next item. That lapse is supposed to be mere seconds.

Her story is littered with references to time beyond the algorithmically generated
time targets coded into her scanner. McClelland's experience supports Rossiter's
claim that "[l]ogistics robs living labour of time" (2014, p. 67) and in so doing
subjects life to new forms of self-regulation, what Foucault (1990; 2007) defined as
biopower. Amazon-like distribution centres are petri dishes of time-criticality, a
product of the logistical worldview's dream of pure rationality and efficiency:
Bestand in motion, 24/7. Jonathan Crary takes '24/7' seriously, moving the term
beyond cliché by elaborating it as a critical concept that can describe the contours of
a society that has become recalibrated around nonhuman, machinic time.

> "24/7 is a static redundancy that disavows its relation to the rhythmic
> and periodic textures of human life … It is only recently that the
> elaboration, the modeling of one's personal and social identity, has
> been reorganized to conform to the uninterrupted operation of
> markets, information networks, and other systems" (2013, p. 9).

Lists abound in the logistical world of 24/7, giving form to everything from
instructions, schedules, and standard operating procedures to warehouse pickers'
daily lists of targets and the algorithms that produce them. Such computational
protocols, processes, and mechanisms enframe contemporary logistical operations
everywhere, not just in Amazon-like distribution centres. Rossiter shows how the
movement of workers in warehouse and transport industries is "increasingly
regulated by global positioning system (GPS) vehicle tracking, radio-frequency
identification tags that profile workers within database time and voice-directed order
picking technologies 'that manage the passage and pace of workers through the
workplace with the aim of maximising efficiencies'" (Rossiter 2014, p. 68). And, as
should be evident, the effects of these changes are not exclusive to production or
labour. "The rhythms of technological consumption are inseparable from the
requirement of continual self-administration" (Crary 2013, p. 46).

For Rossiter, "code is King" (2014, p. 68) in logistical modernity, and "whoever sets the standard rules the world" (p. 65). These claims do not delve deeply enough; code and standards are only effective tools of logistical governmentality because they have the capacity to capture, manipulate, and program time. For instance, database 'contents' (for lack of a better term) materialize on our screens dozens of times each day, re-presenting digital data sets and code in a format recognizable to human senses, such as a Google search results list. What is on the screen is a product of data that has been run through an algorithm and rendered for display on an interface. In such a format, the data appear as spatial 'things.' Data are organized on a screen as we might spatially organize written material on a page. Historically such formats have structured experiential and conceptual space, as we saw in chapter three. However, when we focus solely on screens—a tendency Kirschenbaum (2008) describes as 'screen essentialism'—we mistake as spatial abstractions the operations of computational databases that are actually about time. The popular press has often cast Google or Wikipedia as actualizations of Borges' library of Babel, emergent archives of 'all the world's knowledge.' Such comparisons conjure images of vast archives wherein contents are stored as extant individual items (or coherent sets of 1s and 0s) at the ready to be summoned, as a book on a shelf in a library. Such understandings, which cast databases as a digital equivalent of a physical archive, miss the fact that any data 'contained' by database are summoned, called forth, materialized, and made to function in an essentially temporal operation (Ernst 2013; Parikka 2011; Kirschenbaum 2008). Data points in a database are ontologically distinct from physical objects such as files in an archive or a name written on paper. They do not sit on shelves waiting to be pulled out and opened. Their physical reality is detectable only at the micro-level of inscriptions made on silicon chips (Kirschenbaum 2008). Our language to describe computational databases is infused with metaphors that reference the world of analog technology, but these metaphors paper over the fact that the 'data' of databases are sequences of code that

materialize and de-materialize in real time as required by a programmer or, increasingly an algorithm.

The mining, measure, and analysis of Big Data is different from earlier, analog administrative contexts in that Big Data is essentially about *real time,* the creation of databases—archives—that do not simply exist in space (on server racks), but are constantly made and remade according to the ever-accelerating feedback loop of input/output. The form that structures this feedback loop is very often the list—not only as input/output format, but also as code. The difference from earlier administrative and logistical *milieux* is that control of the archive is no longer about physical space but rather operational time. Put rather crudely, the *database that programs time* has replaced the *register that inventories space* as the paradigmatic form of logistical modernity. With such new problematics and objects of analysis—algorithms, databases, digital footprints, informational persons, and so on—there is need for new tools that can parse the time-critical dimensions of digital culture.

4.2.2   Time-critical media studies

Time-criticality gained a foothold in media studies through the work of Kittler (1990; 1999; 2010), whose unique discovery was that what is essential about modern technical media like gramophone, film, or typewriter, is their ability for 'time-axis manipulation' (see especially Kittler 2010). Technical media produce time as a manipulable unit, one among many, shattering the previous inseparability of time from human experience. What writing and representation had done to space, ideas, and objects, which is abstract them onto surfaces and thus into manipulable data units, technical media do for time. When a gramophone records sound, or a cinematograph a series of images, argued Kittler (1999), these media are not simply recording content but are capturing for the first time data that unfold through time. Such data streams can be sped up, slowed down, reversed, or otherwise

manipulated to produce *new times* previously unknown and incomprehensible to human beings (see also Krämer 2006).

Kittler's insights about the relation between media and time have flowered in the German tradition of media analysis, where he occupies a controversial, yet architectonic role. More recently, Wolfgang Ernst has forged ahead with the Kittlerian emphasis on time. Ernst is most interested in the way categories and practices of memory and history emerge as a corollary of the ways that media-technics process and store time. His argument updates not only Kittler but also Foucault, following Kittler in pushing Foucauldian discourse analysis beyond its space bias—not just taking "Foucault the last historian or first archaeologist" (Kittler 1999, pp. 4-5) out of the library and into the realm of technical media, but also taking the concept of *archive* much further. Ernst writes, "[i]t is worth remembering that the archive as the condition for our knowledge of history becomes dependent on the media of its transmission … The mechanisms that regulate entry into the discourse of history or exclusion from cultural memory are therefore part of the media archaeological investigation" (2013, p. 42). Foucault may have grasped this in part, but Ernst shows that Foucault's medial blind spot regarding how the archive is transmitted prevented his archaeologies of knowledge from moving beyond the *spaces* of the written word (whether formal state archives and libraries, the paper surfaces of documents, observation charts and tables, concepts, etc.). As a result Foucault's analyses cannot offer a comprehensive picture of history, memory, or knowledge outside the world of writing. Ernst argues that when we look beyond alphabetic writing to technical media such as the phonograph and cinematograph we see that "signs of or in time themselves can be registered. Not only do they maintain a symbolical relationship to macro and micro time (such as historiography), but they inscribe and reproduce functions of time themselves" (2013 p. 30). After technical media the mechanisms that transmit, store, and process—that is, mediate—archival information are not reducible to their spatial functions (as with writing and its documentary apparatus)

but instead inaugurate whole new regimes of time. They do so precisely because they are themselves entirely new modalities of measuring and recording time.

Digitization offers a similar rupture: "[i]t is only with the digital computer that the symbolic regime *dia*lectically returns, this time in a genuinely dynamic mode (which differentiates implementation of software from the traditional Gutenberg galaxy): algorithmic time and operative diagrams" (p. 30). So while technical media inaugurate time-critical media studies by foregrounding the extent to which media record the 'flow' of human and machine time, it is not until digital media that we come to see this flow as comprised of discrete, operative units and processes beyond human perception. Digital times are processual and discrete, rather than static and continuous; they are operational rather than narrative, re-inscribing the symbolic as binary 1s and os in place of alphanumeric letters. As a result, the digital archive itself has become an entity always in flux, continuously in-formation, and its analysis requires new conceptual tools.

Time-critical analysis extends and complicates many of the inherited conceptual categories of media studies. For instance, Harold Innis' (2002) formative insights regarding 'time-biased' media and the societies they structure are complicated by Ernst's distinction, absent in the Innisian concept of time, between operative time (such as we find in the algorithms and code of the digital archive) and the static time of the 'classical' archives of the written word. The latter primarily transmits via storage, while the former performs all three data operations—processing, storage, transmission—*at and in the same time*. The distinction Ernst introduces offers a productive vein through which to address a common critique of Innis' concepts of time- and space-bias (that they are too totalizing) by allowing us to account for many often competing times present in any given media device, network, or environment. "The moment a singer of epics sings into a current recording device, two different regimes clash as human performativity is confronted with technological algorithmical operations" (p. 59). Ernst work can also be used to complicate Crary's

(2013) too hasty conflation of all digital time under the totalizing '24/7' concept. Crary argues that all time has melted into a singular, homogenized perpetual present, but this is clearly not the case. There has never been so many *different* times: human, operational, algorithmic, and cinematic, to name a few. The disenchantment that Crary (2013) diagnoses is a product not of the "eradication of shadows and obscurity and of alternate temporalities" (p. 19) but of their proliferation and clashing. The time under which humans labour and think changes and shifts from moment to moment, throwing into relief the very impossibility of ever being able to synchronize, or even understand them. Ernst is particularly insistent that these times be understood according to their own operative dimensions—by going 'under the hood' of media—rather than in relation to inherited, abstract notions of human time that often go unquestioned.

Observing the list form as a constitutive processual operator, as in section 4.1's analysis of Lisp, enables a time-critical understanding of logistical networks. As algorithmic forms of writing, such lists are non-narrative. Ernst (2013) forges productive connections between the algorithmic lists of network society and earlier non-narrative modes of relaying data.

> In digital computing, the sequence of operations required to perform a specific task is known as an *algorithm*. Medieval annalism also stands for a writing aesthetics of organizing a sequence of events in serial, sequential order ... Here diachronical *clustering* serves as a memory operation beyond the narrative unification of data (p. 150).

Ernst means to show that digital computation has more in common with the way data is processed in ancient modes of relaying the past than with the monopoly of narrative in modern historiography; pre-modern modes engender sorting and counting, enumeration rather than causation, and so doing constitute a sense of time rooted in calculation rather than narrative: counting rather than recounting. Modern historiography has excised 'calculative' time, but this was not always so:

> The old English *tellan* derives from a prehistoric Germanic word meaning 'to put in order' (both in narration and counting). We find this kind of non-explanatory and paratactic mode in the epic discourse. Homer, in his *Iliad,* already used the form of listing in the appropriately called 'Catalogue of Ships' … Here telling is counting – a practice well known from ancient oriental lists of rulers (Ernst 2013, p. 148).

Epic discourse mobilizes the list form to relay the past non-narratively, to tell via counting. Goody (1977) shows this with written lists from even earlier periods (ca. 3000 BCE), which visualize words and things into data that can be re-ordered and manipulated in new, non-narrative ways. Later, Leibniz "actually mused on the option to calculate a virtual protocol of the world by counting, not narrating: combining and recombining every letter that has ever been written in world history. Once registered in discrete symbols, events could be literally processed … The form can match every object, every referent" (Ernst 2013, p. 151). The algorithmic logic of protocols, stacks, and compilers in digital computation are the distant echoes of such operations. Digital aesthetics and computation enact a situation in which telling has become counting once again, "[n]arrative on the emphatic literary level (*raconter*) is being replaced by literally counting microevents on the media archaeological level" (Ernst 2013, p. 155). Languages such as Lisp show that computer programming – 'the cultural force of today' which does not tell stories but calculates units – takes shape and unfolds *formally* via certain understudied but vitally important entities such as the list, or as emphasized by Solomon (2013) and Bratton (2015), the stack. An archaeology of the list form allows us to connect computational *a priori* that exists within the very different media environments of logistical modernity, ancient administrative writing, and early modern philosophical speculation.

The constitutive tension between etcetera and everything-included resonates in each context: the unfolding of non- or pre-narrative historical time becomes

thinkable through the listing of events, actors, and things from the past in the annals. These both enumerate data as a bulkhead against the entropy of infinity and reach toward the future by compiling as much information as possible. Meanwhile, algorithms streamline processing mechanisms and protocols as a means by which to *tellan* (give order) to the numerical ontology of computation, while also maintaining a flexibility that enables modes of self-generating, indefinite processing. In both instances, operative forms like lists constitute and facilitate the required networks of actors, signs, processes, events, mechanisms, etc. Such a Benjaminian folding of time, in which different epochs are made to touch and resonate with one another, is precisely what time-critical analysis makes available.

4.3   Conclusion

The chapter offered an analysis of certain infrastructural elements of contemporary logistics and demonstrated that they are essentially about time. Logistical modernity is about the efficient and effective movement of people and things, but these are only moveable through the collection and management of data. The result is a culture increasingly oriented around Big Data and the logistical media forms (protocols, SOPs, formats, alogirthms, etc.) that allow for its mobilization. Thus logistical media have displaced previously hegemonic media, whether technical (gramophone, film, typewriter), transmission-based (telegrath, telephone), or ritual-based (oral speech).[45] I argue Big Data analytics to be a less extreme expression of the logistical worldview that we observed around the Nazi dream of *Bestand in motion*. The latter was itself an extension of certain modern ways of looking at the world that precede World War II by centuries. The logistical worldview was not eradicated with Nagasaki and Hiroshima, but actually accelerated. Logistics have become the animating problematic and supposedly perfect solution to such

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[45] For more on the distinction between ritual- and transmission-based media, see Carey (1989).

problems in contemporary digital modernity. The tasks toward which digital computation is deployed in twenty-first century capitalism are logistical: more operations in less time to produce perfect circulation. Forms such as the list are logistical, operating in physical spaces (Amazon-like distribution centres), on user interfaces, and in computational infrastructure alike. Lists do so primarily because they are flexible structures that operate in real time to facilitate what is required in the physical and computational realms: compression, calculation, and circulation.

But this chapter has also drawn out a peculiar aspect of logistical media forms like lists. Alongside their ability to conjure nonhuman machinic times comes a capacity to conjure ancient, non-narrative modes of relaying the past, which are perhaps not so different. This observation offers an entry point into understanding the mnemonic and poetic function of lists that will be the focus of the final chapter of this thesis.

5. *Poiesis*

*"Let no thought pass incognito, and keep your notebook
as strictly as the authorities keep their register of aliens."*
      – Walter Benjamin[46]

*"But where danger is, grows
The saving power also."*
      – Friedrich Hölderlin.[47]

5.1   Imagination

Chapter four showed that the list is flexible in computation because it is non-narrative, operational writing. With the shift from analog administration, such as outlined in chapters two and three, to digital logistics, outlined in chapter four, we move from primarily spatial lists to primarily temporal; their 'bias,' in Innisian terms, shifts. Digital lists move 'under the hood' of administration and logistics—where once they were formats and categories written by human hands, they are now also code, algorithms, and protocols produced and manipulated by human-machine hybrids. Though their visibility and relation to human hands changes, lists remain a cultural technique of managing the movement of people, things, and data through time and space. Chapter four's exploration of lists in digital culture shed light on the non-narrative quality of lists, thus offering an entry point into understanding the presence of lists in human imagination for thousands of years. We move in this final chapter from the operational realm of code to representation and aesthetics in order to show that the list is not simply an administrative or computational *format*, but also a powerful poetic and imaginative *form*. The chapter is a final provocation to suggest that, as a form that intrudes on the monopoly of narrative and prose, the list opens a space for *poeisis* and even utopian thinking.

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[46] Benjamin (1996, p.458).
[47] quoted in Heidegger (1993, p. 333).

My argument is that listing is a cultural technique that can channel spaces, times, and modes of thinking that can potentially disrupt the processes and logic of logistical modernity that it elsewhere facilitates. It does this by interrupting narrative writing and the pre-digested stories and histories narrative produces. The monopoly of modern narrative, described by White (1973) and Ernst (2013), engenders a relationship to history and memory that marginalizes spaces and times that do not abide by the logic of logistical modernity, which is one of total efficiency and rationality in the extraction of value and labour, 24/7. As intruders, lists open a window on alternate, non-narrative logics, spaces, and times; they are a tool with which to think *other*. The inspiration for conceiving of lists in this way comes from Martin Heidegger, whose provocative understanding of modern technology was integral to my analysis in chapter three of the relationship between lists and the logistical worldview. There, I used Heidegger's diagnostic concepts *Bestand* (standing-reserve) and *Gestell* (enframing) to describe the Nazi census as the way of looking and understanding that is elicited or, in Heidegger's language, *called forth* by modern technology and its attendant cultural techniques. I return to Heidegger now because in addressing the question concerning technology he reveals that, concealed within the 'constellation' of *Gestell,* there exists the very force that can free humankind from its sway: the 'saving power' that he links to poetry and art. "[P]recisely the essence of technology must harbor in itself the growth of the saving power" (Heidegger 1993, p. 334). In this chapter I test the extent to which the list has the capacity to operate as the kind of poetic form conceived by Heidegger as a place where the 'saving power' can grow.

Given that it is embedded within both the constellation of *Gestell* (its operational role in establishing the way of seeing and doing I express as the 'logistical worldview') and the realm of art (such as I describe below), the list reveals the nearness of these two realms and thus the ambiguous essence of technology. Heidegger describes the latter follows:

> The irresistibility of ordering and the restraint of the saving power
> draw past each other like the paths of two stars in the course of the
> heavens. But precisely this, their passing by, is the hidden side of
> their nearness.
>
> When we look into the ambiguous essence of technology, we
> behold the constellation, the stellar course of the mystery.
>
> The question concerning technology is the question concerning the
> constellation in which revealing and concealing, in which the essential
> unfolding of truth propriates.
>
> But what help is it to us to look into the constellation of truth? We
> look into the danger and see the growth of the saving power
> (Heidegger 1993, p. 338).

Heidegger grasps toward a language that can describe the existence of humankind's saving power in precisely the place that we are most endangered, *Gestell*. There is no space outside technology to overthrow or save ourselves from it. Only by developing the proper orientation to the world within *Gestell* might something like a saving power grow. The latter is a process of *revealing*, an unconcealment of the essence of technology that Heidegger argues reveals humankind's highest dignity as the guardian and safekeeper of all revealing, i.e., of truth. "For the saving power lets man see and enter into the highest dignity of his essence. This dignity lies in keeping watch over the unconcealment—and with it, from the first, the concealment—of all essential unfolding on this earth" (Heidegger 1993, p. 337). How to do this remains, as often in Heidegger, frustratingly opaque. It is not enough to look into the constellation and *understand* this double-function of concealment and revealing at the heart of *Gestell*, though we might take this as at least a start. We must also "hol[d] always before our eyes the extreme danger" (Heidegger 1993, p. 338). This danger is a situation in which all revealing, i.e. truth, is reduced to the truth of Order, which is a truth of calculation, compression, and circulation, resulting in a worldview that understands everything as *Bestand*. Thus processes of revealing that break free

from the logic of Order, though they cannot cultivate the saving power entirely, can at least clear a space for its cultivation and growth.

Clearing or preserving a space is the key function of art. Crucially, however, it is not as though art is a realm that 'escapes' *Gestell*. For Heidegger the way forward is to re-connect these seemingly divergent realms, art and technology, which would engender a more profound and meaningful relationship between humans, 'technology' (taken not just as devices, but also as ways of thinking or orientation), and the world. He points, as usual, to Greek antiquity for inspiration. In this brief historical moment art and technology were known simply as *techne*, and the essential relation between them shone forth. "There was a time when it was not technology alone that bore the name *techne*. Once the revealing that brings forth truth into the splendor of radiant appearance was also called *techne* ... The *poiesis* of the fine arts was also called *techne*" (Heidegger 1993, p. 339). This was art of a kind very different from the way it is understood in the modern world. "The arts were not derived from the artistic. Artworks were not enjoyed aesthetically. Art was not a sector of cultural activity" (Heidegger 1993, p. 339). Art was instead the craft of bringing forth that is connected to Heidegger's understanding of revealing—that which does not declare itself to be telling truth, but which in its essence dwells in the realm of truth. *Techne*-as-*poeisis* is a kind of crafting by which the orientation *of* the world (as *Gestell*) and an orientation *toward* the world are brought into contact. If this crafting is limited to concealment (if it lacks the power of revealing), the resulting orientation toward the world is that of order, *Bestand*. But when the 'two stars' are brought together, the saving power can emerge. Because they both conceal and reveal, lists are a form through which *techne*-as-*poeisis* can be explored.

I follow Heidegger here not to claim, once and for all, the fixed meaning of his text or his concepts. Rather, I identify the list as a form through which to explore the *poiesis* Heidegger describes. I argue that this capacity helps to explain the presence of lists in the human imagination for as long as we have written things down. Lists

persist because they both conceal the sway of *Gestell* in operating within the technical apparatuses of logistical modernity described in previous chapters, yet some lists can also reveal the essence of those apparatuses. Put another way, poetic ruptures are provoked by a form that typically enforces the logic of logistical modernity. Lists of the kind described below *intrude* on modern structures and processes, revealing a poetry at the heart of *Gestell* wherein the saving power can grow. I understand the saving power to be an open-ended concept that describes an openness to new and other kinds of thinking, a clearing of the way for alternate knowledges, affects, and engagements to emerge. Certain kinds of lists clear such a space. They exist at the fulcrum of *Bestand* and the saving power. Heidegger's concepts help us to see how they do so, and also to understand why these lists are important, why they should not be reduced to their administrative capacities or dismissed as 'corrupting' of modern reason.[48]

I support these claims by demonstrating four instances of *poeisis* provoked by lists. These are: (1) the ability of lists to render uncanny the structures and epistemological undergrowth of modern thought. These are an integral part of Heidegger's 'frame,' *Gestell*. This instance arises, for example, in the work of Jorge Luis Borges; (2) the use of lists to mediate and reconcile imaginative and experiential tensions. This instance arises again through Borges but also resonates with Aby Warburg's concept of form; (3) the capacity of lists to conjure a relation to the past that resists the monopoly of modern historiography. My reading of Walter Benjamin's work here builds on chapter four's discussion of non-narrative time; (4) the creation by list-like techniques in literature and film of affects and modes of

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[48] Guillory (2004), for instance, describes how the displacement of literary and scholarly/scientific by informational writing in the modern period shifted conventions of argumentation and even truth. Lists are a species of Guillory's Informational writing. The latter, he argues, privileges spatial organization over logic or rhetoric, brevity and concision over rhetorical performance. "Conclusions [are] supposed to be implicit in the order in which information is presented," and, "the effect of such brevity can be a kind of poverty, an over reliance on mere enumeration as a result of which logical relations fail to manifest themselves at all … argument is reduced to mere list" (Guillory 2004, p. 128).

engagement rooted in wonder that clear a space for thinking *other*. These are explored primarily through Chris Marker's films *La Jetée* (1962) and *Sans Soleil* (1983). These discussions, in addition to those of other chapters, help explain the presence of lists throughout the *longue durée* of recorded human history.

5.2   Borges' poetry of the quotidian

What does it mean to call lists 'poetic'? Borges is a good guide to this question. In a series of lectures delivered at Harvard in 1967 (published as Borges 2002), Borges wrestles with the problem of how to describe poetry without sapping it of its power and beauty.

> Whenever I have dipped into books of aesthetics, I have had an
> uncomfortable feeling that I was reading the works of astronomers
> who never looked at the stars. I mean that they were writing about
> poetry as if poetry were a task, and not what it really is: a passion and
> a joy. For example, I have read with great respect Benedetto Croce's
> book on aesthetics, and I have been handed the definition that poetry
> and language are an "expression." Now, if we think of an expression of
> something, then we land back at the old problem of form and matter;
> and if we think about the expression of nothing in particular, that gives
> us really nothing. So we respectfully receive that definition, and then
> we go on to something else. We go on to poetry; we go on to life. And
> life is, I am sure, made of poetry. Poetry is not alien—poetry is, as we
> shall see, lurking round the corner. It may spring on us at any moment
> (Borges 1967).

Later in the same lecture, Borges quips, "If we are in a Chestertonian mood … we might say that we can define something only when we know nothing about it." Borges' open-ended understanding of poetry as the stuff of life rather than a specific

literary genre or formula suits our purpose here because it enables us to see poetry beyond sentences or even words. The claim that 'life is made of poetry' runs perilously close to cliché (clichés are located at the fulcrum of banality and profundity), but when received in the context of Borges' larger body of work it illuminates his interest in the materiality of epistemology and language. Placed beside such work, the claim suggests that it is easy to see poetry in the fluttering wings of a butterfly or the babbling of a brook only because we have been trained to understand these realms as uniquely poetic. It is more difficult to see the poetic quality of banal realms like epistemology and administration, to take two of Borges' favourite subjects. This is not simply poetry of 'everyday life' or individual lived experience. Borges instead explores the poetic aspects of institutions, structures, and practices borne from the modern mind and shared in collective experience of the modern world. These appear in his myriad stories about libraries, archives, maps, forgotten or lost encyclopedias, lists, editorial projects, etymologies, systems of classification. Borges created a rich imaginative laboratory from the objects of modernity often degraded by its critics. He infused the bars of the iron cage with magic. In refusing to define poetry as some particular thing—a literary form, an expression, etc.—Borges bristles against the kind of epistemological structure that he elsewhere revels in: the modern proclivity to define, classify, and categorize. In so doing, Borges throws a mirror up to the modern gaze (the proliferation of mirrors throughout his *Fictiones* is no mere coincidence).

Borges' understanding of poetry aligns with the ancient Greek verb $\pi o\iota\acute{\epsilon}\omega$, also the source of Heidegger's understanding, which describes making, producing, creating, bringing into existence, composing.[49] Borges understands that these actions are not the exclusive purview of poets that work with language; they are also occurrences that arise in quotidian spaces and practices. When viewed through

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[49] As defined by the 9th edition of the LSJ English-Greek Lexicon (online at http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.04.0057:entry=poie/w)

Borges' lens, the everyday structures that delimit thought and action are rich with poetry because they reveal the essential contingency of modern and historical thought. The epistemological operators that Borges foregrounds belong to the modern world. They are the conceptual and imaginative undergrowth of Heidegger's *Gestell*, the systems of measure and order that engender modern technological apparatuses and concepts such as knowledge, fact, history, category, and so on. In rendering this undergrowth uncanny, Borges elicits moments of *poeisis*. The role such structures play in *concealing* the essence of the technical world is itself *revealed* by these same structures when Borges helps us peer at them through the looking glass. Such a revealing preserves a space for the openness to thinking other about knowledge, time, history, and memory that I identify with Heidegger's saving power.

Foucault's famous encounter with one of Borges' lists is a powerful example of such Heideggerian *poeisis*. Foucault writes in *The Order of Things* about coming across the following strange and ingenious taxonomy:

> In its remote pages it is written that the animals are divided into: (a) belonging to the emperor, (b) embalmed, (c) tame, (d) sucking pigs, (e) sirens, (f) fabulous, (g) stray dogs, (h) included in the present classification, (i) frenzied, (j) innumerable, (k) drawn with a very fine camelhair brush, (l) et cetera, (m) having just broken the water pitcher, (n) that from a long way off look like flies (Borges 2000, p. 103).

This encounter led Foucault to meditate on the nature of his own thought. What is it that makes this list so confounding? How to understand the impossibility of this list? What does it say about knowledge and history? Borges' beguiling list causes a rupture for Foucault in revealing to him the limits of his thought. By drawing together a heap of things that does not simply resist, but radically negates any conventional classification system, Borges' list materializes for Foucault the inability of a historical subject to think outside the conditions that delimit his or her thought, or,

in Foucault's terms, outside the archive. Foucault understands himself to be a modern subject 'stamped' by the thought of his age. These limits to thought are rendered immanent through both the list's content (its random series of items), and its form (the placement of things beside one another in writing, the confounding nature of its classification). Its affective power is derived from the very fact that this is a closed list in which everything is included. There is a system to the finite collection of things, but it is unthinkable. In this encounter we can see the role of the list in collecting, organizing, and structuring information—in creating 'knowledge' as networks of known and knowable things. This role is revealed through a *negation* that is achieved formally. Put another way, a rupture is produced by the list's formal negation of modern conventions. We can here see the poetics of lists that have been 'lurking around the corner,' as Borges might say.

Foucault claims this moment as the birth of the 'archaeological' approach that would define his *oeuvre:*

> [*The Order of Things*] first arose out of a passage in Borges, out of the laughter that shattered … all the familiar landmarks of my thought – *our* thought, the thought that bears the stamp of our age and our geography … In the wonderment of his taxonomy, the thing we apprehend in one great leap … is the limitation of our own, the stark impossibility of thinking *that* (Foucault 2009, p. xvi).

The contours of modern thought present themselves for study as historically specific and contingent. These contours are revealed because their logic has been exploded by Borges' use of the list, a form that elsewhere enforces the logic of modernity (which I show to be logistical in chapters three and four). Classificatory lists such as this taxonomy are expected to be agents of efficient, rational thought. This list instead possesses a kind of magic. It occasions a poetic rupture of the kind Heidegger describes. Foucault is provoked to think about alternative, seemingly 'illogical' classification schemes that do not abide by standard rules of his

contemporary historical *milieu*. The list is here revealed as a form that is at the same time (1) embedded within the epistemological undergrowth of logistical modernity and thus implicated in the 'danger' of *Gestell*, but also (2) the site by which a space is cleared for thinking *other*. Lists can be dangerous, as we have seen, yet here they are shown to hold within them the capacity to negate the totalizing logic of modern thought. The list leaps off the page at Foucault, seemingly from nowhere, occasioning a laughter that 'shatters' the contours of a previously unseen system of thought. Shattering laugher arises because this not just any list, but a *heterotopian* list. Heterotopia is a term Foucault develops elsewhere (1986) to describe 'other-spaces' ('des espaces autres') in which layers of meaning, contradiction, function and history are grafted onto one another in surprising and confounding ways. In contrast to utopias ("fundamentally unreal places"), heterotopias are

> places that do exist and that are formed in the very founding of society
> – which are something like counter-sites, a kind of effectively enacted
> utopia in which the real sites, all the other real sites that can be found
> within the culture, are simultaneously represented, contested, and
> inverted (p. 24).

In heterotopian spaces the relations between items and histories (or lack thereof) bubble to the surface and stimulate contemplation (a provocation similar to what Barthes (1982) describes with his concept *punctum*). When taken individually, the items in Borges' taxonomy are unproblematic. They are not purely imaginary, nor do they explicitly deny communicability in language. Foucault knows them. It is instead their spatial juxtaposition that provokes his shattering laughter because this juxtaposition can take place only in the space of language. His laughter arises because of the realization that this heterotopian list brings things together which cannot be brought together anywhere else. It is an *other* space that generates *thinking-other*. The sparks from this explosion caught fire as Foucualt's radically new

approach to understanding knowledge and history. This legacy is a powerful example of the generative capacities of poetic lists.

Poeisis for Heidegger is the ability of art to reveal the essence of technology. This essence is an ambiguity at the heart of *Gestell,* wherein both the danger and the saving power grow. To be clear, Foucault speaks nowhere in this passage about technology. However, we should understand by 'technology' and *Gestell* not simply devices and systems but also the modern ways of thinking and doing, rooted in Order, that produce them. We can then understand how Borges' heterotopian list reveals to Foucault the essence of a particular modern *way of thinking* that is intimately related to Heidegger's *Gestell*. Borges shows the list to Foucault as a form that both conceals and reveals. Its affective power propels Foucault toward a radically new line of thought. Developing such new modes of thought and facilitating moments of rupture are for Heidegger the task of thought and art because they can harbour the saving power. Heidegger understands by the 'saving power' humankind's greatest calling, our destiny to be the keepers of the 'revealing' or truth. The saving power is the sheltering and harbouring of this awareness, the clearing of a space for it to grow. I think we can understand Foucault's ability to generate a radically *other* approach to studying knowledge and history as an example of what Heidegger had in mind as the task of thought. Foucault's project reconfigured conventional approaches to knowledge and history, throwing into relief some of the ways truth is produced in any given historical moment and mobilized as power. It is an example of Heideggerian *other-thinking*. In facilitating the rupture that generated Foucault's project, the list is shown to be a poetic form through which such 'saving power' can be found and harboured.

With his beguiling taxonomy Borges throws a mirror up to Foucault's modern gaze.[50] It is important to note that Borges did not craft such mirrors just to 'critique'

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[50] Mirrors are, incidentally, a paradigmatic heterotopia for Foucault (see 1986, p. 24-25).

modern thought and institutions. We find in his stories not polemic but ambivalence. Affection for order and its satisfactions is accompanied by an understanding of the relationship between order and tyranny. This ambivalence resembles that at the heart of *Gestell*. Such tensions and contradictions are for Borges, as they are for Heidegger, the site of poetry. His most famous story, "The Library of Babel," captures this ambivalence. The confounding paradoxes that Borges explores in the story are essentially modern. They arise out of the latter's jarring recalibration of space and time. As described in chapter three, processes of modernization lead to the expansion of spatial horizons of knowing as communication channels like the telegraph reach further afield. Geographic space seems to shrink as technologies like the railway transport people vast distances in little time. Messages themselves circulate much more quickly as communicative channels are made more efficient. The modern 'Global Village' (McLuhan 1962) also became heavier. Paper and history weigh on shelves and minds alike as they become inscribed into modern administrative and imaginative life. Knowledge and history emerge as civilizational tenets. 'Information' becomes a category of stuff that circulates through new technologies like the book and is preserved in new institutions like libraries and universities (see Peters 1988; Nunberg 1996; Eisenstein 1982; Frohmann 2004). What Borges understands is that such a situation produces practical, imaginative, and experiential paradoxes. Modern people are simultaneously in awe of the plethora of knowledge at our fingertips and burdened by its weight. Thinking about the infinity of 'all the world's knowledge' as contained in a Library of Babel produces both exhilaration and anxiety: exhilaration and awe at the possibilities and power of such a collection, anxiety at its dizzying, incomprehensible scales and speeds. At the same time that modern subjects desire to collect or grasp all the world's knowledge, they know this to be an impossible task. Everything-included is the impossible goal, etcetera is the dizzying reality. This tension is at work throughout Borges' story. We hear it in the melancholy tone of the narrator who, though exhausted by a lifetime of speculating about the nature of the library and its texts,

continues to revere the library as sacred. He is unable to give up hope that someday his efforts will find meaning, "[l]et me be tortured and battered and annihilated, but let there be one instant, one creature, wherein thy enormous Library may find its justification" (1998, p. 117). He also tells us about fanatical bursts of excitement from groups of librarians regarding new theories about the library. Such theories at first promise a metaphysical master key to unlock the mysteries of the library; when they are inevitably proven incorrect they lead only to despair and violence. The tension between order and entropy is also evident when readers cannot grasp the dimensions and the scale of the library. Borges' descriptions are unnerving and induce a kind of vertigo. The library is an infinite loop. Infinite in space means infinite in time: "*The Library is unlimited but periodic.* If an eternal traveler should journey in any direction, he would find after untold centuries that the same volumes are repeated in the same disorder—which, repeated, becomes order: the Order. My solitude is cheered by that elegant hope" (p. 118, emphasis in original). Such a passage captures the unthinkable scale and circulation speeds of knowledge and information in the modern world. We are invited to marvel at the possibilities, maybe even to be hopeful as the librarian is. At the same time, there is a darkness that is never far from the scene. The narrator describes librarians driven to insanity or violence against each other and themselves. Such descriptions force us as readers to reckon with the madness of infinity.

> When it was announced that the Library contained all books, the first
> reaction was unbounded joy ... [eventually] thousands of greedy
> individuals abandoned their sweet native hexagons ... spurred by their
> vain desire to find their Vindication. These pilgrims squabbled in the
> narrow corridors, muttered dark imprecations, strangled one another
> on the divine staircases, threw deceiving volumes down ventilation
> shafts, were themselves hurled to their deaths by men of distant
> regions. Others went insane ... (p. 115)

Solutions developed to reconcile the tension between awe and anxiety provoked by the modern archive bring both pleasure and violence. The story is a litany of such solutions: theories and concepts proposed in books, letters, catalogues, systems of classification, sections and shelves. "Someone proposed searching by regression: To locate book A, first consult book B, which tells where book A can be found; to locate book B, first consult book C, and so on, to infinity ... It is in ventures such as these that I have squandered and spent my years" (p. 117).

Borges explores through form and content the various means humans develop to resolve the tensions and paradoxes of the modern world. Such work recalls Eco's (2009) operative tension at the heart of the list between 'everything included' and 'etcetera.' This tension, he shows, crops up not just in the modern world but continuously throughout the history of human representation. Eco shows, for instance, that some of the most famous literary lists are those of etcetera, such as Homer's catalogue of ships in *The Odyssey*. These are inevitably futile attempts of achieving, or at least gesturing toward, *All*: a total registry of things, the number of which exceeds the possibilities of the human mind. Recall Borges' embattled librarian:

> *All*—the detailed history of the future, the autobiographies of the archangels, the faithful catalog of the Library, thousands and thousands of false catalogs, the proof of the falsity of those false catalogs, a proof of the falsity of the *true* catalog, the Gnostic gospel of Basilides, the commentary upon that gospel, the commentary on the commentary on that gospel, the true story of your death, the translation of every book into every language, the interpolations of every book into all books, the treatise Bede could have written (but did not) on the mythology of the Saxon people, the lost books of Tacitus (1998, p. 115).

Eco (2009) sees in such lists a unique capacity to materialize the '*topos* of ineffability,' which he defines as an aesthetic gesture toward the infinite and unknown that is repeated again and again throughout the ages. Homer channels this *topos* through the poetics of 'etcetera.' Georges Perec also found this impossibility productive, though he channels the *topos* through 'everything included.' Lists litter Perec's work, from fully-formed projects like *Things: A Story of the Sixties* (*Les Choses,* 1965) and *Je me souviens* (1978), to more experimental pieces like "Attempt at an Inventory of the Liquid and Solid Foodstuffs Ingurgitated by Me in the Course of the Year Nineteen Hundred and Seventy-Four" (1974). For Perec, listing was an essential mode through which to explore not just what he calls the "infra-ordinary" or "endotic" (as opposed to extraordinary and exotic, see Wilken and McCosker 2012) but also the melancholy passage of time. Marc Lowenthal suggests that in such works Perec worked through the notion that "everything that happens and that does not happen ultimately serves no other function than that of so many chronometers, so many signals, methods and clues for marking time, for eroding permanence" (Lowenthal in Perec 2010, p. 49-50). Wilken and McCosker (2012) argue that Perec uses lists as "an effective lever with which to pry open for inspection the seemingly inscrutable inner workings of everyday spaces, things, memories, in order that they might [quoting Perec] 'speak of what is and of what we are'" (p. 5). The impossibility of the attempt to see or catch everything is inherent in Perec's work; his enumerations continuously touch an ecstatic madness of infinity. The connection Eco sees and Perec forges between lists and time recalls chapter four's discussion of non-narrative modes of relaying the past. We return to this thread now through the specific figure of the chronicler.

5.3   The Chronicler

Literary lists of the kind created by Perec and Borges and described by Eco confront us with time, history, and memory in a way that does not reduce them to historical

narrative. Homer's catalogue is a re-presentation of events from the past in a form that does not inscribe a causal chain or explanatory framework upon them. Homer is perhaps the most famous chronicler. According to White (1973), "[c]hronicles are, strictly speaking, open-ended. In principle they have no *inaugurations;* they simply 'begin' when the chronicler starts recording events. And they have no culminations or resolutions; they can go on indefinitely" (p. 6). Chronicles say: "these things happened," or perhaps not even that much. Such a list announces itself in the ears of the hearer or before the eyes of the reader: 'these things are here, now.' Benjamin (1968) understands the chronicler as an explicitly temporal figure, and one who possesses a unique relationship to time and memory that resonates with Heidegger's 'saving power.'

> [t]he chronicler, who recounts events without distinguishing between the great and small, thereby accounts for the truth, that nothing which has ever happened is to be given as lost to history. Indeed, the past would fully befall only a resurrected humanity. Said another way: only for a resurrected humanity would its past, in each of its moments, be citable. Each of its lived moments becomes a citation *a l'ordre du jour* [order of the day] – whose day is precisely that of the Last Judgment (p. 254).

The chronicler's relationship to time is as a negation of modern time and narrative history. The figure preserves a space for a relationship to the past and memory that does not reduce them to narrative historiography. According to White,

> "[t]he historian arranges the events in the chronicle into a hierarchy of significance by assigning events different functions as story elements in such a way as to disclose the formal coherence of a whole set of events considered as a comprehensible process with a discernible beginning, middle, and end" (1973, p. 7).

Chronicles, on the other hand, are non-hierarchical lists of events that resist narrative and have no causal chains imposed on them. "In the chronicle, [the] event is simply 'there' as an element of a series; it does not 'function' as a story element" (p. 7). The chronicler's relation to the past is holistic and rooted in lived experience; he or she declares no moment too large or small to be part of a tale. Benjamin argues that in order to understand the world and our place within it we must foster a space for thinking of alternate times and stories—in Heidegger's language, a space wherein the saving power can grow. Narrative and conventional history hierarchize the past and omit certain voices, events, histories, and objects. The occlusion of these by modern thought is revealed when modern time is disrupted by non-narrative times and stories. To describe the chronicle's relationship to the past, Benjamin (in another essay) uses a brilliant metaphor:

> written history [is] in the same relationship to epic forms as white light
> is to the colors of the spectrum … among all forms of the epic there is
> not one whose incidence in the pure, colorless light of written history
> is more certain than the chronicle. And in the broad spectrum of the
> chronicle the ways in which a story can be told are graduated like
> shadings of one and the same color. (1968, p. 95).

For Benjamin the chronicler is a 'storyteller,' a teller of tales rather than a purveyor of information (such as found in newspapers) or narrative (such as found in written histories and novels). Storytelling is a mode of communication that derives from the oral tradition but is not exclusive to it. Benjamin uses this term to describe a mode of relaying the past that is not reducible to modern historical time. The value Benjamin finds in storytelling is related to its status as, using McLuhan's language, a 'cool' medium. In contrast to 'hot' modern novels and information that are "shot through with explanation" and can be easily digested, chronicles and other stories (such as epics) do no arrive fully explained. Instead, the listener must interpret them actively and repetitively (Benjamin 1968, p. 94-5). In this way stories channel *Erfahrung*, a

mode of experience that according to Lash "is neither subjective nor immediate, and in both of these senses grounded"(1999, p. 314). *Erfahrung* is rooted in the storyteller's direct experience of the world, which he or she brings "from afar" (Benjamin 1968, p. 84) and *channels*—not simply represents or recounts—by using particular forms of storytelling, e.g. the epic poem or chronicle. These forms of what Ernst (2013) calls 'telling as counting' do not impose narrative resolution, causal chains, or explanatory grids that structure histories and novels. They say rather, to use the phrase again, 'these things are here, now.'

The countertype of the chronicler is the historian, who is "enclosed in modern bounded time and hence is chained to the logic of explanation" (Lash 1999, p. 319), and set against the *Erfahrung* of the chronicle is the *Erlebnis* of the novel and 'information.' *Erlebnis* is about immediate, subjective sensation that is not grounded in direct experience brought 'from afar.' *Erlebnis* is disconnected from the unfolding of time. What Benjamin means is that novels and information expend themselves. The novel ends. The information of a news story is replaced by the next day's wire. Stories, on the other hand, *go on*. There is no story of which the question 'what happened next?' cannot be asked. The chronicle, a list of historical events, can always be appended with another item. Such stories can be pondered over again and again through the ages. Sometimes they wait patiently for the historical moment that is prepared to receive them. These resemble "seeds of grain which have lain for centuries in the chambers of the pyramids shut up air-tight and have retained their germinative power to this day" (Benjamin 1968, p. 90).

Benjamin shows that stories and novels operate according to different registers of time. Because stories are "embedded in the great inscrutable course of the world" (p. 96), they conjure an eternal time that clashes with the discrete time of modernity. Novels must end, thrusting the obligation of *All* onto the author. Their narratives remind the reader of the finitude of life, its temporal closure. Stories, on the other hand, go on, reveling in plenitude and conjuring the infinite of the eternal.

For Benjamin, according to Lash, "the novel imparts meaning through death as closure, while the story imparts meaning through death as continuity" (1999, p. 317). Narrative abides by the logic of everything included, stories by that of etcetera. Importantly, this is not a matter of dialogue and speech vs. writing. Storytelling emerged first in speech, but is not the latter's exclusive purview. Storytelling of the original and perfect kind may be withdrawing from the world, but glimmers of its power shine forth in forms that bear a family resemblance.

Benjamin points to chroniclers that relay historical information in lists as archetypal storytellers. His fondness for list, aphorism, and quotation is thus not surprising. For instance, he gives special attention to a passage in the story "Unexpected Reunion" by Johann Peter Hebel. Benjamin (1968) marvels at Hebel's ability to conjure death, which is "the sanction of everything that the storyteller can tell" (p. 94). Death grants the storyteller authority. To embed his story within "the great inscrutable course of the world," to infuse it with the weight of eternity, Hebel conjures the non-narrative, pre-modern time of the chronicler in a list of death.

> When Hebel, in the course of this story, was confronted with the
> necessity of making this long period of years graphic, he did so in the
> following sentences: 'In the meantime the city of Lisbon was destroyed
> by an earthquake, and the Seven Years' War came and went, and
> Emperor Francis I died, and the Jesuit Order was abolished, and
> Poland was partitioned, and Empress Maria Theresa died, and
> Struensee was executed. America became independent, and the
> united French and Spanish forces were unable to capture Gibraltar.
> The Turks locked up General Stein in the Veteraner Cave in Hungary,
> and Emperor Joseph died also. King Gustavus of Sweden conquered
> Russian Finland, and the French Revolution and the long war began,
> and Emperor Leopold II went to his grave too. Napoleon captured
> Prussia, and the English bombarded Copenhagen, and the peasants

sowed and harvested. The millers ground, the smiths hammered, and the miners dug for veins of ore in their underground workshops. But when in 1806 the miners at Falun ...' (Benjamin 1968, p. 94-95).

The story is severed from modern time not only because the list form conjures pre-modern modes of relaying the past, but because death pervades the passage in a way that treats it as co-present to life. Rather than pathologizing or romanticizing death, as do modern forms such as the novel, this story reveals death as an organic component of being. As Benjamin says, "[n]ever has a storyteller embedded his report deeper in natural history than Hebel manages to do in this chronology. Read it carefully. Death appears in it with the same regularity as the Reaper does in the processions that pass around the cathedral clock at noon" (p. 95). Hebel achieves this moment of revealing formally by using the list.

Such lists conjure a non-historical time in a poetic revealing of the kind Heidegger describes. The list, which elsewhere enforces the logic of logistical modernity, brings forth alternate modes of engagement with the past. This double function, the capacity to both conceal and reveal, lies at the heart of Heidegger's *Gestell* and at the heart of lists. To find and harbour the saving power, art must hold within its grasp this simultaneous concealing and revealing. Literary lists of the kind described above do this. They reveal the strictures of modern time and historiography by interrupting them using the non-narrative time of the chronicler's list. These lists tell stories—they are not unintelligible—but they do so in a way that is strange and uncanny to the modern ear and eye. Such lists also confront us with the fact as long as we have contemplated the cosmos we have sought to capture it *and* to revel in its infinity—often with the very same formal gesture. Lists like Hebel's, or Homer's catalogue of ships, call forth the past in a way that narrative and prose cannot. They call forth the *topos* of ineffability, or what we might call an 'affect of etcetera.'

The series of tensions and contradictions implicit in lists—everything included vs. etcetera; awe vs. anxiety; wonder vs. horror—are poetically brought forth by thinkers like Borges in order that we might grapple with and possibly reconcile them. Aby Warburg (1995) identified such attempts at reconciliation as the chief function of 'forms' in art and representation. Late in his life and career, Warburg became preoccupied with understanding the way certain forms travel through various spatial, temporal, cultural, and historical contexts. He sought to understand how it is possible, for instance, that Ancient Greek, Middle European, and Native American Pueblo cultures had common forms of representation. Warburg came to understand forms as palimpsests or persistent traces of human memory. According to Laurent Olivier's (2011) reading,

> [t]he shapes and motifs found in Renaissance art, for example, had not simply been reproduced or imitated from classical Antiquity. What appear in 16th century art, Warburg insisted, were actually reworked representation themes dating back to ancient pagan times. In the process, they had assumed a new existence, a 'posthumous life' (*Nachleben*). And this was how cultures, or civilizations, communicated with each other across time and space. They re-evaluated or recomposed shapes they held in common. In effect, they had all been subject, over time, to tensions of a similar kind. Cultural creations were not to be viewed simply as images that were either simple or complex, crude or elaborate, pleasing or unpleasant. They had to be understood as parts of a memory that had developed over the long course of civilization (p. 153).

Warburg proposed that civilizations 'communicated' with each other across space and time through forms: shapes, motifs, and figures that mediate experiential and imaginative tensions, e.g. life vs. death; light vs. dark; man vs. woman, and so on. He understands forms primarily in terms of representation. We should expand this

understanding to include forms of *inscription* to account for forms like lists that are not typically understood as 'representational' but which also mediate tensions. We should also extend Warburg's understanding of form to account for temporal forms rather than simply spatial. Observing the operational real-time lists of chapter four and those of this chapter that channel ancient, non-narrative times allows us to take his understanding of form beyond the spatial into the temporal register. Olivier reads Warburg to argue that "forms survived because they allowed the societies that produced them to mediate with ... opposing forces and reconcile themselves with them" (2011, p. 154). The list negotiates similar tensions by calling forth other, non-narrative times. Perhaps this is why lists are so ubiquitous throughout human history: they operate both spatially and temporally as an open-ended, flexible form by which human cultures can communicate with each other, mediate opposing forces and reconcile themselves with them.

At the very least, thinking of lists in this way shows that they are not strictly administrative forms that corrupt reason and meaningful human exchange. Nor does the evidence provided above allow us the easy conclusion that lists disembed human experience from the world (turning *Erfahrung* into *Erlebnis*). Lists perform affective work as 'heaps'[51] of words and things and also a kind of memory work. Lists arrive at our doorstep and communicate across space and time. They do so because they are not shot through with explanation but rather interpellate us to question the logic of their (dis)order and the nature of what they represent. Lulah Ellender's (2013) poignant essay in *The Junket* demonstrates this point. Ellender ponders a list written by her grandmother, Elisabeth, upon the suicide of Elisabeth's brother Norton.

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[51] Jane Bennett (2011) has described the affective vibrancy of the 'heap' of the hoarder, while Francis Spufford is particularly fascinated with the list-as-heap (1989, 2-4).
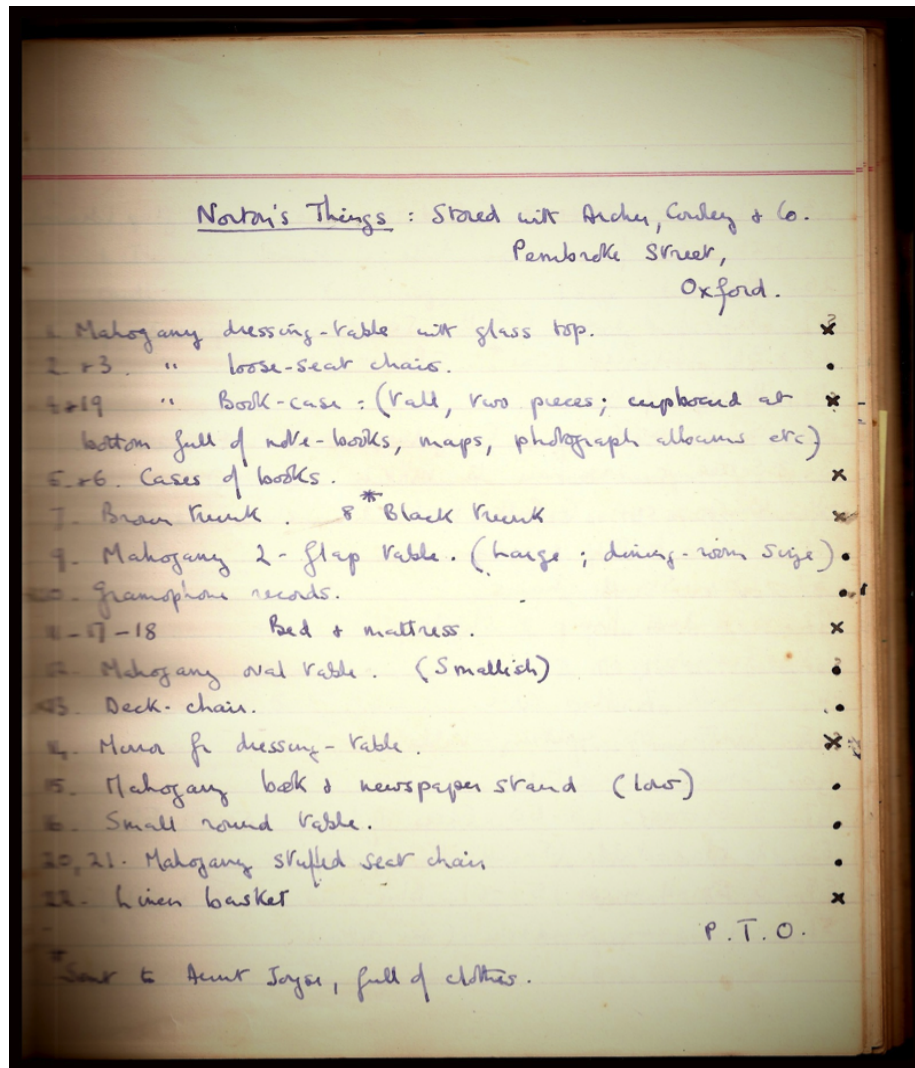
Figure 4: "Norton's Things" (Lulah Ellender, 2013).

This simple list of 'Norton's things,' has a peculiar series of functions. It provides, first of all, a means for Elisabeth to stem the tide of grief brought on by the death of her brother. The list she compiles is an attempt to bring some sense of order to her life, which has been thrust into emotional and spiritual chaos by Norton's suicide. As Ellender describes, Elisabeth was also likely attempting to retroactively inscribe some kind of coherent order on her brother's life, which was wracked by mental illness and tragedy. At the same time as the list serves these functions for Elisabeth, the materiality of this document serves Ellender herself as a memory support. She

becomes privy to what she calls her grandmother's "conversation with herself" through handwriting, a physical trace that seems to jump off the page.

> Within the dots, emphatic crosses and smudges, I find another layer of grief: the things Elisabeth is unable to control, the mess of life seeping onto the page, her emotions ebbing with the ink. Perhaps the crosses are asterisks to mark the things still to be sorted; but a cross also symbolises a negative, the headshakes of disbelief, the 'No!'s, the sadness she can't pack away. The list feels stilted and heavy. It is a catalogue of loss. I imagine Elisabeth bravely writing on though the words were breaking her (Ellender 2013).

The list of 'Norton's Things' refers to a grandmother that Ellender never knew; Elisabeth died in 1957, aged 42. Ellender is also given a glimpse into the world of Norton, a mysterious figure in the family, through this inventory of his possessions. All of this has to do with form rather than content. It is not until the end of the essay that Ellender begins to describe what actually was on the list. Even then, these observations only seem meaningful in the context of the greater whole of the list itself as a 'catalogue of loss.'

'Norton's Things' is a memory support that functions non-narratively. The list reveals memory that is not about anecdotes, personality traits, or images. It does not provide the 'meaning of life'—Norton's, Elisabeth's, Ellender's—through death as closure, the hubristic goal of novels and narrative according to Benjamin (1968). Instead, this list implies continuity, the passage of time, lives that existed beyond its borders. It invites contemplation and reminiscence rather than remembrance, another useful distinction Benjamin draws. Remembrance (as found in novels) is "dedicated to one hero, one odyssey," reminiscence (as found in chronicles) to "many diffuse occurrences" (Benjamin 1968, p. 98). Remembrance implies unity, an imposition of remembering *All*—the total narrative and duration of a life and its meaning with everything included and wrapped up in a bow. 'Norton's Things'

intrudes on such narrative. It is about discontinuity and plenitude, allowing both Elisabeth and Ellender time and space for the slow contemplation of quotidian moments and things. These are modes of engagement that break up the monopoly of narrative and the logic of order that infuse modern life; an ostensibly administrative form that elsewhere enforces the frame of *Gestell* occasions a moment of *poeisis*.

Lists can be a melancholy form. They seem often to swirl around death, poignantly marking absence or loss. Even everyday pragmatic lists function in this way. When we find other people's to-do lists, for instance, they are either cast aside having served their purpose or (more often) they have been abandoned mid-stream. In any case they absent their doers and are stripped of their primary reason for existing. What is a to-do list when it can no longer remind, organize, or program action? Having lost its ability to *do,* and absent of any doer, it is but a trace of past action, a ruin, a vestige of possibility never realized. Who was this person? What happened to make them abandon this list? Such 'catalogues of loss' seem to speak to us through the void. They provoke thought, grief, and wonder.

5.4   Wonder

I explore in the final section of this chapter the relationship between wonder and Heideggerian *poeisis*. Wonder is a concept that accurately describes modes of affect and engagement that resonate with Heidegger's discussions of the saving power at the heart of the modern technical world.

Ian Bogost (2012) wants to re-inscribe wonder, in the sense of awe, back into the Western philosophical and theoretical tradition. His argument is that the other sense of wonder, as in wondering about a specific question, has enjoyed a monopoly for too long (pp. 120-125). For Bogost, wonder is provoked when we are confronted by the isolated strangeness of things in the world, the 'objects' of object-oriented

ontology (OOO) that are always withdrawing from our ability to comprehend them. Bogost is interested in lists because they are an 'ontographic' form uniquely positioned to disclose the alien weirdness of things. To the narrative ear (recalling a passage quoted above) the "off-pitch sound" of lists "only emphasizes their real purpose: disjunction instead of flow. Lists remind us that no matter how fluidly a system may operate, its members nevertheless remain utterly isolated, mutual aliens" (Bogost 2012, p. 40). Robert Belknap (2004) also explores literary lists in terms of wonder, though he uses the term only sparingly. For Belknap, lists are 'intruders' (a term he borrows from Barney, 1982) that break up any narrative in which they are placed. While lists for Belknap reveal the strangeness of alien objects in the world, they do so primarily in relation to the thematic content of a text or the aims of its author. Lists such as in Twain's 'collection of certain schoolboy treasures of inestimable value' in *The Adventures of Tom Sawyer* (1876),

> make explicit the value system under which the novel will operate, one
> that endows ordinary objects with childhood fascination and wonder.
> The worth of these objects is determined by a sort of secret
> underground economy that thrives beneath the awareness and
> certainly the understanding of the adult world (Belknap 2004, p. 18).

This list formally interrupts narrative flow but still possesses some relation, in this case thematic, to the greater work.

Belknap sees such an operation as acting in the service of an idea or meaning the author wants to convey. However, there is an additional mode of affect provoked by such lists that is very different from conventional narrative, thematic, or representational meaning. Lists in literature parachute heaps of words onto the page. They plunk them down in a way that the reader does not expect. They render words and language uncanny, revealing the conventional structures of syntactic prose by interrupting and negating them. Such lists run counter to the narrative way we usually read literature, looking for character arcs, thematic motifs, and

compelling plot twists that together can teach us the 'meaning of a life' (Benjamin).
Lists instead break the 'fourth wall' of a text. Even lists that propel a narrative take
us momentarily out of the story by inviting us to marvel at the uncanniness of text,
writing, language, history, and time. We think not just about the items listed but also
the tissue that ties them together (or the lack thereof, as Foucault learned). Though
Belknap calls them "literary," we do not read such lists as we do literature or even
sentences. We survey lists, scanning, skipping ahead, or going back. We flip through
to the end to see how long Melville's cetological classifications in *Moby Dick* run, or
how many pages Saramago's litany of Christian violence and death in *The Gospel
According to Jesus Christ* will last (15 in total, for those keeping track). We are taken
momentarily out of the story and instead observe the strange qualities of words and
language, or of the book as sheets of paper bound between two covers, and so on.
Such lists reveal the textuality or tactility of whatever medium contains them. Lists
here *mean*, though that might not be the right word; they *invoke* the plenitude of the
world in all of its minutiae, both imaginatively and on the page. In so doing, lists
peform real philosophical work. In Emerson's words: "Bare lists of words are found
suggestive, to an imaginative and excited mind" (2009, p. 294). Lists perform such
work, according to Bogost, not just by naming objects, but also by "disrupt[ing]
being, spilling a heap of unwelcome and incoherent crap at the foot of the
reader...[so that] a tiny part of the expanding universe is revealed through
cataloguing" (2012 p. 41). He continues: "[l]ists of objects without explication can do
the philosophical work of drawing our attention toward them with greater
attentiveness" (p. 45).[52] Belknap concurs, arguing that the function of nominal lists
in literature is to do more than record, "it is to display, to lay out, to arrange—to
create reality—whether that be to represent a moment of complete awareness of the
world or just to experiment, to conjure by naming." (2004, pp. 19-20).

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[52] Several practitioners of the Object-Oriented Ontology movement of which Bogost is a part have
adopted the list as a rhetorical strategy in lectures and public talks. See, for instance, Timothy
Morton's (2012) keynote address, "They Are Here," from 2012's *The Nonhuman Turn* conference at the
21st Century Institute, University of Wisconsin-Madison.

The power of lists to render uncanny, to *reveal,* in Heidegger's language, is not confined to the realm of objects or language. Non-narrative lists of the kind described above resonate with cinema that does not grant narrative a monopoly over its unfolding. I am thinking in particular of the filmmaker Chris Marker. There are many others I could point toward—Terence Malick, Peter Mettler, Peter Greenaway, Luis Buñel—but Marker's films most clearly demonstrate the relationship between lists, wonder and *poeisis.* We can use the list as an interpretive tool to understand how Marker experiments with the poetics of etcetera so as to free his films from the strictures of everything-included narrative. He produces lists of sounds, images, music and words—sound-images—that perform affective and memory work; they provoke wonder. These require very little interpretive work in terms of plot or theme, though they inspire much *thinking*. His films meander and do not abide by conventional cinematic time; they are much closer to poetry than genre cinema. Marker's litanies do not place the demands of narrative on the audience, that we follow along with their story or that we decode their hidden content and themes. Instead, they invite us to wonder. The films do not escape narrative entirely, but I do not think this was ever Marker's goal. He is interested in contrasting the cohesion of the narrative—the stories we tell of ourselves—against the disjunction of the list—life as it actually unfolds through time. Moments of intrusion break up narrative time so as to elicit a different kind of affect than is conventional in mainstream cinema. Such moments clear a space for the kind of *poeisis* being explored in this chapter.

La Jetée (1962) is a series of sequential still photographs, a photomontage rather than a motion picture. Its unfolding establishes a tempo and rhythm akin to poetic verse. The voice-over is aphoristic and often only tangentially related to the images. There is a story, a narrative unfolds, but it is no more essential to the filmic experience of *La Jetée* than imagery or sound. This runs contra Hollywood cinema, wherein formal and stylistic elements are typically subservient to narrative (see Bordwell 1985). The film shows us a post-apocalyptic future in which surviving humans are forced to live underground, beneath the destroyed surface of Earth. How

and when the cities were destroyed is left unclear. What is clear is that without daylight, and with no connection to the past, human memory is fading. To preserve memory in the hope it will facilitate time-travel, or even hold the key for human survival, certain humans are subjected to experiments. The protagonist of the film is chosen because of his ability to hold an image of the past. For Crary (2013), the film negotiates modern anxieties about technology and information, which had galvanized public attention in 1950s and 60s France (see Ellul 1964), and remain with us still (see Turkle 2011). The film asks, "[h]ow does one remain human in the bleakness of this world when the ties that connect us have been shattered and when malevolent forms of rationality are powerfully at work?" (Crary 2013, p. 92). Marker offers no prescriptive or even descriptive answer, but Crary argues *La Jetée* "affirms the indispensability of the imagination for collective survival" (p. 92). This affirmation is primarily articulated *formally*, rather than rhetorically or thematically. For Crary, "[m]uch of the richness of Marker's film stems from its distancing of photography from empirical notions of reality or indexical models of this medium. An image is 'real' affectively, in how it feels, in how it verifies the intensity of a lived or remembered moment" (p. 93). The 'reality' of the images in the protagonist's memory are not what Marker is interested in questioning. He is interested in the power of such images to preserve a realm of otherness, of imagination, in which alternate times, spaces and futures can be revealed or invented.

The logic of *La Jetée* is enumeration and accumulation, which are list-like features. The collection of still images and aphoristic voice-over interrupts conventional cinematic time and space, bending the logic of cinema so as to "pos[e] the extreme difficulty and exhilaration of [the film's] central vocation: 'to imagine or dream another time'" (Crary 2013, p. 93). *La Jetée* is an attempt to displace the forces of modernity that have destroyed the planet and replace them with imagination, to overrun 'history' with memory, *Erlebnis* with *Erfahrung,* to find *poeisis* in *Gestell*. These affects become formally available to Marker in his development of a kind of filmic list. Rather than presenting sound-images 'shot through with explanation,' he

presents a seemingly disjointed series so the audience can explore the spaces between them, the connective tissue that does or does not hold them together. The film is an experiment, a precarious text that may fall apart at any moment. We are never sure what will come next in the series or even if another item will emerge. The spectre of blankness haunts the unfolding of the series. The film's powerful affect arises from the oscillation between exhilaration and anxiety such a project provokes, tensions similar to those explored by Borges.

Marker's *Sans Soleil* (1983) is even less connected to narrative, and even more than *La Jetée* can be viewed as a list transported into film. Transcriptions of the film's voice-over read exactly as a list of philosophical observations and quotations, similar in form to Benjamin's *Arcades Project* (1998). To take one example:

> He wrote: I'm just back from Hokkaido, the Northern Island. Rich and hurried Japanese take the plane, others take the ferry: waiting, immobility, snatches of sleep. Curiously all of that makes me think of a past or future war: night trains, air raids, fallout shelters, small fragments of war enshrined in everyday life. He liked the fragility of those moments suspended in time. Those memories whose only function had been to leave behind nothing but memories. He wrote: I've been round the world several times and now only banality still interests me. On this trip I've tracked it with the relentlessness of a bounty hunter. At dawn we'll be in Tokyo (Marker 1983).

An interest in banality echoes Borges and Perec. The formal techniques Marker uses in film resonate with those used in text by the two authors. The fabric of *Sans Soleil* is non-narrative—it is held together by the rhythm and borders of a list. Marker himself tells us this:

> Sei Shonagon [a lady in waiting to Princess Sadako at the beginning of the 11th century] had a passion for lists: the list of 'elegant things,'

'distressing things,' or even of 'things not worth doing.' One day she
got the idea of drawing up a list of 'things that quicken the heart.' Not
a bad criterion I realize when I'm filming; I bow to the economic
miracle, but what I want to show you are the neighborhood
celebrations (Marker 1983).

As the passage is delivered, we see the following shots: a space shuttle shedding its jets above earth, an explosion and falling projectile (possibly the shuttle's jets); the undersea launch of a missile that rises through water and penetrates its surface before disappearing into the atmosphere; three shots of a bomber from below; the screen of a radar. We hear implacable, otherworldly sounds throughout. These are later revealed to be made by a 'pal' of the narrator's (Marker's?), Hayao Yamaneko. Yamaneko uses these sounds as a solution to the following problem: "if the images of the present don't change, then change the images of the past" (Marker 1983). This sequence is placed between shots of two Japanese street festivals, which are accompanied by no voice-over but have the same synthesizer soundtrack mixed with the soundscape of the festivals. Marker refuses to impose a logic of classification upon this list of sound-images; there is no criterion or even theme that unites the items. Visual images of war are accompanied by talk of a list of things that quicken the heart and sandwiched by exuberant images of everyday life. In an echo of Borges' famous taxonomy that so confounded Foucault, *Sans Soleil* confronts us as an open-ended list that at any moment may switch directions, become something new, something other. And it does. The list of sound-images continuously denies the order we assume it will provide. It instead invites breaks, ruptures, disjunctions, interruptions, diversions, digressions, contradictions, revisions, recursions, and reversals. There is an exhilarating contingency in lists like Borges' and Marker's, a danger that the next item might undo all that has preceded it.[53] This is precisely how

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[53] Thanks to Warren Steele for this observation and its corresponding list.

entries such as Borges' "(h) included in the present classification" and "(l) etcetera" (2000, p. 103) function, as do Marker's haunting final lines of *Sans Soleil*:

> Then I went down into the basement where my friend—the maniac—busies himself with his electronic graffiti. Finally his language touches me, because he talks to that part of us which insists on drawing profiles on prison walls. A piece of chalk to follow the contours of what is not, or is no longer, or is not yet; the handwriting each one of us will use to compose his own list of 'things that quicken the heart,' to offer, or to erase. In that moment poetry will be made by everyone, and there will be emus in the 'zone.'
>
> He writes me from Japan. He writes me from Africa. He writes that he can now summon up the look on the face of the market lady of Praia that had lasted only the length of a film frame.
>
> Will there be a last letter? (Marker 1983)

There is sense to these words, but it is unfamiliar, affective rather than narrative. The film draws together this and other moments as a series of passages, images, and sounds so that we can explore and wonder at a Benjaminian "world of secret affinities" (1998, p. x).

As in *La Jetée,* Marker explores in *Sans Soleil* modes of engagement with alternate worlds, spaces, and times, though *Sans Soleil* is more explicitly concerned with time. Marker uses the *poeisis* of lists to intrude on and break up the continuous and homogeneous temporality of narrative, prose, history, and other conventional representational forms.

> He used to write me from Africa. He contrasted African time to European time, and also to Asian time. He said that in the 19th century mankind had come to terms with space, and that the great question of

the 20th was the coexistence of different concepts of time. By the way,

did you know that there are emus in the Île de France?

The film is not shot through with explanation, but invites reflection. We are given time to think. The cumulative effect of *Sans Soleil* gestures toward etcetera. The fixed duration of the film (103 minutes) compels it toward everything included. Marker deploys the former to explode the latter. The processual time of the list seen by Ernst (2013) in computation is again evident. But in this case it is not about logistics and getting things done as in digital computation or paperwork administration. It rather channels a non-narrative time of plenitude such as Benjamin (1968) describes in chronicles. *Sans Soleil* shows that the non-narrative time of lists is an effective way to produce affect in film, as it is in literature or poetry. This affect of enumerative time also appears in music—recall Ravel's Bolero (the constant repetition and re-orchestration of a single theme, see Eco 2009) and Wagner's *vorspiel* to *Das Rheingold* (a four minute drone piece that continuously sounds the note E flat major[54]). Such strategies can be read as attempts to gesture toward the infinity of the world, to avoid reducing it to a neat package imposed by the limitations of any medium: a film or novel must have an end; photographic frames and sheets of paper are only so many square inches; the human ear can only hear so many frequencies; human lives end in death. The list form is attractive because it channels a mode of engagement with plenitude, a sense of time that can break free from these strictures. It positions its items within Benjamin's "great inscrutable course of the world" (1968, p. 96). Marker's sound-image litanies go on. They grapple with the fact that we cannot reach out and touch, read, hear, smell, feel, or write everything. They provoke an affect that reveals and revels in the paradox of this impossibility—the

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[54] Interestingly, Terrence Malick, another filmmaker invested in exploring non-narrative cinema, uses Wagner's *vorspiel* to build the final sequence of *The New World* (2006) into a crescendo of sound-images that moves fluidly through a number of spaces and times.

inability to catch the cosmos, but the compulsion to try, the "Happiness" and "the black," in Marker's words, that emerge concomitantly with such attempts.[55]

Marker's films resonate with Borges' poetry of the quotidian, Benjamin's time of the chronicler and Eco's *topos* of ineffability. Each thinker provokes moments of Heideggerian *poeisis* through exploring the tension between etcetera and everything included and creating modes of engagement and affect based in wonder. The painter Jack Chambers offers us a useful way to conceive of wonder:

Interviewer: "You are doing with time what you have already done with space. There's a central preoccupation here. What do you think it is?"

Chambers: "Wonder I guess. Something can be so familiar that I see it for the first time. Or maybe it is not being able to see especially what is most familiar so you reach out and shape it again and again in the hope of revealing it. So in that sense I am working with the life within the object and not just the object's appearance" (Woodman 1967, p. 21).

Benjamin describes memory work in a similar fashion, as an 'excavation': "He who seeks to approach his own buried past must conduct himself like a man digging. Above all, he must not be afraid to return again and again to the same matter; to scatter it as one scatters earth, to turn it over as one turns over soil." (2005, p. 576). Chambers' and Benjamin's descriptions encapsulate the filmmaking style of Marker, who creates works that shape the familiar "again and again in the hope of revealing

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[55] But just as the content of every medium is another medium, the resolution of every tension produces another tension. As Marker deploys lists of etcetera to explode the logic of everything-included narrative, they bring forth unintended consequences of etcetera: images of the familiar made uncanny provoke horror, and the repetition of accumulation leads to banality. Alongside Shonagan's list of 'things that quicken the heart' are her lists of 'distressing things' and 'things not worth doing.' Alongside the ecstasy of order is the madness of infinity for Borges' librarians.

it," with 'it' being something like the ineffability of time, space, and the experience of the modern world, *Gestell.* Marker reveals the contours of *Gestell* using a form, the list, that elsewhere conceals these contours. This is Heideggerian *poeisis*, an attempt to clear a space for the other-thinking wherein the saving power might grow. Marker renders the modern world uncanny. His films reveal and seek to reconcile tensions that animate modern imaginative and experiential life: everything included vs. etcetera, order vs. entropy, wonder vs. horror.

5.5   Conclusion

Excavating these kinds of articulations in literature and art (wonder at the ineffable, tensions between entropy and negentropy)—and importantly, understanding their medial dimensions (the forms and devices through which they are articulated)—is the kind of project that Erkki Huhtamo (2011) suggests media archaeology can help develop, through "identifying *topoi*, analyzing their trajectories and transformations, and explaining the cultural logics that condition their 'wanderings' across time and space" (p. 28). I have tried to use the list in order to think through some of these trajectories, to turn them over as one turns over soil so that we might understand with a bit more precision the 'deep time' of poetics encoded in this humble form.

This chapter has shown that the list is not simply an administrative or logistical format. The complicated series of operations traced above (and throughout this thesis) preclude any easy judgment, whether positive or negative. They show that the list illuminates contours of modern epistemologies that are typically unnoticed and unquestioned, rendering them uncanny. We have also seen how lists intrude on modern historical and narrative time by channeling other, non-narrative times and affects. Ernst suggests that the non-narrative time conjured by chronicles can more accurately account for the calculative-bias inherent in digital computation and its corresponding logistical networks and cultural expressions (see 2013 pp.

158-160). Such an operation demonstrates that lists have capacity to clear a space for other-thinking that is productively thought in relation to Heidegger's understanding of *poeisis*. In that understanding, the power of revealing, i.e. truth is dislodged from Order where it typically resides. Put another way, a form that elsewhere (as in chapters 2-4) facilitates the operations and enforces the logic of *Gestell* here reveals the latter as the essence of the modern technical world. Lists dialectically conceal and reveal the contours of logistical modernity's 'frame.' This operation is akin to what Heidegger described as the 'saving power.' In my interpretation this power describes the clearing and preserving of a space wherein alternate logics, systems, and futures might be conceived and explored. The lists described above make room for such a utopian space.

6. Conclusion

6.1   Summary

This thesis used contemporary 'list culture' as a springboard for an exploration of lists as a cultural and communicative form in what Bratton, following Virilio (2006), calls 'logistical modernity.' It traced the list through a variety of contexts—historical, epistemological, administrative, logistical, computational, spatial, temporal, imaginative, and poetic—in an 'anarchaeological wandering' that revealed aspects of this form's role and function in human thought and action. I offered four intersecting arguments: (1) the discipline of media studies is made richer by the importing of certain media materialist approaches and concepts. The tools of media archaeology, associated theories of cultural techniques, actor-network theory, and logistical media studies complement well-established analytic approaches in media studies because they take into account more than the institutions, texts, and audiences that have historically been the focus of North American media studies; (2) the list form is a concrete example of what media materialism makes available to analysis. It is a cultural technique that processes distinctions foundational to the concepts and categories of social and imaginative life; (3) Lists cannot be easily dismissed or endorsed. It is not enough to say lists are good or bad. Their complicated and sometimes contradictory operations demand a precise tracing of how they function; (4) The enduring presence of lists in our thoughts, texts, and programs arises from their capacity to negotiate tensions and paradoxes that have beguiled humans for centuries. Such tensions include those between fear and desire, wonder and horror, entropy and order. Exploration of these tensions and attempts at their reconciliation clear a space for Heideggerian *poeisis.*

These arguments were developed in four chapters, split into two parts. The first part focused on lists that are primarily spatial in their orientation or 'bias.' In chapter two, I traced the list as a standardized format that structures the production,

circulation, and reception of knowledge in popular music. This case study showed how lists inscribe borders and draw distinctions that enact categorizations and modes of classification. The latter structure both epistemological fields and the social action that occurs around them. The case study also showed how lists 'black box' the means and motivations of their creation. Popular music charts were chosen because their operations are relatively easy to trace, and also because they have elicited an unusual amount of criticism when compared with other fields where the list is a more opaque black box. I argued that we can learn from such modes of critical engagement because they acknowledge the dialectic aspect of lists described by Goody (1977)—that lists simultaneously challenge the borders of knowledge they themselves draw.

The third chapter explored listing as a cultural technique of administration in Nazi Germany. I showed the Nazi census to be the product of a particular way of seeing and doing, what I call the 'logistical worldview,' that can be traced back to fifteenth century double-entry bookkeeping. Lists were shown to be (1) constitutive, creating subject positions and categories for people and things (the easier to be calculated and circulated); and (2) facilitative, an economical format by which policy directives were assembled and enacted. Lists were shown to be means by which the 'logistical worldview' materializes, a phase of modernity that privileges compression, calculation, and circulation. I situated this worldview within a longer trajectory of modernity by showing shared cultural techniques between twentieth century fascism and fifteenth century bookkeeping. The granular analysis of cultural techniques is required because conventional accounts of those media networks—paper, ink, and messenger vs. gramophone, film, and typewriter—miss such a connection. Nazism offers a glimpse of the madness of the modern fetish for data and information, which is a function of what Heidegger described in his late works on the 'essence' of modern technology.

Our lens shifted in Part II to lists more strongly oriented toward time. The fourth chapter delved more deeply into understanding contemporary 'logistical modernity.' We observed infrastructural elements of logistical networks, algorithmic lists of code and protocol, to be essentially about time. On the surface, these lists function similar to those of previous chapters. However, media archaeology's 'time-critical' imperative helped to show computational lists, such as the programming language Lisp, as elegant data structures that are inherently open, flexible and able to operate in real time to facilitate what is required of them: compression, calculation, and circulation. In this way, the list discloses itself as an operational building block of networks, both digital and logistical. This time-critical dimension of lists also connects them to ancient, non-narrative modes of relaying the past, such as chronicles and epic—forms of 'counting' rather than 'recounting'—moving lists beyond logistics and administration into the realm of poetry.

The latter was the focus of the fifth chapter, which used the words of Jorge Luis Borges and Walter Benjamin and the images of Chris Marker to show the list as an imaginative form that provides a unique space for Heideggerian *poeisis* and even utopian thinking. It does so by (1) rendering the structures and limitations of modern thought uncanny; (2) intruding on modern historical and narrative time by channeling other, non-narrative times and affects; and (3) preserving a space for thinking other. To demonstrate, I explored Borges' recasting of lists and other 'infromational' writing as heterotopic imaginative forms that negotiate tensions arising out of modernity's new spaces and times, such as between fear and desire, etcetera and everything included. I then used Benjamin's chronicler to elaborate on non-narrative time. Finally, I recast the list as an imaginative form in film, using it as an interpretive tool with which to understand how non-narrative cinema produces 'affects of etcetera.' The chapter saw Goody's list dialectic return, this time in relation to Heidegger's notes on the relationship between poetry and *Gestell*. I proposed the list as the kind of form that can clear a space for a mode of 'revealing,' i.e. truth, that resists the strictures of Order (which it, counter-intuitively, also

facilitates). This resonates with Heidegger's discussion of the 'saving power,' humankind's highest calling, that arises only from within the frame of *Gestell*. Because it is a form by which the Order of *Gestell* materializes, yet can also reveal the nature of that system of ordering, lists seem to be the type of object Heidegger describes. They preserve a space for the revealing of alternative logics, systems, and modes of being.

6.2   Contribution to Media Studies

By developing a media materialist framework for analysis, this research helps to fill gaps in better-established approaches and debates, such as the long-standing debate between 'political economy' and 'cultural studies.' Such debates, though conceptually and historically important, often produce entrenched positions that are inhospitable to the development of more experimental research questions that can push the field in new directions (which, as media archaeology shows, are sometimes old directions). Media studies' traditional 'interpretive triangle' of text-audience-institution (Peters 2008a) often misses or glosses over the material layers—technical, historical, formal, etc.—that together enable the operation of media devices and networks. This research on lists addresses that gap, and engages a tradition that focuses on granular objects and techniques such as buttons (Heilmann 2014), doors (Siegert 2012), maps (Siegert 2011; Peters 2008b), undersea cables (Starosielski 2012), and files (Vismann 2008). These projects provide a window on the way broader spatio-temporal infrastructures are assembled in any given society or historical moment. Such research has roots in the 'civilizational' approach to media and communication research (see Peters 2008a) pioneered in the 1950s and 60s by the Toronto school of communication, particularly by Harold Innis and Marshall McLuhan. This tradition has been marginal in media studies, but is proving ever more relevant and applicable as questions of time and space emerge as the essential problems of logistical modernity and digital culture. The civilizational

approach's emphasis on time and space provides tools to illuminate the emergence of new spaces and, especially, times that clash with extant regimes in ways that can be productive, or potentially destructive, for democratic and ethical life.

It goes without saying that, since this study addresses gaps in other approaches in media studies, their foci are necessarily absent. Their absence should not be interpreted as a dismissal of revelance or importance. I advocate media materialism as a compliment to existing approaches, not as the only direction for media studies. My desire to foreground alternate theoretical orientations and methodological approaches stems from my experience of our discipline, which has been that there is a general hesitancy to engage with 'civilizational' ideas, or to take chances with research in stepping outside the conventional canon of media-cultural-communication studies. The dominant paradigm involves finding a specific 'media' text or institution and boring deep down into its meaning, use, or history. We often spend so much time qualifying the specificity of our chosen object (and the limitations of its analysis) that by the time the object itself appears in a given text both reader and writer are exhausted. There is a hesitancy to extrapolate from specific objects or texts or make risky historical comparisons. Such hesitancy is a new development for a field that was invented as a means by which to engage, head on, civilizational questions. Innis, McLuhan, Havelock, Carpenter, et al. were unafraid to borrow from disciplines like philosophy, classics, mathematics, and art history, which had historically been 'hands off' to non-experts. Thinkers from the German tradition of media analysis have been doing the same for the last thirty years. I appreciate their fearlessness, and think we in North America need more of it. We tend not to touch figures like Heidegger or Aristotle or Jesus or Pythagoras (with some notable exceptions, e.g. Peters 1999; Rotman 2008), but the Germans understand that these figures have just as much to say to us as Marconi, Edison, Hearst, or Zuckerberg. Despite much discussion in North America about interdisciplinarity, the German climate has proven much more hospitable to the generative weaving together of disciplines and traditions. Counter-intuitively, by

going more granular this tradition has become much more far-reaching in the scope of its conclusions. Granularity of devices and techniques leads to questions of ontology and being, it brings us back to those civilizational questions of the Toronto school. Such questions have largely receded over the same time period in North America, replaced by those of identity, representation, subversion, critique, agency, etc. How and why this happened is an interesting question, thought not one I can answer here. But I suspect it has much to do with fears of being branded with the scarlet letters of 'grand narrative' and 'technological determinism,' or both. With this project I have tried to emulate a bit of the German fearlessness, which they borrowed from the Canadians, without getting too far off course. The nature of taking such risks is that sometimes you miss the mark. I hope to have made more hits than misses, though sometimes statements of disagreement that follow misses are just as productive as hits.

6.3   Future trajectories

This research points in several productive directions. First, further case studies could be developed that seek to understand the way the poetic capacities outlined chapter five, or the list criticism of chapter two, can be mobilized in political struggles. For instance, the list was a form around which the global Occupy movement chose to articulate itself through negation. Occupy's difference from conventional protests that abide by the structures and flows of of global capital was marked by its refusal to produce a concrete list of demands or an easy-to-read flow chart of its organizational structure. Such refusals were peceived as flaws that governments and media pundits alike used to patronize the movement. Such characterizations misunderstood the conscious act by which Occupy rejected the formal apparatus of 'reasonable political exchange' under global capital. Analyzing this negation at the level of form might contribute to the ongoing discussion of how to re-configure or re-

mobilize the considerable momentum that was generated by the original Occupy movement.

Certainly, further historical research is required into the role and function of lists in modern governtality, particularly in the legal and policy realms. Watch lists and no-fly lists accummulate ever more currency in the unending global 'war on terror,' as Werbin (2008) shows. What are the historical precusors of such lists? Are they specific to North America? What is the relationship between such lists and the emergence and circulation of 'terrorist' as a category? Canada has a long and complicated history in deploying lists of people for political ends. One case in particular demands attention: what has been the role of lists in the Canadian government's enumeration and administration of first nations peoples? That project could shed much light on the ethics of administration.

This research also calls for further integration of the German media studies *milieu* into North American debates. In particular, software studies and other emerging approaches in the digital humanities present opportunities for rich connections. Combining media archaeology's emphasis on hardware with software studies' considerable conceptual vocabulary will allow us to develop more robost theoretical accounts and policy directives for the algorithmic logic of logistical modernity. The list itself might prove useful in this context: how do lists function in programming languages other than Lisp? Did the early adoption of the list format—as both a handy mode of compression in web design, and a flexible data structure in programming—congeal as a set of cultural practices and conventions in web aesthetics? If so, might this account for the contemporary proliferation of 'list culture' online? Another productive direction related to the German *milieu* this research points toward is the question of what Siegert (2013) calls "the conceptual transformation of media into cultural techniques." Is this description accurate? Do its consequences render obsolete the entire concept of media—upon which methodologies, faculties, industries, etc. rely? Media has certainly become an unruly

concept. We now use it to describe a vast array of different devices, institutions, mechanisms, historical processes, and cultural trends. We speak of 'the (mass) media' and its institutional infrastructure; we describe as media the objects, devices, and platforms that deliver information—both on and offline; journalists and pundits are described as 'the media'; social *media* networks increasingly structure online activity. Further study into how theories of cultural techniques and associated concepts like logistical media can lend conceptual precision to the field, and why that might be necessary, need to be pursued.

Such an imperative animates my next project, already underway, a reintegration of the Toronto school of communication into contemporary debates around media materialism, where Innis et al. are curiously absent. The dissertation has helped bring into view three pillars of Harold Innis' work that serve an architectonic role in media materialism. Innis was, after all, a lover of list and aphorism. The first pillar is *conceptual*—Innis' ideas of space and time are the unacknowledged conceptual forerunners of media archaeology and logistical media studies, approaches that allow us to more accurately grapple with the materiality of digital culture and its global supply chains. Second, Innis' *methodological nomadism* has inspired the emphasis on practice-based engagements with media that engender a robust media literacy rooted in both hard- and software. Third, Innis' *formal* approach to research and writing, with its generative rather than analytical bias, has inspired an exciting constellation of experimental research and writing in emergent approaches to media and communication studies.

For now, however, I hope to have demonstrated how our discipline can be enriched through the incorporation of approaches that have been historically marginalized. This thesis is primarily a work of media theory, an attempt to forge a conceptual language and methodological approach that can account for forms, formats, and techniques missed by other approaches. Consequently, a degree of specificity was unavoidably sacrificed in some areas. Each chapter could be

developed into a thesis on its own. However, an important aspect in the development of my argument—and part of my rationale for pursuing the project—was to draw these divergent case studies together in order to see how they vibrate off one another as do items in a list. I hope to have shown such vibrations tell us not just about lists but also our discipline, and even our position in Benjamin's (1968) "great inscrutable course of the world." The case studies and conceptual fields chosen might also be debated; this is a project necessarily haunted by the spectre of entropy. Today, just 36 hours before I am to submit this document, I was directed to an incredible array of lists compiled by Susan Sontag recently made available by the born-digital Sontag archive at UCLA. In a diary entry from 1967, Sontag addresses her "compoulsion to make lists." By making lists, she writes, "I *percieve* value, I *create* value, I *confer* value, I even create – or guarantee – *existence*" (quoted in Schmidt and Ardam 2014, emphasis in original). This tantalizing quote touches the myriad ambiguities and tensions at the heart of the list form. In this work, I have compiled a list of observations and examples to demonstrate my argument. Your list would be very different. The entropy of logistical modernity is not always or only the continuity of the same. It contains spaces of radical difference. We just need to know where and how to look. Here's a start: microchips, maps, ink pads, formats, categories, hands, buttons, pointing, container boxes, stamps, nanoseconds, typeface, stacks, platforms, levers, ports, bullet points, dials, handles, forks, gears, et cetera …

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