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Media Ecologies

MATERIALIST ENERGIES IN ART AND TECHNOLOGY

Matthew Fuller

Media Ecologies

LEONARDO

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Materialist Energies in Art and Technoculture

Matthew Fuller

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Series Foreword

The cultural convergence of art, science, and technology provides ample opportunity for artists to challenge the very notion of how art is produced and to call into question its subject matter and its function in society. The mission of the Leonardo book series, published by The MIT Press, is to publish texts by artists, scientists, researchers, and scholars that present innovative discourse on the convergence of art, science, and technology.

Envisioned as a catalyst for enterprise, research, and creative and scholarly experimentation, the book series enables diverse intellectual communities to explore common grounds of expertise. The Leonardo book series provides a context for the discussion of contemporary practice, ideas, and frameworks in this rapidly evolving arena where art and science connect.

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1. to document and make known the work of artists, researchers, and scholars interested in the ways that the contemporary arts interact with science and technology, and
2. to create a forum and meeting places where artists, scientists, and engineers can meet, exchange ideas, and, where appropriate, collaborate.

When the journal *Leonardo* was started some thirty-five years ago, these creative disciplines existed in segregated institutional and social networks, a situation dramatized at that time by the “Two Cultures” debates initiated by C. P. Snow. Today we live in a different time of cross-disciplinary ferment, collaboration and intellectual confrontation enabled by new hybrid organizations, new funding sponsors, and the shared tools of computers and the Internet. Above all, new generations of artist-researchers and researcher-artists are now at work individually and in collaborative teams bridging the art, science, and technology disciplines. Perhaps in our lifetime we will see the emergence of “new Leonardos,” creative individuals or teams who will not only develop a meaningful art for our times but also drive new agendas in science and stimulate technological innovation that addresses today’s human needs.

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Foreword

Joel Slayton

All programmatic structures (cultural and informational) are composed of determinates that when analyzed from a specific perspective describe their objects and processes of being. One way to discover or reveal the determinates of any complex structure is to collide it with another. It is a tried and true technique of creativity and innovation. Any consideration of the evolution of media necessarily must account for productions of such schemas.

A medium is a medium is a medium.—*Friedrich Kittler*

Media Ecologies by Matthew Fuller is, in one way, an analysis of the determinates of radio, telephones, cameras, surveillance, computational media, and networks. It is also, critically speaking, a read on the culture of the standard object—a culture based on systemic incorporation of the recombinant production of media objects that are abstracted, layered, and infinitely customizable.

This is a text that addresses innovation as defined by getting strange and interesting things to come out of the wrong end. A process that necessarily demands a better understanding of the mutability of media objects, the constraints of memetics, the language of modifications, the limits and excess of protocol, the implications of numericalization, and the nature of serial media scaling. By example and through theoretical consideration, Matthew Fuller explicates art as the challenge of a compositional dynamic of irresponsibility that engages with the language and context of standard objects through their

self-reflexive character, a challenge out of which emerges production of something in excess of their combinations. He further describes art as necessarily involving productions of innovative schemas of confrontation and insertion. For Fuller, creativity and innovation operate as realization processes outside of the misplaced concreteness of the standard objects of culture.

Media ecology is a very slippery term. It is often used to refer to both an interlaced topological analysis of media objects, as an environ, as well as an accounting of their function. It can also be an address of the materiality and immateriality of media objects, devices, and systems in terms of their form as both pattern and presence including the relative nature of their function. The term also refers to the multiplicity of meanings associative to the constituent binding relations of information objects contained within the ecology, its language. And, as Matthew Fuller illuminates, media ecology is also a descriptor of the parallel histories and affordances of context. Within the multiplicities of these ecologies, complexity reigns supreme. Nonlinear, self-organizational, and transpositional systems behavior combine autopoietically at the intersection of media collisions.

Complementing Manuel De Landa's reading of the *phase space* model and Gilles Deleuze and Félix Guattari's poetics of the *machinic phylum*, Fuller directs our attention toward aesthetics of layering composed of multiple relations of media dimensionality. These are dimensionalities operating as self-referencing structures that cooperate to produce something in excess of themselves and emerge in new structures of political, material, and aesthetic combination. Fuller's *Media Ecologies* stresses an appreciation of the nature of these processes and their compositional terms. It is an understanding that the ontogenic capacity of the media object lies outside of any embedded character of a particular context of being. Nothing is easy.

Presented here is an important and necessary discourse, one that informs a more critical vocabulary of the compositional terms of artistic practice involving new media. The Leonardo Book Series is very pleased to include *Media Ecologies* by Matthew Fuller.

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Abbreviations Used

ATP	<i>A Thousand Plateaus</i>
MBM	<i>Marx beyond Marx</i>
SMW	<i>Science and the Modern World</i>
WTK	<i>The Will to Knowledge</i>
WTP	<i>The Will to Power</i>

Introduction: Media Ecologies

This is a media ecology made in bits of paper: “What abstract poetry tried to achieve is achieved in a similar fashion, though more consistently, by Dadaistic painters, who played off actual real objects by nailing them or gluing them next to each other in a painting. Concepts can be played off against each other much more clearly this way than when their meanings have been translated into words.”¹

Kurt Schwitters was writing about sticking shoes, sausage wrappers, tickets, and wire to a backing board in order to conjure up or discern a relationship among them. Parts no longer exist simply as discrete bits that stay separate; they set in play a process of mutual stimulation that exceeds what they are as a set. They get busy, become *merzbilder*. This patch of text from the master of collage life also makes clear two themes key to this book.

First, the only way to find things out about what happens when complex objects such as media systems interact is to carry out such interactions—it has to be done live, with no control sample. Objects here should also be understood to mean processes embodied as objects, as elements in a composition. Every element is an explosion, a passion or capacity settled temporarily into what passes for a stable state.

Second, the effect of what Schwitters says is to make a fundamentally materialist account of the world. But it is not one that is limited to being naively instrumental or that suffers the blinding effects of positivism. It is a materialism that acknowledges and takes delight in the conceptuality of real objects. All objects have a poetics; they make the world and take part in it, and at the

same time, synthesize, block, or make possible other worlds. It is one of the powers of art or of invention more generally to cross the planned relations of dimensionality—the modes or dynamics that *properly* form or make sensible an object or a process. As it does so, other worlds gently slip into, swell across, or mutate those we are apparently content that we live in.

This book is about such work. It is written at a time when objects have explicitly become informational as much as physical but without losing any of their fundamental materiality. The chapters ahead are about this materiality, how it can be sensed, made use of, and how it in turn makes other elements or compositions tangible. This book asks: what are the different kinds of such qualities in media systems with their various and particular or shared rhythms, codes, politics, capacities, predispositions, and drives, and how these can be said to mix, to interrelate, and to produce patterns, dangers, and potentials? Crucial to such an approach is an understanding that an attention to materiality is most fruitful where it is often deemed irrelevant, in the “immaterial” domains of electronic media. The conceptual dematerialization of art, labor, or information have at particular moments made for revealing and productive epistemological ruses, but more can be done. Drawing on Nietzsche’s grounding of thought in materiality, in the thickness of life, in his renowned Polish blood,² this book attempts to layer such insights with a sense of their own *fabrication*—a medial will to power made in the ontogenetic, reality-forming nature of a media and in its capacity for connection and use.

The term “ecology” is used here because it is one of the most expressive language currently has to indicate the massive and dynamic interrelation of processes and objects, beings and things, patterns and matter. At the same time, like Schwitters’s scraps and scrag-ends, it is a term that obviously has a history.

Media Ecologies, Prior Art

The term “media ecology” is used and in circulation in a number of ways.³ The term is chosen here because this multiple use turns it into a crossroads. Butting these two words up to each other produces a conjunction of two variables that are always busy with meaning. Their dynamism, however, always arises out of concrete conditions. The virtuality of such conditions, their possible reinvention or alternate state, their pregnancy with change and interre-

lation, is as deeply implied in this concreteness as much as it can be said to be subject to definition.

The term is ambiguous, too, given its number of different current uses. That these uses exist, that the present work does not attempt to find a “new” title for itself, is intended to enhance the way in which this book uses pre-existing objects as being more loaded than the new and innocent, and hence potentially more powerful when dimensions of relationality that are virtual to them (but that perhaps remain hidden) are brought to the fore or potentiated. It is not the intention of this book to spend its entire course fidgeting with a possible hermeneutics of the term, but a brief mapping of its concurrent uses will usefully serve to locate the areas of concern here.

“Media ecology,” or more often “information ecology,”⁴ is deployed as a euphemism for the allocation of informational roles in organizations and in computer-supported collaborative work. Commonly, it is used as a saccharine term for the “natural” structuring of the microscopic to macroscopic dimensions of class composition and command in a workforce. On the one hand, this is done on a mundane level, such as in the ordering and management of reception staff within an organization, making sure they have the location, communications filter-rating, and availability of all other staff at their fingertips. Of keen interest too in such contexts is how information flows are routed within an organization. So the term often also implies an inter-relationship with knowledge and time management processes, intellectual property regimes, database and software design, content control, access structuring, metadata, archiving, and the use and generation of new document and information types. A third, and related current is how auditing processes and “quality control” extend through informationalization into greater parts of contemporary work-patterns. In other words, the terms “media ecology” and “information ecology” are highly susceptible to interpretation as part of the jargon effluvia of the early twenty-first century. Underlying these terms, however, are key discussions about the development, contestation, and invention of life in the present day. Some of these issues will be discussed here, but somewhat at a tangent to the refrain of life, as a subset of a larger enterprise opportunity in which they are often found.

In a related sense, in that there is something of a shared predisposition to an uncomplicated but rather more spiritually troubled technological determinism, is another use of the term by a current surrounding media commentator and educationalist Neil Postman.⁵ Here, “media ecology” describes a kind of

environmentalism: using a study of media to sustain a relatively stable notion of human culture. The intellectual background of this current includes Marshall McLuhan, Lewis Mumford, Harold Innis, Walter Ong, and Jacques Ellul—a vivid set of resources. Here, “ecology” is more usually replaced with the term “environment” or is used as a cognate term where the fundamental difference between the two concepts is glossed over. Echoing differences in life sciences and in various Green political movements, “environmentalism” possesses a sustaining vision of the human and wants to make the world safe for it. Such environmentalism also often suggests that there has passed, or that there will be reached, a state of equilibrium: that there is a resilient and harmonic balance to be achieved with some ingenious and beneficent mix of media. Ecologists focus rather more on dynamic systems in which any one part is always multiply connected, acting by virtue of those connections, and always variable, such that it can be regarded as a pattern rather than simply as an object. At times there is certainly an overlap of interests between this book and this current, particularly in attempts to investigate how media can be said to have certain kinds of causality. However, as with the business-oriented discussions of media and information management, much of the work in this second current is rather too often symptomatic of other, more fundamental shifts in cultural modes: how much longer until the ever-awaited fall of the book? Instead of providing a sing-along chorus to these changes, as the first current does for those parts of life falling under the regime of economics, the latter seeks too often only to trace them with the properly cultivated kind of detached horror. Their conceptual resources, however, have more to offer.

A third strand of use of the term is discernible in some of the most interesting parts of literary studies in recent decades in, for instance, the writings of N. Katherine Hayles,⁶ Friedrich Kittler,⁷ and others such as the critic and editor Joseph Tabbi.⁸ These representatives of a thread of study in which literature becomes a part of a subset of media, and thus of discursive storage, calculation, and transmission systems, have fundamental insights to offer. Such work makes electronic or code-based logical composition and a developed theorization of interaction come into play with cultural analysis and production. Of particular use too is such work’s discussion of domains usually roped off as science, its varied histories and philosophies. Such work also often serves to complicate and open up the possibilities to be found in the second thread. The interrelation of Kittler and McLuhan—despite the former’s

amused anticipation of the moment when man is occluded and finally ignored by his “extensions”—is clear, for instance.⁹ Where these thinkers gain perceptual and methodological power is in the introduction of, broadly speaking, poststructuralist concerns to the fundamentally humanistic, or even intrinsically religious, concerns of the “environmental” approach. It must be said, however, that here the specific term “media ecologies” is used largely either as an aside, or more precisely as something already accessible as a known object of reference. The context of this writing is to take this named thing, to take advantages of this reference in circulation, a scrap of phrase or concept-wrapper, and to make use of it, but also to test it and, one hopes, to extend its precision.

A key reference in doing so will be to make use of a sense in which the term ecology has also been extended in texts by Félix Guattari working among social movements that have themselves made such links. It will be clear from a scan of this book that Guattari, his serial collaborator Gilles Deleuze, as well as writers who have made their own uses of their work, such as Manuel De Landa and Howard Slater,¹⁰ provide a persistent thread of reference. Guattari himself derives a great deal of conceptual ground from the cybernetician and anthropologist Gregory Bateson.¹¹ Guattari’s use of the term ecology is worth noting here, first, because the stakes he assigns to media are rightly perceived as being profoundly political or ethico-aesthetic at all scales. Aligning such political processes with creative powers of invention that demand “laboratories of thought and experimentation for future forms of subjectivation”¹² also poses a demand for the inventive rigor with which life among media must be taken up. Equally, Guattari’s repeated linkage and cross-fertilization of the three modes, “mental,” “natural,” and “social” of ecology¹³ within “ecosophy”¹⁴ provides insight into the way that any of these or other modes of an ecology always demand carrying over into another mode, another universe of reference, and always another, in order for these laboratories, whether in texts, persons, movements, or at other scales, to have any function.

Inventory of Parts

In addition to giving some context to the title, an introduction must make available a sense of the ways in which the book will treat its material and the means by which its argument is constructed. Below, each chapter is briefly

summarized, outlining its area of interest and the approaches, ideas, and activities used to mobilize the argument.

Chapter 1: The R, the A, the D, the I, the O: The Media Ecology of Pirate Radio

This chapter focuses on the media ecology of contemporary London-based pirate radio and its interweaving of various high- and low-tech media systems for the broadcast and intensification of music (at the time of writing, primarily garage, hardcore, jungle, and dancehall) and its networks. One of the concerns of this book is to develop arguments for a machine, digital, and electronic aesthetics. Such an aesthetics will take advantage of the perceptual capacities and methodologies of art. It should not, however, suffer the illusion that reflexive powers of invention are its unique purview. Pirate radio in London over the last decade has been the site of immense innovation. One example is the launch of jungle, now a superficially “dated” form but one of the most significant currents to have been produced in recent decades. But alongside music, the way in which the pirates have operated in terms of their mobilization of media systems also make demands on any discussion of media in combination and in excess.

Some of the the key themes to the book are introduced here. Deleuze and Guattari’s “machinic phylum” provides for a sensual and technical aesthetics that can be developed in relation to media and music. The chapter also includes a reading of Stuart Hall’s “Encoding/Decoding,” a text that forms something of an transdisciplinary nodal point in cultural studies, linking as it does to information theory, but which can also be useful if reassessed in relationship to the concept of “Hylomorphism,” the critique of a splitting of form and content or matter introduced by Gilbert Simondon and also developed in *A Thousand Plateaus*.¹⁵ Whereas Hall’s work has usefully illustrated the way in which media ecologies can be broken down into separate parts of a process, at each point undergoing treatment and filtering by specialization of interests, the machinic phylum provides a way of thinking through how elements of complex medial systems “cooperate” to produce something more than the sum of their parts. This tension, between the discrete or isolatable and the dynamic and multiplicitous, runs through the book. Finding ways to conceptualize and use the interplay between such states, rather than reduce them to two grand isolates, forms one of the key concerns of these chapters.

J. J. Gibson's systems-theorization of material "affordances" in ecological psychology¹⁶ has been, partly since its introduction to design discourse by Donald Norman,¹⁷ a key resource in thinking through the predispositions, capacity to combine, and inherent forcefulness of objects and organisms. Here it is put to work to trace how massively layered and interacting sets of affordances, embedded in technologies, music, and social networks in law and in people, shift and combine as part of thriving, inventive scenes.

The contemporary London pirate scene provides a rich lode of activity for thinking through the interrelation of self-organized cultural activity with media systems. The gendered, fleshy construction of technologized voices, the turntable as hip hop computer, the mobile phone as media assemblage, radio as unfinished project: this chapter follows through a sequence of the medial components of the media ecology establishing a means of understanding their traits and interrelations. The scope of the chapter is to develop the beginnings of the range and possibility of operating in media ecologies. Further chapters are thus set up with the task of working these seams in more detail.

Chapter 2: The Camera That Ate Itself

Where the work on pirate radio attempts to develop an account of multiply interlaced minoritarian use of media systems, chapter 2 narrows down to construct an approach to a single media object and its interconnections. Rather than making an initial mapping an "entire" media ecology, it focuses on an account of media aesthetics grounded in the conditions of a particular imaging technology—John Hilliard's 1971 series of photographs, *A Camera Recording Its Own Condition (7 apertures, 10 speeds, 2 mirrors)*. Following Vilém Flusser's concept of the camera as an "apparatus" that allows for media's being composed of multiple programs or drives, the chapter develops a relation between Karl Marx's observations of machine subjectivity in the *Grundrisse* and the interplay of mathematical, material, and social powers.

One way in which the observation of these powers can be used is, via Antonio Negri, to make a rich and inventively political technological sensibility. Such a sensibility necessarily recognizes the embittering conditions of capitalism, but it is, through its access to the dimensions of possibility coursing through life and media, able to scorn them. The prince of affirmational scorn is, of course, Friedrich Nietzsche. His prescient grounding of philosophy in physiology and matter provides one of the key terms of reference here,

the possibility to develop a medial will to power. This concept provides a more nuanced account of medial drives, allowing them to be recognized as formed in composition with other elements and currents. As such, and as a side effect, it is also able to move beyond the rather static formulation of media determinism. Introducing Nietzschean concepts into the debate emphasizes the materiality of machinic life, a move that also demands other forms of knowledge and capacities of perception. Medial will to power also throws the possibility of any neutral account out of whack. “Perspectivalism,” the cognition of the specific loadedness of accounts, drives, and methods, undergirds much of the continuing work. This is one of the key revelations of Hilliard’s careful matrix of photographic feedback, but it also leads to an acknowledgment of Friedrich Kittler’s development of discourse theory as proposed by Michel Foucault—itsself a development of this key Nietzschean theme—to include its constitution by media systems. This chapter, owing much to these last two writers, sets up some of the key tools of the book. It is how they fold in on themselves and each other, what insights they demand and release, that sets its pace.

Chapter 3: How This Becomes That

This chapter contains accounts of the following works: *Embryo Firearms*, by Cornelia Parker—parts withdrawn from the first stages of gun manufacture and made available for viewing under the mechanism of sculpture; *The Switch*, by Jakob Jakobsen—the addition of an on/off switch to a residential area’s street lighting; *BITRadio*, by Bureau of Inverse Technology—a pirate radio broadcast device that cuts into an “owned” frequency when pollutant particulates are detected as present in the air; and *by the way*, by Germaine Koh—a radio transmitter that rebroadcasts the sound of a car as it passes the site of an installation, again cutting into the frequency allocated to another broadcaster.

The chapter begins with a story told by Franz Kafka in which a city’s phone system is “phreaked” in order to establish a particular social space. The city is layered by a system of interpretation, a code, which allows for certain activities within a wider set of constraints to occur. Following previous chapters the work continues to make an exploration of ways in which “hidden” dimensions of invention and combination are embedded and implicit in particular dynamics and affordances of media systems and their parts. These

core themes of the book are tested and expanded toward a discussion of cultural and political dimensions of industrialized and algorithmic material culture.

While chapter 3 develops ideas about the ways in which the capacities and behaviors of media objects, systems, and dynamics are changed, potentiated, and mobilized when brought into abnormal or inappropriately preformatted relations to each other, it is also useful to make some account of how such “normality” comes about, of its own underlying drives. These drives can be understood as the effect of a certain sort of will to knowledge. Alfred North Whitehead’s concept of “misplaced concreteness” as a founding blind spot in modern science and technology is discussed as a form of simultaneously productive and constraining perspectivalism. It is a concept extremely appropriate to media. Whitehead identifies “misplaced concreteness” as Newtonian science’s tendency to construct ideally isolated objects as the basis of knowledge. This chapter suggests the conceptual and material problematic of the “standard object,” a serial element such as an ISO standard shipping container whose potential has been—for the purposes of particular compositional tasks—utterly stabilized, as being the result of such knowledge. The standard object is presented as providing the opportunity for understanding technicity and organizational systematicity in terms that recognize its affordances, and its crucial agency in modernity. But it is also a mode of knowing and producing that effects limitations on other forms of understanding and use. Such limitations have been crucial to the powers of scientific modes of thought, the means by which they test themselves and clarify the scope of their capacity to speak.¹⁸ At the same time, standard objects are always in combination with other forms of life. They exist only as a “settlement” of powers, affordances, and interpretations. More is always to come.

Chapter 4: Seams, Memes, and Flecks of Identity

Cctv—world wide watch is a sequence of Web pages by Heath Bunting that is published on the irrational.org Web site. Users are encouraged to watch feeds from four webcams. If they see a crime, they are to report it on an HTML form. The contents of the form are apparently sent via fax gateway to a nearby police station. In this chapter, each step of the Web site, whether cultural device, imaging system, or protocol, is followed through, as in the chapter on radio, in order to draw out and map its implications.

The chapter opens with a discussion of the memetic theory of cultural evolution. Here it is used to provide a potentially more fine-grained account of medial will to power. Its use is complicated by the misplaced concreteness introduced earlier. As an orthodox scientific theory, memetics suffers the problem of being, at least for the moment, unable to establish a definition of an isolated meme that can be used across cultures. This problem potentially threatens to scupper memetics as a research program. Without being able to be identified, how can a meme be monitored and shown to exhibit certain behaviors and qualities? Here, it is suggested, the *Cctv* site attempts to generate this same “problem” for surveillance. As information travels unevenly from street to image to network to text, what “fleck of identity” can be said to constitute proof? The problematic of the standard object and what escapes it are conjoined. While problematizing one putative standard object, the work relies absolutely on another, the Internet Protocol packet. Thus an opportunity is created to discuss, via “perspectivalism,” the scale and mode in which objects can be said to exist or to operate. Chapter 4 asks how an account might be made of the ways in which such scales layer and interoperate in complex media environments, and how each scale comes with and creates its own dimensions of relationality: political, material, aesthetic, and other dynamics, which generate it and from whose perspectives it may be read. (The term “dimensionality” is used because, alongside those of extension that are obvious, any material element also corresponds and belongs to a multitude of other compositional forces and domains that place it in relation to others that may be virtual, affective, historical, and so on.)

After running for a while, the *Cctv* site received a cease and desist e-mail from the owner of one of the cameras it parasited. This letter in turn became part of the site. Such use of “documentation” allows the site to twist the dimensions of relationality that it exists in, to make others come in to view—even when such a view or perspective is owned. It also suggests an interesting set of approaches to material that is not registered as art but is produced in abundance by and around art systems. Another work, *A Media Art (Manifesto)*, founded on an arguably memetic exploitation of media perspectivalism, also exploits this mesh of possibility and provides a means of testing this culture of evidence.

Here, as with all of the chapters, the media ecology’s materiality, the connections and uses made, missed, and implied, form a grounding part of the work. Webcams, their aesthetics, distribution, and their use, by, among

others, Wolfgang Staehle, are discussed starting from a simple account of their construction. Software and network systems such as those used by these cameras are usually understood to be value-free, simple utilities. Here, their compositional terms are taken up in order to test their affordances and limits.

It is also useful to locate the work in relation to another of its important contexts, namely, surveillance. Responses and additions to expanding processes of surveillance and an account of the developing typology of forms of monitoring, modulation, and control are also discussed in terms of their limits and powers, and the ways in which these are messed with or amplified by their existence and production within multiple dimensions of relationality. An aesthetics of layering, of adding complication and filtering, and of joining processes to networks is proposed, alongside that of forces and powers.

As a result of the several relations of dimensionality within which the work is seen as being made and operative, this chapter is rather longer than the others. Taking such work to exist in an expanded, “ecological” sense demands an effort at a making a nonreductive network of interpretation, with the unfortunate possible result of a certain arduousness. Children make their way around the world by responding with a ceaseless “why” to every explanation or grunt offered them. This chapter perhaps betrays the effects of the main methodological influences in my life at the moment, but I hope it benefits from the rather childish insistence on being able to take every path in a labyrinth simultaneously.

It is also in this sense, but within a much slower media ecology—that of books, one that ostensibly pays less attention to memetic buzz—that the present text is offered. An additional note should also be made on the way the following chapters at times employ different speeds, frames of reference, and narratologically different “voices.” It is often customary in academic writing to spend pages of tangled and anguished excuse before the author dares drop a joke, which is then hurriedly attributed to someone else. This text itself is in a sense also an attempt at something akin to the paintings described by Schwitters. How can words, concepts, quotations, footnotes, the mechanics of a book, and the writings and accounts that evade them themselves be nailed down or glued to a page in a way that makes them reverberate? But more, how can conceptual worlds, different material practices, along variously restrained or absolutely *rude* interdisciplinary dynamics be satisfactorily brought together in a way that seeks not to develop a necessarily unifying

framework, but to hold in its hands for a few moments an explosion of activity and ideas to which it hopes to add an echo?

This last is a question of writing and of language itself as part of various media ecologies, one that provides an underlying question to the whole book. The question of language returns in several of the following chapters, in relation to and as materiality, as Deleuze and Guattari's formulation as "minor," or as the ur-form of a standard object, as a test case for meme theory and as the practice of MCs in the synthesizing of voices in the media ecology of pirate radio. It is a question that has the flexibility to be "reflexive," that is, to operate in second-order terms on itself. That is an advantage of writing. But in a consideration of a media ecology, it is also necessary to ask where these language-embedded and language-driven concepts and accounts go—where do the words end up? How do they operate as an engagement with a particular media ecology? In limited terms, they go into the hands of a few persons and are filed or registered in a number of archives and documentation and audit systems. Thankfully, they go too into the hands of readers who will make their own uses of them, even if only to soak up the coffee needed to keep themselves awake. A more fundamental question is how writing operates in relation to the other kinds of activity discussed. In this case, the question is not how these activities can somehow achieve an isomorphic relationship in which one confirms and absolves the other, but rather to find ways in which the one can trigger, make strange, and intensify the kinds of working and thinking done in each and in both.

The R, the A, the D, the I, the O: The Media Ecology of Pirate Radio

Public space, in an electronic age, is space on the run.

—VITO ACCONCI¹

“. . . [T]he electricity of everyone in the studio coming up on their E's at the same time, by the NRG-currents pulsing down phone-lines and across the cellular-phone ether from kids buzzing at home. Listening to pirate phone-in sessions like this I felt there was a feedback loop of ever-escalating exaltation switching back between the station and the hardcore 'massive' at home. The whole subculture resembled a giant mechanism designed to generate fervour without aim.”²

The style of pirate radio operating currently in London³ has developed precisely in terms of the ways it finds to amplify such fervor to find more routes for it to leak out and feed back. In a sense, this paragraph crystallizes the scope of this chapter. What is attempted here is a discussion of the ways in which this process occurs and how it provides a zone of experimental combination with which other forms of media culture can learn. The process by which this is attempted is to take each part of this giant mechanism and try things out with its components.

Lists and Detours

Describing minoritarian literature through a discussion of the poet Walt Whitman, Gilles Deleuze describes how the “American writing” that

Whitman and a throng of others exemplify is predicated on the hungry combination of many heterogeneous parts. When these writers get rolling, an “infinite patchwork” of “singularities, remarkable and non-totalisable parts extracted from a series of ordinary parts”⁴ is mobilized. In Whitman, one of the ways these fragments coalesce is through the simple list. A key mode of formation in aesthetics of multiplicity, lists are found in the celebrated ecstatic artist Adolf Wolfli’s descriptions of his mythic cities, as the enumeration of facilities and functionality in Michel Foucault’s “archaeologies,” as roiling concatenations of the manifestations of life “drunk on water” in the shaggy dog stories of Henry Miller, and the “dork sublime” of the detail upon detail word-clots of novelist Mark Leyner.⁵ “The index” as a form of list has also been employed by science fiction writer J. G. Ballard,⁶ for example, as a way of bringing a virtual or suppressed text into emergence through the accumulation of detail. As a form of speculative writing, the inventory (the list of items and supplies required for an expedition, an experiment, to open up a laboratory) opens up the space of a system of objects arranging itself in composition with as yet unknown combinatorial potentials.

The accretion 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. Whitman expresses the cosmic urban rapture of the ever unfolding, ever reverberating conviviality and iteration through time in “Crossing Brooklyn Ferry,”⁷ but there is also a sense in which any one of these elements contains the potential to themselves spiral off into further constellations. In “Once I Pass’d through a Populous City”⁸ the writer sloughs off the role of the purposive poet, supposedly traveling in order to be “. . . imprinting my brain for future use with its shows, architecture, customs, traditions,” wiping memory or self-improving intent by disappearing, being detained in love. The city as agglomeration of heterogeneous parts contains a myriad of magic doors and improbably secreted switching-systems opening up into other dimensions. There is an interplay between the one and the multiplicities it contains, that it might be, that it might have been, that it weaves in and out of as relations of dimensionality. Elements in a paratactic list always open up into a matrix of immanent universes. Each of the elements in a list is hypotactically stacked in relation to the immanence of what it is next to, what it abuts to and differs from. Such hypotaxis is virtual, that is, for its actualization it demands power to the imagination.

The fecundity of such writing is not found in adherence to the particular form itself. Lists in digital environments, appearing as menus in applications, the various types of lists available in HTML, or in radio-button interfaced multichoice forms front-ending databases, can, just as easily as being the signature of digital abundance, also provide a not-so-magical entrance to the preformatted pluralism of “customizable” portals.⁹ Here, where the “One is always the index of a multiplicity,”¹⁰ we can assume that it is the one as brand, portal, or identity that takes precedent. The form of the internet portal, for instance, provides not the content accessible via its site, but the “digital environment”¹¹ within which it is managed and policed, a hegemonic “manyness” for which all that can be claimed is that “there’s lots of it and it’s all equally great, being all the same.” The aesthetics of multiplicity that Deleuze describes is instead characterized by an “almost mad sentence, with its changes in direction, its ruptures and leaps, its prolongations, its sprouting, its parentheses.”¹² To be involved in such a sensorium is to experience a constitutional incapacity to be restrained or plugged into a format. A simultaneous reeling off of information and reeling at the implications of each element making it up provides a compositional drive for the use of lists in developing an account of medial interconnection. Simply enumerating the diverse components that make up a media system allows for speculative work to take place. Parataxis (a sequence of this and that, “ands”) always involves a virtuality that is hypotactic (concepts and things, nested, meshed, and writhing). It puts into place a virtual syntax. How *can* they be connected? The heterogeneity, the massive capacity for disconnectedness of the parts, coupled with the plain evidence of their being linked by some syntax, of writing or performative action, allows for the invention of newly transversal, imaginal, technico-aesthetic or communicative dynamics to flower.

So here’s a list. Pirate radio: transmitter, microwave link, antennae, transmission and studio sites; records, record shops, studios, dub plates; turntables, mixers, amplifiers, headphones; microphones; mobile phones, SMS, voice; reception technologies, reception locations, DJ tapes; drugs; clubs, parties; flyers, stickers, posters.

One “understands” what radio is. A list like this merely settles the point, a set of nouns. As a media ecology it has supposedly settled down into its place in the larger scheme of things. The list in the last paragraph is unremarkably flat. It arranges a sequence of components, all of which too are known. Such a list only provides a drop, a break between beats as the parts

themselves by virtue of simple alignment begin to suggest patterns, alliances, affinities. In *Energy Flash*, Reynolds's account of pirate radio focuses on how an "apolitical," rapturous unity is generated among participants in the circuit. At the same time, as all the various elements organize in combination within the sound, across the city, through a jumble of available media, there is also a sense in which the polyphony traversing the signal echoes a wider sense of connective disjuncture as a crucial term of composition. Multiplicity is induced by two processes: the instantiation of particular compositional elements and the establishment of transversal relations between them. The media ecology is synthesized by the broke-up combination of parts. This "unity" is thus brought into being by disequilibrium, the fact that things get moving, by asymmetrical relations of being in media. Each compositional fragment, each item on the list, can—while being under the effect of certain grammatical schema nameable as an object or a whole thing, as with the unexpected discovery of a lover in Whitman's populous city—opens up into other permutational fields. Each part, then, forms an axis to which this shifting patchwork can be connected.

Transmitter, Microwave Link, Aerial, Transmission, and Studio Sites

The tower block, condemned as a vertical slum by a Control¹³ that would rather update its architectural dimension into forms more amenable to representation in the camera-friendly streetscapes of *Coronation Street*, *East Enders*, or *Crimewatch*, becomes an "incubator." The thicker the forest of towers, the more antennae perched above the city, the more the Radiant City, botched, radiates.

The most grinding work of a pirate operation is in maintaining transmission sites—renewing equipment after busts, finding new locations for studios, links, and aerials. Financial attrition as equipment gets eaten up in seizures is one way that the airwaves are kept locked down. Of the legal guidelines governing the running of Independent Local Radio stations in the U.K., there is a host that specify the technical standard of equipment to be used. These, according to Hind and Mosco, authors of a lively survey of pirates operating in the mid-1980s, perform as a substantial hurdle to broadcasting.¹⁴ Pirates operate without such prescriptive demands, working instead with their inverse: at what level of cheapness will things still run? How disposable can

the gear be made in order that when it is seized another can be put into play as soon as possible?

It is also in these areas that much of the pragmatic-conceptual work—the tacit knowledge gained through active participation in a process that any culture of use or self-taught expertise lives on—of running a station arises. There is a phenomenology of cash flows, of the libidinality or dullness of the work of broadcast, of setting signals loose to evade capture, signals that are yet received, and a sense of a technico-aesthetic life inventing and resensing itself through the process. How can this part of the activity of pirate radio be thought through in relation to both the sounds blasting through them and the networks of the exultant city they forge and take part in? The pirates bring together a vast range of skills that are sensual, technical, economic, social, and eminently pragmatic.

For Deleuze and Guattari imagining into the working procedure of itinerant metal-workers, exploring and working the flows and idiosyncratic qualities of certain metals or alloys, “The *machinic phylum* is materiality, natural or artificial, and both simultaneously; it is matter in movement, in flux, in variation, matter as a conveyor of singularities and traits of expression”¹⁵ (emphasis in original). The phylum of the taxonomist exists to demarcate between kingdom, of plant, animal, and so on, and in doing so track their slow torrent of mutations by means of similarity of appearance. The word is in the process of loosing its internality to zoology. Phyla are replaced or added to by other systems of reference, such as clades, analytical tools produced by emergent tools and discourses, such as genetic databases, which provide access to dimensions and interpretations of evolution other than those simply available to the interpretative eye.

Deleuze and Guattari’s use of the term “machine phylum” echoes this loosening from specific reference, allowing the concept to take up its potential for transferability across domains. Like “ecology” itself, or the “replicator,” which appears later, terms jump category. Here, the conceptualization of a phylogeny is the “persistence and change of many individuals through time.”¹⁶ Manuel De Landa provides a succinct image of the machinic phylum when he describes it as “The over all set of self-organising processes in the universe. . . . These include all processes in which a group of previously disconnected elements suddenly reaches a critical point at which they begin to “cooperate” to form a higher level entity.”¹⁷

The metallurgic artisan theorized in *A Thousand Plateaus* provides a key early moment at which consciousness of such transitions into self-organization can be recognized as being also cultural and social. Tracing this flow of matter and the intensive points at which it changes from ore into a purer form, from solid into a molten state, is complicated by and echoed in the flow's relation to the points at which following it becomes subject to circuits, to arrangements between a here and a there, between one fixed state and another. Flows are connected, for instance, to the mercantile, to divisions of labor that separate out the roles of merchant, prospector, and artisan into distinct categories of behavior and access to modes of perception and action. Not properly nomadic, not capable of becoming sedentary, metallurgists become itinerant. Cursed into this border category by their knowledge, they must engage, carefully, with each strata and work with seams and thresholds.

The metallurgist possesses an intense relation to materiality: a proprioception of and through the changes of state of the matter that one is working with, becoming aware of its tics and glitches in terms of how they are mobilizable, in what realms they operate in topological terms, what they connect to or elide. An experiential science or tacit knowledge formed through the use of impurities and changes in structure and integration of metals by leaps between temperatures through heating and quenching. (An alliance of access to wood or charcoal, ores, and water was needed.) This minor science is presented in *A Thousand Plateaus* as being a tradition counter to or partly submerged by that of *hylomorphism*.¹⁸ This schema, or “form–matter model,” has dominated Western thought since the first systematic schools of ancient Greece. In the treatise on nomadology by contrast, Deleuze and Guattari propose an emphasis on the morphogenetic capabilities of material itself: the moments when a series of forces, capacities, and predispositions intermesh to make something else occur, to move into a state of self-organization.

Hylomorphism is “a model of the genesis of form as external to matter, as imposed from the outside like a command on a material which is thought inert and dead.”¹⁹ By contrast, the conceptual device of the machinic phylum allows thought to enter into a thicker relationship with practice, with material traits of expression, their constitution of effects. Counter to hylomorphism in Simondon's account, is the process of individuation, whereby materials produce their own capacities of formation in relation to the morphogenetic affordances around them. Recognizing hylomorphism allows accounts of tech-

nicity and media to escape from a merely semiological reading of the world into an expanded involvement with and of it.

In stating that “Electricity has always existed and it’s not just a phenomenon of this century. It’s always been in thunder, lightning. . . . Instead of wood or leather or metal and all the things we so far make music out of like stroking strings—now we’re using electricity,”²⁰ Björk hooks into one of the thickest of the veins of this machinic arrangement of the wider media ecology of pirate radio. But crucially, her insight at once ablates the distinction between digital and analog electronic music by looking at a scale below: to its substrata, the various means for the extrusion and torture of electrons. It is this—whether it occurs as representation as bits of information, as slider bars on a sequencer interface, as the scraping of a vinyl trench against a needle, in stamping on a fuzzbox, or in the direct construction of circuits and hardware—that calls to mind that semimystical force experienced at the time of Edison and Tesla. It is as the hidden element between metallurgy and music that electricity also brings to light “A life proper to matter . . . a material vitalism that doubtless exists everywhere but is ordinarily hidden or covered.”²¹ Electricity scratches the vitalist itch precisely because it involves the operation of matter on itself.

But as Kittler easily points out, “Electrics does not equal electronics.”²² The media systems that in combination produce the current form of pirate radio include both the primarily electrical or electromagnetic (the T1200 gramophone, the transmitter coil, etc.) and those that exist in the mode of digital information and electronics (e.g., the GSM phone—something of a bastard case in that it necessarily maintains an interface to electromagnetic waves; and computationally based samplers and synthesizers, etc.). Both electric and electronic sound technologies also allow a sense of a *doubling* of the machinic phylum in that the manipulation of singularities and flows at one level becomes explicable only when it manifests at another—in sound waves. Just as for generations of zoology, organic phyla were sensible only through our seeing them in particular senses as mutational fields of a shared body-plan, this area of the machinic phyla is operated in and manifest through sound. The threshold into self-organization is crossed only when a bunch of components becomes something else. This sound not only exists at a level independent of the technical and social assemblages that are mobilized around it; it also articulates them, gives them sensual, rhythmic, and material force. That is to say that the interactions of the multiple social, linguistic, algorithmic,

technical, and other drives that merge and recombine in the media ecology are of necessity not “comprehended” or owned by any one person or group; but there is a clear sensation that when it works—when it generates the mutually excitatory fervor that Reynolds speaks about—it works as a result of all these combinations crossing into another state.

Deleuze and Guattari credit the particular historical example of the itinerant metallurgist trading between the nomad and the sedentary, with a tendency to, of necessity, evade regulation. Such a position does not solely mean a simple disappearance from control, but also a process of pragmatic deformation of control. In this way, interrelation with the phylum, its process of combination, is with more than what simply gets caught up in its flow. The machinic phylum of the pirate radio traverses not simply that of its constituent technologies, but a whole interrogative field of social, juridical, legislative, political, and economic formations. As Tim Westwood points out, in a text full of unfortunately misplaced optimism about the possibility of the legal stations opening up fully to underground music, before the 1984 Telecommunications Act, which allowed for seizure of transmitters *in use*, the key innovation that allowed pirates to broadcast twenty-four hours a day was a barrister’s interpretation of a clause in the Wireless Telegraphy Act (1949), “to the effect that ‘any apparatus made in this country cannot be seized until the case goes to court and the order is made.’”²³

The machinic phylum of the radio in this sense is that of the creation of flow among dense population, an expanded form of phyla that at once multiplies the domains in which it is traced but is *also* produced in the attempted or actualized imposition of hylomorphic patterning—law, the state, or the technologies of capture employed by it. Foucault²⁴ and lived experience remind us that the *capacity* of law for the full subsumption of what it deems its matter is never what is actualized. Elements in a composition are forged and conditioned by this encounter, but not in submission to it. *Readings* of these formations, their utilization, the finding of such loopholes within them—all constitute a way in which hylomorphic patternings themselves can become *hyle*, matter for the constitution of flow.²⁵

Radio’s section of the electromagnetic spectrum was born regulated. At the end of the nineteenth century, the British government “Made the wireless telegraph a state monopoly, assigning it to the Post Office, with oversight granted to the Admiralty.”²⁶ The only portion of the spectrum not directly falling under state control and procedures of licensing is that visible to the naked

eye. For the purposes of radio broadcasters in London and the rest of the U.K., regulation is held by the Radio Authority and carried out by Branch Four of the Department of Trade and Industry (DTI). The media ecology of the radio is perspectively defined for this agency by section 172 of the Broadcasting Act, in its additions to the Wireless Telegraphy Act 1949, as: any premises, vehicles, vessels, or aircraft; any wireless telegraphy apparatus;²⁷ recordings, recording equipment, playback equipment; or any equipment “connected directly or indirectly, to wireless telegraphy apparatus.”²⁸ This is a relatively close-quarters description of material likely to be seized on the spot in a raid by the DTI. Section 170 of the Broadcasting Act 1990,²⁹ however, expands culpability to a network of filiations involved in either maintaining the technical equipment of a station, providing material to be broadcast, or supporting or trading with the station in any way.

A conjunction can be made here with “Encoding/Decoding,”³⁰ an essay by Stuart Hall in which he argues for a derivation of the model of media communications, via several disciplinary permutations, from Claude Shannon and Warren Weaver³¹—a schema in which the process of communication can be resolved into five linearly arranged elements: source, transmitter, channel, receiver, and destination. In Hall’s account, the three middle terms, that is, the “media” elements, have been replaced by the simple term, “message.” The particular way in which “meaning” is shaped and conditioned is the object of Hall’s study. In one sense, the text follows a broadly Althusserian account of “structure in dominance,” in which various practices within this tripartite circuit are conjoined and modulated by the prevalent forms of discursive production. At the same time, the document is a key point in the collapse of left-functionalism and a useful transversal node to recognize as canonical cultural studies engages with information theory. One can read here an account of the breakdown of the smooth isomorphic mapping of the form of domination onto its object, which falls outside of this schema. While Hall follows a hylomorphic model in describing the mechanisms by which media are articulated, how meaning is produced through a “passage of forms,” he also describes how, in the distinction between the circuit of communication and the “meaning” relayed, there is the possibility that, since each phase within it “has its own specific modality and conditions of existence, each can constitute its own break or interruption of the passage of forms on whose continuity the flow of effective production (that is, ‘reproduction’) depends.”³²

These differentiated moments within the “totality” formed by the social relations of the communicative process as a whole are, in Hall’s account, points at which each distinct formation—an institution, a body of technical knowledge, a system of language—articulates the message according to its discursive and productive norms, and furthermore, must deliver the message. At this point again it becomes subject to the frameworks of knowledge, relations of production, and the technical infrastructure at play at the point of reception. At this point, if not earlier (although he is speaking specifically about television), each message is subject to potential mapping by meanings that are not “preferred,” which do not “have the whole social order embedded in them,” and, since “Connotative codes are *not* equal among themselves,” the point of reception, of negotiation, and of potential “resistance” is reached. As is well known, this threshold is a point at which cultural studies as active project and as attentive, painful student of consumption trapped in receiver mode begin to bifurcate.

Although this account is extremely useful (since it distinguishes implicit productive, technical, and discursive activity, allows for a way of analyzing their conjuncture, and provides a way of tracking their ramifications through various layers of mechanisms of influence), it maintains the strict division between form and content. In its emphasis on the imposition of form, the model does not provide for a full account of potential media practices. If we are, for a moment, to follow the form–content model, it is possible to describe the regulations governing radio, the agencies that enforce them, and their technical apparatus and professional procedures as the “form,” the shape-giver to the actual practices of radio—“content.” The ability of the content to mobilize resonances in and of itself, to bust out of the regulatory jelly mold, would in this case be impossible, unconceptualizable. That it *is* able to do so is manifest. And in a sense this is precisely what Hall aims to highlight in his emphasis on the “struggle in discourse,”³³ but it is the way in which such practices are filtered by the form–content model, with its emphasis on reading and coding, that renders such an account unsatisfactory for any enactment or expression of becoming. The emphasis on interpretation comes in part as a residual anchoring in literary and textual practice, which constrains the mobilization that Hall attempts to make of them.³⁴ Here, where the model of form and content floats limply free from what it attempts to describe, the notion of media ecology, where media elements possess ontogenic capacities as well

as being constitutively embedded in particular contexts, begins to make itself useful.

Although we must take it as given that the regulatory agencies only fully exploit their powers to the extent of their discretion, and of those above them, such a formulation of the situation does not adequately describe the more complex interrelations of what are codified as form and content. And this is where an involvement with the tricky materiality of media synthesis pays off. Pirate radio has shown a capacity to generate medial growths that ground themselves in the attempt to impose form on them, to synthesize what is fundamentally heterogeneous. That is, the attempted hylomorphism itself becomes “content”—there is a coevolution, an arms race that feeds the machinic phylum. A particular component of most contemporary pirate radio provides an example.

Once the DTI gained the ability in law and in practice to seize studio equipment, it became imperative to separate the location of transmission from its source, the studio. This can be done physically, by barricading the studio off and keeping a wire connection between the two locations. But it is now most commonly achieved by means of interposing a simple microwave link between the two sites, something that can be done at reasonable range providing line of sight connection is maintained.

Mutual escalation of competing technologies, of legislation and its object, of the appropriation of locations for studios and for transmitter sites, produces its own mutational field in the composition of the machinic phylum of radio—more must be done, at greater difficulty and at higher cost, but the result is *in excess* of what had previously been legislated against. It is now harder to locate and capture a studio connected in this way to a transmitter than it was before the legislation was introduced. (The DTI have to first triangulate the position of the transmitter, then without disabling the broadcast signal repeat the operation from the position of the microwave link aerial.)

Deleuze and Guattari’s introduction of the term “machinic phylum” makes possible its mobilization as a conceptual resource in addressing the process of innovation and constitution within conflict, that is, within historical time, of technologies and of media. What shapes-in-motion, what dynamics do these combinations of media instantiate as they come into composition? What, of these processes, of those that are actualized and those that remain virtual, are the ways in which the users and assemblers of these combinations of

technology track, channel, splice, and provide multipliers for the emergence of these mutations?

The focus of Hall's study is on the influence of other factors on the processes of signification/encoding and of reading/decoding and evinces cultural studies' particular kind of attention to the mechanisms of domination. The treatise on nomadology and more significantly the practices it draws on are by comparison concerned more with dynamics of combinatorial production, a production that in the use of it made here also exceeds that of metallurgy. This is not to say that the machinic phylum, in media for instance, has ever to be in any way metallic, electrical, or electronic. Ghost Dog is made invisible by an anachronism, the use of carrier pigeons to maintain contact with his master.³⁵ Zapatistas, passing unnoticed in the jungle under the array of scanning devices of the state, simply make no direct use of electromagnetic media, but appear at will on all networks.³⁶ In these cases, to avoid becoming content to form, to evade codification, is not only to disappear but to concentrate more fully on the material, the missing middle terms: receiver, channel, transmitter. This other term, the machinic phylum, allows us the chance to do that—to sense into the ways in which medial dynamics in combination generate behaviors, qualities, and openings that are more than the sum of their constituent, codified paths.

Records, Record Shops, Studios, Dub Plates, Turntables, Mixers, Amplifiers, Headphones

When it gets rolling, the psychosensory expansion of the media ecology of radio becomes itself a machine for the generation of potentiality, of combinatorial morphogenesis. At its dullest, too often, it simply becomes one more appendage to the *synergy* of a marketing strategy.

The turntable, with its appendages, is a stalled computer: a head and an infinite tape. It can read stored material, it can reproduce any sound; but used in the standard way, it can only read, not store. Hip hop declared war on this nonfacility by throwing the disc into reverse, mutilating predetermined regimes of speed and frequency. Hip hop mobilized the third category of action of the computer; alongside reading and storing information, the universal machine must be able to act on itself, to calculate. The phase space of all possible sounds of the turntable is determined by the table drawn up at the intersection of speed and frequency. Turntablism opens this space up to

mutation outside of the regimes of melody, harmony, and voice by forming a copula between the two series, rhythm and noise. The endless tape of the Turing machine is imposed on the finite coil, causing it to leap from break to break. Feedback is “the property of being able to adjust future conduct by past performance,”³⁷ to reprogram: to alter its performance in the light of computation. The turntable invents the DJ in order to compute.

Enough has been said about the close-up use of the devices of the DJ. This is an empty zone within this particular medial assemblage, one that is occupied by swarms of the part objects of ear and hand, but one that is—as that element most susceptible to being locked down as a proper name—that of least interest for this particular discussion. Let us simply say that these components can be plugged together in several ways.

Microphone

Tetsuo Kogawa³⁸ occasionally performs a technical instantiation of what Brecht³⁹ and Enzenberger⁴⁰ pointed toward and what every radio engineer knows. Any radio receiver can, with a modicum of fiddling, be converted to a transmitter. Radio waves are produced by feeding an electrical signal to a mast or antennae. The signal changes the energy levels of the electrons in the metal atoms within the antennae, thus causing them to emit radio waves. Before it reaches the mast, the sound wave that is to be transmitted is modulated or superimposed on the radio wave so that it “carries” the sound. At the receiving end, radio waves strike the aerial connected to the receiver—as they strike everything else—producing weak electric carrier signals in the metal atoms. The receiver selects the carrier signal of the required station, extracting the sound signal from the carrier signal, sending it to an amplifier and loudspeaker to produce the sound. The inverse correlation between loudspeaker and microphone continues this existence of the transmitter as mirror-world of the receiver.

Given this process, it is useful to give a listen to the various ways in which what the microphone is connected to—voices, throats, lungs, codes, language—operate within the context of the kinds of music that pump themselves with it through its reverse, the loudspeaker. How do you make a voice? The MC dictates to the ether, pitches rhythms to nervous systems rather than to ears. He or she may be constantly making up patches of lyric and sketching them down in a notebook or scraps of paper, but these are messages that

will never be transcribed. Constantly being written out on these sheets are precise instructions for manufacture of a voice.

How do you make a voice? You are tethered to an iron ring set into the floor by a rope a couple of metres long tied round your waist. You wear a thick coat but have bare legs and feet. Two loops of rope around your shoulders fasten a small glossy-leaved tree onto your back. Under your feet is a thin spread of vegetable oil on a concrete floor, and to the side a roasting tray of the oil, which you step in and out of whenever the puddle thins. Over your mouth is an oxygen mask fitted with a contact microphone. The mic feeds into a computer running speech-recognition software.⁴¹ To make a voice, to speak, you have to run. To run means to slip. This running-slipping creates “nonverbal vocalising”⁴² picked up by the microphone and interpreted as speech by the software.⁴³ A transcript of the interpretation appears on the screen. The dislocation of language by the creation of turbulence in one body allows it to be transversally hooked out of the limited corpus held within another, the computer.

In the first half of his *Discourse Networks 1800/1900*, Friedrich Kittler describes how the German Romantics celebrated the “language of the soul” as a succession of “Ohs” and “Ahs,” the open throat and gaping mouth creating a superhighway for their transports of *Geistlichkeit*. In *Gramophone, Film, Typewriter*, Kittler goes on to note how “By simulating and filtering certain frequency bands” the contemporaneous inventors of automata⁴⁴ were able to generate such sounds in a series of models based on the membranes of throats and mouths.⁴⁵ The manipulation of a set of parameters of frequency and speed of vibration⁴⁶ thus abolishes the soul, and “The real takes the place of the symbolic.”⁴⁷

What are the conditions in which we utter only vowels? “Ay,” “Eeh,” “Iiy,” Oh, “Yoo”? The list starts easily, and goes on. Moments when we give vent without thought to linguistic signification.

In “Hearing Things,” described above, Aaron Williamson enacts perhaps an echo of another of his poems, constructed through the figure of Solo Boy, a four-year-old who is “languageless” yet “padded round / walls soaked through / with sterile terminology.”⁴⁸ Solo Boy perceives “not so much the people / around him, but the / invisible frisson / and tensions caused / by their perplexions / within an endless maze / of routings and referrals / filing cabinets fill up / equipment arrives / casebooks, articles.”⁴⁹ Speech and its reception becomes Law, each syntagmatic accretion another node solidifying along

the alveoli of power. The imperative to adopt the correct positions of sender and receiver is instantiated in these media technologies of the discourse network of the doctor. Language becomes medicine. Eat it up. And the figure of the boy? “In any case he sits there / usually / in a corner / neither here nor there / yet boggled / with his amorphosis.”⁵⁰ In “Hearing Things” the amorphosis is the shapelessness of the ill-disciplined throat. It returns as the making of shapelessness turned loose among the indexes and arrays—the rules for listening—of the speech recognition software.

One among many of the repetition of files and folders of the desktop metaphor, speech synthesis software interprets electromagnetic input from a microphone. The vibration of the mic is transduced into a series of variations in an electric current. This current is further interpreted by a series of logical operations built into the computer at the levels of hardware, operating system, and software. Signals, converted by the hardware into a series of ons and offs, become, in the software, a sequence of zeroes and ones, which the software then compares to an array of tens of thousands of other sequences of zeroes and ones corresponding to words.⁵¹ At this point the software also makes available special discourse-recognition additions, with expanded corpora of specialized vocabularies (for lawyers, “public safety professionals [investigators, agents, detectives, officers, and other law enforcement personnel]”⁵² and doctors). Users can also specify at the point of purchase whether they suspect that they correspond as a speaker to the software’s models of “American, Australian, British, Indian or Southeast Asian”⁵³ varieties of English. At the other end, the selected word appears on screen, free of any encumbrance of context apart from the algorithmically precise accident of being there. The text is pocked by punctuation, marking the momentary stillness of the microphone.

This conveyor of *parole in liberta* is a procedural reversal of Russolo’s Futurist noise machines,⁵⁴ the bellows, plates, hammers, and noise-boxes of which were perhaps the paradigmatic manifestation of modernism’s clocking of the tremors, beats, and aural shocks of industry and the new inventions of warfare. But in “Hearing Things,” there is no music hall catastrophe machine built in much the same way as the speech automata described by Kittler; there is no escape into the purifying rapture of noise. Any signal at all is taken up by language. But language itself becomes the catastrophe. It is language as catastrophic and voice as an engorging of that catastrophe that will be discussed shortly in relation to the construction of the MC voice. First we need to take

a detour through the three key forms of recorded voice found in pirate radio. Here, “recorded voice” refers to voice explicitly realized as medial transduction of voice as recording. What is attended to are the various ways in which the mediality of these voices is produced as domains of mutation or of “reality.”

The voice invented by soul, R&B, and hip hop is based on orality, the live rap, the open throat. The hip hop voice is indexical.⁵⁵ As the words are propelled forward through the throat and out from the mouth they also point precisely back at where they come from. “You represent where you’re from and see who you are, like that.”⁵⁶ Such a voice states its claim to attention in spatiotemporal terms. It emerges not only from a particular body, but from a body that has emerged from the violence of racist and class stratification of the United States, the *banlieue*, the townships, and the fractal colonialism of the U.K. It is an array of voices that has constructed itself as a means of escape from and mode of activation in these zones, while being profoundly marked by the conflicts involved in its “staying hardcore while going global.”⁵⁷ The hip hop voice emerges from an interplay of constraints, attempts at and realizations of “practices of encoding,” and, through amplificatory and productive processes, what sociolinguistics names a “domain.”⁵⁸

A key locus of difference between hip hop and R&B is in the construction of the voice: Hip hop mathematics class. At the front of the classroom the cadaver of a singer is laid out on a workbench cluttered with Bunsen burners, rizlas, vinyl. Limbs wrapped in blood-soaked Gucci loungewear hang loose, one arm flopped over the side. Thick air is sweet with the smell of meat on the turn, and motionless enough to allow columns of smoke from the fat jointed fists of the students/judges at their desks in the dark room to collect directly in a straight line up to the lowering cloud at the ceiling. At the front, behind the demonstration bench, underneath a tall hedge of hair and behind a surgical mask, stands the professor. At the end of his white-coated arm is a machete, sharp enough to be shaving the skull of the specimen. The task is quick and silent. Once the path has been cleared, the professor slowly lifts his blade to the full height of his arm and explains the preliminaries. At the precise moment he ceases to speak, it drops. The skull splits in one stroke. Every thread of smoke in the room is drawn through the same vortex of air echoing the movement of the machete as it spreads and dissipates through the room. Fingers are thrust into the exposed brain. The professor pinches onto

something and eases it smoothly out. He gathers long loops of minusculely thin threads, one hand pulling into the other, cupped. After a few minutes, the material has been spread onto an overhead projector looking like a nest of phlegm-eating worms. The professor spends some time arranging the threads so that their interlinked structure can be revealed. A simple forking hierarchy, a tree structure. The professor shakes bloody jelly from his fingers and looks out at the class with his most serious stare.

“A Markov Chain. The melodic, rhythmic, and lyrical structure of R&B is constructed through the progressive depletion of improbability. Neural pathways.” On the screen, the shadow of his finger pokes a point in the hierarchy. “If the lyricist chooses ‘sweet’ at this point in the tree, and we have three child nodes branching from it, what are the ranges of probability determining their next utterance?” He picks out the next four nodes in the tree. “We have ‘baby’ here. ‘Honey’ here. ‘Sugar’ here, and ‘sweet,’ again, here.”

“This parasitical organism is a mathematical infestation. In this case, the melodic, rhythmic, and lyrical state of each R&B track is a process containing a finite number of states for which the probability of being in each state in the future depends only on the synchronous state of the process. That is to say, the likelihood of any of these four lyrical moves after ‘sweet’ is determined by ‘C,’ the cheese quotient of the track calculable at each moment by its present state. In this case we have a uniform 25 percent probability for either baby, honey, sugar, or sweet. At each stage of branching the probability of one or more of the melodic, rhythmic, and lyrical possibilities rots that little bit more until at the end the subject is left gibbering, crouched on the floor of their soon-to-be-repossessed studio penthouse, and locked into one beat, one microscopic melodic loop and one lyric. At this point it is only civil to put the unfortunate host with the most out of his misery.” He spreads his fingers in the direction of the corpse. “Beware, though: this plague jumps genres. No one is protected. Laws breed themselves more laws.”

Hip hop does funny voices, melancholic monotones, actorial expression, feeds its voices through the bit constraints of telephones and loudhalers, samples voices from other media (often as explicitly *non-hip hop* voices drawn from news, instructional recordings, but also as voices that are mobilized *as* hip hop—Malcolm X, Shaolin spiel, etc.). It teems with allegiances, dead friends riding the vocal cords,⁵⁹ voices of guns,⁶⁰ talking blunts,⁶¹ advertisements,⁶² mouths slurping on themselves in cod-sex. But almost nowhere, even in

beatboxing, and for many reasons, does it allow the voice to become primarily synthetic. The reckoning behind this? That it allows the voice to operate more vigorously in keeping it real.

Recognizing that the audibly synthetic is also what makes this realness is, by dint of many confluences, slips, and mixes, constitutive of the currents of music contemporarily most broadcast by pirates in London: primarily garage music and its spawn. Drum and bass and jungle are available too, where you can find it, as well as techno, electro, and the hemorrhage of genres associated with them.⁶³ Cue up the voices of Mantronik or of Kraftwerk, and what speaks is the Vocoder, the manufacturer of the first explicitly synthetic voices in popular music.⁶⁴ Complexifying the potential split between indexicality and synthesis, the vocoder was invented and initially used for marking the precise identity of the caller as one-of-two at the peaks of governmental-military hierarchies. Churchill and Roosevelt used a then advanced version of the technology to communicate between two room-size sets in Washington's White House or War Department and one in Westminster from 1943 onward. For the voice to be trusted as coming from a certain individual, as bearing truth, it had to become totally unrecognizable—alien.

Once the voice becomes captured, or, more accurately, is recorded as a waveform, it is manipulable along the two axes that map that waveform. Time modulation and frequency modulation, once manipulable, open the voice up to mutation. This is the condition of the voice within digital recording, but it is not the first time that the voice has had to become virtual in order to gain power: “3D recording”—voice overdubbing—was used on early, monaural, rock and roll records in order to give power and clarity to the vocal track. This virtuality, however, was and always is locked into providing a clarity of “presence” for the voice that refers only to its idealization and not to its production.

Dub—the permutational space of the studio combined with that of Kingston—brought to recording the equivalent of the optical unconscious that Walter Benjamin describes as being introduced by the film camera: “With the close up space expands, with slow motion movement is extended. The enlargement . . . reveals entirely new structural formations. So, too, slow motion not only presents familiar qualities of movement but reveals in them entirely unknown ones.”⁶⁵

For the sonic unconscious, speed of movement is processed directly in the body. John Woo (in a trademark technique that defined films such as

Hardboiled Cop, but which has now become part of the general repertoire of effects) slows down a bullet so that the grace and menace of its transition from barrel to body can engorge the sensation of its occurrence. Dub understands bass so well that it produces, in certain tracks, a sense of the bass line folding in on itself, to make a speaker produce a frequency so deep that you can sense yourself hearing the diaphragm slowing down to zero, but vibrating so powerfully that it contains a copy of its own obliteration and survives. The same can occur to the user of the music. Music such as dub and x amount of beats per minute up, jungle, provide a training routine for the user to learn and move among the conditions of operation in medial space in its broadest sense. Sonic unconscious is material that is collectively produced and is gated and intensified by multiple layers of processing—it becomes malleable, potentiated, in reception. These are types of music that are fundamentally synthetic. They declare the whole spectrum of vibrations at any speed or frequency subject to their inventive power.

Once digitized, any waveform becomes not only adjustable along the modulation vectors of time and frequency but also algorithmically manipulable. The voice thus loses itself as a separate category of sound. It is able to construct itself as “A mere motion of the air.”⁶⁶ That is—notwithstanding the epistemological functions of the tools, filters, and capacities of the software and hardware brought to bear on it—it gains at least potential access to a much wider phase space of potential embodiment than the corporeally anchored voice. The sampled voice becomes part of the rhythmic mix, rather than an indexical hook.

Rewind: Buju Queers His Throat

If the digitized voice in drum and bass, jungle, techno, and so on achieves an escape velocity that allows it to become monstrous, there is—in ragga—another field of vocal mutation worth exploring. Dancehall DJs⁶⁷ have invented some of the most powerful styles of voice to be found on pirate radio—and still found largely only on the pirates, or played by DJs who were originally on pirates—in London.

A voice can kill, a voice can destroy. A voice can be engineered to burst from a riven but resilient body. The voice emerging strong and energized from catastrophe is heard in hip hop perhaps most in the immense stomping tracks of early Busta Rhymes,⁶⁸ and others where the throat and mouth become a

chiliastic fuck-muscle drawn in Marvel Comic ink. In dancehall, perhaps the most mutant precariously hypermasculine voice is that of Buju Banton. The esophagus is lowered on its suspension in order to give the volume/velocity waveform at the larynx its typical menacing profile. The throat-scarring tortured roar of hardcore (Napalm Death, Deviated Instinct, Larm, Septic Death, etc.) is turned melodic, is sung, slowed down to wrap the vibrating flesh of the air pipe round your ear. In Buju's old duet with the falsetto Red Rat,⁶⁹ you can hear, as the voices alternate, how the part is literally played—how elements of the media ecology of the sound system, amplifiers, echo boxes, not only provide a venue for this voice, but while it remains ostensibly organic have also been partially incorporated into it. Chopping and cutting from throat-kill to sweet melody in a cunning but polite enough and never truly disturbing way, female vocalists in garage⁷⁰ break from dancehall to soul, from toasting to whispering make the air shudder. Such machinings of the voice do not only occur in terms of “the vocals” but are also drawn out by the other sounds it enters into composition with. Music, as it senses at different times and in different ways its own synthetic nature, intensifies its mutation of voice among sound. Compared to this, the supersaturated sweetness of the more vocally fixated and “mature” sounds typical in garage before it became welcomingly grimy are absolutely forgettable. For voice, becoming electronic—not only becoming digital—makes it already aware of its own machining.

For Rudolf Arnheim, the announcer's voice should behave like polite typography.⁷¹ Discreetly spoken captions to annotate the sequence of sounds being purveyed to equally courteous listeners. This mode remains as a default, constraint equaling authority, but mainstream broadcasting has since also developed an “extended” range of presenter voices.⁷² This extension necessarily includes a categorization of those that are to be excluded:

Don't expect the application of stylistic delivery crutches such as: The Puker, The Big Smile, and The Big O to improve your air person's delivery. (If you're not familiar with these terms, The Puker is the hyperextension of CHR [contemporary hit radio] delivery. The Big Smile, prevalent on soft-rock and AC [adult contemporary] formats, sounds as if a pre-formed plastic smile insert has been placed in the announcer's mouth. The Big O is the female talent who sounds as though they are on the brink of orgasm each time they open the mike.)⁷³

The voice always exists in relation to what it is heard by. Just as the voice of crooners such as Bing Crosby became possible through an alliance with a new type of microphone, one able to pick up a softer, closer, style of singing, the MC voice evolves directly as a result of its wider context.⁷⁴ Intrinsic to pirate radio is that the hardware delay loop operated by all other stations, by means of which any transmission can be screened and brought back from the brink of the forbidden, has been taken out. Continuity is the result of fingers, discs and mixing desks, simple stamina and skills rather than cartridges of jingles and preface links. The function of the MC is fundamentally different from that of the announcer, the newsreader, the personality. Pirate radio is made up of a crossfire of medial trajectories, the MC providing a form of metainformation about their intersection. It is a position that jumps, changes direction, and takes note, adding data on the fly. It gains this position by being hardcore.

What is hardcore?⁷⁵ Is it another “science,” an abstract proving machine that governs the right to speak?⁷⁶ A science in the sense that all those who are allowed the capacity to practice it, who are hardcore and therefore need not speak about it but simply enact it, gain their ability to be hardcore by recognizing and invoking the epistemological, rhythmic, vocabulary modes by which it is made. This is the means of its dispersion, transport, and eventual mutation, its means of connection with other operations. In this manner, hardcore, a meritocracy of sorts, is constitutionally open at certain scales within the wider dimensions in which it operates. At the same time, it is because of the way in which all these stylistic and methodological elements are forged through multiscalar historical interactions with dynamics of social, aesthetic, and economic stratification and subjectivation—and demand that they be acknowledged as being so⁷⁷ (without falling into the trap of saying that it is simply “about,” or the “result of” those of class or race and so on)—that their self-determination functions. If subjectivation here is becoming at the scale of an individual, or of a social body, it can also be said to function as a filtering system, a generator of surplus value, and as a war machine of voices and beats.

At the point of aggregation of all these medial dynamics, what does the MC do? Chats on the mike; gives the shouts; works the phone; reads out the texts; bigs up the DJ and anyone else in the studio; then chats on the mike some more. There’s no naming of tracks, or hardly ever. Exceptions would be

to hype some exclusive new dub plate or the name of a track that keeps getting requested. The vocab is hyperconstrained: imperatives, requests, responses, assertions, declarations. At times, it could be a voice enthusiastically going through an e-mail header, noting its transition from place to place, the protocols by which it gains passage; listing the names of a crew texted to be shouted out to like a cargo manifest; a flow full of imperatives, a language composed entirely of UNIX commands, an operating system bent on beats spelled out in cockneyfied black twang. A market trader selling fresh, fresh, fresh, you know say it's fresh. The position of simply being hardcore is ridiculous, and the voice acknowledges this in gibberish, nursery rhymes, jokes that can't remember when they were last funny, shouts out to a cup of tea, rants bored stiff shouting out to all the sexy ladies from the cold flat studio. Next thing, the MC is inaudible. He's muttering about the DJ, talking over the drop in a track, flattening things out.

The MC voice exists in and among others spinning off the tracks: threats and announcements of painful and fast-approaching death hooked from kung fu movies; vowel sounds sucked out of a stack of electronic lungs doing femme; lick-shots untraceable to any known firearm; clips from any of a shed-load of commercially available sample discs; phrases go out like a little clockwork duck. Just as the same track might be reloaded more times than any one person might want to hear it in a lifetime, just for the joy of the simple fact that they can do it—play it until death—a phrase might be fake, stupid, replicate just because it was heard.

The boredom, the cretinously predictable nature of much MCing is a result of the way it fuses two apparently separate functions of language, two that are also the means by which it generates its strength: the MC's role as switching system for the pirate station, and his or her function as inducer of hype. Take the simple duty of reading off the requests and shout-outs. How does an MC treat data coming in? By engaging in simple data-management tasks: delay, storage, transposition—it's an information ecology. The text or call has to be received and the right moment taken for its delivery: does the shout fit in with a prepared or freestyled rhyme? What's the DJ doing with the track, what is she planning on mixing in next? Is the beat just about to change? What's the prestige of this track—can it just be chatted over? Is that a provocation?

In one sense, the MC voice lives simply in a microworld of calls and responses, but it is in the acknowledgment of this tight mode of operations

that one can hear it suddenly leap out of its apparently constrained ambit. It's not simply that the interlocutors of the MCs calling in on their mobiles, their mum's phone, at work, the ones who can't call but you know are listening in the nick, become hordes, masses, microcliques, empty space, that they obtain heroic proportions—they do. But “the glories of information and communication”⁷⁸ have become infested by passions, puns, rhymes, and more. Jittering, repetitive, nervous, bombastic, happy. That is, at the same time as the MC assumes the secretarial position, he or she corrupts this simply informatic role with the catastrophe of language. The phrases, statements, invocations, and orders bursting out of the radio are acts of enumeration, of the establishment of relations between different elements of the media ecology by a transitory tyrant. They are the results of the enactment of this violence, this escalation of exultation upon the MC position itself. It is in the pacing, heat, fluidity, and skills of this voice that it all becomes manifest.

Drugs, Clubs, Parties, Flyers, Stickers, Posters

Efficacy of a drug is determined in part by the regularity of the crystals of which it is made up. The greater the invariability of the size of these aggregates of molecules the more predictable is its metabolization by the user. That is to say, that the drug must be composed in the most regularized way possible: a pure data stream of zeroes, a molecular landscape of absolutely self-similar order. Dosing bodies with chemicals requires that such bodies must be first organized into a mass, a user base, and that this mass must have verifiably similar dysfunctions and organs: mass dysfunction in order to generate a requisite level of demand. Mass organs in order that use can be allocated to particular corporeal regimes: the blood-circulation system, and the various ways of accessing it, by mouth/stomach or nose/mouth/lung combinations, or directly by vein. Bodies themselves extrude or grow additional organs: mineral mouths that are able to withstand fire, veins that grow sores in order to remain perpetually open. Orifices left out of the schema of mass dosage (except for miserable and tokenistic topical applications) find ways to connect themselves to drugs that are also left out in the cold.

While the peritextual⁷⁹ apparatus of pirate radio—flyers, graffiti, flyposters, stickers—might, like any advertising, aspire to generating a plane of absolute consistency, of perfect commodities fitted to perfect customers, it is clear that not every particle of information reaches its intended receptor. Memes⁸⁰ cannot

be milled to an equidimensional powder, suspended in cream and spread across a city—unless, that is, they are intended only for uptake by subjects organized solely as mass receptors.

An unusual mode of treatment therefore emerges: the mutation of communicational redundancy into hype. To protect a message from getting chewed up, so that the amount of noise interfering with its transmission becomes immaterial to its meaning being received unaltered, it is necessary to reiterate it in different ways. This protective surplus of enunciation is known as redundancy. Redundancy can apply both in terms of the information sent—its meaning can be made many times in many ways—and also to the composition of the channels of its transmission (as in the case of distributed networks such as the Internet).

It is not clear, however, until the message is received, how much of the message—how many of its manifold reiterations—qualifies as actually being “redundant.” “Junk” data may just be those elements that are reiterated until the point at which the information enters into composition with actual consciousness—at which point the last one in the chain “expresses” its message into the carrier body. That is, they cease to be noise and can be evaluated as information. Redundant information, calculated as, say, the number of stickers in corners, on walls, on lampposts that it takes to build cognizance of this information in one subject, may immediately be understood as informational by another subject. Marketing works out a cost-benefit analysis wherein the number of potential exposures to the number of subjects is tabulated against the number of product purchase opportunity uptake actuations. This, however, does not map across to the same mode of operation as hype.

The two uses of the word “information” are linked by their being used to describe conditions that refuse entropy. In the strict sense of information theory, information is measured on a scale of relative improbability where the state of maximum probability is that of entropy. The information carried linearly, from one point to another, by a message is the negative of its entropy. In the more common use of the term, information is simply “meaning”—what something “says” parsed by how it is “read”; how it is sensed, what perceptual and affective dynamics are routed through and with it, what is modulated and spun. Although the two uses of the term “information” are clearly not synonymous, what hype does is to blur the categories. Hype is that moment when the transmission of information in the strict sense reflexively incorporates information about the fact of its transmission as part of that trans-

mission. It is not simply information, but the way in which it moves. Thus, the more the information is transmitted—the more potential it has itself to become entropic—the more it leaves this double trace. At the same time, hype is not simply reducible to the circulation of good news, a good buzz. It has an algorithmic, epidemiological quality that is explicitly heartless, self-organizing. It is this double articulation that engenders the chance to leap out of the repetitious slide to informatic flatline, and into the nonlinear, into meaning mobilized and regenerated by expressive bodies.

Hype is a particularly delicate and temporary phenomenon, and its most intense manifestation within the general economy of pirate radio is the party/bashment/night/rave (these are not mutually interchangeable terms). It is the sense of the potential for it, the gating and opening up of exploratory systems of mutual excitation, as well as its activation that provides a sustaining drive of this media ecology.

Reception Technologies, Reception Locations, DJ Tapes

“Bwoy it jus’ tek you. Its time to pump up the sound and metamorphosise with the world, gwan. We’re all in cars, living rooms, bedrooms screaming for the rewind.”⁸¹

There’s a radio in the studio to check transmission quality every now and then, make sure the signal is getting outside of the room. For those in the studio there’s no guarantee of feedback, of listeners. Selection and mixing of tunes might be happening in a vacuum: a flat, (an apartment) an air-locked chamber designed for an industrial family unit, left over, no connection. The phone provides one way in for the outside. Another way in is constructed by the mapping of the media ecology by the state. According to the Radio Communications Agency, “It is an offence to listen to unlicensed broadcaster (pirate) without a license. Licenses are not issued for this purpose.”⁸²

The imaginary space of all potential listeners as participants in the machine are addressed as much as the actual listeners. Audience induces sound. There is a mythic categorical dimension to crews: the (ever popular) ladies crew, the HMP (Her Majesty’s Prison) crew, crews formed by location. The imaginary circuit of sound is amplified by the possibility of involvement in, of hearing by, real bodies. The continual reference back to listeners as part of the circuit of the show is not an attempt simply to ego-amplify the MC and DJ but to develop a “multiple ear” in the listeners. At the same time as you listen on

Walworth Road, there's someone in Beckton texting or calling in to set up a rewind or a shout for their mates. The radio provides a way of triangulating this relationship based on disjuncture.

When it gets rolling, this imaginal space becomes the medial equivalent of the space of signifying systems and matter described by Burroughs in his description of the cut-up technique as live montage (that is, without obeying restriction to merely literary intertextuality): "Somebody is reading a newspaper, and his eye follows the column in the proper Aristotelian manner, one idea and sentence at a time. But subliminally he is reading the columns on either side and aware of the person sitting next to him. That's a cut-up."⁸³

Just as for Burroughs the cut-up opens out into processes that "make explicit a psychosensory process that is going on all the time anyway"⁸⁴ the presence of the third mind. It is the enormity and variability of number of scales, speeds, and forms of conjuncture in the urban, in the "postindustrial," and all that it works in and out of, that make these connections and the popular consciousness and manufacture of them—the perceptual spaces of subjectivation folded into them—that requires the building of new orifices in order to intensify and explore this process. These organs are called media.

Different reception technologies—static radios, headphones, wearable stereos, and so on—afford particular conditions of listening. The perceptual shock of connective disjuncture is a fundamental loop in accounts of first experiences with a Walkman or other personal stereos. How they are hated by those who demand that you be rooted to your location, observing its norms. This shock is recapitulated by that of the mobile phone, the way it makes manners. Sounds of the street, the train carriage are locked out: a wormhole is opened to another time, place, rhythm, speed, tone of voice, to contexts in which speech is guarded, and to others in which it cuts loose. Mind your body language: the treble seeping out of your ears gives the game away as to what you're belonging to. The "earlid": in 1976, Louis Wolfson creates a pre-Walkman out of a tape recorder and a stethoscope in order to create a linguistic barrier between himself and the possibility of hearing his mother tongue. Thus, according to Deleuze, "For the first time in history a makeshift schizophrenic object lies at the origin of an apparatus that is now spread over the entire universe, and that will in turn schizophrenize entire peoples and generations."⁸⁵

Each of these medial organs, as they arise, requires the superimposition of a new circulatory system to sustain it upon those that preexist. Every system

of calculation, distribution, and storage also entails the development of a system for the reproduction of devices through which the storage element is to be played. The mass production of compact discs, for instance, demands the mass production also of components for players and drives. “Roll-out” of a system requires that it begins to put into place its reception before it occurs: “The entertainment monopolies have triumphed through a process of continuous centralisation and integration of all the stages of music production and dissemination; their imperatives of growth have marked the development of music technology and its communicative discourse from the beginning of broadcasting history.”⁸⁶

Partial vertical integration of markets means that it would be quite possible to be listening to music on a radio made by Sony, from a record published and printed by Columbia (owned by Sony), being played on a turntable and mixer made by Sony, and requested by a listener via a text message from a phone made by the same company. As a paratactic list, each of these elements within the media ecology is only *potentially* branded by any particular company. That the record, turntable, or phone would be made by this particular corporation is not highly probable. But it is the task of shortening the odds on this probability that primarily arranges their activity in the area. (The metaorganization of these elements and their connections by, for instance, standard voltage rates, connector cables and sockets, and so on, is developed later in the discussion of standard objects.)

The movement of power through markets and monopolies appearing as the phenomenon of partial vertical integration of materials is something separate from media “convergence,” and it is also different from the totalizing design concept of the home-entertainment console or system. These are discrete medial elements brought into combination by patterns of use. Such combination is not “authorized” by the company manufacturing these materials. Whether or not it “needs” to be authorized is immaterial. What is clear, however, is that a particular mode of media, consumer electronics, is articulated but not overdetermined by the activities of one—standing in here for a limited number—particular corporation. Key elements of the media ecology of pirate radio, such as the transmitter, are clearly left out of this schematic. The size of the potential market is too small for it to be considered as a possible area for the company’s involvement (although in this case they do manufacture or subcontract for manufacture some of the basic components out of which the transmitter can be constructed). Finding such gaps in the

production of the material of media—in which independent constructions outside of mass production are necessitated—is one way of *symptomatically* tracing media ecologies.⁸⁷

If minoritarian literature is writing in one's mother tongue as if it were a foreign language,⁸⁸ then perhaps to combine media against the syntax of the use of it imagined by its manufacturer and their marketing department would be to produce an analogous current in media. This possibility is complicated by the promise of the consumption of the self as epitomized in the personal computer, that one's personalized salad bar of needs and desires can be tailored to and customized via the desktop and what lies behind it.⁸⁹ In such cases—the mythic foundations of consumer electronics as a market—it is the position of the mother tongue that is assumed by the corporation.

Perhaps there is also a case to suggest that, on the contrary, out of the confluence of nonstandard uses of media that the company selects and focuses on for solidifying into targeted products (a process occurring particularly in the case of second generations of products, the point at which niching and differentiation occurs most massively), the relationship of the corporation to the medial systems that make use of the devices it manufactures is more accurately that of a constraining tendency. That is, the “creativity” of such formations is subordinate to the uses other actors make of its products. Both accounts would be complicated by a consideration of the actual processes of innovation, production, invention, and use that occur.

The aesthetic of mass radio is formed at the same time as that of the autobahn. The conjunction of car and radio accelerates toward the absolute immobilization of drive time. At the same time, it is a combination that plays into the deep slow bass of sounds such as Dr. Dre's early hip hop production efforts aimed toward the pace and habituations of driving in Los Angeles. After all, what is the point of having a huge bass capacity in your trunk if you don't play music to test it? The car and music, the car and radio, are, like the walkman, a way of riding down into your own ear canal at the same time as being manifestly present.

Needless to say, such formations are always themselves subject to technological rupture. The MP3⁹⁰ file format, which has achieved such mass usage as a means of circulating tracks via the Internet, is designed simply to match the included middle of the audio spectrum audible to the human ear. Thus, it obliterates the range of musics designed to be heard with the remainder of the body via bass. This is not simply a white technological cleansing of black

music but the configuration of organs, a call to order for the gut, the arse, to stop vibrating and leave the serious work of signal processing to the head. That's a sick part of it; another part is the way formats are decided on by "expert groups," committees defining standards for file formats and protocols that are supposedly open in procedure but where expertise, like those of hard-core methodologies, is defined in certain ways. Here, a fat bass becomes simply a particular Fourier transform mappable according to certain isolatable dimensions. Standard formation and nonstandard uses create a recursive cycle that is always ongoing but never entirely predictable.

Phones, SMS

In order to talk about phones, and their currently new range of facilities, it is worth marking the multiple features of their past. One episode is an earlier recursion of what Brecht, Enzenberger,⁹¹ and Brian Winston recognize as the suppression or channeling of media's "radical potential"⁹² through the range of compositional dynamics, agencies, and organizations that economic and social norms afford. In the latter months of 1877 the phonograph was "invented." This device, a literal "sound-drawer," consisted of a diaphragm with an attached stylus, vibrating to mark wax paper or tin foil. It figured in the mind of Edison, his collaborating mechanic John Kruesi, and the editor of *Scientific American* to whom it was demonstrated, as a possible way of recording messages delivered by telephone. What Edison and Kruesi did was to combine two already well-established techniques, to capture sound in a vibrating medium (i.e., ear trumpets) and to cause sound to represent itself visually by transferring the vibration to another media. Such media included a horse hair glued to a tuning fork vibrating to tickle carbon off a sheet of glass covered in fine smoke-residue, as well as the more familiar wax tubes.

Concurrent to Edison's development of the phonograph as a recording device, Charles Cros—in work later fully realized by Emile Berliner—produced the machine to become known as the Gramophone, a technology of mass-produced prerecorded sound, a technology of playback. Edison's device, initially conceived of as a recorder of telephone messages, was too slight to gain a market. His company subsequently attempted repurposing it as a recorder of various forms of speech: speaking books; language instruction material; an instrument for the recording of official proceedings; and eventually failing as a substitute for stenography. The Gramophone by contrast

grafted itself to the libidinal motor of prerecorded music.⁹³ The technologies of the phone and of music thus intertwine through their history—in a way that is not exhausted by the music left to you when the answering party departs and you are put on hold. Rather, they reciprocally and independently mark out a dimension of the media ecology, a momentary part of which is explored here. The effect of the development of one technology is occasionally to create a mutational field between two discrete techniques, allowing them to come together in various ways until one or more of their conjunctive compositions is taken up by a scale, drive, mode of enunciation, or by productive or repressive compositional dynamics, thus achieving a territorial consistency—which is then in turn perhaps subject to compositional turbulence by the emergence of other medial, social, political, economic, passional, or aesthetic configuration.

While the network of credit facilities, florist shops, and telephone known as Interflora makes the phone sprout flowers; car, radio, phone—the media ecology of the radio pirate listed above—recapitulates the abstract machine of the Blitzkrieg tracked by Kittler, which in turn is the transposition of the signaling culture of the sea,⁹⁴ of maritime war and emergency, to that of land—each element in motion feeding signals to each other in an endless (that is to say, despatialized—nomadically static) smooth space.⁹⁵ Smoothness of transmission from one to any other element in the assemblage ensures maximum uptake of signals. The transfer of that message of potential connection between one medial form and another is not nearly so smooth. Technology never receives the signals offering potential aggregation sent by the conceptual and technical framework of other technologies without that signal being translated, and hence filtered, noised, and interpreted by other configurations.

Technico-aesthetic turbulence among media technologies and between media and their conceptualizations or precursors is one such form of translation. The telephone also emerges partly as a result of a “failed” experiment in visualizing speech for the interpretative use of the deaf. The third generation of the Bell family of speech correctors originally imagined his device to provide a cross-wiring of the senses.⁹⁶ Not a constructed synesthesia but a codification of sound waves that was an expansion of the “visible speech” alphabet—designed by his father to provide a universal scripting system for vocalization by means of a series of letterlike symbols corresponding to the position of various parts of the mouth.⁹⁷

The problematic of such devices is reiterated by Aaron Williamson's *Hearing Things*. Just as voices appear, disappear, and change in the shifting diffraction pattern of cumulative filtering and interpretative schemas, so do technologies: "this tongue . . . / . . . is, in fact, / an organ misappropriated / into a function / for which it never was / intended."⁹⁸ Currently, the race is on to provide mobile phones with connections to other media. This is its awkwardly born third generation. It is prefaced by a weird moment of product differentiation that is worth remembering. Gadgets merge with gimmicks and additional circuits are crammed into the case. Models such as those including an FM radio are doubtless to grow the same patina of the out-of-time micro-utopia as the alarm-clock-radio-teasmaid and various other dual or multifunction, single-object-casing-over-separate-mechanism devices. Others, aimed at users of a single function SMS (short message service), grow minuscule keyboards for faster texting. They provide not a sign of medial convergence but of the user being involved in a simultaneous concatenation and switching backward and forward between different media and medial codes. While they share certain components, such as headsets, they remain two medial personalities trapped in the same body but firewalled out from any potential schizophrenizing tendency. Instead, the phone-organ finds itself misappropriated into a function that was never intended to provide more than a small additional feature.

The growth in use of SMS, its massive eruption as a media, is a well-known story.⁹⁹ Initially, SMS was just seen as a somewhat gimmicky add-on to a cellular phone. The first generation of mobiles had no capacity for it—voice telephony being their sole facility. Only with the introduction of the GSM standard across all mobile phone manufacturers and service providers in Europe, Asia, and elsewhere (but not the United States where competing standards prevail) did texting take off.

The science fiction writer William Gibson took a job from the *Observer* newspaper running a "Japanese Month" promotional issue of their Sunday lifestyle supplement:

Consider the Mobile Girl, that ubiquitous feature of contemporary Tokyo streetlife: a schoolgirl busily, constantly messaging on her mobile phone (which she never uses for voice communication if she can ever avoid it). The Mobile Girl can convert pad strokes to kanji faster than should be humanly possible, and rates her standing in her cellular community according to the amount of numbers in her phone's memory. What is

it that the Mobile Girls are so busily conveying to one another? Probably not much at all; the equivalent of a schoolgirl's note, passed behind the teacher's back. Content is not the issue here, but rather the speed, the weird unconscious surety, with which the schoolgirls of Tokyo took up a secondary feature (text messaging) of a new version of the cellular-telephone, and generated, almost overnight, a micro-culture.¹⁰⁰

Given the positioning of this article as the introduction to a special issue on the forms of life that count as a life of style (the usual regime of contemporary art, sex, food, tourism, shopping, fashion, cinema), its particular focus on the interactions of media technologies with the wider culture they are part of is set up to resonate throughout the issue—a culture understood by one “national” name's capacity to take up, change, and communicate with one understood by another. Crucially, though, his essay also chimes with the wider problematic of media technology's capacity to operate in a deterministic fashion. Gibson states, “If you believe as I do, that all cultural change is essentially technologically driven, you pay attention to the Japanese.”¹⁰¹ The sentence captures the problematic within its illogic: if technology is “essentially” what drives all cultural change, then such change would be uniform wherever that technology were to be deployed. Nevertheless, when particular dynamics—which may be located at the multiply stratified scale of a “nation”, or at that of an emerging part-generation of users escaping from and reinventing the processes of being female in all the multiplicity of ways in which this might be done, blocked, and detoured—when such dynamics come into composition with particular forms of media technology with their own capacities and propensities, it is clear that some of those dynamics have a greater ability to “find their own uses for things.”

Earlier in this chapter, I presented a flatly described list of elements of the media ecology of pirate radio, and I suggested that any one of these elements, or elements in combination, could provide a route into numerous layers of possibility. We need now to pay close attention to the particular material qualities of these technologies as a means to accessing such layers. If we are to take the elements of these lists as being at one scale a whole, an object—perceptual effects, which will be discussed throughout the following chapters—we can also begin to take them apart. While such an element might provide, as for Whitman's poet detained in love, a door to a new universe of relationality in which we can lose ourselves, each component provides a chance

to get smaller, to get molecular, to get material, while at the same time getting more massive. Details count here. Perhaps any discussion of media technology needs to meet with and use at times the convention of a “straightforward” account. The “Requests for Comment” that provide the cornerstone documents of reference for the construction and development of the Internet are a paradigmatic example here¹⁰²—scrupulously clear, scrupulously accountable to their peers, and revisable. Such an account is always a ruse, one that usually claims to have precleansed any disturbance from its clean laying out of facts and parts, but the ruse *works*. What is hoped for in the following brief account of a particular stage in the development of mobile phone anatomy is in places to make use of such a voice, but at the same time register how it is synthesized.

The author of *The Ecological Approach to Visual Perception*, a systems theory–influenced empirical account of vision and psychology, James J. Gibson suggests that the qualities or properties of an object, its “Color, texture, composition, size, shape, and features of shape, mass, elasticity, rigidity and mobility”¹⁰³ are not what is perceived when an object is looked at or otherwise sensed. (Here, although Gibson’s primary emphasis is on vision, “perception” should be understood as being a fully sensory, not simply visual, act of understanding.) Rather, we perceive what he terms its “affordances.” These are not what an object is “of itself” but what it might become in composition with other elements. This term has been of particular importance in the development of “user-based” approaches to design, notably those of Donald Norman,¹⁰⁴ and also in wider considerations of material culture, but particularly through Norman in the design of interfaces to media technologies.¹⁰⁵ Gibson chimes in with Deleuze (in the assertion that relations are external to their terms)¹⁰⁶ when his approach allows objects to be understood in terms of their *potential or activated relations*, and these relations are something separate from the object itself: “The fact that a stone is a missile does not imply that it cannot be other things as well. It can be a paperweight, a bookend, a hammer, or a pendulum bob.”¹⁰⁷ The advantage of his work is that it takes up the possibility of detailed exploration of the material qualities of things-in-arrangement, rather than of their essence.

Where Gibson rather works to innocent his theory is in his description of humans. While they are described in an ecological sense as providing “mutual and reciprocal affordances at extremely high levels of behavioural complexity”¹⁰⁸ there is no sense of a will to power, or of change or disequilibrium

within this ecology. Instead, “What the male affords the female is reciprocal to what the female affords the male; what the infant affords the mother is reciprocal to what the mother affords the infant; what the prey affords the predator goes along with what the predator affords the prey.”¹⁰⁹ Such statements might be a rather cold-blooded naïveté in some cases, but here it reads more like an idea getting stretch marks. Here, feedback occurs everywhere, but it is neither positive nor negative. It is simply homeostatic. This is the essential problem with holism—it stays in its skin, much like his version of the human body, which has become “topologically closed.”¹¹⁰ There are clues to possible interplay between Gibson’s theory of affordances and that of the machinic phylum: “Substances have biochemical offerings and afford manufacture. Surfaces afford posture, locomotion, collision, manipulation, and in general, behaviour.” It is, however, a rather static sense of the world, one of ergonomics and arrangements but little inherent dynamism. Nevertheless, as a materialist formulation of the micropolitics of detail that also escapes the form–content dichotomy and places objects and processes in a constellation of interrelations, his work is very suggestive. It is unfortunate that in design at least a good deal of its influence has been ideationally privatized, sequestered into the “techniques” of consultants who wish to present their particular brand of thought as a hermetic, individually owned and developed set of procedures. What is important about this emphasis on detail lies fundamentally in the direction suggested by Guattari at the end of *The Three Ecologies*: “The reconquest of a degree of creative autonomy in one particular domain encourages conquests in other domains—the catalyst for a gradual re forging and renewal of humanity’s confidence in itself starting at the most miniscule level.”¹¹¹

Gibson continues that “Special forms of layout afford shelter and concealment. Fires afford warming and burning. Detached objects—tools, utensils, weapons—afford special types of behaviour to primates and humans. . . .”¹¹² In order to enhance its exegetic capacity one might also subject his list to an acknowledgment of the way in which these objects are caught up in the multiplicity of minor processes of power. For instance, Foucault’s brief discussion of technological innovations in disciplinary processes suggests that they may be adopted in response to particular “needs,” such as “An industrial innovation, a renewed outbreak of certain epidemic diseases, the invention of the rifle. . . .”¹¹³ Equally, affordances may be understood as forming the day-to-

day materials of life, its possibilities, the way it is modeled, on work, on expectations of postures, of tasks to be fulfilled and accounted for, the way bodies, in the entire vast domain of industrial, transport, and consumer design are accommodated, positioned, leveraged, and made powerful. To be more substantially mobilized, to realize its own conceptual affordances, Gibson's formulation also needs to engage with what the elements of any ecological arrangement afford the "attentive malevolence that turns everything to account."¹¹⁴

One of the things that mobile phones do well is harness moments of boredom, of suspension between more purposeful activity. Little pockets of time that can be turned inside out, dawdled away, or used to get something over and done with. People text on the bus, type a message in on the tube ready to surface with it, in a lecture while waiting for something more interesting to happen. For the media ecology of pirate radio and other contexts,¹¹⁵ they also exist as a way of intensifying a process and of adding to its composition. For Avital Ronell, it is the telephone's position as a conjunctive media that allowed it to become woven so fully into social fabrics. Newspapers, for instance, gained "addictive dependency"¹¹⁶ for extracting up-to-date news from the far corners of the networks and the national territories that became perceptible around them. The phone, because of the interactive nature of the call, trumped the telegraph's one-way, asynchronous communication. Tighter communication and control between central editorial staff and reporters in the field reading in their stories also allowed greater capacity for the filtering and assessment of informants phoning in with news.¹¹⁷ Thus, one medial dynamic becomes caught up with and works into another: The newspaper never simply becomes a transcript of calls to the editor, but is changed in its relation to what constitutes "news."

In its position as a conjunctive media, the phone gains opportunities to incorporate, copy, layer, or connect to the those technologies it supposedly supersedes—as with asynchronous modes of communication such as voicemail (a logical electronic replica of a cassette tape or solid-state answering machine) or answering service (a rationalized replica of certain functions of a secretary, flatmate, or family member)—and it is as an organ misappropriated by other medial dynamics that the phone is hooked into pirate radio. Call up the ghost of the telegraph in the form of SMS.

Call up too the ruse of clarity. If we are to discuss media as a temporary aggregation of elements, a phone as a set of components, where better to begin at the end of this chapter than with such an object made up of all its components, all its connections, its affordances, what it blocks and makes possible in front of us. If we can cite texts and tracks as references it would also be useful to make such links to an object, a technology, and have that available for users of the text to check in a library. So in order to date this text, or to imagine that such a system were in existence, let's be specific: a Nokia 6210—a GSM phone at the more featurized end of the “second generation” of mobiles, and a model with a sufficient longevity to remain available for retail after the fitful launch of what were not quite the “third generation” services in 2003, and on into the following year. The theory of affordances offers a particularly useful way to—as was suggested a few pages back—to “straight forwardly” notate this device as a set of elements and relationalities. If we are, as Guattari suggests, to start at “the most miniscule level,” where better than at the ends of our fingers?

Keypad-based hardware interfaces to mobile phones are uniformly constrained by fingertip size. The dimensions of each key and the space between keys in turn determine the angle at which a finger must be held in order to press one without touching another. Requirements are placed on the posture of the user. The hand must be ungloved. Direct finger and eye coordination must be maintained. Further demands on the interface of the phone are thus generated. Instant feedback—for instance, via screen, or by sound—for each granule¹¹⁸ of the interaction must be included in the system in order for one interactive sequence, such as keying in a letter or number, to be signaled as complete in order for the next to be entered. To write a text message, the user needs to compose it from the twenty-six characters of the roman alphabet arrayed across eight of the twelve keys on the main facia of the phone, adding other symbols and blank spaces where needed. Each of these keys is doubly articulated as providing access to a sound tone, which, understood by the user as a number or other character such as a star or hash, allows access to voice and other telecommunications systems by which it is interpreted as a command. These numbers may again be included in SMS messages. On the one hand this means that adding a certain character to a text message may take up to four sequential depressions of a key. On the other, it means that one element of the interface may afford three different functions—functions that overlap in certain cases but not in others.¹¹⁹ The particular compositional

domain of the keypad can thus be described as an interlocking series of various affordances of access to different symbolic or instructional formats.

The alphabetical and numeric range of combinatorial possibility of the keypad; that it may take up to four sequential depressions of a key to specify a particular character; and the limit on message length of up to 160 characters¹²⁰ are the technico-aesthetic fields that combine to mark out the domain of potential text messages sent in any language of the roman alphabet.

Clearly, this short description is an exercise in stating the obvious. If you lose the handbook for a phone of this sort, use the above. Recognizing what we have forgotten we have learned, identifying tacit knowledges goes some way toward recognizing the way social intelligence is built into devices, codes, and networks. These clear but at the same time rather awkward affordances have been taken up in unexpectedly massive quantity and variety because the technology affords further connection to other modalities of life and mediality, which it then also becomes folded into and continues to mesh with and compose.

Immediately among these are the implications of the way in which the relational apparatus of the mobile phone ties into that of the cellular network itself. As a phone moves around it is constantly locating itself in relationship to the cellular macrostructure of aeriels and satellites, signals and territorial possession. For the purposes of radio pirates, a phone is identified in two key ways, by its position in relation to a particular aerial or cell and by its subscriber identity module (SIM). Using a phone provides a possibly dangerous link back to a legitimate address, a “data-body”¹²¹ identity that can be policed, and, via the databases of the company from which the telephone service is purchased, can provide punitive access to the physical body of the person. Thus the affordances of the phone must also be read in a manner that recognizes their modulation and conditioning by juridical and police apparatus. Chipped phones¹²² or a handful of “lost” SIM cards are necessitated if the effect of a network’s intermeshing with or stratification by a hierarchical formation—something inherent in the architecture of the phone network, but not in its uses—is to be navigated.

As the market for mobile phones stabilizes somewhat in the overdeveloped world, greater attention is turned toward regularizing the forms of criminality it involves¹²³ and makes possible. Equally, those organizations with an interest in stabilizing crime patterns begin to make use of the technologies. Police, for instance, begin to use phone networks to locate targets.¹²⁴ Use

of phones by radio pirates in London would thus have to change (were the crime to be “prioritized”). In the meantime, though, it is worth quickly documenting the ways in which the phone operates as part of this wider media ecology.

In broadcast media, it is generally unusual for a receiver–consumer to get in direct contact with a source or to feedback into a channel of information. It takes an element of protocol-busting or naive enthusiasm to step up and speak, to take time. When it does occur, it is under strict conditions of encoding, delay, filtering, and format. Perhaps the “rapture” called up by a pirate media ecology on a roll encourages this, or perhaps audiences are so specialized, so familiar with the people on the other end of the line that it’s not such a big deal. (Additionally, since this research first started in 2000—when, in London at least, pirates were almost the sole media organizations making integrated use of the mechanism—use of texting in mainstream media has substantially increased.)

On the pirate stations though, use is made of the phone in three ways: voice, text, and rings. The latter two are of most interest here. Rings have developed as a way to use the telecommunications architecture at no cost to receiver or sender and to process a relatively large number of feedback signals at speed. The MC will call out for listeners to request rewinds of a track by calling the given phone line a set number of times (usually once), and then ringing off. The message is a simple “yes.” Once a set number of rings has been reached, the track gets a reload. The message is not so much that people simply want to listen to the track but that they are out there, that the listening is being done collectively, that there is hype about a certain track, and that there is a system of feedback and production to intensify it. In domestic telephone use, rings are used to get access to someone who doesn’t want to be called by anyone else and who isn’t using voice-filtering via an answer machine: “Ring three times and I’ll know it’s you.” They work as passwords. In this case, they don’t so much allow the user to gain access—they are that access. That is to say, sending a ring in is not aimed at progressing to a second stage within that media, but is aimed at rearticulation as part of a wider process incorporating other media.

SMS, by contrast, is already something operating within an aggregate of media: alphabetical, numeric, auidial, linguistic. As a system, its proliferation is also a result of the interactions between its existence as both a media-

cultural act and as an economic transaction. Each message is substantially lower than the price of a voice call.¹²⁵ Its emergence is conditioned by finding a route through for communication under economic pressure. Communication via constraint is thus on many levels the key “lesson” of SMS.

SMS triangulates the historical interconnection between wireless telegraphy, the telegraph, and the phone by providing a way for the compressed forms of writing employed in the telegraph to return via the telephone. The constraints imposed by the multiple usages of every key on the keypad, by the 160-character limit to each message and the tight limit on the amount of text viewable at any time on the small screen of the phone, have been taken up by a telegraphic speech in which compression is achieved via the shedding of vowels redundant in signifying the word given the probability of its occurrence (determined by its co-occurrent words and the likelihood of their usage in the sequence of exchanges that they form a part of); the use of numbers to stand in for homonymic words or word parts (e.g., “8” for “ate”); the general use of acronyms for standard phrases similar to the compressed phrasing of classified ads, the classification and meaning of which arises only through dialogic agreement and use rather than categorization. All of which is captured only in the minutest way by a clutter of novelty glossaries and handbooks of text protocol.¹²⁶ Language reinvents the alphanumeric character set into thick clots of association.

In this inventing, the tight set of freedoms and constraints of the keypad provide, at one scale, compositional access to another index of multiplicities, those that are symbolic, linguistic, and dialogic. The phone provides connection also to telecommunications systems and their particular and ongoing moment of mutation among longer-term changes in work and life. Phones are at other scales conjoined in the same object: gateways to globalizing systems of location; markets; governmentality; identification; permissions; punishment and ease of movement. These are just some of the dimensions of relationality compressed into a phone. Texting at this scale provides a microscopic opportunity for millions of connections and adjustments to be made. Here—in the way mobile phones are used in the context of London pirate radio—an urban culture, illegal in the capital of a collapsed empire refounded as an integrated circuit for finance, is, on close analysis of parts (which include the rare metal tantalum),¹²⁷ linked directly to the fomentation of a war that provides the raw material for components. Pirate radio is illegal, yet currently

foundational to the generation and regeneration of the cynically named, more-than-cynically operated “culture industries,” which rely on the street innovations interpreted by cultural studies. By following these links through we see a culture making itself out of the virtualities and processes referred to by these names, out of the contradictory and refractory affordances of history: a culture always twisting in and out of the particular matter of the elements of media that make it up.

The account of pirate radio in this chapter has proceeded by following through the flat list of components. Each element was counted as an “index of a multiplicity.” Each of these multiplicities is too much to handle. They are signposted, traveled through. In further chapters, this indexing of multiplicities will be taken up in different ways, different situations. The reader will make the rest of the connections. What goes on outside the text, what surpasses it, what it also I hope in some way thickens and makes perceptible, does the rest of the work. To carry on reading this, switch on the radio, make a transmitter.

The disjointed collective subjectivity of contemporary pirate radio in London is arrayed in multiple networks of production, multiple locations on which it is worked, through multiple medial forms. It is mobilized through relations that are at one moment legal and then illegal; group property, then private property, and then private (intellectual) property breached; but it is ultimately sustained by scenes and rhythmic drives that refuse to give in. It is a media system that is public and broadcast and then public, via filtering, but sent to a single destination: it is topologically inventive. It meshes with dynamics of fundamental violence expressed as economics, as investment, and also with the potential of escape from them. It is forged amid the multivalent conflict over technical standards and between media whose emergence and use is shaped and coded by multiple historical conditions. Pirate radio operates and changes through a range of musical life. It feeds into the styles and genera of musics thrown up by the scenes it makes and is part of. It is a current where formidable stylistic innovation meshes with grinding micro-conservatisms. As a media ecology it remains relatively persistent despite the changes in styles, yet manages to add to itself, often making use of machines ahead of any other media system, and keeps going. Thrown together by groups of varying aptitudes and drive, who understand each other by their capacity to fulfill and exceed certain roles as well as operate collectively in some way,

who connect to currents of libidinality, language, rhythm, and technicality, and who can suffer the tedium and cost of keeping the thing together. It is always more than it is supposed to be, from its almost incidental but foundational breach of the law, to its capacity to focus inward to the point of bruising monotony. But most fundamentally, pirate radio in London and elsewhere is made, and makes itself, by its always awesome capacity to flip into lucid explosions of beats, rhymes, and life.

The Camera That Ate Itself

The camera, for Vilém Flusser, is one of a class. An apparatus.

Does anyone know exactly who is originally culpable of the idea of the leisure society? This persistent whimsy that labor-saving technology will of itself release people into a helter-skelter world of self-determined fun is less a theory than a suburban myth. One, perhaps, of its progenitors turns up a few pages below. It is a dreamscape already crashed into the ground by the pre-science of science fiction's constant turning inside out of future perfect worlds. Nevertheless, Flusser's *Towards a Philosophy of Photography* insists we play along. Having been liberated from the necessity, if not from the compulsion, to work, people are available for play. Play is achieved through the use of simulations, extrapolations from and extensions of body organs and senses. The user's role is to conjoin with this world of simple rules and infinite iterations of use, and to work through them. In this schema, "With every . . . photograph, the photographic program becomes poorer by one possibility while the photographic universe becomes richer by one realisation."¹ The force released by the camera is this drive to complete the program of all potential photographs. The camera is an example of a postinstrumental apparatus. It is no longer simply a tool but a domain in which the user "controls the function of the apparatus thanks to the control of its exterior (the input and output) and is controlled by it thanks to the impenetrability of the interior."² Further, "There are . . . two interweaving programs in the camera. One of them motivates the camera into taking pictures; the other permits the photographer to play. Beyond these are further programs—that of the photographic industry

that programmed the camera; that of the industrial complex that programmed the photographic industry; that of the socio-economic system that programmed the industrial complex; and so on.”³

What is of interest here is, first, the notion that a technology is a bearer of forces and drives, is indeed made up of them. Second, it is composed by the mutual intermeshing of various other forces that might be technical, aesthetic, economic, chemical—that might have to do with capacities of human bodies as affordances—and which pass between all such bodies and are composed through and among them.

Flusser’s open-topped hierarchy of systems that meet and mutually compose the camera maintains a cumulative openness to the inevitability of the embrace of a next layer. Nevertheless, it makes possible a provisional definition of the term “apparatus”: “A complex plaything, so complex that those playing with it are not able to get to the bottom of it; its game consists of combinations of the symbols contained within its program; at the same time this program was installed by a metaprogram and the game results in further programs; whereas fully automated apparatuses can do without human intervention, many apparatuses require the human being as a player and functionary.”⁴

Here, iterations of multiscale relations of causality and interpenetration are compiled layer upon layer, base and superstructure shot through a kaleidoscope. Programs and metaprograms are never clearly defined as distinct from each other. The relation is simply one of scale, of order. Words are wrapped around each other as a sequence of digestions. How to think them through as a dynamic, multimaterial shape? There was an old woman who swallowed a fly. The orthographic space of writing needs to trick itself into growing a digestive, circulatory, and immune system in order to cope with the complexity of the interrelations Flusser begins to signpost. I don’t know why she swallowed a fly. I guess she’ll die. How to navigate a thousand stomachs and their attendant bodies all stretched around each other and sequentially digesting? The programs that interweave to synthesize the camera also sprawl outward denying the possibility of a fundamental or originary procedure of knowing. The smallest speck of fly at the center is compressed into a speck of pure inflammatory antidigestive corpus at the center. The shit-slurping bacteria clinging to its feet multiply and leak out across the red fissures of a thousand layers, erupting as an oracular pustule in the gut of the camel sent down the stomach of the old lady to rid herself of the problem of the yak. The human container

of this zoo becomes simply a figment of an excuse for the mercilessly accumulative deployment of expeditionary force. Each beast piles in with the sole intent of devouring everything that has gone before it. To stretch to the uttermost, to dislocate its jaw in proof of the capacity to swallow and contain all the flesh of every being beneath it. The hierarchies of place in the order of swallowing, or species, of size, the local switching order of bipolar animosity (cat and dog, or elephant and mouse) extend to infinity.

Each body stretched around another marks the mastery of a domain. A feudally stuffed feast of bird corpses, starting with a wren, proceeding through a sparrow, a pigeon, a grouse, and ending with an outer layer of swan, is a display that material can be extracted from watery, hedge, wood, and moorland habitats and an enactment of the rule that the princely eater is at the summit of them all.

The old woman beats her menagerie with a stick; there is no escape from her blows except for the plunge down her throat. An army of zookeepers and peasants, explorers, and biologists threads its way up the stairwells and lifts, dragging animals, carrying boxes, and cages. An industry of receptionists and secretaries, security guards, and interpreters builds up around the scene of her swallowing. She is oblivious to them. The movements of her arms and face, the staggering of her legs as she maneuvers the enormously distended and writhing stomach, are interpreted as instructions and relays of news. Inside the giant stomach, the ribs, skin, and muscle of the flank of an animal burst under pressure. Its contents shoot out of the nostrils of the one sent to catch it, drawing with them further juices and part-digested flesh which flood out of the arse, the ears, the eyes, the nose, the exploded urethra of the subsequent animal. There is a constriction or a collapse of certain sections of the strata. Muscle slimes and fat becomes runny among the acids. Hairs clot into indigestible clumps. Layers swirl around each other. No one can find the fly any more. There is no trace of the spider inside her.

An apparatus is never necessarily taken as the composite or the sum of all the programs that compose it. Any one or any combination of these programs, themselves the result of others, can be pursued as a compositional imperative. This problem is partly to do with the way media technologies are understood to form wholes rather than assemblages. In the previous chapter, the machinic phylum was presented as one model that provides a useful account of the interrelation of heterogeneous elements. Part of the work of all of these chapters is to extend the means by which such conjunctions, such compositions of

elements and drives operating at multiple scales can be said to conjoin. While it may have value in other contexts (chapter 4 will make *use* of such a search and the problems it throws up) here there is no particular need to look for an originary fly, an originary speck in order to form such a set of concepts. This section, then, is itself a section across certain of these layers of apparatuses—at first, of the camera, and then elsewhere.

The scanning device of the art catalog is able to make certain sorts of paratextual statement about either of the class of objects it lists:⁵ a work, an artist. Birth; study; scholarships; exhibitions, solo or group; monographs on, essays on, articles on; teaching positions; residential location; photograph; statement; death. Title; date; materials; dimensions; ownership. Information that registers its contact with other forms of apparatus, institution, citizenship, intentionality, authorship, discipline . . . As with the flat list of components of the pirate radio, each element in the list presents a multidimensionality of composition with its own economies and traits. I am reading that of the exhibition, *Live in Your Head*,⁶ as a photocopy. All the halftone images have been reduced to gray and white patches of toner. Detail has been lost through the filtering processes of the copier. On page 104, John Hilliard's work, *A Camera Recording Its Own Condition (7 apertures, 10 speeds, 2 mirrors)* is reproduced at a thirtieth of its size. The work, however, is still clear, as a procedure.

A camera is positioned in front of a mirror. The photographer works through every combination of settings for aperture and speed. Each time the combination of settings is changed, a picture is taken. The hands working the outside of the apparatus appear along with the camera. They also hold a smaller mirror, showing the settings on the top of the apparatus. At the upper left of the grid of prints resulting from this program of work, the emulsion is left utterly unstained. From the bottom right corner, up to a diagonal margin, and encompassing almost a third of the prints, the results are completely black.

Every size of aperture allowed by the camera is run through, correlated with a procedural workout of every shutter speed. As the various combinations are made, the two mirrors bounce the camera's own reflected light back to it and the film it contains is reorganized by a measured amount of exposure to light waves. The seventy negatives resulting from this procedure allow, through the prints derived from their transition from whiteness to blackness, the gradually appearing and disappearing image of the camera to be seen. The

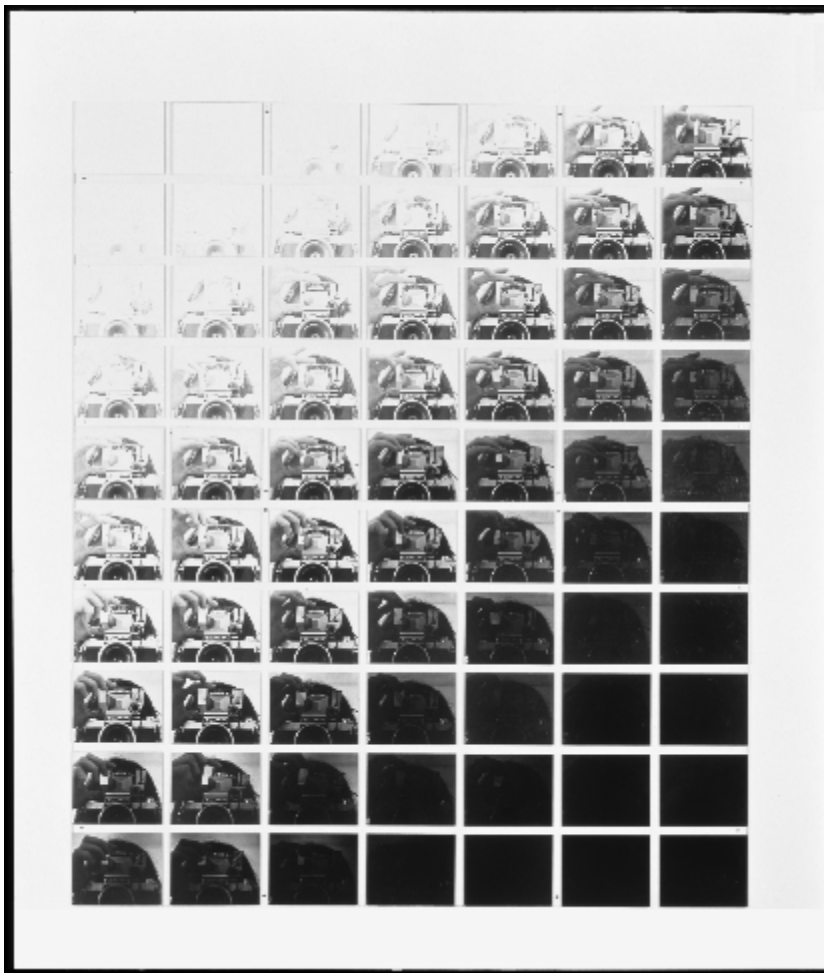


Figure 2.1 John Hilliard, *A Camera Recording Its Own Condition* (7 apertures, 10 speeds, 2 mirrors), 1971. Courtesy of John Hilliard and Tate Gallery, London.

program of the image is both built and erased by the apparatus that composes it. In “photography,” the proper use of a camera, the degree of darkness or lightness of the image, indicates the closeness to or distance from sources of diffuse or direct light of the object being photographed. Such use of the apparatus is here revealed as being precariously lodged between whiteout and blackout.

Media Discourse

A substantial development of the concept of discourse is made by Friedrich Kittler. For Foucault, discursive practices are “characterised by the demarcation of a field of objects, by the definition of a legitimate perspective for a subject of knowledge, by the setting of norms for elaborating concepts and theories.”⁷ Like Flusser’s “programs,” the transformation of a discursive practice is “tied to a whole, often quite complex set of modifications which may occur either outside it (in the forms of production, in the social relations, in the political institutions), or within it (in the techniques for determining objects, in the refinement and adjustment of concepts, in the accumulation of data), or alongside it (in other discursive practices).”⁸ The processes of discourse formation, how such compositions change, what they encompass, how they come to know and to speak are traced by Foucault in a series of studies that move from one crucial locus to another, the hospital, prison, madness, sexuality . . . The rules for the definition of objects are not the same as “the rules of utilisation for words”; that of concepts, “not the laws of syntax”; and those governing the formation of theories are “neither deductive nor rhetorical rules.”⁹ Here, “archaeological” study of discourse, its variable detail and operation, allows deep rules, those that are unspoken, to come to light.

Crucially, discourse formation does not only determine what lies within it. There are also such rules that govern in terms of “its system of exclusion, of rejection, of refusal, in terms of what it does not want, its limits, the way it is obliged to suppress a certain number of things, people, processes. . . .”¹⁰

This aspect is crucial to Foucault’s project, and it is what allows it to be so readily taken up as a political tool: The variability and power that Foucault’s approach in its various forms allows is recapitulated by Kittler, but with something of a sense in which this readily political aspect has itself been attenuated. Kittler’s glee at the displacement of “so-called man” from a universe that cradled him at its center tends occasionally toward a relocation of

Hegelian *Geist* from the human to the technical object. The political dimension that Foucault never lets go of is more implicit than specifically blocked in the notion of discourse developed by Kittler. At the same time, his richly researched operations moving from library stacks to computer circuits provide a compelling example of discourse on and through media. Taking up from where he suggests Foucault leaves off—according to Kittler, Foucault’s work, being primarily concerned with textual material, largely cuts out at the point where modern electronic media emerge, between 1860 and 1870—his procedure for organizing the recognition of discursive practices makes a substantial and profoundly useful expansion of what is understood to be constitutive of discourse. As such, the study on writing systems (*Aufschreibesysteme*)¹¹ ranges through the interrelationships of the invention of a class concerned precisely with writing as a function of the state—the civil service; the development over the period of the nineteenth century of various pedagogical approaches to reading and to the alphabet; the gendered and progressively industrialized economy of books. In works following this, he moves to explore how discursive practices become hardware, how discourse becomes subject to systems of storage, transmission, informatization, and processing, and how they can be said to become both constituted of and operated on by systems of logic incorporated “ultimately” as “voltage differences.”¹²

Foucault did not simply work on documents and their dynamics of composition and arrangement, but also what they refer to and invoke—biopower¹³—and the “apparatuses,” “instrumentalities,” “techniques,” “mechanisms,” “machineries,” and so on by which they are wrought and made available.¹⁴ There is a cycling between text and hardware, textual practices and those of the body, surfeits of namings and orderings. There is a pattern found among certain kinds of enunciation that is also found in certain arrangements of space. We can recognize, for instance, how Kittler takes these arrangements, these procedures, and shows how they are made material. The split between representation and materiality posited by humanist scholars, though always untenable, is in this context felt as more keenly useless than elsewhere.

This chapter will explore what is initiated by Kittler’s extension of discourse—that systems other than books, papers, acts of government (viz., media systems)—also compose discourse, have rules of formation, generate processes, subject material to certain “tests,” allow access, impose filters, establish norms. How are these dynamics present within the “technical ensembles”

of what Flusser describes as media apparatuses, and in post-textual forms of “transmission and dissemination”?¹⁵

The approach to this problem that will be taken is suggested in a description of a course run at the Collège de France.¹⁶ Foucault makes the intriguing suggestion that, operating through discursive practice, there is “anonymous and polymorphous will to knowledge” that girds, forms, and drives discursive formations. For Nietzsche, “Knowledge and wisdom in themselves have no value; no more than goodness: one must first be in the possession of the goal from which these qualities derive their value or non-value.”¹⁷ That is, they are primarily interested and antagonistic, what Sharon Traweek, Donna Haraway, and other feminist writers on science have called “situated”;¹⁸ they operate as a mode of articulation of the will to power.

Given the reformulation of discourse put into play by Kittler, which situates it firmly within and as its domains of mediality, what are the ways in which the elements of media systems might operate as instantiations and bearers of “will”?

Will to Power

As it is a common initial misreading of the scope of the will to power, it is necessary to separate this notion of will from that of intent. (Indeed, under cynical democracy we have necessarily learned to distrust the concept of will generally, that variant “free will” being a legal category that is extended only sufficiently to allow the location of and registration as culpable of a person.¹⁹) There is some possible overlap of these terms when it comes to compositional design or use of materials on the basis of their affordances and predispositions, but this discussion should become apparent as the text progresses. It is necessary, too, as for instance in the discussion on memes in chapter 4, to be clear that there is no reference here either to solely biological systems. “Intent” would, as derived from Nietzsche, operate only on the level of the subjectival apparatus formulated as “the little word ‘I,’”²⁰ a mnemonic, an abbreviative formula that can be momentarily located at one scale as an entity, but which—through bad habits—is misconstrued as a cause.

Alphonso Lingis, writing of Nietzsche’s array of formulations of the will to power expresses it as “the chaos, the primal fund of the unformed—not matter but force beneath the cosmos, which precedes the forms and makes them possible as well as transitory.”²¹ The will to power exists before any of

its alternations of mode and always subverts any attempt to find ultimate cause. Power is also the condition of life. In its molten form, power curses the globe.²² The sun pours an overabundance of energy onto the planet, dragging plants up from the ground by the sheer force of the interaction of their cells and system with heat and resources. The primal fund of the unformed is matter or energy that has escaped from one system into the domain of another. Nothing is rendered innocent by its previous state. If such power cannot be accommodated, turned into fuel, into mutational drive, it is dislocated, moves on, finds another vector. This is the cataclysm of power, the superabundance of energy that courses through all matter to render it “live” and that also ensures its destruction. The will to power is that which moves things across thresholds but cannot be defined by the states exemplified on either side of that threshold; it is what propels the fulfillment of what can momentarily be understood as a phase space but is not reducible to any steadiness of state.

For Nietzsche, the “body and physiology” are “the starting point”²³ for knowledge. Such an understanding of intelligence is useful here in two ways. First, it implies that materiality and action ground perception, ordering, thought, knowledge. Second, it implies that there is no inherent hierarchy in the organization of this process. The “subject” is merely a regent at the head of a “communality” of processes all of which are in a continual state of agitation, in and outside of any named body, with relations between them fluctuating. The subject thus emerges from the sustained interactions of these “subordinate” forms. Indeed, “the relative ignorance in which the regent is kept concerning individual activities and even disturbances within the communality is among the conditions under which rule can be exercised.”²⁴ The subject is a case of perspectival position rather than a categorical a priori condition of knowledge. The question therefore of the scale at which the subject—what constitutes something to be recognized, to be interrogated, that provides resources, evidence, that gains entry to discourse—is approached will later form, in particularly detailed and various ways, a key mode of operation for Foucault to mobilize.²⁵

In the notebooks compiled in one way under the title *The Will to Power*, “thinking” appears in a number of forms. In the brief section entitled “Biology of the Drive to Knowledge. Perspectivism,” it incarnates as the preorganic “crystallisation of forms”;²⁶ as bounded by the extensivity necessary for the preservation of life;²⁷ as a process of “making equal” such as the

“incorporation of appropriated material into the amoeba.”²⁸ Thought is no special category of activity. It echoes and reforms the processes that are described as characterizing the goings on of other entities devoid of soul, spirit, or subjecthood, crystals, animals, accidents, errors. It is as if everything were to locate its proper place in the encyclopedia and then jump a page, shuffle its function, find its precursor, become its “intensive egg.”²⁹ All of these images of thought, of subjecthood, of thought as the activity proper to subjectivity, are subject to morphological shift. Jumps in causation occur, ranging from chemical, evolutionary, or topological function to those of scale: epochal, planetary, racial, cultural, ideological, or cellular. At every point “. . . all sense perceptions are permeated with value judgements.”³⁰

Although, for various reasons, it is by no means possible to conflate their arguments or their special terminologies, it is possible to suggest at this point that for both Nietzsche and Flusser, various programs, compositional terms, and drives interweave to produce the apparatus. We settle for a time at a particular “abbreviative formula,” the camera, for instance, knowing that naming it thus, just as with the invention of the subject, “makes a kind of perspective in seeing the cause of seeing.”³¹ Nevertheless, we must operate on a multiplicity of scales, scales that have both ontogenic³² capacity and perspectival limitation. Nietzsche hungered for the strands of philosophy that had not passed through the recursive sausage machine of monotheistic thought³³ but was still compelled to write with and through concepts poisoned by it; what we understand as the apparatus has a history.

A specific part of such a history is of particular use here, that “The entire apparatus of knowledge is an apparatus for abstraction and simplification—directed not at knowledge but at taking possession of things.”³⁴ Judgment, the pronouncement that something is thus and so, is—by saying that one thing is both the same—the capacity to cross thresholds and obliterate them as well as to constitute them. If it were to remain only thus, undisturbed by memory or other forces, it would constitute simply the performance of reordering parts of a stable configuration. But will to power in the reactive form of the faculty of judgment also equalizes and makes amenable to reification, transfer, exchange, and replacement that which it names as concepts, objects, subjects. This aspect of judgment will be encountered further in chapter 4, in the discussion of proposed units of cultural evolution.

Will, Fixed

One form, conjoined with other economic and legal powers, of this power of naming and judging appears in Marx as “the appropriation of living labour by objectified labour.”³⁵ Once work can be quantified, established as a procedure independent of the particular person carrying out the task, its abstraction and equalization becomes possible. Once dealing with metal can be systematized, assigned numerical values of temperatures, quantity, speed, and pressure, and subject to machine forming, stamping, rolling, and pressing, without any need for the wastefulness of a polymorphous investment in a sensual understanding of the material’s bifurcation points and capacities of flow, the sedentary people have no need for their uncomfortable pact with itinerants. The same act of capture and abstraction occurs on a mutating loop throughout history. The body as the starting point for knowledge has been scanned and disassembled to be rebuilt in a more perfect form. Material becomes a standard object in its apotheosis as a commodity. (This theme is discussed further in the following chapter.) At the same time, as numerous accounts of the factory system and its transmigrations into other parts of life have shown, work too becomes subject to such processes along with the bodies made, mobilized, and wrecked by it.

The following short discussion of technology as a political-economic entity partially locates media ecologies in relation to some of the wider historical and social developments of technology. A number of the projects discussed in these chapters have explicitly political as well as medial and aesthetic dimensions to them. While the general approach here is to draw lessons from specific compositions as they mesh with a network of conceptual tools, it is also useful to flag some of the fundamental dynamics within cultures of media technology. Any advocacy of an opening up and experimentation with computational and medial reality-forming devices taps into wider political debates and combinations. There is danger here as well as the joyfulness of invention. A number of figures are used in this book to describe moments when elements and dynamics conjugate, producing new processes, living explosions, moments of becoming that are at once medial and unprecalculable. But these are not the only such explosions to occur with technology as a contributing factor; that collection of processes and entities known as capitalism is another.

What continues through from the industrial machine to the “universal” machine³⁶ is “the monstrous disproportion”³⁷ achieved between the short time of labor expended on a product and its result. The mathematization of the abstracted form of labor allows for it to be multiplied way beyond the scope of the simple extensions known as tools.³⁸ “Reduced to a pure abstraction,” what was once labor becomes open to algorithmic mutation, sorting, looping or making tirelessly repetitive, subject to an “inhuman” increase of speed. In the *Grundrisse*, the machine tends to reach its “most adequate form”³⁹ the more it becomes automatic, that is, the more its relations are with the elements of a system of compatible machines. Capitalism motivates the extension of this system of sames by achieving a transubstantiation of bodies from living flesh. The many forms of intelligence, rhythmic and productive power carried by bodies are carried over, as in a sum, into another column, another material dimension that is orders of magnitude greater. Physiological and intellectual power is transmogrified into a form adequate to fixed capital and ultimately to circulating capital.⁴⁰

This system of sames is recursive. Such a form of production is also magnified and extended by the objects and processes that pour out of it. Once a particular morphology or technique, a particular protocol, a certain rumor of power gets on a roll, it spreads. You need the bit that fits with that bit, that correlates to that set, that fits in there, that produces an output that can feed without loss into that port. As it spreads, it encourages conformity to its set of presets.⁴¹ There is further discussion of such processes and effects in the following chapter’s model of the standard object. Here it is useful simply to note that in Marx’s account, this results in an organization of the division of labor “which gradually transforms the workers’ operations into more and more mechanical ones, so that at a certain point a mechanism can step into their places.”⁴² The worker as commodity becomes not merely subordinate to the machine as its “living appendage”⁴³ but, when profit or regulation⁴⁴ require it, superfluous precisely to a degree that is determined by capital.

This transposition of knowledges and skills, patterns of life and movements of the body was not drawn simply from individual workers, nor was it simply the result of a statistically idealized aggregate of people engaged in a certain task. Every individual carrying out a task is networked into social arrangements—as we saw in the position of the itinerant metallurgist in the previous chapter. These positions are destabilized, reformulated, or destroyed as their function is subsumed by technologies produced and networked into

other systems and dynamics. At the same time, this is not a story wherein things always simply end. Forces and dynamics may mutate, reappear, separate into parts, find themselves embedded in new arrangements of elements.

There is a tendency in certain theorizations of technology—not in Marx, but prevalent in media environmentalism—that is ever searching backward for the point at which life stopped. God stamps the passports of the trespassers in the garden of Eden: “Citizenship revoked. Go directly to TV, to the book, electricity, agriculture, flint, fire, bipedality, the evacuation of the sea.” There will never be an end to cataloging every single moment at which all was lost forever. This hunger for pinpointing a final moment of defeat, however, will never be satiated—and this is one of the key lessons of the will to power—because there is no equilibrium, and there never was. “Humanity,” which in its very existence as such is flung out of the idealized ecology, is poisoned and driven by technology, and the powers, innovations, curses, and becomings it engenders will never cease.

In his scrupulously suggestive readings of Marx in *Marx beyond Marx* and elsewhere, Antonio Negri reveals social and political class dimensions to this disequilibrium, but this fissuring, interweaving, and invention of forces shows that there will always be more than any set or class can capture within its terms. With this in mind, before returning to focus on media, it is worth exploring Negri’s arguments on technology in order to clarify how what starts as an expropriation of the capacities of the body becomes an opening into a new realm of possibility. At precisely the point that the worker becomes subordinate to the machine-embodied relation to capital, it is suggested, the antagonism between the formation of such machines by capital and those from whose bodies the diagrams for such machines have been abstracted “takes on the form of working class subjectivity.”⁴⁵ Such subjectivity—a perspectivalism that engenders new powers—opens, under the “logic of separation,” the potential for subversion.

In short, the perspective that Negri and others work through allows the production of a tantalizing twist. This is it: “Capital seeks a continual reduction in necessary labour in order to expand the value of surplus value extracted, but the more it succeeds individually with workers taken one by one, the more necessary labour benefits the collectivity and is reappropriated by absorbing the great collective forces that capital would like to determine purely for its own account.”⁴⁶

Here, the paradox of the society of leisure flagged by Flusser returns as tragedy. As capital succeeds in reducing each individual worker to the status of supernumerary⁴⁷ waste, there is also an inherent reduction in the need for capital as a way of organizing the means for life. The more capital succeeds, the more it achieves redundancy. Living labor is no longer subsumed under self-activating objectified labor, but becomes “The expansion of necessary collective labour” that “constructs a ‘social individual,’ capable not only of producing but of enjoying the wealth produced.”⁴⁸ As productivity increases, so does the pressure posed by the questioning of how much work is “needed”. Work at once becomes a psycho-social relation as much as one of material sustainment.

Such an opportunity is also developed by the way in which the contradiction between workers and capital expressed in the wage relation becomes gradually surpassed by the “general state of science and the progress of technology.”⁴⁹ This allows work to change into watching over and controlling productive processes, rather than being their main source of energy, and subsequently, as a result of the way in which science takes leave of determination by capital, to allow the amount of time spent in even this labor to be incrementally or absolutely diminished.⁵⁰

There are two ways in which this insight must be taken. On the one hand, it still describes a potential that is latent within technology, the organization of work and production, in technical and scientific work and its relationship to the mobilization of skills, ideas, and materials in general (however much any of their particular instantiations may be politically, culturally, materially, or otherwise inflected). The abolition of work, “labor-saving,” is sublimated, but it still exists as a potential and a dream within the social and also as a drive within technology. The recognition of this potential provides, at the very least, a test against which all new sociotechnical elements and arrangements must be evaluated.⁵¹

As Paolo Virno notes, describing the way in which this possibility has unfolded, “The specific contradiction that Marx tied to the advent of communism has become a stable component, if not in fact the stabilizing component, of the existing modes of production.”⁵² First, the skills that are liberated from direct labor, of sociability, of culture, of thought, become productive motors that are explicitly contested by capital to be recouped as forces of value production. Their position as unofficial support structures for and relief from the activity of work appears as too valuable to waste. Gossip, for

instance, becomes a marketing vector. (It is clear that much of this spread of value abstraction from areas of life that were considered to be “nonwork” was already anticipated and argued in advance by feminists and others who were not quite included in the masculine version of the modern that Marx’s story tells.) Second, these forms of life—and note that they are substantially expanded from Marx’s formulation of the general intellect as abstract or scientific knowledge to include affective labor, fashion, political activism, cultural activity, and so on—have become forms of actual work or are so closely aligned to the activity of work that they can mutually feed into and supplement each other.⁵³ Thus, there is potential for the theorization of the absolute subsumption of life by capital (which Negri proposes), but also for the suggestion that relations ultimately determined by profit are everywhere contested or contestable, even in the microscopic details of media.

A fundamental problem with this twist is that it anticipates a moment of ahistorical equilibrium, a nowhere to have its news from. The dialectical method it benefits from exceeds in clarity the fissiparous and moving nature of that which it deals with. Now, instead of imagining a stable, even entropic future “communism,” the challenge this insight poses is to find ways of developing, or forcing dynamic means by which this potential, the powers released by it, may in various ways actively subordinate the political project and effects of capitalism.

What can we take from this in relation to the question of the composition and arrangement of drives, will to power, within media? First, it is to recognize that there are substantial political stakes in any figuration of the processes of technical and medial invention. Meshes and orderings of bodies and capacities, forces and materials have the capacity to take part in the making of the world.

What industrialization and—crucially—mathematization of such processes allows for is an unprecedented intensification and extension of scope of such combination. Elements of sociability have become like machines, have become part of machines, but now are crucially engendered and empowered by their arrangement within such assemblages until it is functionally impossible to distinguish them.⁵⁴ New forms of alliance and transmutation between the social and what has been abstracted—and this abstraction is to include givings, impositions, abductions, and so on—from the social into the machined (not simply extractions operating under a uniform capitalist order)

establish the possibility of mutant compositions to cross from one category to the other and the proliferation of hybrid forms.

Before following this proliferation, however, we need to return to the point where “the general productive forces of the social brain”⁵⁵ undergo transduction into patterns of metal, silicon, code. Earlier there was an indication that media are not only of quintessential importance in the unfolding, maintenance, and invention of discourses but that they can be understood to have an inherent medial will to power—this is the thread we will now follow.

Morphology of Forces

If the romantic voice, in Kittler’s model of the discursive technology of early mass readership, was located in the quivering of the open throat, Marx has it otherwise and borrows Dr. Frankenstein’s own electrodes to declare that the machine “possesses skill and strength in place of the worker, is itself the virtuoso, with a soul of its own in the mechanical laws acting through it.”⁵⁶ This raising from the dead of the soul might perhaps work for Marx as a way of stocking up on precious alienation.⁵⁷ From Latour, however, we can derive that “Technological mechanisms are not anthropomorphs any more than humans are technomorphs. Humans and nonhumans take on form by redistributing the competences and performances of the multitude of actors that they hold on to and that hold on to them.”⁵⁸ What was once understood to operate on one plane, that of the human subject, begins to appear elsewhere as technology and vice versa. There is no obligation to search for any originary human fly-speck. In translating this debate into a consideration of media, it is useful to return to Nietzsche’s little word, “cause,”⁵⁹ by a leap down the throat of the old woman. Here she is as a young girl, playing with a snake, feeding it some tadpoles in *The Opoponax*:

When you put the snake in the washbowl with the first tadpole, nothing happens it’s no use putting the snake’s mouth on the tadpole he acts as if he were blind. But he is excited though. The tadpole is excited too he tries to crawl up the smooth side of the washbowl, he falls back, he begins again, suddenly the snake notices the smell, he stiffens up to locate it, he slithers along making rings around the little animal with his body, the last, very narrow ring formed by the snake’s head and neck catches the tadpole.⁶⁰

Artificial life⁶¹ models such movements, abstracts them, creates new machinic relations of forces out of their nonlinear interaction. For example, the behavior of a “flock” can be generated by imposing a set of three “forces,” that is to say, affordances of constraint and freedom: a gathering force that keeps the flock moving together; a predisposition to shared speed; and separation force that prevents collisions with other parts of the flock or with objects. This iteration of excitation, this transit of sensation from one animal to another produces its own schema, its own rules of war that network the affordances of the bowl and the water and the physical and sensorial capacities of the animals (and the vocabulary and style that Wittig deploys to create them). Outside of the water, the steepness of the side of the bowl provides no affordance of life for the tadpole. Yet the sensorium of the snake is also subject to effect by the tadpole: “The snake struggles with the motion in his mouth, he swallows, you can see that the tadpole is wedged in his gullet, that he is still moving, that he is moving through the snake’s body making a lump in it. The snake seems sleepy. This doesn’t keep him from stiffening again when you give him a new tadpole.” The sensorium shutting down into sluggish rest for the moment of digestion? Surely we can recommend eating only in order to ensure a deeper, more absent sleep? What compels the snake to eat all the tadpoles? In what way does the tadpole sense the urgency of movement? Sets of capacities of movement, properties of strength and sensation mesh and wriggle and interlock.⁶²

In corporeality, and here this may as well be that of a camera or a network as that of a snake or a tadpole or cascading sets of rules, “Every force is related to other forces, and it either obeys or commands. . . . Whether chemical, biological, social, or political, every relation of forces constitutes a body.”⁶³ The body that is constituted by these three rules of the flock is made by the battle and interplay between these rules as they cycle in modifying and setting each other off. That bodies are composed by forces that can be replicated (i.e., abstracted and transduced into machinery or computer models) and by forces that operate between and within them (to stay with Marx, let us say “value”) is the passage between what is classified on one hand as the organic, and on the other as the technological. Let us be clear: these bodies have different kinds of consistency. They do not all possess, or pretend to possess, the same kinds of sensory or performative capacity. The human body is not the body referred

to here any more than a body of water or of work; nor can we deny that any of these are more than momentary figures of speech. There is no attempt here to construct a kind of limitless equivalence between bodies in order to reduce them solely to dematerialized patterns (along the lines of Hans Moravec⁶⁴ or other proponents of a reductive cybernetics) but rather to enrich a recognition of the ways in which they are mutually involved and potentiated: that some dynamics cross bodies, are shared by them, that some drives exist only in the differentiation of bodies, that forces may outlast single bodies, that some bodies are multiple, and so on.

In the last chapter it was suggested that the roots of media are as contagions that, as agglomerations of forces, generate new organs. Rather than being mere “extensions of man”⁶⁵ these organs can be discerned to possess a certain will to power. Remember first, via Nietzsche, that all philosophy must originate from matter, from physiology; second, via Marx, that the sensate and intelligent dynamics of the body are proliferated into the technological; and third, via Flusser, that the physiology we thus think through is composed by the multiple interactions of many multiscalar actors.

Now it is time to turn to Nietzsche and “the critique of the concept ‘cause.’”⁶⁶ The first part of this section echoes the critique of perspectivalism, of the “I.” Here, though, it treats the categories of “cause” and “effect.” We search for causes because we hunger for the familiar, for the categories that, for instance, separate an arm muscle from its potentiality of movement, of power. Although “linguistically we do not know how to rid ourselves of them,” not every sequence of events is adequately described by simple stories of progression from one state to another. “If I think of a muscle apart from its ‘effects,’ I negate it.” The sensation of being involved with a relation of forces that include that of an arm, of “strength, tension, resistance,” is itself simply a momentary stage in a truly massive sequence of iterations. It is a muscular feeling, a sense of plasmatic coursing through the potentiality of the dynamic combination of forces at one and more scales of perspective, of multiple incorporation. From this we are able to grasp the simple formulation that “A thing is the sum of its effects, synthetically united by a concept, an image.”⁶⁷

This may seem to be a fundamental break with the understanding we have of “things.” But perhaps it is not. One example, related to the nonlinear generation of behaviors by the multiple interrelation of elements and rules, can be derived from theorizations of the creation of constellations of planets by the interrelation of the force of motion that each planet possesses and by the

gravitational action of each planet on others. A constellation is a nameable “thing,” but it is not simply a “cause.” It is also a process of multiply inter-related movement through which emerges the apparently stable pattern by which we are able to understand it as a constellation—it must be understood as a process.⁶⁸

Materialization

And this allows us to spiral back to the image that we almost began with, that of the camera in *A Camera Recording Its Own Condition (7 apertures, 10 speeds, 2 mirrors)*. What is it that is fascinating about this project? Frankly, it is quite boring. There is nothing we typically enjoy seeing in photographs, no landscapes’ bits, no silly people nor rich ones, no riot police, no members of our beloved family, nor any red faces, spilled bodies, soft furnishings. Can the operator of this camera have taken Flusser’s dictum about the camera being driven to photograph everything so much to heart that he has chosen to shoot more than several types of blackness, of whiteness? If we are to say, “yes, it’s quite clear that this played a part,” what becomes astonishing is that he has somehow resisted adding any other factor into his calculations. Why only aperture and speed? Would not a far more grand effect be achieved by adding other variables: depth of field, focus, the refractive capacity of the lense, types of film, various operations in the darkroom? Perhaps works of art are emptied by viewing; they become worn out if looked at too much. Perhaps, as a strategy of evasion, this set of pictures commits itself to its own exhaustion. And with nothing resembling what we like to look at in it—the quicker the better . . .

To rescue ourselves, though, from missing out on a trip through boredom to its other side, we can perhaps understand *A Camera Recording . . .* best as a strategic reversal of a general principle that Kittler highlights, a good enough summary of his approach to media discourse. “The data processing of a given society can be reconstructed by analysing its artistic media. Being less formal than its systems of knowledge, those media display and propagate the elementary regulations that culturalise the natives of that society.”⁶⁹

A Camera Recording . . . is put together at a time of a more general “crisis of the object” within art. What does this mean? (And let us be clear that this list does not make recourse to a supposed historical hegemony of “conceptual” or any other art movement.) Among other things, it means that:

- a current of work, which has not stopped, began to develop both outside of galleries, dealerships, and salesrooms, and in a nonunilateral relationship with such structures;
- lived practices (performances, events, happenings, behaviors, sociabilities, communicational acts) supplanted fixed objects as the primary instance of the work;
- artwork developed that was rooted in the “postretinal⁷⁰,” which was “conceptual,” “idea art,” distinct from previous currents that were seen to be decorative;
- materials that were seen to be peripheral to art systems, such as documentation, press releases, and announcements,⁷¹ became its primary means;
- art systems were abandoned as sites for production, but were understood and used as the site of political conflicts;⁷²
- communications systems, such as postal art, video, radio, magazines, books, became the often mass-producible locus of the work;
- work began to deal directly with the historication processes of art systems;⁷³
- art methodologies were explicitly tied into the activity of political, cultural, and social movements, which were understood as being non-art;
- the languages used to describe art, the political, psychological, analytical, became subject to programmatic use by artists;⁷⁴
- Other non-art categories such as music,⁷⁵ destruction,⁷⁶ food,⁷⁷ nonhuman “cultural” practices,⁷⁸ “information,” domestic work,⁷⁹ and so on were mobilized “as art” or as gateways to a relationship with other forms of life;⁸⁰ and
- self-generative or combinatorial forms of text, geometrical, or more representational images, often produced by computer, were initiated and made public.⁸¹

A Camera Recording . . . could perhaps be replaced here by certain aspects of Jan Dibbets’s *White Wall: 12 Numbered Photographs Taken at Different Shutter Speeds*⁸²—a series of square snaps of the numbers one to twelve appearing in gradually decreasing contrast against their ground—or any of his shutter speed pieces that adopt this kind of routine, often meshing it with the use of windows as the object of the picture. This work reinfects the problem photography posed to painting—a crisis that, as is familiar, allowed for the invention of new modes of painting—back onto the overstabilized position of the camera. Another work by Hilliard, from 1970, *60 Seconds of Light*, in which

a camera takes twelve shots of a darkroom timer using exposures of between five and sixty seconds, could also stand in to some extent. *A Camera Recording . . .* has, for this text, the advantage of being explicitly reflexive of its apparatus. That is, it feeds the camera back through itself. It should be noted that within the same period, work directly on the materiality of video also parallels what is discussed here.

One should also note a certain cod-scientific quality in the air at the time.⁸³ Here, in Hilliard's work, the numbering, or the timer device, acts to signify an "objective" nature to the work. This is echoed in the literal description of the work in the title of *A Camera Recording . . .*, but the way in which the work is staged as a making account of itself, its mechanisms of operation (which should not be taken for "self-sufficiency"), is severe enough to avoid cod-science cuteness.

Dibbets has generated a large corpus of material through the intersection of the material properties of the camera with geometrically derived regimes for constructing shots and collaging the resulting images in order to generate novel scopic processes. When it gets locked into canvasism from 1979 onward, a spread hand of big old architectural snippets caked with properly "careless" brushstrokes in colors the same as you'd find for distressed furniture at the posh end of the seaside or its representative boutique inland, the work falls into glum academic routine. At other times, it is in the purposiveness of routine, say, in the landscape photographs⁸⁴ of the first half of the seventies, that the work engenders a truly alien retina.

Exploring the material limits of an apparatus also provided a productive regime exploited by Emilio Prini over the same period. In one process, he took thousands of shots with the same camera until it wore out. This took a number of years. In a similar operation he set a cassette player to record the sound of its own mechanism until it broke. Within the wider context listed above, though, the slice made by *A Camera Recording . . .* through the discursive apparatus of the camera comes at a time when photography was increasingly being incorporated into the object-world of art systems as a means to document material, sculpture, event, process, installation, performance, happening; the camera was a timely assay of the means of discourse.⁸⁵ The "truth" of the camera is produced as a problem.

Writing on how nonlinear behaviors can be mapped and generated by algorithmic models and the rapid intensification of speed and complexity that

computers make available to such processes, Manuel De Landa describes a key perceptual tool in cybernetics: phase space. (The underlying idea, if not the specific term, arises earlier in the work of Poincaré and Hamilton, among others.) The “phase portrait” is a schema by which the phase space can be mapped:

The first step in creating a phase portrait is to identify the relevant aspects of the physical system to be modelled. It is impossible, for example, to model an oven by considering each and every atom of which it is composed, but one can consider the single aspect of the oven that matters: its temperature. Similarly, in modelling the behaviour of a pendulum only its velocity and position are important. In technical terms, the oven has one degree of freedom, its change in temperature; the pendulum in turn has two degrees of freedom. A bicycle, on the other hand—taking into account the co-ordinated motion of its different parts (handlebars, front and back wheels, right and left pedals)—is a system with approximately ten degrees of freedom.⁸⁶

What is achieved in *A Camera Recording . . .* is a recording of the phase space of two programs within the photographic apparatus: speed and aperture. These are the parameters whose variation is mapped from one part of the work to the next. Clearly, this portrait is of only two of the large number of variables conjoined in the body of a camera. Although this is interesting as an illustration of the material capacities of the machine, it would stay at the level of benchtests of computers—in which fixed possible combinations of operations are run simultaneously in order to ascertain the processing capacity of the machine—were it not for the way in which it links the degrees of freedom available within this phase space to further programs composing the camera. These can be said to form the embedded culture of the apparatus in the same way that an operating system or other software can be embedded in a chip. In this way, it is inconsequential that there are only two parameters to *A Camera Recording . . .* Each apparatus is also an ensemble of other apparatuses, other systems that have been subsumed within it. The camera, for instance, also includes a notion of time as extensive or quantitative—that duration, continuity, can be dissected into fractions of seconds. Certainly too it would be possible to specify a particular set of moments in photographic history that the work recapitulates. Which version or other of fancied-up pinholed box the work diagrams is not of too much use here, although such an approach would provide a route to tracing particular moments of interrelations of

the camera's programs and the programs that form them within the history of photography.

More substantially, how does the work allow us such a route into the drives that compose the camera? It does so by mobilizing two sets of interconnected and antagonistic relations of force, a sample of those that compose the body of the camera. First, it presents the problematic of the camera working on the condition of being a camera, on the production of a machine reflexivity. Second, it mobilizes the constraints and freedoms generated by the correlation of the intensive and extensive qualities embedded within the camera.⁸⁷

Art, as much as science, often attempts to put an enclosure around a sequence, a process, in order to isolate it as material to be inspected in a certain way, as distinct. Name a system, exhaust its permutations. A certain current of modernism followed a strategy of defining a representational or procedural parameter, a particular operation of materiality, and putting it to manufacture. There are versions of this approach that explicitly demand a reduction of an apparatus (for instance, the canvas/paint assemblage) to an exploration of a subset of its functions that no other such combination can duplicate,⁸⁸ a division of labor within the art supplies shop. Minimalism, by contrast, proposed an ostensibly simplified presentation of matter, which veered between the precisely offhand, the deadpan, and the po-faced. To read this set of images through the codification procedures of minimalism, as a fantasy of equilibrium, of procedurally induced and universalizable identity, marked out and walled up, would require, however, an act of stubborn perceptual amputation. What is demarcated is not "prima materia"—steel, straw, plywood, rough marble—but another compositional dynamic. Perhaps working through all possible combinations of the choices made by the programs of speed and aperture allows the user to gain release from having to think them? Do the results of the exploration of the phase space surprise you? No. What is the surprise is the lack of it—that a photograph disowns its pretension to fascination.

As well as teaching itself its own typology, marking out its body, the camera measures out its collapse—its capacity as a machine to produce acres of monochrome, irredeemable as "pictures." Hundreds of thousands of such choices, to avoid the collapse into whiteout faintness or black unreadability, are being made at this moment by photographers, darkroom operators, automatic cameras, the computational matrices of digital cameras, and film and chemical companies, based on what they assess to be an ideal, acceptable, or useable image.⁸⁹ Although the work ostensibly presents a horizon of

knowledge about the boundaries of performativity of the media system of the camera, it can also be said to present all the images that are untaken—untaken because (where thinking—as the code of judgment—is taking) they are unthinkable. Like the novelty seaside postcard of the black cat, with its eyes closed, down a coal mine, at midnight, there's never an excess of impossibles.

The question remains as to whether the periodicity of the grid used by Hilliard actually allowed, among all its variants, for an “ideal” photograph of the external features of the camera to be taken. As Flusser makes clear, such a question is irrelevant to the drives unleashed by the camera. Just as a muscle cannot be described without its exercise, pictures must simply be taken. *A Camera Recording . . .* can be understood as the result of a particular cross section through a material instance of the mania of numericalization. What Lev Manovich describes as “the logic of a computer . . . to produce endless variations of elements and act as a filter, transforming its input to yield a new output,” which “becomes the logic of culture at large,”⁹⁰ has its roots far earlier. One of these roots is that both the computer and the camera are perpetuations and deformations of the logic of calculus.⁹¹ Both are rooted in extensive—numerically organized—means to describe intensive qualities based on the interaction of a limited set of variables. For cameras, the determinate is what is set into the mechanism: measurements of time and of aperture in the case of *A Camera Recording . . .* The intensive component, that which drives the operation of the apparatus, is reflected light. The machine interacts with it in the way it attempts to track, compensate for, and accommodate its rates of change. In the case of Turing's dreamed machine, the computer is “first of all” an instantiation of a deterministic method to trace the counters of the indeterminate, the edge of computability as posed by Hilbert, or the rational production of the irrational.

Such a simple story of origins is already as deeply fictional as talking about the “contemporary.” But the power of numericalization and the other that it makes, this mania that is epitomized—though not founded—in calculus and its explosive invention with Leibniz and Newton, clearly carries over to the problematic of the interactions of the determinate and indeterminate and to others that we will encounter later in relation to other media ecologies and their contexts.

What does numericalization allow? If we return to the problem of mechanization as discussed by Marx (applied in Taylorism and becoming itself almost primally productive in software and hardware engineering), it allows

for the process of transduction of labor from the worker to the machine. Physical work is described by a symbolic language, numbers, derived from measurements and sequentializations, made of the work carried out. Information in this formal state can then be incorporated into a machine. Calculus provides the mechanism by which the monstrous disproportion can be achieved, by which a variable can be multiplied in matter to an extent far beyond human capacity. Digital abundance—that “infinite” variability, customization, and upgrading offered by “the computer”—is predated by that of industry. At this point, profit, or what Marx and Negri call communism, becomes possible. Capitalism is founded on burning up as fuel what could make something else; this is part of its violence, the colonizing of possibility as it liberates potential. (Remember that the fruits of mathematical reasoning were pure acid to the established hierarchies of the societies that bore them: five decades before they attempted to ban Spinoza’s work,⁹² the States General of the United Provinces were failing to constrain the introduction of the ribbon-loom.)⁹³

Communism is one way of mapping and making this potential, and there are others, but it is this crux identified in Negri’s reading of Marx that is important here rather than its particular mode. Capitalism establishes a particular generative pattern in the mix of labor, capital, and machines. It is founded on, and feeds off of, the monstrous spawn of this mating. This too is part of the machinic phyla. But what it represses, or revisits as myth, is what is grasped in Negri’s twist; communism, the abolition of work, is pushed down into the unconscious of the machine until it remains only as a cursed promise of the ease of labor or greater efficiency.⁹⁴

The release from domination over productive life is here conjoined with the computer’s founding purpose, in Turing’s search for the answer to the *Entscheidungsproblem*. In his paper “On Computable Numbers,” one of its ordinary descriptions, the computer came into being as a machine to trace the contours of the irrational. The universal machine’s purpose was to delineate what was beyond its capacity to grasp hold of in the axiomatic of logic and numbers, to map what was calculable and therefore find the edges of the incalculable. It is an immense numerical and combinatorial surging forth in search of the face of the unknown, a search we are still not done with.

Parts of this volatile torrent of intensity coupling with extensity is described in the sober photographic sequences of Hilliard and Dibbets. But it is in the moments that this rigorous hunger for the irrational also fuses with the machine’s repressed capacity for the abolition of work that the truly

productive capacities of the machinic, of the computer, of networks, are revealed.⁹⁵

A Camera Recording . . . and related works are predicated on paradox. What the work does is stage the collapse of one of the great tenets of classical modernism in the mode of Reinhardt.⁹⁶ Under this regime, the work of art achieves autonomy by virtue of its self-referentiality. *A Camera Recording . . .*, however, achieves self-referentiality, but in the process, it disembowels its “self.” Such autonomy is a suicidal utopia, and this work makes use of such a drive to reveal not only that but the way in which its body is composed. This spilling of guts allows access not only to the work as a closely defined apparatus (the mirrors, the speeds and apertures), but the medial system of art and a number of the programs that compose it. The paradox it presents, then, can be understood to be itself the result of the application of doxa, of a metacompositional rule. Here we need to distinguish rules or modes of composition from hylo-morphism or ideal form, and this can be done by a return to the exploration of the will to knowledge. Nietzsche saw this already in his recurrent attacks on the self-satisfaction of rational knowledge. Foucault took this thread from Nietzsche and used it to propel, as Nietzsche did, a more “comprehensive” but always more precarious knowledge. We can see *A Camera Recording . . .* as performing a medial instantiation of such a problematic, one of the programs that composes it.

How can a thing know itself as a thing, its extent—how can it recognize its own rhythms and characteristics? This is a question that, were philosophy ever to generate a fully satisfactory—that is, functional—answer, would see missiles being read Plato’s *Timaeus* in their sleep in order to improve their targeting capacity. Instead of following this fatal trajectory, however, we need simply note two of the glitches it encounters. One of the problematics that arranges the camera, constituting it as an embedded program, is composed by two formulations of thought.

In one of his last interviews, Michel Foucault famously gives a summary of a particular strand in his work, the related problems of thought and knowledge: “Thought is freedom in relation to what one does, the motion by which one detaches oneself from it, establishes it as an object, and reflects on it as a problem.”⁹⁷ This is also an excellent description of one of the powers of art. The capacities for reflexivity introduced in different ways by a series of practices—which, as was suggested above, in the historical context of Hilliard’s

work, were taken down an isolatory route by Ad Reinhardt, Clement Greenberg, and others—also allow for a thinking and sensing through of the thickness of connection, of interrelation and of constitutional heterogeneity of cultural practices. This is one of the fundamental operational powers of art, one by means of which it is possible to shift to many other domains.

The necessary caution to be tendered toward the devices—such as “object,” “self,” and “one”—named by Foucault, is provided by Nietzsche in writing on “a critique of the faculty of knowledge”⁹⁸ that works as well for the camera: “How should a tool be able to criticise itself when it can only use itself for the critique? It cannot even define itself!”⁹⁹ These statements conjoin to establish thought as a dynamic rather than ideal process, one that establishes another dimensionality to a problematic rather than one separate from it. At the same time, it is not locked down, pacing the walls within an eternal territory. Thought is a freedom that is also found in *The Uses of Pleasure*. It enables the possibility “to get free of oneself.”¹⁰⁰

The problem of the camera would seem to be more resolved. This is a technical object with known, standardized physical properties, after all. It is isolatable and analyzable as performing specific functions, some of the results of which are set out so straightforwardly by Hilliard.

Taking a rule, a logic, a procedure and turning it over on itself, or applying it in another domain, is one of the revelatory and productive procedures to be developed further here. Within the context of writing on media the transfer of one regime or modality is often encountered in uses of McLuhan’s notion of the rearview mirror, in which the first wave of every new media develops following the norms of the media that preceded it. For McLuhan this was understood as “the bias and blindness induced in any society by its pre-existent technology.”¹⁰¹ That media technologies copy, recompose, or perform a recension¹⁰² of already existing media is a useful insight. Yet McLuhan’s characterization of this intermediality is hampered in two ways. First, it occurs only in a linear model of time, with progress toward a certain end-state of media implicitly built into his model. Second, it suggests that media are whole forms rather than apparatuses composed of multiple parts, drives, and compositional terms. The power of Flusser’s concept of the apparatus is that it allows us more adequately to disentangle the various programs that aggregate to form any particular apparatus, and to allow a wider range of elements, drives, and dynamics to be understood as part of this composition. These programs may, for instance, operate as medial forms, but may also be the

problematics that underlie their formation. It allows us, in Deleuze and Guattari's term, to understand the apparatus also as an assemblage, as an "increase in the dimensions of multiplicity that necessarily changes as it expands its connections."¹⁰³ This approach, which underlies much of the writing here, will be further developed in the following chapters.

But first, a note of caution. What is proposed is not to lose everything to an indifferentiable flux: among what has spilled out of the camera there are rules, procedures, and from certain perspectival scales, what look like or can be treated with certain effects as objects. In the case of *A Camera Recording . . .* those that are pertinent include those that compose its particular phase space. We may say that these are what compose the granularity, or the sample rate, of the mechanism: the regimes of speed and of aperture within the camera.

A phase-space model is a diagram of every possible combination of the degrees of freedom possessed by an apparatus such as an oven, bicycle, or camera. It allows every possible combination of the extensive qualities of a mechanism to be made. As De Landa illustrates in his example of the oven, it may not provide an adequate method for measurement of the intensive qualities of such a mechanism: for instance, its capacity to heat its content to specific temperatures. An intensive quality, such as temperature, remains constant regardless of the quantity of the material. In the case of the oven, it is clear that its extension would of course have an effect on the given temperature of the air. Extensity and intensity are differentiable but not separable qualities.¹⁰⁴ Their mutual interrelation condemns the camera to be always out of whack, always on the lookout. This being out of kilter with itself is a drive, one of the programs, that can be said to form a medial will to power embedded in the camera. This will is produced by the disjunctive aggregation of the extensive, measured mechanisms of the camera and the variable intensity of light as it enters the camera, as the camera comes into conjunction with the world—that infinite reservoir of all possible patterns of light that forms its outside. This is the camera, its hunger, and what compels the user, as Flusser suggests, to bring it into alliance with his or her own: a new, medial appetite.

Differences of intensity are productive—they provide the basic mechanism for engines, mills, coffeemakers, hot air balloons, and refrigerators: mechanisms of thermodynamic energy transfer based on eventual entropy. However, there is a fundamental paradox at the root of this productivity: "Difference is the sufficient reason of change only to the extent that the change tends to negate

difference.”¹⁰⁵ Entropy, a flattening cold equality among parts, is what Nietzsche saw as the drive in the protoplasm amassing materials to itself¹⁰⁶—the drive to devour and consolidate sameness. The old woman attempting equilibrium, a stable state, *comprehension*.

Combinations of active and reactive processes, their mutual interference, form bodies, drives, new stabilities and new compositions. Can entropic drives to sameness that work against differentiation also function in such a way? This will be one of the questions implicit in the discussion of the standard object in the next chapter. Here, though, we can say that in the zones of purity, those of black and of white made in *A Camera Recording . . .*, entropy is an attractor, an attractor put into place by difference, but one that, depending on combination, may, however, incongruously also generate movement and further turbulence.

As we have seen above, one history of mathematizations and of machines that may be observed is that of systems grappling with their outside, their virtualities coming into composition with and forging new “figures of truth.” Every permutational exploration of the phase space composed by the problematics they respectively generate produces a cumulative capture (of a likeness), collapse and spillage as a result of their coming into combination with their many outsides. What is staged therefore in *A Camera Recording . . .* is a particular set of the programs (speed and aperture) embedded within the camera, coming into combination with the outside, an outside it is predicated upon—that which is required to take pictures of. As is noted in the development of mathematical techniques to diagram natural phenomena, “Between the behaviour we observe and the laws which produce it is a crevasse, which the human mind can only bridge with calculations.”¹⁰⁷ Stewart hits on something; but perhaps there are no such “laws,” only models of forces. If we can take “laws” in Stewart’s terms to be forces rather than models of them, this crevasse is productive in that it forms an outside of a different intensity. The crevasse itself—difference, not simply what is different—is a force, and it provides the opportunity to make two last observations on the medial will to power of the camera.

First, in *A Camera Recording . . .*, in this thick map of the camera, we can read its relation to its outside, the way in which thresholds of visibility and disappearance are built into it. These are thresholds precisely of material capacity. But, let us not forget, they are also immediately material instantiations of aesthetic acceptability, of cultural, familial, juridical, journalistic,

erotic, and other formulations of reference, representation, memory-making and so on.

Second, it is not a question of establishing a static understanding of an apparatus. Understanding the multiple programs and the medial drives built into it is also a question of mobilizing it. Among the granularity of iterations formed by the intermeshing of rates of speed and aperture of *A Camera Recording . . .* there is also a picture of a camera, a set of them. Photographs of the photographer taking a picture of herself or of her shadow are a commonplace. What is productive about this set of images is that it articulates the camera as the possessor of compositional drive—form is generated by the material qualities of the camera, light, mirror, film, apparatus, and the programs that compose them. The chasm between form and formlessness, between occurrence and calculation, between a system and its outside, is exploited at that moment the work becomes cybernetic. This occurs at the point when the camera focuses on itself. The asymmetry of forces embedded in the multiple layers of program within the apparatus of the camera are set to work on mapping their own asymmetry. Feedback in music is sound produced by bringing a microphone, guitar, or other element of sound input into such a relation of proximity with its output—a speaker—that the sound of the speaker itself becomes input, begins to vibrate the diaphragm of the mic, for instance. The system becomes cyclical and positive—it begins to amplify its own amplifications. In *A Camera Recording . . .* we can view one iteration of that process occurring in visual terms. The presence of difference can be read in Hilliard's flat assembly of visual data, but it provides no access to it as an ongoing process. Mobilizing that potential of disturbance of and within the nested and antagonistic programs of media now comes sliding into opportunity.

How This Becomes That

Information theory is not sufficient. It doesn't include the misunderstanding and the lie.¹

—HUBERT FICHTE

In a fragment from his diary of 1911, Franz Kafka records that “As a result of bribery the telephone and telegraph wires around Warsaw were put up in a complete circle, which in the sense of the Talmud makes the city a bounded area, a courtyard, as it were, so that on Saturday it is possible even for the most pious person to move about, carry trifles (like handkerchiefs) on his person within this circle.”²

Kafka discusses that which the Talmud describes as an Eruv. An Eruv is a linked series of ceremonial doorways that creates the legal fiction of a private courtyard. Within this courtyard, observant Jews may push or carry certain objects during the Sabbath, something they may not do in “public.” An Eruv is almost invisible to those who do not recognize the code, but it creates within itself a zone of multiply increased possibility of activity and relationality of activities within it for those who do—dependent, of course, on the preliminary religious exclusion of these activities. Like the pirate radio sounds of the first chapter, unless you tune in, it's a parallel dimension of the city.

The Warsaw Eruv was an example of the use of the material properties of a preexisting media system by another material and signficatory code that captures it for new purposes. It is founded upon the combination of a particular form of arrangement of matter—telegraph poles and wires—and a

particular classificatory series—Talmudic law. (Note also that what Kafka describes as bribery might possibly be the rent that is required of the users of the Eruv to pay to the owners of the land on which it is located if the area is to be valid under this schema.³)

The telephone system at the start of the last century had no inherent constraint requiring its wires to be distributed in precisely this way. These wires could after all have been laid in pipes underground. There they would have been useless for the purposes of establishing the Eruv. But the price of land, the cost of labor, the ready availability of trees to make poles, the ease of access for maintenance purposes—that is, various economic, ecological, other material dynamics, potentials, and constraints—all combine to set this pattern in motion. The material form of the telegraph pole in general is a simple result of the interplay of constraints and freedoms, affordances, brought about by this combination. Once this patterning of matter has stabilized into a common practice, it is then taken up as providing another set of affordances for an entirely different set of practices. The Warsaw Eruv was an archaism embodied in the arrangement of the then utterly modern, and a territory composed by the material components of what is so often referred to as a deterritorializing technology.

Whether or not the Warsaw Eruv is an entirely fictional entity doesn't matter so much. Some contemporary instances even use telephone poles in the same way as part of their boundary. It is the capacity to distinguish, mobilize, and connect medial powers in relation to other compositional formations that is of interest here. Deleuze, considering the associationism of Hume, reasks his questions: "To establish possession of an abandoned city, does a javelin thrown against the door suffice, or must the door be touched by a finger? To what extent can we be owners of the seas? Why is the ground more important than the surface in a juridical system, whereas in painting, the paint is more important than the canvas?"⁴ These are arguments that fuse the representational with the material, that conjugate the aesthetic with the political, questions of the exercise of power with those of powers made in the interactions of "humans and non-humans."⁵

There is a "casuistry of relations" that is at once aesthetic and political, but, in the important lesson Deleuze derives from Hume, absolutely synthetic.⁶ Objects, processes, and media address themselves to other elements and dynamics. They are made graspable, nameable, and useable by certain

forms of relation in which an understanding of their nature and their powers is inherent.

Blanks

The story of the Warsaw Eruv illustrates that the use of objects is not simply determined by their arrangement but also by interpretation, layering, reuse, and other operations. We can turn to two particular pieces of metal in beginning to think through how the morphogenetic, tensile, and other capacities of materials themselves bring something to the compositional mix. Cornelia Parker's sculpture, *Embryo Firearms* (1995), places together a pair of pieces of steel that are in the first stages of being shaped into Colt .45 pistols. They have assumed a rudimentary handgun shape: grip, barrel, finger guard. This motion capture of the formation of a weapon isolates a moment when a particular threshold of possibility is crossed. At this point it is more likely that they will become guns than bullets. Bullets are no more likely now than needles, replacement hip joints, or saucepans. What the work shows is the potentiality of material and its conjunction with a particular array of compositional dynamics: the shaping of the metal by the next stage of production, and the next, its promissory note of death.

Nas speaks on the subjectivity of a gun, its life history, that the machine has a capacity to squeeze all of life down its barrel and make it come out as lead.⁷ Here the gun is seen in the fullness of its connections. A gun is itself a "parallelogram of forces"⁸ a contraption of constraints and explosions. At the same time, there is a compositional drive within a gun that establishes certain forms of relations, relations that are unilinear and fatal, as being more likely. It is a machine for crossing thresholds of potentiality and closing them down.

Embryo Firearms is poetic in the sense that "The function of poetry isn't to impose a single vision or consciousness, but to liberate similar processes in others."⁹ It establishes the requirement for the permutational field of the gun, and what it connects to, to be imagined into, a contemplative double of the glimmering capacity for violence. There is no presumption of a syntax that leads by this way, that, and the next to the correct answer, but rather the generation of a field of possibility in which a particular set of potentials are themselves becoming capable of being thought and sensed through. The space of

“active determining”¹⁰ inherent to the object is the truth that it establishes, which is what makes the work so compelling. That each is a replica of the other, one facing the other in salute, that they are part of the reliable industrialization of powers, makes evident the serial nature of such production, how as soon as it occurs, the one calls its same into being.

The Orthodox hack of the telephone system recounted by Kafka brings multiple compositions, multiple dimensions of relationality to operate through and around the arrangement of the same set of material. *Embryo Firearms*—and indeed much of Cornelia Parker’s work—makes evident how particular compositional drives, themselves under a process of sorting, layering, affiliation, and blockage, enter into combination with the consistencies and capacities of materials to channel the fields of virtuality around or running through an object. The work is useful to recognize here because, like *A Camera Recording . . .*, it uses some of the qualities of the gallery as media system in order to perform an operation of isolation on its material. Unlike the series of photographs, however, which make an intricate meshwork of relation among themselves, the work instead makes palpable a moment in which these relations of dimensionality are honed down. In short, using those powers of art produced in acts of separation and careful attention, and institutionalized in the operational device of the gallery system, it finds a point of crux in formation, the crossing of a threshold, and makes it palpable.

Much of the work discussed in these chapters deals with media systems as they mix, meld, and clash in different ways. Here, however, we need to note how much of what follows in direct action in the world builds on kinds of precipitation from it.

The Switch

The Switch is a work by Jakob Jakobsen in which an on/off switch was temporarily introduced into the circuit controlling the streetlighting for one cul-de-sac in the Danish town of Vejle.¹¹ As Jakobsen notes, most streetlighting is organized centrally to coincide with dusk. (In other cases, light-sensitive diodes trigger the illumination of lights when luminosity drops below a certain level, thus allowing more local conditions to determine lighting-up time.) The adaptation was made by slightly bemused council workers and was accompanied by the distribution of explanatory leaflets to the forty or so houses on the street.

A streetlight is in one of two states. It either glows or it does not. But, as Jakobsen explains, “It wasn’t just a functional intervention but demanded a renewed social organisation around the new variable introduced into the local environment.”¹² The new variable operates in two ways. First, the act of switching the light from one state to another had to be made locally and manually. Second, it induces a consideration of what effect the lighting of the street has on its uses. Talking to people living on the street once the switch had been installed, Jakobsen found a number of interpretations:

On day four I went to the test area with the intention of interviewing a couple of the residents. First I went to a house where the people were in the garden. I asked them whether they had noticed the new opportunity with the switch. The owner of the house, a man in his fifties, said that they had noticed and they weren’t against the idea, but in case it should become permanent the council should guarantee a clamp down on crime, because burglars thrive in the dark. He viewed the switch in terms of lost security and control. I had noticed the floodlight with sensors dotted around in the bushes when I entered the garden. Then I went to a more modest looking house. The woman who opened the door was in her sixties or seventies. She told me that they knew of the switch but hadn’t used it yet. They intended to use it but hadn’t arrived home late. If they arrived home late one night they would for sure switch off the lights after them. She said it in a similar way that she would probably tell me how she always switches off the lights in the bathroom after use. She viewed the switch in terms of economy. The switch had triggered a complex social situation. Diverse interests were at work. The discussions over the fences and in the street had already begun.¹³

Using the switch himself one night, Jakobsen discovered that reducing the ambient light in the street brings the surrounding landscape and a sky full of stars into view. As a technology of sight, the streetlight has its own affordances, one of which is the tendency to close down the distance over which you can see. Water droplets and dust particles bounce light back into the night air causing a fuzzy glare, sometimes called light pollution.

Nothing could be more plain and obvious than a streetlight, yet the range of interpretations of the switch and its function reveals the massive array of connections made by the introduction of a simple piece of Boolean logic in an “understood” piece of urban technology. Placing a switch in such a context reveals how even technologies that have settled down as part of the routine apparatus of a European human settlement are understood in enormously

varied ways. When the first streetlighting was introduced in cities, it was treated as a spectacle. All the good citizens traveled to see it. Now, perhaps, the potential for darkness, for indirect light, for depth of vision is equally scintillating or disturbing. As well as the more directly perceptual aspects opened up by the insertion of a switch into this circuit, the residents recognized the capacity for the presence or absence of a certain kind of light to tie into patterns of behavior that can be interpreted in ways as varied as commonsensical economics, politeness, household and personal security, mutual conviviality, and so on. Capacities of perception are immediately and explicitly politicized. But this politicization also travels backward in time. While residents ask themselves the question of how to arrange the use of the switch, or whether to remove it altogether—something Jakobsen imagines happened rather swiftly—the question arises of how such a configuration stabilized out as a norm, what the applicable domain of such a norm is, and how it produces effects of transduction, change, amplification, or erasure on other patterns, codes, and behavior that it comes into composition with.

National or international standards for devices such as streetlights are made and coordinated partly in order to remove the need to consider such wider aspects of a designed product. Once the design is completed and production is underway, all that is required is installation on a mass scale. Fine tuning of a technology, to ensure cost-effectiveness, efficient maintenance, aesthetic distinction, or visual or physical unobtrusiveness, the suitability of various levels of light for residential, road-traffic, or decorative purposes, the recyclability of components and easy recovery of pollutants (such as mercury in the case of streetlighting) the designing-out of contributions to the saturation of ambient light, can certainly be made, but the thing has become a module, a device. It can be taken off the shelf, wired in and run—it is known.

When a new street is built, its infrastructural requirements are, along with streetlighting, access to clean water, sewage pipes, electricity, gas mains, TV and other network cabling; its category of road use is understood to be generic to the sort of development that it is planned to be. The kinds of behavior expected of inhabitants or users of a premises on the street are planned into it. Regulations managed by a local authority control any possible change to the premises. The use of such utilities continues to be recorded for billing purposes. By these means and over time, statistical norms of usage can be kept up to date. Such norms can also be used to identify potential transgressions of other codes. The abruptly abnormal uses of heat, light, and water in

medium- to large-scale hydroponic growth of marijuana, for instance, is commonly used to isolate such production in domestic premises. The data body is also an energetic body.

With streetlighting or any “settled” technology, a problem is solved. But it is often a problem posed several generations ago, and which, in general, we no longer have access to.¹⁴ Indeed, the problem it refers to might no longer exist in the same terms. At the same time, each technology is part of an assemblage and carries all or part of this composition with it. Streetlighting, for instance, installed in the British Isles on a local basis by district or town councils, brought with it a system of administration and of additional taxation that was often felt to be onerous. All citizens were to pay for it, but those disproportionately liable to be robbed, and who were therefore afforded protection by the lights, gained the most. (Streetlighting can also be seen from this perspective as a way to route-around the criminal reappropriation of wealth, a form of positive feedback or coevolutionary development.) The “universal” provision of light in the main streets of a town has a class dimension, but it would also be possible to trace its conditions of affordance for other social configurations.¹⁵

Streetlighting systems are “addressed” to certain agencies, to local authorities, town planners, architects, energy companies, those concerned with planning and managing their installation and use. To imagine that they might be addressed at the level of an individual, rather than a population or some other kind of mass whose needs are dealt with in such a way, messes with the scale of interface we expect to have with such systems. This is not to say that technologies are only ever addressed to such users. The “alternative” and “radical” technology¹⁶ movements imagine entirely different sets of actors and needs making demands on the design and implementation of technologies. Continuing a tradition—inherited from texts such as Kropotkin’s *Fields, Factories, and Workshops Tomorrow*¹⁷—of direct imaginative extrapolation based on current materials, devices, and capabilities being organized differently, Murray Bookchin, for instance, suggests a kind of local steel plant whose operation and output could be managed by face-to-face popular assemblies.¹⁸ The very extraordinariness of such a suggestion is often a result of the way in which the relations between technologies, their administration—including that of the economy and the political infrastructure in which they are or are not made available—is resolved, rather than such a situation always being determined by the will to power of a media or a technology.

The Switch can be said to operate by the switching of address. A technology ostensibly aimed at operation by a central mechanism is suddenly endowed with the kind of requirement for choice-making typical of consumer technology. At the same time, the agency assumed by that form of technology, the individual, doesn't fit its interface. Only one hand can operate the switch at a time, yet *The Switch* addresses a whole street. It localizes and radically detemporalizes (in that it can be switched on or off a limitless number of times) the position of the administrator addressed by a "normal" street-lighting system. It is not therefore a piece of work congruent with movements in technological development driven primarily by the involvement of other social actors, actual or imaginable, such as a community or street assembly. It is out of joint with such things. Instead, what it does is make clear just what position is addressed, or even partially instated by such a technology. As it does so, it begins to make the other elements and dynamics of the assemblage dimly, or more clearly visible—the discussions over the fence and in the street are what Jakobsen aims at.

Nietzsche called the moment of becoming "untimely": becoming as extrahistorical time, a moment in which history as a set of determining relations is suspended in a moment of luminous intensive growth. History is here imagined as a series of relatively negative preconditions. In developing a theory of medial becoming we also need to develop an understanding of pre-existing formations as containing dynamics that are unrealized, that await composition with other devices, drives, or patterns. Such moments of composition move toward a consideration of history as an available productive force and repository of potential. An understanding of history in these terms need not rely on anything more than a deployed perspectivalism—or a handy way with bad memory. But it is the extreme naked weirdness of the past, the residue of history as itself a process of becoming, that in turn demands the appreciation of the equally extreme possibilities of becoming in the here and now.

What *The Switch* achieves is this irruption of potential in a settled technology. By shifting the address of the streetlighting system to a decision-making process that did not previously exist, it brought the possibility for such a process to come into being, or for several to clamor for access to the switch together. There is no inherent process of "democratization" in this othering of technology; what is released is something of an insight into the arrangement of the forces, the programs, that make up the body of this system.

It is on these grounds that the work makes a politics. How the terrain revealed by *The Switch* is then navigated, what other formations are produced in order to do so is again created by the relations between the programs and drives revealed in this light or which are attracted or produced in its revelation. (One can imagine a neighbourhood assembly meeting every evening to determine the operation of the circuit; a neural network recording the habits of actuation of the population of light users in order to adjudge a form of average use; a scheduled monthly interval of darkness for the contemplation of unlit landscape; and so on.)

Standard Objects

The streetlight is a standard object, or at least its variations are arranged in proximity to some set of qualities that mean all within that set are understood to be streetlights and to share a number of functional characteristics. One of these is that its operation does not require or allow for any intervention from a passer-by. Such knowledge, that attention need not be paid to that aspect of the material culture of the street, allows a user to move along it with his or her attention paid to other things.

Each standard object is the result of what Alfred North Whitehead called “an ideally isolated system.” Every such system can, under Newton’s first law, be treated as a separate entity within the universe: “This means that there are truths respecting this system which require reference only to the remainder of things by way of a uniform systematic scheme of relationships.”¹⁹

Such objects have become crucial to the generation of media and communications networks and the organizations that handle them. Earlier in time they have provided the grounds for the award of monopolies to guilds; the development of industrialization as it composed itself in part out of the invention of determinate materials and social relations as a route of access to the unknown; and the globalization of production as standard objects are installed, and contested or maintained. Standards come with their own sets of institutions and regulatory bodies, such as the International Standards Organisation (ISO) and the British Standards Institute (BSI). Key examples of standard objects are the freight container and digital packet switching. The former will be discussed here, the latter in the next chapter.

The form of freight container invented by Malcolm McLean and developed by the ISO’s Technical Committee 104 is seen as one of the key devices of

global trade. These are the range of uniformly sized steel boxes that can be seen piled up in yards, stacked high and moving slow on the shipping lanes, loaded onto trucks and trains all over the world. Along with their uniformly ranged size, each container has a special corner fitting. Described in “ISO 1161, Corner Fittings,”²⁰ this allows for cranes and other lifting and carrying equipment to attach themselves to and move each element of a load in a uniform way. This group of technologies allows for the fast loading and unloading of freight at any port or other transfer point equipped with the right, relatively simple gear.

The drastic reduction in the labor requirements that this technology allowed for, coupled with a restructuring and massification of global trade, has meant the erasure of one of the most crucially positioned and combative working class populations.²¹ Yet the “meaning” of the freight container does not end there, and it is of course possible to imagine the same technology embedded in an entirely different set of economic relations.²² The container has been used as a squatter’s shack worldwide. Miniplants containing workshops of all different kinds are now transported around the world as a finished piece of architecture using the container as a standard form. They are used as the walls of temporary stockades to protect intergovernmental summits or to protect embassies from car bombers.²³

Apart from the official history of the freight container as a standard object, its first incarnation may be seen in the imaginary of modular architecture. In a number of texts from the beginning of the twentieth century, the Futurist Velimir Khlebnikov²⁴ describes a form of mobile residential architecture that is composed of any number of uniformly sized personal glass capsules, which can be shipped around the world according to the wishes of their occupant. Once at their destination they are to be slotted into immense steel armatures, towns of regularly sized nomads, crystalline trailer parks. These are fitted with services such as water, electricity, and so on, which the capsule can be plugged into for as long as the occupant stays in residence.

Each container is self-contained. It is tagged with a destination, customs manifest, ownership information, and other data relevant to its being moved from one place to another, kept within a system of property relations and sequentially organized legal accountability. What is inside it is relatively immaterial: bananas one way, computers and fridges the other. The freight container makes no unexpected demands on the carrier except safe handling and an arranged rate of speed. Any special requirements, such as refrigeration,

can be made by installing the necessary equipment within the space of the unit or applied to the load as a whole.

The culture of the standard object, the organizations it is embedded in and with which it forms mutually compositional relations are revealed when the doors of the container are swung open to reveal a stack of asphyxiated corpses among the tomatoes or hair-dryers. In a world where goods but not people are afforded maximum freedom of movement, it is necessary to assume the qualities of a standard object in order to move, to be smuggled across a regulatory line in the sand. Andy Warhol said something along the lines that anyone in the world can have a can of Coke and know that no one in the world has a better can of Coke.

The standard object refers most easily to things that are mass-produced: cars, loaves, houses, the customizable ring of a telephone. A standard can be said to establish a continuum with itself at one pole. Total disorder, or the need for testing each capacity and property of a commodity before use, or its cheaper version, ignorant trust, lie at the other end along with fabulous objects that have no precedent or equivalence. Other elements that enter into compositional arrangement with a standard object do so on the basis of adopting some of its terms, metrics, protocols, rules, coupling systems, and so on. There are other objects, such as pencil sharpenings, a wide and appetizing range of gourmet sandwiches, almost every kind of book, that are produced by the joint action of two or more standard objects. For some products such as drugs and medicines, there is no room for anything but adherence to a cascade of standards, of handlers, testers, licensees, packages, and users with their mundane or novel “conditions” of which the actual object is only a subcomponent. Weapons systems and their organizations, containerized docks and airports are perhaps the most immense concatenations of standard objects conjoined into an assemblage, requiring their own programming languages and technical jargons for even basic use and navigation. Indeed all such things are themselves the result of standardized materials, flour, steel, cotton, sugar, water, sodium, or are engaged in some compositional arrangement with continua of standardization.

What is interesting about the freight container and the technology of digital packet-switching is that they work as a metaobject. A donkey cart can be used to carry turnips or bricks; a wooden barrel can carry tar or wine; these are objects made with other elements in mind. What can be said, though, is that the container and the packet exemplify in particularly pure but different

ways a trajectory toward standardization, which then compels the adoption of their standard in a way that is not complex but direct. What become standardized therefore are not simply objects, but processes. In this way, they typically exhibit the qualities that Niklas Luhmann ascribes to the function systems of modern society: “Differentiation, operational closure and autopoietic autonomy.”²⁵

Complaint against such processes in favor of a lost world of simply human communication and exchange is of less use than observing how such processes are woven in and out of other forms of life. Rather, we need to ask how the isolatable and the amorphous come together and produce each the other, and how, by means of different perspectival scales, technologies, epistemologies, rhythms, and affordances—perhaps all dynamics and elements—can be known in some senses as both standardizable and isolate and as heterogeneous and connected. As Robert Cooper puts it in a text on the figure of the assemblage, “Language itself is a vast linkage of parts that come and go in temporary assemblages that parasitize each other.”²⁶ Language is possibly the first system that incorporates a drive to standardize within it, and out of which all others are made manifest.²⁷ A standard, in this sense, is not an administrative one, but something, a piece of speech, around which arrangements can be made. It need only last for the extent of a particular conjunction of persons; or it may travel and become language.

The standard object implies exchange, trade, command, communality, “otherability,” a difference in state from one location to the next. It demands that something is not individualized but composed in part by the necessity of relations. The sheer multiplicity of such relations make language the vast, sprawlingly alive thing that it is.

In “Postulates of Linguistics,” Deleuze and Guattari bring language to bear on an assessment of its founding role as a technology of location, command, ordering, as a systemization of the transfer of indications and imperatives from one location to another. Rather than being split into a Saussurean schema of *langue* and *parole*, the work in this plateau establishes language as something produced in every actuation, and most significantly here, not simply as a batch of codes and rules but as a pragmatics—as a politics of language—and as something that effectuates “specific, immanent, and necessarily implicit acts”²⁸ as part of a wider social assemblage, acts that are themselves “in constant variation . . . constantly subject to transformations.”²⁹

A discussion of language, in terms of words both as descriptors in processes of control and as elements in dialogic composition, will be developed further in the next chapter. What is important here is to begin to speculate on the possible grammars built into and implied by standard objects, the physical and ideational fields of possibility that course through them, and with which they engage and effectuate. A freight container is something other in the hands of a shipping or haulage company than it is in those of a construction crew using it to store stuff and sleep in, but it is by means of its particular, and overlapping, affordances that it is used by both.

According to Whitehead, the doctrine of simple location is a fallacy of “misplaced concreteness.” Such a fallacy occurs when “by a process of constructive abstraction we can arrive at abstractions which are simply-located bits of material, and at other abstractions which are the minds included in the scientific scheme.”³⁰ The advantage of such an abstracted, schematic view of the world is that “you confine your thoughts to clear-cut definite things, with clear-cut definite relations.”³¹ Defining an area of spacetime, an object according to such a schema, allows access only to an object’s “modal”³² character—that it exists for such and such a limited extent of time and space in a perspectively limited process of realization.³³ (Whitehead proposes that his organismic, relational view allows material to be understood in “prehensive” and “separative” terms—that is, that they are understood as existing along with other elements and that they are separated in terms of spacetime. Such continually renewed acts of separation and joining are, according to Cooper, distinctive of Whitehead’s insistence on mutual relatedness and crucially the beginnings of a potential theory of movement rather than object.)³⁴

The standard object occurs when the particular capacity of distortion necessary to the abstractive power of misplaced concreteness allows the process of simple location to be doubled. Once matter can be understood and handled, operated on, in terms of simple location, it can be formed in such a manner. That is, despite—because of—its clear limits, simple location acts as a productive device. We find ourselves among a naturalized landscape of nouns, things, homogeneities. Just as a certain sort of streetlighting addresses a particular kind of user, a law-abiding citizen, such a device “works to construct legitimate objects of knowing for a knowing subject.”³⁵

It is in this sense that the autopoietic³⁶ autonomy that Luhmann ascribes to the functional systems of modern society brings itself into being. Concrete

misplacedness amplifies itself, produces patterns of positive feedback, gives rewards. Meanwhile, as particular systems become self-generating, perpetuating themselves by virtue of the critical mass of interrelations they build up, other elements come into composition with them, send them on detours, detach themselves, fall into disuse, vanish, arise in contradistinction, or emerge to take up the relations and forces that are now perhaps left in their wake. It is in this sense that we can now speak of, first, standard objects producing, indeed entailing, standard processes.

Second, we can begin to ask a question, crucial to the consideration of media ecologies: What arises when two or more standard processes, with their own regimes, codes, modes of use and department, systems of transduction, and so on, become conjoined? How too do their multiply stacked and non-linearly interlinked interplays of constraints and freedoms produce a way of sensing and launching the materiality of an element in its protoplasmic form—think back to Parker’s embryos—or, put another way, sensing the moment at which an element, particularly a technical object, is still an assemblage rather than a homogeneity?

How can medial operations begin to make use of such a sense of the standard object without falling victim to the way in which it assumes an already bounded system of address and activity for the other elements it comes into composition with? Part of this can be put into play by the way in which Deleuze and Guattari describe their materialist model of pragmatics in language: “True intuition is not a judgement of grammaticality but an evaluation of internal variables of enunciation in relation to the aggregate of the circumstances.”³⁷

The way, then, to ask such a question is by carrying it out.

by the way

The *Torre de los Vientos* is an irregularly conical sculpture of steel and concrete, about fifteen meters high, originally designed by Gilbert Fonseca to mark the 1968 Olympic Games held in Mexico City. The structure is hollow, its inside lit in daytime by sunlight through a hole at the apex of the cone and by a series of narrow slit windows. Internally, there is a cluster of geometrically ordered shapes that look like the parts of an elaborately expandable system of component architecture that never quite made it, tiered seats or steps, blocks.

The site is surrounded by major roads and intersections, the Periferico. Traffic is constant.

In the mid-1990s the site was adopted as a location for installation and other work by the curator and artist Pedro Reyes, who established it as a place of collaboration between an ongoing series of artists and curators.³⁸ The work *by the way* is a piece by Germaine Koh that was situated in the tower for a period in 2001:

by the way recognises that the commuters passing the building are the most regular users of the site. Within the structure a live audio-video feed monitors the passing traffic. The audio feed is processed by an effects unit to resemble gusts of wind that correspond to each passing car. This transformed sound is retransmitted in real time, as a localised FM radio broadcast borrowing, within a very short range, the frequency of an existing radio station known for its frequent traffic reports, so that the commuters passing by can listen to their own passage, transformed into wind. The character of the transmission varies throughout the day, as a real-time measure of the flow of vehicles. It is a kind of alternative traffic-report, one which tends to become the weather report at the same time. I was hoping that in that city infamous for its congestion and pollution, the project might provide a quiet opportunity to imagine a more open space and condition for passage.

I did not ask permission to use the existing frequency, but rather transmitted over the top of it, so that in the rather localised area of my transmission, the commercial station's transmission would give way to mine, without explanation. I didn't get any feedback from unknown drivers. However, I should say that part of the emotional charge of pieces like this . . . is the process of imagining how they are received unexpectedly. An important aspect . . . is the fact that they are anonymous and non-commercial. Both reclaim rather frenetic commercial space in order to insert gentle reminders into other spheres and speeds of activity.³⁹

BITRadio

SPECIFICATIONS: The system consists of an event-activated FM radio transmitter for neighbourhood installation. When news activity is detected, transmitter powers up automatically to broadcast a brief burst of live audio data over local FM [average duration 2–5 seconds, adjustable]. News content consists of either a) burst of realtime audio from the event location; or b) system generated report. BIT [Bureau of Inverse Technology] transmitter is tuned to break in clearly over other network stations, for

rapid information delivery to established audiences. When the BIT news has been delivered, transmitter powers down automatically and normal scheduled programming will resume. This frequency-sharing strategy does not assume collaboration of host/carrier news station, see schematic. BITradio news effects a microinterruption to normal broadcast services. (For a review of the contention that the airwaves are a scarce resource see FCC role as bandwidth conservationists, also UK management tactics.) Bureau operation makes use of brief, economical, intermittent signals: technically difficult to pinpoint, or to classify as violation by detection forces e.g. FCC, DTI, ACA, trained in long-play music/community format radio deterrence.⁴⁰

One actuation of the *BITRadio* system, timed to coincide with the World Economic Forum (WEF) in February 2002, was located on a rooftop in the vicinity of the event's location, the Waldorf Hotel in New York City. *BITRadio's* transmitter was set to the same frequency as a local National Public Radio member station, WNYC. According to the BIT statement, "A one-second alert will break in clearly over normal station programming when either asbestos, dioxins or particulates fluctuate over the EPA⁴¹ set level."⁴² The work echoes another BIT project, *BANGBANG network* (2001), which allows for the "accurate and databased audiovisual reportage of isolated gunfire, intersection events [slamcam] and other triggers and events of interest."⁴³

Related to military target-acquisition systems, this network is actuated by a particular set of sound or movement types, such as a gunshot, crash, or "vertical motion." A particular type of information is isolated as being significant, or particularly rich in informational and social terms, as being the crunch-point of a crisis or as marking the transgression of a convention of movement or behavior. The material recorded by the particular *BANGBANG* system is then fed into a live stream from a Web site and recorded into a database. According to the Bureau's Web site, one installation of the project, in Broadway, New York, appears to have successfully recorded a set of sounds characteristic of gunfire.⁴⁴

Sensor Sensibility

Cybernetics is, in a simple sense, the study of systems wherein a sensor is connected in a direct or indirect way with an actuator. The operation of the actuator is governed in some manner by the information about its behavior

received by the sensor. Typically this might include analysis of the interactions of a hand and an eye or an air-traffic control system and an aircraft. In both of these cases the movement of one object is constantly modified by the information received by another. A dynamic relationship is composed wherein the behavior of one element is constantly informed by that of the other.

It might be suggested that the conceptual division between sensor and actuator replicates the distinction between mind and body. However, cybernetics points more toward the mutual inherence of such elements. (This is one of the roots of the institutional opposition to it by artificial intelligence—a formation that in its early and continuing “strong” form explicitly relies on such a split.) And it is in this composition of a “body,” a composition of forces, that is informationalized and dynamically adaptive that we encounter the fundamental hit provided by these works: “Cybernetics considers systems with some kind of closure, systems that acts on themselves—something which, from a logical point of view, always leads to paradoxes since you encounter the phenomena of self-reference.”⁴⁵

What is the body that these systems form and induce to self-reference? They are formed precisely in and through this paradox. It is a paradox that never ceases to recur. In both cases, the particular systems are relatively autonomous, first in the sense that once set up and switched on they could, given a power supply, just keep going indefinitely. Second, they are autonomous in that there is no explicit act of “reading” the apparatus or the data it gathers and acts on to ascribe any particular meaning to it built into the work. But it is in how they form mechanisms of feedback between sensing and actuation, how they thus produce a “self”—an idiosyncratic domain brought into being by sets of variable repetitions—that the paradox is mobilized and begins to proliferate. In both pieces of work it is simply air—how it moves and what it carries, what it is connected to—that provides mechanisms by which these recursive selfhoods are established. And it is by the way in which “simple air” has become charged as a political, sensual, ecological, and medial paradox—and in the way it makes such words on their own rather inadequate—that makes the work so intriguing.

Concrete Misplacedness

In *by the way*, the position of sensor and actuator is folded back on itself in the following way. At the level of the technical setup of the work, there is

simply a video camera and microphone, constantly on, linked to a low-power radio transmitter that broadcasts a modified version of the sound of vehicles passing along the road. Car radios tuned to a certain frequency pick up the sound of their own passage and that of other vehicles traversing the range of the microphone for as long as they are in broadcast range of the transmitter and their receiver is able to pick up the signal. People inside the space of the tower can listen to the audio transmissions and view the passing traffic through the video monitor. The position of sensor thus migrates into that of actuation. Momentarily, the sound of the passage of cars doubles, as you drive, maybe on your way to view an installation inside a sculpture. Hearing, through the radio, senses its own connection to a normal process made strange.

A key dimension of this project is formed by feeding the work through a system of objects—cars, lorries, buses, trucks. Use and attrition ensure that they are no longer fully standard objects. At the same time, each vehicle is caught up in fields composed by continua of standardization. The most obvious of these is their position as mass-produced, possibly subsequently customized with mass-produced components, or their status as subject to legal regulations; but there are other ways in which a standard object can be sensed. This allows us to find that they are not “simply locatable” as means of transport but are also manifest at the level of sound. What is governed as a mobile private space has literal reverberations. The neglect of the impact of these reverberations as a significant dimension in the design of these vehicles and the road systems they are part of reveals something about the identity of the addressee of this technology, namely, that the sound of the internal combustion engine must be constantly, and without limit, available to all.

It is in revealing the position of the listener as a sensor that has been amputated from any direct means of actuation that the work achieves part of its political charge, but it is in implying missing forms of connection and feedback that it gains the uneasy powers of paradox.

Such powers are also those summoned by *BITRadio*. The WEF version of the *BITRadio* system is activated by the amount of certain atmospheric pollutants detected in the air by the sensor. The work’s transgression of FCC (Federal Communications Commission) regulations in making a transmission is generated by the presence of these chemicals at a level above Environmental Protection Agency limits. In order for the work to momentarily or repeat-

edly break one regulation, it is dependent on the capacity of other organizations, of people, economies, technologies, and materials, to break others, and on the ready capacity of the air to distribute toxic chemicals to the rooftops and lungs of New York.

The WEF meeting, as is standard for gatherings intended to promote democracy and free trade, was held behind an intense security cordon, which, as one consequence, blocked any contact between protestors and attendees. *BITRadio* in this case can be seen as an attempt to provide some form of feedback between the ecological impacts of technologies and social forms such as governments and capitalisms and their own attempts at mutual coordination and information. In BIT's accompanying statement,⁴⁶ the probability of the system actually achieving any contact with those attending the conference is wryly brought down to a sequence of percentages: "likelihood that a conference participant listens to NPR during the event, 4%. Although chance of delegate encountering information from direct street action protesters is estimated as even lower, less than 2%, due to drastic police street isolation tactics around the conference venue." Perhaps we can suggest a similar likelihood that their listening activity coincides with a *BITRadio* overcast of WNYC's frequency. These, compared with cynical democracy's normal chain of increasing irrelevance, are pretty good odds. Rather than simply offering an effective form of automated lobbying, then, it presents us full-square with the fact of the removal of political power from direct mechanisms of feedback and answerability. At the same time, the work refuses to settle for the fact that it makes visible; it adds other sets of process to the world and makes connections where they shouldn't be.

Ideal Isolation Tanks

The standard object is a result of operations in matter made possible by the ruse of an abstraction: misplaced concreteness. The operative power of such an abstraction is generated in how well it accounts for the phenomena it describes. At the same time, in the compositions discussed here, it works most powerfully when it serves to generate overlaps, leaks, misrecognitions, alliances of bastard components.

But these are not breakdowns. *BITRadio* depends on a sequence of components doing their jobs right. Each component is a standard object. An

element is not the same as the social processes it is mobilized in and makes. Equally, an element is never innocent. Each element in the composition here acts as a node wherein multiple forces meet and reshape, block, or amplify each other. The ruse of concrete misplacedness, of an ideally isolatable element, produces its offspring—but they are unruly.

Misplaced concreteness is generated by scientific theories when they objectify, that is, when they expect in advance the results that they obtain. Nietzsche already understood such a process as resulting from an unacknowledged perspectivalism: “We believed that an effect was explained when a condition was detected in which the effect was already inherent. In fact, we invent all causes after the schema of the effect.”⁴⁷

Cybernetics proposes that such conditions are monitorable and adjustable by observations of a second order. A second-order system is one that is able to monitor its own operations and compare them with the operations of others, its past operations, a set of conditions it must meet, or other information to which its behavior can be meaningfully correlated. A concatenation of operations of misplaced concreteness thus allows the gaps, overlaps, and voids in the interrelated capacities of such systems to construct a more “accurate” account of its own operations.

Here it is useful to relate such formulations to a discussion of “fact” in Donna Haraway’s *Modest Witness*. . . . “Fact” is configured here as “crucial points of contingent stability for possible sociotechnical orders, attested by collective, networked, situated practices of witnessing.” Each of the terms used in this sentence deserves a certain amount of unraveling, much of which concerns Haraway’s perceptive book. What is useful here is to take this understanding of fact and apply it to a thicker, second-order, use of misplaced concreteness: contingent stability in a historical time-space.⁴⁸ We return in a sense to the pragmatics proposed in “Postulates of Linguistics,” where a “statement”—which in relation to the particular devices discussed here might be a fact, protocol, data-feed, waveform, amplifier, aerial, law, organization, protest, and so on—“can be evaluated only as a function of its pragmatic implications, in other words in relation to the implicit presuppositions, immanent acts, or incorporeal transformations it expresses and which introduce new configurations of bodies.”⁴⁹

Following *The Switch*, we can also say that such an element does not need to be technically complicated. *The Switch* is a simple logic gate, an associational device linking this to that, but at the same time it is a thing in itself,

a link waiting to happen—a virtuality—or a link in activation. A computer contains millions of such switches. It is its situation, the particular location in which it is lodged, with all the ways it dislocates the already understood function of the apparatus, that makes it work.

Objectification, in Whitehead's use of the term, is built into technical devices. A sensor used to register the presence in the air of a particular chemical exists solely in order to recognize the only thing it can recognize. It has a molecularly precise perspectivalism. The information it is able to deliver means nothing, however, unless it is mobilized by the kind of associational operations that Haraway points to. Bodies are not homogenized absorptions of the forces they are in relation with; otherness is not dissolved. And it is in asking how to explore the potential associationality of a system—the paradoxical, recursive self it composes by the interrelation of these multiple forces—that works such as these produce themselves as further questions.

In *by the way* and in others Germaine Koh uses solely preexisting elements: “Part of this was a simple utopian principle of not adding new objects to an already saturated world, but it also arose from a more general interest on my part in observing the world as it already exists around us.”⁵⁰ Many of the devices that the Bureau of Inverse Technology produce are developed with a view to their ultimate “kitification.” Quite often, full or partial schematics of equipment will be presented on their website in order to allow their replication. As James Stevens, a proponent of Free Networks, states in another context: “The information age has boiled down the magic of telecommunications into a set of modular components that any of us can adopt and explore.”⁵¹ The collectivity, transfer, use by others, and recomposition implied by the use of standard objects in both of these cases is an implicit part of the work. Such an arrangement allows for testing of results in further experiments. What is the object of these experiments? It is the paradoxical self composed by the assemblages used, mobilized, and implied by these projects.

“The fact that it is often phrased in the form of experiments, is related to an attempt to step back in order to observe the world unfolding.”⁵² Such a second-order act of stepping back for observation requires a means by which the world can be observed. Something needs to be placed in the world and connected to its flows (even if it's only, as in Kafka's famous case, an intuition, a room, the act of staying completely still).⁵³ The devices produced here in order to see how the world operates necessitate, as Haraway suggests, a more

complex and involved participation in it, and it is here that a fundamental engagement with media ecologies can take place. What is the form such an experiment takes? Accumulate information, techniques, spread them about, stay with a situation long enough to understand its permutations. Find a conjunction of forces, behaviors, technologies, information systems, stretch it, make it open up and swell so that each of the means by which it senses and acts in the world become a landscape that can be explored and built in. Speed it up and slow it down so that its characteristic movements can be recognized at a glance. Lead it through a hall of mirrors until it loses a sense of its own proper border, begins to leak or creates a new zone. Attach the relations implied by standard objects back onto the mechanisms, subjects, and addresses that they arise from. Remove the possibility from standard objects that they become transcendent. The intensities and arrangements, the will to power, made possible in and through each standard object, but trapped in a stable state, will by such means reopen.

The offer of replication inherent in such moves as the kitification of materials and the use of only preexisting equipment is perhaps becoming part of the general good manners of work in this kind of area. It is assumed that none of the work is a virtuoso performance, something highlighted in the aesthetic of engineering functionalism adopted in BIT's technical reports and information releases and the way it names and constitutes itself—the Bureau is registered as incorporated in the Cayman Isles—and its generally not-quite-anonymous agents. It is possible that such a helpful presentation of information simply acknowledges the inevitability of work being plagiarized, mechanisms being copied, procedures being built on, and senses an opportunity for the maintenance of more author-centered practices in the offering of “support services” rather than the delivery of specific objects as a sustainable mode of economy and nameable cultural presence.⁵⁴ Nevertheless, such a complication, which uses openness but also aims to maintain a process of material engagement with media technologies, is also perhaps a way of thickening and providing space for, rather than necessarily contradicting, such processes. It serves at least to suggest that care in making materials reavailable to other processes is something useful.⁵⁵

Here, we can turn to what Deleuze and Guattari name as the third characteristic of minor literature: that, within such a context, “Everything takes on a collective value.”⁵⁶ Each process is a contribution to a diffuse “movement”

or wave of related work and activity. A standard object is a recursive function, the one that calls its same into being. But as we have seen, solutions create problems, local stabilizations or the development of the concrete generate reverberations that tip other elements out of balance. And this provides an opportunity. These projects acknowledge their involvement in such a process of recursion, twist it, and feed the results back into the ongoing composition.

Seams, Memes, and Flecks of Identity

Don't document and exchange information but think! And every thought must find its own specific and mortal form!¹

—ALEXANDER BRENER AND BARBARA SCHURZ

In her book on the “memetic” theory of cultural evolution, Susan Blackmore lists a media ecology of her household: “We have four telephone lines, two fax machines, three television sets, four hi-fi systems, seven or eight radios, five computers and two modems. And there are only four of us. We also have many thousands of books and a few compact disks, audio tapes and video tapes.”²

A twelve-hour-a-shift operative from a security firm watching the feeds from ten different branches of a supermarket: “In my cubicle, I have twenty monitors, two telephones, an alarm light, my mobile and a walkie-talkie. Aside from that I have a copy of yesterday's paper, snot rag for giving the equipment a shine, dead scratch-card from the National Lottery and a fax machine.”

The Streets: “Make yourself at home, we got geezered off some of that home-grown. Sit back in your throne, turn off your phone, cause this is our zone. Videos, televisions, 64s, Playstations. . . .”³

More inventories, more lists. Reception centers. *Gezelligheid* via black boxes and soft furnishings. Gratification? You put enough bits together and they start breeding. What happens when media systems, with all their dynamics and compositional terms are used together, clash, or are brought into some kind of coarrangement? Starting with the virulent networking sprawl of pirate

radio in London; moving to focus attention toward medial will to power in *A Camera Recording . . .*; followed by accounts of a series of paradox-driven recompositions of locked-down standard objects—this has been a key question. In the first chapter, in order to attempt to keep some kind of pace with the combinatory carnival of pirate radio in London, the work ran as a list: each element runs off as a gateway to another medial dimension, an array of processes; each of these is connected up in ways that block, tease out, evacuate, or mix and amplify potential in what they connect to. This sprawling sense of a media ecology is revisited here in a smaller, closed set of elements in the composition, a particular Web site.

In *Chaosmosis*, Félix Guattari suggests that the range of “ontological modalities,” the machinic capacity to build realities, is infinite. What is hoped for here is to gain some sense of this infinity in media by means of a close launching-off from a small set of elements. If the material on the pirate scene follows an autocatalyzing process that mixes media of all sorts according to the demands and exigencies of always developing, always breaking—also in a number of ways always constrained—music cultures, this chapter focuses on a site that renders tangible the massive array of influences, determinations, and possibilities of a particular, oddly conjoined media ecology.

Each of the three lists this chapter begins with specifies a scalar media ecology that can be understood in terms of its dimensions of relationality—the ways in which it is generated by, acts in, can be read by or conversely evades or remains inscrutable to a multiplicity of compositional dynamics occurring at one or more scalar levels. Each of these first lists also provides a route into a specific approach to the combination of media systems: *memetics*, a set of theories in which cultural elements and processes are proposed as being recognizably “evolutionary”; *seamlessness*, the condition of an uncomplicated confluence of media systems; and *surveillance*, the medial drive to spot, name, and control.

These recurrent thematics of media culture will be taken up at particular moments within this chapter where such conjunctions make them particularly available. Here, a certain Web site, located at <http://www.irrational.org/cctv/>,⁴ provides an opportunity to see how these things roll. The structure of this chapter is to follow through this tangle, to take up and test its parts in the sequence in which they are encountered by a user and to map out some of their ramifications.

Bit Parts in the Populations of Culture: Memes

Susan Blackmore's book *The Meme Machine* is one of the most straightforward attempts yet at developing a model of cultural evolution working on neo-Darwinian principles. The model she works through is that of the meme. Proposed by Richard Dawkins at the close of his book *The Selfish Gene*, the meme is offered as the base unit of cultural formation and change. It is a "replicator" that accounts for both continuity and variation in words, styles, ideas—indeed any cultural element. According to the theory, memes are subject to the possibility of constant mutation as they pass from person to person or media to media. They can also exhibit stability and interrelation with their environment. Indeed, as we will see, such stability or what form it might take forms a crucial node of argument in the theory and one that can be mobilized here. Memetics may reduce culture to a massively multiplayer game of Chinese Whispers, but it may also provide insights into how things endure, are tinkered with, and are combined. As creatures of Darwinian knowledge, memes make an intriguing candidate for elements in a media ecology.

The class "replicator" to which memes belong is also first offered in *The Selfish Gene*. It is worth noting that the term does not imply any necessary reference to "solely" biological systems. Indeed, in the context of that book, the concept is aimed quite significantly at cutting the reach of the gene down to size. This is something often missed by critics of Dawkins. Cultural evolution provides genetic replication with an additional principle that mitigates, complexifies and disturbs what would otherwise be an all too simple determination of life. While this chapter proposes that a trifle more attention might be paid to all that tricky stuff between the gene and the meme, replication can be understood as an abstract machine whose activity can be recognized across a range of material instantiations. The activity of the replicator is essentially to make copies of itself. Variation may or may not occur in such replication, and there is no special limit to its material form although the kind and rate of activity will be substantially determined by its material and its mechanisms. The earliest evolutionary replicators, chemical patterns, necessarily predate genes. The primarily algorithmic replicators produced in artificial life of a variant of the kind of process discussed briefly in chapter 1 also work on an a priori understanding of replicators as a class that is not locked into any one particular material for its realization. Robert Aunger, an

anthropologist and author of *The Electric Meme* also suggests computer viruses and prions (such as those involved in “mad cow disease”) as further classes of replicators.⁵

Memetics is first used here in the discussion of hype in relation to pirate radio. The purpose in this chapter is not to develop an extended account of memetics—nor even to endorse it—but to *use* it, in two ways. First, it allows a certain insight into medial drives. The possibility is posed that such drives might be amenable to interpretation by the terms used to describe memes. Second, memetics is used because this approach—as a science or quasi-science at a point where it may bring new insight, be refuted, or left to drift—allows a way into talking about scale and scalar perspectivalism within media systems. As an epistemological target of the misplaced concreteness both of those attempting to refute the theory, and of those trying to develop meme theory, the meme as a conceptual device has the potential for intensifying speculation on the paradoxical consequences of reflexive mediality. The meme as a more or less fuzzily defined cultural element also provides a parallel to the flecks of identity (a term this chapter will introduce later) that are the objects of surveillance systems.

Blackmore’s pitch (following Dawkins, Daniel Dennett, and others who concur on this list of three qualities of replication) is that the design of media comes about because of the drives within memetic evolution to the “greater fidelity, fecundity, and longevity of replicators.”⁶ Memes, complexes of memes, and the humans that carry them, hunger for them, and are composed of them, favor those medial devices that work with these drives. Consequently, these are the media that thrive. The grab bag of media history in Blackmore’s chapter on the Internet offered in support of this argument is interesting, but it skims too fast over what might be said to be the fitness landscapes that compose the environments these memes shape and operate in.

How, for instance, can we talk about the syllabication of oral Cherokee instigated by Sequoyah’s “Talking Leaves” system simply being “So successful that Cherokee were soon writing, reading and printing their own books and newspapers”⁷ without some understanding of their interrelation with the turbulent consequences of colonialism? We need also to explore the defensive formation of the Cherokee as a tribe out of numerous clans; the subsequent relation of the Cherokee to other tribes such as the Creek Redsticks (Whom they were, in alliance with the U.S. army, engaged in repressing owing to their participation in a series of rebellions instigated by Tecumseh); the

availability of raw materials for print; the changed ecological nature of such “raw materials” such as trees once they are plumed into the industrial systems necessary for books and newspapers; the ways in which the systems of ownership necessary for mass logging inherent to paper production on such scales feed back into the relations of the tribe with the land, from which they would be further expropriated (with the support of the editor of the first publisher of the *Cherokee Phoenix* newspaper); and the initially marginal position of Sequoyah within the tribe, among other factors.⁸

To move from print to electronic media, another kind of longevity, that of the music-industry cartels, may have made some contribution to the mass-market⁹ success of the CD format over vinyl—this, *alongside* Blackmore’s preferred factor, the quality of recording and other features it offers. Nevertheless the triad of powers for replicators usefully allows for a consideration of their often conflictual interplay. The digitalization of sound instantiated by the CD format partially set up the achieved fecundity of file-sharing networks, where audio files in formats such as MP3 are easily distributed, albeit in a lower fidelity format.

There are too many convolutions in the above accounts. They are merely sketches. All of these elements are susceptible to being investigated as memetic at some scale. But what they point to is that meme theory needs to be coupled with other approaches, historical analysis for example, in order to take full advantage of its capacities. (Here, “meme theory” is used to specify the theory of the meme. “Memetics” is used to refer to the field of study that aims to test, use, and develop such a theory.) However, it is worth briefly considering its implications for systems of media. How might it be adjusted? Which other conceptual and dynamics might the scalar ruse of memetics be coupled with, or demand to bring into being?

A difficulty with Blackmore’s argument for memes is that she sees it being countered only by a device such as God or by simple, creative, intentionalistic, human consciousness. Neither of these makes a sufficiently convincing foil. Where she claims that “human brains” are the result of the interplay of genes and memes, a whole world of relations of power, ecology, sensuality, and materiality, among other things—some of which may be usefully but partially understood in terms of these replicators—is ignored. One objection to the meme as an explanatory device is the observation that it risks recapitulating the error of estimating the gene as sole unit of evolutionary change, to the exclusion of the epigenetic processes within the body of the animal that it

forms part of, the wider ecological systems that they operate as part of and shape, and which either provide the selective evolutionary pressures and opportunities brought to bear on it via them or serve to relieve them from such pressure.¹⁰

Often, the theory allows for some brilliant results—for instance, Dawkins’s comments on chain letters,¹¹ which have largely been inaccessible to other accounts of media. One advantage of memetics is that it does not rely on any necessary sensibility, teleology, or interpretation in culture in order to make its account of it. This allows the memetic model a real acuity and flexibility as it goes to work equally as well in the discussion of visual material, body movements, gestures, language. That it provides insight into the cultures of more than one species—as, for instance, in the song patterns of bird populations—strengthens its potential capacity to provide new figures of knowledge. At the same time, a problem with both Dawkins’s and Blackmore’s account of memetics is that neither is yet quite sufficiently reflexive enough to cross the categorical boundaries it constructs.

In the case of Dawkins, there is a residual longing that science be excluded from being understood as a complex of memes because of its unique license in the business of facts. Science does not suffer from the pressure to adapt or sprout variations because there is only one answer, one towering column of fact, which is cumulatively built up and provides that pressure—the uncomplicated truth.¹² Although, this is a wryly admirable aim as a ruse, it is one that fails to endure any contact with the history of science itself. Science, on this account, needs to turn its attention toward its own processes of perspectivalism—that it is cultural. The varying prospects of memetics itself as a grand scale theory, rather than a localizably useful one, serve to illustrate this.

Meme theory profits from its lack of requirement for any incorporation of a theory of meaning or signification. Because it operates solely at the level of recognizing a something that can be copied and that, with variations in replicative fidelity, is or is not copied at a certain rate, it misses the opportunity to develop a more thoroughgoing exploration of cultural mutation via a consideration of factors such as perception. Alongside its model of the host, one might also suggest that the understanding of the vectors of cultural replication needs to be brought into consideration. Too often memetics maintains an artificial distinction between a hylomorphically arranged “content” and “form.” Media—faxes, phones, books, newspapers, email, among others—do not simply afford greater or lesser capacities of fecundity, fidelity, and

longevity to memes that are separate from them but which travel through them. To achieve a level at which it can itself operate reflexively it should be possible, to bastardize von Foerster,¹³ to generate a *second-order memetics*. Second-order cybernetics is characterized in the moment (which Luhmann also exploits so well) when a feedback mechanism gains the capacity to alter its behavior by a representation of that behavior. In the context of the scientific observation of elements and processes, such a process entails that the observer “working with an organism or social system . . . recognises that system as an agent in its own right, interacting with another agent, the observer.”¹⁴

This interrelationship requires that science and every specific act of “being scientific” can be understood to be complexly perspectival and that rather than being spun as one cloth, science might, among other things, also usefully be estimated to be memes and complexes of them. So too the products of science and especially here of technology. In Blackmore’s book, a particular piece of software, a word processor, begins to be treated in this way, on the basis of its digital nature (allowing for fecundity and fidelity), but the World Wide Web—which at least in part relies on the easy “View Source,”¹⁵ replication of its source code for its proliferation (a process easily susceptible to memetic analysis), does not. But unfortunately, as it stands, memes, to meme theory, are seen as being transported within a framework that, while able to treat them as simple “content,” is not itself susceptible to being understood as cultural and hence memetic.

Geared as it is to an appreciation of fitness, memetics also tends to miss out on an opportunity to recognize or observe those memes that die out, that do not replicate beyond a certain spatial or temporal territory—perhaps even that of a few seconds shared between two people or in a locality of songbirds encountering a car alarm and incorporating its sound into their repertoire. Meme theory’s emphasis on relative longevity as a mark of fitness has allowed “meme,” as a word, to become narrowly identified with ideas that are “catchy.” Some memes—doubtless, according to this approach, those that will die out tout suite—explicitly refuse mediation:¹⁶ those that avoid fidelity to the benefit of variation. (How, for example, do you find out that you want nothing of what might be seen as the distortions and deadening effects of media? By reading about it? Hearing lyrics that lay it on the line?)

It may be arguable that memetics is constitutionally geared toward a recognition of seriality¹⁷ rather than singularity, but it is perhaps most attuned to those migrations between them or away from either of these poles. The

advantage of the approach is that it is potentially as equally attuned to emergent gabble, catchphrases, minoritarian repurposings, fashion, collectively generated slips of the tongue—the unknown yet always sung words to “Auld Lang Syne”¹⁸ that it completely bypasses the control linguistics of “meaning.” In doing so it also revises what *Anti-Oedipus* spots when revisiting Sartre’s configuration of the *subjugated group* and the *subject group*:¹⁹ “Freud was Darwinian, Neo-Darwinian, when he said that in the unconscious, everything was a problem of population.”²⁰ This captures two advantages of meme theory: that it is inherently collectivist—that it sees the individual operator in culture as a nodal point, not a totality; and that, following the great centrifugal purging of Man experienced in late modernity, it does not require—although it does not also necessarily negate—the model of an intentional, rational actor.²¹ But at the same time it is the involution, recapitulation, transversality, and hemorrhaging of scales that is acknowledged, mobilized, and explored in the schizoanalysis proposed by Guattari that is missed in existing theories of the meme.²²

If extramediality is always in relation to media, memetics too operates in unspoken relation to that which it fails to register. In *Chaosmosis*, Guattari reintroduces Bakhtin’s list of the five dimensions in which poetry operates. The fifth on the list recapitulates the whole: “The feeling of verbal activity in the generative action of a signifying sound, including motor elements of articulation, gesture, mime: the feeling of a movement in which the whole organism together with the activity and soul of the word are swept along in their concrete unity.”²³ For Guattari, this conception of poetry powerfully amasses corporeal and incorporeal universes²⁴ of signification. It, like much also in the valuable work of Bourdieu, Kristeva, Mauss, and others, provides a multilayered and processual account toward understanding the generation of an existential terrain, a poem, a subjectivity.

There is an interplay of constraints and freedoms, affordances of imaginal and sensory domains that each media composes. This is what memetics is able to slice across. It takes part in and produces the world by collecting traces of a particular kind. It makes them relatable, but a substantial question remains as to whether it can make them available to sense or to understanding in any more useful way. For its own, scale-constrained²⁵ purposes, it does not need to. At the same time, Blackmore’s triad of powers—fecundity, longevity, and fidelity—remains useful. These three forces provide a schema that, once it is recognized that media systems are also susceptible to analysis as memetic, can

be understood as drives in the sense in which that term is being used here. That is, they can be understood as analytical devices for the recognition of affordances in Gibson's use of the term, but also as partially and combinatorially, self-propulsive, or virtual patterning energies that exist within and between medial systems.

GKW or Seamlessness

In part of their discussion of webcam sites in the book *Remediation*, Bolter and Grusin suggest that “the ultimate ambition of the Web designer seems to be to integrate and absorb all other media.”²⁶ This is a modest vision of the Web as a “multimedia” delivery platform rather than as a Gesamtkunstwerk. Gesamtkunstwerk as a climactic realization of Romantic holism becomes subordinate to the cross-media leveraging and confluence of “intellectual properties.” It is immediately problematized, though (in terms that are usefully susceptible to a consideration via memetic “fidelity”), by a variant on a primal problematic in media—that media have their own terms of composition.

Agglomeration of media? Pick a Web site, any Web site: you are processing text as ASCII, text as code, text as a graphic file or textual symbols generated by a script using vectors; images as bitmaps or vectors; video and audio streaming according to different coding and decoding protocols, themselves multilayered aggregations of algorithmically switching decision-trees, variables and loops coming into layered composition with other such protocols; data as data, formatted and interrogable by the conventions and procedures of naming, sampling, addressing, encoding, compressing, decoding, sending, receiving, storing, encrypting; movies, animation front ends unwritable without a compiler, unreadable without a decompiler. What happens to media when they are mixed? One first has to ask whether they mix at all. Perhaps, rather than the anticipated fusion of all media, the disturbance of digitality is its inherent scalar differentiation of parts. Perhaps, just as misplaced concreteness reifies the world to make it work in certain ways, a system built on bits can call into being only its same?

The desire for the Gesamtkunstwerk (let's, like any other receding technological horizon, give it an acronym—GKW) is also the desire for obliteration, chiliastic communion, one love. Here memes' drives to fidelity and fecundity trump that of longevity. The possible unification of all media systems is a perpetual state of emergency. Absolute absorption. Absolute

obliteration. Perhaps, other than straightforward absolutism, nothing could be calculated to appeal more.

Neue Slowenische Kunst,²⁷ the collective of painters, sculptors, and performance artists that also includes the band Laibach, straightfaced and snickering between grit teeth, drove total art into the ground, totaling it. Fluxus, by sniffing out all the bits between, intermedia,²⁸ Dé-coll/age,²⁹ ran with what went missing. But now, such glory! The final conjunction of all culture into a single shining ray of light scalable to any size of screen! Or is this a rapture of another sort? “(This) digital GKW is creating bizarre structures, hilarious failures, crippling interfaces, tragic bankruptcies, brilliant monsters, invisible eyes that will watch over us. It is actually all existing and already history, driven by ordinary commercial interests.”³⁰

Time to slump back into the throne then. Like the other two lists at the front end of this chapter, not all the parts of this media ecology quite fit together: try plugging a Nintendo into a Sony.³¹ Afterward, after nothing’s happened, walk over to that telephone kiosk which has a phone, toughened do-not-touch screen, e-mail client, Web browser, and texting facility in one stainless steel terminal. Put your card in the slot. Please, take it out, and put it in the right way up. Type <http://www.irational.org/cctv/> into the location bar of the Web browser.

So while this is happening, and before this kind of phone box is taken off the few select streets BT (British Telecom) has been depositing it on,³² while the site loads, whatever happened to seamlessness? “Seamlessness” of a network is a term characteristic of critical writers on what the degree trade calls information and communications technology. Use of the term is usually enough to identify the writer as being from a generation previous to those for whom the Nets were at least imaginably always on. It is a vision of media typical of writers such as Paul Virilio and the stock in trade of technology copywriters. McLuhan, for instance, argues that “One of the most startling consequences of the telephone was its introduction of a ‘seamless web’ of interlaced patterns in management and decision making.”³³

Seamlessness here is also understood in the sense that any transition from one protocol or system to another is imperceptible. In the case of data, the transition takes place without any change in its quality. McLuhan mistakes the seamlessness of the effects of a communicational network with the capacity for any address in the system to be contacted by any other. Such networks, when introduced into an established multilayered hierarchy, allow for certain

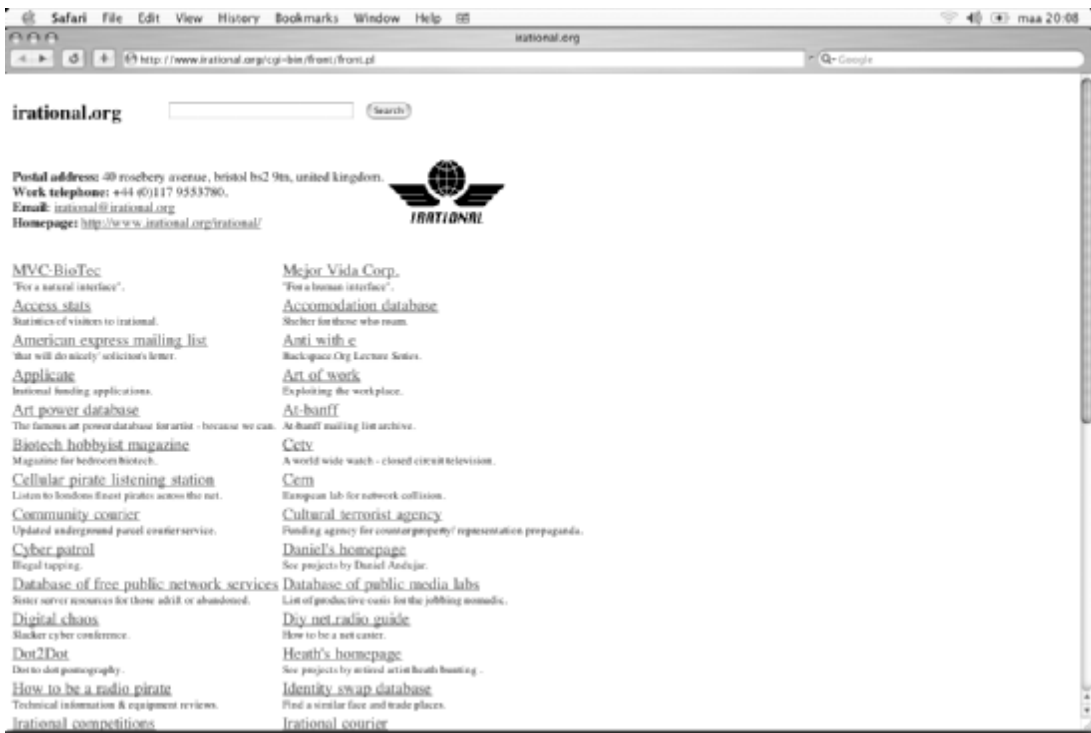


Figure 4.1 The irrational.org index page. Screenshot from *Cctv—world wide watch*, irrational.org. Courtesy of Heath Bunting.

sorts of connections between previously stratified parts. The example he uses of a junior executive getting on first-name terms with his senior (while not insignificant—as in the “restructuring” of management typical of the last quarter of the twentieth century coming partially in the wake of such then still unstabilized insights and technologies) may be simply temporary and local rather than inherently determined by the technology. It would be a mistake, for instance, to suggest to a call-center worker that “It is not feasible to exercise delegated authority by telephone.”³⁴ Such a call, one not also partly composed by the other forms of connection and affiliation that contextualize it, already has a name: wrong number.

Seamlessness is also, like the GKW, a victim of medial actuality: Try plugging a this into a that. But it is also a continuum rather than an opposition between itself and what it is not. We may take as an example the difference

between installing a proprietary operating system written for a specifically configured computer—such as Mac OS—where the process takes a few minutes, to the extended period that it takes to fully compile and install a GNU/Linux distribution, wherein every relation between the different parts of the computer can be—in some cases must be—decided on by the user. Seamlessness can thus be considered to operate by degrees rather than absolutes. The history of media theory can in part be considered as a tracing of these seams, working between them to construct a functional counternetwork of connections of disjunctive parts.³⁵

The actuality of seamlessness itself is governed by different models. In terms of data transfer, two different protocols have versions of seamlessness built into them. If TCP/IP (Transfer Control Protocol/Internet Protocol) is used to send a stream of packets of, say, video data from one point in a network to another, it waits until every packet—which might all go via different routes and at different speeds across the network—has arrived before reassembling them in order. Thus, continuity is maintained, but often at the expense of speed. If UDP/IP (User Datagram Protocol/Internet Protocol) is used, the emphasis is on getting a signal to screen at greatest speed. Thus, packets that do not arrive in correct order are simply deleted. Speed is maintained, but the continuity of a series of images might be affected depending on the availability of bandwidth.

The way in which vision is actuated, negotiated, brokered, and produced by such protocols, those they carry and by which they are formed, is one of the problematics entered into by the site that has just been rendered on our etch-a-sketchy public screen. Following the method of the first chapter, the text will work through the Web site element by element. All such accounts, every list, involves an artificial cutting. What counts as a component of the site? Does the apparent sponsorship of *irational.org* by the Department of Health and Social Security—whose logo once lined up alongside the Arts Council of England, a Web-hosting company, a defunct design-shop, and other sources of cash and services at the bottom row of the *irational.org* index page—require an explanation? Or do such tales require their own detours? Such a gesture functions both as a trophy, a brag, as well as a complication of the economies of art that can never be explicitly stated.

If we were to draw up a table of the alterities and multiplications of medial drives, dynamics and compositions, and what they in turn connect to transduce, remodulate, and echo that are embedded in such a site, it would in truth,

or with any luck, be infinite. The GKW here is a system of recursive swallowing that ends not with digestion and the production of a uniform, nutritively assimilated mass, but with indigestion—the collapse and rescension of layers of bodies in pursuit inside the old woman who swallowed a fly. Moral: Shut your mouth.

The Letter: Forward with the Möbius Strip

Keeping it shut is precisely the object of the first page a user comes to after clicking on “Cctv a world wide watch—closed circuit television.”³⁶ An e-mail from the marketing manager of a company called CamVista to the address heath@irational.org is displayed. CamVista is, depending on whether you believe the slogan on the top, middle, or the bottom of their front page, “the UK’s leading visual application solutions provider,” “The internet’s newest



Figure 4.2 E-mail from CamVista. Screenshot from *Cctv—world wide watch*, irational.org. Courtesy of Heath Bunting.

live webcam website,” or the “UK’s leading webcam solution provider.” The e-mail says:

Hi,

I notice that you have embedded our Leicester Square webcam image onto your site. We are happy for other Internet sites to link to some of our 40 cams, however, we do not allow sites to embed our images directly onto their sites. Especially when there is no acknowledgement or link to us as the webcam operator. Please stop using our image, or should you wish to pay a small annual fee for the rights to use our Leicester Square cam then please contact me. Should you wish just to link to our webcam pages, we will be ok with that.

The page is displayed in a typewriter-style font, spaced as an e-mail, with headers and footers locating the sender and the message. The words “your site” link to the front end of the site in question: a heavily bitmapped graphic, half a globe, half crudely rendered rays making up the other half of the circle. The visual aesthetics are those of early versions of HTML,³⁷ simple layout and images for a low-bandwidth network.³⁸ It is arranged “poorly” in terms of the complexity of its layout, typographic arrangement, and visual sophistication. Typical of much, if not most,³⁹ of the work on irrational, the pages stay homed to an aesthetic produced before the effects of graphic design. The pages look as if stamped by the moment when the display of graphic files was first introduced by the Mosaic browser. At the same time, the site is not stitched together in the straightforward, necessarily open HTML, which would complement the prevalent ethico-aesthetic style of contingency and repurposability. All the items on a page are called up via a CGI⁴⁰ bin. Linear HTML coding is recapitulated as style by a database.

What is the site that predates the e-mail from CamVista and that now comes after it? In brief, it contains small images from four webcams. The user is invited to report any crime they see occurring on any of the feeds. Clicking on one of the images the user is presented with a slightly larger version of the sequence of images from the camera along with a form. The form allows space for a message to be typed in and submitted, by fax, to a police station in the vicinity of the area the camera is surveying. If you submit a message, you can view a log of other messages sent through that form.

This is a gob-shutted tight description of the site. What is useful here, however, is to index some of the seamier aspects of the interrelations of media

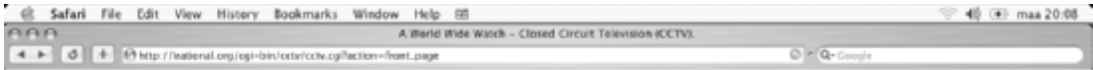


Figure 4.3 The project’s initial front page. Screenshot from *Cctv—world wide watch*, irrational.org. Courtesy of Heath Bunting.

it stages: different enunciative locations—the artists’ group and the small business; the changes of a site over time; the relations of text to image; the form and the fax; the ludicrous “witness” of low-quality, compression-degraded footage; the spatiality of the net; the police station as media system or ecology.

As a legal letter, this isn’t up to much. The internet, as a media system that involves replication and distribution across territories of nation and media-type, has provided a boon for lawyers. “Cease and desist,” “copyright infringement,” “passing off,” and other phrases in the conceptual armory of an economy of copyrights, patents, and trademarks have become newly well known to the spell-checkers of computers in legal offices everywhere.

Another site under the irrational.org domain⁴¹ is fronted by a letter by “Willoughby & Partners,” a firm of solicitors specializing in “intellectual

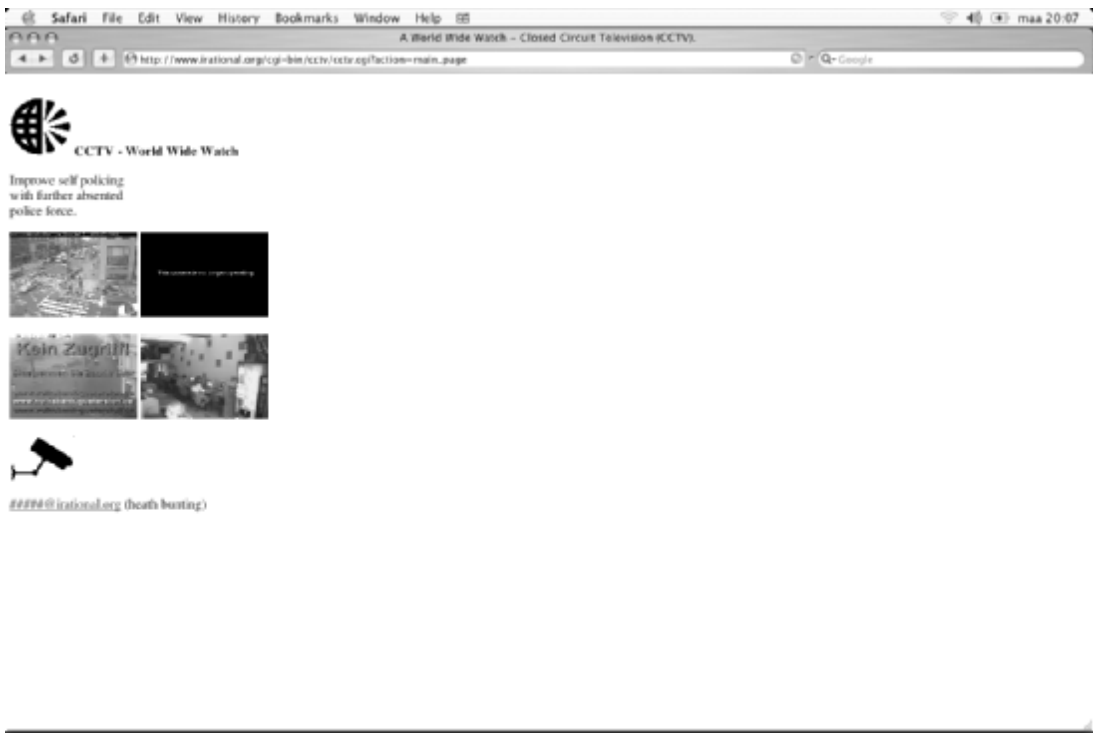


Figure 4.4 Overview of feeds from all four cams. Screenshot from *Cctv—world wide watch*, *irrational.org*. Courtesy of Heath Bunting.

property protection and enforcement”; another⁴² shows a letter from Denton Hall, a larger group of solicitors. Notable in this case is that, although the name of the group is presumably that of an original partnership rather than a person, it is actually signed in that name as that of an individual. A secretarial “multiple name”⁴³ being used to close down the operations of a pseudonymous author, “Trina Mold”⁴⁴

It is possible by a sleight of etymology to show that *textum* provides a Latin name for *web*. If this is so it is easier to recognize how the yawning years of hypertext theory have for so long been stating the doubly obvious. What makes the uses of links in the letters from lawyers published on *irrational* is that they function in precisely the opposite way to dialing the wrong telephone number. The letters from lawyers are published as seeming facsimiles.

Only one thing has changed. Much of the text is blue and underlined. They are W3C⁴⁵ compliant links—to commentary, to “additional” information. They reveal the enunciative modalities of the organizations that produce them: threats of punishment; naming categories of activity; specifying remedies; allocating ownerships and names; and, at the same time, they provide a way to feed these custodial “final words” back into the mix. Little blips of conflict within an informational economy of spin are constituted by the creation of microvortexes of counterturbulence.

Nitpicking with the content, mode, and rhetorical devices of a letter written to compel conformity to its demands may not do much—the offending site is, after all, only withdrawn to a separate “archive” directory. In this archive we can see that links, as changes occur in the sites they link to, fall apart. Just as the *Cctv* site “embeds”⁴⁶ data held in directories on other domains, the *Loyalty Card* projects by Rachel Baker embedded the logos of Tesco and Sainsbury’s, the supermarket chains that they parasited or “added value” to. Over time, the data has been deleted or its location has changed. These projects now register in the browser window simply as fields of “missing .gif” symbols.⁴⁷ This is a media ecology of collapsing archives, systems of address that don’t find their target, with rot as a condition for growth.

The letter comes first into the browser window, but it came after the original site. The site recomposes itself as a response to what tries, lightly, to close it. This is not to say that it, the grit in the works, becomes the pearl that justifies the oyster; rather, simply once this letter is read, the provenance of the rest of site becomes more interesting. The entire site is composed of nonlegit links. As well as that in Leicester Square, the three other webcam feeds come from a Web-design shop in Manhattan, an Internet cafe in Oviedo, and a bank in Guetersloh.

Placing the letter at the front end of the site also puts the work in an unusual relation to documentation of art. When the response becomes the precursor, what are we to make of the original site? Perhaps we should view the work as a jab toward minor notoriety, the display of the letter as a trophy won to endow the jauntiness-enhancing powers of mildly outlaw behavior. This would certainly not be a complete underestimation of the work. At the same time, it can be read to constitute something else, a variation on the uses of documentation of or as artwork. Here, a response that, in however informal terms, aims to lock part of it solely within the realm of information-flow as commodity, provides a new opportunity for mobilization.⁴⁸

The document as a site of artwork has been usefully surveyed particularly in regard to areas such as conceptual, performance, and mail art.⁴⁹ However, peripheral documentation, such as artists' proposals, press releases, presentations, schmooze-traces, and bureaucratic documents are only sporadically and unevenly developed as a zone that can be approached with the same attention as the "actual" work. Larded as it is with the dismal heroics of self-promotion or with the eternally charmed prose of report-fillers and grant-farmers writing for their selected audiences, such material does not make for a particularly appetizing read. There is a chance, though, that for archaeologists who have got up to speed enough to read today's urgencies before they become landfill, they may just make as good a find as a Viking cesspit does for more earthy colleagues. It is in this sense that a couple of notable uses of documentation become relevant to this context.

In *A Media Art (Manifesto)* of 1966, Eduardo Costa, Raul Escari, and Roberto Jacoby outline a procedure for infiltrating the press with documents and accounts of happenings that never happened. "This false report would include the names of the participants, an indication of the time and location in which it took place and a description of the spectacle that is supposed to have happened with pictures taken of the supposed participants in other circumstances."⁵⁰ If art occurs only in its mediation, is there any need, they argue, for an original? Better simply to manufacture its appearance. While the hoax, misinformation, and black propaganda are resoundingly honorable and well-used practices,⁵¹ this proposal is notable for its explicit recognition of the particular characteristics of the media systems it operates with. Indeed, in a reinterpretation of the very worst of art crimes, it can also be said to propose the work of art as medial forgery. But more, because it acknowledges forgery's cheaper twin, mass reproduction and in reproduction, the manifesto recognizes the making of realities via the compositional terms and inherent medial qualities of such systems it is able to gain access to and exploit, for a limited period only, until the ruse is up and its reality-formational powers disperse. The ruse as a dynamic, however, by gaining access to the compositional terms of art—including explicit and inherent reflexivity—gained public power only by being exposed, by ceasing to work as a particular "story," by itself becoming a report.

The tactics of the irrational site in their teasing use of letters from lawyers and sniffy owners of marginal copyrights serve to achieve a documentation of their interlocking discursive and compositional phase spaces. Such tactics

make palpable the dimensions of relationality simultaneous to their “insertion” into and activity in an “ideological circuit.”⁵² As a result, the attack becomes convoluted and the artwork becomes a Möbius strip of formulation, actuation, trouble, part of life.

Packets as Standard Objects

In the previous chapter, the standard object was discussed as a material instantiation of Whitehead’s “misplaced concreteness.” Packet-switching operates like the freight container as a metastandard. It is, however, different in that its realm of location in the sense offered by Whitehead is more fixed. A particular packet, unlike a container among the traffic rumbling past *by the way*, is nothing outside of the specific protocol and infrastructure it conforms to. Its strictly technological conditions of effectuation are entirely coincident with its composition. This is not a condition of all media, nor all modern media, but it is something peculiar to digital media. (Even that thread of media art that focuses on providing reinterpreted output for feeds of data in the “wrong” form—for instance, outputting stock-market data as the relative thickness of gravy in a restaurant⁵³—relies first of all on being able to receive the information it is to use as input.)

Packet-switching is a form of communications protocol. A packet, or datagram, is a group of bits of invariant length. Information, for instance a .jpg file from a webcam, is divided into uniform chunks. The group of bits contains control signals, error control bits, encoded information, and the address to which it is being sent. As part of the TCP/IP architecture of the Internet, it is an enormously widespread and familiar convention, and it is also used in varying forms in other areas—such as certain kinds of radio and in digital phone networks.

Breaking a message down into chunks means that, in some forms of packet network, if a part of it is corrupted or lost, only that part has to be sent again. Packets are stored by each sending node in the network until they have verifiably reached the next node. It also allows, where necessary, every one of the packets in a message to be sent via a different route across a network according to available bandwidth. Different types of network formation afford variations in the activation and use of the network. If we are to understand the packet as a form of standard object, we can also see that it is embedded within and mobilized by a variety of often contradictory network structures. Indeed,

the “same” network can change over time. The fifteen early nodes of the ARPANET,⁵⁴ precursor to the Internet, where all computers were simultaneously clients and servers, peers, are very different from the formation of the Internet today, wherein a large percentage of computers are PCs networking via dial-up. Here, the division between client and host is, if not built into the hardware, made ever more likely by means of dynamic IP addressing, firewalls, and other measures. Increases in higher bandwidth access to the Internet such as ADSL reinforce this trend by making a carefully spreadsheeted apportioning of roles to participants in the nets: high download bandwidth—allowing you to view and use material provided by others; and a low capacity to serve material from your own computer. While this ruse of control has fed into the development of peer-to-peer network dynamics,⁵⁵ where the special position of peer is usurped by computers at the edges of the network, this is now something achieved at the cost of contestation of the architecture introduced by a consumer model of the Internet rather than something inherent to it.

Self-Organization: Die-Cast Accurate Scale Model

Although it also makes better use of limited or variable bandwidth, data that routes itself in transmission across a network, each part of which manages its own movement locally in relation to the materials and permissions that surround it and then reassembles itself as a composite, certainly sounds philosophically more appetizing than a single linear squirt of signal. Packet protocols and related innovations, such as peer-to-peer networks, look like they offer Free Association at the level of code. (But let us be clear, in the case of TCP/IP it is a form of association that operates via tree-shaped protocols such as Open Shortest Path First⁵⁶ that commit to an action before moving a packet and that work by consulting routers rather than negotiate movement as a property emergent solely at their scale.) Here, it seems, the ability to take an action in the dimensions within which it operates, its movement from register to register, is located within that object and the routines by which it negotiates with other objects, such as routers. Any talk about informational tokens carrying out collaborative, self-organizing work carries a payload of gallows humor, but it is worth recognizing too that a good deal of the conceptual work that feeds into the development of nonlinear distributed organizing comes at least in part out of social practices that seek to instantiate them

on a multiscalar level as a release from hierarchy and for the generation of untapped, uninvited powers.⁵⁷

Democracy, produced in the “Self-motivating exhilaration that accompanies truly effective interaction with information through a good console and a good network to a good computer,”⁵⁸ can perhaps, so goes the paradoxical hope of the head of a Cold War research budget, also arise by means of at least partial systemic predisposition. The gamble that constitutional noncentralization of such systems at any one scalar level will concatenate outward is, though worth taking at times, also a fraught one. The bulk of the infrastructure of the Internet—including its key bottlenecks⁵⁹—remains in the hands of a very few corporate individuals. Utilitarianism—utopia achieved by utilitarian means, as in that of the digital “commons”—works, it produces effects, but never unilaterally.⁶⁰

Seams Showing

Lawrence Lessig, a lawyer working and writing in the area of intellectual property and software, notes the current constitutional unregulability of Internet packets. At the perspectival scale of the technology, they are isolates that are “labelled, in the sense of having an address,” but, under current protocols, “beyond that . . . could contain anything at all.”⁶¹ This is a characteristic of the packet as standard object. (Others include a uniform bit-length, the observation of regular addressing and ordering protocols, and, more widely, their common existence within digital information systems.) The important lesson of his book is that architectures can be layered, can be imposed, can be abolished as well as invented. Lessig’s list of factors that can appropriate and produce a behavior or technological process is constrained to norms, law, market, and architecture. This allows him to construct a working account of the potential for regulation of the Internet, as a counter to arguments that propose its inherent, technologically determined resistance to control.

Such an argument allows us to recognize another characteristic of the standard object: that, while it may be simultaneously embedded within multiple compositions wherein it may be involved in many, separate, disjunctive, contiguous, or contradictory processes, it does provide a threshold, either side of which is differentiated enough for significant political, technical, aesthetic, and social conjunctions or conflicts to occur.

The threshold of a packet, the difference between what it “contains” and its status as a discrete element, is a boundary around and onto which substantial forces are arrayed. At present, many of these operations, whether in public debate, software, legislation, precautionary hacking, or other areas, is carried out within the framework of “privacy.” Privacy operates precisely as a problematic. That is, it is a knot of competing, complementary, and allusive terms, frameworks, and interests, which are perhaps irresolvable; yet at the same time these interconnect by virtue of their mutual operation in and on a particular skein of definitions, actions, and interpretations, which compose a comprehensive or partial domain for their mutual and collective composition.⁶² It is not necessary here either to map out or to accept the terms by which privacy as a problematic engrosses itself. At the same time, the terms by which this problematic comes into being, by which it is described, maintained, reinvented, and isolated as something concrete, by which it patches together assumptions, produces precursors and aims, achieves institutional form, mobilizes technological work, produces ground for the blossoming of spreadsheets, stabilizes or disrupts divisions of labor, canalizes lives, ideas, and bodies, or allows or induces them to shed their moulds—such terms have substantial consequences. And most of them cannot be recognized before or as they occur—if ever.

The packet as standard object also acts as a threshold around which other technologies, other procedures that include aggregations of technologies, laws, concepts, people, and organizations, form themselves. If we follow the thread of “privacy” in relation to the packet, there are many. Notable among these are the surveillance processes that “sniff” a packet during its passage through the network, and, depending on the capacities of the specific software used, can parse for specific strings, register keywords, isolate password transfer sequences, recognize URLs, and credit data and other items of interest. (Equally, other objects—solely here at the level of the computer, network, and specific technologies—are surveyed at their particular scalar levels: social network analysis; the contents of hard drives; the recording of keystrokes; password detection.) Just as a computer operates only on the basis of absolutely clearly defined “events,” law, infractions of it, and responses to such infractions could conceivably be built into the code. Already, e-mail software such as Eudora⁶³ contains a “mood watch” option, which alerts users if an outgoing or incoming e-mail “might be offensive” on the basis of character strings that it contains. The mood watch of entire populations’ e-mail traffic built

into mass surveillance systems such as Echelon or that are dubiously built into recent Web-mail services operates on a similar basis. Equally, other dynamics, interests, and processes aggregate around maintaining the packet as a threshold. The production of strong encryption software,⁶⁴ for instance, is a key form of defending and defining the boundary of the packet.

The seam of the packet, its threshold, is constituted as a scalar node by and in dimensions of relationality, which it also contributes to making. Relationality is understood to be the extent to which particular compositional dynamics or drives gain access or are composed by forces and qualities that are constitutive or otherwise compositional of a scalar element.⁶⁵ Each scalar element may be understood in Whitman's experience as the tip of a parallel universe in the city, a launching device into becoming. Additionally, such a relation may simply be able to read, visualize, sense, record, or otherwise apprehend an object, process, or event without being able to alter it. But a dimension of relationality may also be usefully understood in terms of formatting devices such as the profane trinity of causation: class, race, and gender.

Dimensions of Relationality and Scale

A dimension of relationality, the combinatorial arrangement of such relations, can further be said to provide a means toward describing, actuating, or multiplying the powers of an element within a composition. (Here, then, there is no chance for a flattening "relativism"—rather, a dynamic relationality that is always, and in everything, political.) A dimension of relationality describes the vectors of influence or transversality aggregated within and through any element. The set of formations conjoined in this transversality can be thought of as a potentially infinite set, operating across and through scales. In practice, however, the number of dimensions must be contingently limited. In considering any element within a composition—which may be termed an "object" in the sense in which Whitehead reveals as being so limited; a process; an assemblage; or a compositional dynamic—any dimensions of relationality can be thought of as part of a potentially infinite set of axes, or more accurately, axiometric forces, that compose the element. (As a simple example of such axes, we might, as one beginning, usefully turn back to Lessig's too-short list of four forces—norms, law, market, and architecture—that describe some of the dimensions of relationality that come into compositional alignment with the software running computer networks.)

Complementary to the dimension of relationality is that which it weaves in and out of: scale. A “scale” is something that operates at one level in what might be thought of as an infinite zoom, were a camera to be built that could be sensitized to elements as diverse as practices, institutions, atomical structures, weather patterns, linguistic formations, protocols, transport infrastructures, a glance. (This “zoom” is not the self-identical vomiting forth of a fractal equation. A fractal, possessing recursive symmetry across scale, is in effect always operative at the same scale.) A scale provides a certain perspectival optic by which dimensions of relationality and other scales may be “read.” An example of such an articulation of scale can be found in Guattari’s suggestion that a key achievement of Marx—he was certainly not the first, but was in some ways the most precise—is to name the working class. This is a Duchampian, nominative act. By means of misplaced concreteness it renders a means of recognition perceptible. From this newly sensible scale it became possible to read new dimensions of potentiality. Assessing the spatial and temporal permutational field within which the scale, or class, exists within and is composed, new dimensions of relationality may be seen or invented—such as the inventions of the general strike or internationalism.

A dimension of relationality in a sense comes into, or reverberates out from, a scale—or many scales—from an angle. It may play a part in composing it, by production, constraint, or both, or may “read” it. At the same time, it must be recognized that such a relation is not one of hylomorphism. Being simply the domain appropriate to a particular perspectival capacity, a scale, does not mean powerless matter. A dimensional relation is not “form-giving.”

Misplaced Memes

Earlier it was noted that, as it is currently constituted, meme theory also contains a model of an event. It has a basic unit of observation. (This basic unit of observation is contested to the extent of its explanatory thickness; the degree to which it can be said to constitute a universally applicable tool or “universal acid”⁶⁶ of one sort or another; or whether it benefits from supplementary tools and units of analysis.) Regardless of the precision or fuzziness of the particular model of meme adopted, perhaps we can experiment with its qualities.

What would occur if we were to add to Dawkins’s and Blackmore’s list of the three forces—fidelity, fecundity, and longevity—by which a meme may

be said to be constituted in terms of its powers of replication? Perhaps a fourth characteristic of a meme, not a force as such but a trait that is required by the methodology, memetics, that seeks to recognize it and which, by means of an easily recognizable dimension of relationality, generates it as an “event” is “monitorability.” For a meme to become recognized as an object of scientific scrutiny, a clear definition of a meme is required in order that it may be identified and isolated against its ground. That such a definition has not yet adequately proven to be quite workable within the discursive regimes that it aspires to conform to provides a knotty and interesting problem within meme theory. That such a problem can be isolated, despite the lack of a final definition of its object, provides the opportunity for such a problem to be mobilized as a revealing *problematic*. The degree of monitorability possessed by a particular meme corresponds to its conformity to meme theory’s requirement for it to be isolated. This makes meme theory a troubled epistemological device available for use without implying any necessary commitment to belief.

That memetics is constrained to view things at a particular scalar resolution does not in itself provide an objection to it as a tool. It is precisely the way in which it can be carried over from one domain of activity to another and still carry exploratory and explanatory power by virtue of those constraints—the very smallness of what it looks for—that makes it useful. An example here is Manuel De Landa’s use of the term “replicator” to specify the scalar level of “sounds, words and grammatical operatives in language constructions.”⁶⁷ While De Landa does not carry out a more fundamental discussion about the category of replicators—which is taken as *a priori* and, for the purposes of the book *A Thousand Years of Non-Linear History* at least, as operative only in linguistic terms—the approach of nonlinear history that he takes up compels an array of political, social, intellectual, and economic dimensionalities. The advantage of De Landa’s use of “replicator” is that it is explicitly woven into multiscale accounts of material culture, the development of cities, nations, and populations, and of the interplay of meshworks and hierarchies by which they are interpreted and made palpable.

De Landa’s use of replicators works perceptively in relation to language. It must be noted, however, that he specially differentiates between memes and “norms.” Memes in this case, similar to Daniel Sperber’s use of the term, are cultural particles that replicate solely by imitation. Norms are socially enforced or obligatory usages. This formulation has the advantage of

potentially shedding some of the fundamental problems with meme theory by narrowing its scope. But it must also be said that the formulation does not offer any fundamental reason for the two sets referred to by these terms not to overlap. First, as would no doubt be recognized by the author, norm-obeying and imitating replicators are not mutually exclusive as categories. Second, meme theory allows for multiple modes of replication. Indeed, other patterns of replication besides these two are certainly observable.

It can be proposed that alongside this work the scope of meme theory can be extended without falling into the trap of assuming its *a priori* and absolute universality. Meme theory early on made useful and telling accounts of gestures, fashion, of protocols, of coding. These successes, despite their necessary scalar limitations, can surely be added to at the same time as making clearer the interrelation of the problematic of memetics at its particular scale through clarification of the range of dimensions of relationality that can be said to be operative in and through it. Monitorability can be raised as a question here, as can, in the context of the *Cctv* site, the relation of vision and recording to movement; the relation of the local to the networks; and the relation of information, of certain kinds, to processes of control.

Those reservations listed earlier about the explanatory capacity of meme theory in terms of its phenomenological and experiential blind spots, its incapacity for micro- to macroscale transversality, provide the stuff of the opportunity that is exploited in the *Cctv* site. The sheer incommunication engendered here relies in part on a twisting of the possibility of monitorability. Here, at the scale of media and their seaminess, it is particularly fruitful to continue. It is useful to keep the question of memes and the appropriate degree of concrete misplacedness with which they might be isolated on a back burner for now. We will return to the question when we discuss the flecks of identity produced in a particular and changing set of medial relations: surveillance.

Always On: Webcams

There are three seams, or thresholds, left to discuss in this account of the irrational.org *Cctv* site: the webcam feeds, the form, and the fax. By now, the possibility that this work constitutes anything in the way of the legendary GKW can summarily be dismissed. But, given the intermediary open

systems⁶⁸ function of HTTP (hypertext transfer protocol), although the parts don't fit, they are stuck together.

Slumped in a chair on a twelve hour shift of electronic twilight, it is now the security guard's turn to speak:

Security guard: Zzz Zzz Zzz . . .

Documentary voice-over: Hush, he's asleep. Let us simply observe the natural grandeur of man in his habitat.

SG: (continues to sleep)

DVO: (in a reverential whisper) On the screen over there, we can just make out a pattern of dots. Red. Green. Blue . . .

A basic cheap webcam is a relatively simple piece of technology. A lens set to an infinite depth of field feeds light to an integrated circuit via an array of photodiodes. The chip interprets the information, subjects it to vertical and horizontal shift calculation, and converts it from analog to digital form. A piece of software on the computer it is linked to by cable or by radio grabs a frame from the camera at a set interval: ten, twenty, or thirty seconds are common. The image is converted to a .jpg format. Every time a new image is grabbed, a script renews the image. As an alternative to using the .jpg refresh method, it is possible to use streaming software, which generates a continuous stream (see above for variations of continuousness built into different protocols) of data refreshed according to a user's connection speed. If the image is to be made available on the World Wide Web, the computer (or more simply a processing circuit with enough memory to store each new image) or one connected to it via a protocol such as FTP (file transfer protocol) needs to be running as a Web server and have a constant Web connection. Other webcams include those with superior lenses, aperture adjustment according to light levels, and mechanical panning and zooming capacities as found in standard video cameras, which can, of course, be used given an appropriate video capture device.

To take the simplest of Web cameras, the conversion of received light into a signal useable by the computer and then into .jpg format requires a number of conversions—changing data from one format into another without altering its “content”—and modulations—where data is transduced to another format potentially involving a change of content, produced typically in sampling, compression, or in shifting colors to another register or palette.

Earlier, John Hilliard's careful staging of the autodissection of his camera showed the way in which this part of the phase space of a camera could be mapped by combining patterns of extensity (size of aperture) and intensity (luminosity). Such a phase space can also be said to be constructed or to be interrogable by the dimensions of relationality that as axiometric forces make it up or render it sensible in a particular way.

It is not proposed here to repeat the exercise of chapter 2—modified by an additional factoring-in of the numerous protocols and constraints put into place by the architectures of the hardware and software that manage the transition of light from its original analog state to that of the computer screen. This would be an interesting and useful exercise in mapping out the compositional terms of digital images, the phase space of constraints and affordances by which they are achieved, and the relations that every point in such a phase space has with its constitutive dimensions of relation, which may be discursive, sensual or perceptual, economic, ecological, to do with the organization of time, which may be aesthetic, and so on. What can be done is to trace a few of the dimensions that the webcam images are composed of and interrogable by, and, in the interlocking of these dimensions, to trace a number of the torsions that they exert on the apparently straightforward transfer of information.

The particular dimension of vision that these images are brought into in this site is surveillance. It is immediately the twisting of the intent of the images, from their source sites, to that of *irational.org's Cctv*, in which we can sense a ramified dimensionality. The image becomes more complex by virtue of its layering, its literal embedding, within multiple sites.

As noted above, these images come from several sources and exist in more than one state of activation. Characteristic of the digital image, some of the feeds come with paratextual information, the name of the owner of the site, local date and time, street location. Surprisingly, in that a chance for branding the image is missed, the feed from Leicester Square has no information identifying its source (viz., a building owned by a radio station.) The image of Guetersloh's square, however, has "Kein Zugriff!" (No Access!) and the address of another Web site (written three times in primary colors).⁶⁹ The feed from Guetersloh is nonexistent. Nothing moves. Perhaps no crime has been committed since "9:04:19 29-SEPT-1998"—the timecode that sits on the top left of the image. The image cyclically reloads at the same speed as the other feeds, every thirty seconds or so depending on download bandwidth. Crime detection, like the attention of the artist, must carry on elsewhere.

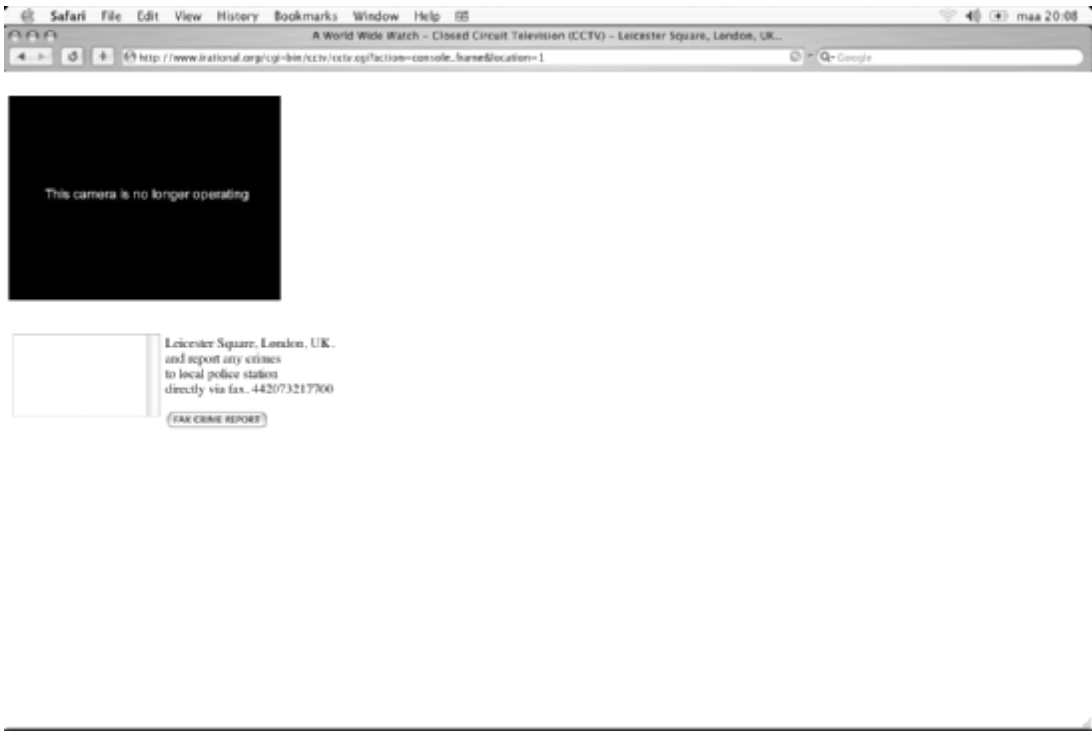


Figure 4.5 The “dead” feed from Leicester Square, London. Screenshot from *Cctv—world wide watch*, irrational.org. Courtesy of Heath Bunting.

Before approaching the relationship of this site to surveillance, it is useful to locate it within a discussion of the digital image. Within accounts of emerging media, recourse is often made to McLuhan’s figuration of the “rearview mirror.” Here, each newly developed media system bears traces of those it comes after, displaces, or supplements. Such an argument is, for instance, used to explain the resilience of conventions for displaying text built up over the hundreds of years of written and print culture. Whereas digital media provides the potential for, and occasionally the actuality of, new dynamics and structures for reading and looking, there is still a recursion of the compositional drives of layout conventions, visual and compositional syntax,⁷⁰ familiar from print. Too often, the rearview is used as a form of lament, or a theoretically inclined apologetics for evolutionary capitulation to the obvious and to the settled.



Figure 4.6 Rather than facing the street, the camera at the site in Oviedo was later turned inward. Screenshot from *Cctv—world wide watch*, irrational.org. Courtesy of Heath Bunting.

Yes, it is true: The present recapitulates some of the past. Marx notes it in an observation also cited in the *Arcades Project* that the development of machines also bears traces of what they displace: in this case, “an experimental locomotive that was tested before the discovery of today’s locomotives, which had in fact two feet that it raised up alternately like a horse.”⁷¹ Compositional dynamics, as much as they break up, jump location, also carry on in the same old way, also stretch, and repeat, repeat, repeat. Perhaps the simple fact of their extension in time guarantees a greater chance that they will carry on; that is a common gamble. A location stabilized in terms of scalar and relational coordinates perhaps needs only just to keep ticking over. This is the insight provided to meme theory by the power of fidelity in memes as they move across time (evolution), and the drive of fecundity as they mobilize space (population). What can be suggested here though is that media do not simply



Figure 4.7 Guetersloh. Screenshot from *Cctv—world wide watch*, irrational.org. Courtesy of Heath Bunting.

recapitulate previous forms, but conversely, have future systems, their potentiality, embedded within them. Dimensions of relationality allow and cause compositional dynamics to travel in more than one direction. In memetic terms, these are the constraints and compulsions of selection, variation, and transmission that feed in and out of the multiscalar generations of powers, potentials, and materialities seething through organic and nonorganic life.

Walter Benjamin saw this in surrealism, in the details picked up in Aragon's *Paris Peasant* with its exploration of the deep texture of the disruptive potential of outmoded things, and in his own mobilization of odd bits, knickknacks as condensers of memory, of scalar nodes that connect dimensions of relationality and of reverie with a materialistic poetics.⁷² Chiming with Adorno's suggestion, contrary to that of McLuhan, that one should "attempt to see the new in the old instead of simply the old in the new,"⁷³ in *Little*



Figure 4.8 Manhattan. Screenshot from *Cctv—world wide watch*, irrational.org. Courtesy of Heath Bunting.

History of Photography he suggests that “New advances are prefigured in older techniques, for the early art of portrait painting, before its disappearance, had produced the strange flower of mezzotint.”⁷⁴ In one of the elements in the *Passagenwerk* clustered around the theme of photography, he lists other lost devices and processes, scalar universes with their own rhythms, plagues, powers, and dimensions of relationality.

In Benjamin’s account, mezzotint⁷⁵ disappears. It becomes, as the name of that fabulous trawl of the communications back catalog makes clear, dead media⁷⁶—that or near gone. However, elements of the compositional drives that form it—the saving of patches of variable light from utterly inky darkness—persist in a manner analogous to those more easily recognizable but generic refrains in photography drawn from painting: portrait, landscape, still life. The most awesome of mezzotints, John Martin’s 1825 series of

illustrations to *Paradise Lost*—by virtue of their phantasmagorical graduation of degrees of light and dark produced by the subtle texturing of steel and careful inking of the plate—leapfrog the merely photographic image and enter the domain of special effects: the first disaster movie. (The durability of these images as replicators, as modes of catastrophic vision, is impressive and would perhaps make another good case study for a test of meme theory as able to account in part for persistent generic tropes.)

The field of media archaeology too insists that we understand precursors, that we connect media to their historic and evolutionary formation.⁷⁷ Images fed from webcams, like anything on an electronic screen, are generated by an aggregate of dots that, on the perspectival level of the human optical system, is sufficient to cohere at the level of an image. The technology is a reiteration of the compositional form of print. RGB reformulates CMYK.⁷⁸ This is one scalar limit that must necessarily feed into an evaluation of monitorability, the grid of dots on a screen, its resolution, refresh rate, and the ways in which light is modulated by the apparatuses that bring the image to it.

One characteristic that marks out webcam feeds is their relative incapacity to exploit chiaroscuro as a compositional dynamic. Rather than patterns of light and shade generating depth, most of these tiny images, limited to the 256-color palette of a Web browser generate a sense of space by a concatenation of patches rather than as luminously delineated figures. The images from these webcams, even perhaps that rather repetitious one from the kind folk at the Volksbank, do, however, lodge themselves into and make use of a type of screenal composition that is recognized in *The Language of New Media*: the real-time screen: the screen that “Shows the present.”⁷⁹

In irrational’s *Cctv* site, the feeds wear the crappiness of their imaging as a part of their seaminess. A figure is there, a flat lump crossing the road at a Manhattan intersection. The image refreshes, calls the next .jpg. There’s a stalk coming out of the lump. It might be an arm. There might be a blade, a blown scarf, a waving of a hand, some interference. Next time the screen is refreshed, the lump is gone. It has become part of a blob. In Leicester Square, the trees—well, they get in the way. If you’re itching to fight crime, keep scratching ’til autumn when the leaves fall and you can see something. The very low quality of the image, the impossibility of accurately seeing any sequence of movement in any but the most jerky manner, makes them functionally unusable for surveillance.⁸⁰

In terms of monitorability, the evolutionary pressures of selection, variation, and transmission imposed on every element that—making it through from one side of the lens to the screen—might register as a meme are put in place by a particular concatenation of technologies and interpretations that capture, sieve, amplify, or mutate the light reflected by the movements of people and objects. *The identification of the meme required by meme theory and of the “event” (perpetrator, crime, victim, or other category of thing) required by surveillance are staged by the Cctv site as the same problem.* This will be taken up again shortly. It is the exploitation of this very visible sieving that makes the site. At the same time, the work is constituted by and takes advantage of other dimensions of relationality, for example, the context of the cultures of use associated with webcams.

In considering a site that operates as part of an “art” practice, it is useful to note how much it also operates outside of contexts specifically coded with this term. This is so in a compositional sense and in the way that it takes part in and advantage of multiple mobilizations of media and inventive technological practice. Art brings some special kinds of looking and thinking and distribution to the mix, but it cannot be said to provide an absolute “outside” to these other practices.

What marks webcams is their cheapness and ease of use. As medial organs, they may sprout almost anywhere that can be connected to the Web. In the earliest phases of the Web they were known for the goofiness of their usage: to check the level of a coffee pot in someone’s office or other operations that required a certain stretch of the classificatory imagination as they connected with a system originally designed for the publication of scientific reports. All forms of viewing underwent their webcam variation, the particular compositional mutation afforded by this media system. You could see landscapes, watch goldfish, peep into TV shows or radio studios, and—given available bandwidth—take part in some of the first mass events experienced on the Net: watch the space shuttle take off, or see the feed from an *Explorer* robot wobbling around on the surface of Mars. At the same time, new uses were developed, such as CamGirl sites where young women place a camera in their home to allow constant viewing of parts of their private space.⁸¹ The new capacity to mix absolute boredom with moments of low-resolution but real-time titillation, or personal outlet and opportunity for self-controlled staging of everyday life, was often linked to chat rooms, subscription and small-scale merchandising or gift-receiving schemes, thus mobilizing new representa-

tional, economic, and communicational patterns. Porn sites were soon to follow the generic conventions—minus the open, friendly enough and mildly anthropological drive of sites such as Jennicam—with scintillating cinematic innovations such as the in-toilet camera.

The scattered, impromptu, do-it-yourself nature of webcams, coupled with variations in Internet access costs, allows for a high degree of toleration and enjoyment of the low-quality image.⁸² Cameras aimed at ant farms, those functioning as traffic-monitors or weather-watchers provide a means to observe local parts of flows, while those fed from Earth-orbiting satellites offer a view you are never otherwise likely to see. This is a networked but disjointed, non-programmatic development of visuality that is dispersed in terms of both scale and the multiplicity of its dimensional relations. There is, to excuse this little story in the past tense above, surely more to come.

Because the screen displays what is occurring in front of the camera as it happens, in real time, the calculations, compressions, and captures that the mechanism performs, the seaminess of the image is up front. In a Web site that is at once one of the simplest and most compelling Wolfgang Staehle's *Empire 24/7*⁸³ exploits these qualities in a revisitation of the site of one of the most straight-up durational⁸⁴ films, Warhol's *Empire* (1964), where eight hours of footage taken from a single point stands and stares at the Empire State Building until the film runs out. This work, always on, seems to thrive on its effective compounding of all three types of screen in Manovich's formulation. There is a "classical" still image—neither the camera nor the Empire State Building (which the camera lies sideways to focus on) exhibit much movement; there is the "dynamic" movement of clouds, internal and external light; and, evinced by the time and date mark at the bottom left of the screen, the image is live—refreshed every second. At the same time, the particular constraints of the process, which become exaggerated under low light, make the image clearly readable in terms of the processes it is undergoing. Viewing the image at Eastern Standard Time's sunrise, for instance, you can often see the computer literally filling in space with visual guesswork. The feed no longer functions as an image simply indexable to the Empire State Building but to the convolutions of its own processing and computation: great bitmappy chunks and bleeds, patches of red or mauve interpellated out of nowhere, a corona that might be cloud, the solid form of the building turned to stripes or blotches. At other times, certain of the upright lines in the building are picked out as white streams while the rest of the frame smudges as blue, gray, and brown, sending

the windows to dark recesses. The structure body-doubles for a flat-water side reflection of some high-density warehousing development. At night, they become a floorplan of shining points, or, given the low-receptive capacity of the camera, a rectangle of black and darkest blue pixels. Then, light breaks through, hits it from another side, and the colors shift in their hexadecimal numbers. If, in Michel Serres' judicious term, Turner thermodynamically translates Carnot,⁸⁵ Staehle feeds the painter through Turing.

The imaginary science of second-order memetics would be able to mobilize the layers of processing and the "metamorphosis of being by knowledge"⁸⁶ occurring in the fecund collapse and reformulation of monitorability staged by this site. Necessarily, it would, at a series of appropriate scales, have to account for all the dimensions of relationality embedded at every layer of the technologically embodied knowledge that a meme passes through, or is blocked, generated or mutated by. Perhaps we can call second-order memetics by another name: art—a process of acting in culture, in the world, within which every aspect, at every scale, and in relation to all or a chosen set of its dimensions of relationality, is taken reflexively as the launching point of production. Here, genealogy is, however disjointedly and with however many involutory or "reactive" coils, coupled with becoming.⁸⁷

Some Dimensions of Relationality: Types of Surveillance

In discussing image-processing technologies, the dynamics of the webcam, the network protocols they operate in relation to and the particular affordances and constraints that they embody, we need also to relate how these images operate in terms of another form of processing: surveillance. Here, three modes of surveillance are discussed: abuse, chilling, and production. These terms, not by any means a comprehensive typology, apply to tendencies rather than categories, each of which carries with it its own scalar, perspectival terms of conceptual and practical affordance. They are offered simply for use and disposal rather than systemization.

Notorious Examples of Abuse

The first kind of figuration of surveillance is that which performs "notorious abuse"⁸⁸ upon its objects, where the technology is actively used against them. This is the kind of surveillance that David Lyon, following the tradition of sociology, calls "modern."⁸⁹ Such surveillance operates in economic, political,

and technological terms. Albert Speer stated of the National Socialist command structure that it was the first industrial dictatorship in the age of communications technology. In an extract from his memoirs, the Third Reich's chief architect, then its director of Ministry for Armaments and Munitions, proposed that: "telephones, teletypes, and radios made it possible to relay messages from the highest levels directly to the lowest echelons. . . . This state system may seem as confusing as the wires of a switchboard to an outsider, but like the switchboard, it could be controlled and dominated by someone's will . . . the means of communications alone make it possible to mechanise the work of the lower echelons."⁹⁰ Whether this constitutes a historical first or not, possibly so in terms of electronic media, the tendency is adequately conveyed here.

Such a system is surveillance reconfigured as diagrammatic workout of command, control, communications, and intelligence. The command is simply given. Receiver simply becomes output for Sender. There is no chance of misinterpretation, of noise or of feedback. This is the fantastic vision of the eye at the center of the storm that spun Bertelli's craft for Mussolini's⁹¹ blemishless head 360 degrees. The greatest atrocity of this form of surveillance is when everything is as it should be. Here, communications and intelligence merely serve as confirmation of subordination. The head has no need but to be empty.

This mode of surveillance operates only at a particular scalar level. It is dependent on the dimensions of relationality conjoined by any number of discrete and linked acts of surveillance that have the power to couple information about a person or a process with an unavoidable change: it demands repressive power. As Foucault suggests, power represses only *in extremis*. The calculation as to what constitutes such an extreme varies, however, from one historical situation or ideology to another. Power operates, as a matter of course, in every fold and exchange of life. That particular state-forms ally themselves with a ferocious, libidinal, and aesthetic state of emergency involving and inducing limitless militarization of all the zones and processes of the planet, as partner to their capitalization, testifies simply to their hunger for an absolutism without limits.

Such dynamics do not exist in a "clean" sense. They exist as chronic organizational spasms, ghosts cut free of any originary utility. The various police forces of Britain cannot be understood to have any "crime-fighting" rationale in their consistent use of stop-and-search procedures, under whatever

legislative or procedural name and routine they are coded, to harass black youth. Nevertheless, despite repeated confirmations of their lack of relation to their stated utility there is no sign of any letup in such operations. What racist horror drives these ghouls on—have they not heard of statistics? Simple color-blind technocratic repression of the kind desired by all good citizens cannot account for this. Power must chase the merest white scraps of its own ghosts.

Nicholas Mirzoeff describes “The Empire of Camps.”⁹² These are the camps of internment, the limbo of “terrorist suspects” without legal status or of refugees with a cruelly precise status as ghosts compelled to await some glorious future fate, and the regime of Macquiladoras, camp factories uncannily like those at the beginning of the industrial revolution sited at border zones for the benefit of cheap people. The camps are designed to turn those inside into ghosts and at the same time to “maintain low-waged manufacturing workers in their place in the global marketplace and reduce the social welfare costs of the advanced nations to the lowest possible point.”⁹³ Mirzoeff observes the common construction of such camps, a regime of low-cost holding units, sharply fenced, slathered in the cheap insecurity of *Cctv*, is different from the overused figure of the Panopticon in that there is no all-seeing specter implied by the physical architecture. Actuarial surveillance gains preeminence as a coefficient of architecture because those held in such camps are not deemed worthy of anything approaching an apparatus of “moral improvement” as was posited by Bentham. Camps are there for holding. A phase-space with no temporal dimension. No evolution. An old warehouse or empty ship will do. While power chases its own ghosts, we can be reminded by Hannah Arendt’s accounts of camps in *The Origins of Totalitarianism*⁹⁴ that such camps are always rational. Camps are always laboratories.

Generalized Chilling

Generalized chilling is the effect of knowing that surveillance is going on—that surveillance is immanent, not just located in definable processes or spaces, but smeared from one zone to the next. As often as not, surveillance provides a means of such movement, such networking of processes and structures—it guarantees transit of a standard object. At the same time, generalized chilling operates by being nonlocalized as much as networked; it works by being not quite apparent, by positing a maybe state. Here, a homogeneous social body is produced by virtue of what lies outside it. Cling to the ragged raft of

security lest the waves suck you under. There are two options if you don't hold on tight: Drown under the thick sea of truncheons or that of crime. In the meantime, there are plenty of forms for you to fill in, some buttons to press.

A simple model of chilling is one that suggests that certain things are not done because it is known that to do them is to infract a rule. A wholeness of being is kept in check behind a set of lines. Being is repressed. Watch out! It may explode or become rotten.⁹⁵ In many ways this is the model adopted by proprivacy campaigns. It is not fully adequate, however, in that it assumes a static and preexisting or natural whole being or state of communication that is marred by an outside. From a scalar perspective of mobilizing against particular forms of surveillance, it may have its useful effects—it does after all operate on the scale of the individual who is summoned into being and called to account by law. But to accept it fully would be to block a more nuanced understanding of the processes of surveillance.

A further model of the chilling effects of surveillance suggests that it occurs not solely from any array of single points, but mutually and in a networked fashion. Surveillance operates by means of norms, affordances, and expectations—the enculturation of probabilities, by the brokering and sublimation of will to power. This begins to be useful, but it needs also to be coupled with the ways in which surveillance produces its objects of knowledge, captures them from other scalar and perspectival dynamics, makes events and problematics, syncretizes dimensions of relationality—in short, acts productively.

Script and Proscription: Surveillance as Production

In the 1898 novella *The Iron Cage*, the “world of whiffs and glimpses,”⁹⁶ of information, “of affairs, their appointments and arrangements, their little games and secrets and vices”⁹⁷ that Henry James’s young telegraphist catches in fragments about the world and the communications of her customers leads to fabulations and invention, traps and mute scandal. Harnessed to the world-machines of manners, etiquette, class, money, gendering, the flecks of identity that pass through her apparatus, a life is called into being. In this story, surveillance comes via the eyes and imagination of an inconsequential P.O. girl, not from a camera suspended in the heavens. She nibbles at the data, supplements it, spins a story, makes it *work*—what happens is diffused. (Such living in and out of surveillance at moments of scalar conjunction with such processes, the possibilities for fabulation and invention they afford, are discussed further later.)

There are two senses in which we can read the way in which surveillance systems engage and produce subjectivation. First, it is easy to say that surveillance produces behaviors—this is the “positive” dimension of the effect of chilling, its “educative” function. A good citizen learns to do the right thing. There is also a second function of surveillance, that it produces new objects.

It is useful here to describe two well-known models of surveillance, that of discipline, proposed by Foucault,⁹⁸ and its supplement, described by Deleuze⁹⁹ following William Burroughs,¹⁰⁰ that of control. In the first model, social organizations produce a homogeneous body, a machine, an army, a school, a movement that is divided up and conjoined by rooms, by scripts, special furniture, uniforms, devices, modes of address, examinations. As a person moves through life he or she shuttles from one to another of these regimes. At every point in this series of transitions there is some capacity of recording or of watching that marks and ensures conformity to discipline. Such systems are always virtual as much as actual. That is, they describe the extreme end of a particular tendency. There is always and in everything a rich current of disobedience, infraction, and mutiny that such a schematic cannot contain. In the second model, that of control, social ordering moves into a mode that is characterized by a series of overlapping procedures of modulation. Life, activity, becomes a flowing force that is gated, transduced, filtered, recombined, rendered positive as if it were a stream of data.

Bit Parts in the Populations of Surveillance: Flecks of Identity

Within this context it becomes possible to describe *flecks of identity*, in their existence as standard objects, within databases as a primary compositional element within surveillance systems. This is what at its scalar levels control sees, an informational token of conformity or infraction. An element, cluster, or concatenation of data, flecks of identity—a number, a sample, a document, racial categorization¹⁰¹—are features that identify the bearer as belonging to particular scalar positions and relations. Such flecks are processed in ways that make them resolvable, contradictory, that make them bear—given certain forms of interpretation—certain values, deprecations or openings, and are made useable. The citizen has a place, a speed, a set of functions as a variable within a social, bodily, and technical algorithm.

At this point, it is useful to make clear the conjunction of the two terms *meme* and *fleck of identity*. Under the rubric of monitorability demanded by

meme theory as an epistemology—that it requires an identifiable isolate, the meme—we can say that the processes constituting control make a similar demand. They require identifiers, tags. Within the society of control, the meme is transducted as a fleck of identity.

In a process society, being able to access, deploy, or simulate the correct informational qualities guarantees all ports access. Otherwise: access denied. In a disciplinary formation, surveillance leads to a separate stage of control. Under control, surveillance and control are the same process—behavior is a waveform to be modulated. Surveillance as a term applies too much to real time. It refers backward to pairs of unseen eyes. Surveillance in the contemporary sense needs also to indicate prediction and production. Lyon¹⁰² and Gandy¹⁰³ have both used the term “sorting” to describe this active and constructive processual surveillance. Sorting is the result of the monstrous capacity for programming, for processing developed in mechanization, industrialization, reappearing at another degree of magnitude, in computation. Recording, comparing, networking, prediction, calculating to variable degrees of accuracy, identifying, pattern-finding, risk-assessment: Such behavior is always linked for effectivity to other patterns of action, sanction, correction, punishment, inclusion, reward, exclusion, billing, qualification, grading. Data is coordinated and passed between different channels and institutional, electronic, and commercial agencies where once it would not have existed in an analyzable or transmittable form. And let us be clear: Surveillance in the present context applies very little to acts of seeing.¹⁰⁴ Surveillance is a socioalgorithmic process. Flecks of identity are variables and events. From the perspectival scale of such systems, life is a trail of triggers and tokens: date, time, location, status, speed, choice, amount, accomplices. Surveillance, not simply as eyes, but rather as a processual dynamic of composition occurring in and as a phase space, occurs not just in space, but in history.

Such developments are, in part, a consequence of digitalization and the particular form of seamlessness that it affords. Once something is stored on a computer it becomes relatively easy to transfer it to another. (The development of intermediary protocols and languages and the developing fields of interoperability serve only to increase this tendency, despite the equally prevalent rise in the privatization of protocols—and their contestation by open standards.) Such data is also extremely easy to store and, as Gandy notes,¹⁰⁵ the storage of data for potential, as yet undetermined future use becomes—thanks to the relative consistency of the decline in cost of data storage owing to the

cloud-burst of the mathematico-industrial drives in computing—suggests that it becomes increasingly cheap to store any data generated by any kind of transaction. Such capacity for storage provides the potential for systems geared to generalized chilling to switch into notorious abuse if they are captured at any future time by a different or modified compositional formation.¹⁰⁶

Alongside digitalization, we see the increased gathering, generation, and sale of data by private companies. The privatization of record keeping, data mining, polling, predication, and security processes within society mean that (in an echo of the transition the other way) such data comes closer to the status of money. It becomes a commodity, alienable, transferable across contexts—as abstract as a concept and with an equally uncanny power to latch onto life. Thus both the digitalization and the capitalization of data change it into something new. They create a generalized relation of dimensionality¹⁰⁷ in which control becomes as much a function of capitalisms as of the state or institutions.

Let us take an example:¹⁰⁸ You are arrested for a minor driving offense. The police cross-reference your records. They are on the lookout for people who may go on to commit further crimes, or who may be terrorists. In order to enhance your access to information, your television viewing habits and internet usage have been logged in a hard-drive farm run by a company working for your Internet Service Provider and a number of media conglomerates, or by your “personal digital TV recorder.” The company gives you discounted access to networks in return for being able to use this data to target advertising for product-types you display a pattern of interest in. The case comes to court. The prosecution gain entry to such databases in order to gain background information on your character. The police’s consultation of this service reveals that you are a viewer of formula-one races and car rallies; that you often watch police surveillance documentaries including car chases. Their search also reveals that you have visited the Web site of Jaguar and Porsche in recent weeks. The prosecution lawyer argues on the basis of this evidence that you are an obsessive, hooked on high-speed cars, and a danger to society who should be imprisoned. A patterned look at a pattern of looking allows the perspectival mobilization of data as evidence. A particular interpretative act is accomplished, but it is not simply a “creative”—misleading—use of evidence.

Your defense lawyer suggests another reading. Your interest in these car manufacturers in fact reveals that you are a responsible citizen, looking to pur-

chase a high-quality transport product. According to this story, the trail of viewing records shows instead that you have a keen interest in road safety. In either reading, your “data-body”¹⁰⁹ has greater confessional status than your own account of the episode. This is the creation of a new subject. Flecks of identity, laid out in a list, supplant the citizen. Neither has, of necessity, any greater truth-value. But it is their perspectival dislocation—the relative power the *doppelgänger* has over its fleshier shadow within the dimensions of relationality of control—and the new conditions of concreteness acquired by misplaced concreteness in its form as data that commands attention.

Perspectival systems moor flecks of identity to particular relations of dimensionality. In doing so they produce, or attempt to channel, the fields of interlocking constraints and affordances from which the future is spawned. This is an attempt to guard against the risks of liability or need. Just as digitalization and capitalization have tended to dedifferentiate the functions of capital and the state, what David Lyon has called “actuarial surveillance,”¹¹⁰ surveillance for the purposes of protection against and the calculation and brokering of risks becomes also part of the function of the police. As such, “Surveillance is a mode of social orchestration that operates, not according to some shared standard of morality and justice but according to merely utilitarian norms, it tends to bypass the language of justice.”¹¹¹ Lyon’s insight in naming actuarial surveillance is substantial in that it makes the systems of contemporary control as processes of modulation visible at the scale both of everyday life and of systems operating on and in life at a more macroscopic scale and intensively and extensively monitored over time. Think of life insurance or of epidemiology as models, riding and shaping waves of life and death via statistics and millions of interlocking probabilities.

In such cases, any act or installation of surveillance becomes a solely pragmatic interplay between multiple dimensions of relationality: cashflow; risk; personnel availability; estates management; urban and architectural planning; the interrogability of recording and predictive mechanisms; the personnel and response requirements of particular media systems; public or private demands for an image of safety. The gruesome managerialism of contemporary state discourse is too often simply an attempt to reduce such complexity to a capsule dense enough to be swallowed.

Such apparent pragmatism is, however, not quite capable of providing a coherent or even manageable coating to the will to power that these various systems embody and draw together. Projective surveillance hungers for

the perfect preemptive capture of crime in its primordial, embryonic state. Predictive data-mining searches for the desire to shop in its raw, unnameable, infinitely plastic form. The unbearable yearning for answers, for finality and for the ideally isolatable thing, mates with the schematic roll-out of product plans. Mathematico-industrial drives such as that encapsulated by the purported Moore's Law¹¹² (that, in terms of computing hardware in the overdeveloped world,¹¹³ the price of processing and memory drops by around fifty percent every eighteen months owing, primarily, to technical improvement)¹¹⁴ are one result of such coupling. Spectacular crashes and busts are another. What form will be taken by the spooks' utopia of Total Information Awareness¹¹⁵ and its consumer-grade spin-offs remains to be experienced.

Having established a brief sense of some of the various dynamics, scales, and terms by which surveillance presently operates as a synthetic field, it is now useful to examine some of the moves by which such utopias are being erased. A brief survey of strategies of response to surveillance of which the *Cctv* site forms one example is useful here. A short, nonexhaustive list includes: the mobilization of the discourse of rights; tactics of evasion; the related tactics of feedback; overload and noncompressibility. The following section follows these through.

Human Rights for Flecks of Identity

According to the script, we live in a culture that sees things in individual terms: We construct oppositions or modifications to surveillance on the Enlightenment concepts of rights to privacy and to property. But control lives off the memetic part objects that are the *flecks of identity* in a sorting system: irises, fingerprints, postal codes, number plates, age, spending power, magazine subscriptions, criminal record, drug use, gender assignment, dates, location, racial category, medical records, credit rating, telephone use patterns, energy use, salary, insurance status, shampoo preference, local crime level and type, employment history, citation records. Control has no need of individuals per se, only as referents: as scalar nodes in the flows of cash, commodity, and behavior. Anthropocentric naivety, the banal warmth of the real, makes for a good cover story.

For sure the discourse of rights has its usefulness as a ruse, to preface a humanitarian bloodbath or to establish a threshold beyond which—at a particular scalar level—certain compositional dynamics may not pass; but it is

not sufficient. The terms of such rights are always changeable by those who charter them. Such rights must be used, but they cannot be relied on; they are disposable. Instead of, or at the very least alongside of, demanding that surveillance conform to the conditions of a previous state it is time to extend operations within, against, and outside such systems and to explore the disruptive advantage of its particular qualities. Find the compositional terms enacted by control, transduce them, fold eyes back in on themselves, hide. Such are the terms of operation of a second-order memetics within the context of control.

Evasion, Overload, Noncompressibility

Evasion is quite simply the aim of being that which falls off the map. Here we may distinguish between invisibility and blocking. Invisibility is what occurs when a surveillance device, operating at a particular scale, with a constrained perspectival capacity, is no longer able to register an activity. An example of constructed invisibility in relation to surveillance is related to that already mentioned in the first chapter. Drop out of the electromagnetic spectrum. Fall from recorded sight. Two projects worth noting in this regard are the *Isee* Web site and *Spot the Cam*.¹¹⁶

Isee by the Institute for Applied Autonomy provides a dynamic map of central New York.¹¹⁷ In a rudimentary, wireframe diagram of the central area, the locations of all the cameras are given in order to allow the user to plan, or at least sense the possibility of planning, a route across the city without being intersected. Like *Isee*, *Spot the Cam* is a Web site that maps the presence of surveillance cameras. The site, based on a participatory content-management system, allows users to upload pictures of cameras and to locate them on a map of central Amsterdam. Both of these projects would require a certain amount of development were they to function fully as evasion-enabling devices. Interpreted information on the light-sensitivity of particular camera models or any special sensors used, the angle of vision, whether images are stored or used only for real-time monitoring, and so on, would enhance the reach and usefulness of the work, but would also demand more time in terms of research, user expertise, the recruitment of informants, and consequent developments in interface design.

Blocking is closely tied to perspectival invisibility. It allows for the recognition that something is going on but maintains a threshold beyond which it

is impossible or extremely difficult to cross. In the context of digital surveillance this mode of contestation is carried out through practices such as cryptography. Here, patterns of communication, networks of contacts¹¹⁸ are still easy to track, though the contents of individual communications might not be.

The three general modes of engagement with surveillance systems briefly discussed here—evasion, overload, and noncompressibility—are linked in terms of their relatively willful entry into such systems that see them as a political and technological condition of life as such and seek to manipulate them for other ends. These may not be easily labeled as “contestational,” however. The fullest feedback of its own scalar and compositional terms into a surveillance system is realized in fraud. The system is given exactly what it wants to hear. Kerchinggg! Out comes the result. If writing begins as a form of state, mercantile, and theocratic record keeping, feed it back in. Start generating records of sheep, slaves, and other goods bought or moved. Vomit endless gouts of divine propaganda, births and accessions and victories of kings, the astronomical observations of priests. The problem with fraud is that the labor time spent simulating something in order accurately to produce the required flecks of identity needs never exceed the labor invested in the something other, one’s “actual” life, than the thing being so nicely surveilled.¹¹⁹

One quality of these mapping projects is to produce feedback by putting the installations of urban surveillance under another set of recording processes.¹²⁰ Other forms of feedback begin to edge into overload. Overload is simply feeding a system more information than it can possibly compute to be of any use in real time or, with luck, in any of the lower levels of the cost-benefit calculus thrown at any resourcing decision that might stretch out such time by analysis. Such an approach recognizes that surveillance requires a social and technological body in order to work. Any new system also requires developments and changes in the kinds of work organization, and—where useful for purposes of feigning accountability—permissions structures, required to carry them out.¹²¹ In such cases, the disarmingly simple approach of even asking who has ownership and responsibility for a camera installation in a “public” building can end up launching an iterative network of buck-passing with no one actually being willing to take on accountability for such systems, until eventually they are removed. Here a system of surveillance becomes overloaded by its virtual effectiveness; it closes down because it cannot process what it might eventually see.

Overload and related approaches are clearly distinct from a rights-based claim to privacy with which evasion might easily be conjoint. They see any system of surveillance as subject to manipulation, as an assemblage rather than as a fate. Such manipulation may take the form of direct misuse of a system's affordances, or it may mean exacerbating a particular medial will to power embedded within an apparatus. It may also take the form of an utter rejection of privacy, as a term dependent on the notions of property suitable only for a time period massively stacked with nested borders that are ripe for overflowing. It is possible to conceive of the initial traces of an absolute openness, aggressive openness, as a form of informational civil disobedience.¹²² Such approaches may usefully perhaps be addressed to gray areas of activity. The helpful operation of the fax to the local police station on the *Cctv* site is one such. Deliberately weak, and marginal—to the extent that anything on the Net is more or less marginal than any other—it just probes and niggles without ever being annoying to the extent that its absolutely open, locatable, and authorially culpable efforts are worth investigating. This is an algorithmic testing of the thresholds of actuarial surveillance.

Such an overflowing is related to one last approach that needs mention here, that of noncompressibility. In their introduction to *A Thousand Plateaus*, Deleuze and Guattari suggest rhizome structures, realized at one scalar level and quality in plants as a way of making impossible any reduction to objecthood. They contrast this against a hierarchical addressing structure that makes the shortest route possible between a center and its target. The rhizome, by contrast, is a thing that can't be summarized. It can't be broken down. It can't be compressed by the repetition of one of its parts (in the way that an image, sound, or other file can be compressed by a file storing an instruction to read, say, "8 × 1" instead of eight ones in a row). Noncompressibility insists on every relation of dimensionality of a word in a poem, of an act in a life, being taken into account. Something can never simply be a "crime" or the crossing from one category into another. It is this and this and this, *more*. If you are ever convicted on the basis of DNA evidence, demand that every trace of DNA you ever left is taken into prison along with you as part of your person.

This kind of approach slaps bang up against the perspectival capacities of surveillance systems as they operate via misplaced concreteness. In most current contexts this means that "In order to operate best for risk-assessment purposes, surveillance strips down the complex actions of self-conscious embodied persons to their basic behaviour components."¹²³ Behavior

components are here the elements of any life that are perspectively available as “behaviors” to a particular surveillant scale. *A fleck of identity is to a surveillance system what a meme is to meme theory.* A fleck of identity is an isolate, a standard object that such a system is conditioned, thanks to its scalar perspectivalism, to recognize. The difference between them is that the fleck leads “inextricably” to an object with which it is linked or of which it is a part—a person, the presence of a chemical, the infraction of a threshold. The categories are certainly overlapping in places, but the meme necessitates an analytically separate existence from the wider formations such as those of poetry listed by Bakhtin, and those other dynamics of which it is part.

What the *Cctv* site exploits is the combination of these elements. Their combination occurs in the interpretation of the webcam feed by the viewer. In the comprehension of the image as an image in real time comes also that of the image as a process. Digital images—especially in such a visibly raw, low-bandwidth state—demand to be understood as a computational and algorithmic process. The computer cannot be seen simply as a seamless personal media player for all media nor as the ultimate coding and decoding apparatus for the GKW. Here, if Hilliard’s *A Camera Recording . . .* demonstrates the geometrization of vision and the camera’s function as a thickener of the interplay between extensive and intensive qualities, we can say also that *Cctv* allows for such findings to be brought into relation with Virilio’s mapping of the apparatuses of sight and their inherent conjugation of scalar fields of perception with dimensional relations of control.¹²⁴ The image cuts into the flow of life, detours it into an object and into a memorial trace, but also gives it a new opportunity to be launched.

Isolate: Memes and Flecks

One problem for memetics is that, as anthropologist Maurice Bloch suggests, it “implies that human cultures are made of discrete bits.”¹²⁵ Some kind of analytical isolation of a meme is required in order to substantiate its exploratory power as a working scientific concept. Such a problem returns to the question of poetry as the multiple perceptual and cultural dimensions of relation listed by Bakhtin and used by Guattari earlier. The discrete bits of poetry are the digital¹²⁶ elements of written text. These are a limited set of standard objects that, as Blackmore celebrates, operate together to produce a field of potential combinations, which is then modified by various syntaxes,

grammars, and other forces of arrangement in local and specific acts of speech. Text, any particular piece of text, operates on a constrained set of scalar levels. These scalar levels of text provide the sense in which they be understood to be isolated units in the way in which Bloch requires in order that they may be susceptible to analysis. It is proposed here that anything that passes through a computer, or through print media as text, is necessarily a discrete media rather than a stream and is thus viewable, at a the scalar level of memetics, as a meme. At the same time, through the dimensions of relationality that compose them and among which they operate, texts sabotage such “concrete misplacedness.” It is the explosiveness and precision with which it explores and establishes its dimensions of relationality that marks poetry and it is by means of these qualities that it escapes simple identification as memetic.

Here is an example, suitable only because of its bluntness and its existence both as a fleck of identity and as a meme: take a personal identification number (PIN) such as might be used to access a bank account via an automated teller machine. The number is used because it supposedly—in combination with the possession of a uniquely encoded card—maintains an indexical relation to its one and only user. The person with the bank account is not supposed to reveal the number to anyone else. She is instructed not to write it down, nor to store the piece of paper sent by the bank informing her of the number. In this state, the element, a meme (albeit one derived from a random number generator in a computer), a fleck of identity, maintains its state as a discrete bit. As soon as it enters human memory, however, the number is added to, it becomes supplementary to other numbers and strings and memories. One way in which this occurs is the common habit by which people link such numbers to historical dates or birthdays and so on. But it is also necessarily part of a string of associations that may be ephemeral or obvious, but that are to do with and make possible the tacit knowledge of the use of cash machines. At this point, the simple scalar level of the number as an isolate ceases to make a full account of the dimensions of relationality that is required by the number to function as an isolate on another scalar level, that identifying the user and only the user as the bearer of this card–number combination. We can also say that prior to and ongoing after the first reception of the PIN meme by the user it is already composed by and bearing of dimensions of relationality (to economic structures and processes, to software, to the postal system that delivers it, as a short string with a designed amount of “memorability,” and so on). Nevertheless, this particular scale, at which it is a meme, which may not be

spoken, which must only remain invariable (or else “die”), at which it may be communicated only to machines, is a scale at which it can be understood, isolated, and composed and active within dimensions of relationality, both as a meme and as a fleck of identity. This conjoint nature will be taken up again in the section entitled “Spot,” where a user takes on the role of informant. First, however, we must briefly follow through the remainder of the components of the site: the form and the fax.

One Last Seam: Form

The convention for constructing forms was one of the earliest developments within HTML. Essentially, the form allows for a part of the screen to be set aside for the entry of text by a user. Once the text has been completed, it can, by one’s clicking on a button—the rudimentary design and text editing of which are also contained within the formal conventions of HTML—be submitted to some kind of record, such as a table, database, or text file, or it can trigger an interactive sequence. In this case, the text is sent to a fax gateway—a computer that remodulates text or other data into an appropriate form for fax reception. It is then sent by modem via a telephone line to the fax.

There is not space here to provide a typology of all the ways in which forms are used on Web sites, but it is useful to briefly compare two examples. The first is from a corporate advertising site proselytizing the deeply human values of the petroleum company BP.¹²⁷ In this case the site uses forms to allow the site’s managers to gain user responses to QuickTime¹²⁸ versions of the company’s TV and cinema advertisements. This particular batch of advertisements are filmed in a “low budget” documentary style. People resembling ordinary people respond to a question: “What message would you give to the head of an oil company?” The idea of the company as responsive and responsible is part of the new sunny image of BP, essential as it moves to capitalize on centralizable aspects of postpetroleum, “environmentally friendly” energy technologies. The user is able to watch the clip and then type in a response. No promise of a reply is given.

A second example is the use of forms to arrange interactive elements of sites using forum-based content-management systems.¹²⁹ Here, although it is certainly still possible for moderators to hide or censor data that is entered into the system, the general ethics of the code is to produce a system wherein feedback ramifies and encourages further participation, and contribution to



Figure 4.9 Information is entered into the form. Screenshot from *Cctv—world wide watch*, *irrational.org*. Courtesy of Heath Bunting.

the discourse. Simply enough, responses to an article are published, with chains of responses and comments forming threads through which a discussion can be followed, linked, and added to. The *Cctv* site by comparison allows users to see the results of previous users' acts of informing only after they too have filled in and submitted a form. In all of these cases, there is the staging of the contribution of information that is in some sense or another collaborative. The way in which the various forms of collaboration are structured by the treatment and revelation of information from multiple sources points toward the development of an ethico-aesthetic that is at once openly systematic, medial, and social.¹³⁰ What these sites and others make apparent is the development of a widespread familiarity and engagement with the potential of networked media to formulate communicational and productive assemblages. It is here, too, along with the earlier observations on the development



Figure 4.10 Submitting the information allows the user to view previous informants’ texts. Screenshot from *Cctv—world wide watch*, irrational.org. Courtesy of Heath Bunting.

of webcams, that the site needs to be seen as part of practices that lie both within and outside of specifically art domains.

One Last Seam: Fax

One of the commonplaces of studies of the World Wide Web is that sites with similar interests tend to cluster.¹³¹ Sites on similar subjects or that operate with related approaches tend to display strong interlinking. This does not mean that sites that are simply on the same subject necessarily interlink. It is likely if they occupy conflictual positions in relation to a problematic that they will absolutely not link in order to maintain the “security” of their position. This in part is what is a mite shocking or amusing about the link to the cops. While it might be that “the problem of the work of art is to establish

a system of communication among those parts or elements that are in themselves non-communicating,”¹³² such a maneuver is also reminiscent of Mafia tactics: Keep your enemies close. Turn them into family. It is here in the connection to the cops that the work enacts the twist. The torsion it performs on the dimensions of relationality that it meshes can be understood in a number of ways.

In the context of the *Cctv* site, one such twist is the response to policing as it develops the actuarial tendencies that Lyon documents. Just as the people answering phones in emergency services call centers always talk to callers by using a sequentially structured script they read from a screen they hypertextually move through according to the information they give and are given about each incident, policing operates according to a calculus of risk–benefit. While the intrusion of police forces into urban societies has become culturally resolved enough that it can be thought of as a “traditionally” face-to-face process, computation has moved on to incorporate policing into an algorithm whose variables are formed as a scale of standard objects. Policing is processing. The end process of the *Cctv* site is an extra variable slipped into the stack of that algorithm. Just as the lawyers’ letters draw them into participation in the development of the sites, the cops too, so one is led to believe, become part of the work.

In his book *Networked Art*, Craig Saper suggests that mail artists, zine-makers, Fluxus participants, concrete poets, and others transduct the ephemera and core media of bureaucracies, such as postage stamps, envelopes, photocopiers, rubber stamps, typewriters into “intimate bureaucracies” that, “create counter-intuitively intimate aesthetic situations.”¹³³ Here, standard objects are made warm, become weird, divulge their secret traits, are pushed to the edge of their functionality until they cough up a stream of pure media, designed to encourage further participation and invention.

Such intimacy can be seen as a conscious reversal of suggestions, such as Pierre Clastres’ that “The language of civilised man has become completely external to him, for it is no longer anything for him but a pure means of communication and information.”¹³⁴ Here, language has become a standard object, at odds with its multiple affective, phenomenological, medial, and physiological dimensionality as mapped by Bakhtin. Communication and information become standard objects, scalar perspectival distortions that mask the dimensions of relationality momentarily fused or challenged in a word, a poem, a gasp, or a string of code.

The site does not attempt anything along the lines of “recovering” what Clastres rather eerily suggests is the relationship of “primitive” peoples to language; rather, it shoves its flood of dead letters back into their source. “Non-sense syllables or chromatic tones of equal value constitute media in the modern sense: material produced by random generation, selected and grouped into individual complexes.”¹³⁵ There is no sense of mourning; there is rather a glee in the possibility of making the state adapt to the environmental conditions it establishes. The information passed on to the police by the site’s users is drivel. A sentence, a phrase, passed on by users slumped into their thrones.

At the same time, and in a slight, gentle, way, the site functions to give the sender of information a sense of being irremediably exposed to the dimensions of relationality that are brought together there. For certainly it is possible that the faxes might be traced to the internet service provider serving *irational.org* and to whichever fax gateway the messages are being scripted to. (One should of course question whether they are ever sent.) A user sits ensconced in a zone of temporary anonymity, tapping in a few lines, but each packet bears its own trace. There is no evidence that, if they are actually sent, the texts are being fed through an anonymizing process that would hide their source. Certainly, it is arguable that the detailed and useful way in which the site reveals its implication in legal disputes over the use of data needs also to be brought to bear upon the technological composition of the work. Who can read the data? How? There is a dandyish irresponsibility here, which abdicates to some extent any connection with users of the site. Are they there merely to provide evidence, hit counts, for the artist’s subversion rate? Of course, some of this is already read and understood by the site’s users. No one, as can be seen in the log of messages sent, goes by a real name, but that’s a matter of form. More substantially, the use of the site is just for laughs—another gimmick site to kill time at work with. No one is feeding the cops something that might for a moment be taken as a substantial witness account of a crime. The responses are limited to one-liners. “The cops’re wankers.” “It’s him. There. He’s done a runner.” The work therefore openly differentiates itself from any “serious” attempt at disinformation or the hacking of information processes.

The bite-size dandyism of the work is related too to the way in which it can be said to be entrepreneurial.¹³⁶ That is, it follows the Schumpeterian logic wherein the role of the entrepreneur is to identify and pursue opportunities,

irrespective of direct control of resources.¹³⁷ First, it finds and enacts new uses for streams of data and channels of information. Second, it says to control: This belongs to you, have it back. Have it back . . . But does it perhaps do this always too much as the novel act of an individual? Regardless, it is the deliberate triteness of the work, the way in which it cloaks itself in pointlessness in order to do something really novelly pointless, that provides it with its refractory power but also its self-parodying and effective uselessness.

Just as the legal position of the work is weakly defensible—everything is nicked—and as the materials of the work are poor—an instance of apparently unsophisticated coding; the link to defunct webcams—its “political” function is small, if not (in the way it provides traces to users) eventually negative, and it chooses the most negligible of media to make itself known to the police. The point of reception of the work, the fax, must surely be the most minor within a police station. While the *Cctv* site can be said to mobilize and twist the weak position of the honest citizen taking an initiative to help the police—perhaps if you gently tug at the elbow of the defenders of the peace for long enough their body armor’ll fall off—this is part of its nonrepresentational effect. It nibbles away at resources, at time and at attention.

Spot

If a user of the *irational.org Cctv* Web site spots a crime via the memetic fidelity of the webcam, reporting it to a nearby police station is readily available. To do this, they must translate actions viewed on the webcam into a textual description that contains sufficient information for: the perpetrators or victim to be recognized and their subsequent movements to be traced; the nature of the crime, involving—given global access to the site—some judgment as to the variable applicability of local regulations; the time and place at which the crime is occurring; and so on. If all acts of translation are betrayals, this site offers a concatenation of backstabblings, from one media system to another, from webcam to text.

If a witness reports a crime via standard means such as a phone call or face-to-face verbal account, their report is drawn into a system of standard objects. The transduction of bodies, objects, movements, the city, into text, a report, requires an axiomatic: codes, signficatory economies, discourse, notational systems. One of these, for instance, is the system of call signs, used by the

police to identify ranks, types of accident or crime, “racial” groups, policing areas, types of vehicle via short alphanumeric combination.

A compositional mode engenders a schema by which it must be spoken to. Each act of communication within a system actuates a probabilistic path within that system, what may be said, what is likely to be said, what cannot, with sense, be said. Sometimes, as in the example of the PIN, a system is closed in order to maximize the clarity of the messages sent within it. This also assists in guaranteeing the fidelity of transfer of information from one node to another. Situations might arise where a schema is spoken to in a manner that it cannot reduce to the set of terms it contains. Not every possible crime or description of a possible crime corresponds to a specific police call sign or even to those listed in law—there’s room for invention at least.

Each such compositional mode creates a body, a relation of forces that forms its particular powers of composition, its drives. Given their—often largely partial—closure, such a body need also have a model of or a potential for receiving elements outside of it that may not or are unlikely to be composed in the same way. The body needs to have some “sense” of, or more accurately capacity for coming into composition with, dimensions of relationality that are not of its scale, nor necessarily of the original set of dimensions of relationality that provided the powers and constraints for its genesis. (Such relations of course change through time and may themselves become “alien” as, for instance, in the recording quality of a bank card’s magnetic strip, or in the analytical powers afforded by the term “class.”)

The way in which such relations of force enter into this body are prefigured as “representations” of such interruptions, buffers. But they can also force a choice of either actuating a strict adherence to the initial schema or compositional dynamic and refusing any external disturbance—and hence perhaps ceding the capacity to be sustained in new conditions—or of building within itself the capacity for its own incorporation within the relational fields of other bodies. Additionally, such an interruption may force at least one scale of activity to stop.

It is possible that in order to maintain its longevity such a code needs to incorporate a model of its own breakdown, sequences that allow it to degrade gracefully, to trip into another state or to become fissiparous and allusive—as most successfully does language. The conjunction of the formal language of call signs with the “natural language” of descriptive speech, taken up itself in

and through other codes, senses, and conventions is one way by which this is achieved.

This comes to the nub of the work in a sense. Given the extreme codification of crime and criminality, the unusual way in which its observation, or—given the quality of image and rate at which the images are refreshed—nonobservation, is set up, the odd procedure by which it may be “reported,” the concatenation of medias and codes hooked together and all of the linked elements’ particular scales and dimensions of relationality, the site provides a way in which to observe and play with their mixing and interference.

This is not to say that this site is necessarily the clearest or most powerful example of such a process. Where it is useful, however, is in connecting a procedure of observation—and hence the formulation, production, and shaping of “results”—directly to a series of apparatuses; medial devices; representational forms; coding and decoding protocols; principles of data organization; the emergent dynamics of a media in the process of invention; repurposing and use by popular and specialist mobilizations. In addition, the process is made available to its very special audience, the police stations to whom, so it seems, the faxes reporting the events are destined.

If this is an example of the fictional science of second-order memetics, it is inherently done live, without a control, and with no guarantees other than hunches and conventions by which to limit in advance what might emerge. The seamy conjunction of particular elements from media systems that were hitherto not simply unconnected but of fundamentally different perspectives and relational lineages allows for the scales, rhythms, compositional drives, the ontogenic medial will to power inherent in each element, to reinvest, excavate, and provide new terrains of selection, variation, and transmission for their materiality, for their operation at the ambiguous scale of memes, and for their mutual interference as politics. The work butts media systems up against each other, makes them produce seams. It dials the wrong number, but in doing so reveals something of the dimensions of relationality composing any such number, string of characters or protocol. In forging a temporary media ecology out of a few wrong bits and connections it is possible to patch together something of another order.

Inventory

What can be made of the ideas here? How does this account of media ecologies provide any ideas that can be used elsewhere? How can we find, sense, and make use of the parallel dimensions of the items on a list? Where's the big flashing exit sign in all that smoke? Here it is useful to take something of an inventory.

Through much of this text it has been hoped that the writing would itself edge toward making escapes and inventions, that it would not so much make its argument dead, as in obvious, as much as working by the cumulative and interacting operations of ideas and activity attempt to induce such processes in its reading. To identify what emerge as the figures in an argument too distinctly against their background risks awarding them a greater degree of agency or of importance than is warranted. Deprecating further what is thereby reduced to incidental or marginal material seems to be the opposite of much of the intention here, recording ways in which such detail within a wider composition—especially when paid rather too much attention—can open gateways to new formations of thought and activity. Is it desirable to make a new set of conceptual standard objects?

If this book takes one of its own hypotheses seriously, this problem should set a trap that springs itself. All standard objects contain with them drives, propensities, and affordances that are “repressed” by their standard uses, by the grammar of operations within which they are fit. (This “repression” should not necessarily be construed negatively. It is likely itself to arise as the result of a previous or immanent recombination, disassembly, or adaptation.) Placed

together in conjunction with another such object, a chance arises for something to happen, a signal to get strange by coming out the wrong end. To list out a grammar for the set of ideas developed here should simply provide an opportunity for reduction to fall into this same trap and start sprouting.

In this case, would it not be more useful simply to search for such a grammar, with its set of licit and illicit propositions, to run a routine that conjugated all parts until it could be measured on a scale of the most standard and the most “subversive” conjunction of parts? (The impression may be had from certain strands in contemporary manipulation that such a scale may indeed already exist or be dreamed of and that it faithfully and desperately doles out its results according to the results of another multidimensional table drawn up from the variables of identity and access.) Such a productive and rigorous grammar has not been sought here. Rather, the book has hoped to operate via the demands made upon an account of media by concrete uses and inventions. This means that the scope of the book, the territory to which it may suggest its ideas, is potentially rather limited. Each chapter follows up a few details, working with a kind of bent scholasticism through some of the dimensions of relationality brought together by a particular conjunction of elements. It does not hope to lay out a surgical metaaesthetics of media with all of that art dreck, that music, people, software, and awkward stuff, sloughed off. Rather, what it hopes to achieve is an insight into what is made in the conjunction of an account of a number of activities in media with a certain set of conceptual work of various sorts. Each of these sets makes demands in the way in which it is taken up and used. Further, neither of these sets is internally homogeneous; they are fractious if not fractured. What can be said about both sets is that they are concerned with the interaction of multiple parts without positing the existence of a resulting whole. Indeed, lines cut across from one set to another, demanding that different alliances be registered. The simple sets that are offered here, between the written and the made, are only relatively arbitrary lines constructed by media and the conventions and hierarchies in which they are active. Aaron Williamson makes a computer write the superaccurate gibberish of speech-recognition by hooking his throat, mouth, and lungs up to a mic at the ear of another corpus. In a sense, what this conclusion should offer is a discussion of these parts, those moments when the book itself acts as a media ecology in the terms it describes, mobilizing and mapping, *using* the perspectivalism of particular approaches, materials, and ideas as they intersect.

Making access to these transversal points clearer than they might otherwise be is of use insofar as they can be taken up without providing the means to reimpose a set of norms. They are perspectival forces acting in dimensions of relationality, not laws. What I hope to list below, then, are some of these elements that exist between chapters, the ideas that carry across from one account of a media activity to another. In one of the terms of the preceding chapters these are the seams of the argument. Such seams mark its thresholds. They pull it together rather than stitch it up.

Standard Object/Seaminess

The standard object is that moment when misplaced concreteness becomes productive rather than simply reductive, when the analytical isolation of elements inherited from Newton produces a whole world of amputated, self-sufficient but recomposable elements. In the most straightforward sense, it is what makes the component-based world of manufacture. There's no need to reinvent the wheel, because not only is it there already, but it exists in thousands of standardized types, each relatively fit for different dimensions of use. At the same time, standard objects, even wheels—think of the transition, and resulting gains in strength, from the cart wheel of planks cut into a circle to that of spokes and a rim—undergo development according to the morphogenetic forces in and on the phyla.

A society of standard objects also relies for their invention or development on the mobilization of affordances within them, drives that surpass their limits. One of the underlying themes of this book has been how the compositional dynamics developed in art contexts exceed the art systems that have grown up to instrumentalize and (sometimes usefully, as in those moments when they provide a context of careful attention, a “license to irresponsibility,”¹ or parallel histories of the world) delimit them. Art is a compositional dynamic in which the standard object exists only as a cliché. One of the powers of art, despite its current limitation to a special case, a zone of exception, is to insist on the possibility of the entirety or any part of life being always reinvented. This is its role as the imaginary science of second-order memetics. While it should be possible to navigate a pavement without falling into a pit of metaphysical doubt, we should not be relieved of the need to think about how our streets are lit, or whose streets they are, or of what a street is or might be.

The resistance of standard objects to change, occurring through the dimensions of relationality by which they are formed and which they make, is itself something to be recognized as a force. Not everything can be easily “turned to account.” The standard object is the concrete shadow of the potentiality of which it embodies and mobilizes a part. It exists as such only as a certain scalar moment of equilibrium. Like anything else, standard objects have their own kind of mortality and renewal. (There is something of this in the melancholy of pop art and what follows it.) Recognition of this is implicit in another way too in the manner Guattari lists Bakhtin’s multiple dimensionality of speech, that it is physical, poetic, and dialogic. Words are momentary standards. Such moments may endure or fizzle. Viewed as memes they are populations bearing repetition over generations, or disappearing within days, but they are always also composed and mobilized by this kind of seaminess, the way they can be tangibly sensed to connect.

This tangibility of connection also implies an interplay between distinct elements. Here, the standard object allows for conjuncture in that its relative predictability potentially allows it to provide affordances to a number of computational dynamics simultaneously. The predictability of a communications protocol, its constitutive “hardness” allows time to be spent on the more difficult work of communication. But there are also moments of such interplay between elements that are not the same when the capacity to differentiate between what is categorized as the hard and the soft, or what acts as such, is surpassed, broken, or fallen away from. It is at these moments that new compositions arise, new affinities of objects and processes, invention.

It is the negotiation between these two kinds of materiality that occurs so pungently in Nietzsche. Discourse and language arise as both tabulatory, isolatable object, the maker of lists, and as visceral reality-forming means of escape from the grid. One of the struggles Nietzsche undertook was in bringing records of his thought and experience in a recordable communicative form back from the depths and heights of this most organic of intellectuals. Every written phrase, each thought, is the temporary scalar residue of a churning capacity for doubt, affect, and perception, if it occurs in a mind, or on a piece of paper in a system of grammar as a perspectival cross-section across an innumerable storm-wracked phase-space of becoming. Such a section is deeply paradoxical, a sensor, lived life, that conjures up its own set of connections to reach back and forward to its mechanisms of actuation, text. Textual mechanisms that betray life on the one side, push it onward and deeper on the other.

On every side of the diagonal stretch of “legible” photographs taken by John Hilliard in *A Camera Recording* . . . the remainder slides off into black-out or snowblindness, the edge of the apparatus. To the side of every line of text is a nonrecorded chaos of life, of deleted words, gibberish, a health improper to record among the thin lines of carefully non-nonsensical findings and leavings. To construct such a text, without being bound by it, to be able to leave it, is in a sense the point of convergence between Nietzsche’s interaction with the “reality principle” of codifiers and of science and Whitehead’s figure of the ideally isolated object. Pierre Klossowski’s book² on Nietzsche concerns itself in an intense and deeply challenging way with the many levels with which this problems recurs. How to live, record, and interact on the scale at which one exists as what counts as a human, while simultaneously giving play to the vast realms of that which is beneath and beyond such a fate?

In terms of media, at such a scale, the problematic is recurrent in the synthetic, mutational capacities of media, the distortions they effectuate and the powers they release. As for Nietzsche, the question is how to couple reality-forming, ontogenetic drives with this reality principle, without falling into the normalizing trap of the latter, but using it as a mechanism by which a greater intensity of life may be sprung. The question is also how to recognize objects in the state in which ideal isolation, as a perspectival trick, has effects and gains purchase, but also to be able to act in and mobilize the dimensions of relationality that are settled or oscillating around and through such an object, and to launch and learn from its capacities of disturbance and creation.

Medial Will to Power/Machinic Phylum/Ecologies/Aesthetics of Layering

John Hilliard’s *A Camera Recording Its Own Condition* (7 apertures, 10 speeds, 2 mirrors) already reveals one *known* object, the camera, to be an assemblage of many. A “conservative” reading of this piece would be that it shows the truth of the camera, the thing in itself. But it is precisely the paradox of the camera—a closed thing that is open, and an interplay between intensity and extensity—that the work makes palpable. It is not truthful, but reality-forming. The camera is a device wherein many technologies are combined; it is itself a process of synthesis and layering. Any one camera or type of camera arrives at a stable form, at a standard; but it is also a device predicated, in Flusser’s estimation, on a drive to take pictures, to come into composition

with light and what it reflects on. Such a drive is also a perspectival limitation—the prints fade to black and to white, chart the beginnings of a drift into endless monotone—but in the threshold between, there is a constant grappling with a relation to an object, a reflection, with which it is engaged. For Nietzsche, all life, all thought, is an activation first and foremost of the physical capacities of matter. Such drives are, in media, a form of will to power. At one point in *On the Genealogy of Morality* Nietzsche translates Goethe into “[his] language.” He says that the will to power is what the poet calls “the very instinct for freedom.” But it is more than that; it is how freedom is made in the context of what it fights through. In this case, Nietzsche describes it in relation to bad conscience, but the same could be said for any form of subordination. Nietzsche identifies the will to power as “This secret self-violation, this artist’s cruelty, this desire to give form to oneself as a piece of difficult, resisting, suffering matter, to brand it with a will, a critique, a contradiction, a contempt, a ‘no.’” Such a struggle, against oneself, against a fixed place a known set of capacities, eventually brings “a wealth of novel, disconcerting beauty and affirmation to light.”³ Here, will to power is something that tricks reactive bad conscience into generating its own overthrow.

Art, in the senses in which the term is used here, is predicated on sensing things to their fullest capacity, something it shares with other intense currents of life, and to which it adds only certain sorts of reflexiveness. This reflexiveness is in part a refusal to assume it already understands what is there and what it does. It is a testing against other dimensions of the means by which it comes to know and to perceive. One of the means by which this is done is by the construction of medial organs. If a standard object is understood to have a specific set of qualities and affordances in one context, one set of dimensions of relationality, how can we use this constrained understanding of its capacities in another? Media are experimented on, not simply in terms of their affordances as standards, but also in terms of what may be mobilized or released when they come into odd conjunction with another scale, dimension of relationality, or drive.

Chapter 2 makes the claim that this can also be understood in a profoundly political sense. What Marx named the proletariat, but which is always more than that mobilizing nominative act, is a class that, violently severed from god and *gemeinschaft*, welded itself together through a disjunctive alliance with such drives, numerical, metallurgic, massive, and ravaging. This is not just

the simple conjunction of naked labor with fluid capital, but what exists in between, with the machine, Latour's "nonhuman," the deranging catastrophic fructiferousness of production. It means that although we are unable ever to present anyone as simple victims, we are also required to attend to life, to cruelty and history with a ramified sense of the potentiality that surrounds every act.

One result of such attention is the suggestion that the degree to which people are able to generate this relationship, to garden this fructiferousness, away from capital, or even the more it can be mutated within but against the regime of work, can be said to provide one measure and motive for their autonomy. We can say too that this ambivalent conjugational drive also finds itself manifest in the ecstatic network of pirate radio, of dance marathons, or in the triumphal capacity to work of heroic geek culture.

A Thousand Plateaus locates the itinerant metallurgist of the steppes at the seam between the nomads and the sedentary people as a historical figure formed in this position. The metallurgist is one who is burned, propitiated, and synthesized through combination with the capacities of matter. This figure also allows Deleuze and Guattari access to another conceptual figure, the machinic phylum. In Manuel De Landa's brilliant reworkings of this theme, two key modes of the machinic phylum are used. The first is the non-reducible topological spatium shared by a phyla as it moves and evolves through time, making innovations in this basic patterning. What graffiti writers do with letterforms, evolution does with assemblages and with bodies and ecologies. This is what can be understood as its phase-space, the map of all possible combinations of its affordances.

This first sense of the phylum, though, is complicated by a second, without which it would necessarily be static. The machinic phylum is also produced in the dynamic and nonlinear combination of drives and capacities that, stimulating each other to new realms of potential, produce something that is in virulent excess of the sum of its parts. Indeed such parts can no longer be disassembled; they produce an ecology. Not a whole, but a live torrent in time of variegated and combinatorial energy and matter. Several of the chapters here have discussed projects and actions in media that produce a sense of this. The pirates, from the sounds broadcast to their collaging approach to technologies, are founded precisely on a sense of this synergistic and livid capacity. Other work here exists in between this permutational power and its edges. Such a torrent can be used to drive other little machines that dip a drive or

an organ into it, setting them ticking away, gurgling, jumping. The *Cctv* site, for instance, exists out of the combination of media systems, making more than something out of parts that don't fit, but it also provides an insight into the contours or limits of the phylum, that which, according to perspective, is not caught up in its rapture. The work uses combinations of machines, layers protocols, devices, and drives, but cannot entirely be said to be composed by their nonpredeterminate interplay. It works at the "edges," with a sense of how it is also blocked, gated, and modulated by a number of the dimensions of relationality it is composed by and accessible through. Elements of predetermination, standard objects, become uncanny organs by which media may be sensed.

These "edges" also exist in a spatium composed by multiple dimensions of relationality. These dimensions "cooperate" to produce something in excess of themselves. But while relations of dimensionality feed into this process of becoming they do not provide a precise topography for it. Rather, they perform by different modes of tracking and making and by themselves mutating in composition with it. Equally, what is intensely exciting about these edges, which many of these projects produce, is that the process of becoming that is machinic heterogenesis has no plot, as in story or territory, only a "middle," an ongoingness: It cannot be turned into a standard object, it must be *done*.

Perspectivalism/Flecks of Identity/Memes

A media ecology is a cascade of parasites. These parasites, roiling around inside each other's stomachs, the endless devouring that this text cannot contain, these medial organs all grab hold of each other, gain purchase and insight by means of their particular capacities. Media provide access to another or to an outside by means of the specific perspectivalism or affordances that they embody. Just as capacities of thought, of being, are made in lived bodies, in complex and delicately conjoined tissues and processes, and just as powers are inherent in all matter, materialism also requires that the capacities of activity, thought, sensation, and affect possible to each composition whether organic or not are shaped by what it is, what it connects to, and the dimensions of relationality around it. This is a guarantor but also a certain kind of limit to the will to power and to knowledge. Perspectivalism is inevitable. It can be mourned, but it can also be exploited, twisted, patiently refined.

Recognition of perspectivalism also allows for something of an advantage in limiting or sharpening some of the other concepts proposed here. There is a danger, if sufficient attention is not paid to developing a finer-grained account, that medial will to power will simply appear as yet another sort of indifferent and contingent flux, an ahistorical patternless “nature.” This is a particular danger when dealing with digital media, which is too often understood as providing an undifferentiable field of opportunity. The book first proposes that computational media have inherent and discernible drives and compositional terms. One of these is, very basically, that of digitality, that everything is in recomposable bits. The computer’s coupled founding drives to trace the edges of the irrational and incalculable and to abolish drudgery also come within these terms. Second, all media here are treated, rather than being possessed of infinite malleability, as being intersected and composed by dimensions of relationality that can, according to the instruments used to interpret them, be seen to be political, economic, rhythmic, aesthetic, and so on. Such dimensions make cuts, apply breaks as much as they intensify flows. The book has adopted a method that works on the basis of a relatively detailed grounding in specific media elements in order to draw out what is, one hopes, a more accurate and hence useful account. This is its own perspectivalism, used to draw out some of that discernible in media.

A particular model in the evolutionary study of culture provides another opportunity for examining a mode of the will to knowledge. Meme theory allows a set of potential insights into the kinds of force media embody. Longevity, fecundity, and fidelity are standard forms by which replication can be understood. These three qualities of replication, while providing the conceptual ground for the figure of the meme, also provide the benchmarks of its most difficult test. Here, monitorability is also posed as a problematic embedded in the epistemology of meme theory, something that can be said to define a replicator from the perspective that the theory constructs for itself. The theory’s fundamental problem in attaining recognition as a “progressive research program” is the identification, if such exists, of a standard object of study. Monitorability, for second-order memetics, becomes an opportunity to fuse this problematic with another, that of evidence in surveillance or the identification and production of “flecks of identity” within monitoring and modulation regimes (in the works treated here, of crime, consumption, or chemistry). The will to knowledge of a scientific method, the will to see of a control apparatus, and the monitoring affordances of a certain sequence of

technologies and protocols improperly joined, together make something happen, a hemorrhage. Second-order memetics is a fictional science, a pata-physics. Materialism, as an inquiry concerning the powers of matter and its organization, is here fused with the question of not simply what is proper to media, but what is possible.

The story of the Warsaw Eruv, the flexible composition of London pirate radio, irrational's *Cctv* site, *BITradio*, *by the way*, *The Switch*, and a number of the other compositions discussed here illustrate that the use of objects is not simply determined by their arrangement but also by interpretation, layering, reuse. Such layering of systems does not have to be necessarily "visible." The question of the gallery as media system is not inherent to *embryo firearms*. It is taken as a compositional *a priori* that finds it in the same way that HTML or frequency modulation is in other works here.

Equally, such layerings do not need to be reciprocal. In Schwitter's collages it is "impossible" to understand a bus ticket next to a beer label, unless they conjure up a nonpreexistent third part, which is the commodity system, in order to explain their nonconjuncture. They cannot be traded, but have to become money. Or perhaps they have to be absorbed into another kind of body, an eating and a moving one, which itself operates by another rhythm entirely, and not simply that of the harmonious and discombobulating patterning of bits, and that is also as a trace of a life's trajectory through time. Such elements do not have to merge, and their communication in the media ecology may be through many intermediating parts. What is shared, though, in all these layerings—the feeding of this into that from there—is that they are done live; as life, without a control, they affirm the capacities of invention built into the materials they are constituted through in both the careful making of the composition, and in simply releasing them to do what they do.

Appendix A

Nonexhaustive List of Pirate Radio Stations Received in Central London in 2001–2002. (A number of stations also have intermittent Web sites.)

Name	Frequency (FM)	Style
Rude FM	88.2	Jungle/drum and bass
Ice FM	88.4	2 Step
Non-stop FM	89.6	Ragga
Station	89.8	Reggae
Magic	90.2	Breakbeat garage
Lightning	90.8	Dancehall/R&B/Reggae/Garage
Genesis	91.6	Hip hop, funk, reggae, conscious talk
Passion	91.8	Garage
Powerjam	92	Reggae
Taste	92.5	Garage/drum and bass/etc.
Mack FM	92.7	Breakbeat garage
Vibes	93.9	Mixed genres black music
Soundz	94.3	Garage
Kool	94.5	Jungle/drum and bass
Entice	95.5	Breakbeat garage/jungle/drum and bass
Dance UK	96.1	Breakbeat garage
Flashback	97.6	Breakbeat garage
Bassline	98.3	Hip hop/R&B/Soca
Up For It	99.3	Garage
Sexy/Erotic	101.3	Garage
Freak	103/101.8	Breakbeat garage/jungle
Galaxy Radio	103.5	R&B/reggae/talk
Flex	103.6	Garage

Appendix A (continued)

Name	Frequency (FM)	Style
N-Power	103.8	African. Now named "African Community Radio"
?	104	Portuguese language and music
?	104.2	Jungle
Rude Awakening	104.5	Hardcore/breakbeats
Jive FM	105.9	Garage
Addiction	106.2	Happy hardcore
Stations for which promotional material was seen. Signal not picked up.		
Abyss	96.5	sticker—Tottenham
Fusion	99.0	poster—Brixton
Kray-Z	99.6	Garage banner on side of old Henry Cooper pub, Old Kent Road

Notes

Introduction: Media Ecologies

1. Kurt Schwitters, "Consistent Poetry" (1924), in *pppppp: Poems Performances Pieces Proses Plays Poetics*, edited and translated by Jerome Rothenberg and Pierre Joris, Exact Change, Cambridge, 2002, p. 223.
2. Friedrich Nietzsche, *Ecce Homo*, trans. R. J. Hollingdale, Penguin, London, 1979 (see esp. §3).
3. Historical precedent is not what is at issue here. However, the earliest use of the term that I have noticed is an intriguing short article in the form of a set of notes in a magazine of experimental video, *Radical Software* archived at <http://www.radical-software.org/>. Raymond Arlo, "Media Ecology," *Radical Software*, vol. 1, no. 3, spring 1971, p. 19.
4. A sympathetic book on the nature of interface and information cultures, which does not fully match the uses of "information ecology" mentioned here, is Bonnie A. Nardi and Vicki O'Day, *Information Ecologies: Using Technology with Heart*, The MIT Press, Cambridge, Mass., 2000. A problem with such a work is that although it is formed out of a substantial care for technologies and for people, the scope of the work is insufficient to challenge standardizations of either. This leaves such accounts in all their attentiveness too easily open to use as a cover story for the same old restructuration.
5. See the "Media Ecology Association" Web site: <http://www.media-ecology.org/>.

6. See, for instance, N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*, University of Chicago Press, Chicago, 1999, or her *Writing Machines*, The MIT Press, Cambridge, Mass., 2002.
7. I.e., in Friedrich Kittler, *Discourse Networks 1800/1900*, trans. Michael Metteer with Chris Cullens, Stanford University Press, Stanford, 1990.
8. See the *Electronic Book Review* at <http://www.altx.com/ebr/>.
9. I.e., the closing parts of Friedrich Kittler, “The History of Communication Media,” *CTheory*, http://www.ctheory.net/text_file.asp?pick=45#note63.
10. I.e., Howard Slater, *Postmedia Operators*, archived at <http://www.nettime.org/>.
11. See Gregory Bateson, *Steps to an Ecology of Mind*, Ballantine, New York, 1972.
12. Félix Guattari, “Entering the Post-Media Era,” in his *Soft Subversions*, ed. Sylvère Lotringer, trans. David L. Sweet and Chet Wiener, Semiotext(e), New York, 1996.
13. Félix Guattari, *The Three Ecologies*, trans. Ian Pindar and Paul Sutton, Athlone, London, 2000.
14. N.B.: There is no substantial link to Arne Naess’s deep ecological coining of the term “ecosophy” in *Ecology, Community, and Lifestyle: Outline of an Ecosophy*, trans. David Rothenberg, Cambridge University Press, 1990.
15. Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia 2*, trans. Brian Massumi, Athlone, London, 1988. Hereafter, ATP.
16. James J. Gibson, *The Ecological Approach to Visual Perception*, Lawrence Erlbaum, Hillsdale, 1986.
17. See, for instance, Donald Norman, *The Design of Everyday Things*, The MIT Press, Cambridge, Mass., 1998.
18. Particle physics is one well-known case in which, through schemas such as the “uncertainty principle,” certain kinds of convulsive reflexivity are demanded of scientific practice—perhaps providing a limit case for the argument here.

Chapter One: The R, the A, the D, the I, the O: The Media Ecology of Pirate Radio

1. Vito Acconci, "Public Space, Private Time," in W. J. T. Mitchell, ed., *Art and the Public Sphere*, University of Chicago Press, Chicago, 1990, pp. 158–176.
2. Simon Reynolds, *Energy Flash: A Journey through Rave Music and Dance Culture*, Picador, London, 1998, p. 234. While its central thesis about the inventive power of hardcores as both popular and experimental movements is important, the book is flawed in some details. One example is the profoundly inaccurate description of Praxis records, a label specializing in fast, abrupt, and grimy-sounding techno, as somehow reproducing fascist and militarized body-culture. This accusation is made through vague argument by analogy. Aside from the material refuting this characterization in the Praxis-allied zine, *Datacide* (<http://datacide.c8.com/>), the series of ideas about the related work of Underground Resistance assembled by Kodwo Eshun in *More Brilliant Than the Sun* (Quartet, London, 1999) works to provide a more productive account of "brutal" sound at speed.
3. See appendix A in this volume, "Nonexhaustive List of Pirate Radio Stations Received in Central London in 2001–2002."
4. Gilles Deleuze, "Whitman," in *Essays Critical and Clinical*, trans. Daniel W. Smith and Michael A. Greco, Verso, London, 1998, p. 57. See also Gilles Deleuze and Claire Parnet, "On the Superiority of Anglo-American Literature," in *Dialogues II*, trans. Hugh Tomlinson and Barbara Habberjam, Continuum, London, 2002.
5. I.e., Mark Leyner, *I Smell Esther Williams*, Fiction Collective Two, Boulder, 1983; *My Cousin, My Gastroenterologist*, Flamingo, London, 1990.
6. J. G. Ballard, "Notes Towards a Mental Breakdown," *ReSearch No. 8/9*, San Francisco, 1984, pp. 84–87.
7. Walt Whitman, *Selected Poems*, Penguin Popular Classics, London, 1996, pp. 128–135.
8. *Ibid.*, p. 165.
9. See an analysis of AOL's "My News" by Korinna Patelis, "E-mediation by America-Online," in Richard Rogers, ed., *Preferred Placement: Knowledge Politics on the Web*, Jan van Eyck Academy Editions, Maastricht, 2000, pp. 49–64.

10. Gilles Deleuze, *Pure Immanence: A Life*, trans. Anne Boyman, Zone Books, New York, 2001, p. 30.
11. Patelis, "E-mediation by America-Online."
12. Deleuze, *Pure Immanence*, p. 58.
13. Control is here understood to refer to three things: the cybernetic facility of control (Norbert Weiner); that element of the will to power which constitutes a drive to dominate, "*Herrschaft*" (Nietzsche); and the dynamics and agencies of such control which Burroughs refers to by that name in the Interzone trilogy, in "Ah Pook," and in other texts.
14. John Hind and Stephen Mosco, *Rebel Radio: The Full Story of British Pirate Radio*, Pluto Press, London, 1985.
15. ATP, p. 409.
16. Lynn Margulis and Dorion Sagan, *What Is Life?*, Weidenfield and Nicholson, London, 1995, p. 185.
17. Manuel De Landa, *War in the Age of Intelligent Machines*, Swerve Editions, New York, 1991, p. 6.
18. In its complex discussions of substance, the term "hylomorphism" is derived from Aristotle's *Metaphysics*. Deleuze and Guattari's attempt to think beyond its constraints is prompted by Gilbert Simondon in works such as *Du Mode d'existence des objets techniques*, Editions Aubier-Montaigne, Paris, 1989. See also Gilbert Simondon, "The Genesis of the Individual," in Jonathan Crary and Sanford Kwinter, eds., *Zone 6: Incorporations*, Zone, New York, 1992. Useful discussions of the term in relation to theories of corporeality can be found in Adrian MacKenzie, *Translations: Bodies and Machines at Speed*, Continuum, London, 2002. A discussion of hylomorphism also figures in John Protevi, *Political Physics: Deleuze, Derrida, and the Body Politic*, Athlone, London, 2001. Also useful in this area is Alistair Welchman, "On the Matter of Chaos" in *Pli—Warwick Journal of Philosophy*, vol. 4, nos. 1, 2, pp. 137–158.
19. Manuel De Landa, "The Machinic Phylum," in V2, ed., *Technomorphica*, V2_organisation for the unstable media, Rotterdam, 1997, p. 39.

20. Björk, cited in Brian Belle Fortune, *All Crew Muss Big Up: Journeys through Jungle Drum and Bass Culture*, second edition, All Crew, London, 2000, p. 35. For those looking for material on the recent world of London pirate radio to update the accounts in Hind and Mosco's *Rebel Radio*, the chapter on radio in this book is excellent.

21. ATP, p. 411.

22. Friedrich Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz, Stanford University Press, Stanford, 1999.

23. Tim Westwood, foreword to Hind and Mosco, *Rebel Radio*.

24. Foucault's arguments in this area, treated in terms of the thematic of architecture, are usefully expressed in the essay, "Space, Knowledge, and Power," in *Michel Foucault: The Essential Works*, volume 3, *Power*, ed. James D. Faubion, trans. Robert Hurley et al., Allen Lane, The Penguin Press, 2000, pp. 349–364. There is a possibility that the suspension of society in such an infinitesimally controllable solution is made difficult to some extent to the degree that unified frameworks are kludged by their need to operate via layers of heterogeneous organizational forms. For instance, the U.K. government is a layering of monarchical, feudal, bourgeois, liberal democratic, budgetarily rationalized, and technocratic forms and practices. This said, however, the tendency to make these variables sing in harmony can clearly be seen, for instance, in compositional formations such as international trade agreements and infrastructures as well as in militarizing multiscalar panic attacks.

25. In the section of ATP entitled "The Body without Organs," it occurs this way: "To block, to be blocked, is that not still an intensity? In each case we must define what comes to pass and what does not pass, what causes passage and what prevents it."

26. Armand Mattelart, *The Invention of Communication*, trans. Susan Emanuel, University of Minnesota Press, Minneapolis, 1996, p. 221.

27. Broadcasting Act 1990, Public General Acts and Measures of 1990, Part III, London: HMSO 1991, section 172, clause 4 (3).

28. *Ibid.*, clause 4 (3AB).

29. (a) Participating in the management, financing, operation, or day-to-day funding of the station, knowing or having reasonable cause to believe, that unauthorized broadcasts are made by the station;
- (b) supplying, installing, repairing, or maintaining any wireless telegraphy apparatus or any other item knowing, or having reasonable cause to believe, that the apparatus or other item is, or is to be, used for the purposes of facilitating the operation or day-to-day running of the station and that unauthorized broadcasts are made by the station;
- (c) rendering any service to any person knowing or having reasonable cause to believe that the rendering of that service to that person will facilitate the operation or day-to-day running of the station and that unauthorized broadcasts are so made;
- (d) supplying a film or sound recording knowing, or having reasonable cause to believe, that an unauthorized broadcast of the film or recording is to be so made;
- (e) making a literary, dramatic, or musical work knowing or having reasonable cause to believe that an unauthorized broadcast of the film or recording is to be so made;
- (f) making an artistic work knowing or having reasonable cause to believe that an unauthorized broadcast including that work is to be so made;
- (g) doing any of the following acts, namely—
- (i) participating in an unauthorized broadcast made by the station, being actually present as an announcer, as a performer or one of the performers concerned in an entertainment given, or as the deliverer of a speech;
- (ii) advertising, or inviting another to advertise, by means of an unauthorized broadcast made by means of the station; or
- (iii) publishing the times or other details of any unauthorized broadcasts made by the station or (otherwise than by publishing such details) publishing an advertisement of matter calculated to promote the station (whether directly or indirectly).

30. Stuart Hall, "Encoding/Decoding," in S. Hall et al., eds., *Culture, Media, and Language*, Centre for Contemporary Cultural Studies and Hutchinson University Library, Birmingham, 1980, p. 128. For a useful survey of Hall's work, which includes an extended discussion of this essay, see Chris Rojek, *Stuart Hall*, Polity, Cambridge, 2003.

31. Claude Shannon and Warren Weaver, *The Mathematical Theory of Communication*, University of Illinois Press, 1963.

32. Hall, "Encoding/Decoding," p. 129.

33. *Ibid.*, p. 138.

34. This particular moment in the encoding/decoding model is contextualized usefully by Colin Sparks in “Stuart Hall, Cultural Studies, and Marxism,” in David Morley and Kuan-Hsing Chen, eds., *Stuart Hall: Critical Dialogues in Cultural Studies*, Routledge, London, 1996.
35. Jim Jarmusch, dir., *Ghost Dog: The Way of the Samurai*, 1999.
36. Ricardo Dominguez, “The Ante-Chamber of Revolution: A Prelude to a Theory of Resistance and Maps,” *CTheory*, http://www.ctheory.net/text_file.asp?pick=203.
37. Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society*, Free Association Books, London, 1989, p. 33.
38. Tetsuo Kogawa’s homepage, giving basic information, is at <http://anarchy.k2.tku.ac.jp/>.
39. Berthold Brecht situates his short, “The Radio as an Apparatus of Communication,” as a proposal for innovative excess, the utopian and materialist exploration of potential in media technology as a form of struggle. In Neil Strauss and David Mandl, eds., “Radiotext(e),” *Semiotext(e)* no. 16, New York, 1993. See also “An Example of Paedagogics (Notes to *Der Flug der Lindberghs*),” which shares some of the elements of this text, in John Willett, ed., *Brecht on Theatre*, Methuen, London, 1978.
40. Hans Magnus Enzenberger, “Towards a Critique of Media,” in *Raids and Reconstructions: Essays in Politics, Crime, and Culture*, trans. Michael Roloff et al., Pluto Press, London, 1976.
41. The software used by Aaron Williamson in this series of performances is Dragon’s *Naturally Speaking*, <http://www.lhsl.com/naturallyspeaking/>.
42. Aaron Williamson, *Hearing Things*, BookWorks, London, 2001, p. 41.
43. Aaron Williamson, *Hearing Things*, performance, Beaconsfield, London, Friday, March 2, 2001.
44. Avital Ronell cites an episode from Alexander Graham Bell’s childhood, in which the construction of such a speaking device was set as a project for him and his brother by his father after he had seen a Professor Faber’s speaking machine *Euphonia* on a visit

down to London. Avital Ronell, *The Telephone Book: Technology, Schizophrenia, Electric Speech*, University of Nebraska Press, 1989, p. 315. Both Kittler and Ronell provide vivid and substantial resources in the material imaginaries of the telephone and its precursors.

A useful history of automata is Gaby Wood, *Living Dolls: A Magical History of the Quest for Mechanical Life*, Faber and Faber, London, 2002. Descriptions of the internal configuration of several famous automata are given here.

45. Much of this simulation now occurs in a form of reverse engineering. A neural network “listens” to a voice and attempts to generate the same sounds. Work to physically reproduce speech by mechanical means is still ongoing; see, for instance, the work of Hideyuki Sawada, <http://www.eng.kagawa-u.ac.jp/~sawada/>.

46. Helmholtz’s speech synthesizer, a copy of which is on view at the Teyler’s Museum, Haarlem, is notable for taking a different approach. Rather than attempting to recreate a physical throat and mouth assemblage, this synthesizer uses a series of tuning forks. The forks are made to vibrate by means of an electromagnet attached to them, each of which is activated by a key, similar to that of a piano. The result is a machine capable of generating a series of vowel-like tones or the “resonators” that Helmholtz later theorized in *On the Sensations of Tone as a Physiological Basis for the Theory of Music*, trans. Alexander J. Ellis, Dover, New York, 1954.

47. Kittler, *Gramophone, Film, Typewriter*, p. 24.

48. Aaron Williamson, “Solo Boy,” in *A Holy Throat Symposium*, Creation Press, London, 1993, p. 65.

49. Ibid.

50. Ibid.

51. *Naturally Speaking* advertises a basic corpus of 2,300,000 words.

52. [Http://www.lhsl.com/naturallyspeaking/](http://www.lhsl.com/naturallyspeaking/).

53. Ibid.

54. Luigi Russolo, *The Art of Noises*, trans. Barclay Brown, Pendragon Press, New York, 1986.

55. Charles Sanders Peirce, *Collected Papers*, vols. 1 and 2, ed. C. Hartshorne and P. Weiss, Harvard University Press, Cambridge, Mass., 1960. In Peircian semiotics, an indexical sign is one that is an inevitable consequence of the thing it signifies. Examples are the symptom of a disease or the movement of a barometer caused by changes in air pressure.
56. Sample from Andre Gurov, "Livetime Monologue," on *Electric Ladyland 5*, Force Inc., Frankfurt, 1998.
57. Richard Pierre-Davis of Mongrel, in conversation, February 2001.
58. "Domains are . . . associated with widespread sociocultural norms and expectations and lead to congruent social and linguistic behaviour." Gerhard Leitner, "The Social Background of the Language of Radio," in Howard Davis and Paul Walton, eds., *Language, Image, Media*, Basil Blackwell, Oxford, 1983, p. 55.
59. KRS ONE raps, of his dead partner, Scott La Rock, "I knew his breath was one with my breath." *Return of the Boom Bap*, Jive Records, 1993.
60. Nas, "I Gave You Power," on *It Was Written*, Columbia Records, 1996.
61. KRS ONE, "I Can't Wake Up," on *Return of the Boom Bap*, Jive Records, 1993.
62. El-P, "Stepfather Factory," on *Definitive Jux Presents 2*, DefJux, New York, 2002.
63. For links to track such currents, see *Datacide*, cited above, and the excellent *Hyperdub*, <http://www.hyperdub.com/>.
64. Recordings of synthetic voices singing popular songs had by contrast been made since the late 1950s. Max Matthews produced a series of programs called "Music", which, by controlling only pitch, time, and volume, could produce basic vocalization. See Max Matthews, "Bicycle Built for Two," on *Early Modulations, Vintage Volts*, Caipirinha Music, cat. no. CAI-2027. An intriguing analysis of recent uses of another kind of relationship of synthesis to voice is Natalie Jeremijenko, "Dialogue with a Monologue: Voice Chips and the Products of Abstract Speech," available at <http://www.cat.nyu.edu/natalie/VoiceChips.pdf/>.
65. Walter Benjamin, "The Work of Art in the Age of Its Technological Reproducibility," *Selected Writings*, volume 3, 1935–1938, Harvard University Press, Cambridge, 2002, pp. 101–133.

66. Alexander Graham Bell, cited in Avital Ronell, *The Telephone Book*, p. 322.
67. Footnoting the obvious: In the context of Jamaican-originated dancehall/ragga, “DJ” means what in the U.K. or U.S. would mean MC or rapper, whereas the “Selector” operates the turntables.
68. Compare also the rapping voices of Ja Rule to his speaking voice, or the special praise for the bullet-mashed mildly slurring mouth of Fifty Cent. Roots Manuva is probably the rapper who messes with his voice the most, slurry, stung, laughing, doped, watch out—here comes a little singing, drifting out of this style and that.
69. Red Rat featuring Buju Banton, “Love Them Bad,” on *Ob No, It’s Red Rat*, Main Street Records, 1997.
70. See, for instance, Sticky, featuring Ms Dynamite “Boo,” London Records, 2001, or several tracks by Mis-Teeq.
71. Rudolf Arnheim, *Radio*, trans. Margeret Ludwig and Herbert Read, Faber and Faber, London, 1936.
72. See Gerhard Leitner, “The Social Background of the Language of Radio,” in H. Davis and P. Walton eds., *Language, Image, Media*, Blackwells, Oxford, 1983, pp. 50–74.
73. Tyree Ford, “Monday Memo,” broadcast May 11, 1987, p. 18, cited in Peter B. Orlik, *The Electronic Media: An Introduction to the Profession*, second edition, Iowa State University Press, Ames, 1997, p. 401.
74. There are also histories of recursive couplings between voices and ears. Allan Ginsberg describes one such: “. . . Frank Sinatra was actually an influence on Karouac. Sinatra, I think, learned his technique from Billie Holiday. So the lineage is Billie Holiday through Sinatra to Karouac.” Elissa Scheppel, “A Semester with Ginsberg,” in George Plimpton, ed., *Beat Writers at Work*, Harvill Press, London, 1999, p. 256.
75. Some notes on “hardcore”: Hardcore takes a number of routes. The name turns up in use for the most compelling areas of music (i.e., an initially U.S. outcropping of punk beginning in the early 1980s; a form of techno that introduced break-beats and accentuated its potential for “cheesy” sounds—this aspect is well covered by Reynolds in *Energy Flash*) and also an approach to making music and being in life that transcends any specific area of music, such as the following sample: “Q: What do

you believe in? A: Hardcore. . . .” Gunshot, *Patriot Games*, Vinyl Solution, London, 1993.

76. For one take on this process of inclusion, based on familiarity back in the day, see Oxide and Neutrino, “Up Middle Finger,” on *Execute*, Warner Music UK, 2001. So Solid’s lyrics in general are like set theory with a beat.

77. See Paul Gilroy, “. . . To Be Real’: The Dissident Forms of Black Expressive Culture,” in Catherine Ugwu, ed., *Let’s Get It On: The Politics of Black Performance*, ICA and Bay Press, London, 1995, pp. 12–33.

78. Jean-Jacques Lecercle, *The Violence of Language*, Routledge, 1990, p. 51.

79. The “Publisher’s Peritext” is that “zone” of the book which is the direct and principal responsibility of the publisher—here, understood to relate to the work of promoters, designers, possibly a separate group of managers, etc. Genette provides the founding and exemplary close analysis of this aspect of publishing, which also offers a good to other accounts of media working through detail. (Thanks to Miriam Rivett for an introduction to this material.) Gerard Genette, *Paratexts: Thresholds of Interpretation*, trans. Jane E. Lewin, Cambridge University Press, 1997.

80. For the initial proposal of meme theory, see Richard Dawkins, *The Selfish Gene*, second edition, Oxford University Press, Oxford, 1989. Meme theory is discussed further in chapter 4. For now it is useful to counterpose it with the following statements on the evolutionary, conflictual, mutually assistive, and adaptive in §508 of Nietzsche’s late notebooks published as *The Will To Power*: “Originally a chaos of ideas. The ideas that were consistent with one another remain, the greater number perished—and are perishing.” But this must be counterposed with §709: “We do not make our ‘desiderata’ judges of being! That we do not also set up terminal forms of evolution (e.g. spirit) as another ‘in-itself’ behind evolution!” This last needs restating as respite after almost every sentence of Dawkins’s idealization of the gene.

81. Brian Belle-Fortune, *All Crew Muss Big Up*, p. 93.

82. Radio Communications Agency Information Sheet RA 169 (rev. 4), May 1999, reproduced in Richard Allport, *RadioToday: Ultimate Scanning Guide*, Radio Society of Great Britain, Potters Bar, 2000, pp. 7–8.

83. William Burroughs and Brion Gysin, *The Third Mind*, John Calder, London, 1979, p. 4.

84. Ibid.

85. Gilles Deleuze, "Louis Wolfson; Or, the Procedure," in *Essays Critical and Clinical*, p. 13.

86. Judy Borland, "Contradicting Media: Towards a Political Phenomenology of Listening," in Strauss and Mandl, eds., *Radiotext(e)*, p. 209.

87. It is a measure of the depleted imagination of electronics culture and the economies it exists in that with such a range of prefabricated circuits and highly powerful components available, the best that can be delivered, or made popularly available are yet more and more featured mobile phones. (Thanks to Rolf Pixley for numerous insights into such areas.)

88. Such a reading corresponds to what Deleuze and Guattari name as the first characteristic of minor literature, "That in its language is effected with a high coefficient of deterritorialisation," *Kafka: Towards a Minor Literature*, trans. Dana Polan, University of Minnesota Press, Minneapolis, 1986, p. 16.

89. See Brian Holmes, "The Flexible Personality," in his *Hieroglyphs of the Future: Art and Politics in a Networked Era*, What How and For Whom and Arkzin, Zagreb, 2003.

90. The Shorten compression format provides the beginnings of an alternative to MP3. It offers less compression but is fundamentally lossless. See Tony Robinson, "SHORTEN: Simple Lossless and Near-Lossless Waveform Compression," Cambridge University Engineering Department Technical Report CUED/F-INFENG/TR.156, 1994.

The MP3 format has the potential effect of triggering a new mass format shift in a similar manner to that of the shift from vinyl to compact disc. The substantial income for record labels as people "rebought" their existing record collections may be short-circuited this time around by the capacity to copy CDs. The restructuring, extension, and strengthening of intellectual property regimes or their alternate reinvention along the lines of positive rights to share is now a crucial ground of contestation and invention, and one in which digital file formats is already playing a key part.

91. Hans Magnus Enzenberger, "Constituents of a Theory of Media," trans. Stuart Hood, in *Raids and Reconstructions*.

92. Brian Winston, *Media, Technology, and Society: A History: From the Telegraph to the Internet*, Routledge, London, 1998.

93. In *Media, Technology, and Society*, Winston, pp. 60–64, recounts how with the development of the inscriptive sound-recording technologies of the last quarter of the nineteenth century, no one really had a clear idea as to their applications. It took their nominative and organizational “invention” as the gramophone, as a storage and playback system for music, to make them really take off. Winston’s book excels at describing such situations. Even more remarkable perhaps is the story of the Atikythera. This sophisticated clockwork device, apparently usable for celestial navigation, was sunk in approximately 76 B.C. and recovered by divers in 1901. The first thorough work on this object was by Derek J. de Solla Price, “An Ancient Greek Computer,” in *Scientific American*, June 1959, pp. 60–67.

94. The network structure with which Guderain so effectively invested his tank formations was basically a transposition of the wireless telegraphy communications first installed by the naval commands of the imperial powers necessitated by the introduction of “Ironclad” ships. Turning land into fluid in this way is a typical example of the spatiotemporal compression achieved by military control theorized by Virilio and later “innocently” taken up by proponents of the “networked enterprise” etc. (see Castells, *The Rise of the Network Society*). This characterization of the car–broadcast radio coupling is first made by Kittler in *Gramophone, Film, Typewriter*, and is useful in understanding the mobile crowd, on the road, tuned into the same station, and also able to communicate laterally among themselves (given the knowledge of personal numbers) and provide feedback to the network hub (the studio) of which they form the spokes.

95. “. . . Tape decks made music consumers mobile, indeed automobile, as did the radio producers in the Magnetophone-equipped German lead tanks of old. Thus, the ‘American mass market’ was ‘opened up’ by the car playback system.” Friedrich Kittler, *Gramophone, Film, Typewriter*, p. 108, citation from Steve Chapple and Reebee Garofalo, *Rock and Roll Is Here to Pay: History and Politics of the Music Industry*, Nelson Hall, New York, 1980. Vinyl, a by-product of petroleum, further develops the coevolution of the two processes. See also Kittler, “Unconditional Surrender,” in Hans Ulrich Gumbrecht and K. Ludwig Pfeiffer, eds., *Materialities of Communication*, trans. William Whobrey, Stanford University Press, Stanford, 1994, pp. 319–334. For another source of this argument, see also Marshall McLuhan, *Understanding Media: The Extensions of Man*, The MIT Press, Cambridge, 1994, p. 271.

96. Avital Ronell, *The Telephone Book*, p. 329. Jay Clayton describes conversely how the devices making up the various early telegraphy systems produced noises that were

listened to rather than read visually. Jay Clayton, “The Voice in the Machine: Hazlitt, Hardy, James,” in Jeffrey Masten, Peter Stallybrass, and Nancy Vickers, eds., *Language Machines: Technologies of Literary and Cultural Production*, Routledge, London, 1997, pp. 209–232.

97. Norbert Wiener also discusses the potential for such inscription systems by means of the vocoder in *The Human Use of Human Beings*.

98. Aaron Williamson, “Dear Surgeon,” in his *Cease to Exist*, Creation Press, London, 1991.

99. Statistics showing the increasing use of SMS can be found on the Mobile Communications Association Web site: <http://www.gsmworld.com/>.

100. William Gibson, “Modern Boys and Mobile Girls,” *Life*, April 1, 2001, pp. 8–11. See also Akira Suzuki, “Unplugged Connected Pockets,” in Fiona Raby, ed., with Ben Hooker, *Project #26765—FLIRT: Flexible Information and Recreation for Mobile Users*, RCA CRD Research, London, 2001.

101. Gibson, “Modern Boys and Mobile Girls.”

102. The Requests For Comment archives are maintained by the Internet Engineering Taskforce at <http://www.ietf.org/>.

103. James J. Gibson, *The Ecological Approach to Visual Perception*, Lawrence Erlbaum, Hillsdale, 1986, p. 134.

104. Donald Norman, *The Design of Everyday Things*.

105. See, for instance, Brenda Laurel, ed., *The Art of Human Computer Interface Design*, Addison Wesley, Boston, 1990.

106. Deleuze draws this from David Hume (and it is explored in a section entitled “The Nature of Relations” in Gilles Deleuze, *Pure Immanence*, p. 37), but it is also a cybernetic insight about patterns and their continuity.

107. James J. Gibson, *The Ecological Approach to Visual Perception*, p. 134.

108. *Ibid.*, p. 137.

109. Ibid., p. 135.

110. Ibid.

111. Félix Guattari, *The Three Ecologies*, trans. Ian Pindar and Paul Sutton, Athlone, London, 2000, p. 83.

112. Gibson, *The Ecological Approach*, p. 137.

113. Michel Foucault, *Discipline and Punish: The Birth of the Prison*, Peregrine, London, 1979, p. 138. Here we can also refer to Nietzsche's explicit critique of a stable understanding of the usefulness of objects, codes, and customs in §12 of *On the Genealogy of Morality* (Cambridge University Press, Cambridge, 1994), which makes every element in a composition susceptible to futurity.

114. Foucault, *Discipline and Punish*, p. 139. Deleuze, in a footnote on this aspect of Foucault's work, suggests that we should also understand it in useful correlation to the "microsociology" of Gabriel Tarde and the "sociology of strategies" promulgated by Pierre Bourdieu. Gilles Deleuze, *Foucault*, trans. Séan Hand, Athlone, London, 1999, p. 142, n. 7. Certainly Bourdieu also begins to make possible a theorization of medial affordances. Tarde's work, and its conflict with Durkheimian mass sociology, is also discussed in ATP, pp. 218–219. For a development in theorizations of Tarde, see a special section of the journal *Multitudes*, no. 7, December, 2001, available online at http://multitudes.samizdat.net/rubrique.php3?id_rubrique=38.

115. For an account of three uses of mobile media in mass spectator events, see Andreas Nilsson, Urban Nuldén, and Daniel Olssen, "Mobile Media: The Convergence of Media and Mobile Telecommunications," *Convergence*, vol. 7, no. 1, spring 2001.

116. Ronell, *The Telephone Book*, p. 301. See also Elias Cannetti, *Crowds and Power*, trans. Carol Stewart, Phoenix Press, London, 2000, p. 52.

117. An extension of this, once phones lose their wire tail, is that "Cellphones break down space. . . there's no place that can't be connected to another space. If there's an image that captures this, it's the great moment in the movie 'Three Kings,' where Marky Mark finds a cellphone deep in an Iraqi bunker in the middle of the desert, and uses it to call his wife, back home in suburban America." McKenzie Wark, "The Cancer of Cellspace: The New Culture of Cellphone Communication Is Leaving Cyberspace Behind," *Artbyte*, archived at <http://www.nettime.org>.

118. “Granularity” is a term to describe the basic isolatable unit of which an interactive process can be broken down to and at the end of which another can begin. (Stewart Brand, *Media Lab: Inventing the Future at MIT*, Penguin, London, 1987.) In a sense, each granule can be understood as a “moment” in the use made of the term by Hall’s “Encoding/Decoding.”

119. This number of functions is of course a minimal description of what exists or is possible. Chip expansion and product differentiation, and the many reasons for them, enable the phone to operate in many more than the few modes described here.

120. In 2001 a number of phones were introduced that allowed the composition and sending of 480 characters, using three sequenced SMS messages.

121. Critical Art Ensemble, “The Electronic Theatre and the Performative Matrix,” in their *The Electronic Disturbance*, Autonomedia, New York, 1994, p. 59.

122. To “chip” or “clone” a phone is to capture the phone number and serial number transmitted by any legitimate phone and program it into a new SIM card to be inserted into a stolen or new and blank phone. The GSM standard, which includes a basic level of encryption, means that this is less and less easy to do. For a “law-enforcement” perspective, see Dorothy E. Denning and William E. Baugh, Jr., “Hiding Crimes in Cyberspace,” in Peter Ludlow, ed., *Crypto Anarchy, Cyberstates, and Pirate Utopias*, The MIT Press, 2001, pp. 115–142.

123. This, along with the purging of large and expendable sections of the work force as seen in mass firings and factory closures in the U.K. by Ericsson and Motorola in April 2001.

124. See the U.S. E911 or the EU the E112 mandates.

125. Between 10 and 12 pence per message was the standard price of the four major networks in the U.K., April 2001–April 2003. The cost of a message is largely incurred by the connection to the network, not use of bandwidth. A bit-per-pence comparison of the price of an SMS with dial-up e-mail reveals the disparity in price—with SMS tens of thousands of times more expensive.

126. A number of series of these small booklets exist, sold at checkouts and trinket outlets, e.g., *LUVTLK! Lite bk of luv txt*, Michael O’Mara Books, London, 2001.

127. See, for instance, Steven Fyffe, “Tantalum Carnage Continues in the Congo,” *Electronic News*, <http://www.e-insite.net/electronicnews/index.asp?layout=article&articleid=CA91083>.

Chapter Two: The Camera That Ate Itself

1. Vilém Flusser, *Towards a Philosophy of Photography*, Reaktion Books, London, 2000, p. 26. Flusser’s suggestion that the apparatus of the camera compels the user to take photographs, and in a demented encyclopedism to attempt to exhaust the infinity of all possible images, is perhaps best taken up by Bernd and Hiller Becher’s cataloging of building types—water towers or half-timbered houses; Ed Ruscha’s *Every Building on the Sunset Strip* (1966); photographic documentation projects such as the *London’s Found Riverscape* project; the cataloging of people, types, and individuals by the police initiated by Cesare Lombroso and Georges Bertillon (see Peter Hamilton and Roger Hargreaves, *The Beautiful and the Damned: The Creation of Identity in Nineteenth-Century Photography*, Lund Humphries/National Portrait Gallery, London, 2001; John Tagg, *The Burden of Representation: Essays on Photographies and Histories*, Macmillan, Basingstoke, 1988; Armand Mattelart, *The Invention of Communication*; Marek Kohn, *The Race Gallery: The Return of Racial Science*, Vintage, London, 1996); or by the compulsive second-order copying of or attaining rights to copy picture libraries. Such a drive or a codification of it can be seen also to compose recent photographic activity, as it veers into acknowledging and using its potential collapse—in the amassing of near nonphotos by Hiromix, for instance—and of the representational task supposedly left to it by painting. (Facial recognition software inverts this relationship. Every face is scanned, but only those that correspond to a certain “meaning” by which they are correlated to another sector of the photographic universe count as “successful” images.)

2. Flusser, *Towards a Philosophy of Photography*, p. 28.

3. Ibid., p. 29.

4. Ibid., p. 31.

5. See the artist group Bank’s section of commentary on art press-releases in *Bank*, Black Dog Publishing, London, 2000.

6. Catherine Lambert, *Live in Your Head: Concept and Experiment in Britain 1965–1975*, Whitechapel Gallery, London, 2000. There is a better, full-page reproduction of

Camera Recording . . . in “Three Pieces by John Hilliard,” *Studio International*, April 1972.

7. Michel Foucault, “The Will to Knowledge,” in *Michel Foucault: The Essential Works 1, Ethics*, ed. Paul Rabinow, Allen Lane, the Penguin Press, London, 1997, p. 11. Hereafter, WTK.

8. WTK, p. 12.

9. Michel Foucault, *Foucault Live*, ed. Sylvère Lotringer, trans. John Johnstone, *Semiotext(e)*, New York, 1989, p. 52.

10. *Ibid.*, p. 65.

11. Friedrich Kittler, *Discourse Networks 1800/1900*. Although the potential for this development is certainly latent within Foucault’s work, Kittler’s development of it is very significant. For example: “Discursive practices are not purely and simply modes of manufacture of discourse. They take place in technical ensembles, in institutions, in behavioural schemes, in types of transmission and dissemination, in pedagogical forms that both impose and maintain them.” WTK, p. 12.

12. Friedrich Kittler, “There Is No Software,” in *Literature, Media, Information Systems*, ed. John Johnstone, G&B Arts International, Amsterdam, 1997, p. 150.

13. Michel Foucault, *The Will to Knowledge: The History of Sexuality*, vol. 1, trans. Robert Hurley, Penguin, London, 1998, pp. 140–144. See also Michael Hardt and Antonio Negri, *Empire*, Harvard University Press, Cambridge, Mass., 2000.

14. This partial list of terms derived from Foucault is that made by Michel de Certeau, in “Foucault and Bourdieu,” *The Practice of Everyday Life*, trans. Steven Rendall, University of California Press, Berkeley, 1988, p. 45.

15. WTK, p. 12.

16. *Ibid.*, p. 11.

17. Friedrich Nietzsche, *The Will to Power*, trans. Stuart Kaufmann, Vintage Books, New York, 1968, §244. Hereafter, WTP.

18. It should be noted that many of the insights to be gleaned from Kittler parallel in part developments in the study of science and technology over the past two decades, through, for example, the current termed actor–network theory, and through related and proceeding tendencies. This useful set of currents is not comprehensively mapped, referred to, or mobilized here, although it is referred to, but it does provide a set of explicitly discursive interconnections which it is essential to flag. In a sense, too, by their explicit and subtle development of the themes referred to as biopower, via Foucault in *The History of Sexuality*, such work may well provide an advance on a good deal of the more “media”-specific work discussed here.

19. See for instance, §68, “Will and Willingness,” in Friedrich Nietzsche, *The Gay Science*, trans. Walter Kaufmann, Vintage Books, New York, 1974.

20. WTP, §548.

21. Alphonso Lingis, “The Will to Power,” in David B. Allison, ed., *The New Nietzsche*, The MIT Press, Cambridge, Mass., 1985, p. 38.

22. George Bataille, *The Accursed Share: An Essay on General Economy*, vol. 1, trans. Robert Hurley, Zone, New York, 1991.

23. WTP, §492.

24. *Ibid.*

25. For a summary of this influence in relationship to the subject, see Keith Ansell-Pearson, “The Significance of Michel Foucault’s Reading of Nietzsche: Power, the Subject, and Political Theory,” in Peter R. Sedgwick, ed., *Nietzsche: A Critical Reader*, Blackwell, Oxford, 1995.

26. WTP, §499.

27. *Ibid.*, §494.

28. *Ibid.*, §501.

29. ATP, p. 153.

30. WTP, §505.

31. Ibid., §548.
32. Félix Guattari, “Machinic Heterogenesis,” in *Chaosmosis: An Ethico-Aesthetic Paradigm*, trans. Paul Baines and Julian Pefanis, Power Publications, Sydney, 1995.
33. See, for instance, David B. Allison, “Nietzsche’s Identity,” in Keith Ansell-Pearson and Howard Caygill, eds., *The Fate of the New Nietzsche*, Ashgate, Aldershot, 1993.
34. WTP, §503.
35. Karl Marx, *Grundrisse: Foundations of a Critique of Political Economy*, trans. Martin Nicolaus, Penguin Books, in association with New Left Review, London, 1993, p. 693.
36. The universal machine is a name for the abstract, logical machine underlying, but not exclusive to, the digital computer. The name was coined by Alan Turing in his paper, “On Computable Numbers, with an Application to the Entscheidungsproblem,” in *Proceedings of the London Mathematics Society*, second series, vol. 42, pp. 230–265. The description relies on the fact that the machine is able to simulate the operation of any other symbol-based machine. A version of the paper is available online at <http://www.abelard.org/turpap2/tp2-ie.asp/>. For an inspiring and comprehensive biography of Turing, see Andrew Hodges, *Alan Turing: The Enigma of Intelligence*, Unwin, London, 1985.
37. *Grundrisse*, p. 705.
38. Marx names tools as the “means of labour,” whose purpose is to “transmit the worker’s activity to the object,” *Grundrisse*, p. 692.
39. Ibid.
40. Ibid.
41. See, for example, W. Brian Arthur, “Competing Technologies and Economic Prediction,” in Donald Mackenzie and Judy Wacjman, eds., *The Social Shaping of Technology*, second edition, Open University Press, Buckingham, 1999, pp. 106–112; and *Increasing Returns and Path-Dependency in the Economy*, University of Michigan Press, Ann Arbor, 1994.

42. *Grundrisse*, p. 704.

43. Marx, *Capital*, p. 614.

44. See Marx's precise comments on the Factory Act in the chapter entitled "Machinery and Large-Scale Industry," in *Capital*, vol. 1.

45. Antonio Negri, *Marx beyond Marx: Lessons on the Grundrisse*, trans. Harry Cleaver, Michael Ryan, and Maurizio Viano, ed. Jim Fleming, Autonomedia/Pluto Press, New York/London, 1991, p. 139. Hereafter, MBM.

46. MBM, p. 145; see also *Grundrisse*, p. 706.

47. This telling term, indicating that the person has become surplus to requirements, is used a number of times in *Capital*, e.g., on p. 579.

48. MBM, p. 145. The "social individual" can be usefully understood as a point of synthesis for a network of relations between forces, of nature, of intelligence, emotion, and skill, a node also in the network of social, cultural, and productive composition. Howard Slater usefully summarizes the stakes of this development: "This is the danger of the vocational model of work. It brings the energy of desire, an energy between need and satisfaction, into the circuit of labour not as a sublimation and repression of activity, but as the hope for personal fulfilment and socialisation; as an investment of energy. . . . If the factory is now a 'social factory' which has 'general social knowledge' as a force of production, then our very relation to expression as a foregrounding of desire, brings us into a combative relation to capitalism not only as that which reproduces itself through an extortion of surplus value beyond 'necessary labour,' but as that which imposes its own space-time, its own institutional values, its own ontology." *Break/Flow Occasional Documents, Towards Situation*, July 2001, section 3.

49. *Grundrisse*, p. 408.

50. It should be noted that this part of the theory makes no useful account of the growth in service work or other "postindustrial" sectors.

51. There is a rich vein of theoretical work arising from this kind of insight generated by the "Italian" workerist and postworkerist autonomous movements as they articulate the layering and invention of forms of production. For English-language accounts, see Steve Wright, *Storming Heaven*, Pluto Press, London, 2002; Robert

Lumley, *States of Emergency: Cultures of Revolt in Italy from 1968–1978*, Verso, London, 1990; *Semiotext(e)*, vol. 3, no. 3, *Italy: Autonomia, Post-Political Politics*, New York, 1980.

52. Paolo Virno, “The Ambivalence of Disenchantment,” in Paolo Virno and Michael Hardt, eds., *Radical Thought in Italy: A Potential Politics*, University of Minnesota Press, 1996.

53. See also Raf “Valvola” Scelsi, “The Networking of Intellect: The Work Experience of Italian Post-Fordism,” trans. Syd “I was a junkie stagehand” Migx, in *Nettime*, eds., *README! ASCII Culture and the Revenge of Knowledge*, Autonomedia, New York, 1999, pp. 201–207. This formulation is different from, but not immune to questions from, other Marxist and related approaches (e.g., Horkheimer and Adorno, Althusser, Debord) or those from cultural studies and feminism, among others, concerning the degree of autonomy of cultural and social production that is not primarily organized as work.

54. The theory of originary technicity, prevalent in both cultural and evolutionary theory, that *Homo sapiens* was always already technical, locates this particular acceleration and intensification in a far longer evolutionary time-scale. See Keith Ansell-Pearson, *Virroid Life: Perspectives on Nietzsche and the Transhuman Condition*, Routledge, London, 1997; see also Adrian Mackenzie, *Transductions*.

55. *Grundrisse*, p. 694.

56. *Ibid.*, p. 693. See also, on Frankenstein and new social body of industrial capitalism, Franco Moretti, “Dialectic of Fear,” trans. David Forgac, in *Signs Taken for Wonders: Essays on the Sociology of Literary Forms*, Verso, London, 1983.

57. “Alienation” is a key motor in the revolutionary arrangement that Marx envisages. It is stoked as much by the vision of a nonalienated community that he hints at, wherein no one is amputated from the fulfillment of his or her potential, as by the recognition of the nature of capital. Alienation is always necessary to recognize the disjuncture between these two. In the terms of systems theory it is a second-order operation that allows self-recognition. Alienation is the anticipatory form of becoming.

58. Bruno Latour, *Aramis, Or, The Love of Technology*, trans. Catherine Porter, Harvard University Press, 1996, p. 225. A notable precursor to this “real technology story,”

which deploys theoretical, historical, and “factional” approaches to constructing an account of technological development, is Ilya Ehrenberg, *The Life of the Automobile*, trans. Joachim Neugroschel, Urizen Books, New York, 1976.

59. WTP, §551.

60. Monique Wittig, *The Opponentax*, trans. Helen Weaver, Daughters Inc., Plainfield, Vermont, 1976, p. 115.

61. A useful anthology from the first three issues of the journal *Artificial Life* covers much of the formative territory in the area: Christopher G. Langton, ed., *Artificial Life: An Overview*, The MIT Press, Cambridge, Mass., 1997.

62. In his discussion of animals in the *Abecedaire* (Gilles Deleuze and Claire Parnet, *L'Abecedaire de Gilles Deleuze*, Editions Montparnasse, 1996), Deleuze describes the actions of animals, their lives, as being “on the border of thought and non-thought.” However, what is interesting is not necessarily the attribution of such and such a characteristic (in which animals would doubtless get trapped in relation to an anthropomorphized version of thought—or rather, not animals, but their treatment by certain forms of human activity), but how in this tension between these two poles a space is created in which the will to power can be said to be forged. One of the ways such forces can be understood is by their abstraction, as in the procedures adopted in artificial life and complex adaptive systems modeling more generally.

Artificial life shows that, from simple rules followed many times in parallel, complex operations can emerge from the group behavior of simple, algorithmically determinable elements, and that such determinability does not automatically equate to predictability. Robert Axelrod has also famously shown how a political body, a cooperative body can be formed by the sustained interaction of simple actions; see Robert Axelrod, *The Evolution of Co-operation*, Basic Books, New York, 1984. See also Mitchell Resnick, *Termites, Turtles, and Traffic Jams: Explorations in Massively Parallel Microworlds*, The MIT Press, Cambridge, Mass., 1994. For continuing work on social modeling using computational models of complex adaptive systems, see the *Journal of Artificial Societies and Social Simulation*, available at <http://jasss.soc.surrey.ac.uk/JASSS.html>.

For a simple performance script that uses a genetic algorithm based on John Conway’s *Life* game, see Matthew Fuller, *Human Cellular Automata* (2000–2001); or, for records of various and inspired “generative psychogeographic” work, see [socialfiction.org](http://www.socialfiction.org/) at <http://www.socialfiction.org/>.

63. Gilles Deleuze, *Nietzsche and Philosophy*, trans. Hugh Tomlinson, Continuum, London, 2002, p. 40. A later configuration of this approach in Deleuze is to be found in the use of the terms latitude and longitude in the treatment of haecceity in ATP, pp. 262–263, 256–257.

It is at this point that Deleuze's use of Nietzsche connects with his reading of Spinoza: "In short, if we are Spinozists we will not define a thing by its form, nor by its organs and functions, nor as a substance or subject. Borrowing terms from the Middle Ages, or from geography, we will define it by longitude and latitude. A body can be anything; it can be an animal, a body of sounds, a mind or an idea; it can be a linguistic corpus, a social body, a collectivity. We call longitude of a body the set of relations of speed and slowness, of motion and rest, between particles that compose it from this point of view, that is, between unformed elements. We call latitude the set of affects that occupy a body at each moment, that is the intensive states of an *anonymous force* (force for existing, capacity for being affected). In this way we construct the map of a body." Gilles Deleuze, *Spinoza: Practical Philosophy*, trans. Robert Hurley, City Lights, 1988, pp. 127–128. For useful commentary on this passage, see also André Pierre Colombat, "Three Powers of Literature and Philosophy," in Ian Buchanan, ed., *A Deleuzian Century*, Duke University Press, Durham 1999, pp. 199–217.

64. See Hans Moravec, *Mind Children: The Future of Robot and Human Intelligence*, Harvard University Press, Cambridge, Mass., 1988. A brief and telling commentary is provided in Steven Pfohl, "Theses on the Cyberotics of HIStory: Venus in Microsoft, Remix," in Joan Broadhurst Dixon and Eric J. Cassidy, eds., *Virtual Futures: Cyberotics, Technology, and Post-Human Pragmatism*, Routledge, London, 1998, pp. 11–29.

65. See McLuhan, *Understanding Media*.

66. WTP, §551.

67. *Ibid.*

68. The interaction of the two forces described by Newton—how a mass accelerates given force, and how strong gravity is between two bodies—is very simply accounted for when two bodies are involved. When a third enters the system, calculations become massively more complicated. For recent developments of this theory to model the interactions of multiple objects, see David Appell, "Celestial Swingers," *New Scientist*, vol. 171, no. 2302, August 4, 2001, pp. 36–39.

69. Friedrich Kittler, "A Discourse on Discourse," *Stanford Literary Review*, vol. 3, no 1 (spring 1986), p. 159.
70. See Pierre Cabanne, *Dialogues with Marcel Duchamp*, trans. Ron Padgett, Di Capo, New York, 1979.
71. See Eduardo Costa, Raul Escari, and Roberto Jacoby, "A Media Art (Manifesto)," in Alexander Alberro and Blake Stimson, eds., *Conceptual Art: A Critical Anthology*, The MIT Press, Cambridge, 1999, pp. 2–4. See chapter 4 for further discussion of this work.
72. See Guerrilla Art Action Group, *GAAG: The Guerrilla Art Action Group, 1969–76*, Printed Matter, New York, 1976; and the work of Henry Flynt from this period (see the site maintained by John Berndt, <http://www.henryflynt.org/>).
73. Such as Eduardo Costa's *A Piece That Is Essentially The Same as a Piece Made by Any of the First Conceptual Artists, Dated Two Years Earlier Than the Original and Signed by Somebody Else*, of 1970, or the various and many direct actions by feminist and black artists for inclusion, reformulation, or self-determination.
74. The various stages of Art & Language being the obvious example.
75. I.e., the activities of Fluxus.
76. I.e., Destruction In Art Symposium.
77. I.e., the café, Food, run by Caroline Goodden, Tina Girouard, Suzanne Harris, Rachel Lew, Gordon Matta-Clark, and others, documented in Pamela M. Lee, *Object to Be Destroyed: The Work of Gordon Matta-Clark*, The MIT Press, Cambridge, Mass., 2000.
78. I.e., Jan Dibbets's 1:1 scale mappings of bird territories in *Robin Redbreast's Territory*, sculpture (1969), and work by Douglas Huebler of the same period using territorial birdcalls to determine the direction of a walk.
79. I.e., the "maintenance" work of Mierle Laderman Ukeles.
80. Such as the initiatives made by the Artists Placement Group.

81. See Jasia Reichardt, ed., *Cybernetic Serendipity: The Computer and the Arts*, Studio International, London, 1969.

82. Reproduced in Lucy Lippard, *Six Years: The Dematerialisation of the Art Object from 1966 to 1972*, University of California Press, Berkeley, 1997, p. 210.

83. Lucy Lippard comments on this fashion for the adoption of “austere,” “systemic,” “positivist” language in “*Six Years*,” pp. xv–xvi. See also the citation from Jeff Wall in Peter Osborne, “Philosophy and Conceptual Art,” in Michael Newman and John Bird, eds., *Rewriting Conceptual Art*, Reaktion Books, London, 2000.

84. *Jan Dibbets* (essays by R. H. Fuchs and M. M. M. Vos, with an introduction by Martin Friedman), Walker Art Centre, Minneapolis (catalog), Rizzoli, New York, 1987. In these photographs a set of geometric conditions, incrementally changing angles of incidence, for positioning the camera are established. A landscape is shot in a panoramic series following this routine and then reassembled with notation that marks its construction. The land is extraordinarily and sensually reconfigured as a series of interlocked judders, or as waves.

85. See John Roberts, ed., *The Impossible Document: Photography and Conceptual Art in Britain 1966–1976*, Cameraworks, London, 1997.

86. Manuel De Landa, “Non-Organic Life,” in Jonathan Crary and Sanford Kwinter, eds., *Zone 6: Incorporations*, Zone, New York, 1992, p. 136. The phase-space as a way of mapping interrelated fields of freedom and constraint is explained in, among other sources, William Ross Ashby, *An Introduction to Cybernetics*, Chapman Hall, London, 1964, p. 131.

87. See Manuel De Landa, *Intensive Science and Virtual Philosophy*, Continuum, London, 2002, and Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton, Athlone Press, London, 1994. Alfred North Whitehead’s discussion of related dynamics of perception of qualities to spacetime and perspective (e.g., in *Science and the Modern World*, Free Association Books, London, 1985, pp. 83 onward—hereafter, SMW) also makes a useful contribution to this debate.

88. I.e. in Clement Greenberg, “Modernist Painting,” in Gregory Battcock, ed., *The New Art*, Dutton, New York, 1966, pp. 100–110.

89. See, for instance, Richard Dyer, “Making ‘White’ People White,” in his *White*, Routledge, London, 1997, or Brian Winston, “A Whole Technology of Dyeing: A

Note on Ideology and the Apparatus of the Chromatic Moving Image,” *Daedalus*, vol. 114, no. 4, 1985, pp. 105–123.

90. Lev Manovich, *The Language of New Media*, The MIT Press, Cambridge, Mass., 2000, p. 236.

91. J. David Bolter, *Turing's Man: Western Culture in the Computer Age*, Penguin, London, 1986; William Asprey, ed., *Computing before Computers*, Iowa State University Press, Ames, 1990; Carl B. Boyer, revised by Uta C. Merzbach, *A History of Mathematics*, second edition, John Wiley and Sons, New York, 1991.

92. See Jonathan I. Israel, *Radical Enlightenment: Philosophy and the Making of Modernity 1650–1750*, Oxford University Press, Oxford, 2001.

93. Karl Marx, *Capital*, volume 1, trans. Ben Fowkes, Penguin, London, 1990, p. 554, n. 14.

94. Note that release from work is not inherent to the machine itself, but rather its social combination, i.e., “. . . under the rule of capital, the application of machinery does not shorten labour; but rather prolongs it,” *Grundrisse*, p. 825. This is also the finding in numerous places in *Capital*. Andrew Ross in *No Collar* (Basic Books, New York, 2003) notes, for instance, that the higher strata of digital worker, those whose creativity is invested in the machine, are always eager for faster processors: not in order to spend less time working, but in order to get more realized.

95. This productive capacity for the monstrous is what makes collectivity so threatening to capitalism, and the rich so comparatively pathetic in their stupefying insistence on remaining so utterly normal despite the mutational power of wealth. If you're going to be a rich bastard, at least have the decency to be a correspondingly spectacular freak.

96. Ad Reinhardt, *Art as Art: The Selected Writings of Ad Reinhardt*, ed. Barbara Rose, University of California Press, Berkeley, 1991.

97. Michel Foucault, “Polemics, Politics, and Problematisation,” interview conducted by Paul Rabinow in Paul Rabinow, *Michel Foucault: The Essential Works*, vol. 1: *Ethics*, p. 117.

98. WTP, §486.

99. Ibid.

100. Michel Foucault, *The Use of Pleasure: The History of Sexuality*, vol. 2, trans. Robert Hurley, Penguin, London, 1992, p. 8.

101. McLuhan, *Understanding Media*, p. 304.

102. Raqs Media Collective, *A Concise Lexicon of for the Digital Commons*, available at <http://www.sarai.net/>.

103. ATP, p. 8.

104. See Gilles Deleuze, *Difference and Repetition*, p. 223.

105. Ibid.

106. WTP, §510.

107. Ian Stewart, *Nature's Numbers: Discovering Order and Pattern in the Universe*, Phoenix, London, 1996, p. 64.

Chapter Three: How This Becomes That

1. Hubert Fichte, *Detlev's Imitations*, trans. Martin Chalmers, Serpent's Tail, London 1991, p. 250.

2. Franz Kafka, *The Diaries of Franz Kafka, 1910–23*, ed. Max Brod, Penguin, London, 1964.

3. Mislplaced opposition to the establishment of Eruvin is often based on a misapprehension of this key point. The land is not “owned” by the people who use it for these purposes. It is simply assigned a special ritual quality by those who wish to observe it. It does not therefore preclude any other use and, more than likely, remains perspectivaly invisible.

4. Gilles Deleuze, *Pure Immanence*, p. 36. The question, a key organizational node for Deleuze's use of Hume's empiricism, is also related in a later section, p. 51, and appears again in a slightly different form in the preface to *Empiricism and Subjectivity*, again in Deleuze and Parnet, *Dialogues*, p. 56.

5. Bruno Latour, "Where Are the Missing Masses? The Sociology of a Few Mundane Artefacts," in Wiebe E. Bijker and John Law, eds., *Shaping Technology, Building Society: Studies in Sociotechnical Change*, The MIT Press, Cambridge, Mass., 1992.

6. Deleuze, *Pure Immanence*, p. 51.

7. Nas, "I Gave You Power," on *It Was Written*, Columbia Records, 1996. Here, the gun-narrator—set up in the first lines as a simile for a guy doing monologue but later sliding into a straight-from-the-muzzle account of the life of a gun—is constantly in use, constantly in relation and combination. Even toward the end of the track when the piece self-sabotages, jamming to result in the death of its current user, there is no let up, just another pick-up, another user's hand.

For an account erring on the side of the cartoon will to power of a device and not the assemblage it is part of or those parts that compose it, see the pleasingly nutsoid rant made by the "mad ex-cop" character played by Dennis Hopper in *Speed*, dir. Jan de Bont, 1994, where he glories in the "becoming" of a bomb.

8. Friedrich Engels, "Letter to Joseph Bloch," London, September 21, 1890, available at http://www.marxists.org/archive/marx/works/1890/letters/90_09_21.htm.

9. Jerome Rothenberg, "Pre-face" to *Revolution of the Word: A New Gathering of American Avant-Garde Poetry 1914–1945*, Exact Change Press, Boston, undated (original edition 1974).

10. WTP, §552.

11. For a full account of this project, see Jakob Jakobsen, "The Switch," in *Transgressions: A Journal of Urban Exploration*, vd. 5, pp. 90–91.

12. Ibid.

13. Ibid.

14. See Wolfgang Schivelbusch, *Disenchanted Night: The Industrialisation of Light in the Nineteenth Century*, University of California Press, Berkeley, 1988.

15. Research on the relation of the provision of street-lighting to crime, with a particularly notable comparison to the effects of *Cctv* installation, can be found in a U.K. Home Office commissioned survey: David P. Farrington and Brandon C. Welsh, *Effects*

of *Improved Street Lighting on Crime: A Systematic Review*, Home Office Research Study 251, Home Office Research, Development and Statistics Directorate, August 2002. The findings of this survey are interesting, noting the current predatory, centralizing, and privatizing dynamics of *Cctv*, yet the benefits are keyed toward “homogeneous” communities—the survey does not distinguish between “deviant” behavior and crime (the suggestion that lighting is “civil-liberties neutral” when it comes to, for instance, public sex is unrealistic—see Pat Califia, *Public Sex: The Culture of Radical Sex*, Cleis Press, Pittsburgh, 1994). Being as it is a survey of other research, there is also a difficulty in interrogating the survey’s results by the way in which what counts as “crime” is coded by racial and economic structuration. Street lighting brings with it another set of informational and control relations. The findings of this survey support the case for informal and participatory social control, but its short set of pointers to the effects of the technology needs investigation and a reinvention of the technology and the social formation it is part of.

16. For an early collection, see Geoffrey Boyle and Peter Harper, eds., *Radical Technology*, Wildwood House, London, 1976, or the magazine *Undercurrents*, which provided a forum for much of this area of work. Thanks to Stefan Szczelkun for suggesting these sources.

17. Peter Kropotkin, *Fields, Factories, and Workshops Tomorrow*, ed. Colin Ward, Freedom Press, London, 1985.

18. Murray Bookchin, *Post-Scarcity Anarchism*, Black Rose Books, Montreal, 1986. In dealing with such a subject, there are necessarily certain echoes of Mao’s Great Leap Forward, in which “decentralized” steel production played a core part in generating an immense disaster of deforestation, forced labor, low-quality steel, and mass starvation. The high stakes should make one careful of any easy reading of such proposals, but that the stakes are high and that the ambition of such works is attuned to them, makes this and other texts on alternative technologies and their social contexts extremely urgent.

19. SMW, p. 58. For useful commentary and development of this part of Whitehead’s work, a reading on which this text also rests, see Donna J. Haraway, *Modest Witness@Second_Millennium: FemaleMan_Meets_OncoMouse, Feminism and Technoscience*, Routledge, London, 1997.

20. Interesting in relation to the current imposition by the World Trade Organization—a regime supported by the ISO—of Western intellectual property laws

by means such as the General Agreement on Trade in Services (GATS), McLean at first chose to privately patent (USA Patent Number 3 042 227) the corner fitting, but would have doomed the design through lack of uptake had he not subsequently allowed the ISO a royalty-free license in order to establish it as an international standard.

21. The shipping container is an economic and regulatory object as much as it is of aluminium or steel. Fernand Braudel notes that in early capitalism, the sea was always oriented more toward “free trade” because the costs of haulage are primarily cheaper and faster but also subject to less intermediary tariffs than transport by land. See Fernand Braudel, *Capitalism and Material Life, 1400–1800*, trans. Miriam Kochan, Fontana, 1979, pp. 320–321. An object that is subject to less regulatory or transactional drag achieves the fluidity of the sea. Contemporarily though the sea itself along with its populations and ecologies becomes more and more fixed into lanes, territories, quotas, and purposes. See Alan Sekula, *Fish Story*, Witte de With, Rotterdam, 1998.

The particular forms of container used throughout the history of shipping display substantial economic, class, and regulatory relations of dimensionality. An excellent history of the Hogshead barrel is contained in the “Socking: The Hogshead and the Excise” chapter of Peter Linebaugh, *The London Hanged: Crime and Civil Society in the Eighteenth Century*, Penguin, London, 1991.

Such innovations in the technology of transport are thoroughly interwoven with the intellectual skills of their design: “. . . the artists shared with their clients certain kinds of knowledge, certain ways of looking at the world, which gave them common points of reference. Piero della Francesca was the author of a mathematical handbook for merchants, from which we can see how sophisticated was their way of measuring the capacity of complex objects like barrels at a time when these containers were not standard. Gauging, a skill the Florentines had to use all the time, was something they could appreciate when they saw stock objects in paintings.” Peter Hall, *Cities in Civilization*, Weidenfeld and Nicholson, London, 1999, p. 100.

22. See, for instance, the several incarnations of the container in Courtney Smith and Sean Topham, *Xtreme Architecture*, Prestel, Munich, 2002. See also *The Container*, a mobile media center in Jamaica that uses an adapted 40-ft. steel container: <http://www.container-project.net/>.

23. For the construction around the high-security Zona Rossa to isolate the G8 meeting in Genoa of July 2001, see *On Fire: The Battle of Genoa and the Anti-Capitalist Movement*, One Off Press, London, 2001 (published anonymously).

24. Velimir Khlebnikov, "Proposals," in his *Collected Works*, vol. 1, trans. Paul Schmidt, ed. Charlotte Douglas, Harvard University Press, London, 1987, pp. 357–361.
25. Niklas Luhmann, *The Reality of the Mass Media*, trans. Kathleen Cross, Polity Press, Cambridge, 2000, p. 8.
26. Robert Cooper, "Assemblage Notes," in Robert C. H. Chia, ed., *Organised Worlds: Explorations in Technology and Organisation with Robert Cooper*, Routledge, London, 1998, p. 110.
27. Such a drive can be recognized in memetic terms by the *longevity* of a particular word. See chapter 4.
28. ATP, p. 76.
29. *Ibid.*, p. 82.
30. SMW, p. 72. (A problem with Whitehead's critique of simple location, and his useful counterproposition for a general theory of the organism, is that it potentially allows for a relocation of misplaced concreteness to the "wholeness" of a society—see, for instance, the remarks on the European invasion of America, or the account of rain-forest as a stable system in the last chapter of SMW.)
31. *Ibid.*, p. 73.
32. *Ibid.*, p. 80.
33. *Ibid.*, p. 87.
34. Cooper, "Assemblage Notes," p. 112.
35. Chia, *Organised Worlds*, p. 10.
36. For the formation of this term, see Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living*, D. Reidel, Dordrecht, 1980 (original publication 1972); Ricardo Uribe, Umberto Maturana, and Francisco Varela, "Autopoiesis: The Organization of Living Systems: Its Characterization and a Model," *Currents in Modern Biology*, vol. 5, no. 4 (1974), pp. 187–196.

37. ATP, p. 83.
38. See the project's site, <http://www.arteinsitu.org.mx/>, and the document "La Torre de Los Vientos: A Project by Pedro Reyes," which gives a history of the various installations and actions there.
39. Matthew Kabatoff, "Signals—An Interview with Germaine Koh," January 30, 2001, <http://www.rhizome.org/>. Also available at Koh's reference site: <http://www.germainekoh.com/>.
40. Bit radio, Radioengineer's Report, Bureau of Inverse Technology Web site, <http://bureauIT.org/>.
41. EPA = Environmental Protection Agency.
42. Bit Release for immediate release, <http://bureauIT.org/>.
43. <http://bureauIT.org/>. BIT also used similar sensors in *Feral Robot Engineering* (2003), in which they equipped cheap toy electronic dogs with new power, wheels, and other equipment, including radioactivity sensors that triggered an alert when over EPA standards. These were released in various public spaces in the U.S. See <http://www.bureauit.org/feral/>.
44. Accumulated Report from gunfire-triggered BANGBANG network cam, Broadway, N.Y., filed 14:0:0, Jan. 17, 2001. http://www.bureauit.org/data/ho_bway.html.
45. Stefano Franchi, Güven Güzeldere, and Eric Minch, "Interview with Heinz Von Foerster," *Stanford Humanities Review*, vol. 4, no. 2: "Constructions of the Mind." For a work that attempts to deal with the difficulty of making the self-reference of second-order cybernetics on von Foerster's terms palpable in relation to computational processes, see Margerete Jahrmann and Max Moswitzer's installation *Nybble Engine* (from 2002 onward).
46. Bit Report: New York, New York, Feb. 7, 2002, <http://bureauit.org/data/radio.html>.
47. WTP, §551. See also more generally the section "Origin of Reason and Logic," §508–§522.

48. For a discussion of Haraway's earlier descriptions of objectivity (in, for instance, "Situated Knowledges," in Donna J. Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*, Free Association Books, London, 1991) and—also relevant here—of the utility of second-order cybernetics, among other things, see Cary Wolfe, "In Search of Post-Humanist Theory: The Second-Order Cybernetics of Maturana and Varela," *Cultural Critique*, no. 30 (spring 1995), pp. 33–70.

49. ATP, p. 83.

50. Matthew Kabatoff, Germaine Koh interview.

51. James Stevens, "Free Networks," *Mute*, vol. 23, March 2002, p. 9. See also <http://www.freenetworks.org/> and <http://www.consume.net/>.

52. Matthew Kabatoff, Germaine Koh interview.

53. See the fragment "The Street Window," in Franz Kafka, *Collected Stories*.

54. The trade in support services rather than software, living rather than dead labor, is one of the economic models used by the free software and open source movements.

55. I.e., such processes in the work of De Geuzen. See <http://www.geuzen.org/>.

56. Gilles Deleuze and Félix Guattari, *Kafka: Toward a Minor Literature*, p. 17.

Chapter Four: Seams, Memes, and Flecks of Identity

1. Alexander Brener and Barbara Schurz, *Bukaka Spat Here*, Vargas Organisation, London, 2002.

2. Susan Blackmore, *The Meme Machine*, Oxford University Press, Oxford, 1999, p. 204.

3. The Streets, "Has It Come to This?" on *Original Pirate Material*, Warner, 2002.

4. <http://www.irational.org/cctv/> is by Heath Bunting. Others involved in irational.org on a long-term basis are Daniel Andujar, Rachel Baker, and Minerva Cuevas. There are a number of others acting on a per-project basis.

5. Robert Aunger, *The Electric Meme: A New Theory of How We Think*, The Free Press, New York, 2002.

6. Blackmore, *The Meme Machine*, p. 204. The authority given by Blackmore for these characteristics is Richard Dawkins, *The Selfish Gene*, p. 194.

7. *The Meme Machine*, p. 206. It should be noted that although Blackmore uses Jared Diamond's *Guns, Germs, and Steel* as a source here, Diamond's text is substantially more nuanced in its discussion of linguistic development. Though the terminology is different, it too bears traces of influence by meme theory, discussing the transfer of cultural forms in terms of "blueprints," direct and detailed base-copies, or "idea diffusion" as developed both by Blackmore, Dawkins, and others. The book also suggests—and this is presumably where Blackmore picks it up (see, e.g., Diamond, p. 228)—that alphabets, compared to logograms or syllabaries, succeed in part by virtue of their precision and simplicity (contributing to fidelity, fecundity, and longevity), Jared Diamond, *Guns, Germs, and Steel: A Short History of Everybody for the Last 13,000 Years*, Vintage, London, 1998, p. 228.

8. Equally, to use another example of Blackmore's attribution of solely memetic qualities to explain the success of an act of alphabetization, Kemal Ataturk's legislative imposition of roman script—itsself made available by a particular matrix of historical circumstances—on Turkey is not simply the result of that alphabet's virtue in being able to build a great complexity of combinations out of a relatively small number of signs. What influential and decisive complexes are also formed by the militarization, state secularization, "openness" to Europe, partial industrial modernization, and their attendant compositional demands that accompanied the wave of change that was brought about at the same time as the switch-over in alphabet? Perhaps there is some kind of unrecognized teleology lurking under that Darwinian rigor?

9. This success occurs primarily at the level of mass market, and then only in certain parts of the globe. More specialized markets, such as those of collectors, or currents in dance music or hip hop operate largely—primarily, when geared toward a live context—through vinyl. It is clear of course that this interplay can itself be interrogated by fidelity—here, fidelity to a complex of other memes and medial elements, themselves memes, which have reached a certain point of equilibrium, turntable, mixing desk, and sound system; fecundity—with vinyl, despite the introduction of scratching simulators in certain CD players (where a sound wave is modulated by the action of a hand on an interface composed of a pair of discs) there is at least a sense

(modified of course by fidelity) that there is more flexibility of interaction with the sound producing apparatus in the use of vinyl; and longevity, here, simply, that it lasts.

10. For discussion of gene relation to proteins, cells, organisms, and ecologies, see Steven Rose, *Lifelines: Biology, Freedom, Determinism*, Penguin, London, 1997; and R. C. Lewontin, *The Doctrine of DNA*, Penguin, London, 1993. See also Kim Sterelny, *Dawkins vs. Gould: Survival of the Fittest*, Icon Books, London, 2001.

For commentary on the relation of changing and discursive definitions of genetic units and of evolutionary selection in relation to meme theory, see David L. Hull, "Taking Memetics Seriously: Memetics Will Be What We Make It," in Robert Aunger, ed., *Darwinising Culture: The Status of Memetics as a Science*, Oxford University Press, 2000. For a discussion of the nonisolate nature of genes in relation to memetics, see J. S. Wilkins, "What's in a Meme? Reflections from the Perspective of the History and Philosophy of Evolutionary Biology," *Journal of Memetics—Evolutionary Models of Information Transmission*, vol. 2, available at <http://www.spm.mmu.ac.uk/jom-emit/1998/vol2/wilkinsjs.html/>.

For a short account of meme theory in relation to Darwin and Nietzsche, which it is hoped the discussion here usefully supplements, see Keith Ansell Pearson, *Viroid Life*, p. 12, n. 3.

11. Richard Dawkins, *River Out of Eden: A Darwinian View of Life*, Basic Books, 1995, pp. 146–150.

12. For the investigations of "epistemological breaks" between scientific approaches, see sections of Georges Canguilhem, *A Vital Rationalist: Selected Writings from Georges Canguilhem*, ed. François Delaporte, Zone Books, New York, 2000; for a discussion of the discontinuities and jumps in the development of scientific discourse, see Thomas S. Kuhn, *The Structure of Scientific Revolutions*, third edition, The University of Chicago Press, London, 1996.

13. Heinz von Foerster, *Observing Systems*, North Holland Press, Seaside, Calif., 1981.

14. Francis Heylighen and Cliff Joslyn, "Cybernetics and Second-Order Cybernetics," in R. A. Meyers, ed., *Encyclopaedia of Physical Science and Technology*, third ed., Academic Press, New York, 2001. Also downloadable as a .pdf file at <http://pespmc1.vub.ac.be/Papers/Cybernetics-EPST.pdf> p.3.

15. The “view source” option on Web browsers is a mechanism by which visitors to a Web site can see, read, and copy all or part of the mark-up or scripting (i.e. in JavaScript) of a site. As it is so easy, it is one of the ways in which the World Wide Web was rapidly taken up—with people making sites often directly copying mark-up from a page they had previously visited to one they were putting together. Unfortunately, with “advances” in Web technologies, this informal openness is significantly less evenly spread.

16. For instance, a rich account of the antimedia, among other things, in Adilkno, *Cracking the Movement: Squatting beyond the Media*, Autonomedia, New York, 1990.

17. It is worth noting here in relation to seriality that Daniel Sperber’s discussion of memetics, which counters it with “influence” as a form of cultural transmission, does not seem sufficient. Memetics is reduced to “imitation.” Using his own formulation, there is no reason for influence to be anything other than a subset of a wider class of modes of memetic replication. Where the account is useful is in introducing the discussion of contextual or “epimemetic” factors in replication as a limit condition rather than simply as further unqualified evidence for meme theory. The collection of essays (particularly “The Epidemiology of Beliefs”) gathered in this book also works in providing a set of approaches that demand an ecological, i.e., in this case, nontotalizing understanding of culture. See Daniel Sperber, *Explaining Culture: A Naturalistic Approach*, Blackwell, Oxford, 1996.

18. See Dawkins’s perceptive comments on this song and its “remembered” lyrics in *The Selfish Gene*.

19. For useful commentary on the influence of Sartre on Guattari, and as a substantial resource in general, see Gary Genosko, *Félix Guattari: An Aberrant Introduction*, Continuum, London, 2002.

20. Deleuze and Guattari, *Anti-Oedipus*, p. 280. The theme is covered again, although in a way that makes Freud’s accomplishment more troubled, in the thrilling account of multiplicities in ATP, “1914: One or Several Wolves.” See especially p. 30.

21. See Rosaria Conte, “Memes through (Social) Minds,” in Robert Aunger, ed., *Darwinising Culture*, pp. 83–120.

22. Some acknowledgment of this is made by supporters of meme theory when they recognize that there are problems with a directly evolutionary model of cultural replication. Unlike evolution of species or populations there is no inherent necessity of

irreversibility—a threshold that, once crossed, remains crossed. Media theory, however, does contain such a model of a boundary in time and culture that is permeable only in one direction, namely the transition from orality to literacy presented by Walter J. Ong in *Orality and Literacy: The Technologising of the Word*, Routledge, London, 1993.

This argument, that cultural evolution depends on recourse to compositions, drives, dynamics, and elements from the past, is developed in order to test memetics by Daniel Dennett, citing Steven Jay Gould, in *Darwin's Dangerous Idea*, Penguin, London, 1995. Such an argument makes clear how well meme theory works in terms of the archive as a cultural “standing reserve.” For a useful text on archives as a mobilizing cultural force, see Howard Slater, “Canon-Blasting for a Living Culture, *Resonance* (London Musicians’ Collective), vol. 8, no. 1, pp. 4–6.

23. *Chaosmosis*, p. 15. The material from Bakhtin can be found in Mikhail Bakhtin, “Content, Material, and Form in Verbal Art,” in *Art and Answerability: Early Philosophical Essays by M. M. Bakhtin*, ed. Michael Holquist and Vadim Liapunov, University of Texas Press, Austin, 1990. The important preceding points on the list are: “1. The sonority of the word, its musical aspect; 2. Its material significations with their nuances and variants; 3. Its verbal connections; its emotional, intonational and volitional aspects.”

24. For useful commentary on Guattari’s use of the term “universe,” see Genosko’s *Aberrant Introduction*, pp. 106–107.

25. A photo-text that deliberately makes use of medial scale-constraint and illustrates the term usefully is Martha Rosler’s *The Bowery in Two Inadequate Descriptive Systems* (1974–1975). A small image of this is, along with shots of other work, available at <http://home.earthlink.net/~navva/photo/index.html>.

26. Jay David Bolter and Richard Grusin, *Remediation: Understanding New Media*, The MIT Press, Cambridge, Mass., 1999, p. 208.

27. Marina Griznic, *Fiction Reconstructed: Eastern Europe, Post-Socialism, and the Retro-Avantgarde*, Edition Selene, Vienna, 2000; NSK, *Neue Slowenische Kunst/New Slovenian Art*, Amok Books, Los Angeles; Inke Arns, *Neue Slowenische Kunst (NSK)—eine Analyse ihrer künstlerischen Strategien im Kontext der 1980er Jahre in Jugoslawien*, Museum Ostdeutsche Galerie, Regensburg, 2002.

28. See Dick Higgins, “Statement on Intermedia,” archived at <http://www.artpool.hu/Fluxus/Higgins/intermedia2.html>.

29. See Wolf Vostell, ed., *Dé-collage (décollage)*, Typos Verlag, Frankfurt and Something Else Press, New York, 1967.

30. Geert Lovink, *Dark Fiber: Tracking Critical Internet Culture*, The MIT Press, Cambridge, Mass., 2002, p. 164.

31. These black plastic boxes and others, such as Microsoft's X-Box, are themselves intended to provide the beginnings of a form of infrastructural GKW under strict technological and proprietary differentiation of parts—providing limited Web access (in the manner of the failed WebTV); DVD play; games—they offer to the companies that manufacture and retail them the prospect of control of the domestic media environment—are only one of several tendencies in this direction.

32. Phone units with these facilities were inserted into phoneboxes in various parts of the U.K. from 2001 on.

33. Marshall McLuhan, *Understanding Media*, p. 271. Abnormal contacts between points in a hierarchy of the kind McLuhan discusses can more effectively make the kind of displacements of compositions of power when additional dimensions of relation are brought into the contact. A common example of this is when patients bring material on their condition to a doctor, destabilizing the skill, knowledge, and interpretative balance of the relationship. Sadie Plant in her survey of mobile phone use also identifies similar as yet unstabilized currents of connection, such as: the potential connection of primary farmers with world market prices; the loosening of telephone use from parental wall-socket moorings in their use by teenagers, and so on. Sadie Plant, *On the Mobile*, Motorola, 2002.

34. McLuhan, *Understanding Media*, p. 271.

35. The area of work known as “uses and gratifications,” the early reception work of David Morley in “The Nationwide Audience,” and indeed much of cultural studies—including the theorization of “encoding–decoding” of Stuart Hall discussed earlier, operate by articulating the multiple seams along lines of class, gender, race, in the composition of the user. (Indeed, as Gary Hall points out in *Culture in Bits*, such studies of the popular “are themselves predicated on a seamy differentiation between the ‘intellectual’ and the popular. ‘Naffness’ inhabits the analysis of popular culture as the condition both of its possibility and impossibility,” p. 39.) It is difficult to find either “popular” or “intellectual” a term wholly appetizing in terms of its powers of suggestion and invention. (Naffness, though, has its own constitutive power. Upski's account of geekiness in fat laces, baggy clothes, wonky hat, in early hip hop bears this

out. William “Upski” Wimsat, *Bomb the Suburbs*, Subway and Elevated Press, Chicago, 1994.)

Back to seaminess though, in media design too we can look to elements of a current that explicitly uses gaps or differences between systems to new advantage. See, for example, Ian McColl, Matthew Chalmers, Yvonne Rogers, and Hilary Smith, “Seamful Ubiquity: Beyond Seamlessness,” available at <http://www.equator.ac.uk/>.

36. The link is to <http://www.irational.org/heath/cctv/>.

37. HTML = hypertext mark-up language.

38. This appearance is deceptive. While the bandwidth-demands of the site are indeed low, a glimpse of the page source shows that all data on the site is stored in a CGI-bin rather than a standard HTML style directory.

39. Notable exceptions are some of the pages by Daniel Andujar in *Technologies to the People*, also on [irational.org](http://www.irational.org).

40. CGI = common gateway interface.

41. See <http://www.irational.org/tm/archived/tesco/>.

42. See <http://www.irational.org/tm/archived/sainsbury/>. Both of these sites are part of a telling project by Rachel Baker to add another layer of use and network to an already existing supermarket “loyalty” scheme.

43. For an early text on this technique, see Stewart Home, “Multiple Names,” in *Neoism, Plagiarism, and Praxis*, AK Press, Edinburgh, 1995.

44. The fiction of corporate legal identity as a person would later be exploited by the group RTmark in their use of the corporate individual, with limited liability for the embodied individuals behind it, as a way to “fund” cultural sabotage.

RTMark at <http://www.rtmark.com>. Their use of the corporate individual as an enabling fiction echoes contemporary usage of civil rights rhetoric by business. Perhaps this mirroring achieves its most visible point in RTMark’s offer to fund “any judge in a US court who sentences a corporate individual to death.”

45. W3C is the World Wide Web Consortium, a standards-setting body that determines HTML standards.

46. Embedding a link within HTML is a way of calling data existing in one site or directory to appear in the browser window of a site user without actually storing the data of that file on the server of the site appearing in the location window. It thus more nearly conforms to the function of a “quote,” and is thus susceptible to interpretation as “fair use,” but one that is only live for as long as the data linked to exists at the linked-to address.

47. Systems such as the longstanding proposal, Xanadu (<http://www.xanadu.com/>), where all links are two-way or FreeNet, where every object is assigned a unique identifier, would avoid these problems of broken links—as do some utilizations of XML. The collaborative data system, Nine (<http://www.nine.org/> or <http://9.waag.org/>), wherein an e-mail is sent to the first person who loads a file to a common database each time that data is linked, also suggests linking as a negotiated practice.

48. A useful text that documents the U.K. Police Federation’s attempted blocking of TV broadcasts of the Migrant Media (<http://webgate.poptel.org.uk/migrantmedia/>) documentary film *Injustice*, about deaths in police custody, and which was shown anyway, underground style, in locations booked at short notice, with speakers and family representatives, is illustrative of the ways in which attempts at control produce loops of feedback and intensification that allow the objects of control to amplify their message, is Bhri Gupta Singh, “Screening Injustice: Race, Violence, and Media Flows,” in *Sarai Reader 2, The Cities of Everyday Life*, Sarai, Delhi, 2002, pp. 85–91. Mobilizing off the back of an attempt at control is of course not limited to these cases—one easily thinks of McLibel (see <http://www.mcspotlight.org/> and Eveline Lubbers, ed., *Battling Big Business: Countering Greenwash, Infiltration, and Other Forms of Corporate Bullying*, Green Books, Totnes, 2002), and many others—but Singh’s account is useful particularly for drawing out some principles, some abstract dynamics, which can be applied elsewhere.

For an opposite case, see that of Napster, a centralized peer-to-peer service that became a standard object—a company—incorporated with certain fixed forms of obligation and relation to other actually or nominally standard objects and therefore, in the context in which it operated, too fixed or isolatable. In other cases, of course, operating as a company brings the attendant privilege and protection.

49. Catherine Moseley, *Conception: Conceptual Documents, 1968–1972*, Norwich Gallery, Norwich, 2001.

50. Eduardo Costa, Raul Escari, and Roberto Jacoby, *A Media Art (Manifesto)*. It should be noted that this work is preceded by other uses of non-art media by these

artists, i.e. the early parts of the *Fashion Fiction* series by Eduardo Costa, which troped off fashion editorial copy and imaging. (1966—onwards)

51. See Spectacular Times, *Buffo: Tales of Political Pranks and Anarchic Buffoonery*, Reading, undated; Juno and Vale, eds., *ReSearch: Pranks*, *ReSearch* magazine, Los Angeles, 1991; Stewart Home, ed., *Mind Invaders*, Serpents Tail, London, 1998. A notable precursor can also be seen in the accounts of “The Party of Moderate Progress within the Bounds of the Law,” in Jaroslav Hasek, *The Red Commissar*, trans. Cecil Parrott, Abacus, 1981. See also the various events and procedures used by Berlin Dada, including one hoax insurrection resulting in the deployment of 2000 troops, noted in Richard Huelsenbeck, ed., *Dada Almanac*, ed. Malcolm Green, Atlas Press, London, 1993.

52. See Cildo Mereiles, *Insertions into Ideological Circuits* (rubber stamps on bank notes [1970–] and silk-screen messages on cola bottles [1973–.])

53. Chaim Hodbrick, *The English Pub, Food Data-Cycle: Autopoietic Recursive System under Network Analysis, Gustatory Instance* (2003), International Symposium on Electronic Art, Linz. Installation in Cyril’s English Bar, Banff and Karlsruhe, with collaboration of Foundation for Sententious Lifeforms.

54. James Martin, *Telecommunications and the Computer*, second edition, Prentice Hall, Englewood Cliffs, 1976; Janet Abbate, *Inventing the Internet*, The MIT Press, Cambridge, Mass., 1999; Paul E. Ceruzzi, *A History of Modern Computing*, The MIT Press, Cambridge, Mass., 1998.

55. I.e., Andy Oram, ed., *Peer-to-Peer: Harnessing the Power of Disruptive Technologies*, O’Reilly Associates, Sebastapol, 2000.

56. See Internet Engineering Task Force, Network Working Group, *Request for Comments 2328, OSPF version 2*, April 1998, available at <http://www.ietf.org/rfc/rfc2328.txt>.

57. See, for instance, the charged accounts of the roots of communications networks, and the understanding of the term “communications” in Saint-Simonian, Fourierist, and other radical frameworks in Armand Mattelart, *The Invention of Communication*, or the historical descriptions of anarchist affinity group structures in Andre Skirda, *Facing the Enemy*, trans. Paul Sharkey, AK Press, Edinburgh, 2002. For a corrective to ideas of absolute determinist freedom on the internet, see Tim Jordan, *Cyberpower: The Culture and Politics of Cyberspace and the Internet*, Routledge, London, 1999, in particular the section on “anti-hierarchical,” pp. 79–85.

58. J. C. R. Licklider, "Man-Computer Symbiosis," *IRE Transactions on Human Factors in Electronics*, volume HFE-1, pp. 4-11, March 1960. Many contemporary republications of this text are available on the Web.

59. These bottlenecks should be understood as being operative at several scales: that of the cables and satellites through which most global bandwidth passes; the computer and communications hardware through which these routes are reached; the software, both infrastructural and user-end by which the nets are made and used; and finally those of the actual links made between files. For analysis of the ownership of telecommunications, see Dan Schiller, "Télécommunications, les échecs d'une révolution," *Le Monde Diplomatique*, no. 592, July 2003, pp. 28-29. A useful survey of the ways in which apparently decentralized networks can be seen to be susceptible to the production of hubs is Albert-László Barabási, *Linked: The New Science of Networks*, Perseus, Cambridge, 2002. See also Bernardo Huberman, *The Laws of the Web*, The MIT Press, Cambridge, Mass., 2001. It would be interesting to compare patterns of capital accumulation, resource ownership and link density, linking the political economy approach of Schiller with the network analysis approaches of these texts and others. Perhaps something along the way is a paper that uses Barabási's model of scale-free networks to describe aspects of political control during the Inquisition is Paul Ormerod and Andrew Roach, "The Medieval Inquisition: Scale-Free Networks and the Suppression of Heresy," available at <http://www.arxiv.org/abs/cond-mat/0306031/>.

60. As the case is clearly made with operations such as Freenet, a rather tortuous to use peer-to-peer network designed to make external censorship of a file on that network nearly impossible (see <http://freenet.sourceforge.net/>), the recognition of scale within larger compositions makes clear that it is also worth making the effort to ensure that such layers will prove impervious to certain sorts of hierarchization. (Ambivalently, while it is possible to hide, shift, and irrevocably duplicate data within this and similar networks, such a system produces a scalarly "safe" environment for the circulation of material that transgresses overt societal norms. The ambivalence is in the fact that the automation of freedom of circulation of such material at one scale is bought at the cost of sustaining other forms of hierarchization at at least two others: the trade in visual recordings that recapitulate sexual attacks on children; and the enthusiastic embrace of this trade by cops and moralizers as an ultimate evil demanding recourse to greater power.)

61. Lawrence Lessig, *Code and Other Laws of Cyberspace*, Basic Books, New York, 1999, p. 28. For a considered and useful review, see Ted Byfield, "Exporting the Apocalypse," *Mute*, vol. 16, pp. 30-35.

62. A short survey of privacy concerns in the context of the internet, from a human rights perspective, is: Privacy International, *Privacy and Human Rights: An International Survey of Privacy Laws and Practice*, located at the Global Internet Liberty Campaign site: <http://www.gilc.org/privacy/survey/intro.html#defining>.

63. *Eudora v5.1*, Qualcomm Inc., 2002.

64. See, for example, PGP at <http://www.pgpi.org/>. PGP is difficult to use on a regular level. One company developing open-source, strong cryptography products built into the normal working operations of a computer is NAH6, <http://www.nah6.nl/>.

65. In such a case, the changed form of the packet, its new headers provided by the encryption program, may themselves provide notification that it is of potential interest.

66. Dennett, *Darwin's Dangerous Idea*.

67. From the third section, "Memes and Norms," of *A Thousand Years of Non-Linear History*, Swerve Editions, New York, 1997, p. 183.

68. Janet Abbate, "Open Systems and the Internet," available at <http://www.wam.umd.edu/~abbate/papers/4S.html/>.

69. At this site, www.volksbank-guetersloh.de, is an exemplary webcam site featuring a live feed, sample archive of the square it records at typical times through the day and night and organized by month, a diagram giving location of the camera, verbose thanks to camera suppliers and co-occupiers of the building, technical information, and so on.

70. See Nicholas Zurbrugg, ed., *The Multimedia Text*, Academy Editions, London, 1995.

71. Karl Marx, from *Capital*, vol. 1, cited in Walter Benjamin, *The Arcades Project*, trans. Howard Eiland and Kevin McLaughlin, Harvard University Press, Cambridge, Mass., 1999, p. 155.

This image is of one of reciprocation over time. The metalized shod foot of the trained and harnessed horse provides a particular locus for the "mineralization" of society as discussed by De Landa, launching its own range of affordances and effects. One machine reinvents another.

Interestingly, the account in *Capital* goes on to suggest that “Only after further development of mechanics and the accumulation of practical experience does the form become totally determined by the mechanistic principle and thereby completely emancipated from the traditional physical form of the work instrument that bursts forth into a machine.” For Benjamin, material coated with varnish, paints, or lacquers, into a trompe l’oeil likeness of another is a recurring theme in the integration of new materials.

Perhaps we can say first that only after the relationship to hylomorphic “form” is shed, and its construction, its “proto-subjectivity” (Guattari, *On Machines*) becomes engaged in the most intense manner with the relations with material and with the organization of work around and through it, does the will to power of the machine tend to become fully realized, or achieve a maximum virtuality. But also we should note, along with Benjamin, that “these vain attempts are the most authentic proof that technological production, was in the grip of dreams.” *The Arcades Project*, p. 152.

Marx uses the term *Korperform des Werkzeugs*, “body form of the tool.” Perhaps it is here, then, that the machinic phylum, in the subtly different sense of being a common “body-plan” (De Landa) of the machinic, can again be linked to the development of matter through time and through context—not the least of which would be the combinations Benjamin discusses.

For comment on this material in general, see also Susan Buck-Morss, *The Dialectics of Seeing: Walter Benjamin and the Arcades Project*, The MIT Press, Cambridge, Mass., 1989, p. 115.

For a confirmation of the metaphor-lag by which “fire-horses” were also explained to contemporaries, see an account of an early passenger of Stephenson’s engine from the actor Fanny Kemble, in Humphrey Jennings, *Pandaemonium: The Coming of the Machine as Seen by Contemporary Observers*, ed. Mary-Lou Jennings and Charles Madge, Papermac, London, 1995, pp. 172–176.

72. I.e., in Walter Benjamin, “Surrealism: The Last Snapshot of the European Intellects,” *Selected Writings*, vol. 2, Michael W. Jennings, ed., Harvard University Press, Cambridge, Mass., 1999, pp. 207–221.

73. Theodor W. Adorno, cited in Martin Jay, *The Dialectical Imagination: A History of the Frankfurt School and the Institute of Social Research, 1923–1950*, Little, Brown, New York, 1973, p. 69.

74. Walter Benjamin, “Little History of Photography,” in *Selected Writings*, vol. 2, p. 517.

Brian Winston, in *Media, Technology, and Society*, provides us with a means of adequately recognizing a developmental dynamic staged in the following way: scientific

competence; ideation; prototyping; the coupling of necessity and “invention”; and the subsequent stages of suppression and diffusion. Earlier, in chapter 1, the way in which Winston casts suppression—as finalizing—was questioned. The model he proposes has no room for medial will to power. It cannot, however, be cast aside. Constraints (understood in the manner in which they are used in relation to affordances) also operate over time and are composed in many ways, discursively, phenomenologically, through economics, relations of power, and incapacity.

75. The technique of mezzotint, taken up because of the wide tonal range it affords, involves repeatedly pitting or grinding into a metal plate. Once the plate is covered with thousands of raised points, those parts that are to remain lighter, or completely white, are smoothed down. The rougher the surface, the more ink is retained. Once completed, ink is rolled onto the plate and an impression is made. See Carol Wax, *Mezzotint: History and Technique*, Harry N. Abrams, New York, 1990.

76. *The Dead Media Project* is no longer developed on a regular basis. Its archive, however, is available at <http://www.deadmedia.org/>.

77. See, for example, Siegfried Zielinski, “Media Archaeology,” available at http://www.ctheory.net/text_file.asp?pick=42.

78. RGB = red, green, blue—the mix of four colors that makes up a computer screen, television, or beamer. CMYK = cyan, magenta, yellow, kohl (black)—the four separate colors that combine in “full color” offset printing.

79. Lev Manovich, *The Language of New Media*. Under this construction the real-time screen is third in a series of screens: the classical screen, characterized by a painted, rectangularly defined field of canvas; the dynamic screen, of moving elements, characterized by film or TV.

80. At the point of completion of this book, several of the cameras used have changed: an oddly static corner of Bourbon Street, New Orleans; a black screen where the valuable intellectual property from Leicester Square once went; a broken link image instead of the broken Volksbank, and so on. The link in Manhattan remains.

81. Possibly the most the most famous of these was [www.jennicam](http://www.jennicam.com), “A sort of window into a virtual human zoo.” Run by “computer geek” Jennifer Ringley, the site featured a number of cameras dotted around the apartment where she and her boyfriend lived. The site closed in January 2004. Paypal, a “family-friendly” online payment

broker, refused to continue processing payments for the site (\$15 per year) because of the occasional nudity. For other cams, try <http://www.earthcam.com/>.

82. Parallels can be made with the Fisher Price toy video camera PXL 2000, which recorded black-and-white images onto audio tape. During the 1990s and onward when this quickly discontinued stock became a prized item, Sadie Benning, tentatively a convenience (see http://www.thing.de/projekte/7:9%23/tent_index.html), and hundreds of others made films using this camera. Akin in some way to zines as being, of necessity, networked, the phenomenon was taken up, along with anything else they could get their hands on, in the U.K. by groups such as the Exploding Cinema (<http://www.bak.spc.org/exploding/>).

83. Wolfgang Staehle, *Empire 24/7*, is at <http://www.thing.net/empire.html/>.

84. Peter Gidal, *Materialist Film*, Routledge, London, 1989.

85. Michel Serres, "Turner Translates Carnot," in J. V. Harari and D. F. Bell, eds., *Literature, Science, Philosophy*, Johns Hopkins, Baltimore, 1982.

86. Friedrich Nietzsche, cited in George Canguilhem, *A Vital Rationalist*, p. 382.

87. For a useful discussion of the relation of the eternal return, evolution, and active and reactive forces in Nietzsche and in Deleuze's reading of Nietzsche, see chapter 2 of Keith Ansell Pearson, *Vivoid Life*.

88. The term "notorious abuse" is borrowed from Duncan Campbell, a journalist who has carried out substantial and significant work in this area and who spoke at a symposium, "Surveillance and Control," curated by Honor Harger, Tate Modern, March 9, 2002.

89. David Lyon, *Surveillance Society: Monitoring Everyday Life*, Open University Press, Buckingham, 2001.

90. Albert Speer, *Inside the Third Reich*, Phoenix, London, 1995.

91. R. A. Bertelli, *Continuous Profile of Mussolini* (1933).

92. Nicholas Mirzoeff, "The Empire of Camps," *Situation Analysis*, no. 1, October 2002, pp. 20–25.

93. Ibid., p. 23.
94. Hannah Arendt, *The Origins of Totalitarianism*, Harcourt, London, 1973.
95. Such a perspective is characteristic of writers such as Wilhelm Reich and the “anti-repressive” currents that followed his and other moves to “socialize” Freud and, in the constant instruction to “liberate your desires,” it remains so of much activist material on capitalism and the state. This theme is taken up in the first four novels of Stewart Home: *Pure Mania*; *Defiant Pose*; *Red London*; and *No Pity*.
96. From Henry James, *In the Cage*, Hesperus Press, London, 1898, 2002, p. 28. Also available as a text file at Project Gutenberg, <http://promo.net/pg/>.
97. Ibid.
98. Michel Foucault, *Discipline and Punish*.
99. Gilles Deleuze and Claire Parnet, “Note on the Societies of Control,” in their *Dialogues II*, Continuum, London, 2002.
100. William S. Burroughs, “Ah Pook Is Here,” in *Ah Pook Is Here and Other Texts*, John Calder, London, 1979.
101. See Jennifer Hannah and Oscar H. Gandy, Jr., “Editorial Opinion and Racial Profiling: Coming to Terms with Driving while Black,” paper submitted to the Annual Meeting of the International Communication Association, Acapulco, Mexico, May 2000. Available at <http://www.asc.upenn.edu/usr/ogandy/ICA2000.htm>.
102. Lyon, *Surveillance Society*.
103. Oscar Gandy, *The Panoptic Sort: A Political Economy of Personal Information*, Westview Press, Boulder, 1993.
104. This conflation of surveillance with seeing is a problem, understandable of course in relationship to its historic overidentification with visual culture, with much of the discourse in art on the area.
105. Oscar Gandy, “Datamining and Surveillance in the Post 9-11 Environment,” presentation to the Political Economy Section, IAMCR, Barcelona, July 2002. Available at <http://www.asc.upenn.edu/usr/gandy/>.

106. This can happen at different scales, and with fundamentally different consequences: credit records accessed by hackers; religious and racial records kept by governments given over to fascists (as in the Netherlands during the Nazi occupation, or in Gujarat under the rule of the Bharatiya Janata Party [BJP] during 2002).

107. Exactly how digitalization manifests in other circumstances depends on the other relations, the other scales with and at which it accretes. The “digital commons,” for instance, is another vision of digital seamlessness, using digital abundance to bypass scarcity as a boundary to use.

108. Thanks to Carl Reynolds for a discussion that began this thread.

109. Critical Art Ensemble, *The Electronic Disturbance*.

110. According to Lyon: “Police, for example, act as brokers of knowledge—personal data—that is used to satisfy the demands of institutions, especially those of insurance. Thus the making up of individuals according to certain categories useful to those institutions produces databases used in the effort to eliminate or at least to minimize criminal behaviour. Police today are concerned less to apprehend criminals after the fact than to anticipate criminal behaviours, classify them on a risk calculus, and contain or pre-empt them.” *Surveillance Society*, p. 148.

This assertion can certainly be challenged, on the basis of particular episodes and more general strategy; however, it is a useful insight into an influential tendency.

111. Lyon, *Surveillance Society*, p. 68.

112. Gordon E. Moore, “Cramming More Components onto Integrated Circuits,” *Electronics*, vol. 38, no. 8, April 19, 1965, pp. 114–117.

113. Paul Gilroy, *The Black Atlantic: Modernity and Double-Consciousness*, Verso, London, 1993.

114. Needless to say, this vision of technological rapture involves a vision of labor in which it simply becomes fuel. The bodies of those doing the assembling of computers, the minds of those designing them, exist only insofar as they can be burned up in the rush toward escape velocity.

115. This is the surveillance component of the Homeland Security program launched by the United States in late 2002. Headed by John Poindexter, a key actor in the

Iran–Contra scandal, the program seems set to establish a new level of invasive policing for the protection of democracy. See <http://www.darpa.mil/iao/>.

116. These are both efforts of relatively small groups. That they exhibit a relation in scale to the *Cctv* site does not of course constitute a preference against more large-scale activities. It may be that at present the capacity to actively test the thresholds of techno-social processing currently lies most acutely in such groups. However, any fundamental move away from regimes of control will require far more than the dispersed networks of tinkerers that in various ways this book focuses on. Another factor conditioning their availability as exemplars is that as projects with some relationships to art—they are produced by groups involving artists or that engage in art discourses—they have a relation to making things visible. Whether or not making becoming invisible visible serves solely a useful function is one of the problematics constituting the more productive edges of current art and exits from it. It is notable, though, that all these projects engage surveillance not only at a symbolic scale but at a functional one.

117. See <http://www.appliedautonomy.com/isee/>.

118. Anonymous remailers to some extent make this more difficult. Anonymizers are pieces of software sited at nodes of the Internet where traffic is interchanged, such as routers and remailers. They are used to hide the source and route of particular packets. A good example of such software is Mixmaster. See the software's FAQ at <http://mixmaster.sourceforge.net/faq.shtml/>.

119. The film *Gattaca*, for instance, shows how one surveillance-approved life requires two lives, and then more, to maintain the supplies of materials and data. *Gattaca*, dir. Andrew Nicol, Columbia TriStar, 1997.

120. For another formulation of such feedback, see also, the *Government Information Awareness* project at <http://opengov.media.mit.edu/>.

121. See, for an example, the accounts of telephone tapping, letter opening, and informing, in Tony Bunyan, *The History and Practice of the Political Police in Britain*, Quartet, London, 1983.

122. For the beginnings of such an approach, see Matthew Fuller, "Data Nudism: An Interview with 0100101110101101.org about life_sharing," available at http://www.walkerart.org/gallery9/lifesharing/g9_lifesharing_interview.html/.

123. *Surveillance Society*, p. 150.

124. For an example of Virilio's theses in this area, which are developed through several books, see *War and Cinema: The Logistics of Perception*, trans. Patrick Camiller, Verso, London, 1989. For a discussion of webcams and networks, see *The Information Bomb*, trans. Chris Turner, Verso, London, 2000.

125. Maurice Bloch, "A Well-Disposed Social Anthropologist's Problems with Memetics," in Robert Aunger, ed., *Darwinising Culture*.

126. Nelson Goodman, *Languages of Art: An Approach to a Theory of Symbols*, Hackett, Indianapolis, 1976.

127. The site, moved into an archival subdirectory of the BP site, would be despicable if it were not so thin. Designed by a since-disappeared company, it heartily lauds BP's commitments to health and safety and to human rights and was launched less than a year after their signing of an agreement with the government of Turkey to suspend national laws for the purposes of building the Baku pipeline. According to Friends of the Earth, in a press release of August 30, 2002, the agreement "Exempts the companies from obligations under any current or future Turkish law that may threaten the project's profits, including environmental, social and human rights legislation. The only Turkish law not superseded by the agreement is the Constitution." See http://www.foe.co.uk/resource/press_releases/20020830100059.html.

128. QuickTime is an Apple Codec for video and audio.

129. Content management and collaborative content systems such as *slash* or *scoop*, sites such as indymedia.org, slashdot.org, kuro5hin.org, and so on. Notable though is that while on the scalar level of participation these sites are substantially "open," at that of the permissions structures they embody they are often functionally hierarchical. Thanks to Harwood for reading through the slash code that illustrates this.

130. Steven Johnson, *Emergence: The Connected Lives of Ants, Brains, Cities, and Software*, Penguin, London, 2002. See also a straightforward Habermasian analysis of Slashdot published on *firstmonday*: Andrew ÓBaoill, "Slashdot and the Public Sphere," available at http://www.firstmonday.dk/issues5_9/baoill/index.html/. For a close analysis of the moderation process in such sites, see Yochai Benkler, "Coases' Penguin, or Linux and the Nature of the Firm," *Yale Law Journal*, vol. 112, no. 369, 2002.

131. For examples of such work, see Huberman, *The Laws of the Web*.
132. Daniel W. Smith, introduction to Gilles Deleuze, *Essays Critical and Clinical*.
133. Craig J. Saper, *Networked Art*, Minnesota University Press, Minneapolis, 2001, p. 9.
134. Pierre Clastres, *Society against the State*, trans. Robert Hurley in collaboration with Abe Stein, Zone Books, New York, 1989, p. 127.
135. Friedrich Kittler, *Discourse Networks 1800/1900*, Stanford University Press, p. 211.
136. There is a relation here with the Superweed project. Heath Bunting allegedly introduced Monsanto-bred “round-up ready” rape seeds into U.K. plant populations as a way to purportedly build up, via wild cross-breeding, their resistance to the pesticide. The work succeeded on what Baudrillard would call the symbolic level in that Bunting was able to ape, for the benefit of a particular art audience attuned to environmental activism, the utter nonaccountability of the corporations attempting the proprietary control of human food-chains. By means of this dyad, at the material level, it merely served to reinforce this irresponsibility by exposing unaffected plant populations to modified genes, reinforcing, in an—again—studiedly minor way, the attempts by GM food companies to force their product as an accomplished fate.
137. Joseph Schumpeter, *The Theory of Economic Development*, Harvard University Press, Cambridge, Mass., 1934.

Inventory

1. Thanks to Marko Peljhan for this term.
2. Pierre Klossowski, *Nietzsche and the Vicious Circle*, trans. Daniel W. Smith, Athlone, London, 1997.
3. Friedrich Nietzsche, *On the Genealogy of Morality*, ed. Keith Ansell-Pearson, trans. Carol Diethe, Cambridge University Press, Cambridge, 1994, §18.

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