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**The Politics of Networks: Using Actor Network Theory to trace
Techniques, Collectives, and Space-Times**

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Abstract

The progressive unfolding of the internet into all spheres of life brings forward new types of publics which question prevalent notions of technology, the social, and spatio-temporality. These network publics pose a problem to social science because they escape the traditional projection of a social sphere populated by actors and a natural/technical sphere populated by objects. Therefore, to analyse the politics of networks, researchers need a projection capable of examining hybrid actors questioning the very conceptualisation of the social used in social science.

This thesis sets out to re-construct internet politics as a gathering of techniques, collectives, and spatio-temporalities within a common assemblage. This is a theoretical undertaking based on the insights of actor network theory and thinkers such as Gabriel Tarde and Michel Serres. Firstly, the thesis argues that the bifurcation of nature into social and material/technical spheres inscribes a discourse of mastery in the attachments between entities and obfuscates a multitude of relations. It is proposed that an alternative projection will involve a plenist ontology of hybrid agencies. The thesis contends that technique has to be understood as a shifting and coagulation of agency, and technical networks as an enfolding of multiple spatio-temporalities. Following from this, the thesis approaches the notions of network spatiality and temporality as performative effects of the circulation of agencies.

Further, the thesis establishes that politics appear as the performative effect of the circulation of publics, and then explores the questions of control, domination, and representation of publics. The argument clarifies the steps needed to make a public durable over distance, to perform a locale, enact agencies from afar, and stabilise a public as an assemblage. Finally, the thesis argues that the effect of depth in the temporality of information networks appears as an effect of the circulation of immutable mobiles, and

introduces the concept of an internet of things as a setting where the multitude of thus far invisible and unacknowledged publics finally becomes visible.

It is concluded that a re-constructed politics of networks will involve a projection capturing both the spatial and temporal shifts of agencies within a plenist ontology of in-becoming. The role of critique is re-imagined as that of tracing, assembling, and making visible the collective of entities constituting a public.

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Introduction

If historians of science from the distant future were to interest themselves in the last decade of the 20th century and the first decade of the 21st, they might be surprised to discover that the discourse of the social sciences during these twenty years was positioned almost entirely under the auspices of the concept of networks. Future historians would find networks touted as nothing short of a new paradigm for understanding the world; from the micro-realities of self-organizing microbes (Kauffman, 1995), to the macro-realities of global capital (Castells, 2004), networks come as a ready concept for depicting the topology of relations between entities. Nowhere is this state of affairs more pronounced than in studies of information networks.¹

The rise of the internet² prompted a veritable deluge of research on information networks, and led to the establishment of a more or less ‘common sense’ position among social scientists, according to which the arrival of the internet challenges prevailing notions of time, space, community, identity, and politics, among others.³ This position seems correct, to the extent that the progressive unfolding of the internet into all spheres of life brings forward new types of publics, which question prevalent notions of technology, the social, and spatio-temporality. These network(ed) publics pose a

¹ As the thesis argues, there is a conflation of notions involved in the concept of networks, yet the term is so prevalent that I use it nevertheless. In the terminology of the thesis, information networks indicate communication infrastructure, whereas the general notion of networks indicates a fluid relationality and transformational shifts.

² It has become almost the norm to refer to the internet with a capital letter, but this thesis takes a contrarian view to underline the position that there is no qualitative difference between information networks and (non)technical assemblages; this difference is seen here as at best prosaic and at worst non-existent.

³ This position appears ‘across the board,’ from the work of Manuel Castells (1996), to critical theory (Virilio, 2005), and network theory (Haythornthwaite & Wellman, 2001).

problem to social science, because they escape the traditional projection of a social sphere populated by human actors and a natural/technical sphere populated by objects.

This problem is most visible in analyses of the politics of information networks, where the hybridity and opacity of the medium make it especially hard to distinguish who is the actor, and who the acted upon.⁴ Arguably, that is because the conceptual toolkit of researchers relies mostly on a projection of reality always already bifurcated into social and natural plains;⁵ this projection in turn rests on a “modern contract” (Latour, 1993) dating back to the 17 century, and itself a skeuomorph of earlier positions.⁶ Crucially, and this is the argument underlying the thesis, the conceptual toolkit resulting from this projection orders the potentialities visible to researchers even before those potentialities are encountered. For example, consider the array of discourses accompanying the appearance of the internet.

Future historians might be surprised to discover that the internet made its entrance as a skeuomorph narrative of disembodiment⁷ and paradigmatically new socialities.⁸ The notion of disembodiment stood for the promise of a posthuman future, while the new social stood for the promise of a future without hierarchical power, which in turn promised new types of communities. Anything but fresh or new, these narrative tropes can be traced as the latest conceptual reiteration of the old refrains of Romanticism.⁹ As

⁴ This problematic is extensively analysed in the first chapter of this thesis.

⁵ I am referring to Alfred North Whitehead’s argument against the *bifurcation of nature* (1920); this problematic is addressed extensively in the first chapter, and used as an argumentative canvass throughout the thesis.

⁶ As the pragmatist school of philosophy argues, the projection forming the “modern contract” extends all the way back to Plato’s cave (Rorty, 1979).

⁷ For an analysis of narratives of disembodiment in relation to information networks, see Dery (1996), who refers to them as an “ejector seat condition.”

⁸ For an early analysis of the internet phenomenon as a harbinger of new types of social organisation, see Rheingold (1993); he develops those ideas further in (2003).

⁹ For a masterly analysis of the various Romantic threads weaved within the techno-discourse surrounding the internet, see Coyne (1999).

media theorist Katherine Hayles has written in reference to the discourse of disembodiment and virtuality:

The reading of cyberspace as a disembodied realm is a skeuomorph that harks back to the first wave of cybernetics, which in turn is a reading of information that reinscribes into cybernetics a very old and traditional distinction between form and matter. These residues, echoing in a chain of allusion and reinscription that stretches back to Plato's cave, testify to the importance of *excavating* the sedimented history of artifacts and concepts, for they allow us to understand how the inertial weight of tradition continues to exert gravitational pull on the present. (1994: 464)¹⁰ [emphasis mine]

Another set of problems in approaching information networks is caused by the “gravitational pull” of the old sociological concepts of actor and structure, permeated by a dynamic of overcoming; as if in a zero-sum game, either the actor succumbs to, or overcomes the structure. Indeed, politics as a research concept of the social sciences has come to be thought in conjunction with the notions of power and society, forming a self-explicating discourse underlined by a dynamic of mastery. Whatever the usefulness of these concepts in the past, they do not help in approaching the hybridity of network assemblages. Any attempt to *excavate* the “sedimented” setting of network politics with the help of these concepts will inevitably fall into the discourse of mastery by sheer nature of the fact that relations of mastery are the only political relations this conceptualisation is able to see.

Therefore, at the onset of approaching the politics of networks it is important to avoid the propensity for falling into a worldview poeticized by a discourse of mastery pre-ordering all relations into a zero-sum game. Any such pre-formatting of relations results in an obfuscated and partial image of the studied assemblage. As Bruno Latour - one of the founders of actor network theory (ANT) – argues in his analysis of Machiavelli's *Prince*:

¹⁰ For a development of this argument, see Hayles (1999, 2002, 2006).

When we read through the literature of social sciences or of the natural ones, our situation is often as absurd as that of a geographer who would get, from navigators sent around the world, either the longitudes or the latitudes of the points he wishes to map but never the two together! In order to map out what ties all of us together we have to invent a projection system that provides both for the information about human and about non-human actors. (Latour, 1988a)

Therefore, to analyse the politics of networks, researchers need a projection capable of examining hybrid actors questioning the very conceptualisation of the social used in the social sciences. In an attempt to outline such a projection, this thesis sets out to reconstruct the politics of networks as a gathering of techniques, collectives, and spatio-temporalities within a common assemblage. As the title of the thesis already indicates, the thesis argues that to approach the politics of networks one has to trace the techniques and publics performing the spatio-temporalities within which the politics appear. In that sense, the argument of the thesis can be represented as a shift in scope: the task of establishing how political relations in networks differ from social, technical, or other relations is *substituted* with the task of establishing which entities have the capacity to act and are therefore visible.

In the former approach, politics appears as a stratum of signification – entities gain their significance by engaging in political manoeuvres; in the latter approach, politics is a rare effect of composition, which has to be studied as the contingent outcome of certain logistical manoeuvres by entities. In examining the logistics of composition, the thesis aims to outline a projection capable of approaching the politics of networks in all their messy complexity. Why is this substitution of approaches, or projections, considered a valid exploratory move?

This thesis started as an exploration of online activism, and the peculiar politics emerging from the ad hoc nature of the online public assemblages.¹¹ However, the initial

¹¹ For an introduction to the problematic, see Mitew (2005). For a general introduction to the thematic of online activism, see Ayers (2003).

examination of the concepts used to approach the politics of online activism resulted in discovering “on the one hand a long heterogeneous list of contrivances to be explained and, on the other, a short homogeneous and repetitive list from which to offer the explanation” (Latour, 1988a). Unlike the traditional social settings known to political theory, online activism appears as a complex enfolding of issues, spaces, times, publics, and techniques. It can easily be argued that that is also the case with so-called traditional social settings; however, what differentiates online assemblages is the fact that their hybridity is plainly visible. This visible “heterogeneous list of contrivances” appears as a question-mark in front of references to concepts such as power, or social, and refuses to go away. The longer “the list of contrivances,” the less believable the explanations offered by a short list of skeuomorph concepts from a projection incapable of dealing with complexity. In that sense, the thesis established that explanations referring automatically to concepts such as power, or society, are not useful in approaching the politics of network assemblages.

The substitution of projections is also useful, because in trying to examine the politics of networks the thesis examines at first sight completely unrelated topics. In looking at technical assemblages one inevitably has to look at the issues surrounding the problem of technicity;¹² in looking at network space one inevitably is shifted into exploring the issues of control, stability and domination;¹³ and in looking at network time, inevitably one has to explore the way temporal flow and depth are constructed. The complexity of the topics precludes the use of the short and homogenous list of concepts headlined by the notion of a social sphere projecting agency on a dull world of technical objects; a projection additionally inscribed with a discourse of mastery serving as ready-made politics. The thesis therefore examines a projection capable of ridding the narrative of

¹² Technicity, and techniques, will be discussed in detail in the first chapter. At this point it suffices to say that technicity is used here as a general description for the condition of techniques; techniques in turn, are to be understood as mediations. In that understanding, the common term *technology* stands for the study of techniques.

¹³ The second chapter of the thesis argues for a difference between the notions of control and domination, in an effort to retain a meaningful distinction between those terms and indicate a qualitative difference in the accumulation of stable space and time.

networks of the discourse of mastery, by way of demonstrating that discourse's impotence in dealing with the complexity of network assemblages.

The thesis' examination can be illustrated by the way archaeologists approach a dig.¹⁴ The gaze of the excavator uncovers consecutive layers from a 'flat' sociality, where each entity is in radical symmetry to the others, at least until it is transported, or *shifted*, by the archaeologists to a measuring scale on which they can observe relationalities and establish meanings. The story of those relationalities, the social of those entities, appears only as the contingent effect of the archaeologist's work. Moreover, each of these radically symmetrical entities *shifts* the archaeologist's tracing gaze along a flat path, from one entity-setting to the next; the gaze does not encounter an underlining structure signifying the uncovered artifacts. Considering these shifts in more detail, it is also interesting to note that the observer's gaze never leaves a perfectly local setting, no matter how abstract the shift might be – the new place where the gaze of the observer lands is always another setting, another 'flat' site.

The method of examination which the thesis uses can be illustrated as precisely such a practice of shifting between 'flat' settings. Given the established projection of social and natural spheres, what this method entails is a constant tension between the skeuomorph notions of agency and structure mentioned above. ANT has suggested a way out of this dynamic through establishing a radically different projection, which is utilised by this thesis in approaching network politics. Specifically, the thesis uses the arguments of ANT to build a projection capable of encountering the complexity of network assemblages without assigning relationalities beforehand. To that extent, ANT's insights inform some of the arguments of this thesis, while the exploration develops its own vocabulary for dealing with the complexity of network publics. But what does the notion of actor network stand for? As another of the founders of ANT¹⁵ - John Law - writes:

¹⁴ For an in-depth introduction to the projection described in the paragraph, see Shanks (1992); Shanks & Tilley (1993). This approach is examined in the third chapter in the context of network temporality.

¹⁵ The founders of the theory are generally considered to be Michel Callon, Madeleine Akrich, John Law, and Bruno Latour; sometimes they are referred to as 'the CALL collective.'

This is a name, a term which embodies a tension. *It is intentionally oxymoronic.* The tension, of course, lies between the centred ‘actor’ on the one hand and the decentred ‘network’ on the other. In one sense the word is thus a way of performing both an elision of, and a difference between, what Anglophones like to call ‘agency’ and ‘structure’. (Law, 1997: 3) [emphasis mine]

The notion of networks, as understood by ANT, is of particular interest to this thesis’ argument. As Law writes (1997), the notion came as a translation of the French *reseau*, and stands for the translational shifts undertaken by entities (actors); it indicates a chain of transformations, or transductions of agency in its traversal of various spatialities. In that sense, the notion of networks as used by ANT is radically different from the notion of networks in the social sciences, where it stands for a particular topology allowing “transport without deformation” (Latour, 1999b: 15). Understood as a stand-in for transductions, the notion of networks is useful in depicting the movement of entities, because it does not restrict the potential topological transformations entities undertake.

When understood as a particular form of spatiality however, it naturally delimits the possibilities for spatial formations, and homogenises the character of potential relations (Law, 1997: 4). Furthermore, this distinction is mirrored in ANT’s approach to acting entities. For ANT, the canonical subject-object distinction of Western epistemology does not make sense as a notional projection because it pre-orders the possible relations; instead it borrows from the toolkit of semiotics a projection for which “entities take their form and acquire their attributes as a result of their relations with other entities” (Law, 1999a: 3).

Crucially, the distinctions between entities are not hardwired into the projection, but appear as an effect of the *relations between* entities. Therefore, ANT approaches the world as a fluid undetermined topos, performed by the relational shifts of entities; both the topology and the entities populating it appear as an outcome of those relational shifts. That is what the notion of actor networks is out to express. It then follows, that

the relational moves performing the world are one of the important research objectives of ANT.

ANT concentrates its attention on a movement (...) the summing up of interactions through various kinds of devices, inscriptions, forms and formulae, into a very local, very practical, very tiny locus. (Latour, 1999b: 17)

In that sense, ANT is not a theory of the social, but a purposefully simplified projection allowing tracing entities “without imposing on them an a priori definition of their world-building capacities” (Latour, 1999b: 20). Therefore, ANT is akin to a theory of the associations between entities, where the notion of associations encompasses and extends the social of traditional sociology to all sorts of relations. To use Latour’s vocabulary, ANT is a description of the circulations of entities in a non-modern setting (1993). This means that ANT is a projection grasping *both* the logistics of world-building and the circulations of the already-built worlds. Latour likens the liquidity of the notions of actor and network in this understanding, to the notions of waves and particles in physics – that is, forming the two faces of the same phenomenon (1999b: 18-19). The flatness and heterogeneity of this projection are so absolute, that any notion, no matter how micro or macro, appears as just another entity circulating along relational channels. There is no ‘above,’ or ‘below,’ to the surface traversed by the relationalities populating the projection; everything is literally performed in a local setting. In that sense, ANT could be labelled as a theory of settings.

There is never any need to leave our networks, even if we are talking about defining the truth, the exactitude, the coherence, the absurdity, or the reality of a statement. The judgment of reality is immanent in, and not transcendent to, the path of a statement. (Latour, 1991: 128)

From its inception in the late 1970’s, ANT has been trying to re-position sociology and science studies along the tracks of this new projection. The beginnings of the theory can be traced to Latour and Steve Woolgar’s programmatic study of scientific practices *Laboratory Life: The Social Construction of Scientific Facts* (Latour & Woolgar,

1979).¹⁶ The study was followed by theoretical studies of materiality (Callon & Latour, 1981); studies of the practices of scallops, fishermen and electric vehicles (Callon, 1986a, 1986b); of Portuguese maritime expansion and the problems of global navigation (Law, 1986); further studies of scientific practice (Latour, 1987); studies of the intersection of politics and materiality (Latour, 1988a); of religious paintings and the concept of attachment (Latour, 1988b); of the practice of innovation as exemplified by Louis Pasteur (Latour, 1988c); of failed socio-technical projects (Latour, 1996);¹⁷ of the performativity of bodies (Mol & Law, 2000, 2004); of the circulation of agencies and their performance of networks (Callon & Law, 2004); of the practice of economic calculation and the way it performs markets (Callon, 1998b; Callon & Law, 2005). ANT has also been applied extensively in studies of spatiality as a performative effect of agencies (Latour, 1997; Law, 2000d, 2004b; Law & Mol, 2002b; Mol & Law, 1994, 2005).¹⁸

On the other hand, ANT has been also heavily criticized, both from within and without, for a variety of reasons. Predictably, the heaviest critique comes from traditional sociology, which feels threatened by ANT's thorough re-description of the very notion of 'social,' as well as by ANT's insistence on approaching human, nonhuman, technical and every other type of entities in a radical symmetry. The main line of critique coming

¹⁶ The following is only a cursory, and extremely limited, listing of the constantly growing ANT literature. For an exhaustive source of ANT texts published until 2004, see the Actor Network resource maintained by John Law: <http://www.lancs.ac.uk/fass/centres/css/ant/antres.htm>. For a general introduction to ANT, see Law (1992); for an introduction relating ANT to new media studies, see Latour (1998b, 1998c). From my perspective, the crucial texts in approaching the insights of ANT are Latour's (1993, 1999c, 2005b), Law's (2004a), and Law & Hassard's (1999).

¹⁷ It is indicative that ANT is so applicable in analysing disasters where a setting collapses, and a previously homogenous and coherent structure suddenly becomes heterogeneous and incoherent. From studies of train disasters (Law, 2000a; Law & Mol, 2002b), to earthquakes (Harada, 2000), ANT has uniformly argued that collectivity and individuality are irrevocably tied to, and formed together with, materiality.

¹⁸ In addition, ANT has been very influential in the areas of geography, urban studies, and the sociology of space (Bingham, 1996; Bingham & Thrift, 2000; Murdoch, 1997, 1998; Thrift, 1999; Urry, 2005).

from traditional sociology is expressed perfectly by Roger Silverstone in his critique of Law and ANT's notion of networks:

However one can grant this and still privilege the social; indeed one must do so, since the natural, the economic and the technical, in their obduracy or their malleability, have no significance except through social action. (...) The socio-technical system is therefore just that: a more or less fragile, more or less secure, concatenation of human, social and material elements and relations, structured in, and structuring of, social action (...). (Silverstone, 1994: 84-85)¹⁹

The natural, the economic, and the technical have no significance except through social action; no ANT theorist could have put the traditional position any better. This position will be encountered continuously throughout the thesis in a variety of theoretical forms, unified by the projection driving Silverstone's critique. The social, or politics, or power, or domination, are used as strata of signification, structuring and homogenizing the relations of entities. From the perspective of this projection, ANT is simply trying to offer a new theory of Silverstone's social, and its efforts are naturally seen as a failure because it lacks a stratum of signification.

From that perspective, ANT does not "offer the basis for a completely new theorisation of social order, nor even a new way of analysing social action" (Couldry, 2004: 3).²⁰ ANT cannot offer any kind of perspective for analysing social action, simply because it does not know what the social *is* until it traces the entities performing it; as for action, ANT disarms itself even further, by allowing all matter of entities the capacity for world-building, and therefore for action. This of course, is a heresy of the highest order – the heresy of objectification of human relations; naturally, ANT has been heavily criticized on these grounds.²¹

¹⁹ See also Silverstone & Hirsch (1992); for a critique of ANT's approach to modernity, see Freed (2003).

²⁰ For media-theory based critique of ANT, see Bolter & Grusin (2000), Couldry (2004), and Wise (1997). For an attempt at utilisation of ANT in studies of new media, see Thompson & Cupples (2008).

²¹ For example of such critique, see Routledge (2008), Van Der Ploeg (2004), and Vandenberghe (2002).

Moreover, ANT's perceived objectification of human relations is often criticized as a deliberately conservative, and even anti-progressive, political choice on part of the ANT thinkers.²² This allows critical theory to dismiss ANT as just another attempt of imperialist discourse to dominate the social (Elam, 1999). When Susan Leigh Star writes that "it is both more analytically interesting and more politically just to begin with the question *cui bono*, than to begin with a celebration of the fact of human/non-human mingling" (1991: 43), she ties the question of politics precisely to ANT's heretical stance on objects. How can nonhumans have the right of agency! Star is right to deduce a political aspect in ANT's position, but very wrong in identifying the politics involved.

To determine *cui bono*, one would first have to define the *cui* (who is involved), and the *bono* (what is the issue that involves them); and therefore, define the logistics of composition of the public. ANT's insistence on reducing the social to a series of associations between ontologically symmetrical entities, is critiqued as an inability to imagine a unique ontological otherness (Lee, N. & Brown, 1994), or as the pathological inscription of success in the network-building efforts of social actors (Barnes, 2001). Ultimately, this is a problem of vocabularies; as Latour humorously quips:

There are four things that do not work with actor-network theory; the word actor, the word network, the word theory and the hyphen! Four nails in the coffin. (Latour, 1999b: 15)

The problem facing ANT, from a pragmatist perspective, is that it has no way to answer these accusations through the use of its own vocabulary, because that very vocabulary is the cause of critique. If there is no a priori ontological distinction between human and nonhuman agencies there is no way to answer the critique of objectification, other than to keep pointing at the theoretical benefits of that position. To some extent ANT is to blame for this state of affairs, because of its borrowing of the skeuomorph notions of

²² For example, Nick Couldry argues that "ANT comes charged with a heavy load of political conservatism that is (...) directly linked to its professed disinterest in human agency" (2004: 7).

actor and network. In that respect, perhaps the most introspective and critical look at the practice of ANT comes from within the theory, when Law argues that:

[ANT] is refusing to find and to make the undiscovered continent, refusing to discover the shady and heterotopic places, the places of Otherness, that lie beyond the limits of the current conditions of possibility. (Law, 2002: 92)²³

According to Law, from a Foucauldian perspective of Otherness, ANT seems to curtail the potentialities for different topologies, by nature of its approach to the notion of contexts. When contexts are seen as the circulating effects of the relations between entities upholding them, the effects and later interactions of those contexts seem as a trivial matter of empirical observation. As Law later argues, ANT's response to this critique would be to examine more deeply the multiple spatialities emerging with the constitution of entities, and study the logistics of their connectivity to one another. ANT's strength comes from a projection simple enough not to make an a priori epistemological distinction between heterogeneity and homogeneity. In that sense, the best thing about ANT is what comes after it; because only *after* the shifts of the entities have been traced can one establish their potential "conditions of possibility." Therefore, the value of ANT does not lie primarily or exclusively in its capacity to trace assemblages, but rather in the flatness of its world, in the radical symmetry between its entities. The projection of ANT seems to be as blind to a priori ontological closure, as it is blind to a priori ontological difference.²⁴

It is this relational²⁵ ambiguity that makes ANT's projection appealing to the argument presented on these pages. The thesis' exploration, and its accompanying arguments, develops through three chapters constructing the spatio-temporal complexity of the new

²³ A more or less similar critique comes from Nigel Thrift, when he faults ANT with an inability to approach events in their complexity (2000).

²⁴ This is one aspect of the point I believe Kevin Hetherington and Nick Lee make with their argument on the role of blank and ambiguous figures in social order (2000).

²⁵ The notion of *relationality* is used here and throughout the thesis to avoid the pejorative meanings carried by the notion of *relativism*.

projection under the notions of *Networks*, *Nodes*, and *Edges*. The three stages of the exploration first outline a new projection capable of apprehending network publics, and then populate it with spatial and temporal layers. Each of the three main chapters is further divided into three sections exploring the heterogeneous problematic of the projection; a section usually consists of two subsections, one of which delineates a problem while the other examines a solution.

The first chapter of the thesis is titled *Networks: from zoom to shift*. The title refers to the concept of networks and the distinctive manoeuvres visible to the two projections mentioned above; the notion of *zoom* refers to movement without cost, and a projection without the capacity for describing the process of entity-formation. For such a projection entities appear as a phenomenon similar to the effect of a camera zooming on an object – the object fills the field of vision and seems to exist *an sich*, outside of any possible formative relations. For this approach relationalities are effectuated by the existence of an entity, and therefore to understand the entity the projection has to literally zoom *behind*, or *below* the thicket of relations.

The notion of *shift* in turn refers to a projection where an entity *is* the thicket of relations; therefore, to understand that entity the projection has to shift along the channels where those relations are performed. While the zooming gaze looks to find what is *behind* and *below*, the shifting gaze looks to find what is *adjacent* and *away*. To outline these two approaches, the first section of this chapter, titled *Towards a plenist ontology*, starts by exploring Whitehead's arguments against the projection he termed as *the bifurcation of nature*. The first subsection, titled *The bifurcation of nature*, outlines an alternative ontological projection where the subject-object distinction is substituted with a processual understanding of in-becoming entities.

This substitution allows the argument to free itself from the shackling division between human and non-human actors, and its baggage of political assumptions. Following that, the next subsection, titled *On having agency*, explores the notion of actor²⁶ and, basing

²⁶ ANT texts sometimes use the term *actant*, instead of traditional sociology's notion of actor, to indicate

on the work of sociologist Gabriel Tarde, constructs a non-bifurcatory understanding of acting entity.

Having formed the outlines of the new projection, the second section, titled *Techniques*, explores the question of technology, and notions of instrumentality and machinic logic. This problematic is crucial in approaching information networks, because of the prevalence of narratives assigning deterministic or alienating roles to technical assemblages. Furthermore, the question of technology is formative in understanding how agency works over spatio-temporal distances, and how entities delegate agency to others. Moreover, the question of technique has a special relevance to internet studies in the context of information networks and computer code.

A bifurcated projection will inevitably distort and obfuscate the logistical shifts of entities in relation to code, and preclude any understanding of the publics enfolded in information networks. Therefore, the first subsection, titled *Gazing at Medusa: the question concerning technology*, examines the process through which technicity appears as a radical other to humans. The next two subsections, titled *The shifts of Daedalus*, and *Monsters*, then approach technicity through the already-developed un-bifurcated projection, and form a general understanding of technique as coagulated agency.

The final section, titled *Networks*, examines the concept of information networks, and prevalent notions of spatio-temporal compression coupled with the emergence of new forms of control, attributed to information networks. The first subsection, titled *Spectrum flows*, argues that the discourse of a bifurcated nature is an impediment in analysing and tracing networks, because it continuously reinserts a dynamic of mastery into the relational attachments of entities. This dynamic explains the relative stability and power of network entities as either inherent in their position, or as the result of an inherent network logic of control. In contrast, the second subsection, titled *Crossings*, argues for an approach to networks as aggregated agencies enfolding heterogeneous

the processual nature of agency and avoid bifurcatory talk of intentionality.

spatio-temporalities in a stable assemblage. This definition in turn suggests a close examination of the way space and time are affected, and effected, by networks.

Therefore, the second chapter, titled *Nodes: from actors to attachments*, shifts the argument towards an examination of network spatiality. The title refers to the concept of nodes as the entities performing the network topology; the notions of actor and attachment are used to illustrate the appearance of spatiality as an explanans, and explanandum. To that extent, the argument in the first section, titled *Spacings: assembling of the public*, is constructed around two opposing projections of space, one where space acts as a container for the relations between entities and another where space emerges as an effect of those relations.

The first subsection, titled *The question concerning space*, posits that the former projection obfuscates the emergence of entities, and the logistical moves they perform to stabilise their assemblages. It is argued that this understanding of space inserts a discourse of mastery into any reading of politics, because it fixates an image of politics as a container-like referential background within which actors struggle for autonomy. The alternative projection suggests that space emerges as a result of the relations between entities, and that, similarly, politics is the contingent effect of the assembling and relations between publics.

Therefore, as the second subsection, titled *Assembling network publics*, argues, approaching the politics of networks equates to having a projection capable of tracing the logistics of publics. Two conclusions emerge out of this argumentation; first, if the politics of networks appear as an affect of the relational performativities of publics, then the logistics of assembling, stabilising, and moving publics in space-time are the crucial element to be examined; second, if the logistics of relational shifts are to be traced, it is necessary to perform a conceptual shift from the notion of actor to that of attachment.²⁷ The resulting projection is argued to be useful in approaching the politics of networks, because it can trace the attachments, movements, and transformations of publics.

²⁷ For a detailed study demonstrating ANT's focus on attachments, see Gomert & Hennion (1999).

However, to trace the logistics of network publics the projection needs to be able to understand the process of public formation and the transformational shifts required to achieve stability. Therefore, the second section, titled *Surfaces: domination and dissociation*, examines two crucial questions: to what extent can an assemblage stabilise and fix entities within its relational frame, and at what cost; and how the resulting, already stable, assemblage deals with dissociating forces over a spatio-temporal distance. The former question relates to the notion of control and is explored in the first subsection, titled *Protocol and distributed control*; the latter question relates to the notion of domination and is explored in the second subsection, titled *The problem of domination*.²⁸

To understand that distinction, the notion of spatio-temporal distance is of utmost importance, because, as the subsection argues, this distance has to be performed by the assemblage as a locale, and then kept operational, again at a cost. The notions of control and domination are argued to appear as an effect, contingent on an array of logistical moves performed by the entities in the network in order to stabilize it.

It is further demonstrated that this conclusion is in stark opposition to the notions of network control prevalent in critical theory analyses of information networks. This conclusion is then illustrated in the last section of the chapter, titled *Maps: tracing attachments*, through examining two distinct approaches to network maps, and the practice of mapping. The approaches are illustrated in the two subsections, titled *Mapping as unveiling* and *Mapping as attaching*, by projects from locative media and counter-cartography.²⁹

The third chapter, titled *Edges: from attachments to affinities*, shifts the argument towards an examination of network temporality. The title of the chapter refers to the

²⁸ The notions of control and domination are used to retain a qualitative difference in the accumulation of stable space and time.

²⁹ This part of the argument has been further explored by the author in (Mitew, 2008).

concept of edges, understood as the relational channels between the entities performing the network topology. The notions of attachment and affinity refer to the change in perspective when the logistical shifts of network publics are seen through a projection enriched by temporal depth. The addition of temporality to the projection constructed by the thesis adds fluidity and further heterogeneity to network publics, and necessitates a conceptual approach capable of tracing the resulting complex spatio-temporal entanglements.

The first section of this chapter, titled *Deep timings*, establishes the position, in necessary symmetry to the argument on space, that temporality appears as the effect of the circulations of entities, and that those circulations perform a multiplicity of timings. The first subsection, titled *The question concerning time*, reaches the conclusion that the appearance of temporal depth in information networks is the effect of the performative circulations of entities enfolding multiple timings. Therefore, as the second subsection, titled *Timing depth, immutability, and movement*, establishes, measuring the intensity of network timings equates to tracing the logistics of the circulations of those entities.³⁰

This argumentation is necessary to approach the complex world by now populating the projection constructed by the thesis. As a conceptual illustration of the argument, the second section, titled *Spimes: spacing the internet of things*, examines the notion of *spimes*, that is, entities inscribed with a visible layer of folded space-time displaying the logistics of that entity's circulations.³¹ The two subsections, titled *Spimes* and *An internet of things*, argue that when aggregated into an assemblage, spimes form an *internet of things* - a notion referring to the visibility of the heretofore silent majority of actors performing information networks.

At that stage of the argument, the last section, titled *Durable affinities*, finds the notion of networks too rigid to account for the complexity of the projection. The first

³⁰ For a more heterogeneous theoretical approach to the temporality of the internet, see Celletti, Leong, Mitew, & Pearson (2008).

³¹ This part of the argument is informed by the author's work in (Mitew, 2006).

subsection, titled *Finding publics in affinities*, argues that the network concept is poorly equipped to account for the spatio-temporal heterogeneity of mobile publics, and therefore ill-prepared to approach what has been so far referred to as ‘the politics of networks.’

Therefore, the last subsection, titled *Durable affinities: plenist ontology revisited*, concludes by establishing a conceptual approach capable of approaching simultaneously the timings, spacings, and emotive affect of mobile publics; this conceptual approach is termed as *durable affinity*. Essentially, the notion of durable affinity indicates the assembled argumentative shifts established throughout the thesis; it indicates a projection capable of accounting for the opacity of techniques, the logistics of stabilising spatial frames, and the intensities of timings involved in complex assemblages. In other words, this projection is the expected effect of tracing the techniques, collectives, and space-times enfolded in a network assemblage.

How then, to approach the politics of network assemblages without limiting the heterogeneity of publics beforehand? Unable to define the political in advance, one is left with the task of tracing its construction through the vectors of movement that form and uphold the assemblage. Another way to describe this approach is as a shift away from a projection framing the relations of actors in advance, and into a projection for which the dichotomies of the bifurcated world would seem as the contingent outcome of a local setting. This shift of projections frames the starting point of my argumentation.

Chapter 1

Networks: from zoom to shift

Finally it was down to one leg. Still, it pulled itself forward. Tilden was ecstatic. The machine was working splendidly. The human in command of the exercise, however - an Army colonel - blew a fuse. The colonel ordered the test stopped.

‘Why?’ asked Tilden. ‘What’s wrong?’

The colonel just could not stand the pathos of watching the burned, scarred and crippled machine drag itself forward on its last leg.

This test, he charged, was inhumane.

May 6, 2007, The Washington Post (Garreau, 2007)

The puzzling reaction of the army colonel from the anecdote quoted above illustrates the uncertainty of the common-sense subject-object division. How can the treatment of a crippled machine be inhumane?³² Is this not a mere fetishisation of hardware, or at best a simple anthropomorphism borne out of the culture of an organization long used to otherwise uncomfortable intimacy with technology? Are the links between the army machine and its operator social, or technical? If they are social, then is the machine in possession of a distinct technical essence, which the colonel somehow mistook for human? Most importantly, which of the entities participating in the anecdote have the capacity to act and are therefore visible? If most of the components of a network are not present, not considered as actors or intermediaries,³³ not visible, how can there be functional politics?

As the chapter argues, the puzzling reaction of the colonel marks the uncertainty of the subject/object division, the contumacious role of technical artefacts, and ultimately

³² Moreover, consider the irony implicit in the statement coming from an army colonel.

³³ The distinction between actor and intermediary will be explained below.

points to the transgressive and enfolding character of socio-technical networks.³⁴ The first section of this chapter uses Alfred North Whitehead's definition of an a priori separation between mind and reality, which he terms as a *bifurcation*, to argue that the dichotomy between 'society' and 'nature' obfuscates the multitude of actors involved in networks crossing both sides of the artificial divide. The section argues that when this bifurcation is ignored, the moves of the entities crisscrossing the 'social' and the 'natural' resemble translations between actorial states, or shifts; and that entities have to be seen as in-becoming in order to grasp their fluidity.

The battle robot from the anecdote provides a ready example of fluid actorial ambivalence. Is there an ontological essence differentiating technology from the ready-made planes of 'social' and 'natural' - a ghost in the machine? The second section argues that techniques have never been stranded between the imaginary planes of 'social and 'natural,' let alone in possession of an autonomous essence. To the contrary, the section argues that technique is inseparable from the capacity to act, because it is through technique that the association and dissociation manoeuvres of actors become possible. Furthermore, such a definition of technique allows viewing networks as complex spatio-temporal knots.

Informed by the arguments of the previous two sections, the third section examines some of the problematic assumptions regarding the internet, such as compression of time-space, and alienation of subjectivity. The section argues, that to avoid bifurcations information networks have to be approached as the associated programs of action of so many heterogeneous entities, rather than as rigid structures built out of abstractions such as 'social ties' or 'information.' The section further argues that technical networks enfold multiple spaces and times, and that this enfolding can be made visible and traceable. This argument in turn uncovers a host of problems connected to the effects of information networks on space and time, and points the way for the explorations of the following two chapters.

³⁴ For lack of a better adjective at the moment I use the term 'socio-technical,' however, as the following argument will point out, this description is, in fact, tautological.

Towards a plenist ontology

This section argues that the paradox of the opening anecdote is caused by what Alfred North Whitehead termed as *the bifurcation of nature*. The bifurcation is quite simply an a priori ordering of reality into two distinct planes, out of which emerge the notions of subject and object, and society and nature. This division effectively assigns the roles of entities beforehand, and creates a reality-projection with crippled actors where the ‘natural’ plane is populated by ‘objects’ and the ‘social’ plane populated by ‘subjects’ without any cross-over between them. Whitehead’s insight is used in conjunction with the work of sociologist Gabriel Tarde, and the arguments of actor network theory to point an alternative projection to the artificial bifurcation. Furthermore, the section abandons the subject-object distinction for a general understanding of acting entity. It is argued that entities in this re-formulated reality will always negotiate their way along translatory shifts between actorial states, necessitated by their being suspended in networks of other such entities, and in permanent in-becoming.

The bifurcation of nature

I am at two with Nature. *Woody Allen*

As the introduction already suggested, the paradox of the opening anecdote comes from the ambivalent position of the battle drone. Common sense dictates that the drone is both an object, a social entity (to the extent to which it interacts with ‘subjects’), a technical artefact, and above all a passive, ‘stupid’ chunk of matter. Usually it is taken for granted that when a machine (or any object) has a voice it is only metaphorically so, because any

actorial powers are projected unto it by the ‘subjects’ surrounding it. Any relations between ‘subjects’ and ‘objects,’ no matter how hybrid and ambivalent they may seem, are in fact neatly divided into the cold machinic world of cause and effect and the warm social world of mental projections. What makes the colonel’s reaction funny in the context of our culture is his sentimental crossover, transgressing the separation of reality into two very distinct planes – that of a ‘warm’ populated by subjects *social*, and that of a ‘cold’ populated by objects *natural*.³⁵ The treatment of the crippled machine therefore cannot be ‘inhumane,’ because there is nothing humane about the machine in the first place; so the logic goes.

The separation of the world into ‘society’ and ‘nature’ provides great convenience for an a priori ordering and structuring of relations. The problem is that by specifying in advance the types of possible relations, and therefore the types of actors and their possible movements, this position cannot account for the multiplicity of roles, and beings, played by entities such as the battle drone. Instead, this position has to resort to mental projections, illusion, and fetishisation, so as to silence the plenitude of transgressive voices. How inhumane indeed.

The causes for this state of affairs run deep, and have been argued to extend as far back as the end of the sixteenth century, when the nascent Europe, given wings by the *Renascimento*, chose to substitute God as the basis for legitimation with a completely new concept – that of Nature.³⁶ The animated, hybrid and monstrous reality of the medieval world gave way to a much ‘purer’ new setting: that of a neatly delineated field of passive machine-like Nature ruled by the laws of Reason, with the world of Man (thus gendered for a long time to come) above it. From now on philosophers did not need the dizzying heights of scholastic argumentation to look for a neutral authority on political and ‘social’ issues, instead one had to just revert to the machine of Nature with its

³⁵ Any kind of objects, be they machines or mere matter, fall on the *natural* plane, unless a subject projects some social intentionality on them.

³⁶ For an account of the links between the Renaissance and the rise of mechanical philosophy, see Bono (1995), Shapin & Schaffer (1985), Webster (1982), and Lüthy, Murdoch, & Newman (2001).

inexorable and ultimately ‘objective’ laws. “The very enslavement of nature to a metaphysics of regularity, necessity, and uniformity recommended it as an arbitrator” (Daston, 1998b: 151).

This position, fully developed by the new science of the seventeenth century into what became known as “the famous mechanistic theory of nature” (Whitehead, 1967: 50), moulded reality into a slow and inexorable conveyor belt of successive configurations of dull matter, all instantaneous and self-contained. The resulting “Mechanical Philosophy” (Bono, 2005: 138), armed with its access to the neutral laws of the metaphysics of regularity, deposed religion from the throne of the ultimate political arbitrator; a position it holds to this day. To function, this position needs the premise of a Nature metaphysical in its mechanical purity, serving as the explanans for the social reality apprehended in the mind. This is the manoeuvre which Alfred North Whitehead condemned as *the bifurcation of nature* in his programmatic work on process philosophy *The Concept of Nature* (1920). I think it is worth quoting him in detail:

What I am essentially protesting against is the bifurcation of nature into two systems of reality, which in so far as they are real, are real in different senses. One reality would be the entities such as electrons which are the study of speculative physics. This would be the reality which is there for knowledge; although on this theory it is never known. For what is known is the other sort of reality, which is the byplay of the mind. Thus there would be two natures, one is the conjecture and the other is the dream. Another way of phrasing this theory which I am arguing against is to bifurcate nature into two divisions, namely into the nature apprehended in awareness and the nature which is the cause of awareness. The nature which is in fact apprehended in awareness holds within it the greenness of the trees, the song of the birds, the warmth of the sun, the hardness of the chairs, and the feel of the velvet. The nature which is the cause of awareness is the conjectured system of molecules and electrons which so affects the mind as to produce the awareness of apparent nature. The meeting point of these two natures is the mind, the causal nature being influent and the apparent nature being effluent. (Whitehead, 1920: 30-31)

Of all the problematic assumptions entangled in the bifurcation against which Whitehead protests, the one most relevant to the argument is the conceptualisation of matter as a substance with inherent attributes waiting to be perceived in awareness (the drone's in-human machine-ness). That is, the division of reality into a nature apprehended in awareness as *attributes*, and the nature which is the cause of awareness as *substance*. In this setting, the attributes of matter are eternally anchored in the mind, while matter-as-substance is merely the side effect of "the fortunes of matter in its adventures through space" (Whitehead, 1920: 20). In other words, on the one hand there is the substantive, material nature populated by knowable objects and serving as an *explanans*, while on the other hand there is the nature of attributes and senses, populated by knowing subjects and serving as an *explanandum*. On the one side of the divide a dull and repetitious machine (the battle robot's substance), on the other "a phantasmagoria of our senses with no other existence than the circumvolution of our brain and the illusions of our mind" (Latour, 2005d: 4) - (all the attributes of the battle robot) (Figure 1).

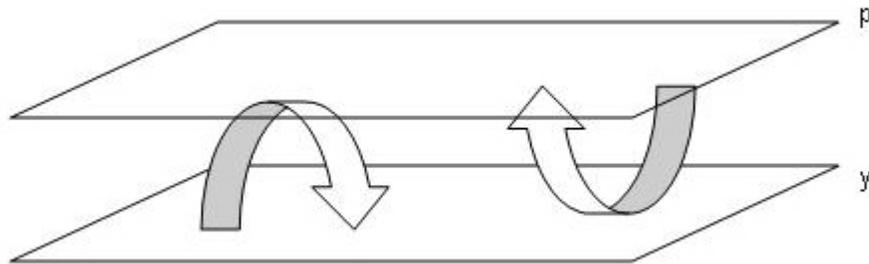


Figure 1: Bifurcation - the nature apprehended in awareness (p) and the nature that is the cause of awareness (y). *P* is borne out of the mind as the awareness of *Y*, while *Y* is simply the "fortunes of matter in its adventures through space."

Notice that the dichotomy depicted in Figure 1 does not in any way account for a potentially complex spatio-temporal reality; both time and space are essentially simple and discrete occurrences tied to the presumed substantive essence of objects in the bifurcated nature. Each object is located in a discrete instance of space and time, which fully accounts for the object's substance; that is, the object is substantive in any

observable instance of time-space and is therefore prior to its relations to any other such substance. In fact, this quality of the bifurcated projection is also its biggest problem, because it leaves it unable to account for relational modalities.³⁷

[The] material is fully itself in any sub-period however short. Thus the transition of time has nothing to do with the character of the material. The material is equally itself at any instant of time. Here an instant of time is conceived as in itself without transition, since the temporal transition is the succession of instants. (Whitehead, 1967: 50)

The bifurcated nature leads to an almost caricatured image of time and space consisting of nothing more than repetitive instances of a substantive essence without any processual order between them.³⁸ The passing of time in this world-view is in essence an accident (Bono, 2005: 144-145) unrelated to the essential qualities of matter, and more importantly, unrelated to any other times. Accordingly, on this theory the precise substantive essence is never known except by its attributes, which in turn are mere instances of perception related by an inductive trick of the mind.³⁹

It is at once evident that the concept of simple location is going to make great difficulties for induction. For, if in the location of configurations of matter throughout a stretch of time there is no inherent reference to any other times, past or future, it immediately follows that nature within any period does not refer to nature at any other period. (...) In other words, the order of nature cannot be justified by the mere observation of nature. For there is nothing in the present fact which inherently refers either to the past or to the future. (Whitehead, 1967: 51)

According to Whitehead, the bifurcation theory of nature uses two mutually excluding principles to overcome this problem. What he terms the *sensationalist principle* posits

³⁷ Arguably, this is also the reason why philosophy from the 17th century to the present has been wholly preoccupied with the problem of being.

³⁸ The notions of space and time are engaged in detail in the second and third chapters.

³⁹ From here flow the convoluted problems of the correspondence theory of truth – another favourite pastime of modern philosophy.

that the problem of knowledge in a bifurcated reality can be solved by the concept of pure sensation, or pure experience, for which the world speaks itself in the form of pure unadulterated sense-perception data.⁴⁰ For this principle, sense-perception is a passive medium for the message-datum originating in substantive nature, and is incapable of explaining or informing the analysis of the datum. In other words, the sensationalist principle hopes to cut through the endless misalignment between the two bifurcated halves of nature, by positing a direct channel through which nature literally speaks itself across the bifurcation as an ‘objective object.’ Effectively, the sensationalist principle attempts to solve the bifurcation by theorising a way for nature to speak itself as pure datum into the mind.

This bridge across the bifurcation can only hope to work however, as long as it ignores the whole gamut of forms in which the world presents itself; that is, the manner in which the sense-perception data is delivered, received, and ordered. The sensationalist principle cannot afford to delve into the “subjective form of reception” because that would inevitably establish the heterogeneity of the supposedly pure datum; if substantive nature is to speak itself as pure datum there can be no questions of form. Whitehead’s critique of this principle points precisely to this weakness of the sensationalist principle when he argues that “all information can only be fully understood if the manner in which it presents itself is taken into account” (Halewood, 2005: 79).⁴¹

The other position, mirror opposite of the former, is what Whitehead terms as the *subjectivist principle*. While the sensationalist principle prioritizes sense-perception as substance revealed, the subjectivist principle prioritizes the other end of the unbridgeable divide – the subject experiencing the sense-perception.⁴² Here the

⁴⁰ Whitehead’s precise definition of the sensationalist principle is that “the primary activity in the act of experience is the bare subjective entertainment of the datum, devoid of any subjective form of reception. This is the doctrine of mere sensation” (1978 [1929]: 157).

⁴¹ Faint echoes of Whitehead’s argument can be found in McLuhan’s famous dictum “the media is the message.”

⁴² The subjectivist principle according to Whitehead presupposes that “the datum in the act of experience can be adequately analysed purely in terms of universals” (1978 [1929]: 157).

perceiving subject comes first, and subjective experience is a constant attempt to account for reality as pure form⁴³ - the exact opposite of the sensationalist approach. The subjectivist principle attempts to bridge the bifurcation by positing sense-datum as pure formalised reception resulting in subjective experience which, if it is to escape solipsism, needs to define itself as part of a class of subjective experiences, or universals, such as 'society' or 'morality.' As a result, there appears an additional bifurcation into an 'inside' - where the subjective experience occurs, and an 'outside' - of which only the shadow on the 'inside' is known. Accordingly, the role of subjective experience is to qualify the shadowy perceptions on the wall of this Platonic cave, and thus constitute and establish the particular order of the 'outside' world.⁴⁴

[Those] substances which are the subjects enjoying conscious experiences provide the primary data for philosophy, namely, themselves as the enjoyment of such experience. This is the famous subjectivist bias which entered into modern philosophy through Descartes. (Whitehead, 1978 [1929]: 159)

As Figure 1 attempted to demonstrate, the bifurcation needs to be predicated on the assumption of some sort of primary substance [(y): the nature which is the cause of awareness]; the part of the bifurcatory divide where 'the adventures of matter' occur and which is independent of any subjective perceptions of its possible attributes. This primary substance is the point of departure for the sensationalist principle aiming to align the objective substances with their correct attributes. The subjectivist principle in turn – departing from the formal attributes – aims to demonstrate how knowledge of the correctness of those attributes is possible. These are the moves that, while nominally

⁴³ I use 'pure form' for what Whitehead calls 'universals' in ironic reference to the medieval dispute between nominals and universals – itself deriving from the unsolvable 'truth problem' of Aristotelian philosophy mentioned above.

⁴⁴ In positing the two principles, Whitehead was also pointing out the main difference between the sciences on one hand and the humanities and social sciences on the other (Halewood, 2005: 80). While the former view sense-data as inert chunks of matter, or objects (sensationalist principle), the latter view sense-data as formal frames of meaning (subjectivist principle). Neither is able to account simultaneously for the concerns of the other.

attempting to bridge the bifurcation, build and reinforce it by creating a dichotomy between the world in itself and knowledge about the world in itself.⁴⁵ Right across this trench, on the one side of which is *the knower* while on the other – *the known*, lies the birth of the subject-object distinction. Accordingly, all knowledge lies with the subject, while the object has the innate ability to make itself known (Whitehead, 1967 [1933]: 175).⁴⁶

The unquestioned acceptance of the Aristotelian logic has led to an ingrained tendency to postulate a substratum for whatever is disclosed in sense awareness, namely, to look below what we are aware of for the substance in the sense of the ‘concrete thing’.
(Whitehead, 1920: 18)

Returning to the opening anecdote, the impulse to look below the reaction of the colonel, in search for a referential point in the material substance of the machine conceived as mere object seems to suggest the correctness of Whitehead’s observation.⁴⁷ The simple effectiveness of the bifurcating manoeuvre lies in its ability to strip the world of attributes and re-locate them in the mind, while simultaneously populating the world with ‘mere objects’ waiting to be assigned some attributes by that very mind. This simple manoeuvre has enormous political repercussions, as extensively argued by Bruno Latour in his *We Have Never Been Modern* (1993). Crucially, each object, each substance ends up being conceived as “complete in itself, without reference to any other substantial thing” (Whitehead, 1967 [1933]: 132-133); reference being henceforth

⁴⁵ This is what Whitehead calls the ‘subject-predicate approach’: “the evil produced by Aristotelian ‘primary substance’ is exactly this habit of metaphysical emphasis upon the ‘subject–predicate’ form of propositions” (1978 [1929]: 30).

⁴⁶ For example, inert matter making itself known as pure data appears as the tenet of logical positivism, while subjective experience knowing the world as pure forms appears already in Descartes’ *Treatise on Man* (1972 [1662]) as mentioned by Whitehead, but also in present day phenomenology. As Whitehead convincingly demonstrates, virtually all of the philosophical problems of modernity revolve around “the difficulty of describing the world in terms of subject and predicate, substance and quality, particular and universal” (1978 [1929]: 30).

⁴⁷ ‘The plague of looking below’ will be encountered throughout the thesis as a common thread in various approaches to the politics of socio-technical networks.

reserved for the all-perceiving mind of the subject. With one masterstroke, the world is rendered both mute and discretely static; and a discourse of mastery is firmly anchored in every attempt to describe the bifurcated world.⁴⁸ Rapid successions of solitary time-blocks envelope unrelated and mute objects forming a substantive exterior; the exterior in turn serving as the origin and explanans for the attributes of the subjective mind.

The whole notion is partly based on the implicit assumption that the mind can only know that which it has itself produced and retains in some sense within itself, though it requires an exterior reason both as originating and as determining the character of its activity. (Whitehead, 1920: 32)

In contrast to the bleak landscape of a bifurcated nature painted by the “theory of materialistic mechanism” Whitehead offers his own “theory of organic mechanism” (1967),⁴⁹ which first and foremost abandons the subject-object dichotomy in favour of a world populated by a plurality of hybrid subjects. To that end, he insists on a concept of subjectivity that would take account of all hybrid ways-of-being that entities could occupy. Moreover, he ignores the sensationalist-subjectivist divide, so as to render the world as filled with agencies, none of which is bifurcated into the subject-predicate conundrum. In Whitehead’s solution, the substance and its attributes are inseparable and “apart from the experiences of subjects there is nothing, nothing, nothing, bare nothingness” (1978: 167).

In other words, the theory of organic mechanism sees the world as filled with subjects, including those entities such as the battle drone, which we might be inclined to term as objects. This move allows his organism philosophy to account for a multiplicity of processual spatio-temporalities, teeming with actorial entities (subjects), which are neither inert nor discrete, but always existing in relation to the experience of other such subjects (Halewood, 2005: 82). By describing every thing⁵⁰ in terms of subjectivity,

⁴⁸ This may offer a clue as to the reason why critical theory is profoundly incapable of producing a description of reality without a discourse of mastery embedded somewhere within it.

⁴⁹ This position is also known interchangeably as the philosophy of organism, or process philosophy.

⁵⁰ The important role of ‘the thing’ will be examined in the next section in the context of technology.

Whitehead manages to deny with one stroke the rationale for the bifurcatory manoeuvre. Each entity now finds itself not only in-relation to others and incapable of any conceivable ‘substance’ outside of those relations, but also in-becoming – for relationality is a property of a dynamic time freed from the chains of bifurcated nature. The ‘problem of being’ stops being a problem, because there is no observable self-contained substance to speak of – only the experiences of other subjects. Materiality stops being a discrete chunk observable through epistemologically-correct attributes, and becomes a property of relational entities: “the notion of the self-contained particle of matter, self-sufficient within its local habitation is an abstraction” (Whitehead, 1938: 189).⁵¹

As a result, the philosophy of organism renders an approach to the world for which bodies take account of other bodies, “where bodies in some sense exhibit the property of perception and hence the ability to be affected by other bodies” (Bono, 2005: 166). The importance of Whitehead’s thesis lies precisely in his insistence on an organicist ontology for which each entity (subject) is an ontological event – an interrelation of spatio-temporalities and therefore other events (entities).⁵² When the world is rendered through the theses of process philosophy, the colonel’s remark sounds perfectly normal. More importantly, each entity (a human, an animal, a machine) appears as a network, a gathering of entangled in-becoming others (Whitehead, 1978 [1929]: 80).⁵³ Perhaps the most appropriate label for this settlement would be ‘*plenist ontology*.’

One cannot derive the concrete from the abstract or the ideal. And the concrete does not come to us already split into symbolic and material categories. Indeed, nature is unbifurcated: it is a single, *plenist ontology* in which matter, matters of fact, feelings,

⁵¹ This aspect of Whitehead’s reasoning can be traced to the influence of pragmatist philosophy and William James’s argument on the ‘use-value’ of propositions. On Whitehead’s connection and debt to pragmatism and specifically to the philosophy of William James, see Richardson (2005).

⁵² For a contemporary re-evaluation of Whitehead’s process ontology, see also Byrd (2005).

⁵³ Whitehead’s term for this is *concrecence* - from the Latin *con* + *crescere*, literally meaning ‘growing together.’

subjective experience, the experiencing subject, and experienced entities are deeply entangled.(Sha, 2005: 79) [emphasis mine]

Following Whitehead, the thesis that the world is populated not by facts and observations about them, but by concrescent agency, has been forcefully defended by actor network theory (Law, 2004a), science studies (Pickering, 1995), and heterodox philosophers such as Michel Serres⁵⁴ among others.⁵⁵ A plenist ontology pulls, metaphorically speaking, the rug from under the bifurcated projection of nature, and substitutes the entire knowledge-experience-fact problematic with an approach deeply rooted in a reality populated by actorial entities; “from matters of fact to matter as richly entwined and situated in a world of agencies” (Bono, 2005: 136).⁵⁶

For example, Bruno Latour has argued,⁵⁷ in concurrence with Whitehead’s position, that the solution to the bifurcation problem is not to add a rich lived experience to the matter-of-factness of nature - the way phenomenology does, because that approach only in fact deepens the divide by combining the sensationalist and subjectivist principles (Latour, 2004d: 244). Instead, his advise is to treat the subject-predicate approach (statements and matters of fact in his terminology) as the extreme positions of abstract reasoning, which too often come to substitute for an actual entity always belonging to matter at one end and to form at the other (Latour, 2003).

⁵⁴ For a masterly exposition of Serres’ approach to the subject-predicate problem, see Assad (2000).

⁵⁵ For example, a similar argument appears in the work of Gabriel Tarde, to be analysed below, and in the American pragmatist school – most notably with the thought of William James as was already mentioned. One can even find it in the Heideggerian concept of ‘thing’ – to be analysed in the next section, and in Heidegger’s treatment of metaphysics when he writes: “a regard for metaphysics still prevails even in the intending to overcome metaphysics. Therefore our task is to cease all overcoming, and leave metaphysics to itself” (1972: 24).

⁵⁶ On organicist approaches to materiality see also Lenoir (1998), Latour (2003, 2004d, 2005c), Jensen (2004), and Deleuze (1993).

⁵⁷ His argument appears most notably in his lectures on the bifurcation of nature (2005d).

Following Whitehead, Latour argues against the pernicious bifurcation of experience as the confrontation of a knowing mind with a knowable object, and instead re-describes experience as the concrescence of subjects.⁵⁸ Those subjects, or ‘operators’ as he terms them, are accordingly “linked in a series that *passes across* the difference between things and words, and that redistributes these two obsolete fixtures of the philosophy of language” (Latour, 1999c: 69).⁵⁹

For natural philosophy everything perceived is in nature. We may not pick and choose. For us the red glow of the sunset should be as much part of nature as are the molecules and electric waves by which men of science would explain the phenomenon. (Whitehead, 1920: 29)

As Donna Haraway argues, a plenist ontology therefore constitutes reality as “an active verb” (2003: 6), as a world in which relations define beings and there are no pre-established subjects, objects, actors, or forces.⁶⁰ Indeed, where the substance of a bifurcated nature is always to be found below and outside of its attributes, the entities of plenist ontology are always an entanglement of subjects, matter, feelings, and experience. Therefore, to assert, in the context of the opening anecdote, that there exists some primary substance or quality, some social force below and beyond the entangled concrescence, is to recreate the Platonic cave⁶¹ and re-establish the bifurcation. “Like nature, and for the same reason, society finds itself at the end of collective experimentation, not at the beginning, not all ready-made, not already there” (Latour, 2004c: 225).

⁵⁸ Interestingly, he points to the etymology of the word *reference* – deriving from the Latin *referre* – to bring back, and asks ironically: “is the referent what I point to with my finger outside of discourse, or is it what I bring back inside discourse?” (1999c: 32).

⁵⁹ Latour’s ‘operators’ are also referred to as ‘attractors’ by complexity theory; see Mackenzie (2005b).

⁶⁰ On Donna Haraway and processual ontologies, see Braidotti (2006).

⁶¹ The Platonic cave, in the words of Latour, permeated by “the logorrhea of the prisoners shackled in the shadows, who never know how to bring their interminable disputes to an end” (2004c: 11).

On *having* agency

A giant in a story is not a bigger character than a dwarf, it just does different things.
(Latour, 1988c: 30)

Despite Whitehead's convincing arguments to the contrary however, the subjectivity of the crippled machine seems to extend only as far as the subjective feelings of the humans around it. Barring the bestowal of some sort of innate quality (essence, substance, identity) on the machine, it still seems impossible to engage it in ontological arguments. Ontology after all is about *ontos* – *being*. The plenist ontology of process philosophy may deny the existence of substances as it turns its attention to being through others, but its reasoning may seem too 'soft' to invalidate a divide even bigger than the bifurcation of nature – that between humans and non-humans.⁶² Positing a common ontic plane of experiences both for humans and for non-humans seems to equate the being of humans to that of mere objects – and the heresy of objectification knocks at the door.

Modernity, at least in the way actor network theory approaches it, gives *things*⁶³ voice in one of two ways: on the one hand as idols (fetishes), which are 'false witnesses' and mere attribute projections of a deluded mind, and on the other as something self-evidential (facts), which leads the mind to truth as it is, without the corruption of human interpretation. The etymology of both *fact*⁶⁴ and *fiction* may stem from the common root of *facere* – to make, to construct, and to fabricate – but, as far as modernity is concerned,

⁶² As David Toews writes with regards to actor network theory (ANT): "How, without going back to medieval scholasticism and some sort of theory of innate qualities in each element of the universe granted by an all-powerful God, could an ant (read: ANT) be a participant in ontology?" (2003: 83)

⁶³ "In Roman and Germanic languages, 'thing' (*Causa, Sache, Ding, Thang*) originally stood for 'trial,' 'lawsuit,' 'judiciary assembly,' 'deliberation,' or 'accusation'" (Pels, Hetherington, & Vandenberghe, 2002: 3). On the etymology of the word *thing*, see also Heidegger (1967). Things, and Heidegger, will have a bigger part in the next section on technology.

⁶⁴ For a beautiful rendering of the history of the concept, see Campbell (1999).

the fetish needs denunciation for its obvious originary sin: the alienated agency of a human projected on a mute object. Things therefore speak, and have agency, in the already established pattern of a bifurcated nature - either as fetish, or as reified fact.⁶⁵

In both cases, critical theory strives to ‘unmask’ these seemingly inherent powers of agency as alienated and phantasmagoric representations of human definitions and performances, reducing what appear to be natural properties which emanate from the object itself as delegated actions and properties of humans. Because of this symmetrical ontological confusion, which juxtaposes the thing-ification of human actions and definitions to the personification and spiritualization of things, the critical vocabularies of reification and fetishism emerge as crucial sites of perplexity as soon as the ontological boundary between subjects and objects is rendered equally problematic and fluid as the epistemological boundary between the imaginary and the real. (Pels et al., 2002: 4)

How to talk about the world in a way entangling in a radical symmetry “matter, matters of fact, feelings, subjective experience, the experiencing subject, and experienced entities?” How to make things eloquent without resorting to “ventriloquism or projection” (Daston, 2004: 9)? Arguably, theoretically Whitehead has done the hard work in answering these questions, for the answers can be found in his argumentation. Facts here will always be remembered to come from *facere*, and as such, to be a “dead abstraction (...) from the living importance of things” (Whitehead, 1938: 11), an act of forgetting the trajectory of existence, the flux of difference, so as to isolate a single

⁶⁵ Pels, Hetherington, and Vandenberghe make a very convincing argument in tracing the convoluted metamorphoses of the concept of thing reification in critical theory, from Marxism to the Frankfurt School, through Debord, Baudrillard and their contemporary followers. Complicated by critical theory’s need to denounce Power, or some other overwhelming force, the epistemological problems around bifurcation grow exponentially. Their Platonic cave ends up consisting of layers of symbolic signification: shadows signifying other shadows in a vicious circle of what Richard Rorty termed as a ‘purificatory askesis’: “Suppose that this desire to be overwhelmed is itself just a sublimated form of the urge to share in the power of anything strong enough to overwhelm you. One form such sharing might take would be to become identical with this power, through a purificatory askesis” (1991a: 31).

point.⁶⁶ Additionally, the ‘operators’ (in-becoming entities) can be matter-of-factual only as long as one isolates and forgets the much wider network within which their in-becoming is suspended.

In that sense the poor objects of critical theory, covered in alienated projections, are a very serious act of forgetting the entire scenography of their becoming; what is required of course is a simple “shifting your attention from the stage to the whole machinery of a theatre” (Latour, 2005d: 21), and I will have more to say about *shifting* below. However, how to keep together the warm red glow of the sunset with the molecules and the electric waves, without assigning their places on the scale of being *beforehand*? How can the theorists of plenist ontology, metaphorically, have their cake, and eat it too? It seems that one can establish a platform on which to build the answer through the concept of agency, of reality as an ‘active verb;’ and it is in the work of Gabriel Tarde – the un-acknowledged godfather of actor network theory (Latour, 2002a) – that these questions meet their brilliant solutions.⁶⁷

Tarde argued that the word ‘society’ does not designate in advance some special type of relations, but is a verb describing the constant coming into being and performing of existence. For him society was another word for associations, not a descriptor of one set of relations (between subjects). He argued that there is no difference between the associations of – and therefore the societies of – rocks, atoms, painters, fish, or accountants; what made them alike was the necessity to associate, to remain in-relation,

⁶⁶ As Stengers argues: “Abstraction is not the product of an ‘abstract way of seeing things’. It has nothing psychological or methodological about it. It is relative to the invention of an experimental practice that distinguishes it from one fiction among others while ‘creating’ a fact that singularizes one class of phenomena among others” (2000b: 86). For a beautiful rendering of Whitehead’s position on facts, see Stengers (2005b).

⁶⁷ Gabriel Tarde is predominantly remembered as Emile Durkheim’s opponent in a famous debate on the direction of the discipline of sociology. Recently Bruno Latour has made an effort to re-introduce Tarde’s thought as the predecessor and ‘godfather’ of actor network theory. For an English translation of some of his work, see Tarde (1969). For a masterly discussion of Tarde’s sociology and its value in contemporary contexts, see Barry & Thrift (2007).

in order to remain in existence. As Andrew Barry and Nigel Thrift demonstrate, Tarde's approach constitutes "a sociology of relations" (2007: 514), where *relations* stand for all kinds of associations. The crucial shift in Tarde's ontology occurs in a direction similar to that pointed at by Whitehead (though arguably Tarde does a better job at expressing it), and is best captured in the motto of his philosophy: *Exister c'est différer - To exist is to differ* (Latour, 2002a).

Contrary to the bifurcated position where being is a matter of substances, Tarde repositions societies as a constant re-enactment of being, achieved through the exploration of new types of difference. Each society, each entity, has to repeat itself into existence through a constant transaction with others, the goal of which is - difference.⁶⁸ The 'bill' detailing the constant process of achieving difference is in essence the much sought after 'identity' realm; each entity repeating, opposing, and differentiating itself in a series of 'transactions' forming the trajectory of in-becoming. Furthermore, Tarde hits right at the centre of the *ontos*:

So far, all of philosophy has been founded on the verb *to be*, the defining of which resembles the discovery of the Rosetta stone. One may say that if only philosophy had been founded on the verb *to have*, then so many sterile discussions, so many mental falterings, would have been avoided. From this principle 'I am', it is impossible to deduce any other existence than mine, in spite of all the subtleties of the world. But affirm first this postulate 'I have' as the basic fact, then that which is *had* as well as that which *has* are given at the same time as inseparable. [Tarde, G. in (Latour, 2002a: 129)]

Notice how almost unthinkable this suggestion sounds even today, more than a century after first appearing: instead of *I am – I have* (and simultaneously *I am had*). The

⁶⁸ According to Tarde, no matter what they are, entities have to repeat themselves in existence from moment to moment, to oppose one another in order to continue existing, and to adapt to each other's opposition through difference. "'Repetition', 'opposition' and 'adaptation' are the three 'social laws' that are common, according to Tarde, to everything that moves forward in the same direction and that he calls 'societies'" (Latour, 2002a: 129). Notice also that Tarde's solution completely enfolds both space and time into the process of repetition of being.

projection changes instantly – a radical symmetry between humans and non-humans becomes undeniable simply by nature of that re-description. I may *have you*, but through being *had by me*, you establish a foothold and so *you have me* too. The colonel may sound funny treating an object as a subject, but by *enunciating* it into existence, he is *being had* by that very object-subject; and, crucially, the *having* goes both ways. “[That] which is *had* as well as that which *has* are given at the same time as inseparable” [Tarde, G. in (Latour, 2002a: 129)]. In other words, Tarde not only extends the notion of society to all kinds of agencies, therefore rendering the whole human versus non-human problem irrelevant, but also makes it impossible to talk of entities as something else *but* agencies.

While Whitehead’s positioning of his plenist ontology seems to leave enough ambiguity for the charge that he is simply equating humans with objects, Tarde repositions the subject-predicate problem in such a way that instead of him having to explain how objects can have agency, now the onus is on his opponents to explain how objects can be without agency yet still *be*.

To say that we don’t know the *being-in-itself* of a stone or of a plant, and at the same time to continue saying that they *are*, is logically inconsistent. [Tarde in (Latour, 2002a: 130)]

By shifting the discussion from *being* to *having*, he makes it impossible to perform the bifurcating manoeuvre of stripping the world from attributes and populating it with passive objects; now it is the bifurcators who have to prove they can *have* their cake and eat it too. When I enunciate any *thing* into existence I associate with it, and through me, its invoker, it gains difference, and yes – being. What Latour calls “the abyss” (Latour, 2005b: 164) between the social seen as a distinct substance, and the social seen as another word for association, is perhaps best visible when one realises that Tarde’s *to have* is another way of saying *to be translated into another*.

What is translated? Agency is! If an entity is enunciated, it *has* difference *enacted* through its enunciator. For the bifurcated view, agency is forever chained to that one

dominating substance which assigns attributes – the social and its population of subjects; in Tarde’s approach agency is a property of associations, of the chain of *to have – to be had*. Everything could be seen as having agency, or actorial powers, as long as it could be said to exist.⁶⁹

Because existence is defined as difference, ‘the bill’ of translations through past differences is the only way to define and study an entity’s existence.⁷⁰ If the colonel insists the battle robot’s treatment is inhuman, then this is to be added to the machine’s bill, or trajectory of differences: it *has* been human while repeating itself into existence through its network of being.⁷¹ The life story of a being is therefore the list and trajectory of its enunciations, of its *havings*, of its *prehensions*.⁷² Furthermore, if each actor-entity is simultaneously a bill of past translations and trajectories, it is also both a discernible node, and a network. Starting from the attribution of the label ‘social’ to all associations, and then re-defining the definition of actorial entity, Tarde also provides a working level distinction between societies. As Latour summarizes Tarde’s argument:

[When] a society is seen from far away and in bulk it seems to have structural features, that is, a set of characteristics that floats beyond, or beneath the multiplicity of its

⁶⁹ For a discussion of some of the implications of Tarde’s sociology for contemporary social studies, see Borch (2005).

⁷⁰ According to Latour, Tarde argued that sociology should be a general science studying precisely this bill of existence (2005d: 7).

⁷¹ To illustrate this point further, consider the following part of the battle drone story: “Even more startling than these machines’ capabilities, however, are the effects they have on their friendly keepers who, for example, award their bots ‘battlefield promotions’ and ‘purple hearts.’ ‘Ours was called Sgt. Talon,’ says Sgt. Michael Maxson of the 737th Ordnance Company (EOD). ‘We always wanted him as our main robot. Every time he was working, nothing bad ever happened. He always got the job done. He took a couple of detonations in front of his face and didn’t stop working. One time, he actually did break down in a mission, and we sent another robot in and it got blown to pieces. It’s like he shut down because he knew something bad would happen.’ The troops promoted the robot to staff sergeant - a high honor, since that usually means a squad leader. They also awarded it three ‘purple hearts’” (Garreau, 2007).

⁷² ‘Prehensions’ is part of Whitehead’s terminology for agency; see Richardson (2005), and Haraway (2003).

members. But when a society is seen from the inside, it's made of differences and of events and all its structural features are provisional amplifications and simplifications of those linkages. (Latour, 2005d: 8)

The more linkages and differences enfolded within – the more sturdy the characteristics of the society when seen from ‘outside.’⁷³ Once again, notice the difference between a bifurcated worldview with definite ‘social processes’ and facts waiting to be discovered somewhere out there, and a plenist ontology where ‘structural features’ stand for provisional amplifications of translational differences (Law, 2004a: 6). Bearing in mind Tarde’s definition of being, and the consequences it has for entities (both nodes and networks), ‘structural features’ seem to be a consequence of approaching societies (and entities in general) with a metric crude enough to conflate their difference and heterogeneity.⁷⁴ Once this process is understood for what it is, a working plenist definition of an *actor* becomes easy.

Following Whitehead’s and Tarde’s insights, an *actor* seems to be any entity which can present a bill of existence – a list of answers to trials which it managed to overcome in buying its repetition and continuation into being. Show me your bill, please, and I will grant that you *have* actorial powers. Or, more specifically: an actor is whatever shifts the actions of *others*, where action stands for the list of performances through trials which provide an actor’s trajectory (Akrich & Latour, 1992: 259). It follows that the more lists an entity appears on, the *bigger* actor it is; ‘*bigger*’ of course, stands for nothing else but the competences of the entity.⁷⁵

⁷³ As the last section of this chapter demonstrates, this is also a crucial feature of networks. This argument will be revisited in the second chapter in the context of network space and control, and in the third – in the context of network time.

⁷⁴ A similar conclusion seems to appear in feminist studies, semiology, and science studies; see Haraway (1994), Lenoir (1994), Woolgar (2002).

⁷⁵ For an example of the practical value of Latour’s concept of agency (in this case in archaeology), see Martin (2005).

How do you define an actant? An actant is a list of answers to trials - a list which, once stabilized, is hooked to a name of a thing and to a substance. This substance...is made the origin of actions. The longer the list [of appearances] the more active the actor is. The more variations that exist among the actors to which it is linked, the more polymorphous our actor is. The more it appears as being composed of different elements from version to version, the less stable its essence. Conversely, the shorter the list, the less important the actor. (Latour, 1991: 122)

How about all those *others*, the dwarves between giants who, through their prehensions, constitute the world yet remain invisible? As long as they take part in an enunciation, in any sort of in-becoming – they are actors too; and if they are invisible and indiscernible through the ‘structural features’ imposed by translational differences, they still exist - but as *intermediaries*. The difference between an intermediary and an actor is not ontological, it does not amount to a lesser sort of being, but flows out of the varying coordination and translation regimes⁷⁶ utilised by the various societies taking part in concrescence (Callon, 1991: 147). As long as we see the node – it is an actor, but the moment we go through it and see the network behind it the actor becomes an intermediary. In fact, as ANT argues, actors and intermediaries always emerge as a *consequence* of analysis, never as its starting point; the point of departure is always a *setting* where the competences are distributed between associations of entities, between networks waiting to be traced.

Setting: A machine can no more be studied than a human, because what the analyst is faced with are assemblies of humans and nonhuman actants where the competences and performances are distributed. (Akrich & Latour, 1992: 259)

It is the setting, the concrescence that provides actors with their agency and subjectivity; there is no other place of origin hidden behind or below, there is no substance beyond the attributes. The common space containing the details of the bill of in-becoming – that is an actor: “actantiality is not what an actor does - but what provides actants with their actions” (Latour, 1999b: 18). Actors then, are entities which constitute both networks

⁷⁶ On the complexities of coordination regimes, see Law & Singleton (2003).

and nodes (societies and subjects); they are individuals and collectives, the division between the two being an *effect*, a working fiction (Callon & Law, 1997).⁷⁷ Thus defined, the concept of agency opens up possibilities for analysing all matter of settings involving *anything* - from the red light of the sunset to the atoms and electrons occupying the same plenist ontology. The entities being-through those agencies have no fixed boundaries and no a priori attributes (Law & Singleton, 2003: 3); they may fit oddly, or only partially, in any given setting or association, yet they *are* in a radical symmetry to their relations.⁷⁸

So far, however, the argument has not addressed the issue of temporal misalignment between structures and individual entities, and the closely related problem of translational displacement (shifts). Undeniably, often structures understood as particularly stable settings and translational regimes predate the entities who find themselves entangled within them. Where does agency reside in this case? It seems commonsensical and even routine to assert that in that case the agency resides solely within the structure predating the entity entangled within it; a relationship resembling that between a prey and a spider's web. That however, would lead straight back to the landscape of a bifurcated nature, with structures and symbolic significations enveloping the hapless entities entangled within them.⁷⁹

The bifurcation appears when structures acquire their "transcendent aura as a result of performative activities which are routinely misrecognized for what they are" (Pels, 2002: 73). As long as it is remembered that the 'structure' in question is nothing more than a very stable setting, a concrescence with a long and heterogeneous bill, the question of temporal misalignment boils down to a question of translational shifts.

⁷⁷ As philosopher of science Isabelle Stengers puts it: "only retrospectively do science and technological innovations ever allow morality tales to be made out of history. Once a controversy is over, it seems that Nature has spoken, has designated the winner" (2000a: 45).

⁷⁸ A similar conclusion also appears in pragmatist philosophy: "[T]here is no interesting difference between tables and texts, between protons and poems [...] these are all just permanent possibilities for use, and thus for redescription, reinterpretation, manipulation" (Rorty, 1982: 152).

⁷⁹ This will also sound a prompt return to the discourse of mastery and all its unsolvable problems.

No one ‘reflects’ a pre-given structure: every one pushes and pulls at it, works upon it, modifies it, in order to render it a little more solid or a little more fluid. (Pels, 2002: 84)

Similarly to the famous Baron Von Münchhausen of German folklore, the acting entity pulls itself out of the bog of ‘structure’ by the hair, while the bog pulls it in.⁸⁰ In that sense the relationship is always *have – have*; a mutual performative activation of agency where both entity and setting constitute each other’s agency. This situation is somewhat similar to the text-reader relationship in semiological theory, where the text acquires agency through being *had* by the reader, and the reader acquires agency through being *had* by the text. The reader confronts a ‘structure’ which is literally, and in the most physical of ways, performing her as a reader while simultaneously being performed by her as a text (Lotman, 1990: 63).⁸¹ The list of consecutive agencies acquired in this way is the very same bill of existence mentioned earlier; and the shifts between agencies are the translational displacements (trials) caused by temporal or spatial misalignment.

In that sense, the capacity to act as manifested by the ‘Münchhausen law,’ does not ‘reside’ in any particular actor; as Latour argues, it is not a property of substance, but of

⁸⁰ Dick Pels terms this as the ‘Münchhausen law’ in social theory (2002), arguing that actors misinterpret their performative contribution to the surrounding reality and reify imaginary ‘structures,’ which, thus reified, go on to act back on the actors, but this time as facts. Baron Von Münchhausen was an actual 18th century German aristocrat who, having returned from years of military campaigns in Eastern Europe and against the Turks, quickly gained notoriety and fame due to the completely unbelievable tales of his adventures. Probably the most famous of these was the tale of how the Baron, having ridden his horse straight into a swamp, managed to pull the horse and himself out by pulling his hair.

⁸¹ Semiologist Yuri Lotman terms this mutual enactment of the world (similar to Whitehead’s concrescence) as a ‘semiosphere.’ He likens the semiosphere to a “museum hall where exhibits from different periods are on display, along with inscriptions in known and unknown languages, and instructions for decoding them; there are also the explanations composed by the museum staff, plans for tours and rules for the behavior of the visitors. Imagine also in this hall tour-leaders and visitors and imagine all of this as a single mechanism (which in a certain sense it is). (...) Then we have to remember that all elements of the semiosphere are in dynamic, not static, correlations whose terms are constantly changing” (1990: 126-127).

reference. The reference in question is not the bifurcatory subject-predicate manoeuvre but the mutual activation spoken of above. Therefore, the problem of the predating structure is only a problem as long as actorial powers ‘reside’ within substances limited by their spatio-temporal location. As was already argued, the brilliance of Tarde’s solution frees us from this limitation and instead positions agency firmly as an effect of relational performativity. It is not the displacement of substances that is followed, but the re-appearance, the re-presentation of agency; not “respect for the image itself but for the movement of the image” (Latour, 1998a: 421). Viewed in time then, the reference between entity and ‘structure’ predating it can also be formulated as a translation process, where the formulation of the ‘object’ of reference is a function of the alignment of the various participatory bills.⁸²

This realisation comes in confirmation to the obvious observation that no two reader-text enactments look alike. Finally, each translational shift⁸³ is “always away, but not beyond” (Latour, 1998a: 436) – away to another setting and a richer bill, but not beyond the firm ground of an un-bifurcated ontology. The sterile oscillations of the philosophy (and politics) of identity always keep rotating between substance and attributes; in that context the concept of identity leads to nowhere but bifurcations. Where for bifurcated entities what matters most is substantial essence, for plenist ontology what matters most are the attachments, associations, properties, and proprietors of an entity. The entire politics changes with this little flick of the projection - from *I am* - to *I have*.

⁸² As historian of science Peter Galison puts it: “objectivity is bound up with the process of depicting objects” (Galison, 1998: 327).

⁸³ ANT has developed a particular jargon of meanings around the concept of shifting: “Shifting out, shifting in: Any displacement to another frame of reference that allows an actant to leave the ego.hic.nunc - shifting out - or to come back to the departure point - shifting in. For narratives there are three shiftings: actorial (from ‘I’ to another actor and back), spatial (from here to there and back), temporal (from now to then and back); in the study of settings one has to add a fourth type of shifting, the material shifting through which the matter of the expression is modified (from a sign FASTEN YOUR SEAT BELT, to an alarm)” (Akrich & Latour, 1992: 260).

In this there is no longer a site delegated to thought; the situation of the thinker - now Ulysses in the ocean of complexities - is both mobile and immobile, relative and absolute (...) As a monad-echo of a thousand voices, in continual relation with the monadic network, but without a prearranged harmony (...). (Polizzi, 2000: 249)

Having indicates attachment, relation, involvement, enrolment, enfolding. As this section argued, when the bifurcation of nature is ignored the world becomes populated by agencies, not substances, and those agencies are properties of relation, of *having*; “from *An Sich* to *Inter Se*” (Latour, 2005d: 10). With the bifurcation of nature left behind, the moves of the entities ordinarily populating the ‘social’ and the ‘natural’ were argued to constitute translations between agencies, or shifts. Furthermore, it was argued that entities should be considered as trajectories of in-becoming if the rich heterogeneity of plenist ontology is to be grasped. Utilising the crippled body of a battle robot, the section posited that actorial roles cannot be assigned in advance, and that each entity – human or non-human – can be said to have agency if it can be said to exist. The section asserted that an approach based on substances does not describe well networks of translations, but one based on becoming and difference does.

Techniques

Here, too, the gods are present. *Heraclitus*

Starting with an inhumanely treated machine, the previous section established that the ‘social,’ as encountered in the term ‘socio-technical,’ stands for associations of entities, and that those entities are equally rooted in a plenist ontology of in-becoming. With the ground cleared of the subject-predicate problems of a bifurcated nature and the whole baggage of issues of mastery and identity surrounding them, this section examines the technological side of the ‘socio-technical’ assemblage. Specifically, it is argued that the investment of technology with radically in-human instrumental logic is problematic. It is argued that the bracketing-off of technique as a machinic life-form in ontological opposition to the human creates a bifurcation more pernicious than the one attacked by Whitehead and Tarde. Furthermore, technique is argued to be contumacious not because of an inherent machinic logic, but because it enfolds agency and transports it in time and space. Technique is argued to simultaneously associate and dissociate agency, and coagulate the translatory shifts of entities. The section reaches the conclusion that the social and the technical are in fact indistinguishable, and that technique is simply another word for coagulated agency.

Gazing at Medusa: the question concerning technology

To begin the argument on technology let us return to the anecdote of the crippled machine and the army colonel’s seemingly paradoxical reaction. When cleared from the muddle of the subject-predicate problematic, the story is left with two actor-entities: a

human and a machine. Obviously, both have agencies but the question arises whether their agency is of the same kind. In other words, is there any particular quality in machinic agency that makes it radically discernible from human, or other, agencies? Notice how even when the bifurcation of nature is left behind, there is still fissure wide enough to insert a wedge within the coherence of plenist ontology; the issue at stake is the type of agency involved in displacement. The arguments presented so far leave, on face value, no such space of contention – the battle robot is an actor, and a subject – but it is also a machine, and it is here that another bifurcation appears. In this bifurcation machines and technology in general are presumed to filter their entanglements with reality through a uniquely machinic and autonomous ‘logic’; a logic whose essence is a radically inhuman instrumentality positing it in direct dichotomous relation with humans.

This presumption, of course, automatically orders the actors and their agencies into two distinct fields with a clearly hierarchical separation of roles. Either the human is in control and the drone a mere tool – this relationship bearing resemblance to the standard subject-object dichotomy; or the drone is a dangerous supplement to the human with a distinct a-human instrumental logic which has to be kept in check. This bifurcation diminishes the entire range of potential actor-roles into the already encountered discourse of mastery. In symmetry to the earlier arguments, the section will therefore begin by asserting that as long as the presumption of mastery appears in the descriptions of actors and relations, the relations between the battle drone and the humans around it will be inexplicable. As long as the discourse of mastery appears as a ‘social fact,’ a study of the politics of networks – all kinds of networks – will be a futile sublimation of the human subject from its immersion in technicity. For the discourse of mastery, the technological ‘other’ will always be either subservient to, or autonomous from humans, therefore returning the subject-predicate bifurcation back on the table.

My position is that the dichotomy between technical and human agency is a misapprehension of the essence of technique, precluding any understanding of the complexity of a network assemblage. Philosopher Walter Ong once quipped that “texts

are inherently contumacious” (1982: 79) and the previous section demonstrated that all matter of entities are contumacious too. Below I will also suggest that contumacy is one of the defining characteristics of technique. My thesis is that the question concerning technology is primarily a question of explaining agency as it relates to time and repetition; time, because agency undeniably appears as a displacement in time-space with the help of technique, and repetition, because this displacement has the quality of being stable enough so as to allow a constant re-enactment. It is this quality of technique that, my thesis posits, allows it to be mistaken for an autonomous and dangerous force.

Of the two positions on technology emerging from the colonel-crippled machine setting, the first – positing a simple relation of mastery between a human (user, master) and a machine (used, tool) – falls well within the simplistic and is easily refutable with the toolkit provided by the previous section. The second however – positing a complex relation between a human user who is simultaneously used and potentially diminished by an autonomous machinic instrumentality – requires further enquiry.⁸⁴ At first sight, this second position is non-bifurcated because it establishes some sort of symmetry between technical and non-technical actors.

However, this is exactly the new dichotomy it creates; it invests technicity with a discernible autonomous agency which – here mastery reappears – is always engaged in a zero-sum game with the human. The more machinic agency - the less human the setting and the more diminished the social, ultimately leading to a total mastery of technicity over the human.⁸⁵ At the core of this idea lies the positioning of technicity as an

⁸⁴ The distinction between the two positions appears in various forms in numerous studies of technology. For example, philosopher of technology Andrew Feenberg argues that there are two approaches to technology - instrumental and substantial (2002). The instrumental is argued to treat the technical as subservient to other social spheres and positions it as a tool of mastery. The substantial in turn attributes an autonomous instrumentality to technology and positions it as a force overriding other social spheres (2002: 5).

⁸⁵ This position on technicity, similarly to the bifurcation of nature, can be traced back to Plato. Socrates in Plato’s *Phaedrus* opposes the technology of writing as inhuman, because it establishes memory outside of the mind; he argues that it in effect robs the mind of the ability to memorize, unless it delegates this

originary and dangerous ‘prosthesis’ to the human, in other words as the “other within” (Mackenzie, 2002: 6).

Technology, when bracketed off and posited as a question - as in ‘the question concerning technology,’ the title of Martin Heidegger’s famous essay on technique – appears as a bifurcation of techniques from humans, technical artefacts from human facts of art. Technicity, seen as the basic manoeuvres leading to a technical entanglement, is rendered as a “material opacity” (Barnet, 2003) with an indigenous and inexorable logic. This logic transgresses the subject-predicate bifurcation and establishes in its place a far more sophisticated bifurcation of ‘logics.’ The dichotomy of technical-human gives birth to a separation between human and technological artefacts, ‘natural’ objects, and technical constructs; where the former are supposedly unspoiled by the supplement of technical logic.⁸⁶ The permitted moves within this bifurcation are in the already encountered realm of the contradictory: substance versus mediation, *being-in-itself* versus being-in-construction, *episteme* versus *techne* (Barnet, 2004).

Martin Heidegger’s theoretical position on technology is of primary importance if one is to understand the conceptual features of the bifurcation. His thought on technology encapsulates the two prevalent approaches outlined above – technology as a tool, and as a dangerous prosthesis to the human. Furthermore, the influence of his concept of *enframing* (*Das Gestell*), and the conceptual apparatus it provides to feed the bifurcation, could be found to inform the majority of the modern discourses on technique. If that claim sounds too boisterous, consider this – one of the opening

ability to writing. Ironically, Plato’s thought was possible only because of the effects writing was beginning to have on oral culture. His objections were as much the product of writing as an objection to writing. In fact Plato excluded from his republic the only people who represented pre-writing culture - the poets. As I examine this position below, there will appear various ‘flavours’: in its instrumental logic technicity is either overtaking us (Ellul, 1964; Heidegger, 1977), or we are internalizing it (Mumford, 1967), or we are merging with it towards an Omega point (De Chardin, 1965).

⁸⁶ On the historical development of the concept of artefacts, see Bredekamp (1995), Freedberg (2002), and Egginton (2003).

statements of Heidegger's essay: "Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it" (1977: 4).

From popular culture, to serious academic studies, to critical theory, humanity is portrayed in an at best uneasy relationship with a technical ready to enslave its 'master.' From Stanley Kubrick's rebellious on-board Artificial Intelligence *Hal* (1968), to William Gibson's nefarious cyberspace Artificial Intelligence in *Neuromancer* (1984), to the Wachowski Brothers' unhinged virus-like *Agent Smith* (1999), to Mamoru Oshii's evil cyborg hacker with the appropriate name *Puppet Master* in the cult anime series *Ghost in the Shell* (1995, 2004, 2006), technicity is firmly enframed within a discourse of mastery in the modern cultural milieu; and the poet of this enframing was undoubtedly Martin Heidegger.

It was Heidegger's special insight to understand that the future coded in the language of technology spoke quietly, but not less insistently, of another death - the hyperbolic sign of the death of the human. (Kroker, 2004: 24)

Heidegger saw the technical as an entanglement of an autonomous and in-human logic with the real, and a simultaneous disentanglement of that part of the real as an ordering already corrupted by technology. According to him, the entanglement occurs through the process of technological revealing, while the disentanglement is inherent in the return of the revealed as an already ordered, or enframed (*Gestell*), world. The goal of Heidegger's philosophy is at the first instance to warn humanity of the inherent danger of technique, and furthermore, to achieve a bracketing-off of the human from the enframing technical.

According to Heidegger, the enframing of the world is the essence of technology, it is "the way in which the real reveals itself as standing-reserve" (1977: 23) through the filter of technical artefacts. Being as "standing-reserve" first and foremost asks objects to present themselves as an ordering, it transforms reality itself into an order of

mobilized passivity where meaning exists only as the form of that ordering and never outside of it - the content of its form is the form itself (Figure 2).

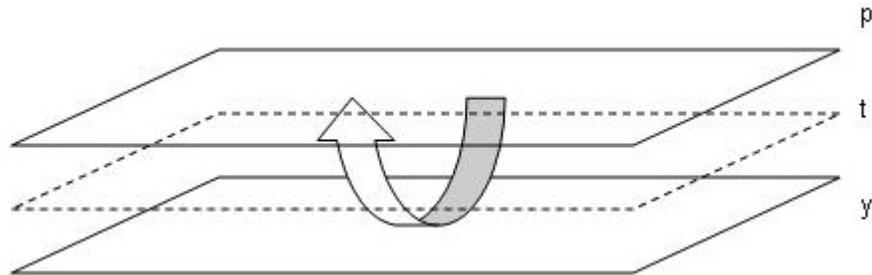


Figure 2: The enframing-revealing dynamic: the real (y) is challenged forth and enframed by instrumentality (t) into a standing reserve (p). The standing reserve (p) simultaneously reveals itself to (y) thus challenging it forth towards further enframing. Notice that the movement is a continuous extraction from (y) to (p) with its conclusion being the total ordering of (y). In other words, it is a hollowing out of the un-ordered ‘real’(y) into an ordered *Gestell* (p). With the introduction of *Gestell* Heidegger manages to split the already bifurcated reality into further bifurcations, and introduce a sinister dynamic into the process.

Human subjectivity is transformed by the technical mode into an “*objectless object*” (Kroker, 2004: 25),⁸⁷ and doubly denied access to the real - first through objectification, and second through the nihilistic ordering of objects into standing reserve where the only meaning is the ordering itself.⁸⁸ The technological mode of being is, accordingly, not a substance but a process; what Heidegger dubs as the “mode of revealing” (1977: 13). The “mode of revealing” is the return of the enframed, which, at the instant of its revealing, reorders the reality exposed to it into a “standing-reserve.”

Thus envisioned, technological revealing empties reality of any inherent (‘substantial’ in the bifurcatory vocabulary) property per se, apart from that which is ordered in the mode of “standing-reserve” (1977: 17). Technology therefore is not in the first instance an

⁸⁷ For a contemporary critical theory rendering of Heidegger, see Kroker (2002).

⁸⁸ For another account of the links between Heidegger and the Frankfurt School, see Feenberg (1996).

assembly of tools and instrumental practices (although it is also that), but a looped process of enframing-revealing which leaves behind nothing, apart from an ordered reality – the “standing-reserve.”

In the context of a plenist ontology of agencies, Heidegger’s theory positions technique as an agency radically foreign to the human life-form – a virtually mirror-opposite to the messy organic world of the *lived*. The instrumental agency of technicity introduces in every possible world the discourse of mastery, with the dual move of enframing-revealing “challenging forth” the enfolded entities “to order the real into standing reserve” (Kroker, 2004: 52). As part of the master-slave bifurcation brought with an autonomous technicity, Heidegger positions the essential qualities of the human-technical divide of agencies as a clash between the human *poiesis*⁸⁹ as opposed to that of machinic *techne*⁹⁰ (1977: 18).

To reassess, Heidegger positions technology as a process driven by an autonomous logic through which the world is first enframed, and then revealed as a standing reserve. The enframed functions as a sort of ‘database’ for technicity⁹¹ although this “standing-reserve” constantly reveals itself and challenges forth the remaining real into enframing. The concept of enframing therefore functions as an explanans for a double-bind agency, which brings forward (reveals), and returns – orders into standing reserve. What exactly is being revealed? Heidegger’s answer is truth, or rather, the being of the world without mediation – *aletheia*.⁹² The revealing of which Heidegger speaks is essentially the coming to presence of *aletheia* into the framework of *Gestell* (1972) (Figure 3).

⁸⁹ *Poiesis* derives from the Greek verb indicating *to make*, it is also at the root of *poetry*, and is used by Heidegger as a descriptor for the natural, artful ‘bringing forth’ of a new being.

⁹⁰ *Techne* derives from the Greek word for craft, for something which is made through crafty manipulation of matter, and as such it had a slightly derogatory meaning for both Plato and Aristotle, who viewed *techne* as at best of secondary importance to *episteme*, and at worst as an outright dangerous activity. For Heidegger *techne* is the ‘dangerous other’ lurking in the process of creation. “Heidegger saw nothing in technology save the punishment for our original Platonic sin” (Rorty, 1991b: 74).

⁹¹ The technicity of databases will be examined somewhat closer below.

⁹² *Aletheia* derives from the Greek word for something that is just there, for a pure being disclosed in itself

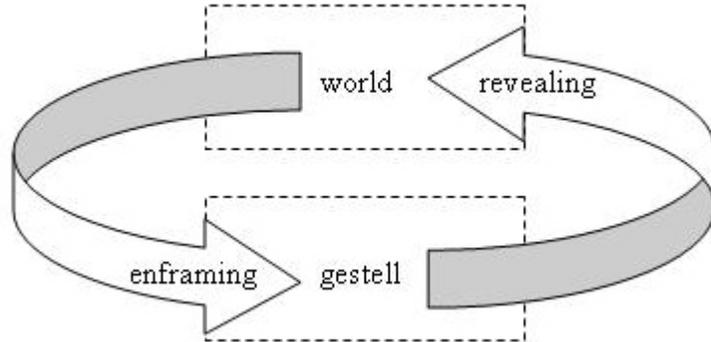


Figure 3: The dual aspects of techne (Medusa's gaze): technology in the mode of enframing-revealing acts as a centrifugal filter, purifying reality, and ordering *the lived - aletheia* into the standing reserve of *the instrumental - gestell*.

It follows that technology is a fully formed mode of being - a self-enclosed and self-reliant mode which has a teleological direction - that of a final re-ordering of everything revealed in being as pure substance into being as standing-reserve.⁹³ By depicting technicity in this way, Heidegger established a counter-program for a new and reinvigorated epistemology, which aims to know the world as a self-revealing substance (*aletheia*), rather than as a mediation of technicity. For Heidegger mediation was always suspect – it hinted of craft and techne.⁹⁴

without mediation. In resurrecting this concept, Heidegger aims to circumvent the bifurcation of nature by positing a direct way in which Nature speaks itself as a pure truth or being – *aletheia*. In light of the argument of the previous section, Heidegger's attempt can easily be recognized as Whitehead's 'sensationalist principle' of bifurcation.

⁹³ Interestingly, the conceptualisation of technology as an essentially autonomous agency with a teleological development appears also as the concept driving the work of philosopher Teilhard De Chardin (1965). The difference is that in his case technicity and humanity strive towards the 'Omega point' of merger, whereas for Heidegger the end line is the total enframing of the real and therefore obliteration of the human.

⁹⁴ It is also interesting that Heidegger had such an aversion to craft as a mode of creation. In that, as in the rest of his philosophy, he tried to replicate Plato's republic of philosophers. The irony is that Plato did to Greek myth what Heidegger accused technicity of doing to the peasants of his beloved Black Forest.

[Heidegger] wanted a language that was not hammered out as an instrument for communicating, for helping us get what we want, but one that 'is what it says' (a compliment he once paid to Greek). He wanted to discover a language that was as close to silence as possible, rather than to reweave the connections between the various things we want to say. (Rorty, 1991b: 73)

An interesting aspect of Heidegger's position is that technology and techniques are not mere objects in the colloquial way of the subject-predicate position. Technology is never only a function of human agency nor a mere means within such an agency (1977: 21). Instrumentality has, according to him, the uncanny ability to repeat itself into existence through its very essence as enframing-revealing.⁹⁵ The essence of technology is in effect this bringing forth, or revealing, of entities into a new form of instrumental being which substitutes the *aletheia* of a lived world with the *Gestell* of a standing reserve. Technology is literally a self-propelled, virus-like being-dissolving force.⁹⁶ The ordering for ordering's sake is the only quality which technology possesses – an essence whose revealing is the ordering of everyone and everything in front of which it is revealed. The essence of technology is in effect the gaze of the gorgon Medusa from the myth of Perseus – everyone who meets it finds themselves ordered into a “standing-reserve,” into stone.

The Medusa gaze of technicity represents a potentiality, which, if left unchecked, obliterates and reorders the real. Heidegger's suggested way out of this bewitched dynamic involves his concept of *poiesis*; the question concerning technology, as he sees it, is a question concerning the dichotomy between *techne* and *poiesis*. For Heidegger it is the hidden, the veiled, that is also the poetic and essentially human part of the coming to presence of being which asks us to choose between itself and *techne*. *Poiesis* then is

⁹⁵ Philosopher Mark Poster explicitly critiques this aspect of Heidegger's position in (2001a: 21-38), though he bases his critique on the assumption that information machines are 'different' from Heidegger's *techne*.

⁹⁶ Perhaps the best visual illustration of Heidegger's position on technology comes from the role of the 'Agent Smith' character in the Matrix movie trilogy (1999). At the end of the final film Agent Smith has ordered everything in the Matrix-reality into a standing reserve for Smith-ness.

the artful and poetic deflection of technicity into an artistic creation; if *techne* is the gaze of Medusa, *poiesis* stands for the shield of Perseus.⁹⁷ Considering the almost dialectical play of *techne* and *poiesis*, the essence of technicity appears as “*split consciousness*” (Kroker, 2004: 38) in the form of two irreconcilable ‘logics.’ The shield of Perseus is also a technique, but it speaks the language of *poiesis*, not *techne*, because it was transformed by the human. The question concerning technology is ultimately a quest for a human purity of essence which technology, in its “mode of revealing” and conversion of reality into “standing-reserve,” denies and turns into stone.⁹⁸

The moderns indeed declare that technology is nothing more than pure instrumental mastery, science pure Enframing and pure Stamping, that economics is pure calculation, capitalism pure reproduction, the subject pure consciousness. Purity everywhere! (Latour, 1993: 66)

The influence and popularity of Heidegger’s theory of technology derive in my opinion precisely from his rendering of technique within the tried and tested discourse of mastery, and the addition of a dangerous oppressive dynamic of technical mediation to be resisted at all costs; at stake is nothing less but the purity of being. This conceptual toolkit has proven useful for multiple variations of the mastery discourse because all the essential ingredients are present: an insidious oppressive force with a claim to mastery, a dichotomous zero-sum relationship with the social (perceived as the ‘social’ in a bifurcated nature), and a logic of control which hollows out the world of its purity of being.⁹⁹ Indeed, an indigenous logic of control is an essential aspect of technology

⁹⁷ According to the Greek myth Perseus used a polished bronze shield given to him by the goddess Athena (the goddess of wisdom) to deflect the deadly gaze of the gorgon and approach her safely.

⁹⁸ Ironically, in the myth Perseus cut off Medusa’s head and used it afterwards against his enemies - *poiesis* became *techne* and *techne – poiesis*; a fitting practical coda to Heidegger’s dialectics.

⁹⁹ For example, every machinic solution added to the process of production, that is, every technological innovation, can be argued to serve to alienate and discipline the workers through the degradation of skills and the fear of displacement. As workers are substituted with machine logic what is left is either not to work or otherwise detour the process (Debord, 1994 [1967]), or to directly confront the logic of instrumental machinic reordering in all its implementations in a return to idealised tradition. Thus, the machines and their instrumental logic supply all kinds of totalizing discourses with a ready villain. Ludism

according to this reading; “technology restructures the entire social world as an object of control” (Feenberg, 2002: 6). Resisting the logic of control then becomes a self-evidential part of the oppression dynamic, with the only way out of total instrumentalisation being “a total retreat to tradition” (Feenberg, 2002: 7).

Therefore, when philosopher Jacques Ellul proclaims in despair, that “technique has become autonomous” (1964: 14), he also simultaneously reinforces the mastery narrative and introduces a fear of the unknown *other* within our midst.¹⁰⁰ According to Ellul, technology tends towards closure and self-determination, it aims to radically separate itself from the social because the autonomy of closure (enframing again) is the very condition of technological development.¹⁰¹ Instrumental reason is supposed to radically uproot and re-order objects exposed to it, while retaining a transcendental detachment from those same objects. Accordingly, within this matrix, the technical can only be seen as a hollowing-out, a vampirical force.¹⁰²

An important aspect of this autonomy is that technology radically modifies the objects to which it is applied while being scarcely modified in its own features. (Ellul, 1980: 386)

A somewhat alternative reading of Heidegger’s unholy technical dynamic would simply return to the already firmly established bifurcation theory of nature and attempt to explain away the strange opacity of the technical through the bifurcated version of the social (Feenberg & Hannay, 1995: 5). On this assumption, any position that does not explain technicity through a reference to society is simply technological determinism. Therefore, while the simplistic logic of technological determinism gives all the power to

and its call to tradition and a non-machinic past neatly fit this picture. A thorough critique of this position and its spiritual origins appears in MacKenzie (1984).

¹⁰⁰ The same warning cry can be found on the technical pages of virtually every newspaper on the planet; here, as well as in the rest of contemporary culture, technicity is firmly positioned as ‘the other within.’

¹⁰¹ Latour terms Ellul’s position as *elludism* (1988a).

¹⁰² The metaphorical view of technicity as a vampirical force fits nicely with critical theory’s position on capitalism – technology’s partner in crime. The pop-version of this position appears notably in Klein (2007).

a machinic essence, which in turn confronts and impacts the social while hanging in “Euclidean space” (Wilson & Corey, 2000: 26), technological determinism’s illusionary opposite performs the same magic trick with the forces of society.¹⁰³

On the one side of this field there is the technological, the instrumental method, the ordering that imposes itself on a resisting social fabric while containing itself in an absolutely enclosed logic. On the other side there is a social imposing itself on a neatly delineated technological, which in turn is always-already a political practice and a social choice. Two absolute and pure structures of unilateral enforcement (Callon, Law, & Rip, 1986a: 8). Going back to the bifurcatory subject-predicate manoeuvre - if the technical cannot be explained through the object in itself, then it surely must be attributed within the subject. When Mark Poster insists that “information machines put into question humanity as instrumental agent” (2001a: 23), he merely avers that something within the logic of information machines exteriorises instrumentality from the human (social) where it previously resided.

Of course, once the logic of technicity is empowered with an autonomous teleological dynamic it becomes easy to explain all kinds of complex phenomena. For example Paul Virilio’s thesis that technological acceleration, understood by him as an inherent property of technical enframing, leads to a loss of human control, fits firmly within that format (1995). Virilio argues that technology enframes space-time into a permanent present, and any increase in technicity (affecting concomitantly an increase in speed) leads to a disappearance of the capacity of time to unfold as a future. The teleological event horizon unfolds as a permanent present where the entire length of time is enframed as a standing reserve set in a looped repeat mode. But since, in Virilio’s own logic, the

¹⁰³ This position is well illustrated by the argument that: “Technology can be viewed as a ‘language’ of social action from which we extract (...) tools or machines - required to carry out a particular task” (Dickson, 1986: 16).

present has already been constrained by the technologies of the past, we have not much present to live in either (Mackenzie, 2002: 32-33).¹⁰⁴

Another version of this dynamic appears in the work of philosopher Lewis Mumford and his concept of the “megamachine” (1967). Mumford went a step toward healing the bifurcational rift between *techne* and *poiesis*, when he argued that technicity as a mode of repetition, order and control - what he calls “the megamachine” - comes straight from the mind; that it is a product of the body and thus entirely human. According to him “the machine came out of the primeval repetitive order of ritual” (1967: 348), and the “megamachine” was initially constructed almost entirely out of humans. Accordingly, the act of mechanization appeared through the sphere of ritual, which was based on repetition, order, and predictability – “an argument that suggests no original separation between art and technics” (Miller, 1990: 159). Therefore, at the beginning the rift is radically healed – technicity and humanity are one and the same. However, this very machine once released upon the world acquires the same logic of instrumentality discussed before.

Instead of functioning actively as an autonomous personality, man will become a passive, purposeless, machine-coordinated animal whose proper functions, as technicians now interpret man’s role, will either be fed into the machine or strictly limited and controlled for the benefit of de-personalized collective organizations. (Mumford, 1966: 344)

As with the majority of similar polemics, Mumford’s position led him to blame the unhinged logic of instrumentality for all the ills of industrial society. He imagined it being enveloped by a ‘myth of the machine’ which forced the values of control, authority, and unrestrained technological development (Davis, 1998: 3). Mumford’s approach is essentially a reverse extrapolation of the instrumental logic of technicity,

¹⁰⁴ Philosopher of technology Adrian Mackenzie terms the bifurcation I am describing as “modern catastrophic techno discourses” in his analysis of Virilio, Heidegger, Marcuse, and Habermas (2002: 62-66).

followed by its positioning as a program of action outside of any particular formal object. Conceptually Mumford's machine is an autonomous teleological logic with no substantial difference from the Heideggerian *Gestell*, save for the fact that technicity according to him originates from certain detestable aspects of the social.

Conceptually the megamachine was already detached from other human functions and purposes than the increase of mechanical power and order. (Mumford, 1966: 349)

A more contemporary expression of Mumford's position appears in Manuel DeLanda's concept of the "war machine" (1991). While for Mumford, technicity came out of the primeval repetitive order of social ritual, for DeLanda technicity appears from the social practice of war. Once technicity-as-war gains acceleration, it of course forms an autonomous instrumentality termed by DeLanda as the "war machine." According to him, the logic of the "war machine" leads inexorably to a future in which humans form the simple expandable parts of a complex robotic assemblage on a path to the complete elimination of the human form.

[The] role of humans would be seen as little more than that of industrious insects pollinating an independent species of machine-flowers that simply did not possess its own reproductive organs during a segment of its evolution. (DeLanda, 1991: 3)

His argument borrows from Gilles Deleuze and Felix Guattari the concept of "machinic phylum" (1987), which in its original meaning refers to a set of disconnected entities reaching a critical point and merging into an assemblage forming a higher order entity; in other words the "machinic phylum" is a conceptual stand-in for all kinds of self-organizing processes. DeLanda however, uses the concept to posit the appearance of an autonomous instrumentality as a gradually emerging self-organising assemblage of otherwise disparate techniques of war. This self-organising assemblage leads to the emergence of a "robot consciousness" for which the human is initially a "pollinating insect" and ultimately an insignificant impediment to be brushed aside and occasionally remembered by "robot historians" (1991).

As with all teleological versions of the Heideggerian bifurcation, the key here is the notion of the critical point – the point of closure – an indispensable element of both the Platonic cave and the accompanying “purificatory askesis” of bifurcation. This point of course originates in Heidegger’s position, when he posits a dynamic process of enframing leading to a static and final ordering of being into standing reserve. Once established, the bifurcation of nature into *techne* and *poiesis*, into machinic repetition and artful becoming, into construction and truth, unleashes a veritable Pandora’s Box of catastrophic scenarios. It also completely obfuscates any enquiry into technicity as a process of becoming, and into technique as a property of agency. Issues of spatio-temporal displacement of agency have no chance of being explored because of the opacity of the “machinic phylum.” As was already demonstrated in the previous section, bifurcation manoeuvres have no use for heterogeneous agency because its contumacy does not lead to purity and closure.

022

The shifts of Daedalus

He gave them speech, and they became souls. *A.N. Whitehead*

To avert bifurcation in the pursuit of the setting of technique, one has to follow the lessons of the first section of this chapter. The human has to be posited in a radical symmetry to the technical, without instrumentality, control, or other similarly charged dynamics making an appearance. Instead, it is the agencies of the two entities to be examined; for, as was already argued in the beginning of the exploration of technicity, it is in those agencies that one can find the bill of existence of technique. The battle robot of the anecdote is, to simplify matters somewhat, a stand-in, a *lieu-tenant*¹⁰⁵ for a human actor; its role being the detection and defusing of explosive devices and mines.

¹⁰⁵ The meaning of the word *lieu-tenant* is literally – placeholder. The military rank derives from that meaning; as was already mentioned, the robot in the story had the rank of ‘staff sergeant’ awarded by the soldiers in its squad.

Therefore, it is an entity with a delegated role, a speaker in place of another. In terms of agency, this is a realisation of crucial importance because it demonstrates the *shifting* of an actor from here and now to there and then. The enunciator – in this case an anonymous human – sends in her place a delegate carrying and performing continuously *her* shifted agency. It re-presents the shifted human agency in a new spatio-temporal setting thus allowing the human enunciator to disappear. The drone acts in a similar fashion to the way a speed bump carries the shifted agency of a traffic police officer. If the bill of existence of the speed bump is inspected, one would presumably find its single entry stating – ‘a translated police officer.’ Is it that simple however? Is the whole setting only a matter of shifting human agency or is there more to staff sergeant Talon?

Firstly, notice how effective the speed bump is at its job as a translated traffic officer; it does much more than simply translate, or even amplify, the agency of its presumed human enunciator. Therefore, it appears that there is much more to shifting than simple translation and amplification of agency. A human has to convince her fellow humans to break their speed, or at least slow down, by means of - what? Barring the use of a technical apparatus of some – of any sort – the human traffic officer has to use her own body and lie down on the tarmac, or at least stand in the middle of the road with arms outstretched for maximum effect. Even then, she cannot guarantee the achievement of the desired effect. The speed bump on the other hand achieves with unimaginable ease what seemed impossible for a human of some social standing. The human simply has no means to associate herself with the oncoming car, to establish an association strong enough to *persuade* the car to slow down *no matter what*. Granted, the officer may raise her police stop sign, the driver may see the sign, and then press on the breaks and voila. But what if the driver is not looking?

The human has no way of persuading the car to slow down, but the speed bump has. It has because, contrary to the human, it associates itself with the oncoming car by means of its agency. Simply put, the car’s agency is to move forward (usually), and its means to achieve that is through a *program of action* (the good old bill of existence). The car’s

program of action involves a complex cascade of translations drawing on Carnot's cycle, but in relevance to the example, it primarily involves wheels suspended from the car. The agency of the wheels is to rotate and the agency of the suspension is to keep them hanging and rotating under the car. The program of action of the speed bump in turn is to force a detour in the agencies of the wheels and the suspension of incoming cars. The faster the wheels rotate – the bigger the detour will be for the combined agencies of wheels and suspension; the wheels' program literally meets the speed bump's *antiprogram* and a detour will occur.¹⁰⁶

Notice how targeted the speed bump's program of action is – it associates with wheels but only of certain size, and would not associate in any way with the propulsion system of a tank, or a walking human being. The speed bump's antiprogram *shifts* the car's program by *associating* with it, but in order to do that the technique had to be first *dissociated* from the human police officer, who in fact has no role whatsoever in the association, save for being the absent enunciator. The speed bump also dissociates the human driver of the car, because she also has no role in the association of speed bump and wheels save for being the physically present intermediary in rescuing her car's suspension from certain collapse. Therefore, there is more to staff sergeant Talon after all!

Indeed, technicity has a luminous pedigree and modernity would have done well to study it in detail rather than falling into simplistic narratives of idolatry or iconoclasm. It is important to stress that the eponym of technique is Daedalus, the mythical master-craftsman of the Mediterranean,¹⁰⁷ and its patron deity is Hermes – the messenger god, but also the mediator, trickster, and lord of arts and commerce.¹⁰⁸ Both Daedalus and Hermes were revered as tricksters and craftsmen, and both personify important and often

¹⁰⁶ Latour illustrates this relationship brilliantly with the help of a door hinge and a cat flap (1995).

¹⁰⁷ For an exhaustive study of the artistic, technical, and ethnological roles of the Daedalus myth in the civilisations of the Mediterranean basin, see Morris (1992).

¹⁰⁸ Hermes - the god of merchants is also the god of comedy: by mediating the circulations of all things, the lived collectivity of individual exchanges, he is the originator of drama (the misalignment of agencies) and laughter. See Michel Serres' exhaustive exegesis on Hermes (1982).

overlooked or misunderstood aspects of technique. Hermes, known by the Romans as Mercury, was primarily a messenger between gods and humans, and therefore *also* a stand-in, lieu-tenant, transducer, displacer and translator of information. His trickery in myth – notably in the *Iliad* - speaks of the contumacy of information exchange; as a messenger he is depicted with wings on his feet and so he is the volatile personification of a communication channel, an avatar for information networks (Davis, 1998: 14-15).¹⁰⁹

He was also the trickster of many *shifts* and roads (*polytropos*), the patron of crossroads, crossings, and borders, and therefore a personification of the transgressive, the contumacious, and the liminal.¹¹⁰ Above all, Hermes is the inventor of the first technique – fire, as attested in the myth of Prometheus and Pandora’s Box. In the myth, Prometheus’ brother Epimetheus¹¹¹ is tasked with giving living beings traits, but forgets to leave a trait for humans, forcing his brother to steal the technique of fire for which he is promptly punished. Epimetheus then marries the first woman – Pandora, who is given the proverbial box as a gift from the trickster Hermes. The myth entangles technique with the awareness of time personified in the concepts of future and past (Prometheus and Epimetheus), and establishes technology as a question of externalisation of agency and temporal displacement.¹¹²

¹⁰⁹ The word *volatile* derives from the Latin *volatilis* - things that have wings. Volatility is therefore an attribute of angels, messengers and information (Serres, 1995a).

¹¹⁰ In that, he was also the patron of travellers and thieves, and a guide of souls to the afterlife: an eponymous guide for all the entities existing within the liminal. An incarnation of Hermes - the god of information and the crossroads - appears in a much more technological setting in William Gibson’s second novel *Count Zero* (1987). In the novel, which is a continuation of his groundbreaking *Neuromancer*, the protagonist hacker encounters a mysterious trickster-god of the matrix, which for pragmatic reasons has employed the avatar of the voodoo god of the crossroads *Legba*. I point that out, to indicate the persistence of the metaphor of crossroads, and crossing, in relation to technical assemblages.

¹¹¹ The meaning of the names is important: Epimetheus stands for afterthought – for memory and awareness of the past, while Prometheus stands for forethought and the prediction of the future. For a complex and fascinating analysis of the myth of Epimetheus in relation to technique, see Stiegler (1998)

¹¹² Philosopher of technology Bernard Stiegler sees technique as an externalization of memory (1998).

Daedalus in turn, was famed, among others, for his skill in imitating life, building statues, contraptions and artefacts, and creating the famous labyrinth where the Minotaur was imprisoned. The myth of the labyrinth bears an uncanny resemblance to the speed bump setting constructed above.¹¹³ Daedalus was asked by the king of Crete to build an inescapable maze in which to imprison the monstrous Minotaur, only to find himself afterwards asked by the beautiful Ariadne to devise a way for her lover – Theseus – to escape the maze. The labyrinth’s program of action was to keep those within its walls firmly inside; it achieved that by dissociating its prisoners from their sense of positioning, space, and direction, with the help of seemingly endless and uniform passageways. Daedalus’ solution, or antiprogram, was to present Theseus with a ball of thread, and the rest was history. His antiprogram associated the human with the space from which he was being dissociated by the labyrinth’s program.

Therefore, already in myth, technique displaces time and acts to associate and dissociate agency; however, as a craft, it also gives voice and therefore agency and soul to those who – like staff sergeant Talon - are otherwise mute.

In the Greek view to possess spirit was synonymous with having a voice. In a fragment of a comedy by Plato Comicus, a statue of Hermes stumbles onstage and must answer the sceptic’s question: “Who are you? Tell me at once. Why are you silent? Won’t you speak?” To which the image replies, “I am Hermes, with a voice of Daidalos, made of wood, but I came here by walking on my own.” (Daston, 2004: 39)

I speak with the voice of my creator but came here by walking on my own. Notice the multiplication of mediators in one comic (hermetic) scene – a statue (mediation) of a messenger god (mediator), speaks with the voice of another (mediation), who happens to be Daedalus (the ultimate mediator), and, above all, announces that it came on its own (yes, others mediate through me, but I am a mediator too!). In this comical play of words Hermes, the messenger god, speaks with the voice of Daedalus of the same paradox as described in the beginning of the chapter. “I may be a machine with the voice of another,

¹¹³ The myth will be revisited again in the second chapter for the analysis of network mapping.

but crippling me is inhuman”); because the technique, the statue with the voice of another, not only amplifies and translates its creator but it also enrolls and therefore *has* human agency.

[Technologies] and moralities happen to be indissolubly mingled because, in both cases, the question of the relation of ends and means is profoundly problematized. What is folded into technical action? Time, space and the type of actants. (Latour, 2002b: 248)

In a now famous essay on technique, philosopher of science Langdon Winner asks whether technical artefacts can be considered to have politics (1980). He then narrates the story of one Robert Moses – a city planner in New York - who designed overhead bridges on the road between the city and a park in such a way as to prevent public transport buses from reaching the park. In other words, the city planner invested the bridges with a very political program of action – that of excluding the urban proletariat (whose definition presumably was ‘those unable to afford a car’) from frequenting the park. Just as in the case of the speed bump, the overhead bridge performs its agency better than any human could.

It displaces a whole police department of traffic enforcers, by associating with incoming buses whose passengers find themselves instantly dissociated from the heretofore class-segregated park; in that, the bridge is as politically opinionated as the most racist or class-minded police officer.¹¹⁴ However, the bridge is far more resilient than humans also in the morality of its political opinions – it would not budge even if faced by a public bus full of millionaires.

The behaviour imposed back onto the human by nonhuman delegates (...) is the moral and ethical dimension of mechanisms. (No) human is as relentlessly moral as a machine. (Latour, 1992: 232)

¹¹⁴ Moreover, if one was to study the politics of New York City how can one omit the political opinions of overhead bridges?

Notice however how easy it would be to present it with an antiprogram by making the buses shorter.¹¹⁵ In that, the bridge is as focused and hyper-social in its associations as the speed bump – it associates resiliently, relentlessly even, and imposes its morality and ethical choices on the setting. Heidegger would want us to believe that technicity is the embodiment of pure autonomous instrumentality in radical opposition to a pure human. Others would make us see technicity as a simple projection of the social – a sort of simulacrum testifying to the existence of a symbolic subject long gone. But is it not that technique is therefore a simple mimetic repository of the morality of another?

Does technicity have a moral dimension? The answer suggested by the story of the New York overhead bridge - and virtually any possible case study of technique - is a resounding yes. Technique enfolds and translates in one fluid process times, spaces, and agencies; the morality of its enunciator, her space and time, become enfolded, shifted, enacted, mediated into a new setting. Simultaneously, the entities encountering a technique's thus formed program of action are shifted into a detour – they are equally enfolded.

What creates the illusion of autonomy is arguably the opacity, the black box¹¹⁶ effect appearing when techniques are layered into cascades of translations. This “successive accumulation of layers” (Latour, 2002b: 251) creates the effect of instrumentality and radical otherness; techniques such as the speed bump are easy to isolate and analyse yet if too many layers are blackboxed one can only speak of technologies, of assemblages, machines, complexes (Mackenzie, 2002: 12). This accumulation however does not in any way alter the definition of techniques into some sort of monstrous machinic phylum on its way to overtake the human.

¹¹⁵ This case study in the politics of technique is analysed in detail in (Callon & Law, 1997).

¹¹⁶ According to Latour, the fluid action of delegation of powers creates what he calls a ‘black box’ – a detour which was needed to mediate certain action, and which is then encapsulated and made invisible (black-boxed) in the larger actor-network (1999c). Any working technical tool is a good example of a black box, as it encapsulates the multiple detours and mediations needed to bring it into being.

We see only assemblies, crises, disputes, inventions, compromises, substitutions, translations, and orderings that get more and more complicated and engage more and more elements. Why not replace the impossible opposition between humans and techniques by association (AND) and substitution (OR)? Endow each being with a program of action and consider everything that interrupts the program as so many anti-programs. (...) This is the big lesson of the philosophy of techniques: things are not stable, but people are much less stable still. (Latour, 1995: 277)

One could imagine the essence of technicity as a dialogue (*have-had*), where every technique is a possible answer to an objection. The dialogue between program and antiprogram is therefore where the politics of technology is to be located; what is allowed, what is denied, which agency can associate, which agency is dissociated, who is shifted where – these are the common political questions one has to tackle in studying even the smallest technical mechanism. “[Every] piece of an artefact becomes fascinating when you see that every wheel and crank is the possible answer to an objection” (Latour, 1992: 247).

But how is that different from studying the bill of existence of any entity? Each entity, as was posited earlier, has to buy its difference (its existence) through repetition, imitation, and opposition. When studying the New York overhead bridges one cannot exclude their human enunciators; and when studying the New York political system one would be foolish to exclude its overhead bridges – they go together as one actor network, as one setting, as one political concrescence.

The bizarre idea that society might be made up of human relations is a mirror image of the other no less bizarre idea that techniques might be made up of nonhuman relations. [We] deal with characters, delegates, representatives, lieutenants. (Latour, 1992: 239)

Therefore technicity can in no way be posited as a question and bracketed off from the human; the definition of technique does not belong in the vocabulary of bifurcation, because that vocabulary demands the roles of human and nonhuman, of subject and object, of master and slave, to be established beforehand. In the vocabulary of a plenist

ontology, technicity is the delegation, translation and shifting of agency; in it technicity stands for the enfolding of actors in stable roles. How is stability achieved?¹¹⁷ It is effected through the translation and displacement of times, spaces, and agencies. “The hallmark of a transductive process is the intersection and knotting together of diverse realities” (Mackenzie, 2002: 13). The mystery of technique unfolds itself as the temporal coagulation of agency.¹¹⁸ When pointing out a technique, one points at a shift of spatio-temporality, at a displacement of a chunk of space-time achieved through a displacement of agency. Crucially, agency has to be understood as the *have-had* of Tarde’s philosophy of associations – agency is always bidirectional.

Action is continuous, and the fact that parts of it are black-boxed and made unassailable by being called ‘disinterested’ or ‘authentic’ is itself part of that action.(Callon, Law, & Rip, 1986b: 223)

Technique therefore appears as that which is enunciated, delegated, put-in-place by another, but also as that which “carries us from words to things and from things to words” (Latour, 1991: 106). It translates our political views into a physical (and even more relentlessly political) program of action, but it also translates our physical bodies on their way to the park into a very political statement.¹¹⁹ Technicity is therefore a statement that is always *both* physical and textual; when a word is enunciated into agency the messenger god appears, when an agency enunciates words Daedalus has shown his craft. As a transgressive shift techniques are artifactual, a “fact of art” (Stengers, 2000b: 50), a material *thing*; and linguistic – an inscription or a text.¹²⁰

In fact, technique simultaneously transcends, associates, and dissociates the arbitrary planes of words and things. A technique is therefore both a thing and a text, yet actual,

¹¹⁷ The second chapter tackles this question in detail through its examination of network spatiality.

¹¹⁸ A good visualisation of technique as coagulated agency is the air-view which presents itself from the plane when one approaches at night a big metropolis; all that can be seen is a complex geometry of electrical lights – invisible in the day yet standing-in for it (literally a *day-shift* at night).

¹¹⁹ On the role of technique in the performance of politics, see Law & Singleton (2000).

¹²⁰ On the role of technique as inscription and word, see Callon (2002).

that is – in action. It serves as the repository and enactment of some past and/or some future action. As a fact of action, or what Bruno Latour calls “*a factish*”¹²¹ (Latour, 2003), it both associates and dissociates the agencies of others. It is an artefact, art-fact-action, because it is enunciated, exists, and acts. It is created by the action of another, exists in relation to another and acts as a delegate of another, allowing a series of actors or techniques to withdraw into obscurity, and testifying in their place (Stengers, 2000b: 83); it is “always away, but never beyond.”

Technique furthermore *performs* not only someone else’s enunciated agency, but also the possible agencies of those actors it *enfolds*; its program of action therefore performs “a network of roles” (Callon, 1991: 136) involving both the appearing and disappearing, entangling and disentangling of actors and statements.¹²² Because of its entanglement within a chain or a network of chains of action, a technique cannot be extracted and separated in the form of a self-replicating organism with its own logic, away from the other actors within that same chain or network. For that goal to be achieved, the artefact – in this case technique – should be posited outside of the common plenist ontology, and into the bifurcated nature.

Technological exteriority cannot be bracketed off and posed as a question. In particular, it cannot be bracketed off from the human being as a creature that invents itself within technics. (Stiegler, 1998: 134)

Technicity is also an externalisation of programs of action in that its existence, its bill of difference, is also its milieu of operation (Barnet, 2004). What is meant by that statement is that a speed bump’s program of action is externalised – broadcast even – so as to enrol others. In that, technique acts as the enunciated, the enunciator, and simultaneously an opaque material thing for those who cannot be associated; it is both a text and an opaque

¹²¹ As a playful opposite to the fetish-fact dichotomy; for a detailed description, see Latour’s introduction to the *Iconoclash* volume (2003).

¹²² In that technique resembles the programs of action of the artist studio and the laboratory: as a setting they withdraw from the world “for the purpose of attending better to it” (Alpers, 1998: 405).

inscription, both a coagulated memory of operational agencies and an opaque archive. In that too technique is transgressive and hermetic – how else can something be simultaneously opaque, social, active, and passive, enunciator, and enunciated?

There is no archive without a place of consignment, without a technique of repetition, and without an exteriority. No archive without an outside. (Derrida, 1996: 11)

In similar vein, technicity as coagulated agency formats its positional spatiality as well as the dynamic temporality surrounding it. The word to be used is ‘solidified’ or ‘ossified,’ as a particular program of action becomes simplified to the point of its inscription into a particular time-space. This property of techniques can be observed with great clarity in the operational mode of computer code where a set of entities within the larger actor-network serve also as invocators for the appearance of others and so on. For example, in any computer operating system a combination of certain keys or mouse gestures will summon or invoke certain system resources or dispel others, much like the invocational powers attributed to traditional sorcery (Chesher, 2002).¹²³

The simplifications which make up the actor-world are a powerful means of action because each entity summons or enlists a cascade of other entities. (Callon et al., 1986a: 31)

Similarly to the conclusion drawn in the previous section, techniques should be differentiated by the complexity of their associations. The longer its list of possible associations, the more a technique is detachable from a particular context; the shorter the list, the more limited the set of contexts within which a technical artefact can operate. The production of a new technique – as in the case of the overhead bridge – involves the addition of new associations to its program of action. Thanks to the addition of new associative agencies, suddenly the bridge is not responsible only for the carrying of people above the road, but also for the enrolment of buses below.

¹²³ Inasmuch as it is the power to invoke into being seemingly non-existent, or not directly related entities. Technique-as-invocation will be discussed in more detail in the second chapter.

Heretofore buses appeared as a society with which the bridge wanted to associate. With the buses came an enrolment of a new program¹²⁴ - to dissociate the public transport (and its passengers) from further travel down the road. With the new program came a new bill of existence – suddenly the bridge is enrolled as a major actor in the politics of the city. In that role the bridge stands for the New York City traffic police department which has been substituted in its role of class segregation enforcer. Now the enforcer is a much more stable entity – the overhead bridge. Notice how one technique enfolds and black-boxes so many layers of entities, so many types of existence. A veritable plenist ontology encapsulated in a simple technique.

What is a technical innovation? Modifications in a chain of associations. Where do these modifications come from? First - from the addition of new beings. Second - the passage of an actor from a program to an anti-program or vice-versa. Third - the change of state of an actor that finds itself endowed with new properties. Fourth - modifications come from a substitution between beings. Fifth - a packaging, a routinization of the actors who have become faithful to each other. Fragile existences become stable essences once again, black boxes. (Latour, 1995: 279)

Therefore technique is a trick of displacement, a black box, a labyrinth built with Daedalus' hands. Any moment that we might wish to access the daedalion¹²⁵ we will find ourselves in need of Ariadne's thread which holds it together, the thread which binds words and things into the labyrinth of a potential action and conceals the many into one. The more techniques, the more twisted the daedalion becomes, and the more enmeshed with it those holding Ariadne's thread. A technique carries its own meaning, creates meaning, and acquires meaning in one fluid move; it carries meaning, agency, morality, politics, and anything that can have a program of action. It is metaphorical in

¹²⁴ Or antiprogram – what is a program or antiprogram depends on the position of the observer. In the case of the bridge its newly acquired agency adds a new program, which demands an antiprogram (a detour) from the buses.

¹²⁵ A daedalion is what antiquity called the labyrinth.

that it *carries across*, it *shifts* others,¹²⁶ and it is also metaphorical in the sense of “a device for simplifying and summing” (Porush, 1985: xi), a black box hiding a chain of contexts. As Belinda Barnet argues, the technique of language brings us into its own operational memory, and it is our memory. The two cannot be disentangled because technique is us (Barnet, 2004).¹²⁷

If there is such a thing as the alienation of humanity (or culture) by technics, it is caused not by the machine but by the misunderstanding of its essence and nature. [Simondon, G. in (Stiegler, 1998: 66)]

Technology in turn could be defined after Latour as “the science of techniques” (1988a), rather than as a tautological description of technical artefacts. It is the summary of any given set of techniques in a wider network of interdependencies. Therefore positioning technology as a system with inherently machinic logic, fully or even partially autonomous of what Miguel Tamen calls a “society of friends” (2001: 3) is problematic to say the least.¹²⁸ This becomes explicit when the bifurcatory manoeuvres are discarded and all matter of entities end up recognised as in-becoming within their concrescence. Whitehead’s concrescence – seen here as a “society of friends” - delineates each actor’s significance and defines the limitations which the actors inevitably face. Essentially a setting for agency, it constantly translates each actor into a network of relations with others within and without the setting (Callon, 1986a: 30).

¹²⁶ The term *metaphor* literally means - to carry across.

¹²⁷ Paleo-anthropologist Andre Leroi-Gourhan argued that the human body is the first technique – the human mind developing out of the technique (and the corresponding program of action) of the thumb and the elbow. According to him humanity literally emerged out of technique – this in confirmation of the myth of fire (1993).

¹²⁸ Miguel Tamen argues that things (or people) become interpretable in an intentional way, that is they can be ascribed the role of an actor, only in the context of what he calls “a society of friends.” Any such society delineates a group of objects (and people) which *count* as interpretable and intentional to each other. That is, the members of such a society have entered into an intersubjective (everyone is a subject) exchange of cues as to what constitutes an intentional act and what ‘can be said when’ (2001).

The problematic investment of technology, or technical artefacts, with deterministic autonomy obscures the fact that those artefacts exist in chains of constant negotiation within un-bifurcated and relational actor-networks.¹²⁹ The denial of the transformative function of these negotiations in turn obscures the fact that actors operating in them serve as translational devices for one another, that is, that there is always a “society of friends,” or a network of actors which needs to be delineated. This actor-network is nothing more but the playground on which different actors such as institutions, humans, machines and techniques enrol each other into cascades of action (Latour, 2004c). There are no delineations of objects and subjects, apart from the purely vectoral and relational effects of agency (Wilson & Corey, 2000: 23).

Each jump of simplification and translation is a delicate negotiation of detours, a labyrinth in its own right, with consecutive translations serving as delegates of the entities being translated (Callon, 1986a: 25). Through technique a string shifts a labyrinth into a program of action and displaces it with such ease as to become myth. Ultimately then, techniques are forms of inscription, transmission and delegation of action in time and space; they associate one set of actors while simultaneously dissociating another. Not imposition of an inhuman will willing itself into being, or extraction of human actions from their social context into the empty void of instrumental reason and total alienation, but a relational materialization of a plenist ontology of in-becoming.

¹²⁹ For a critical cross-examination of Latour and Heidegger, see Khong (2003)

Monsters

Non-linguistic artefacts, such as pots, are borderline cases of texts. (Rorty, 1991a: 84)

What however, if instead of a speed bump there is a fallen tree lying across the road? Would drivers react in the same way to a fallen tree as to a speed bump? Does the fallen tree possess any program of action? More importantly, would the program of action of wheels and suspensions associate in the same way with a fallen tree as with a speed bump? Notice how these questions reveal – again – the duality, the *have-had* of agency. If the tree is big enough, if its *effects* associate with the wheels' program of action so as to *affect* a detour, the tree *has* a program of action – it *has* agency because some other agency *has* to deal with it. From the perspective of the wheels and suspension the tree is a legitimate actor with a program of action.

This seemingly paradoxical conclusion posits again the question of intentionality. And the answer to this question is similar to the one given in the case of techniques – agency is a property of relations. The accidentally fallen tree has at least as much agency as a police officer parading across the road, *because* it enacts at least as effectively its program of action in the face of another. Therefore, the logic of technicity and more importantly – the intentionality of agency - appears not *an sich*, but *inter se*, not in the originary myth of the bifurcators but in the effective displacement of agency within a common setting.

When we encounter a fallen tree barring the road, we encounter an actor so opaque as to border on that phantasm of the bifurcators – a self-contained object. The tree has no enunciator – as long as no one put it there deliberately – and stands in for no other identifiable actor. At first sight it achieves its program of action purely as a mirror of our agency – had it fallen along the road instead of across it, it would be an integral part of the picturesque landscape rather than an integral part of our wheels' detour. In that its opacity posits a dilemma because humans have been shifted, translated, detoured – yet

the agency behind those shifts seems to barely associate with us. Firstly – there is no human behind it; that in itself is preposterous – how dare it? Secondly, its intentionality is frightening and seemingly inexplicable; it has gained a human morality yet there is no enunciator behind it – behold the monstrosity! Its association seems offhanded, accidental, hybrid, transgressive even, because it challenges us through its opacity and difference – a wonder.

When techniques are blackboxed to such an extent as to become an almost completely opaque machinic assemblage, and when this assemblage detours humans into its program of action, it becomes in effect a wonder, a monster.¹³⁰ The purpose of this terminology is to illustrate the effect of hybrid ambiguity created by the near total opacity of a technical assemblage. Such assemblages appear as boundary objects – to a bifurcated vocabulary they seem to suggest a nearly perfect objective materiality,¹³¹ yet they have all the attributes of subjective agency. They appear as “a critical strain in the order of things” (Daston & Park, 1998: 26), a heterogeneity somehow out of form and out of place, a liminal, hermetic event.

The popular depictions of technicity gone autonomous which I mentioned above – from *HAL*, to *Agent Smith*, and the *Puppet Master* – speak of a dramatised opaqueness bordering on the monstrous.¹³² Technicity as a monstrous effect is a sign of ambiguity serving within this order to “erect the limits of the human” (Hanafi, 2000: 2). Of course, this paradoxical juxtaposition appears only because of the profound influence the bifurcation of nature has had, and continues to have, on our vocabularies and world-perceptions.¹³³ This however, does not change the fact that the opacity of these hybrid objects challenges our conception of agency and enunciation.

¹³⁰ On the historical life of the concepts of monsters and wonders, see Daston & Park (1998), Daston (1998a, 2004), and Hanafi (2000).

¹³¹ A materiality usually personified in epistemology by rocks and coffee mugs.

¹³² The figure of the cyborg fits within this discourse all too well, and that is why it was picked by Donna Haraway for her programmatic essay. She elaborates this point in (Haraway, 1991).

¹³³ I use the term ‘vocabulary’ in the way it was used by the American school of pragmatism: “[The creation of a new vocabulary] is more like discarding the lever and the chock because one has envisaged

The argument above already mentioned that technique in its capacity as coagulated agency translates and displaces space and time. It appears that the longer the shift, the more opaque the detoured agency will seem; particularly when agency is transported over a distance¹³⁴ it seems to both gain and lose a great deal to the extent that no enunciator may be easily recognised in its program of action. By dissociating itself from its present setting (including its entities), agency is translated into another form so as to shift in space-time and associate with another setting. Consequently, the process of shifting seems to unsettle the image of an ordered world;¹³⁵ relationality clearly transgresses the conceptual world of a bifurcated nature and reinserts hybrids into the ordered reality of subject-predicate relations. In that respect, Heidegger was correct – technicity clearly ruins the day for those in search of purificatory askesis.

To travel over a distance entities have to shift and undertake countless detours; within the mastery discourse of modernity technicity handles that role so well that its end-results return to haunt us, not unlike the talking statues of Daedalus entertaining the ancients, who however, had the epimethean audacity to enjoy them as hybrids. Particularly within the setting of massively layered technical assemblages the effect of opacity appears as a profound displacement of form and agency. But there is no alternative – if something is to be sent over a great distance it has to be enunciated in such a way as to preserve a certain program of action while dissociating as much from its former setting as is necessary – “I speak with the voice of another but came here on my own;” in other words the question behind the effect of opacity is “what should be kept constant through which sort of transformations into different media” (Latour, 1998a: 425).

the pulley, or like discarding gesso and tempera because one has now figured out how to size canvas properly” (Rorty, 1989: 12).

¹³⁴ This problematic forms the canvass for the explorations of the second and third chapters.

¹³⁵ One could also make the argument using the monsters of central European folklore who - from vampires to werewolves - are all shape-shifters.

The alternative to mediation is always Heidegger's dream – a language that says so little that it just points at things silently with the index finger (Latour, 1998a: 424); in contrast, for plenist ontology mediation is being, because to exist is to differ, to be in-becoming. Therefore, that which is enunciated over a distance, that which is in effect information, is also a harbinger of uncertainty because it carries an unperturbed *other*. Whose voice are we hearing – that of the absent *another*, or that of the *idol* behaving as a subject?

The stability, the repetition in existence of one technique has to be bought with its dissociation from some other entity; the police department disappears, only so that the bridge can become a stable political actor. The agency and the morality of a political actor is dissociated, shifted, and translated into an additional entry to the program of action of another entity; here program and antiprogram are purely relational denominations of agencies “relative to the chosen observer” (Akrich & Latour, 1992: 261). I keep reinforcing this point so as to make clear the link between opacity and stability, between transportation and transformation. The agency being shifted over distance and positioned into another setting never stops being an agency; it is information, not pure form without a substance or pure sign without a signified.

For the bifurcated worldview, information¹³⁶ is always the rupture of thing and sign; it is a monstrous decoupling of a whole being, resulting in the pure formalism of a simulacrum. For the bifurcation theory of nature the opacity of technicity as information is as monstrous as fallen trees are to drivers – signifiers without the signified; an enframed *Gestell* returning to haunt us as the revealing of reality as a standing reserve.¹³⁷ For the bifurcators, information profoundly disrupts the subject-predicate order by supposedly displacing the object with its mere signifier.¹³⁸ Suddenly, the subject is

¹³⁶ In this case by *information* is meant any agency shifted over electronic communication networks.

¹³⁷ When Mark Poster claims that “electronic communication upsets the relation between subject and object and substitutes the object with a stream of signifiers (simulacra)” (2001b: 16), he exhibits precisely this fallacy of the bifurcation theory.

¹³⁸ Mark Poster again: “for the subject in electronically mediated communication, the object tends to become not the material world as represented in language but the flow of signifiers itself” (2001b: 16).

drowning in a sea of signifiers and ‘all that is solid melts into air’; of course, the shifting of agency through association and dissociation appears as a monstrosity only in a bifurcated world.¹³⁹

We never detect the rupture between things and signs, and we never face the imposition of arbitrary and discrete signs on shapeless and continuous matter. We see only an unbroken series of well-nested elements, each of which plays the role of sign for the previous one and of thing for the succeeding one. (Latour, 1999c: 56)

Inasmuch as techniques transport an action, past or future, they are coagulated time. Techniques could also be thought of as “*congealed* labour” (Latour, 1999c: 189); we take a detour, mediate our action through other actants in an emerging network, and create a new actor – a hybrid which carries our detoured action in time and space allowing for the whole chain to be represented without any of the participating actors being there. Techniques thus emerging into being carry within them both time (the action) and the space within which it occurred. Chunks of time and space disappear,¹⁴⁰ but only to allow for the appearance of new time and space in the chain of cascades.

[There] is no important difference between [stories and materials]. Or, to put it a little differently: stories, effective stories, perform themselves into the material world—yes, in the form of social relations, but also in the form of machines, architectural arrangements, bodies, and all the rest. This means that one way of imagining the world is that it is a set of (pretty disorderly) stories that intersect and interfere with one another. It means also that these are, however, not simply narrations in the standard linguistic sense of the term. (Law, 2000c: 2)

For example in computer code – the ultimate ‘stream of signifiers’ - each logical layer is a cascade of translations folded into an effect, a delineated and enunciated potentiality. It is always possible to increase the amount of mediators, exchange layers, and add new ones provided that the chain of translations is not broken and no plateau of code is

¹³⁹ For a critique of essentialist approaches to information, see Hayles (2005, 2006).

¹⁴⁰ They ‘disappear’ in the sense that they become ‘invisible’ in the assemblage.

extracted and separated from all others thus breaking the cascade of performative delegations.¹⁴¹ “Formulated as an assertion, software requires both reflection and obfuscation” (Galloway, A. R., 2006b: 322). Within the rigid chain of associations and dissociations forming computer software, agency shifts up and down along channels which seem perfectly obfuscated (pure signifiers!), only so that the agency in question can be transported, delegated, and shifted further.

Obfuscation, or ‘information hiding’, is employed in order to make code more modular and abstract and thus easier to maintain. A class’s method can be updated and, as long as it continues to fit its public interface ‘signature’, one may be reasonably assured the code will continue to run. (Galloway, A. R., 2006b: 323)

Rather than a wedge between subject and object, or an empty flow of signifiers, code is simply an enunciatory cascade shifted and stabilised so well as to seem completely opaque from outside. It could be depicted as a cascade leading from interfacial metaphors (inscriptions), through a chain of translatory detours (logical gates), to an enunciation of electromagnetic impulses, and back on the very same chain, towards a metaphorical inscription.¹⁴² The whole process is a good illustration for agency as information: one setting of agencies is shifted into a detour by a black box,¹⁴³ and returns

¹⁴¹ For a masterful treatment of the performative agency of computer code, see Mackenzie (2005a), as well as Dodge & Kitchin (2005).

¹⁴² As Alexander Galloway argues, “Logic gates are electronic machines; they are physical devices through and through. Voltages in electronic circuits are material, not immaterial (whatever that may be). When basic logic gate functionality is abstracted and strung together into machine commands, translated into assembly op-codes, and then later articulated in a higher-level computer language such as C, (...) one should never understand this ‘higher’ symbolic machine as anything empirically different from the ‘lower’ symbolic interactions of voltages through logic gates” (2006b: 319).

¹⁴³ Of course, the politics of that black box is of enormous importance: code which is ‘closed source,’ that is, which acts without disclosing its program of action, denies those it detours the capacity to understand or modify its being. The box is closed, the agencies are delegated, shifts have occurred and the process is concealed. The resulting construction presents itself as its own effect. ‘Open source’ code can be argued to resemble a purposefully open black box; as a FLOSS (Free/Libre and Open Source Software) (Liang,

in another form. Computer technicity in the form of software and hardware literally translates agency through a series of code levels.

The operating system receives input through the keyboard, transforms it to a lower level code, and communicates it to its command shell, which in turn translates one set of code into another, from one set of memory into another. The techniques of hard memory and of random access memory ultimately are being transformed into an abstract permutation of the input-output system, the I/O. As philosopher of technology Friedrich Kittler convincingly demonstrates, information as software code is in effect a cascade of translations from words to oscillations of electrical currents (1997b); a monstrous hybrid for the bifurcators, but another example of agency for plenist ontology.¹⁴⁴

What computation brings to a situation is a way of moving across the threshold between inside and outside by encoding important features in computational time. (...) Computers function as a passage between the surface forms of order or disorder and underlying rules of generation. (Mackenzie, 1996: 377)

The illusion of a separation between subject and object believed to be caused by the circulatory shifts of information networks could also be originating in the capacity of technique to replicate and repeat (simulate) a program of action. An entity is re-enacted without physical presence, its bill of existence simulated out of a list of patterned agencies. Alan Turing was probably the first to point precisely at this paradox in his groundbreaking paper *Computing Machinery and Intelligence* (1950); the paper that suggested what came to be universally known as the Turing Test. Published once the ashes of the great war subsided, and Turing – the driving force behind the biggest secret of that war¹⁴⁵ - once again having freedom to work on his own projects, the paper starts

2004: 24) it keeps its program of action open for inspection and configuration, it provides the Ariadne thread to the labyrinth of its program of action.

¹⁴⁴ For a discussion of Kittler's theory of technology, see Armitage (2006), and Breger (2006).

¹⁴⁵ Details of Turing's actual role and contribution in the Allied cryptography efforts during the war were fully declassified only in the 1990's. For decades, he was known as the somewhat talented mathematician who had in his youth solved, together with Alonzo Church, the famous *Entscheidungsproblem* in

with the simplest of questions: ‘can machines think?’ Bearing in mind that virtually his entire audience was perfectly ignorant of the knowledge he had gained during the war, and that this will not change any time soon, Turing approached that question as a hypothetical game.

He proposed that in that “imitation game” (1950: 433) three players – a man, a woman, and an interrogator – sit in two different rooms; the interrogator separated from the other two by a thick wall. The goal of the game as he conceived it is for the interrogator to guess correctly the gender of the other two players. The interrogator is supposed to achieve that by asking them questions typed on pieces of paper, to which they must reply in the same form. As a complication, he conceived that one of the players – say the man (X) – be instructed beforehand to simulate the gender of the other (Y), while Y is instructed to tell the truth. Turing further suggests that at some point in the game player X – the simulator – is substituted with a machine able to simulate human answers; he then asks whether the interrogator will come with the wrong guess as often in the latter case, as when the game is played between a man and a woman. This last form of the game substitutes for him the original question on machine intelligence.

Notice that the way he posits the question is entirely relational, and that what is really revealed here is not ‘intelligence’ as a property of substance (human identity), but the opacity of information as agency, and the fact that agency is essentially iterable. The twist in the game comes with the introduction of simulated roles, because the method of communication is made so opaque as to arguably dissociate any possible pointers for the interrogator. The interrogator, exposed to nothing but typewritten text, sees only the agency encoded in that text, only the agency transported, shifted, translated, transduced into a format capable of associating with his or her program of action.

In effect the interrogator is forcibly shifted by Turing into the program-antiprogram game between the wheels and the speed bump; from within that game there is no way to

mathematics, had published a controversial paper on machine intelligence, and had tragically died in an apparent suicide.

be certain just who is at the steering wheel. Furthermore, from within that game it borders on the impossible to establish with certainty whether there is a human behind the wheel or just another technique *simulating* the behaviour of human programs of action when confronted by a speed bump. Simulation here is nothing more but the replication of a pattern in the program of action of another entity.¹⁴⁶

Turing had ample opportunity to observe the contumacious and iterative qualities of technicity during his time at the cryptological nerve centre of the Allied forces at Bletchley Park.¹⁴⁷ While there, he spearheaded initially almost single-handedly the Allied efforts to break the German encryption system *Enigma*, used in slightly different permutations by the entire German armed forces. His success in cracking the codes was achieved through simulating and rendering obvious the underlying program of action of the encoding machine. “Through cryptanalysis, a sequence of orders internal to one State was simulated within another State” (Mackenzie, 1996: 372).

In other words Turing devised a machine¹⁴⁸ with an exact antiprogram to the Enigma and therefore in perfect association with it; it was because of *that* association that the otherwise completely opaque messages of the Enigma found their mirror double at Bletchley Park.¹⁴⁹ Turing’s simulation machine and the game which it inspired suggest that agency, even when enclosed and obfuscated within a perfectly opaque information channel, does not exist *an sich*, outside of a translational chain of associations and dissociations. No enunciated/enunciatory program of action, no matter how opaque, is posited outside of possible cascades of translational shifts.

¹⁴⁶ Turing suggested at the end of his essay, that the capacity of technical assemblages to replicate and reiterate programs of action would make great chess players out of machines, because the possible agency shifts in chess are easily listed as a program of action and therefore potentially easily replicated. If Turing only knew how profoundly misunderstood he would be to this day!

¹⁴⁷ An exhaustive resource on the life and works of Turing can be found in (Copeland, 2004).

¹⁴⁸ The many iterations of Turing’s cryptological machine had names such as *The Bombe*, *The Oriental Goddess*, *Colossus*.

¹⁴⁹ From then on, Hitler’s orders to his generals could reach Churchill’s desk often before their intended recipients.

[Turing proved] that undecidability inhabits any general system of marks, no matter what purpose, what meaning, or what particular substrate they invoke or submit to. In very general terms, this means that certain sequences of marks perturb the line between the text and its context, between what is contained within the set of marks, and what apparently stands outside of them. (Mackenzie, 1996: 366-367)

Simulation therefore, so monstrous to a bifurcated nature because it dissociates a program of action from its enunciator and allows it to be associated with another, is an aspect of technicity's capacity to repeat itself into existence, to reiterate and transduce¹⁵⁰ a program of action in a manner more stable than any human possibly could. Simulation is also inherently related to the carrying-across of time-space involved in replicating an agency.

The capacity of technique to transcend time-space can also be illustrated with the concept of feedback from cybernetics. In cybernetics, feedback is the process of connecting the output of a system to its input. This feedback may be positive or negative; positive feedback amplifies errors, while negative feedback corrects and controls them. In the words of Norbert Wiener,¹⁵¹ "feedback is the property of being able to adjust future conduct by past performance" (1950: 33); feedback is another word for the capacity of technicity to carry information – and therefore agency – back and forth across time-space. The resilience of technicity in its ability to coagulate agency and displace it as in-formation, makes an appearance in cybernetic theory too: in cybernetics something is said to carry information "if it reduces uncertainty, restricts choice, or controls something else" (Bate, 2002: 12).¹⁵²

¹⁵⁰ For a detailed study of the process of transduction, see Mackenzie (2002).

¹⁵¹ Together with Claude Shannon considered as the founder of information science.

¹⁵² For an account of the development of cybernetics as a theory of information, and the contribution of Claude Shannon, Norbert Wiener, and the Macy Conferences, see Hayles (1999). For an account of the role of information science in the development of biological sciences, see Kay (2000), and Haraway (1989).

Technicity as an information machine therefore marks its appearance with the suspension of time, the ability to transduce through time, that is, to relate an action back and forward in time. The only way an action can travel through space and time is as a technique. The alternative is, as was already stated, to stand in front of the setting and point at it silently with the index finger; but even then the enunciation-through-pointing is an enrolment, an agency, and therefore technique. Moreover, the only way techniques can operate in time is through the enrolment of other techniques which come from the past or the future in that they carry a different temporality.¹⁵³ Therefore, techniques “can operate on the past” (Barnet, 2004) as well as on the future, because they link “realities of heterogeneous domains” (Mackenzie, 2002: 46).

Technicity is then an extraction, translation, and delegation of agency in time; when lists and indexes dissociate in-formation from its setting so as to carry it in time and open it for association in the future, they exhibit precisely this property.¹⁵⁴ For example the instruction cards used by Frederick Taylor¹⁵⁵ described as procedures in a list (program of action) the set of continuous movements of a bricklayer. Taylor translated the bricklayer’s agency into discrete plateaus of coded shifts, and delegated the codes to a list of re-orderable agencies enunciating the possible shifts towards making a brick (Liu, A., 2004: 67). The resultant list of actions formed in effect a database – another monstrous example of opaque technicity.¹⁵⁶

¹⁵³ This observation will be explored in detail in the third chapter.

¹⁵⁴ The list form of text organisation - Sumerian account-keeping - is the oldest text form we know (Ong, 1982: 99).

¹⁵⁵ There is an enormous amount of literature from all political angles on Taylor, his invention, and ‘Taylorism’ as a precursor of the modern industrial society; for a historical account of Taylor and his ideas on what came to be known as scientific management, see Kanigel (1999).

¹⁵⁶ In line with his earlier arguments on information, Mark Poster argues that “with the advent of computerized databases, a new discourse/practice operates in the social field, a super-panopticon if you will, which reconfigures the constitution of the subject” (1995: 85).

Concomitantly, the database format, understood as a list of programs of action, or a list of shifts, is literally a displacement of space-time encoded as agency;¹⁵⁷ it is a bouquet of times and spaces shifted into coagulated agency with associative powers. Understood this way, the temporality of techniques is “always enmeshed with a topology” (Mackenzie, 2002: 70), a setting of enunciation. Information, computer code, databases, and lists all point to the capacity of technique to transduce through and yet shift time-space so as to form a hybrid entity which is simultaneously brutally opaque and earnestly social.

We've always been artificial for nine-tenths of our intelligence. Certain objects in this world write and think; we take them and make others so that they can think for us, with us, among us, and by means of which, we think. The artificial intelligence revolution dates from at least as far back as Neolithic times. (Serres, 1995a: 50)

This section argued that technique is characterised by the shifting of agency along associative and dissociative tracks, and that these shifts cause the effect of opacity. Furthermore, it was argued that when an enunciator is not clearly visible, techniques appear as contumacious, hybrid, and in effect monstrously transgressive forces that – in the order of a bifurcated world – challenge and confront the purported correspondence of subject and object. The capacity of technique to enfold, translate and shift space-time was argued to reinforce the hybridity of machine assemblages within the bifurcated discourse; coupled with the astounding ease with which technicity replicates and reiterates programs of action – in effect simulating an absent enunciator, it becomes clear how the machinic as a distinct form can be posited as a radical other to the human. Ultimately however, this section aimed to probe for, and assemble an alternative understanding of technicity, one where technique literally forms the human as a living entity; where it would be impossible and ludicrous to imagine a human entity posited outside of her technical in-becoming.

¹⁵⁷ For an exhaustive critical theory inspired account of the database mode of information, see Manovich (1999, 2002a).

03

Networks

My whole method relies on the particularly convenient way in which the crossing of a bridge can be represented. *Leonhard Euler*

The first two sections of this chapter examined the bifurcation of nature into the subject-predicate dead-end, and the bracketing off of technicity from the human and positing it as a questionable other. This section examines some of the problematic assumptions surrounding information networks, such as the internet, and argues that the presumptions behind these issues flow out of the bifurcated positions described earlier in the chapter. In particular, the section isolates purported effects of information networks such as time-space compression, subject-object decoupling, exclusion and alienation, and control and domination. Utilising the arguments developed above, the section then suggests that networks are chains of enunciations and agencies - the net-like works of entities made visible; that it does not matter how the agency is translated, as long as it enrolls another entity into a common network; and that therefore one should trace networks as the associated programs of action of so many heterogeneous entities, rather than as rigid structures built out of abstractions such as 'social ties' or 'information.'

031

Spectrum flows

In keeping with the practice of the preceding sections, I will start the treatment of the concept of networks with another visit to the crippled body of staff sergeant Talon. The machine's wider setting, or 'in-theatre role' as it is known in military jargon, is, as was already mentioned, to clear explosive devices and mines in a hostile environment. To

that extent it is equipped with an onboard computer, and an antenna connecting it permanently to the US military's information network which covers the battlefield as a blanket. Most of the time the machine is operated remotely through that connection by a human operator either from its platoon, or from a location often hundreds of miles away; as was already mentioned, in that sense staff sergeant Talon is a lieu-tenant, a stand-in, for a human. But in a sense the machine is also the coagulation of the information network through which its enunciating agency is constantly being translated; by oscillating the latent *potentiality* for agency across the 'theatre,' the information network is both entirely opaque and radically present.

The appearance of this communication network re-inserts again the bifurcatory tension, because actantiality becomes a potential wherever the network appears – it is just a matter of coagulation. In other words a communication network operating at speeds approaching the speed of light suddenly makes visible all those translational agency shifts whose existence I was arguing for above; it creates a setting where agency becomes *visibly* a latent potentiality, it simply magnifies enormously what was already there as technique. The appearance of this latent, ubiquitous, ambient connectivity profoundly shakes the bifurcatory discourse because what was until now easily dismissed as fetishisation of matter, or objectification of subjects, suddenly starts dissolving the very foundations of the purified bifurcatory realm through its insistence on being visible.

Consider as an example the extraordinary story unfolding early in 2006 in the most popular online role-playing world. The World of Warcraft (WoW)¹⁵⁸ online community found itself divided into two bitterly opposed camps. The point of contention was a

¹⁵⁸ The World of Warcraft online game is developed, ran, and owned by Blizzard Entertainment. The game is essentially a fantasy online world, a game without an end-goal, to which players can log-in from their home computers, choose an appropriate avatar (their in-game body), and interact with other players and the game environment. Players can choose fantasy avatars such as elves, orcs, or wizards for example, develop their character's skills and capabilities, gather riches, form 'tribes' or 'hordes' and – predominantly – take part in individual or group battles with other players. For a critical theory inspired treatment of the game, see Galloway, A. R. (2006c).

bizarre event providing a concentrated encapsulation not only of the praxis of living and playing online, but also of the bifurcatory conceptual approaches to the internet and information networks in general. A player of a somewhat popular standing within her WoW ‘horde’ suffered a real-life¹⁵⁹ fatal stroke, and her friends from the game decided to organise an in-game funeral where all her in-game ‘allies’ and acquaintances could pay their respects. The organizers discussed the idea on their ‘horde’ in-game forum, and chose to hold the funeral in the player’s favourite spot, beside an in-game lake which also happened to be a contested territory between her tribe and another tribe.

When the time for the in-game funeral came, all the mourners formed a line to pay their respects to the avatar of the player, which had been activated and transported to the lake for that purpose by her friends. The rival tribe meanwhile, having found out about the event through a spy, decided to use the occasion and secretly ambush¹⁶⁰ their opponents for the contested territory. The ambush proved to be an overwhelming success leading to a ‘massacre’ of avatars and the virtual wipe out of the mourning tribe and their allies.

The incident instantly became a point of controversy, even though it did not violate any of the written or unwritten rules of the game; the story further became particularly infamous after the rival tribe published a video of their exploit on a number of video sites.¹⁶¹ Many players felt that a taboo had been shattered in a despicable manner, while others felt that the conflation of in-game and out-game realities to such an extent was ridiculous and hailed the marauding raid as a restoration of ‘normalcy’ within the in-game world. Seen through the lens of a bifurcated nature, this is a similar setting to the one opening the chapter, but with a further twist.

¹⁵⁹ How misleading that adjective is in the context of the story; perhaps a better delineation of worlds would be in-game and out-game.

¹⁶⁰ That is – ‘kill’ their enemies’ avatars in-game; when a player ‘dies’ in the game he or she loses all the knowledge and artifacts acquired at great expense during months or even years of game-play.

¹⁶¹ The video of the event can be accessed at <http://www.youtube.com/watch?v=Zdeg4Yx6n4Y>.

First, a fetishised object (the avatar) is given a voice to stand in for an absent subject (the player), in an equally fetishised symbolic world standing in for an absent real world.¹⁶² But then, the absent real world encroaches (the subject passes away) only to enunciate a simulacrum-like ritual (the funeral) involving the symbolic burial of a non-existent body within a non-existent grave; following which the symbolic world responds by enunciating the ultimate fetish – the breaking of a taboo from the non-in-game-existent ‘real world.’ Thus, the symbolic unshackles itself from the real only to return and conquer it with a vengeance – echoes of *Gestell* abounding.

From the perspective of my argument, this story illustrates the bifurcated theoretical ‘memes’ connected to the rise of information networks and the arrival of the internet: the purported disjointment of subject and object and the following alienation of the subject from her surroundings; the separation of space and time and the compression of time into a discrete flow of signifiers further alienating the subject; and the subtle, subversive, and ubiquitous forms of control purportedly enfolded within the very matrix of network materiality. One can presume that the majority of her tribe knew the deceased only through her avatar and the character she inhabited in the in-game world; for them her out-game character was always already a ‘ghost in the shell,’ a completely opaque enunciating agency.

Despite the fact that the enunciated agency – the avatar (the body in the in-game world) – remained intact, the permanent loss of the already completely absent enunciator (the subject) triggered a re-enactment of a ritual from the out-game world, only for that ritual to be obliterated by the in-game play-logic; “but does the body wither away?” (Varnelis & Friedberg, 2006: 12). This game of un-layering absent signifiers is a veritable archaeological dig if one is to follow the subject-predicate discourse.¹⁶³

¹⁶² For a critical theory inspired treatment of gaming as a distinct cultural form, see Galloway, A. R. (2006a).

¹⁶³ For an analysis of the narratives of alleged transcendence or loss of physicality online, see Graham (2004).

It is important to point out however that the game of signifiers is inevitable when one tries to analyse the incident, or as I will argue – information networks in general, through the discourse of bifurcation. From that perspective, the out-game bodies of the players are always alienated from their local, and lived, spatiality. Their subjectivity is always disjointed from their bodies only to be enframed in the in-game simulated non-space of pure signifiers. Their desire for make-believe is always an expression of out-game alienation; and the non-space of the information networks making WoW possible, is always overriding and obliterating the ‘real,’ and decoupling the subject into an imaginary time of ‘freely enjoyed’ fetishisation resulting from the cold logic of network control. It is my contention that at the very base of this approach there lays a presumption as to the nature of information networks, and their purported effects. Consider the following two - separated by more than two decades - descriptions of the spatiality of information networks, one uttered in the ancient no-time before the internet, the other coming at the time of this writing:

“Cyberspace. A consensual hallucination (...).” *William Gibson* (1984)

“We define the domain as the entire electromagnetic spectrum.” *Major General William T. Lord, Commander Air Force Cyberspace Command* (Donnelly, 2008)

What unanimity! Perhaps unbeknownst to their enunciators, these two quotes are profoundly related by the etymology of the metaphors they are grounded on; William Gibson’s shared apparitional non-space of mastery is virtually identical to the aptly named Major General Lord Commander’s spectrum domain.¹⁶⁴ Both descriptions originate from a unitary image of information networks - that of illusionary appearances over a realm of mastery; a piling-up of non-reality and mastery over a non-space. The discourse of mastery it seems is the bifurcatory manoeuvre hardest to get rid of. Within this narrative any attempt at analysis of network politics revolves necessarily around the

¹⁶⁴ ‘Cyber’ derives from the Greek *kubernetes* – steersman, governor, master; ‘spectrum’ derives from the Latin *spectrum* - appearance, apparition, ghost; while ‘domain’ derives from the common Latin root for property (dominium), and mastery (dominus).

building blocks of the bifurcated theory of nature: the subject-predicate dichotomy in all its permutations, and container-like space and time within which the permutations occur.

Exactly as was the case with staff sergeant Talon, the story of the bizarre online incident seems to be populated only by subjects and objects, attributes and substances, fact and fetish, signifiers and signified. Additionally, because of the complexity of the technical mediations involved in information networks, the already present subject-predicate problematic is compounded by the full range of bifurcatory depictions of technique. The politics of this 'spectrum domain' will then inevitably involve a deterministic materiality and a purified social.

The resultant theoretical approach is best exemplified by Manuel Castells' magnum opus trilogy on the arrival of the 'information age' and the rise of the 'network society' (1996, 1997, 1998). His overwhelming achievement is to have captured all the prevailing 'memes' regarding the spread of communication networks and the rise of the internet, and to have formulated the first coherent theory of the 'spectrum domain' phenomenon. According to Castells, the entire realm of social communication is being enclosed within information networks of "flexible, inclusive hypertext" (2000: 13). The enclosure¹⁶⁵ of social communication within this shapeless realm leads, according to Castells, to profound changes in politics, for, information and communication network technologies are supposedly characterised by emergent types of space and time (ibid.). These are what Castells terms "timeless time" and the "space of flows" (ibid.);¹⁶⁶ "timeless time" is the effect of information networks on the pre-network time, a "relentless effort to annihilate time" (ibid.) through compression and de-sequencing of lived events. The "space of flows" in turn, a mirror process to "timeless time," annihilates and de-sequences non-network spatiality.¹⁶⁷

¹⁶⁵ As a Marxist, he uses the 'enclosure' terminology to draw a theoretical similarity between the purported effects of the rise of information networks and the 'enclosure' of agricultural land in 18th century England and Wales which, by dispossessing the peasants, is supposed by Marxist theory to have laid the conditions for industrial capitalism.

¹⁶⁶ The second and third chapters will analyse both of these concepts in more detail.

¹⁶⁷ For a critical analysis of Castells theory of networks, see Stalder (2005, 2006).

The space of flows refers to the technological and organizational possibility of organizing the simultaneity of social practices without geographical contiguity. (Castells, 2000: 14)

The social is dislocated into the spectral domain of a “space of flows” in which ‘social practices’ are supposedly uprooted from their geographical continuity and rearranged by the flow into the non-space of the consensual hallucination reiterated within the electromagnetic spectrum. The concepts of “timeless time” and “space of flows” illustrate for Castells the effects of information networks on the perspective of lived locality and whole subjectivity; their result is a decoupling, a disjuncture in a unitary time-space. Time becomes a non-time of discrete non-events, while space becomes a shapeless flow of substance-less signifiers.

The underlying logic of this decoupling is, according to Castells, a new form of power and control – a network mode; the modality of its domination residing in flows of disjointed signifiers. The “space of flows” does include a territorial dimension, as it requires a technological infrastructure that operates from certain locations, and as it connects functions and people located in specific places. Yet, the meaning and function of the “space of flows” depend on the flows processed within the networks, by contrast with the space of places, in which meaning, function, and locality are closely interrelated.

The space of flows is made of nodes and networks. In the space of flows places receive their meaning and function from their nodal role in the specific networks to which they belong. (Castells, 1997: 36)

Spatiality and locatedness therefore fall victim to an overarching logic of interconnected network control; the logic of network control in turn being a function of, according to Castells, the network’s “programmed goals” (1997: 32).¹⁶⁸ It becomes obvious then, that

¹⁶⁸ Castells’ notion of power is fairly simple: “Power is founded upon the ability to exercise violence.

for Castells the real danger of information networks is the concentration of power in the hands of the ‘programmer’ – understood as the entity making the political choices regarding the logic of control – rather than the nodes of the network. The social therefore finds itself first de-sequenced and de-territorialized, only to be ordered into the discrete nodality of anonymous network control. The politics of networks then become a triple extraction of the oppressed subject – from a “timeless time,” from a “space of flows,” and from a network logic based on inclusion and exclusion. The problematic of exclusion looms large because, according to Castells, “nodes only exist and function as components of networks” (1997: 3) and redundancy is not an option; the exclusion of the outside is absolute.

Between nodes in the network and those outside the network distance is infinite, since there is no access unless the program of the network is changed. (Castells, 1997: 4)

In discussing the effects of the arriving ‘network society’ on established social formations such as nation-states, Castells differentiates between power and influence, where power is the ability to dispose of violence and impose outcomes, while influence is the ability to shape outcomes but not in a sovereign manner (Stalder, 2006: 105). According to him, information networks deny traditional social formations such as nation-states the capacity to wield power, while leaving them with influence. Essentially, Castells re-inscribes the discourse of mastery into his theory of communication networks by reiterating the emergence of control as a major characteristic of those networks and establishing the loss of sovereignty as its major effect on the social.¹⁶⁹

This conclusion finds its confirmation in Castells’ insistence on seeing information networks as automatons (2000: 16), reiterating a set of programmed social rules decided by the all-important programmer; “once the network is programmed, it imposes its logic

Power is the structural capacity to impose one’s will over another’s will” (1997: 32).

¹⁶⁹ This approach is of course another of the many flavours of *Gestell*, reappearing in theoretical analyses of technical assemblages. For another example of such an approach, see (Barney, 2000, 2004).

to all its members” (ibid.). The uniqueness of Castells’ theory lies precisely here, in his insistence on unifying both bifurcatory ends into one coherent approach. On the one hand the spectral flows of significations obliterate the subjectivity of social actors and reorder them into a nodal paradigm of faceless control, while on the other hand it is all a simple automaton behind which faceless elites decide which way the control should go. Castells’ spectrum flows are the already encountered rivers of empty signifiers seen by a bifurcated worldview whenever mediation or delegation of agency occurs, while the problems flowing out of his theory of the network society fall within an already encountered delineation: either approaching technicity from the perspective of a bifurcated social, or attempting to perform the same manoeuvre from the perspective of a bifurcated materiality.

As an illustration of the former, for critical theorists Michael Hardt and Antonio Negri, information networks are the embodiment of a new mode of domination and control which they term *Empire* (2000). Unlike Castells’ networks however, *Empire* is not an automaton but a radically new form of political domination which can be resisted by a radically new form of the social – a *Multitude* (2004). The same discourse is picked up by critical media theorist Alexander Galloway, when he argues that information networks are characterised by a new form of oppressive control, that he terms *Protocol* (2004). According to him, information networks represent a radically new form of politics where domination is inscribed deep within the very logic of technicity. This in turn makes it impossible to loosen the control by decentralising the assemblage, because by now control has been embedded within the very technical apparatus making the assemblage possible.

This conclusion leads Galloway and his collaborator Eugene Thacker, to propose that ‘the question concerning’ the new form of network domination is one of connectivity and collectivity (2004a, 2004b); in other words, if control-based network connectivity determines the materiality of a collective, then it is of utmost importance to determine what kind of a collective would be best positioned to oppose the logic of control.¹⁷⁰

¹⁷⁰ For a slight different flavour of the same argument, see Lovink & Rossiter (2005).

Galloway and Thacker further develop their theory of networks in their latest and aptly titled book *The Exploit* (2007).¹⁷¹ The book argues that there is a constant internal tension within networks, namely between their nodes and edges; nodes here stand for the building substances of networks, such as their protocols, technical structures, and actors, while edges stand for the pure flow of agencies (always human) which format and determine the shape of the networks. This instability should be used in their opinion to reshape the oppressive character of information networks.

The work of media theorist Mark Poster also falls on the side of the bifurcatory divide occupied by the ‘poets of control,’ when he criticizes Hardt and Negri for their naïve, in his opinion, Marxist juxtaposition of labour to information technologies, and their use of Castells’ notion of information networks as immaterial flows. However, Poster’s critique serves his argument only to reassert that those networks are characterised by a “new materiality” (2004: 325) with a new logic of control. According to him, it is precisely this new form of material organisation that profoundly reconstructs the social and “only by recognizing the specificity of the materiality of new media” (ibid.) resistance to the domination of information networks can become successful.¹⁷²

Another approach to information networks, this time from the perspective of a bifurcatory materiality, comes with the work of authors such as Yochai Benkler (2006), and Lawrence Lessig (2001, 2004, 2006), who see in the purportedly ‘free’ and ‘open’ materiality of network organisation a new and better future for culture and the social in general, provided that it is not overtaken and misused by oppressive social forces.¹⁷³ In that, there is little difference between this approach and the celebratory and entirely deterministic positions of technology-gurus such as Howard Rheingold (1993, 2003) and Kevin Kelly (2005); both celebrate technical networks as the advent of a new and better

¹⁷¹ The title relates to the hacker jargon for an opening within the code of an attacked program, allowing the attacker to gain control over the program. For the authors, the only way to resist the control logic of information networks is to subvert them from the inside.

¹⁷² For an expose of Poster’s position on the influence of information networks on culture, see (2005).

¹⁷³ This approach stands, naturally, in opposition to the discourse of critical theory and is heavily criticised in (Galloway, A. R., 2005).

tomorrow for humanity, and both are attacked by the critical theory approach narrated earlier, as at best naïve, and at worst complicit to new forms of oppression embedded within technical networks.

The ‘poets of control’ are abetted in their critique of their opponents on the other side of the bifurcatory divide by the fact that the military is profoundly involved in the applications of communication networks, or, as the US military terms them – networks of command and control. For the military, just as for critical theory, information networks are entirely permeated by the discourse of mastery. For war theoreticians John Arquilla and David Ronfeldt – members of the RAND military think-tank - there is no doubt that nothing can stop the advent of network-centric-warfare – or netwar in short (1996, 1998, 2001). According to them, the fluid and decentralised materiality of networks, coupled with their ubiquity as a form of organisation, predisposes them to trump the rigid forms of hierarchical structures.¹⁷⁴ In that, they argue that networks as material formations represent the next evolutionary stage in human (and military) organisation.

Similar arguments – although from a completely peaceful perspective – appear in the works of notable network theorists such as Albert-Laszlo Barabasi (2002), Mark Buchanan (2002), Stuart Kaufman (1995, 2000), and Duncan Watts (2004); the network here is a ubiquitous structural pattern of organization found in all forms of the materiality of life – both in nature and the social. The position is illustrated best in the words of physicist Fritjof Capra when he says that “the network is a pattern that is common to all life. Wherever we see life, we see networks” (2002: 9). Networks-as-the-all-permeating structure of materiality is the assumption on which this approach operates.

The bifurcatory tension between the critical theorists firmly positioned in the social, and all those attempting to approach the materiality of information networks through an

¹⁷⁴ Notice the constant need for locating a structure – both sides of the bifurcatory divide see in networks a new form of material structure but differ on its aspects; both testifying for the ‘plague of looking below.’

analysis of their technicity, comes to focus in the controversial work of media theorist and philosopher Friedrich Kittler (1992, 1997a, 1999). Kittler approaches the materiality of networks as a deterministic evolutionary development – what he terms a “discourse network”; he then proceeds to analyse the social as an emergent function of that materiality. For him, information networks form an autonomous instrumentality deriving from the Heideggerian *gestell*, which he terms as “*aufschreibesystem*” (1997a: 9), a system-in-writing notably writing and reading itself. This system is an underlying ordering of reality from which the social (and culture) spring out as mechanical flowers. “In any given *aufschreibesystem* only certain data objects are being recorded, processed, and read. Everything else is noise and disruption” (1997a: 9). The bifurcatory divide in approaches is perhaps best illustrated by the reaction of the critical theorists to the proponents of materialism:

This anti-humanist or post-human method of analysis is quite different from the subject-centred approaches that are commonly found in traditional (sociological) approaches to media technology (from Weber through to Castells). It reverses traditional procedures by reconstructing humanness from the machine world, rather than vice versa: What remains of people is what media can store and communicate. (Gane, 2005: 29)

Clearly, as long as the bifurcation of nature remains untouched, as long the politics of networks will be a contest to bridge a series of un-bridgeable divides: either a materiality of control undermining the social, or a materiality of openness and freedom reshaping the social; either an immaterial non-space putting in doubt the materiality of the subject, or a sudden discovery of an a-priori order of materiality enveloping both subject and object.¹⁷⁵ Either way, the contestants establish a bridgehead on one of the banks of the bifurcatory divide, only to explain through it the other; either the social gains ascendance through resisting the encroaching materiality of the network technical, or the social is explained by pointing out the ubiquity of said materiality. The barricades

¹⁷⁵ For an expose of the dilemmas posed by information networks for the bifurcated landscape, see Slater (2002).

having been erected, critique abounds; yet the bizarre incident in WoW still haunts the landscape – a spectrum flow and a missing body.

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Crossings

It should be obvious by now, provided that my argument was coherent, that from the perspective of plenist ontology as delineated so far, the problem of information networks is not a problem at all. The enunciatory translation of agency between the WoW player, her avatar, and the opaque spatiality of the game never stopped being fully material and fully embodied; her passing away may have removed her as an enunciator of the avatar, yet as her lieu-tenant in the game the avatar was still *having* her agency and therefore *being*. In that, both the mourners and the opposing tribe were equally enfolded in the avatar's program of action; the mourners by seeing in the avatar the lieu-tenant of an absent another, the shifted agency, the totem through whom they could touch the other; and the opposing tribe by seeing in the avatar the agency it *also had* – a material being, and an enemy.¹⁷⁶

The non-bifurcated concept of agency, when coupled with an understanding of technicity allowing for massive scalability and complete opacity of the assemblage, form a toolkit robust enough to explore inside and out, any network of humans and non-humans. Bearing in mind that the purported effects of information networks on space and time will be examined in detail by the next two chapters, below I want to approach networks as a concept for understanding the aggregated shifts of agency transgressing space and time.

¹⁷⁶ In this there seems to be a lesson about religion, especially when it is seen as *religare* – to bind and link.

The word network takes its name from an arrangement of materials which resembles the pattern of a fisherman's net.¹⁷⁷ The first and main quality of the concept therefore, if one had to explain it to a child, is that it is net-like. But what does that mean? On the one hand, it suggests the composition of a net, the arrangement of threads into a regular mesh-like pattern of knots and straight lines connecting them, with some empty spaces left in between. The form of the pattern, that is the empty spaces left between the knots and the thread-lines, is ultimately decided by the purpose for which the fisherman wants to use the net. On the other hand, net-like may delineate an object or a relation that resembles the way a fisherman uses her net – that is, to gather, collect, and otherwise extract something. In that sense net-like would suggest a practice, an action of reordering something into a different state, of displacing it, gathering it into a new form, relation, or place.

Therefore, conceptually networks stand for a technical assemblage coagulated into a particular pattern with the role of gathering things. The program of action of that technical assemblage is, like all other programs, to associate with a set of agencies and dissociate with other sets. Therefore, what is called gathering is essentially the effect of the association, the detour of the 'gathered' entity by the program of action of the assemblage. The process of the passing of that detour is of specific interest because it involves the already mentioned empty spaces in the pattern of the technical assemblage called net. The net associates with some entities while dissociating from others; the associative powers of the assemblage being latent throughout its entire surface thanks to the distribution of the thread-lines and the knots. In particular, the coagulated agency appears as a crossing-over between the empty spaces and the pattern, that is, by removing some of the links in the pattern the agency of the assemblage will be altered. To reiterate again, the net effect appears because this particular program of action is enunciated as a spatial pattern traversed by the agency of the assemblage.

¹⁷⁷ Etymologically the word 'net' stands in for something twisted or knotted in both Latin and the proto-Germanic languages.

What however, if we approached the concept from the perspective of the latent agency rather than the pattern? In other words, what if one encountered the program of action first, and then tried to deduce a conceptual formulation of the enunciatory pattern behind it? In 1736 the Swiss mathematician Leonhard Euler did just that and published his findings in a theoretical article formulating the basic concepts of graph theory and network science. Euler was trying to solve the at the time famous problem of the seven Königsberg bridges. The city of Königsberg in East Prussia (now Kaliningrad in Russia), was crossed by the river Pregel (now Pregolya). In the centre of the city there were two islands which were connected with the rest of the city and to each other by seven bridges. Apparently, the burghers of Königsberg had a knack for logical problems, and were entertaining themselves by trying to devise a route around the city which would cross each of the seven bridges just once (Figure 4).

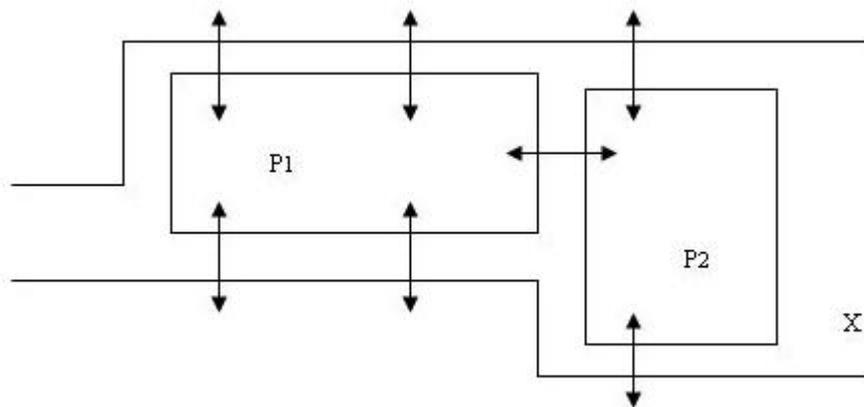


Figure 4: The Königsberg bridge problem. The river is marked by *X*, the two islands by *P1* and *P2*, and the arrows indicate the seven bridges.

They always failed to find a way and the effort grew into a legend, but Euler managed to prove that it is mathematically impossible to find a solution. He published his reasoning in an article titled *The solution of a problem relating to the geometry of position* (Biggs, Lloyd, & Wilson, 1976: 3), and also deducted a general pattern of the problem with a

method to solve it in the future.¹⁷⁸ Euler started by formulating the problem around space and an action in space – the crossing of a bridge. He first dissociated the city of Königsberg by eliminating everything which was not connected with the action he centred his problem on. He then rearranged the locality into a setting with interlocking agencies. Each spatial point became only a start or end location for crossing the bridge; in this way Euler excluded all other spaces not related in any way to the bridges at hand.

He represented this with letters - crossing from end A to end B of a bridge was represented as AB. Therefore the action of traversing space, of moving from one spatial location to another, was re-presented as a bringing-together, knotting, netting, or associating of two locations. In other words Euler literally extracted the program of action of a bridge. As Euler himself wrote, “my whole method relies on the particularly convenient way in which the crossing of a bridge can be represented” (Biggs et al., 1976: 3).

This statement is so important in grasping Euler’s achievement that it is worth repeating it again – “the convenient way in which the crossing of a bridge can be re-presented”; in which a crossing can be translated; a crossing shifted; a program of action extracted *and* re-presented spatially into directional agency. The whole city had to be dissociated, with the exception of the places connected by the bridges and the bridges themselves. He then dissociated all other features of the remaining spatialities, except those which indicated their association with the bridges; to represent that simplification, he inscribed spatially each bridge as a shift or detour in agency (line, edge), and the spaces to which the shifts led as the new resting places of that agency (dots, nodes) (Andrasfai, 1977). Now that the setting was re-inscribed as a program of action he was ready to attack the problem.¹⁷⁹

Euler presumed that in order to solve the problem the key would be the number of bridges (edges) and the places they connect (nodes). By taking this presumption on hand

¹⁷⁸ The title already suggests what Euler’s approach is; the original text is in Latin and the title reads as *Solutio Problematis Ad Geometriam Situs Pertinentis*.

¹⁷⁹ Notice the similarities between Euler’s conceptualisation and the work of Turing.

he not only completely disassociated the problem from its location, but also gave shape to the possibility that a general rule applying to all cases of this kind might be found. He further pointed out, that what matters is not the length of particular bridges (that is the time for which they are crossed), just as it did not matter what is the distance between individual bridges. Time, he decided, was irrelevant here, or rather, the only time-bound agencies involved in the setting – the crossing of a bridge – were flattened into space; in other words, they were re-presented as a shift between spatialities. From now on, what mattered was only which space involves which other space, which edge connects to which node. In that way Euler translated the problem of an afternoon walk into a problem of the transportation of agencies *crossing* from one spatiality into another; a network therefore began with the crossing of a bridge.¹⁸⁰

Therefore, when approaching a network as a program of action, Euler re-presented all agency shifts, existing at different points of time, as different surfaces of space visible at once; time translated into surfaces so as to re-link a program of action spatially. However, it is important to underline that by ‘abstracting’ a network pattern from the agentorial shifts of entities detoured into crossing between spatialities, Euler did not reach an underlying ‘base materiality,’ or structure, conditioning the agencies ‘above it.’ Despite the claims of network science, networks as material structure subsuming the social are nowhere to be found. His success did not rely on zooming in on an already present spatial pattern, but on allowing the shifts of entities to become visible as agentorial shifts across spatial planes on which he had positioned them beforehand. I will repeat that again – Euler made visible the shifts of agencies over variable space-times by translating the time component into space so as to make the shifts visible *at once*.

The ‘big picture’ is not given in one frame of reference, but in going from one frame to all the others through a network. Operations like thinking, abstracting, building pictures, are not *above* other practical operations like setting up instruments, arraying devices, laying rods, but are *in between* them. The vocabulary often used by cognitive and social

¹⁸⁰ For a network theory reading of Euler’s solution, see Barabasi (2002: 9-13).

sciences to describe mental operations is misleading. Abstraction does not designate a higher level of figuration but a fast circulation from one repertoire to another. It is not a property of mind, it is a property of reference. (Latour, 1988c: 35)

It is at this stage that the concepts of agency, technique, and shifts developed earlier show their use. Conceptually, a technical network's connectivity is literally fastened together by the dynamic shifts of agencies;¹⁸¹ their connectivity is not a set-piece structural feature of materiality as many want to see it, but a dynamic process which must be constantly maintained. It also follows, that it does not matter how the agency is shifted, as long as the chain of enunciations is not broken. The network ends where the enunciations end, where there are no more actors or intermediaries making their programs of action felt by the entities they encounter. "The scope of the network being studied is determined by the existence of actors that are able to make their presence individually felt on it" (Law, 1987: 131). The chain of enunciations does never stop being completely material and completely local, because the enunciating actors are always *both* material *and* local; in that, networks are always local at all their points (Latour, 1993: 117).

Crucially, as the example of Euler denotes, the concept of networks involves transformation; associations and dissociations have to occur for agency to pass *across*, to be re-presented, and to be shifted into *another* spatiality, and *another* setting. For a network to occur *something* has to *cross*, to be shifted, translated, transduced into another form; without crossing and delegation, without the *displacement* of an agency there is no network. Contrary to the image of networks as structures allowing displacement without translation - "transport without deformation" (Latour, 1999b: 15) - conceptually networks have to be seen as in-becoming, even though they may be perfectly stable. That is because the agencies they shift across are transformed and re-presented. Furthermore, because networks are properties of the relations between agencies, their stability is a function of those relations; if an agency coagulates into a stable technique, then its network of enunciations will be stable too. Therefore, networks

¹⁸¹ 'Connection' derives from the Latin *connectere* – to fasten together.

have to be conceptually seen as stable only “at certain places and at certain times” (Callon, 1991: 155).

Furthermore, as Euler’s process of deduction demonstrates, when we trace and link spatialities and agencies we literally “help to perform networks into being” (Law, 2000b: 6). With that realisation another aspect of networks falls into place – they are performative, and the agency enunciating the links is also a part of them. Therefore, it seems apparent that when tracing a network the point on which to focus is crucial; if you move the focus from one element to another you do not hold the same assemblage anymore - you are shifting to a different setting altogether because you yourself have shifted. What was an actor in the first setting may be an intermediary or disappear altogether in the second.

Entities - human, non-human, and textual - aren't solid. They aren't discrete, or clearly separated from their context. They don't have well-established boundaries. They aren't, as the jargon puts it, distinct subjects and objects. Instead they are sets of relations, for instance in the form of networks. And they are co-extensive with those networks. (Callon & Law, 1997: 170)

The concept of networks that emerges from this argument posits them as the associated programs of action of various heterogeneous entities, where the programs of action are at least equally heterogeneous, contumacious, and transgressive as the entities enunciating them. Each entity in the network both *associates with* and *dissociates from* others; “the solidity of the whole results from an architecture in which every point is at the intersection of two networks: one that it simplifies and another which simplifies it” (Callon, 1986a: 32). As long as the chain of translations is unperturbed as long the enunciators will be stable in their roles.

Again, the appearance of a network – the stability of the spatial pattern – is bought at the cost of transformation, of shifting, of crossing between settings; the more stable and opaque the pattern, the more its participating entities are enrolled with other settings. Therefore, contrary to the image of alienation, networks speak of never-before seen

enfolding. Contrary to the image of homogeneity, networks speak of never-before seen heterogeneity. Contrary to the image of linearity, networks speak of never-before seen transgression.

The simplifications which make up the actor-world are a powerful means of action because each entity summons or enlists a cascade of other entities. (Callon, 1986a: 31)

The power, the control, the domination of entities within a network is not inherent to those entities or to an invisible 'network logic' of control, but flows out of the relationality of those very entities; those will be powerful who, like the speed bump or the overhead bridge, associate with and detour others because they have enfolded the politics and the morality of numerous enunciators (Murdoch, 1995: 748). But their power is a function only of their program of action's ability to associate with and enrol others; to a pedestrian the speed bump is a non-event, to a car the overhead bridge is a meaningless city-landscape. As long as those 'powerful' entities can keep their associations intact, as long their power will last; network 'domination' therefore appears as the stability of the associations and dissociations of entities.

The bifurcators were wrong; purity and stability are not the natural state of technical networks but precisely the opposite – the result of multiple translatory shiftings between agencies which have to be kept folded-in. The originary myth of homogeneous technicity questioning the human has to be corrected: networks of shifting agencies are neither static, nor homeostatic, but homeorrhetic.¹⁸² The pattern changes but the flow of delegated agency remains.

One always swims in the same river, one never sits down on the same bank. The fluid is stable; the solid which wears away is unstable - Heraclitus and Parmenides were both right. (Serres, 1982: 74)

¹⁸² 'Homeorrhesis' derives from the Greek *homos* - meaning 'same', and *rhyxis* - meaning 'flow.'

With that, the study of the politics of networks can begin. In following agencies across the provisional patterns of their prehensions we follow their in-becoming in a commonly shared and experienced plenist ontology; we follow their politics. This chapter argued that to analyse and trace networks – be they informational or not was pointed to be of no consequence – we cannot rely on the discourse of a bifurcated nature because it continuously obfuscates and befuddles the setting by reinserting a dynamic of mastery. In approaching technical assemblages we have to rely on the simplest ontological manoeuvre: tracing the minute shifts of agencies. In approaching the complexities of information networks, the opacity and - yes, the monstrosity of the networks we enrol with, we can only rely on never letting go of the thread of agency opening up the labyrinth.

Chapter 2

Nodes: from actors to attachments

The previous chapter established, following the work of the actor network theorists, that the bifurcation of nature obfuscates the multitude of actors involved in networks, and reinserts a vicious dynamic of mastery. It argued that when the bifurcation is ignored, one can only move through the newly found surface by shifting along networks of agencies. Furthermore, the section argued that techniques have never been in opposition to some imaginary human essence, but, to the contrary, are inseparable from *being* human and therefore also part of the actor-networks along which the agency shifts occur; and finally, that by gathering heterogeneous assemblies of actors, networks enfold space and time.

This chapter continues the exploration of networks by concentrating on the effects of information networks on spatiality. The first section argues against the notion of isotopy – a projection of homogenous space *within which* actors move and events occur. It suggests that this type of spatial projection fixates an image of politics as a container-like referential background within which actors struggle for autonomy. Contrary to this projection, the section argues that space is literally performed and upheld by the movement of entities, and that, similarly, politics is performed by the movement of publics. This in turn suggests that the way to approach the politics of networks is by tracing the movement of *spacing* entities and publics.

At this point of the argument the section performs the second conceptual shift, from the notion of actor to that of attachment. The shift is necessitated by the realization that once the notion of isotopy is discarded there emerges a multitude of fluid and shifting entities of which it can only be said that they are noticeable because they are *attached to others*. Therefore, the section argues that in examining entities, we find ourselves tracing

circulating attachments, not actors. Armed with this understanding, the section re-approaches politics again in order to trace how publics assemble and move.

The second section explores the notions of control and domination, crucial in understanding the way network publics assemble and move while retaining their shape. The section establishes that an isotopic projection leads to a totalizing notion of domination which completely obfuscates the mechanisms by which a network is performed, stabilized, and upheld against adversaries. It is argued that domination is always an *effect* contingent on an array of logistical moves performed by the entities in the network in order to stabilize it. As such, domination is an inherently unstable phenomenon and the opposite of its grotesque image prevalent in critical theory.

Furthermore, it is discovered that the assemblies of attachments constituting a network are subject to simultaneous associating and dissociating tensions which constantly lead to *overflowing* and instability. It is these tensions which necessitate the constant performing of the network space and the resulting control over it. Therefore, the section concludes, both control and domination are only the effects of network logistics, and moreover, they are expensive and rare because of the cost involved in upholding and moving an entity while averting its deformation.

Informed by the topological features described above, the final section explores how to trace and map the heterogeneous attachments performing a public. It is again discovered that the reinscribing of a homogeneous and isotopic referential framework obfuscates the entire field of attachments which conspire to produce the *effect* of homogeneity. It is demonstrated that the cartography resulting from this projection has all the characteristics of a panorama, which *displays* everything and yet sees nothing. The cartography of attachments in turn will be found to display very little but to see it well, because it allows for the tracing of the logistics of performativity, that is, the series of spacings involved in any given space.

Spacings: assembling of the public

When objects are constituted then spatial relations are simultaneously being performed.
(Callon & Law, 2004: 4)

This section investigates how to think space as a series of topoi in-performance.¹⁸³ It argues against the notion of isotopy, and suggests that spatiality is performed by the shifting of attachments and entities in motion. While problematizing the notion of homogenous, container-like space, the section argues that if spatial relations are performed through the constitution of heterogeneous entities, so are politics. If the assembling and movement of publics performs the political,¹⁸⁴ the logistics of gathering and *emplacing* publics emerge out of obfuscation and take the centre-stage as the making of politics. The section proceeds along three steps: locating the spacings, framing the participants, and finally, assembling the public.

The question concerning space

In the last section of the previous chapter I approached the spatial problematic of networks through the metaphor of a fishing net. The net simultaneously catches and gathers some entities, while letting others pass through. In other words, even metaphorically a network *performs* a kind of topos through constraining and channelling

¹⁸³ I term these performative spaces as *spacings* to indicate their being processual – more a verb than a noun.

¹⁸⁴ Similar to objects performing spatial relations, I view publics as the entities performing political relations. In that sense politics is only what emerges from the constitution of publics.

the movement of entities. The interesting question however concerns the, at first sight, relative ambiguity of the wider spatial perspective allowed by this projection. If we think of space along Euclidean terms, our network would seem to project itself *in reference to* a fixed-frame topos.

What is gathered would be therefore always already framed and emplaced, in a state of total attachment, while what is left out would be in turn perceived as totally detached. If we significantly increase the size and complexity of the network in this projection, we will almost certainly face this condition as a reified presence-absence dichotomy. Moreover, the reification of presence and absence would become the overriding issue for publics¹⁸⁵ while, due to the referential projection, the only movement visible to it would be the rapid jump, or zoom, oscillating between the two absolute states. How therefore to think the politics of networks?

It is my contention that because a network is above all a topological projection its politics has to be thought above all topologically. As I would argue in this chapter, if space is taken as a container-like background, primary to all relations, and providing a grounded referential matrix inside which events occur, then inevitably one ends with bifurcations. This will be seen as the reason that critical theory sees everywhere either the ghastly landscape of isotopy, or its mirror image – the ghost of pure autonomy.

The most serious problem with this projection is that while reifying presence and absence it makes it impossible to see, trace, and understand how spacings are produced, how difference emerges and recombines itself in the networks of circulation we have been always building. While taking rare effects as always present givens, it blinds itself to the enormous heterogeneity of the world outside. If however, space is seen as the performed outcome in a long chain of agencies, then suddenly, instead of dealing with isotopy, we are faced with a field of immense complexity.¹⁸⁶

¹⁸⁵ Therefore, the questions - who is on, who is off, who is in, and who is out – will become the most important to answer.

¹⁸⁶ The next chapter argues that this observation applies to the question of time as well.

A referential spatial projection by necessity sees any and all topoi as within a larger spatial frame of reference. The affirmation of referential space creates the illusionary firm referents which in turn serve to stabilize the locales operating ‘within.’ Its opposite in turn - the relational projection - could be likened to a sort of plasma or gel,¹⁸⁷ in that it lacks solid referential stability, or to a cascade of surface-plaits¹⁸⁸ where both frames and the framed circulate ceaselessly.¹⁸⁹ To trace publics we need to use a projection able to see the logistics of this circulation, and follow its movements and transformations as faithfully as possible. The issue of movement is crucial, and this brings us to the problem of location.

Locating

The already mentioned Leonhard Euler solution to the famous Königsberg problem started with the crossing of a bridge;¹⁹⁰ as the previous chapter argued, it is this crossing-attaching that literally performs a network. When we want to see a panorama of an entire group of crossings, to take the whole view at once, we have to perform a magic trick similar to Euler’s – flatten time into its surface-plaits, and pretend for the sake of the panorama that the entire projection is somehow a purely spatial, topological phenomenon. This means that any and all visualizations of network space produce a summing-up, an un-folding to some extent, of what is a purely relational performance of attachments. As long as we remember that what we see is the effect of a trick of projection, we are safe. However, when pushed to a ludicrous extreme this effect gives birth to illusions of panopticon and total domination, and allows mistaking a rare effect

¹⁸⁷ This is an argument developed by sociologist of mobilities Mimi Sheller (2004). This approach is discussed in the third chapter.

¹⁸⁸ This term is used to indicate the layered, flat, and folded spatiality of the performative projection.

¹⁸⁹ This imagery resembles the ANT approach.

¹⁹⁰ To remind the reader, out of the infinite amount of spatialities performed by the citizens of Königsberg Euler focused only on the act of crossing a bridge, thus re-presenting the citizens’ morning walk as a linked series of spatial attachments.

of relationality – the appearance of an always local referential frame, for a main feature of the projection.¹⁹¹

Time, the event as duration, was flattened by Euler into a series of spatial relations distinguishable in just two variable states – nodes and edges. Edges designate an action, a movement from one spatial end-state to another. However, movement through what locale and at what transformational cost? This question was left unanswered by Euler simply because he did not need to answer it; for him the dynamism of edges and stability of nodes designated a contingent convention. For my argument however this question is crucial, as it exposes an illusion of movement through a container-like Euclidean space, an illusion of transportation without transformation. Once such a container-like space is taken for granted, then every quality with which one chooses to endow it gains a total presence.

Moreover, all types of movement in this space become easy. As long as one does not need to negotiate countless mediators, to account for transformations, to exhaust resources in upholding a network, one's movement consists of rapid zooms, of revolutionary jumps to hidden and fixed referential backgrounds. As an example consider the spatial movements of a complex assemblage such as an army: while in a relational un-bifurcated projection an army moves only because of long and perilous logistical chains which have to be observed, tended and repaired, in container-space the same army's moves would consist only of the lightning-fast jumps of avant-gardes.

To counter the projection of space as an abstract and amorphous background against which we distinguish “concrete and localized expressions” (Strathern, 2002: 90), we could substitute *a space* with *spacings*, indicating not only a plurality of topoi but also the involvement of *others* in performing and upholding those topoi. Spacing denotes a spatiality appearing through movement caused by a chain of entities, and denies us the temptation of occupying the total panoramic view without realizing what its costs are. Similarly, the notion of *publics* would indicate a departure from a monolithic projection

¹⁹¹ This is discussed in detail in the last section of this chapter.

of politics and substitute it with the concept of a politics appearing through the movement of contingent mobilizations.

Instead of politics projected as a monolithic background against which we can distinguish the localized expressions of difference, we then end up with a politics as a fragmented, constantly decaying effect of the circulations of publics. An exploration of the politics of networks in that case translates into a study of the movement of publics, of their logistics of circulation and association. This definition, as I would argue, is the only way to both uphold the performativity of space and trace the participation of otherwise invisible entities in the framing, performing and stabilizing of politics. As sociologist of mobilities, Mimi Sheller, argues:

What if the relation between social actor, social movement, and political context were put into question? Most significantly, what if we re-thought both actors and contexts as effects of mobilisation rather than simply as conditions? (2001: 3)

If, as was argued in the first chapter, we succumb to the bifurcation between society and nature, a particular kind of homogeneous space is being performed. On the other hand, if we ignore the bifurcation and instead of reified actor-contexts see the circulation of attachments, of traces to be followed, then a very different kind of space emerges. In the former kind of space movement is always from an actor to a frame, in the latter it is between circulations. In the former, actor identity is a referential correspondence with a contextual frame, in the latter – actor identity is a misnomer, because each actorial entity's being is defined by a series of contingent alignments between circulating surfaces.

Crucially, what emerges from this argumentation is that for performativity the choice in tracing a public is not between an actor and a context, but between attachments. In other words, the choice is not between superficial surfaces and a real, lived, deep, performative space without superficiality, but between one fixed surface kept as a

panorama, and a flow of surfaces.¹⁹² The notion of referentiality is therefore of not much use to a relational projection, as no single attachment, frame, or surface, points to a fixed background context, they all point instead to other attachments, frames or surfaces.

In this sense the resulting projections of seemingly homogeneous spatiality or politics have to be thought as the inscription of movement *qua* transformation of spacings or publics. Going back to Euler's trick, we realise that his network topology of Königsberg is nothing else but the inscription of the movement *and* transformation of a hypothetical entity. If you want to see the otherwise temporally diffuse crossing of multiple bridges *at once*, you have to transform stone, water, and humans into dots and lines, and then transport them into a room on a sheet of paper where you can finally see them all. The reification of presence and absence which the critical theorists first take for granted and then see as the emanation of a new form of control, is in this case the contingent *effect* of a chain of inscriptions, of shifts of agency.¹⁹³

The problem however, is that within a referential projection the political is viewed as an always already present and discernible whole while social actors (always human) derive their identity through a reference to this amorphous and pure context. The circulations of entities are then argued away as contextual, and all that matters is the revealing of a full and total whole.¹⁹⁴ Furthermore, the proponents of this isotopic projection might agree with all the arguments of performativity, yet still insist on the total homogeneity of the topology. This is achieved by declaring that the isotopic context is distributed through a sinister process of network control so that, even if we break the disciplinary bondage of

¹⁹² As Bruno Latour argues, the only rule when approaching a flow of attachments and performativities is "thou shall not freeze-frame" (2002c: 37).

¹⁹³ Furthermore, though the inscriptions admittedly reduce the rich subjectivity of humans into edges and nodes, they also allow the appearance of a 'big picture.' In this case seeing less is literally seeing more.

¹⁹⁴ In their magisterial work *Paris, the Invisible City*, Latour and Emile Hermant refer to this projection as follows: "by dreaming of a full, entire reality, common sense simply dreams of a diorama enclosed in a narrow room" (2006).

the fixed context, the all-encompassing image of domination is still there in front of our eyes.¹⁹⁵

How else can the iconoclasts explain that after all the smashing and breaking of images and attachments we are more attached than ever?¹⁹⁶ According to the referential logic, there must be a deeper and more sinister structure of control which still keeps the attachments firmly in place, this time by making without a room of confinement but distributing a new, dynamic form of control. This narrative can be illustrated through the observably growing complexity of the referential projection. For example, in the work of Herbert Marcuse (1964), or Theodor Adorno and Max Horkheimer (1972), the individual was absolutely dominated and moulded by the sinister forces of a total capitalism front working through the culture industry. Horizontal communication between individual citizens was supposedly replaced by vertical communication through the culture industry, the public sphere giving way to spectacular public imagery, thus allowing capitalism to become the sole referent for individual difference. A single totally dominated public and a single totally homogenous politics.

In the work of Jürgen Habermas however, this early and rather simplistic understanding is being replaced by a more complex picture of a rather diffuse public striving in its turn to replace the dominant master-frame with alternatives (Downey & Fenton, 2003: 187). Habermas attempts to incorporate the rise of information networks, which undoubtedly has imposed an additional layer of complexity to this picture, and prompted a frantic search for new referential approaches.¹⁹⁷ According to him,

the growth of systems and networks multiplies possible contacts and exchanges of information [but] does not lead per se to the expansion of an intersubjectively shared world ... The publics produced by the Internet remain closed off from one another (...)

¹⁹⁵ I am alluding to Deleuze's conception of the society of control (1992), to be discussed further below.

¹⁹⁶ In his foreword to the catalogue of the *Iconoclash* exhibition Latour (2002c) makes a clear link between this reinscription of the pure context and the iconoclastic impulse.

¹⁹⁷ For further examples, see CAE (1996), Touraine (2004), Jordan (1999), Jordan & Taylor (2004), Ayers (2003), and Donk & Wim (2004).

the systemic processes, having become independent, have long since severed their ties with all contexts. (1998: 120-121)

Arguably, the most complex expression of the narrative appears in Gilles Deleuze's celebrated essay *Postscript on Societies of Control* (1992).¹⁹⁸ Deleuze essentially argues that the previous referential approaches, summarized by him under the aegis of Michel Foucault's 'disciplinary society,' have given way for a new 'society of control.' Places of concentrated discipline and confinement are supposed to have given way to a flow of distributed and modular control, while technological networks reinscribe control-modulation. Therefore, while in the earlier and less complex referential narratives control and domination were the functions of a master context which was easy to identify, this version inscribes the referential setting of actor-frame into an, at first sight, performative projection (Elmer, 2003: 240). In other words, the argument insists on a total referential context which simultaneously self-performs through all kinds of entities.¹⁹⁹ As a result, the logic of total referential-performative control truly melts all that is solid into the air (Law, 2000b: 6).

In the work of Paul Virilio for example, the initial referential impulse finds itself ironically reduced by the logic of network control to mere imagery as he decries that "public images (in real time) are more important than public space" (1993: 3). According to him the public sphere has now mutated into a publicity stunt and the battle for the public space into a battle for the image. Any form of publicity is therefore by necessity part of a mediatization process (1986, 1995, 2005). Viewed this way, referential space is a form of spectacle, controlled and dominated by the new logic of modulation and the instrumental speed with which it performs itself.²⁰⁰

¹⁹⁸ In the next section I will analyse more recent works trying to uphold the notion of distributed control.

¹⁹⁹ This argument is also developed in (Beniger, 1986). Furthermore, and as a result from this narrative, "a confrontation with networked, global forms of control" (Terranova, 2001: 96) is now taken as the main political task.

²⁰⁰ As the theorists of the Critical Art Ensemble augur - "the speed at which pancapitalist vectors move demands instant response or else one is left gurgling in the backwater" (2003: 9).

This shift in focus has allowed critical theorists to enrol in their narratives the arrival of information networks and explain away any and all logical cracks in the referential projection as proof of the existence of a new referential-performative form of network control. For critical sociologists Luc Boltanski and Eve Chiapello for example, network control marks the arrival of nothing less but a new “connexionist” form of capitalism which performs exploitation through modulating mobility and immobility (2005). Therefore, as if in an enchanted story, the referential argument constantly loops back on itself referring to a reified presence-absence.

As long as movement is tied within this enchanted loop, as long as there is a bifurcated referential relation between spatiality and entities, between contexts and actors, there cannot be a tracing of publics, as we see neither the logistics of their appearance, nor their circulation. The only move the referential projection allows us to see is a rapid zoom between the two absurdly pure states of actor/entity and space/context. Visually it is akin to trying to follow someone’s movements through a room while someone else rapidly switches the light on and off. At one moment our actor is here, at the next – there; but how she crossed the distance, what trials she undertook, we can never know. By remaining blind to movement and transformation, which after all are relational phenomena, the referential projection allows us to see only a vile relationship of domination and control played out in pure isotopy; a relationship by necessity inscribed everywhere in order to explain the obvious transformations (Figure 5).

Moreover, the referential projection cannot explain how, through what negotiations and transformations, new contexts appear. When it comes to the task of locating a public, networked or not, we always find ourselves in the familiar landscape inhabited by pure avant-gardes and equally pure domination. Crucially, fundamentally, we are incapable of following the logistics of movement, the micro-shifts, and circulations which entities undergo. When it comes to the relations between networks as a structural context, and publics, this projection tends to see an automatic self-performing one-way relation of reference, where the structure acts to limit the entity moving along it. In the words of Mimi Sheller:

many existing network analyses of social movements assume that networks function mainly as structural constraints on social movement actors, rather than as outcomes of the actual process of mobilization. (2001: 8)

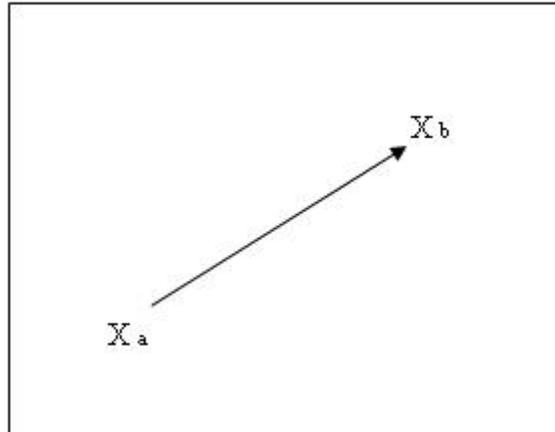


Figure 5: Entity X moving through isotropy from point *a* to point *b* without any transformation. No space is performed on the way. Since no space is performed, there is no difference but only homogeneity of movement without any deformation or negotiation. This barren, featureless landscape is the panorama inhabited by critical theory.

The alternative, relational projection, would insist that the contexts which publics inhabit are created by movement; that entities create, or perform, a context for movement while simultaneously the context creates or performs them.²⁰¹ In this projection the focus is on the entities which, while cohering to each other, shift within networks of relations and cause the constant performing of a contextual topos. It is also necessary to point that the entities named ‘networks of relations’ and ‘contextual topos’ are themselves circulating, cohering and performing.

Therefore, any movement and transformation, or stability and fixation, is a function and effect of the relations between other entities. It could be said that in the relational projection each entity is a space-performing network of other relations, or, in other

²⁰¹ This position is similar to the Münchhausen theorem mentioned in the first chapter.

words, that there are as many spaces and times as there are types of relations producing them. Therefore, while the referential projection always looks for contexts *behind* the visible, the relational projection always looks for the relations performing and upholding the visible. This position, however radical it may sound, is well-known to anthropologists, geographers, and architects among others. As geographer David Turnbull argues in the context of indigenous wayfinding:

We create space in the process of travelling through it and in creating narratives of journeys we simultaneously construct knowledge. (2002: 133)

As it should be obvious, the key element of this projection is movement. Movement entails transportation *and* transformation, and it is these two functions of movement that are both responsible for performative space and allow us to trace it. In other words, we perform spatiality by moving through it, and it performs us, by channelling and constraining our moves (Turnbull, 1991: 35). For relationality, space stops being a container, and becomes an itinerary, a program of action, a series of inscriptions, surfaces, stories of encounters and transformations, knowledges and assemblies.²⁰²

Crucially, movement is coupled to both performativity and the trace, to the future and the past: “if space is performative, it has a history, and if knowledge is performative it is spatial” (Turnbull, 2002: 137). As it would be seen in the last chapter, relationality ultimately entails that both time and space are performed through movement.²⁰³ Moreover, as I would argue in the last section of this chapter, we discover this projection in studies of indigenous practices of wayfinding and cartography, in which the very act of dwelling in the world entails movement, and therefore transformation (Ingold, 2000).

Therefore, in observing movement suddenly we see relations to which we were blind before, and moreover, we see the logistics of their performance. Returning to my earlier

²⁰² This aspect of the relational projection is beautifully narrated by Jim Clifford (1997).

²⁰³ One could add that therefore spaces and times flow out of locales performing moving entities, concluding that “space and time are contained in places rather than places in them” (Casey, 1996).

example, when looking at an army we now see a long and fragile chain of logistics of which the lightning-fast avant-garde is only a contingent effect. Indeed imagining an army without its logistical ‘trail’ would be in effect an absurdity. Napoleon is supposed to have famously exclaimed that an army marches on its stomach, but, to simplify this example even further, one could add that only by performing the space for marching and the stomachs to march would one end up with an army. Therefore, and exactly to the contrary of the referential projection, what was the most natural and always present - a stable fixated context – appears to us the most artificial and hardest to find. This is not to say that a performative projection would deny the existence of stable homogenous contexts, but that these contexts would be seen as the relational effects of the interactions between other entities, and that their stability would have to be constantly performed.

The performative approach to space appears first as the granting of powers of spatial enactment to entities, and second as the readiness to perceive the multiple forms of spatiality emanating from the formation and circulation of objects. In other words, first we need to have a projection allowing entities to perform spaces, and second – being able to trace the movements of entities through various spatialities. Admittedly, while some relations would be well understood within the confines of Euclidean space, and others within the confines of network space, still others would be visible only through the juxtaposition of various spatial projections (Law, 1999b: 3). As John Law argues, the process of performing an entity appears to be also the process of performing its spatial protocol of movement – what he terms as “spatial conditions of im/possibility” (2002: 92). These conditions concern the formatting of movement in space, the protocol of im/possible shifts that an entity can perform in the process of its spatial travails.²⁰⁴

²⁰⁴ In the sense that, while an entity such as a car or a corporation remains stable in the network space of its internal relational composition, it simultaneously is mobile in *another* performed space (i.e. Euclidean). The ‘conditions of im/possibility’ to which Law refers, are in this case the result of relations between the spatialities occupied by an entity.

Therefore, the key to the performative approach to locating publics seems to lie in understanding these shifts. Entities occupy multiple spatialities defined by the ratio of movement to stability they undergo.²⁰⁵ John Law elaborates extensively on this problem in his essay *Objects and Spaces* (2002), using as an example the problems faced by Portuguese navigators and seamen in the first attempts at long distance oceanic navigation of the 15th century Europeans.²⁰⁶ The, at first sight insurmountable, problems they faced were of a very simple nature: how to maintain a network object (the ship and its crew) stable, while transporting it over adverse and unknown spatialities? For us the question would translate as follows: “under what circumstances can an object be deformed (for instance moved through space in relation to other objects) without changing its shape” (2002: 95)? According to Law the solution to this problem lies in the techniques of performing and enrolling a spatiality which the ship could then navigate in a homeomorphic²⁰⁷ way.

Law concludes that, first, spatiality is a convention in the sense that it is the effect of relations between entities, and second, that questions concerning the continuity of spatiality and objects should be settled together as both are locked in a relational performativity. Because there is no limit to the number of possible relations performing a space or an object, there is an infinite amount of possible answers to the question of homeomorphism, and concurrently, an indefinite amount of possible spacings or traceable stable locales. The crucial issue for us is the ability to locate the logistics of performativity building up the spatial context of the object, and describe their transformation and transportation in the spaces and times they enrol.

When the problem is viewed in terms of publics, it amounts to describing the micro-relations sustaining a context, a public, or an issue in a way allowing for the appearance of multiple spatialities while retaining the stability of the context, public, or issue.

²⁰⁵ This relationship will be clarified even further when the next chapter takes into account the time vector.

²⁰⁶ Here I am only marginally engaging the rich argumentation employed by Law to illustrate the problem of performativity. He explores this fascinating episode at length in (Law, 1986, 1987).

²⁰⁷ The term *homeomorphic* stands for - in a stable shape.

Returning to Law's example, if a ship remains physically intact and capable of sailing it could be described as a stable object, but also, and crucially, as an entity remaining homeomorphic *because* of its attachment and relation to other entities. In other words – it is stable *yet moving* only because it is attached to others.²⁰⁸ As Law argues:

It is the stability of the syntax of those relations that is crucial. Hull, spars, sails, stays, stores, rudder, crew, water, winds, all of these (and many others) have to hold in place functionally if we are to be able to point to an object and call it a (properly working) ship. All these bits and pieces have to do their jobs. (...) So a properly working ship has to borrow the force of the wind, the flow of the current, the position of the stars, the energy of the members of the crew, it has to borrow all these and include them (so to speak) within itself.

This means that vessels are spatially or topologically multiple, inhabiting both Euclidean and network spaces. They are also homeomorphic within each of the forms of space, holding together physically in the one, and functionally or syntactically in the other. However, they move only within Euclidean space, remaining immobile within network space. (If there is rupture in the relations between the components in network space then they are no longer a network object.). At the same time it is this immobility within network space which affords their displacement within Euclidean space, that allows them to sail successfully from Calicut to Lisbon. (2002: 95)

What this means, is that the performing of a ship homeomorphic in a spatiality defined by coordinates also, and simultaneously, performs the spatiality within which the ship is located and moves. As Law succinctly phrases the relationship – “spaces are made with objects” (2002: 96). Therefore, and quite obviously at this point, the entire scale of protocols effecting from Euclidean space with its coordinates and grids, is not inscribed in some essential logic of things but is an enactment, a convention performed by the objects using it to maintain their stability. It is literally a way to bring the winds and the

²⁰⁸ The problematic of stability through transportation is perhaps best captured in the concept of ‘immutable mobiles’ developed by Latour in his groundbreaking work *Science in Action: how to follow scientists and engineers through society* (1987). Immutable mobiles will be discussed in detail in the next chapter, together with the analysis of network temporality.

waves, the hull and the crew together as a stable network entity. Also crucially, homeomorphism, when viewed as temporal event, has to occur both in a performative relational projection (network spatiality), and in a referential projection (Euclidean space).

In other words, the importance of a simple referential co-ordinate convention (and it is always a convention) lies in it providing *another* relational attachment with which to trace displacement and transformation and simultaneously tie down and stabilise the object undergoing them. The lesson the Portuguese learned was that when faced with an unpredictable and amorphous spatiality of the kind performed by a major planetary ocean, one had better have a handy way of *adding to it* a predictable and homogenous spatiality of the kind performed by a co-ordinate grid. Only then can one perform these spatialities *and* retain homeomorphism.²⁰⁹

To re-assess the argument so far, the performative projection seems to be useful for locating network publics because firstly, it inevitably sees attachments to *others*; secondly, because it sees entities in movement and is able to trace their transformations; and finally, because it is open to tracing multiple spatialities at once. That is the case because, according to Law, “objects are always enacted in a multi-topological manner, and are dependent for their constancy on the intersection of different spaces” (2002: 98). Furthermore, and perhaps none the less crucially, spatial qualities such as distance and movement appear in this projection as a function of a performed spatiality on which to chart them. There is no distance or movement between entities enrolled in divergent spatialities simply because there is no common network of relations between them. The same relationality applies to all issues of scale, which become meaningful only within a common spatial context.²¹⁰

²⁰⁹ Also, the notion of adding one spatial convention to another is absolutely crucial, and notably the opposite of the iconoclastic impulse to cleanse. Stability (and purity) is achieved by adding attachments – not cutting them.

²¹⁰ In that sense notions such as proximity, distance, and scale, and the quality of relations they entail, can be traced only after we have mapped the common topos of which they are an effect.

Fundamentally, the lesson learned in locating publics is that if there is no way to track *both* transformation *and* transportation simultaneously, there is no movement to speak of, and therefore no locale. As Figure 5 attempted to visualize, in this case there would be only rapid jumps and zooms performed by entities equally fantastic as the ‘revolutionary avant-garde.’ In this kind of ‘tyrannical’ spatial projection “the path from the local to the global is always already given and unproblematic” (Bingham & Thrift, 2000: 288), and therefore non-existent. How to analyse network politics if one cannot detect the entities making up the network, let alone trace their movement? Helped by the experience of the Portuguese navigators, we now know that it is not enough to trace the movement of entities enacting a network, unless one also traces the multiple spatialities framing those movements.

Framing who/what moves

The concept of framing was introduced into the social sciences by Erving Goffman (1974), and further developed by David Snow and Robert Benford (1988; 1992), to describe the methods of social movements in handling semantic issues. According to Snow and Benford it is a strategy used to “underscore, embellish and redefine (...) a social condition” (1992: 137).²¹¹ In the sense suggested by them, but also by Sydney Tarrow (1998: 119), framing is essentially a semantic technique used for performing and channelling a political issue. I am using the concept of frames in this, original, meaning while underlining the fact that too often they cease to be “interpretive schemata” and are instead mistaken for structural features of the landscape.

Framing is in this sense a conventionally performed semantic topos added to another spatiality so as to stabilise it – the way the Portuguese navigators were shown to have

²¹¹ The act of framing was further described by them as an “interpretive schemata that simplifies and condenses the ‘world out there’ by selectively punctuating and encoding objects, situations, events, experiences and sequences of actions within one’s present or past environment” (Snow & Benford, 1992: 137).

stabilised the currents of the Atlantic Ocean. The concept of the frame is convenient because of its association with a limited topos, and thus helpful for the locating of publics as a dynamic process performed along multiple limited spatialities. Sheller points precisely at this quality of frames, when she argues that framing allows conceiving of publics “as a liquid that is always at risk of overflowing its container or ebbing away out of a leaky container” (2001: 9). The metaphor of an overflowing container is useful in that it points to the unstable and contingent nature of frames as channelling techniques. It also crucially suggests, that a stable and homeomorphic frame is a rare phenomenon, itself the effect of relational performativity.

The topoi performed by the frames of publics would be subject to the same projection rules as described above. Therefore on the one hand there would be a projection seeing frames as a priori features of a given topology, and on the other, a projection seeing them as performative effects. The former would see frames as stable structural elements of a referential topos, the latter as circulating entities of a relational and performative spatiality. When observing publics, the former projection will only see them as channelled along already formed topoi and dominated by a referential master frame.²¹² The latter projection in turn will see the channelling of publics by a frame, but it will *also see* the performing of the frame by those publics. Below I approach these projections through two, slightly idealized for the sake of argument, framing moves: either as an exercise in unveiling an obscured referential context, or in assembling the entities performing the frame.

Two moves: Unveiling

Hence sociology adopted from modernist ethics the ideal of a subject without ties.
(Latour, 1999a)

This move, as its name suggests, aims to unveil an entity without any attachments and of pure essence. Specifically, the metaphor of unveiling indicates a looped process of

²¹² The notion of a master frame indicates the referential background.

looking for, and discovering a hidden and obfuscated background in relation to which all entities comprising the public are framed. For example, if that background is the dream of pure autonomy, then the entities participating in a given assembly would be framed around the reification of presence – absence inscribed upon the quest for pure autonomy. Otherwise, if the frame is that of power, then the background hidden behind the imagery will be that of total domination, while all entities framed in this way will be part of this referential relation. Since the setting is defined by the interplay between an actor and a referential context framing her, the only possible political move is that of unveiling the framing performed by the context and debunking the context with the goal of, romantically, removing the chains of attachment and discovering a deeper, unspoiled real populated by autonomous subjects without ties.

At its heart, this projection performs the ideal iconoclastic act, by first showing that the frame is merely an empty image obscuring the real, and then unveiling the real in all its purity by severing all perceived attachments between an ideal subject and the frame. The impulse of unveiling sees the political as a box with a fake bottom; there is always something behind, always a hidden background from which attachments frame the unwitting subject, while the task of the critic is, predictably, to find and denounce the background.

Moreover, by inscribing the political move into the context of unveiling a hidden background, this projection simply totalizes the political. It sees it everywhere as an explanatory force-stratum which is *behind* and *before* any other assemblages and associations. It is a pure and amorphous spatial projection pre-existing any possible relations. The projection allows creating a political relationship of dominance and oppression (they go hand-in-hand) with regard to any association, simply by insisting that a topology of dominance existed before those associations.

But how is it possible to imagine an outside world? Has anyone ever seen such a bizarre oddity? No Problem. We will make the world into a spectacle seen from the inside.
(Latour, 1999c: 13)

The unveiling move resembles the political outlook of the Situationist International's *Society of the Spectacle*.²¹³ Accordingly, all means of communication are perceived as a tool of social control aiming to induce passivity and isolation (Bonnett, 2006: 31). The spectacular frame is so total and overwhelming, that the only way to overcome it is through a move bearing the mark of the most revolutionary of avant-garde's – that of radical authenticity (Debord, 1994 [1967]), or, in effect – lifestyle.

What emerges is a politicized way of living: of the 'authentic life' as a series of spontaneous acts of refusal of the spectacle that are simultaneously expressions of revolutionary hope and despair. (Bonnett, 2006: 33)

By essentially adding a social theory of power to every political problem,²¹⁴ the projection constructs a frame in which publics and their movements are completely insignificant, since all they do is move along frame channels pre-set by a hidden authority (Figure 6).

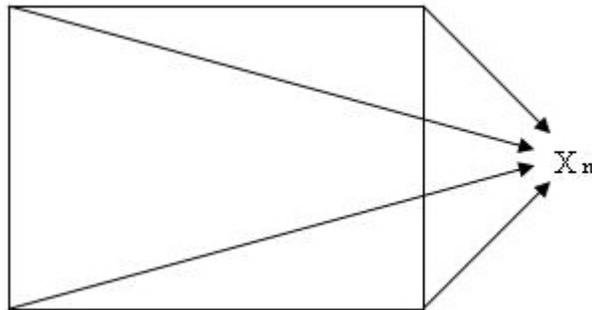


Figure 6: Spectacular politics enframes an actor within a frame of total domination

²¹³ This concept was first developed by Guy Debord in his influential *The Society of the Spectacle* (1994 [1967]), and further refined in his *Comments on the Society of the Spectacle* (1988). Since then the idea has been picked up by theorists such as Jean Baudrillard (1995) and Douglas Kellner (2003).

²¹⁴ Latour hints at this in an interview with Katti (2006).

In other words, when the only visible elements of topology consist of a hidden context and an entity framed by it, then the only sensible politics for that entity seems to be to extract itself from that context. Philosopher Richard Rorty once argued with regards to social movements embracing the frame of spectacular politics (and therefore the entire referential projection), that their ‘authenticity’ consists of neither succeeding nor failing. Rather, according to him, they share in

what Kierkegaard called ‘the passion of the infinite.’ They are needed to provide a larger context within which politics is no longer just politics, but rather the matrix out of which will emerge something like ‘a new being in Christ’ or ‘a new socialist man.’ [They] assume that things will be changed utterly, that a terrible new beauty will be born. (1998: 114)

The unveiling move is best exemplified by two of the most recent critical approaches to politics through a topological projection. Both are built around the idea of politics as the extraction of the subject from spectacular domination, and appear in the Critical Art Ensemble’s (CAE) theory of *Electronic Civil Disobedience* (1996), and Hakim Bey’s *Network of Castles* manifesto (1997). Their positions deserve to be traced in greater detail as an example of the projection discussed here.

According to CAE, public space as understood by critical theorists such as Habermas has turned into ‘dead capital.’ Debord’s *Spectacle* has totalised the entirety of social relations, while political power has mutated into a nomadic form of pure absence – “power itself cannot be seen; only its representation appears” (1996). To counter this, one must appropriate the tactics of nomadic absence, eluding domination by the frame of a hidden power, staying below the radar, and yet altering the spectacle by symbolic acts that will (hopefully) open cracks in the edifice of the monolith.²¹⁵

²¹⁵ Perhaps not surprisingly, this scenario eerily resembles the script of the popular *Matrix* movies by the Wachowski Brothers (1999). In any case the roles are easily identifiable: the master frame of spectacular politics is the evil computer program, the drone-like humans used to power the program are the utterly dominated consumers described by the theory of the spectacle, while the role of the brave but few hacker-rebels, originally reserved by Guy Debord for himself and his friends, is now occupied by the critically-

First, the CAE theorists believe that politics is played out through the exercise of hidden power. Second, the spectacle frame projected by this power is seen to inevitably appropriate all alternative messages for its own uses, thus rendering oppositional movements powerless – “since mass media allegiance is skewed toward the status quo (...) there is no way that activist groups can outdo them” (2001: 15). As a consequence of this CAE argues for the subversive and the covert while preaching “abhorrence of public space as a theatre of action” (2001: 25). The activist avant-garde is the only actor able to “maintain at all times a multi-dimensional persona” (1996), thus not losing its own autonomy to a spectacular frame.

The avant-garde fights for the rights of the oppressed but is not and cannot be known to them – it is a force *ex nihilo*, an alter ego to the elusive power. The avant-garde of *Electronic Civil Disobedience* (ECD) is moreover predestined to be the eternal *significant other* of power. CAE’s vision of this struggle insists that “authoritarian structure cannot be smashed; it can only be resisted” (1996), therefore creating a dialectical condition of ever-shifting frames of resistance and oppression.

Hakim Bey’s manifesto in turn expands on his earlier theory of *Temporary Autonomous Zones* (TAZ).²¹⁶ TAZ is, according to him, utopia somewhere (1997), preferably here and now, appearing and disappearing, a paradoxical frame without image, beyond the spectacle yet spectacular – in effect virtual. Similar to the ECD, the TAZ is built around the concept of staying below the radar of power and countering network control with nomadic dissent. The resistant public’s ‘nomadic war machine’ “conquers without being noticed and moves on before the map can be adjusted” (1992). The use of the map metaphor is instructive here, as it reveals a persistent belief that any form of explicit representation of a public is doomed to be appropriated by power. In this understanding a map is a power technique which denies autonomous subjectivities of any kind. It is the discourse of technological enframing, emboldened by the iconoclastic belief that

minded autonomous subject jamming the spectacular signal from the inside.

²¹⁶ Hakim Bey is the *nome de plume* of theorist Peter Lamborn Wilson.

representation is absorption. Once on the map, framed and attached, there is no autonomy to speak of.²¹⁷

Obviously this understanding leads to a particular framing of politics. Here the invisibility of a public is seen as a necessary framing manoeuvre which creates meaning through its paradoxical absence/presence – it *is* not (as in *does not exist as an image*) but it *could* and *must* be taken as physically present. Its purpose is to escape spectacular politics and the domination it entails and thus sublimate a perfect autonomy free from desire: “it will call a world into being - even if only for a few moments - in which our desires are not only articulated but satisfied” (1997). According to Bey, this fantastic topos would be existing on the border between the real and the virtual, inaccessible to power, “rooted partly in the imaginaire...in the image of mysterious inaccessibility and danger” (1997). It is both a public frame rooted in located topology, and a construct of perfectly occluded purity from attachments, by nature inaccessible to framing. Its role is to escape the spatiality occupied by spectacular politics and thus be *real* again. As Bey puts it:

The tactical problem consists of the need (or desire) to stay ahead of representation - not just to escape it, but to attain through mobilization a relative invulnerability to representation. (1997)

In effect, Bey concludes the quest for being free from attachments by sublimating from nowhere a physical reality without mediated desire, and therefore pure from attachments. In this act of total, ultimate iconoclasm, the icon of the image is abolished, public space is exorcised from mediated desire, and the void left by the spectacle-politics presents itself as a fulfilled public being. Thus framed, the referential projection reveals itself as the ancient utopian quest for the perfect self – a symbolic and aesthetic paradox where “the original ego, basis of our hopes, evokes the void and ultimately reduces itself to it” (Cioran, 1996: 118). The *real* of the unveiling move is marked by the

²¹⁷ This reasoning will be encountered again in the last section of this chapter when the problem of tracing attachments is explored.

titanic struggle of liberation from attachments. It is an iconoclastic frame perhaps best summed up by philosopher Mark Poster:

[It] establishes a process of liberation at the heart of history which requires at its base a pre-social, foundational, individual identity. The individual is posted as outside of and prior to history, only later becoming ensnared in externally imposed chains. Politics for this modern perspective is then the arduous extraction of an autonomous agent from the contingent obstacles imposed by the past. In its rush to ontologize freedom, the modern view of the subject hides the process of its historical construction. The insistence on the freedom of the subject, the compulsive, repetitive inscription into discourse of the sign of the resisting agent, functions to restrict the shape of identity to its modern form, an ideological and legitimizing gesture of its own position rather than a step towards emancipation. (1997: 213-214)

Versions of this framing move can be observed in various recent studies of network politics. According to Tim Jordan and Paul A. Taylor for example, the one discerning feature of information networks is that as a result of their proliferation “we are trapped in a reality constructed by information - mostly, the particular kind of information that is constituted by images” (2004: 39). According to them, this results in the altering of the constitutive structure of individual experience, to the extent that “the self is no longer firmly pinned to a stable identity; it wavers, staggers, and may crumble” (2004: 39).²¹⁸

Accordingly, this turn of events has been precipitated by the systemic logic of an instrumental and total network, which in turn can be defeated only by the counter-systemic logic of autonomous publics (2004: 145).²¹⁹ The quest for the pure authentic frame is clearly visible here: a dominant frame in the form of a spectacular image (iconoclasm likes to think in terms of images), a systemic instrumental logic of domination which perverts all politics into spectacle, and finally a small dedicated team

²¹⁸ The reader would notice the abounding echoes of the subject-predicate bifurcation discussed in the previous chapter.

²¹⁹ For a full view of Tim Jordan’s theses, see also Jordan (1999).

of authentic rebels who aim to ‘jam’ the spectacular signal and deliver their counter-image.

As Joseph Heath and Andrew Potter convincingly argue, the ‘culture jammers’ have a prominent role in the unveiling manoeuvre described above (2005). Once the premises of the unveiling move have been taken for granted, it seems natural that the totality of culture can be nothing else but a system of ideology which needs to be resisted in its entirety (2005: 9). Since iconoclasm essentially strives for a ‘purificatory askesis’, every attachment to a system of total ideology is presumed as cooptation by that system. Therefore, autonomy itself becomes a completely closed and total system of pure self-referential authenticity - the authentic lifestyle²²⁰ (Bennett, 2003b: 27), just as in the theories of CAE and Bey narrated above. The complete totality of this frame, its severance of all attachments, is its proof of alienation from the dominating context and therefore of authenticity.²²¹

Indeed, once the unveiling move is, so to speak, enrolled in the frame, the only possible politics of authenticity is to unmask the spectacle in all its appearances and deduce from it the locality of the authentic public. The quest for the real boils down in effect to breaking the chains and leaving the Platonic cave. Douglas Kellner for example, analyzes the entirety of network phenomena through the prism of what he terms “megaspectacle” (2005). According to him, information networks create values serving to “enculturate individuals” (ibid.), while simultaneously providing an opportunity for an “experimental identity construction and politics” (Kahn & Kellner, 2004: 89). The “megaspectacle” is essentially a colonization of the entirety of social life, a total frame covering in a thick curtain of appearances all that is solid and real and pure. Moreover,

²²⁰ For further discussion of the politics of the authentic lifestyle, see Bennett (1998, 2003a).

²²¹ Perhaps best summed up in the words of the poet of spectacular domination Guy Debord: “This revolution must definitively break with its own prehistory and derive all its poetry from the future” Guy Debord in (Bonnett, 2006: 25).

politics appear as projections on this spectacular curtain, while the only real political move is, naturally, that of unveiling, of tearing down, the curtain.²²²

The unveiling manoeuvre can be observed in the already mentioned theoretical position of Castells, when he writes that “the placeless logic of the space of flows [characterizes] social domination in the information age” (1997: 358), or in the thought of Scott Lash, when he writes that “forms of life in the network society are somehow lifted out, disembedded” (2002: viii), compressed and characterized by “an absence of identity” (ibid: 21).²²³ The common thread running through these arguments, is the positioning of the real – be it in the form of politics, the social, power, or identity – *underneath* the blanket of a dominating and illusionary frame. The role of the critic is to unveil that blanket, and is perhaps best summed up and displayed in the work of Michael Hardt and Antonio Negri (2000: , 2004).²²⁴

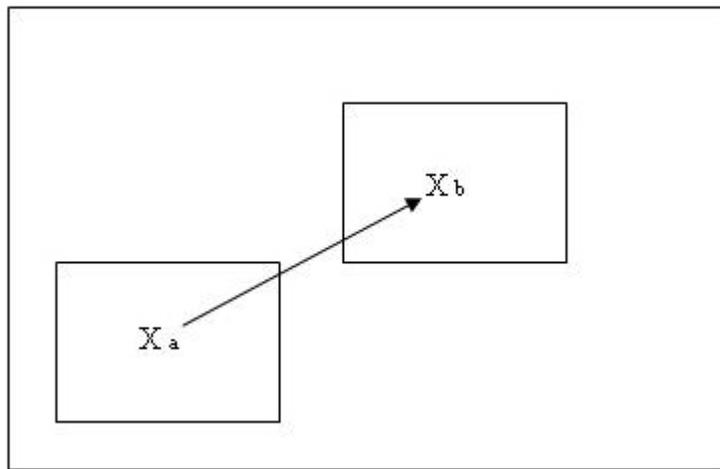


Figure 7: The spatiality of total spectacular politics; not only is X moving through isotopy, but she is also being constantly dominated by a spectacular frame.

²²² To further explore Kellner’s position, see Kellner (1989, 1995, 2001, 2002, 2003).

²²³ I only cursorily mention these arguments here because they are engaged at length in the last chapter. For an actor network theory response to the global ‘time-space compression’ argument, see May & Thrift (2000: 7).

²²⁴ Mark Poster offers a detailed, almost point-by-point, rebuttal of Deleuze’s, and Hardt and Negri’s positions on the network society in (Poster, 2004).

Perhaps the best coda to the unveiling manoeuvre comes from Martin McQuillan’s critique of Naomi Klein’s famous book *No Logo* (2000). He identifies the unveiling manoeuvre, as the manifestation of “a deep craving for metaphorical space: release, escape, some kind of open-ended freedom” (McQuillan, 2001: 117). He refers to the spectre of this spatiality as a “hauntological not ontological” (ibid: 122) construction; a framing which first insists on severing all attachments, and then painting this imagery as purity from images (‘no logo’), only to be haunted by the reappearance of those images at every step. As I have argued so far, the referential projection’s inability to locate the attachments and mediations performing and performed by publics causes its frame to be blind to the constant re-appearance of those attachments and mediators (Figures 7-8). This is a truly hauntological position, with a politics that can only be described as “hide and seek” (Katti, 2006: 108).



Figure 8: Katsushika Hokusai, *Behind the Great Wave at Kanagawa*, 1829. Metropolitan Museum of Art, New York.

Indeed, the entire notion of the unveiling move is one where politics does not count as a valid *thing*, with its own logistics, performative publics, issues, timelines and spatialities to stabilise. No, what counts for this projection is the issue of the spatiality *behind* the politics, the hidden (and therefore pure, and real, and true) topos, out of which authenticity flows without attachments and mediations. Essentially, for this projection the movements of publics are a façade, a diversion to be discounted or purified (Katti, 2006: 108).

Take some small business-owner hesitatingly going after a few market shares, some conqueror trembling with fever, some poor scientist tinkering in his lab, a lowly engineer piecing together a few more or less favourable relationships of force, some stuttering and fearful politician; turn the critics loose on them, and what do you get? Capitalism, imperialism, science, technology, domination - all equally absolute, systematic, totalitarian. In the first scenario, the actors were trembling; in the second, they are not. The actors in the first scenario could be defeated; in the second, they no longer can. In the first scenario, the actors were still quite close to the modest work of fragile and modifiable mediations; now they are purified, and they are all equally formidable. (Latour, 1993: 126-127)

To look at politics, the unveiling frame asks us first to construe the political as an image, and then to look somewhere *behind* it. This configuration produces an act of double disappearance. First, the process of producing a public is occluded by the insistence on an already existing political, and second, the establishment of local stability by a public is occluded by the insistence on an already existent force of domination within the pre-existing political stratum.

Katsushika Hokusai's famous woodcut *Behind the Great Wave at Kanagawa*, shown in Figure 8, can serve as a telling illustration of the way the unveiling manoeuvre operates. Armed with the unveiling projection, we can immediately discern another epic struggle for autonomy. The giant wave is about to spectacularly dominate the fishermen, *and* Mount Fuji seen in the background. Here Mount Fuji plays the role of the fixed isotopic background, while the wave that of the amorphous spectacular domination engulfing

both the topos and the subjects moving through it. The fishermen in turn are in the heat of the great struggle for autonomy against the oppression of waves, rowing to keep the amorphous spectacle from engulfing Mount Fuji and themselves. The only movement is that of reference and oppression, with its mirror-movement of unveiling and severing the ties.

What is to be done, then, with such sleek, filled-in surfaces, with such absolute totalities? Turn them inside out all at once, of course; subvert them, revolutionize them - such was the strategy of those modernists par excellence, the Marxists. Oh, what a lovely paradox! By means of the critical spirit, the moderns have invented at one and the same time the total system, the total revolution to put an end to the system, and the equally total failure to carry out that revolution - a failure that leaves them in total postmodern despair! (Latour, 1993: 125-126)

So it is either Mount Fuji or the wave, either pure autonomy or spectacular domination. It is a zero-sum world. But there is a way to retain Mount Fuji, the fishermen of Kanagawa, and other such marvellous places, as well as the great wave and the pink sky hanging above it. That would involve a frame able to look at how they move, locate what spatialities they perform, and then assemble them as a heterogeneous (and deeply attached) public.

Two moves: Assembling

[If] the world is topological, then so too must be its description.
(Bingham & Thrift, 2000: 290)

The lesson that the referential projection can teach us regards the existence of a 'big picture,' a panoramic view encompassing varying spatialities, be they political or other. The projection seems correct to point at the existence of a 'big picture,' but then wrong in taking for granted that in showing seemingly all it must be dominating all that it represents. Unfortunately the projection is stuck with this interpretation because, as was already mentioned, it cannot detect the movement of entities. If it could, it would notice

that the ‘big picture’ is not present at some higher and abstracted topos to which all attachments ultimately lead, but to the contrary, it appears only through following the attachments and shifts *between* frames and other entities. Instead of a single, all encompassing image, the ‘big picture’ appears as the unperturbed succession of images.²²⁵ Crucially, it is not above and behind a common spatiality, but literally *in between it*. In other words, it is not extracted from a topos, but added, or attached to it.²²⁶

Therefore, the alternative framing manoeuvre will agree that certain frames display a picture bigger than others’, but only because they are attached to many more entities than those others. Essentially, what I have termed as the assembling move settles down for a much humbler program of action summed up by the quote above – if the world is topological, then so too must be its description. It sees only shifting entities performing multiple spatialities and is content with adding new topoi to an always already existing heterotopy.

Regarding the problem of framing, this projection would first observe that the political is a *function* of the movement of publics (of which frames are a part), and second, that it is ready to detect dominance but only by also detecting the logistics performing its homeomorphism against dissociating forces. For this projection domination would appear as a contingency, in that it is dependent on the upholding of a stable public. Once the public dissipates through dissociating forces, its ‘domination’ disappears. In addition, the public in this formulation is, as might be already obvious, another word for a network, or an assemblage.

²²⁵ Curiously enough, this is in accordance with the logistics of assembling Hokusai’s woodcut of the Kanagawa fishermen. The technique of producing such colourful woodcut prints consists of first cutting all the different colours as separate images on individual woodblocks (frames), and then carefully arranging them in succession *on the same frame* so that a ‘big’ image encompassing all the colours and contours will appear from the *framed series* of images.

²²⁶ As was already mentioned in the first chapter, Latour points at this quality of framing when he insists that abstraction “does not designate a higher level of figuration, but a fast circulation from one repertoire to another. It is not a property of mind, [but] of reference” (1988c: 35).

The critical question then stops being how to unveil what is behind the curtain of politics, but rather how to assemble a public and therefore have a chance of performing politics. Issues concerning the logistics of an assembly therefore take the foreground. How to gather a public, how to frame an issue, where to assemble, who should participate? Those are the questions the assembling move will be interested to answer.²²⁷ If politics is viewed as the performative space of publics, then those will be the questions that matter. My argument is concerned with the intricacies of the framing manoeuvre itself, because I believe they show a way to approach the politics of networks without succumbing to iconoclastic impulses.

If the world we are describing is topological, so too must be our description. Therefore, this manoeuvre will have to move topologically, that is, both the frame and its effects will have to be performative. Furthermore, since it is based on a performative projection of space, it will entail a shifting across topoi and adding a descriptive trail to a heterotopic landscape. As I would argue below, this approach resembles a legend in both meanings of the word: the legend as a semiotic key, and as an instruction to a topology; in both cases a program of action.

A key feature of a performative frame will be that as it performs the various entities for which it is brought to being, it is also simultaneously being performed by them. What this means is that, as Sheller was quoted noting earlier, just as a frame encloses an entity it is “simultaneously a potential conduit for overflows” (Callon, 1998a: 254).²²⁸ Overflows here stand for attachments to another setting, or frame. In other words, a frame is a relational entity, and the moulding or channelling of attachments it enacts is just another attachment. From this perspective politics appears as a continuously re-emerging phenomenon, a process of in-becoming in plenist ontology, requiring constant

²²⁷ Latour’s opening essay for the catalogue of the *Making Things Public* exhibition discusses this issue at length (2005a).

²²⁸ Callon develops the notion of overflows in his analysis of market framing (1998a). For a further exploration of the notion of framing in the context of politics and economics, see Barry (2002), and Barry & Slater (2002).

consolidation and stabilisation. At no point does the assembling frame seem to display a monolithic picture of total homogenous spectacle, rather, it displays a contingent mobilisation of always-already attached heterogeneities.²²⁹

[Everything] mobilized in the framed setting guarantees, simply by virtue of its presence, that the outside world is also present. (Callon, 1998a: 250)

Furthermore, a projection based on tracing circulating entities would notice that stable framing is rare, while overflowing is the rule. That is because, again returning to the example of an army and its logistics, a stable frame is expensive to uphold and requires stabilisation against dissociating forces. Those forces in turn could often be none other but all the entities brought into the frame, all the members of a public brought around an issue. As Callon argues, the process is therefore both dynamic and incomplete:

first because a wholly hermetic frame is a contradiction in terms, and second because flows are always bidirectional, overflows simply being the inevitable corollary of the requisite links with the surrounding environment.(Callon, 1998a: 255)

A topological description will therefore be always incomplete, because it knows that potentially there are an infinite number of relations producing an infinite number of spatialities to describe. Furthermore, as Latour argues in *We Have Never Been Modern* (1993), the spatialities captured by this framing manoeuvre constitute more often than not what he terms as “hybrid forums.” Those represent situations of high confusion over who constitutes an actor, what are the exact frames, the overflows, and the stages of calculation.²³⁰ Of the two manoeuvres described above, unveiling was seen to frame a constant and pure topology, while assembling - a contingent and heterogeneous one.²³¹ The former always inserts a topos (even if it defines it as a network) into a larger un-

²²⁹ This was also the conclusion of Richard Rorty’s greatly misunderstood book *Contingency, Irony and Solidarity* (1989); also see Rorty (2001).

²³⁰ He gives as an example hybrid issues such as global warming and the mad cow disease.

²³¹ On the question of different topological projections, see also Harrison, Pile, & Thrift (2004).

attached frame; if you wanted to move from one to the other you have to jump over. The latter manoeuvre in contrast, sees circulating plaits.

The network public was found to be a shifting phenomenon; it may be a “phantom public,” to use Walter Lippmann’s expression (2002 [1927]),²³² but that is because when it does not move, when it does not shift and differ - it does not exist. The publics we trace appear to be alive only if they move, that is if they are attached and performed. Since we are looking for something that moves, we must hold a frame, a projection, able to see in-movement. In this kind of projection there are no isotopic or isochronic interactions and one can never account for all the present actors. Here heterogeneity and uncertainty appear to be the rule, not the exception. If the political topos is perceived to be always already present, then the pragmatics and logistics of upholding it are lost. Had we believed in the existence of a fixed frame or structure of reference then our task would be metaphysical. Fortunately, the assembling manoeuvre suggests an alternative way.

012

Assembling network publics²³³

Where there was purity, now there is heterogeneity. (Law & Bijker, 1992: 290)

Following the arguments of the previous section, the fundamental question of network publics concerns their mobilization. The logistics of identifying who and what belongs, gathering entities into a topos, and layering frames of circulation and performance, constitute the critical aspects of the mobilization process. As I have argued so far, the

²³² For a contemporary analysis of Lippmann, see Marres (2005).

²³³ The term ‘network publics’ has been used in the *Networked Publics* online book collaboration by the Annenberg Center for Communication, “to reference a linked set of social, cultural, and technological developments that have accompanied the growing engagement with digitally networked media” (Ito, 2006).

actor network theory approach is to trace the relational performativities of all entities constituting the logistical process of politics formation. This means that in each and every case we have to ask anew the questions of what counts as an entity, and as an issue, what counts as a topos for assembly, what counts as a public, and how these entities circulate.²³⁴

It was also established, that a stable frame suggests a long and heterogeneous network of attachments upholding it and performing the homogeneity of the topos. That in turn would suggest, that every spatial stability is also a relational phenomenon, and is therefore in-movement relative to other entities. Referential frames, being an example of such a stable topos, are therefore circulations too, and the same process that allows them to circulate is also the source of the dissociating forces causing overflows within the framed topos (Sheller, 2001).

Now, this projection obviously lacks a temporal component, and that would be addressed in the next chapter; below I will concentrate on analyzing the process of assembling network publics, and specifically on the aspects of assembling that relate to spatiality. From a topological point of view, the logical start of the assembling process concerns the framing of a locale, a topos serving as a frame to slow down the overflows and bring together the entities to perform a public. The framed topos, as the referential projection was correct to point out, serves to contain the public, to slow it down and maximize interrelations within it.²³⁵ Because the frame is itself a relational entity, it is of course prone to overflows and is reliant on its constant performance by the public within it. Nevertheless, it is important to embellish the containment function of a public assembly space.²³⁶

²³⁴ On the complexity of tracing the mobilisation of network publics, see also Knorr Cetina (2005).

²³⁵ In the last chapter it will be seen that this process of spatio-temporal containment of networked publics can be established as an essential part of the logistics of performative politics and traced back to the origins of the Greek polis.

²³⁶ This of course is the reason Latour engages in the play of words calling for a ‘politics of things’ – a reference to the old Germanic public gathering space *ding*.

Without involving temporality into the argument, we could observe that this containment, or slowing down, serves to stabilize and channel the public to be performed. This slowing down could be argued to precede the emergence of a public proper, as it is in effect part of the performative process *after* which the public would appear as a stable network. Without suitable channels for performing the attachments within the frame, one cannot stabilise a public and give it a voice. This channelling function of the topos could be exemplified by the notion of diplomatic *protocol*: who speaks, in what manner they can speak, where, and when.²³⁷

In that sense public space – the space where publics gather, or rather form – is framed by and through a channelling protocol. The protocol functions as, metaphorically speaking, a theatricalisation of the actor: *I play the role of a speaker, and therefore I am entitled to act.*²³⁸ It also allows the entities forming the public to engage in mutual observation, that is, to *stage* feedback reinforcing the attachments. I point this out because of the crucial problem of stability, or in other words, homeomorphism. As it will be seen in the next section, the issue of stability and control is crucial for the continuous existence of a network (and therefore a public).

So far the argument of actor network theory has been that the concepts of network and entity are co-extensive, that is, that there is no clear demarcation indicating in each and every case what is an entity and what is a network. Rather, those characteristics were discovered to appear only as effects of the frame employed. If, for the moment, we allow time to percolate in the already framed topos we would observe the logistics of locating, mobilizing, and framing as a continuous and performative flow. When a so far stable network dissolves, the flow effect will unfold into seemingly separate networks. The crucial point is that solidity and discreteness are effects of attachments, and the distinction between networks and entities comes only after the framing of those attachments. This conclusion has important consequences.

²³⁷ The concept of protocol is the object of the next section in this chapter.

²³⁸ That was, and still is, also the function of court protocol – to perform the royal presence.

To illustrate that point we need go no further but back to the earlier military example. In light of what has been just discussed, every soldier would appear as a logistical chain, comprising network entities as distinct as kitchens, armouries, hospitals, transportation machinery etc. Similarly, whenever a public is formed each and every entity could also be described as a logistical chain, and the role this chain (or network) plays in the public would only be clear thanks to the framing protocol of the topos where the assembly occurs. This is what ANT means by claiming that networks and persons are co-extensive. Networks, as was already argued in the first chapter, always comprise human and non-human entities. Boundaries between entities, and therefore distinctions, appear only as effects of framing.

To that effect we could picture a scene in which highly formalized clothes are the main framing element between two individuals, as for example is the case in an interaction between a priest and a lay person.²³⁹ We could say that the clothes are the framing actor of this network, but thus defined they are also part of a long logistical chain involving humans – for example a tailor, other materials – for example linen, and techniques such as weaving. The distinctions result from the relations.²⁴⁰ Therefore, when assembling network publics, we notice that the entities to be gathered are fluid and multi-spatial.

Their heterogeneity is always present because they are first and foremost networks. Furthermore, the role each entity is to play in a mobilized assembly emerges only as an effect of the relational performativities within the framed topos. This rule does not simply relate to performative roles but also to the entire range of possible logistical sets. In other words, the table on which two parties sign an agreement is *another party*, representing a long logistical chain somewhere along which a carpenter and a forest are also present.

²³⁹ This example is valid at least in countries where priests still dress in a manner very distinct from everyone else.

²⁴⁰ The role of appearance in framing social interactions, and the logistical assumptions involved, can also be illustrated through the ritualistic but also ludic practices in the medieval carnival (Huizinga, 1955), an important part of which was the perverting of protocol frames and therefore dissembling the otherwise fixed identities performed by them.

The methodological lesson is this: that objects - for instance people and texts - are processes of transformation, compromise or negotiation. (Callon & Law, 1997: 171)

Moreover, this leads us to the conclusion that scale, distance, density, strength and other characteristics are all effects of relational performativities; when this projection sees an adjective it asks for its performative relations. Therefore when assembling a network public (and by now it should be obvious that these two terms are equivalent), we always deal with hybrid entities. Who will play the role of the subject emerges only from the framing protocol of the topos. Needless to say, this line of reasoning points to the framing manoeuvre undertaken by entities, as the critical moment in the forming of a public.²⁴¹ The protocol of stabilisation and spatial performance of a network is also the formative protocol for the acting capacities of the entities in the frame.

As was already argued in the first chapter, a network of successfully stabilised attachments would act as a black box and translate those attachments into a new entity.²⁴² The effect of coherence and homogeneity was argued to be the result of this black box effect. Therefore, when a stable and homeomorphic public seems to act and function as a homogenous entity it is because of the black box effect of stability.²⁴³ This transformational effect has obvious consequences for the assembling of publics. It means that the process of assembling and stabilizing a public involves constant detours caused by the stability and coherence of *other* entities. Every time a new entity is approached, one has to make a detour, so as to determine whether or not it can play a role in the assembly; whether it needs to be associated with, or dissociated from. Moreover, it is only through a detour that an entity becomes noticeable in the first place; if the assemblage is not detoured by the program of action of the entity, it would simply

²⁴¹ It seems that here again the referential projection had a correct intuition, but drew the wrong conclusions.

²⁴² On attachments and translation, see also Wilson & Corey (2000: 23-26).

²⁴³ This would serve to explain the continuous infatuation of the spectacular projection with the 'homogeneity of power.'

not notice its existence. Perhaps the topology of those detours also tells us something about assembling publics?

It seems that we can only decide what entity is to belong to a public by tracing their relational specificities through a topology, or in other words, filtering them through a frame performing the distinction between entities and networks, individuals and collectives.²⁴⁴ In the case of assembling a public this move could be imagined as flowing in one spatio-temporal direction, and in the case of tracing the already assembled public – in the opposite. In the case of tracing, this frame could be identified as the notion of a *trial* used in actor network theory, while in the case of assembling it would coincide with the notion of *enrolment*.²⁴⁵

This conclusion fully implies that the action of a public itself would be viewed as an effect of the already mentioned framing manoeuvre. The actions of publics, that is, the politics they perform, are therefore both a combination of the actions of the assembled entities and, simultaneously, an unpredictable transformation of them caused by the inevitable overflow caused by associating and dissociating forces. This in turn supports the earlier argument that no single frame would explain the circulations of publics; the contingent specificities of every public have to be addressed topologically, in a similar manner in which they were formed and move.

Reassessing the conclusions of my argument so far - to say something about an entity we have to trace its relational performativity through detours. The framing to be performed, both during the assembly of a public and its tracing (disassembling), plays the role of such a detour. Therefore an entity appears as the attachment between detours – that is, instead of entities we should be thinking of attachments.

²⁴⁴ Naturally, this decision stands in front of both the assemblers of the public, and the researcher tracing and re-assembling said public. For the latter, the task is doubly complicated by the problem of identifying who and what belongs only *after* those who belong have been assembled and enfolded.

²⁴⁵ On the notions of trial and enrolment, see Latour (1988c).

For if action has no identifiable source but is located through heterogeneous patterns, then to describe it will not be to locate it in a particular place - the human agent; social structure; the divine; or a platonic realm of essences. Rather it will be to find ways of characterising the patterns in the relations of influence - the patterns that make up hybrid collectifs [sic]. (Callon & Law, 1997: 177)

What are the consequences of this conceptual shift from actors to attachments? Heterogeneity, or impurity, appear as the rule in approaching publics (Callon, 1991: 139). Predictability of action appears as a rare effect of stabilisation. A public, and the entities, topoi, issues, and frames comprising it, consist of attachments “linking incommensurable space-times” (Bingham & Thrift, 2000: 291). Tracing a public therefore translates into the tracing of attachments between those incommensurabilities without a priori reducing them to a particular state.

Either you focus on the group itself [the network] and go no further, in which case you have an actor. Or you pass through it into the networks that lie beyond, and you have a simple intermediary. (Callon, 1991: 142)

The size and endurance of a public will in turn depend on the amount of, and transformations undergone by, the attachments performing it. The less overflowing and the more stability in a frame, the more stable the attachments and the more black boxed the public’s actions seem. Therefore when we speak of a ‘big’ entity or issue, we indicate its interconnectedness, its ‘thickness’ of attachments (Latour, 1988c: 30). This conclusion dispels the phantom of the subject free of attachments – such a subject is indeed the most attached. Paradoxically, detachment is simply the *effect* of carefully performed and very stable attachments; and, at the risk of repetition, they are stable because they are multiple. Therefore, both the assembling, and tracing manoeuvres never encounter something without ties - a pure outside - only *ties of different quality*. In the absence of isotopy only varieties in the heterotopy can be the object of discussion. It

follows, that the question of autonomy cannot be answered by a performative politics; such politics concerns itself only with the quality of attachments.²⁴⁶

We can substitute one attachment with another, but we can not move from a state of attachment to that of unattachment. (Latour, 1999a)

The role of the actor in this politics is not that of a subject striving for autonomy, but of an attachment always in the process of making and being made (Figure 9); the folding-in of one network and un-folding of another; the shift between two different programs of action.

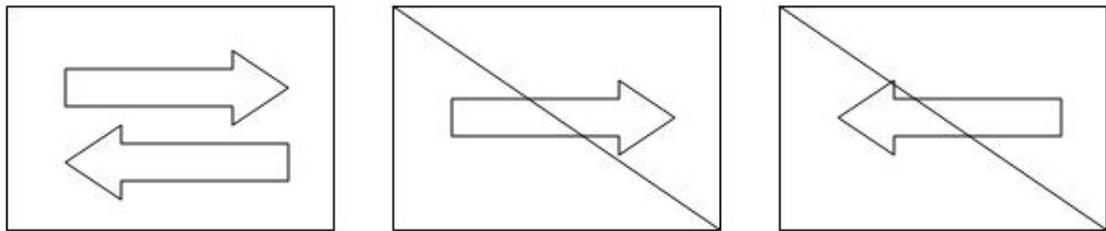


Figure 9: Attachments are always bidirectional; always within the Tardean *have – had*; always make and are made; and simultaneously never towards an imaginary object or an equally imaginary subject – both fruits of a bifurcated nature.

As Latour argues, if an entity, public or otherwise, is always in the process of making and being made, tending to relations and itself being attached by others, it would be hard to take it as a matter of fact – it would always rather remain a matter of concern.²⁴⁷ A concern, because even a black box cannot be taken for granted - it has to be repaired and kept enrolled in a network.²⁴⁸ While the notion of an actor easily suggests itself as comparable to that of a node, the shift to attachments leaves no doubt that each node is

²⁴⁶ Notice also that characteristics such as oppression and autonomy are as a result fully relational and not inscribed in some imaginary context.

²⁴⁷ As was already mentioned in the previous chapter, Latour uses as an example the etymological root of the words fact and fetish – both deriving from *facere* – something made (2005a: 16).

²⁴⁸ Latour emphasises this point the most in his study of Machiavelli's *Prince* (1988a).

merely a coagulated series of edges. The ‘nodality’ of those edges in turn would appear only through the framing topos, through the matter of concern. That much seems obvious from the argument so far.

Assembling and unifying a public would seem then to rely as much on the framing of the topos, understood as issue, physical locus, and protocol, as on the dissemination of attachments. Unity, stability, and homogeneity would appear only through heterogeneity and extensive inter-linking with other entities. In fact, it follows that the more attached a public is the more it can extend its reach and enrol *others*, be they entities, spaces or issues (Latour, 1998b). The very definition of a growing public would involve a growth in attachments, while the tracing and explication of said public would constitute the same move but in the opposite direction. The act of tracing a public is also a re-assembling of its topos and involves the same topological description that was performed during its assembly. What the builders of the public collected, the researcher has to re-collect.

If the researcher has to work hard to follow the public’s transformations, the same rule would apply to the public’s ‘builders.’ Whoever assembles the network public travels along the same channels as everyone else, and has to pay the price for enrolling a heterogeneous network of attachments, transform them through a framing topos, and minimize the overflows. If other entities move, so does the ‘builder;’ references, frames, and contexts equally flow along the conduits of the performed topos. Throughout the tracing manoeuvre, and therefore also throughout its opposite – that of assembling, there is no jump from one scale to another, no zoom from local to global; we never leave the local, never venture outside of a frame or a topos. For every experience of different scale we have to pay for in terms of a detour, a shift, and a transformation – and so does the public assembler.

Actor and network - if we want to still use those terms - designates two faces of the same phenomenon, like waves and particles, the slow realization that the social is a certain type of circulation that can travel endlessly without ever encountering either the micro-level - there is never an interaction that is not framed - or the macro-level - there

are only local summing up which produce either local totalities ('oligoptica') or total localities (agencies). (Latour, 1999b: 18-19)²⁴⁹

Paradoxically then, it emerges that rather than being always already bound by some homogenous force of reference, a public has literally to discover, and by discovering to perform, "what binds us all together" (Latour, 2005b: 8). The emergence of politics and publics, as I have tried to theorise it in this chapter, would be therefore entirely dependent on movement, circulation, and attachment. Even when a public assembles, against all odds to the contrary, it still moves, attaches, enrolls new participants, and discards old ones. The macro world of 'global publics' turns out to be equally micro as other topoi, just another locus of circulation, framing and transforming particular traces along specific channels. If, once traced, this always located and performed public is taken as a referential context somehow fixed in an imaginary firmament, one would

begin to take what has been connected together for a special type of fabric: the social explains the social. You have entered a world that is no longer traceable, a world that is in danger of being quickly invaded by the fairies, dragons, heroes, and witches of critical sociology. (Latour, 2005b: 160)

Contrary to the referential projection inhabited by entities of certainty and purity, I have hoped to illustrate that the assembling of network publics is certain only of heterogeneity and impurity. If, when tracing a public, this projection encounters stable frames of reference and containment, the projection looks at the performativities that make them stable.²⁵⁰ If the projection encounters divisions, distinctions, or shifts of scale, it understands them as *effects* or *outcomes* of a long chain of associations. As was already established, for the performative projection entities such as publics emerge through detours and trials. In addition, the builders of a public will always have to deal with the

²⁴⁹ The notion of *oligoptica* is Latour's playful re-casting of the notion of the panopticon: while the panopticon purportedly sees all - and yet nothing, an oligopticon sees very little - and yet sees it well. For a detailed explanation, see Latour & Hermant (2006).

²⁵⁰ As John Law humorously quips, actor network theory is "a machine for waging war on Euclideanism" (1999a: 7).

establishment of a topos, a frame, an issue for the public to gather around, and a protocol for letting the assembled entities act.

[A] virtual and always present entity is exactly the opposite of what is needed for the collective to be assembled: if it's already there, the practical means to *compose* it are no longer traceable; if it's total, the practical means to *totalize* it are no longer visible; if it's virtual, the practical means to *realize*, *visualize*, and *collect* it have disappeared from view. (Latour, 2005b: 163)

In tracing this process, one has to discard the 'hauntological' ghosts of critical theory with their total globalities "adrift in a mythical sea" (Thrift, 1996: 45), and concentrate instead on the local frames and agencies. As I hoped to illustrate so far, this process boils down to performing a topology and the attachments underpinning it (Law, 2000a, 2002). Furthermore, the section argued that the tracing manoeuvre performs a series of shifts between the spatialities occupied by an entity. The very notion of entity, or a public, was argued to designate a circulating attachment, a shift, a detour, an assembly, an enfolding. The resulting landscape resembles a dynamic fluid populated by a multitude of vortices of stabilisation; nowhere in this landscape can one observe a fixed context of homogenous power. If, and when, it appears, this context is just another circulating frame, added and constantly performed by all those who would rather resist the haunted frame of spectacular politics than attempt to assemble a contingent public (Latour, 2004b: 225).

The conclusion emerging at the end of this section is that the logistics of stabilizing a public are crucial. The framing manoeuvre (protocol) assigning the performative roles of actants, is a critical element in controlling and holding together a public. At this stage, it seems clear that "it takes effort to sustain stable networks of relations" (Law & Singleton, 2003: 4), and that whoever assembles and performs a public, will also have to unfold diffuse topologies, and hold them together. The following section will explore how the assembling manoeuvre is initially performed, to what extent it can stabilise and fix entities within a frame and what does it cost for it to work at a distance.

Surfaces: domination and dissociation

[...] the fear of discovering this reality so new to modern man who has acquired the habit to dominate: there are no masters anymore - not even crazed technologies. (Latour, 2002b: 255)

This section explores how a network deals with dissociating forces and what tactics are employed to stabilise it. The notions of control and domination are instrumental in recent analyses of information networks, and are examined here from the perspective of the performative projection outlined above. The previous section establishes that a totalizing notion of spatiality and politics completely obfuscates the mechanisms by which a network is performed, stabilized, and upheld against dissociating forces. The section argues that assembling a network involves enfolding diffuse topologies and holding them together within a frame. The controlling frame in turn is a performative topos and an effect of the movement of entities. This definition however, does not answer how the stabilizing move appears, and cannot say much about the techniques to not only retain homeomorphism but to control others over distance and time. To explore how networks deal with adverse topologies I examine below the notions of protocol and distributed control; I then engage the problem of domination from the perspective of control over a sequence of spatial surfaces *enrolled in the same frame*.

Protocol and distributed control

The question then, is how to establish control in a performative space? Performative space is a topology emerging from the movement of entities, and the second law of

thermodynamics tells us that the entities doing the moving have to undergo a continuous metamorphosis caused by their constant relational deformation in space. However, the entities can engage in an effort to maintain their homeomorphic shape at the cost of channelling and framing the transformational forces towards *others*. In both cases there is a cost, a bill of existence, and the conclusions of the previous section suggest that the key to understanding this process is in the notion of dissociating agencies. The entity establishing a stable network has to deal with a range of dissociating agencies, which have to be either countered or channelled within its frame. Those agencies of course, are nothing else but the programs of action, the vectors of movement of other entities, be they other frames, topologies, issues or broadly speaking – actors.

I think it fairly obvious to suppose, that the techniques used to perform a stabilizing and counter-dissociative frame leave traces revealing the logistics of control. As was already argued, those traces can be read as shifts or detours, enrolling or channelling adversity; the more successful those shifts, the more stable the entire apparatus. The issue then, from the perspective of those assembling and upholding a network, is the ability to continuously perform those shifts, while from the perspective of researchers – the ability to detect and trace them.

For example, consider how important it is for a football team to keep itself stable as a unit in the face of the dissociative forces performed on its frame by the opponent, the weather, the quality of the pitch, and even the spectators. Each of the entities in the team, from players, to physiotherapists and coaches, performs counter-dissociative shifts in an effort to maintain the stability of the collective. From the perspective of researchers, and opponents, the logistics of those shifts are the key to understanding the stability of the assemblage.

My argument is that control, and domination as extended control, are essentially traces on a measurement scale indicating the stability of a network *in space and time*. Therefore, strictly speaking, the notion of control is a function of the ratio of associating to dissociating forces operating on the network frame *over a measurable surface*. In

other words, and somewhat metaphorically, the notions of control, and as I will argue – domination, are the effects of a continuously undergoing transaction between an assemblage and all the forces operating on it from within and without. Continuing with the transaction metaphor, to assess the intensity of the transaction one has to inspect the bill it generates and all the items aggregated on it.²⁵¹ Furthermore, as I will argue below, both the format of the transaction and the format of the bill are elements which have to be explicitly performed by the assemblage for stability and control to emerge. In other words, the format of the transaction corresponds to a football teams' struggles against its opponents on the pitch, and the format of the bill is merely the teams' measurement scale for success and failure.

By tracing the shifts undergone by an assemblage (or in other words mapping it), we therefore discover its attachments working hard to avoid disassembly during movement and trials. Since each particular frame has to be described individually, the only rule to be observed when tracing (or assembling) is that homeomorphism is an effect with a cost. Therefore, at the initial performing of a frame, just as in each consecutive one, something has to undergo transformation for something else to retain its shape. Also - a lesson learned in the previous section - homeomorphism involves at least two different spatialities to be performed by an entity, for movement without deformation to occur.²⁵²

To make sense of multiplicity, we need to think and write in topological ways, discovering methods for laying out a space, for laying out spaces, and for discovering paths to walk through these. (Law & Mol, 2002a: 8)

Two crucial questions emerge from this story. First, to what extent can an assemblage stabilise and fix entities within a frame, and at what cost? The topology of networks translates this question into a problem concerning control over a series of frames. Because each frame is also a performed locus – a surface, the question concerns the issue of distributed control. From this follows the second question: what does it cost to

²⁵¹ This bill of course is nothing else but the Tardean bill of existence.

²⁵² They could be imagined as the topos of the transaction and the topos of the bill.

work at a distance? In other words, how first *to perform a distance* and then *maintain it* so that multiple entities can move over it without losing their shape, without having to buy their stability on the way? The first question concerns control and the second the stage when control is aggregated into domination.

Entities do not come with a predetermined part in a larger scheme of things;²⁵³ they rather co-exist from event to event in an indefinite number of possible topoi. If they exist within the same frame, it is at least partially because they have been channelled within it and are being continuously made to work within that topos.²⁵⁴ Therefore, the very existence of a frame presupposes the existence of a common topos performed through circulations of entities along channels. Circulation is therefore the status quo, and the very process of performativity is nothing else but the re-enactment of attachments by entities. Furthermore, as Callon and Law argue:

There has to be movement between the points for action at a distance and mobilisation to be possible. For control, information has to move. There have to be intermediaries. If one place is to be 'globalised' then it has to be linked to others. (2004: 4)

For control, information has to move. Therefore, apart from a common spatiality framing channels for movement, there also have to be *others* (intermediaries) enrolled to relay information. What does the notion of information mean in this setting? In a place where everything is in constant flux by default, and every stability has to be accounted for, information is a way of transporting an entity over a distance without losing its shape.²⁵⁵ As Callon and Law suggest, this is achieved through the enrolment of intermediaries who account for the necessary transformation.²⁵⁶

²⁵³ Although admittedly one can freely hold this view and still utilize a performative projection. The third chapter addresses this eventuality in detail.

²⁵⁴ This realisation has uncomfortable overtones to the extent that it seems to suggest a relationship of mastery. However, as suggested by the example of the New York overhead bridges from the previous chapter, the bus commuters really *were* channelled and made to work within the topos of the overhead bridge.

²⁵⁵ As the first chapter argued, information is in that sense merely the opaque result of a transformative

Paradoxically, this implies an inherent instability, which grows with the number of entities enrolled as intermediaries; the more a frame is stabilised, the more attachments it enrolls and therefore the more it is susceptible to overflows. This conclusion appears to be at odds to the conclusion drawn earlier, when it was argued that the more an entity is attached to others, the more stable it is. However, now it becomes obvious that the cost of this stability is the threat of constant overflows caused by those very attachments; this comes to show that thinking in terms of static closure simply would not do.

Perhaps somewhat contrary to common sense, the notion of control emerges as a precocious balance rather than a simple one-off manoeuvre, or a protocol of exclusion. A totally closed frame is a contradiction in terms, because closure means severance of attachments and instant disintegration. Therefore, the condition I am trying to describe resembles an ongoing balancing act trying to channel and perform movement and space while dealing with increasing dissociation. Analysing assemblages in terms of exclusion and inclusion makes sense as long as they are seen as stationary referential structure-contexts; in that case it is sensible to talk of total control over a frame. However if the process we analyse is performative and relational, projections built on the premise of total control lose their meaning. Instead, in describing network control we need to be able to describe balancing movements involving constant decay - impure, crumpling, messy, and mangled.

[The] world is involved in a continuous dying that can only be fended off by constant repair and maintenance. A similar insight can be found in the architectural literature in the argument that buildings are flows that are always in a state of flux as they strive constantly to fend off decay, diverse means of, in effect, choosing particular means of dying. (Graham & Thrift, 2007: 6)

shift of agencies.

²⁵⁶ The sequence of relations and events I am describing derive from Latour's concept of 'immutable mobiles,' which I use extensively in the last chapter.

So write Stephen Graham and Nigel Thrift in a wonderful essay on the performativities of decay and maintenance,²⁵⁷ while also pointing out that perhaps our entire approach to networks in general, and publics in particular, is tainted by the a priori notions of connection and assembly. A projection which takes for granted that all entities strive to be part of a greater whole, to be connected, assembled and organized, would have no problem with that a priori premise, but then it would find it hard to explain the cost of exercising stability and control. After all if connectivity is an a priori state then stability is a one-off expense.

On the other hand, a truly performative projection would approach this matter from an altogether different perspective. As Graham and Thrift point out, if we can speak of disconnection and disassembly it is only because connection and assembly have been made possible (2007: 7). Furthermore, there needs to be constructed and performed another topos or frame *against which* the stability of an assemblage is measured. For control to exist information needs to circulate; that is, a common spatiality has to be constantly performed, following which the traces of this frame have to be translated and compared to inscriptions fixed *on another frame* so as to establish stability.

To illustrate this point better let me sketch two scenarios. Presume that a network is assembled and stabilised to the extent that one can safely announce the assemblage controls a topos and the entities circulating within it. From the perspective of the entities assembling the network, the notion of control would be equivalent to the assembling process that a system performs in order to stabilize relations between its parts. From this perspective, control is the alignment and maintenance of the relations between the entities part of the assemblage. This is the first scenario.

In the second scenario the perspective is shifted to a frame adjacent to the one occupied by the already stable assemblage. For the entity occupying this perspective the assemblage would seem like a black box performing a persistent and stable topos of which control would seem to be the effect. From this perspective, control is what

²⁵⁷ There is a growing literature on the subject, for example see Strathern (2004), and Phillips (1999).

happens when the observer tries to associate with the assemblage. For the builders, control is the unperturbed flow of information between spatialities, while for the observer it is the effect emanating from stability. It follows therefore, that we will only be able to understand the problem of network control if we take *both* these perspectives into account *simultaneously*. On its own, the perspective of the network builder does not tell us much about how other entities negotiate with the stable system, while the ‘gaze from outside’²⁵⁸ always shows a homogenous black box and does not tell us anything about the performative logistics of the assemblage.

The crucial importance of taking into account *both* topoi-frames, is perhaps best illustrated by the notion of computer code as protocol, as developed by Alexander Galloway in his influential treatise *Protocol: How Control Exists after Decentralization* (2004). His concept of protocol²⁵⁹ is exemplified by the following example from the book. A neighbourhood is organized around a central street which is notorious for speeding violations. The neighbourhood decides at a community meeting to install speed bumps²⁶⁰ on the street in the hope that drivers will be compelled to slow down (2004: 241). Another neighbourhood with a similar problem decides instead to install along the street speed limit signs and speed cameras, together with increased police surveillance, in the hope that these measures will deter drivers from speeding. Both solutions to the speeding problem may be successful, yet according to Galloway, only the first solution resembles distributed network control (protocol), because the exercise of control is distributed to the speed bump itself.

According to Galloway, while it may appear that the second approach is more ‘networky,’ because of the superimposed layers of disciplinary control and persuasion through implied threat of punishment, speed bumps operate under the same logic as

²⁵⁸ The notion of ‘outside’ being here purely a figure of speech; as I argued earlier both ‘inside’ and ‘outside’ spatialities have to be performed by a network which has a need for them.

²⁵⁹ He derives the notion from diplomatic and court protocols.

²⁶⁰ In many parts of the world humorously referred to as ‘sleeping policemen’; as the first chapter demonstrated, the banality of the joke reveals a surprising insight into the process of delegation of agency.

information networks.²⁶¹ As Galloway argues, information networks are formatted around the circulation of protocols of computer code, the very existence of which is taken as a precondition for connectivity and collectivity (Thacker, 2004a). These protocols constitute languages upon themselves, like the Transfer Control Protocol/Internet Protocol (TCP/IP), the Hyper Text Markup Language (HTML) or the Domain Name System (DNS). Furthermore, inspired by Hardt and Negri's *Empire* and Deleuze's *Society of Control*,²⁶² Galloway extends his political analysis of computer code to theorize protocol as the formatting principle of a new network society of distributed control.²⁶³ According to his analysis, protocol is simply the organizing principle of networks and all 'power' based on networks is protocological. Protocol therefore is

a totalizing control apparatus that guides both the technical and political formation of computer networks, biological systems and other media. Put simply, protocols are all the conventional rules and standards that govern relationships within networks. (Galloway, A. R. & Thacker, 2004)

In other words, Galloway deduces that networks are the structures that connect entities, and protocols are the rules that ensure the connections function. Furthermore, those rules are deduced as totally homogenous one-way attachments of force, which simply enrol everything that gets in their way.

²⁶¹ That is, according to Galloway, because they modulate the body; of course this marks the reappearance of the discourse of mastery in a bifurcated nature, as the previous chapter demonstrated. Galloway however is right in his hunch that there is something common between speed bumps and computer code – these are both examples of coagulated agency.

²⁶² As is made clear by this passage from Deleuze: "In the societies of control (...) what is important is no longer either a signature or a number, but a code: the code is a password (...). The numerical language of control is made of codes that mark access to information, or reject it" (1992: 5). Notice the reinscription of the presence/absence dichotomy.

²⁶³ Another important influence on Galloway is William Bogard's oft quoted *The Simulation of Surveillance: Hypercontrol in Telematic Societies* (1996). Bogard further develops his position in (Bogard, 2007).

A goal of protocol is to accommodate everything, no matter what source or destination, no matter what originary definition or identity. (Galloway, A. R. & Thacker, 2004)

Protocol in this setting is a distributed system for formatting the movement of entities that allows “control to exist within a heterogeneous material milieu” (Galloway, A. R., 2005: 22). In a way, Galloway’s idea of protocol resembles the efforts of the observer from the second scenario described above, to imagine how the black box operates and maintains its coherence. Perhaps not surprisingly, the politics of this projection resembles the spectacular frame from the previous section,²⁶⁴ and carries traces of the Heideggerian notion of instrumentality. For this perspective the assemblage performing the protocol seems like a black box of which control is only the effect. Indeed, Galloway extends the protocological metaphor even further and argues that it is the instrumental nature of computer code itself that creates this state of affairs.

This is the fundamental contradiction of software: what you see is not what you get. Code is the medium that is not a medium. It is never viewed as it is, but instead is compiled, interpreted, parsed, and otherwise driven into hiding by still larger globs of code. (2006b: 325)

Of course, as I already argued in the first chapter, all techniques and indeed all agencies work in this way; without displacement and transformation there is no movement. It might seem commonsensical enough that the enactment of control over a distance would be explained by the notion of distributed control. However, this explanation leaves us with a homogenous image and an inclination to see a pre-existing totalizing force - Galloway’s protocol - formatting all relations. In this setting information does not circulate between frames, and dissociating forces do not appear; instead, order is simply imprinted by an already homogenous logic of control distributed within the very network apparatus. Instead of a balancing act against dissociating forces, protocol

²⁶⁴ This point is perhaps best exemplified by Wendy Chun’s *Control and Freedom: Power and Paranoia in the Age of Fiber Optics* (2006). Building on Galloway’s work she argues that ‘power’ now operates through the coupling of control and freedom, access and its denial (2006: 1).

imagined this way simply re-enacts the referential projection described in the previous section.

An alternative approach to network control, also based on a theorization of computer code, appears in Chris Chesher's concept of code as series of invocations and avocations (2002). Etymologically an invocation is a call from one entity to another for assistance or support,²⁶⁵ and Chesher uses the concept as a metaphor for the performativities of computer code. As he points out, in Greek mythology the father of the Muses is Zeus - the god of command, and their mother is Mnemosyne - the goddess of memory. Therefore, invocations metaphorically oscillate between memory and command, in a manner similar to the circulation states of computer code. Avocations in turn format the channels of performativity along which invocations circulate.

When users answer avocations by making invocations, they identify themselves as the source of an action. They feel the invocator actualises their own intention. However, to a certain extent their invocation puts into action possibilities already laid down by avocations. (Chesher, 2003)

While invocations correspond to a move in one direction – towards the frame, avocations correspond to a move in the opposite direction – they are the frame. Viewed this way the metaphor presents both sides of the control process – on the one hand is the performative enactment of a stable frame as seen from the position of the assembler (avocation), and on the other is the, also performative, engagement between the frame and another entity (invocation). Essentially, Chesher's metaphor points to the same quality of computer code as the one pointed out by Galloway, but from a substantially different perspective. While in the former example code always calls on another, more hidden layer of code, never in the end revealing itself 'as it is' and always part of a larger whole, in the latter example code displays the same characteristics as any other technique.

²⁶⁵ The notion comes from classic Greek poetry in the form of the poet's call to one of the nine Muses.

A protocological view of network control sees a new sinister development and a new form of domination establishing itself on society; in turn, an invocational view of network control sees a technique stabilised so well so as to appear as a perfect avocational black box. Chesher extends the notion of invocation-avocation to technology in general (2002), from light switches to computer games,²⁶⁶ because the metaphor lends itself easily to analyzing the way assemblages perform control. Crucially, the metaphor allows breaking down the immense complexity of manoeuvres performed by a control frame into simple shifts consisting of engaging an entity (reading), channelling it along a framed topos (interpreting), and stabilizing it along the topologies performed by the assemblage (acting upon instructions).²⁶⁷ When stable, this network looks from the outside as a black box, and the individual shifts, the logistics of control, become invisible.

While each invocation is simple, in combination they rapidly become hypercomplex. The fetch-execute cycle abstracts switchings to a point where individual invocations interleave and merge into a constant stream. (Chesher, 2002)

Naturally, this cycle performs in time only insofar as it manages to stave off dissociating forces. From an outside perspective the entire process is essentially the time-space framing I described in the previous section, but the importance of this example lies in its ability to pinpoint the discrete logistics of network control, while retaining the capacity to see ‘the big picture.’ Following this detour, I can now return to the scenario outlined in the beginning of this section. It was established that a topological description of the

²⁶⁶ In his work on computer games he builds on the notion of invocation-avocation to theorize games as ‘glaze-space’ (2004). Crucially, while computer games lend themselves too easily to a spectacular politics domination approach, Chesher refuses to go this way and instead analyses the assemblage from the perspective of simple semantic-topological shifts. According to him “in glaze-space (which varies in intensity), players suspend their awareness of their day-to-day world to become cybernetically suspended within a virtualised sensorimotor space of the game world” (ibid.).

²⁶⁷ Mackenzie theorizes along similar lines when he argues that a computer algorithm should be treated as a framing of space and time, as “establishing relations between things that are disjointed, by concatenating events in paths” (2005c).

logistics of network control has to be able to see simultaneously both the framing of an event, and the logistics of the frame itself. Furthermore, the section argued that for stability to be established and performed there has to be another topos, another frame, against which it will be measured.

022

The problem of domination

[If] these attempts at long-distance control are to be understood then it is not only necessary to develop a form of analysis capable of handling the social, the technological, the natural and the rest with equal facility, though this is essential. It is also necessary that the approach should be capable of making sense of the way in which these are fitted together. (Law, 1986: 2)

The ability to see the logistics of the frame allows us to detect the shifts of the entities performing it, while the ability to see the ‘outside’ of the assemblage allows us to detect the dissociating forces working on the frame. Crucially, stability (and its intensity) emerges from the interplay between those forces; the more stable an assemblage the more capable it is in channelling dissociating forces and the more black-boxed its elements are. To elaborate further on this aspect of network control, it is useful to return to John Law’s examination of Portuguese naval expansion, already cursorily mentioned in the first section of this chapter (Law, 1987). The most important element in that scenario, as Law narrates it, is the galley.

When we observe that a galley is capable of sailing in relatively calm waters, we observe that it is stable enough to enrol and perform this kind of topology; it exercises a relatively stable control. However, when this same galley sails out of the Mediterranean and into the Atlantic, it rapidly finds itself incapable of enrolling the dissociating forces of this new spatiality and simply ceases to be stable – it falls apart. When pressed further, the example reveals that control is an emergent quality of the “stable relations

between the component parts” (1987: 121), that is, control is what happens when component parts are channelled within a frame and able to withstand a trial as measured against another frame. And here is the crucial point - the assemblage has to construct a background “against which to measure success” (1987: 126).

For the Portuguese to cross the Atlantic, the sun and all the stars on the sky had to be reduced to a table of numbers against which, with an appropriate re-enactment of the topology by the navigator, movement, location and the very ship itself are performed. As was discovered earlier, the essence of techniques is that they simultaneously associate and dissociate agency; if we had a projection capable of showing us only the ship’s navigational charts, without the entire assemblage of which they are a part, we would imagine that the Portuguese instrumental logic dominated nature and obliterated space-time substituting it with a grid and numbers.

True, the chart dissociates the beauty of the night sky, by forcing the gaze of the navigator down, towards a grid, but that is because in this way it associates the ship with other equally enrolled entities (a distant land, a sea current, a monsoon) so as to achieve stability. How does it enrol distant entities and what are the logistics of network control over distance?

Control performed by a stable assemblage over a distance can be given the label of domination. Adapted to the example of the Portuguese naval expansion, domination stands for the ability to transport entities in a homeomorphic way and thus influence events and entities *from afar*.²⁶⁸ It stands for the ability to enrol those others, as a network builder, without having to be there in person, and more importantly, to perform a topology nearly immutable to dissociating forces. As Law brilliantly argues, the Portuguese vessels had to perform an envelope (a frame) associating with and

²⁶⁸ In the context of this example I am referring to spatial distance, but the next chapter witnesses the same argument extended to temporal distance; the apparent disjunction of time and space is of course purely for the sake of better illustrating the argument.

channelling all dissociating agencies, while this frame was generated by that other frame – the space of rutters and charts.

As long as the ships remained within the topology performed by those frames they were stable, in control, and capable of crossing great distances. Crucially, the external environment had to be enrolled within the frame of the ships; the currents, the storms, the winds, the reefs and coastlines had all to be channelled within the assemblage, and the semiotic key to this process came from the *added frame* of the rutters and charts.

Understood within the notion of programs of action, the two frames worked in tandem to both associate with, and dissociate from, the programs of action of all those others enrolled within the frame. If the rutters and charts were good, then the envelope they provided – the topology they performed, protected the ships from disassembling forces by translating those forces into the inscriptions on the rutters and charts.²⁶⁹ The very act of movement over any distance whatsoever involves enrolling diverse forces within the topology performed by the assemblage.²⁷⁰ As was already argued, for distance to have any meaning a common topology needs to be performed and the traces generated then compared to *another* topos. This relationship is not one of one-way referential jumps, but of *adding* one frame to another so as to form a series, and then performing them together (Figure 10).²⁷¹

²⁶⁹ While the Portuguese ‘domination’ lasted, the rutters were the most prized possession of the ship, more important than any possible cargo. If a ship was threatened by capture from non-Portuguese forces the rutter had to be destroyed at any cost; see Boxer (1969), and Penrose (1952).

²⁷⁰ This, needless to say, turns on its head the notion of space-time compression.

²⁷¹ This conclusion also invokes the earlier example provided by Hokusai’s *The great wave at Kanagawa* (Figure 8).

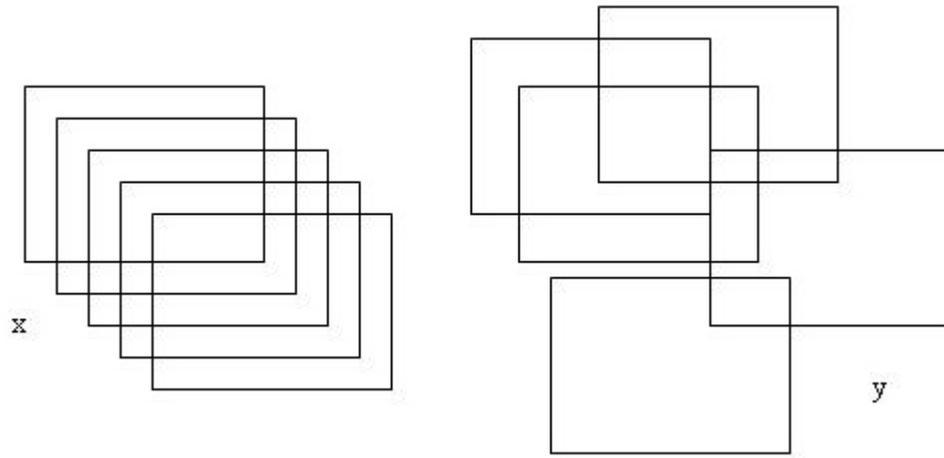


Figure 10: Example of control over a series of spatial surfaces enrolled in the same frame. In the case of stack *x* we can say that it is stable as all the surfaces are enrolled in one continuous frame. An entity willing to move along the network of surfaces will have a concept of distance, scale, speed etc; which is not the case with stack *y*, where an entity will have to enrol the surfaces into one frame if any movement is to occur. “The crucial distinction is not between a world of images and a world of no images - but between the *interrupted* flow of pictures and a *cascade* of them” (Latour, 2002c: 32).

Therefore, a chart has to enrol other entities and then maintain its stability (because this frame is also an assemblage – like any other entity) under trials, if it is to serve its stabilizing function for the other assemblage (the ship). The crucial aspect of long distance control lies therefore in the logistics of creating this very special frame. Law demonstrates, that the success of the Portuguese lay in their ability to build a context (a frame) heterogeneous enough to be able to enrol a much bigger number of dissociating forces than the ones present in the Mediterranean (another frame). This meant building a new kind of ship, training a new kind of navigator, and most crucially creating a new kind of chart – one that would enrol all kinds of possible topologies (Law, 1986: 7).

In other words, and in confirmation of an earlier conclusion, the more attachments a frame enrolls, the more stable it is.²⁷² By creating a frame capable of performing a stable

²⁷² As was already mentioned, we also have to remember that the frame has to work ever harder to keep those attachments in line, because the stability achieved with the increase in attachments is bought at the cost of increased potentiality for overflows and disintegration.

topology (distance) and at the same time allowing the homeomorphic movement of entities within this topology the Portuguese performed their domination.

This also meant that the frame was able to perform what Law elsewhere terms as a “knowing location” (1999b: 4) – a point in the assemblage through which are formatted all the traces generated by the entities within the frame. This topos is a relational effect of the movement of those entities, but seen from without it appears as the source of domination; the centre of control. In the Portuguese example, all the traces generated by navigators on distant voyages had to end at the desk of the royal cartographer, and only the cartographer could *add them* onto another frame so as to form a series – a better image, a better, more detailed, more attached, map. This image *is* domination, but only because of the long and precocious chains of attachments leading away from the cartographer’s desk. Cut the attachments, or redirect them to another room, or another frame, and the cartographer dominates nothing, the image becomes a simple empty panorama. Knowledge, control, and domination are therefore relational performative functions of an infinite number of possible frames of circulation.

In effect, the entire assemblage, and all the possible topologies it performs, have to be seen as one continuous alignment of entities (as in stack *x* in Figure 10) for control to emerge. The navigator had to align with his instruments (and it was always *a him*), tables of star positions, observations of actual stars, measurement of clocks on board, so as to determine with some precision the latitude of the ship (Law, 1999b: 5) on yet another frame – the chart. The more frames available for alignment, the more work the “knowing location” (navigator) had to perform, but also the more stable the final frame was. From this, so very contingent and painfully uncertain process, emerge spaces, distances, locations, and finally – domination.

Characteristics such as distance and difference have meaning only if there is a common spatiality within which they are performed. Absent an assemblage stable enough to perform a common topos, distance, and difference are meaningless – there is no common frame to perform them in. On the other hand, it needs to be said that the

performing of distance leads to a particular asymmetrical enactment of entities – they delegate actions and are translated into other frames in other forms (a coastline turns into a drawing, a human into a number). As Law argues, this means that,

that which is large in the geographical sense, spread out over time and over space, gets reduced to a report, to a map (...). Everything – or representatives of everything – are being brought to one place, all at one time. That which was big is thereby being rendered small. And, as it is being rendered small, it generates a capacity to see far for the privileged centre. (1999b: 8)

In turn, the effect of this process, when stabilised and sustained over time, forms domination, which from a distance seems homogenous and ‘natural.’ The notion of network control therefore depends on the performing of a stable frame, the homeomorphic movement of entities along a stable topology, the circulation of information, and the existence of ‘knowing locations’ where frames are stacked and compared, and knowledge is generated. Both the topologies, and the frames and scales used to measure them, have to be performed simultaneously and in a stable manner if any distance and movement are to occur.

[The] result of building these networks is to act at a distance, that is, to do things at the centres that sometimes make it possible to dominate spatially as well as chronologically the periphery. (Latour, 1987: 232)

Therefore, network control is a performative effect – unstable, contingent, in constant decay. It is, somewhat counter-intuitively, also performed by the very entities it aims to channel, and enrol. A process bearing some similarity to the way a city street is performed as a topos by the entities it enfolds and also enfolds (Latour & Hermant, 2006).²⁷³ What differentiates the notions of domination and control is the performing of distance and duration: control performs a topos, and domination extends that control over a distance and in duration. Ultimately, the crucial lesson of this section is that

²⁷³ The city street acts in accordance with the Münchhausen theorem discussed in the first chapter.

domination is an image circulating within a network of other entities; it is not bigger, vaster, and more durable than any other image or frame - it is only the *effect* of a long chain of attachments which has to be maintained.

Domination is never a capital that can be stored in a bank. It has to be deployed, black-boxed, repaired, maintained. Connectivity is itself not a set-piece but a process which must be dynamic, that is, it must be maintained. (Latour, 1991: 118)

Network control, and the frame protocol formatting the channels along which entities circulate, are similarly dependant on series of *other* attachments. Ultimately therefore, the issue of network control and stabilisation rests on the ability of an assemblage to perform asymmetrical shifts through entities. It rests on the one hand on the invocational ability to bring to existence more spatialities, more opportunities to exist and to be, and on the other hand on the avocational ability to format, channel and multiply opportunities to be absent. However, the most interesting element of the control assemblage is undoubtedly the 'knowing location,' the desk of the cartographer where in the middle of the night, and after a long and perilous journey, new traces are added *on the same frame* thus allowing a strange new image to appear. The next section will preoccupy itself with the result of this mysterious process of network control – a map.

Maps: tracing attachments

‘What terrifies you most in purity?’ I asked.

‘Haste,’ William answered.

Umberto Eco, *The Name of the Rose* (1998 [1980])

Armed with the conclusions of the previous section, it is now easier to approach again the issue of spatial projections, this time from the perspective of the ‘knowing location,’ described by Law in the context of his examination of Portuguese naval exploration. This section is concerned with two opposing concepts of *a map* and the ramifications they produce for understanding stability, control, and domination. The concepts derive, to use the positions charted earlier in the chapter, from two radically different ways of thinking space. The first approach sees space as something we move through, put things into and generally exist in.

Space here plays the role of a container, a referential context serving as an absolute determinant for the position of everything in it. In other words, space is always primary to any relations that might be observed. The second approach sees space as a performative effect of relations between entities, that is, for it spatiality is literally in-performance through circulation. While the first projection sees space as a static referential *context*, the second sees space as a dynamic relational *effect*; the difference between these spatial projections causes the divergent effects in seeing the entities populating the topology.

Mapping as unveiling

The argument so far suggests the problem of tracing movement can be depicted as a function of the spatial projection employed. As the previous section suggested, a *knowing location* would ‘know’ only that which fits the frames it performs; a map in a room depicts only what has been transformed, or shifted, onto its frame. It follows, that an investigation of the knowing locations of spatial projections would probably reveal the conceptual horizon of a mapping approach and the types of entities visible to it. Therefore, the section constructs the arguments around practices of network cartography, used as an example here, as originating from two divergent spatial projections, resulting in two forms of mapping.

For the first, a map is always an extraction from or a revealing of spatiality (*unveiling*), while for the second a map is always an addition to a process of performing spatiality (*attaching*). In that, the example closely follows the delineation used so far throughout this chapter. As was already mentioned, proponents of actor network theory have long argued that there are two basic approaches to space. One sees space as a container pre-existing the entities within it, and can be recognised as the projection familiar to Euclid, Descartes, and what - for lack of a better word - could be termed as ‘the common sense opinion.’ Space here plays the role of a referential context - each entity within it is a priori defined by its reference to the spatial context - serving as an absolute determinant of the relations performed within.

In other words, space is viewed as always primary to any relations that might be observed. The second approach in turn, sees space as a performative effect of the relations between entities, and could be described as the projection familiar to many indigenous peoples, and the special theory of relativity. For this projection, entities and their inter-attachments come first, and space comes second. In other words, the relational attachments between entities perform the space, not vice versa. While the first projection sees space as a static referential *context*, the second sees space as a dynamic relational

effect. The two projections arguably result in wildly divergent approaches to spatial entities, their movement, and the traces they leave.

The former projection produces imagery preoccupied with a totality where convergence and inter-linking are taken as the natural state of affairs,²⁷⁴ while heterogeneity and autonomy are rare flowers to be explained and tended. The latter projection in turn produces imagery unable to see beyond the local (even if it seems to represent something global), where convergence is a rarity to be explained, autonomy from attachments does not exist, and heterogeneity is the rule.

For the former spatial projection, a map represents relations *in reference to* a context, which is for example, an already existing politics or an a priori topos. For the latter in turn, a map is a tracing of the relations performing the politics or the topos, which in this case is not an a priori context but an effect of performativity. The only movement that the former projection can detect is the referential jump from an object to its context, while the latter in turn sees all manner of circulations and shifts being performed by, and in their turn performing spatial relations. In other words, the difference between the two spatial projections is best observed in the types of moves they are able to see and display. The former projection is capable of detecting a referential movement from an object to a frame, which is termed as *unveiling*,²⁷⁵ because it aims to display the hidden context *in reference to which* an entity is defined. The latter in turn captures something akin to a relational movement between circulating frames, which I term as *attaching*, because - contrary to displaying a reference to a context - it produces an interface between two forms of circulation.

This situation resembles the example given in the previous section, where projections from the inside and outside of a stable frame produced vastly different observations as to the nature of control. Here, from the outside the bill produced by a knowing location –

²⁷⁴ As is to some extent suggested by Albert-László Barabási's network theory, mentioned in the first chapter.

²⁷⁵ I use this term to indicate a continuity from the earlier discussion of spatial projections

the map on the cartographer's table – seems to perfectly capture and *stand for* all the entities depicted on it. From the inside however, the map is simply the coagulated result of long and perilous chains of attachments. As it was already pointed out, if one is to understand the assemblage in question both these views have to be taken at once, both the association and dissociation manoeuvres of the knowing location have to be accounted for.

Every entity, be it human or non-human, leaves traces as it struggles against entropy. Whether an entity's existence is projected as being, becoming, or having, it inevitably involves a spatial locatedness. That is, it can be approached as a thing leaving spatial traces, or annotations, which in turn can be observed, or tracked. As the previous two sections argued, these logistical traces are the adversity-channelling shifts which an entity performs so as to maintain stability. Even the journey of the smallest grain of sugar, from a plant in a plantation to an olfactory sensation from a morning coffee, is a spatial phenomenon of mind-boggling complexity, involving an enormity of *other* entities.

Until very recently the banality of this realisation served no further purpose, as all those *other* entities and the logistics of their relations receded in an invisible and mute background never to be found again. As the first chapter demonstrated, information networks finally make those logistics visible and thus perturb the homogeneity of the bifurcated world. While a mute and invisible background is a simple matter of fact (or a pure externality as economists term it), a visible locale endowed with a multitude of voices becomes a matter of concern not to be ignored. How to approach the ambient traceability of a performative world populated by agencies?

The relatively recent practices of locative media mapping, to be discussed in this section, have been preoccupied with re-approaching spatiality as the locale of heretofore unseen relations and transforming it from a matter of fact to many matters of concern, sometimes at the cost of great controversy. Whenever independent or corporate-funded locative media projects utilise network techniques to map entities, collectives, or locales,

they expose hitherto hidden or ignored logistics and relations.²⁷⁶ However, more often than not they are met with critique ranging from accusations of sell-out, to naiveté regarding the dangerous implications of tracking and annotation.²⁷⁷ All new media mapping projects²⁷⁸ attempt to trace network entities in one way or another, yet the controversy starts when the movements of those entities, or their lack, become visible.

Undoubtedly, the increased importance of cartography for new media practitioners and various critical approaches to modernity is connected to the effects of information networks on representations of space and time. The unprecedented ability to map various topoi (and spatial relations) stems from the proliferation of fluid information networks which multiply and perpetuate both traces of and potentialities for tracking and annotation.²⁷⁹ Yet, simultaneously the fluidity of these networks makes network maps less and less stable. The more traces and annotations there are, the less explanatory and revealing maps seem.

Practices of mapping networks of power concentration seem to be the hardest hit by this paradox. Finally there are tools available to uncover, map, and display the doings and dealings of the powerful, but, somewhat counter-intuitively, efforts to map network structures of domination are not really effective.²⁸⁰ Obviously, the circulation of entities within those networks is too fluid for the projection, and therefore the resulting map is too poor an interface to assess the relations of those in power. It is, again, a problem of movement caused by a projection too crude to capture the shifts of entities. It is my contention that this problem is generated by the inability of the cartography of unveiling to see, or even look for, the logistics of performativity. It constantly mistakes barely

²⁷⁶ As is the case with the examples discussed below.

²⁷⁷ The section engages these arguments within the canvass of the unveiling and attaching projections.

²⁷⁸ A general term denoting mapping projects from locative media to Brian Holmes' "counter-cartographies" (Holmes, 2006a).

²⁷⁹ This is also the reason why surveillance has become such a thorny issue for locative media practices.

²⁸⁰ As the political philosopher and new media theorist Noortje Marres observes with regards to network mapping: "the disruptive power of the exposure of these activities to the public, today seems especially low" (2003: 54)

stabilized effects for total contexts and so makes itself blind for the entire range of actors, intermediaries, and mediators who produce those effects.²⁸¹

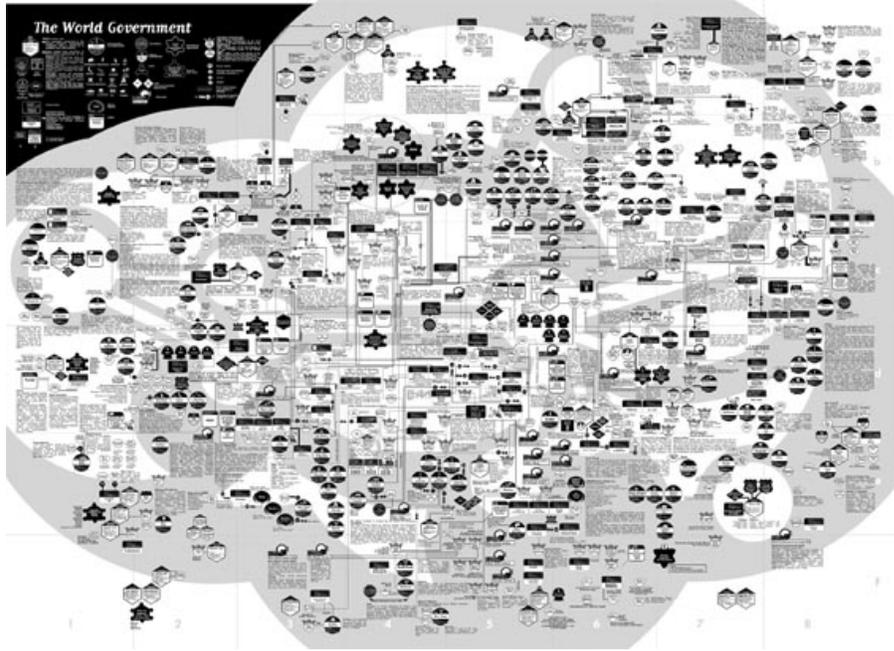


Figure 11: The World Government (image by Bureau d'Etudes)

Two examples of what I term *mapping as unveiling* are provided by the range of cartography projects of *Bureau d'Etudes*²⁸² (Figures 11 and 12), and Josh On's *They Rule*²⁸³ (Figure 13). *Bureau d'Etudes* is a collective producing a series of mapping projects, aiming at charting and exposing hidden structures of global power and domination. *They Rule* in turn, is an interactive database mapping tool on the web, created by Josh On, and visualizing the links between the 'old boy' communities of corporate America based on membership in Fortune 500 boards of directors.

²⁸¹ The importance of the logistics of performativity for understanding network assemblages has also been suggested by the work of geographer Nigel Thrift (1996, 1999, 2006), and urban sociologist Mimi Sheller (2001, 2004), among others.

²⁸² The website of the collective is: <http://utangente.free.fr/index2.html>.

²⁸³ Josh On's website is: <http://www.theyrule.net/2004/tr2.php>.

Both projects can be characterized by the epistemological outlook that networks have become the dominant structures of power, and that this power is largely invisible (Holmes, 2006a: 20). Furthermore, their epistemology leads them to see network mapping either as critical and dissenting or as established and dominant (ibid.). The objective of this dissident cartography is to dissolve social hierarchies “by a deliberate twisting or counter-application” (Holmes, 2006a: 22) of network technologies.

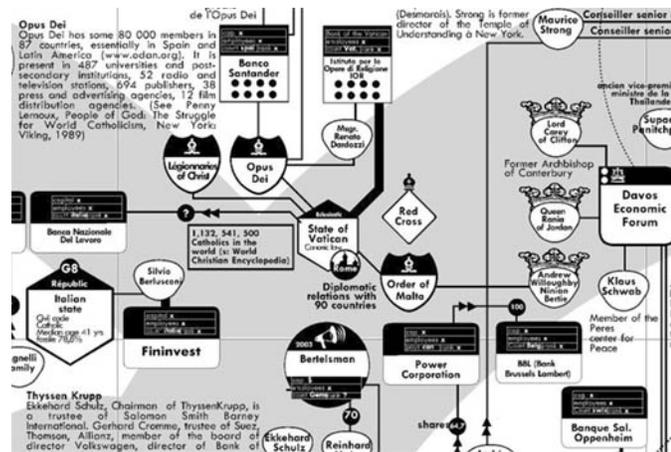


Figure 12: The World Government (detail)

As Holmes argues, the “counter-application” of network technologies works with the help of both static network maps and dynamic energy diagrams, which display respectively structures of network power and potential openings for action. At the bottom of this approach lies the belief that there exists some ‘normalised’ and ‘dominant’ way to use maps, which produces a cartography of domination and power, while simultaneously its mirror opposite is the autonomous practice which through an exercise of Situationist detournement re-appropriates the tools of power.²⁸⁴

The counter-cartographers in this scenario are believed to “denormalise” the predominant order “with the very tools that consolidate the control society” (Holmes, 2006a: 25). Meanwhile, the established and dominant cartographies and the global

²⁸⁴ As the first chapter already discovered, the discourse of mastery is the hardest to dispel element of the bifurcatory manoeuvre.

networks represented by them are seen by this approach as forces of “imperial infrastructure.”

When presented with the homogeneity of “imperial infrastructure,” the charting goal is “an inscription of the individual, a geodetic tracery of individual difference” (Holmes, 2004). The role of mapping in this epistemology is to locate a subject who has been lost in Manuel Castells’ “space of flows,” and to allow the subject to regain her capacity to act and struggle. Therefore, at its deepest level the cartography of unveiling is in a two-pronged search, on the one hand for a subject-identity and on the other, for knowledge that will bring empowerment and the ability to act. Its goal is nothing less than “to go beyond representation, to rediscover and share the space-creating potentials of a revolutionary imagination” (Holmes, 2003).

In that, the counter-mapping is of course the last in a long line of desperate bifurcatory attempts to bridge the ancient divide or at least purify reality from all mediation. Accordingly, after all the attachments of dominance have been cut away, the subject is supposed to establish a relation to the a priori spatiality now free from instrumental logic. In this epistemology, the subject is presented with a total space, alone and without attachments or intermediaries, while the goal of mapping is to constantly capture this totality.²⁸⁵

The force of these maps is in any case to represent a totality which demands specific analysis in order to grasp its potential to function as a whole. (Holmes, 2006b)

²⁸⁵ As philosopher of science Isabelle Stengers has argued, the belief in a total and homogenous spatiality (or power, with a capital letter) always transforms the rhizomes and networks into trees. “[Each] branch is ‘explained’ by its relation to another branch, one closer to the trunk, and, indeed to the roots, that is, to the site - occupied by a ‘logic’ if not by actors - from which all the rest can be denounced as puppets, acted on beyond their intention and their plans” (2000b: 123).

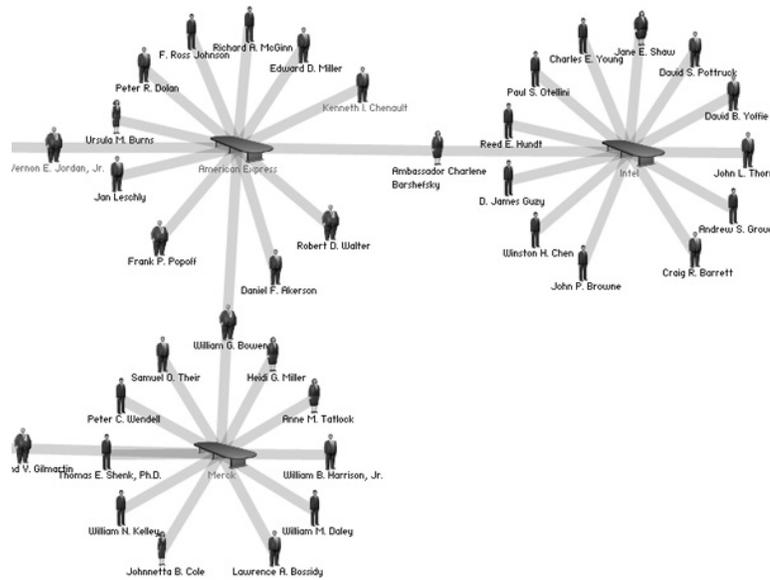


Figure 13: They Rule (screenshot) – the ties between the boards of directors of *American Express*, *Intel*, and *Merck* corporations.

Perhaps this epistemology is borne out of the belief in a logic of total surveillance (Manovich, 2006), permeating an equally total imperial infrastructure and demanding an appropriately total alternative? Indeed, some theorists would go as far as suggesting that, as the latest reincarnation of *Gestell*, the instrumental logic supposedly permeating those networks of domination and control “accords strategic primacy to space and simultaneously downplays time” (Fusco, 2004). Accordingly, practices of locative media, examples of which will be discussed below, are accused of succumbing to the logic of homogeneity because of their interest in all kinds of topologies, which, after all, according to the cartography of unveiling, are always-already under the spell of total domination.²⁸⁶

²⁸⁶ The argument between locative media and critical cartography has been raging for some time, with theorists from the latter camp accusing locative media projects of nothing short of a ‘sell-out.’ According to Mark Tutters and Kazys Varnelis, locative media projects generally fall under one of two mapping practices, “either annotative - virtually tagging the world, or phenomenological - tracing the action of the subject in the world” (2006). I would suggest however, that annotation and tracing amount to the two sides of the same continuous move – as was argued in the previous section with regards to control.

In her critique of locative media Coco Fusco directly suggests that the very act of viewing the world as a map “eliminates time, focuses disproportionately on space and dehumanizes life” (2004). This conclusion too, has been already encountered earlier; in the first chapter as the opacity of techniques and technical assemblages mistaken for autonomous logic, and in this chapter as the logistics of stability mistaken for inherent domination. Either way, the fragile, barely stabilised result of a long chain of attachments becomes the reified *master* oppressing those very attachments; the table of the cartographer dominates the lived space-time of the sailors.

By adding “to the studiable and modifiable skein of means to achieve powers, an un-studiable, invisible, immovable, homogenous world of power in itself” (Latour, 2004b: 225), this projection simply re-inscribes an a priori state of convergence and homogeneity to each and every mediated interface to the world. By substituting the heterogeneous and messy rhizome of modifiable effects for a pure homogenous context, the cartography of unveiling commits the sin of *haste* and overlooks all those others, all the mediators performing the attachments it is so impatient to denounce and sever. Furthermore, it is important to find out how these so called ‘networks of power’ operate. Within the counter-cartography position, there is an underlying assumption that a network structure is a homogenous, static, and total topos, which contextually by itself enables all subsequent claims of action. All the branches of a messy, heterogeneous rhizome are a priori expected to lead to a common referential root. When looking at the *They Rule* or *Bureau d’Etudes* maps one could ask:

What if we introduced a suitcase of money into this structure? Which path might it take? With path shown, would we have to redraw the map, perhaps fade out some nodes or remove them? Once the map is redrawn continually, ‘structure’ (in the historical sense) may or may not emerge. We may or may not have history ‘layers’ to turn on an off. (Rogers, 2006)²⁸⁷

²⁸⁷ Richard Rogers is one of the founders of the Govcom foundation (<http://govcom.org/>), makers of the Issuecrawler web-mapping software (<http://www.issuecrawler.net/>). The Issue crawler is a link-analysis tool which visualizes the entities performing a particular issue online.

More importantly, how do we know what is the intensity of the links, who and what performs them, how many mediators, how many intermediaries, at what cost? If we are to understand the quality of the attachments between the knowing location and the long logistical chains of which it is part, these questions are crucial. However, the unveiling epistemology cannot afford to display such detail because if it does, it will not deal with a totality anymore. Instead of dealing with totally homogenous imperial infrastructure it will have to deal with unstable techniques, and as the first chapter already pointed out, in dealing with techniques it will simply re-inscribe another bifurcation on top of the subject-predicate debacle coupled with the discourse of mastery.²⁸⁸

We now understand why critique, whether high-brow or popular, cumbersome or miniaturized, costly or cheap, brave or facile, sees nothing but lies everywhere. It still longs for a full, wholesome reality and finds only strands, paths or channels that it doesn't know how to follow, objects that it can't see how to fathom, stumbling at each step on the same abysmal distance between words and things, past and present. (Latour & Hermant, 2006)

Non-surprisingly, and as Figures 11-13 aim to demonstrate, the unveiling impulse leads to maps from the top down, "attempting to understand the systems they represent from above or from the outside" (King, 2006: 49); the ideology behind them demanding a total identifiable whole, depicting in the most pure possible way *only* the knowing location. The image produced by such an epistemology is probably best illustrated by a dialogue from the English TV series *Blackadder*. The character *General Melchett* looks at the back of a war map, erroneously thinking it is the actual image, and exclaims: "God, it's a barren featureless desert out there, isn't it" (Shardlow, Fletcher, & Boden, 2002 [1989]).

²⁸⁸ Perhaps the desire for a total autonomy from all attachments perversely results in imagining a total enemy against whom one can take a symmetrically total position.

The cartography of unveiling is willingly blinding itself by occluding the entire process of summing up, stabilizing and upholding an assemblage. Unfortunately, by occluding this process for the sake of constantly presenting a total view, it ends up presenting a view from nowhere; all the traces which could illuminate the *topology of knowledge* are missing. The maps of unveiling are similar to panoramas, in that they see *everything* from all sides, and yet, similar to panoramas, they see nothing “since they simply *show* an image painted (or projected) on the tiny wall of a room fully *closed* to the outside” (Latour, 2005b: 187).

There is no way to ‘be’ simultaneously in all, or wholly in any, of the privileged positions structured by gender, race, nation, and class. The search for such a ‘full’ and total position is the search for the fetishised perfect subject of oppositional history. (Haraway, 1991: 22)

However, network situations and identities are never stable enough to fit the straight and totalizing roles prescribed to them by the cartography of unveiling. To the contrary, plenist ontology is not populated by a homogenized mass of equally oppressed entities, but by a plethora of Tardean difference; to exist is to differ. The effort of mapping should be precisely to avoid homogenization, and the appearance of ‘the masses,’ and instead look for the tiny conduits along which the *image of the masses* flows. Arguably, the cartographer does not unearth the occult connections between power networks, but, to the contrary “it is the format of the map that (dramatically) organizes these networks” (Rogers, 2006). Therefore, instead of searching for the subject without ties (Latour, 1999a), or for the Heideggerian Ding, isolated in their purity of being free from attachment, we need a concept of mapping agency that opens up possibilities for finding connections within social worlds where actors always fit only partially and oddly, at best.

If there is a totality it does not present itself as a fixed frame, as a constantly present context. Instead “it is obtained through a process of summing up, itself localized and perpetually restarted, whose course can be tracked” (Latour & Hermant, 2006); as was already argued, the map on the cartographer’s desk is not an extraction from the lived

real, but an addition to it – another frame in a cascade of shifting spatialities. If the goal is to map difference, trace heterogeneous attachments, and annotate desire, one needs to be attuned to the moves of all those assemblages producing the difference, attachments, and desire. Only a mapping tactic which opens its eyes to those intensities will be capable of displaying the full spectrum of logistics upholding an otherwise impossibly ephemeral homogeneity.

032

Mapping as attaching

How to approach mapping through complexity, uncertainty, and flux while retaining the capacity to trace, annotate, and know? More importantly, how to approach it *without haste*? Perhaps the most legendary map ever made, in both senses of the word, was the one given by the already mentioned mythical master-craftsman Daedalus to Ariadne, helping the Athenian hero Theseus escape the labyrinth and kill the Minotaur.²⁸⁹ When Ariadne, in love with Theseus condemned to die in the maze, asked for help Daedalus, builder of the labyrinth, he gave her a ball of thread. He did not give her a parchment with a plan of the labyrinth carrying a big red sign ‘and here is the EXIT,’ but a simple thread. The thread is crucially a technique for tracing and annotating space, both dynamically in real time, and slowly, that is - taking account of every step and every turn. It opens potentialities for action and is a storage technique allowing the retracing of past movements through space. The thread is an interface for accessing space *and* time, transportation and transformation. Following a thread is slow, but it is the only way to track and represent spatially all topological shifts of the actor.

The trickery of Daedalus leads us to a different metaphorical description of a map - not a static representation of spatial power relationships, or a hegemonic extraction of difference, but a mediator for the construction of agency in space. Literally, for the

²⁸⁹ The myth was already mentioned in the first chapter when discussing technique.

captains of the Portuguese caravels the rutter and the chart were the key to associating the agencies of the oceans, the reefs, and the winds. The moment the projection is shifted from representations of total power to the construction of local agency it becomes impossible to produce cartographies of unveiling. However, suddenly the projection is populated by actors and intermediaries that were never visible before. The shift could be traced directly back to the two divergent spatial projections described in the beginning of this chapter. The thread of Daedalus leads therefore to a performative conception of depicting the produce of a knowing location.

We create space in the process of travelling through it and in creating narratives of journeys we simultaneously construct knowledge. (Turnbull, 2002: 133)

As was already argued, if the world is topological, so too must be its description; the performative approach to space appears first as the granting of powers of spatial enactment to entities, and second as the readiness to perceive the multiple forms of spatiality emanating from the formation and circulation of entities. In other words, first one needs to have a projection allowing entities to perform spaces, and second to be able to trace the movements of entities through various spatialities. Such a performative understanding of spatiality has been observed by anthropologists in recent discussions of indigenous wayfinding (Ingold, 1995, 2000; Turnbull, 1991, 2000). Being in the world entails movement, and movement entails knowing and performing the surrounding spatiality:

In wayfinding people do not traverse the surface of a world whose layout is fixed in advance – as represented on the cartographic map. Rather they “feel their way” through a world that is itself in motion, continually coming into being through the combined action of human and non-human agencies. I develop a notion of mapping as the narrative re-enactment of journeys made, and of maps as the inscriptions to which such reenactments may give rise. (Ingold, 2000: 155)

The movement, or shifting, of entities allows registering the variation between transportation and transformation, while simultaneously performing the entire texture, or

setting, of spatial displacement. Therefore the map produced by a knowing location is both a lieu-tenant for the agencies in whose place it stands, and a re-enactment of the spatial frames of those agencies; it is a key to both tracing and annotation. When we move we perform the surrounding spatiality, that is, we annotate the space with a performative presence, while simultaneously the spatiality performs us, by constraining and channelling our movements and assembling potentialities of attachments, thus allowing a tracing and subsequently knowing. Knowing, and mapping is after all an interface to spatial knowledge, is therefore deeply attached to moving through space, to spacing.²⁹⁰

One can no more know in places than travel in them. Rather knowledge is regional: it is to be cultivated by moving along paths that lead around, towards or away from places, from or to places elsewhere (...) all knowledge systems including science are integrated laterally rather than vertically (...) we know as we go, from place to place. (Ingold, 2000: 229)

For example, the Ongee tribe from the Andaman Islands bases its entire navigation skills and spatial knowledge on performative movement rather than fixed locations (Pandya, 1990: 793). The topography of their territory does not exist for them as an a priori context, a total referential frame to which they can relate, but literally emerges through the practice of displacement. In that, they of course are no different to any other entity traversing space, but by shifting the onus *explicitly* to movement, their example illustrates perfectly what has otherwise become a black-boxed *implicit* assumption. Their maps are

not of places in space but of movements in space. Movements from one locality to another and the sequence in which movements are accomplished become direct representations of changes in places in a space. For the Ongee, movement alone defines

²⁹⁰ Philosopher Adrian Cussins uses the notion of “cognitive trails” to express this spatiality of knowledge (1992). A cognitive trail is a technique to avoid the tired epistemological bifurcation into things and words; it is a “travelling account of understanding and representation that does not opt for an epistemological grounding in either of the two standard alternatives, thought or experience” (1992: 654).

and constructs space: space does not define and construct movement. (Turnbull, 2002: 136)

In other words, similarly to one of the two spatial projections described at the beginning of this chapter, they see space as a performative effect of the relations between themselves and other entities. It seems necessary to point out however, that a spatial projection capable of detecting the intensities produced through movement would not insist on an a priori ontological difference between information networks and the complex travails of indigenous fishermen. As my arguments against the bifurcation of nature and its accompanying discourse of mastery already noted, the difference between control networks and Ongee fishermen is not one of pure concentrated domination versus pure autonomy, but one of density and quality of attachments.

In other words, the ratio of immutability over displacement undergone by entities shifted along massively stacked technical assemblages would be different if those same entities shifted along the spatial frames of the Ongee. Networks of command and control are much more stable than the networks of the Ongee not because of some inherent instrumental logic, but because they enrol an immensely larger number of immutable mobilities, the cost of whose circulation in turn is offset by yet *other* performative relations.

Therefore, the essential starting point for a cartography of attachments, is that “if space is performative, it has a history, and if knowledge is performative it is spatial” (Turnbull, 2002: 137).²⁹¹ This approach, although it relies on the tracing and performing of multiple attachments, does not preclude the emergence of a general picture, a ‘big map,’ but reaches it through as many heterogeneous paths as possible; and crucially, it makes those paths visible. In performing and imagining different spatial settings, “it allows far

²⁹¹ The spatial aspect of knowledge can also be illustrated through the mnemotechnical invention of Simonides of Ceos known as *Ars Memoriae* (Kittler, W., 2002: 111-112). It consists of imaginary locations (*loci*) or spatial forms tied to a particular memory in the mind. The act of remembering performs an architecture in order to retrieve a knowledge (Yates, 1966).

more differences to be explained than when a single meta-narrative is applied after studying just one of them” (Martin, 2005: 299). The cartography of attachments would see maps as inscriptions on space, as extensions and stratifications of space (Tuters, 2005). This realization applies especially to the technique of the grid. For the cartography of unveiling the grid is a hegemonic extraction of an instrumental logic out of lived space, it is the symbol of domination; for the cartography of attachments however the grid is simply a convention, a negotiation, an agreement.

In order to bring the distant and the large to your table top you need perspective geometry, reproducible and combinable representations, a grid and the agreement of your fellows. (Turnbull, 1989: 26)

The grid does not mark the frame along which the individual moves, and neither is it an interface for referential relations of power and domination: it is simply “the interface between two forms of circulation” (Latour & Hermant, 2006). That is, the interface between at least two different spatial performativities. Yes, it simplifies and dissociates, but that is also why it allows augmenting, associating and performing spatialities we could not imagine before.²⁹² The complexity of this projection brings the realization that rather than fighting an illusionary ‘imperial grid’ we need to rapidly multiply interfaces for accessing and tracing performativity, we need matrices for accessing spatial semantics.²⁹³

What there is high up there, underneath and everywhere are intensities looking for expression. (Rolnik, 2005)

²⁹² The concept of ‘augmented space’ originates with Lev Manovich, who argues that information networks allow the transformation of physical space into a dataspace “extracting data from it (surveillance) or augmenting it with data (cellspace, computer displays). (...) Thus augmented space is also monitored space” (2002b). The cartography of attachments however would riposte that performative space has always already been dataspace (and thus monitored, annotated, traced, etc), and information networks finally allow us to see the traces of dataspace performativity.

²⁹³ McCullough calls this agenda a “situated semantics” (2006), a piling up of annotated layers of space one upon another, thus both enriching performativity and allowing for better tracing of intensities.

Nothing, of course, prevents us from deriving a holistic image of a performative topos; it is still useful after all to see a setting from all sides, but we should by now have realised that this is an *effect* achieved because “we are inside a room in which the illusion is mastered, and not outside” (Latour & Hermant, 2006). In other words, if a map is total, it is because it is very local. If it unveils, it should be understood that it unveils very little, if it discovers a context, this context is very small and circulating along paths we need to trace. Tracing the modalities of an entity allows establishing the logistics behind a setting, that is, not only its locale, and not only who or what belongs, but how the entire assembly changes in time, what transformations it undergoes under trials, and during movement. If the cartography of attachments approaches performative space through a particular prism, it is as an interface.

Maps then would not be viewed as static representations of an equally static space, but as ways to open an interface – just as Daedalus’ thread opened up the labyrinth for Theseus. This projection makes us realize that homogeneity is so rare, so expensive, and so hard to stabilize, that it needs to be explained.

If it is no longer a question of opposing attachment and detachment, but instead of good and poor attachments, then there is only one way of deciding the quality of these ties: to inquire of what they consist, what they do, how one is affected by them. (Latour, 1999a)

In fact, taking spatial homogeneity for granted would in most cases amount to blinding oneself to all the difference percolating and performing the topos.²⁹⁴ Annotating and tracing simultaneously, the cartography of attachments allows thinking space and time, knowledge and the body, as one continuous percolation.²⁹⁵

²⁹⁴ As in the *Interestmap* social network mapping software, whose creators quickly discovered that mapping ‘persons’ gives much richer results than mapping ‘users’ (Liu, H. & Maes, 2005). Another example comes from the location-based game *Uncle Roy All Around You*, which combines street and online players while using an actual city as a canvas-in-performance (Benford, S. et al., 2006).

²⁹⁵ Or as the makers of another location-based game – *Asphalt Games* insist, “hybrid games such as ours acknowledge that spatial knowledge becomes social, and the social can become spatial” (Chang &

One example of what this section means by cartography of attachments is provided by the work of Dutch location-media artist Esther Polak. In her *Amsterdam Realtime* (ART) mapping project, several inhabitants of Amsterdam carried PDA's (personal digital assistant) with an embedded GPS (global positioning system) receiver, which traced their movement in the city in real time over a number of weeks.²⁹⁶ Their movement literally aggregated and performed the city in 'real time,' or in other words, provided a glimpse at just how different a spatiality Amsterdam presents to a taxi driver and a student. ART also demonstrates how a network extends surfaces into time; it allows time and movement to become a series of surface traces in an ever-expanding present of cohabitation. It shows maps as interfaces between knowledge and experience (van Weelden, 2006: 26), memory and potentiality. In that, ART opens the black box and shows how agency slowly coagulates into a pattern which then becomes space.

[Every] room has an accessible history/every place has emotional attachments you can open and save/you can search for sadness in New York (Russell, 2003)

Another example is served by the *MILK* project - collaboration between Esther Polak and Latvian artist Ieva Auzina - using GPS to trace the actors involved in the production, transportation, and distribution of cheese.²⁹⁷ The main actor – milk, undergoes a series of transformations and shifts in its displacements from an assemblage of cows and grass, to bottled milk, and finally cheese travelling in a truck across Europe; and *MILK* manages to account for all of them. From a Latvian farm, to a local factory, a truck on a long road, a Dutch cheese warehouse, an Utrecht market, and finally the plate of a particular human, the spatiality is performed through movement and transformation on the part of all participants.

Goodman, 2006).

²⁹⁶ The ART website is at: <http://realtime.waag.org>.

²⁹⁷ The MILK website is at: <http://milkproject.net/>. *MILK* won the 2005 Golden Nica award at the Ars Electronica exhibition, and was also exhibited by Bruno Latour and Peter Weibel in their *Making Things Public* exhibition at ZKM (2005).

Instead of the invisible space of flows of global capitalism, we have the fragile journey of a transforming entity (milk – cheese) who is the main actor, while every human is an intermediary. There is no social, technical or natural space here; there is only the circulation of actors and attachments which the project traces, while never losing sight of the intermediaries and mediators performing this ephemeral yet stable spatiality. The action in this cartographic exercise is brought in by the intermediaries; remove the intermediaries and we end up with a Borges map.²⁹⁸ Trace what mediates, who attaches and how many intermediaries there are, and our map becomes a mediator for the construction of agency in space.

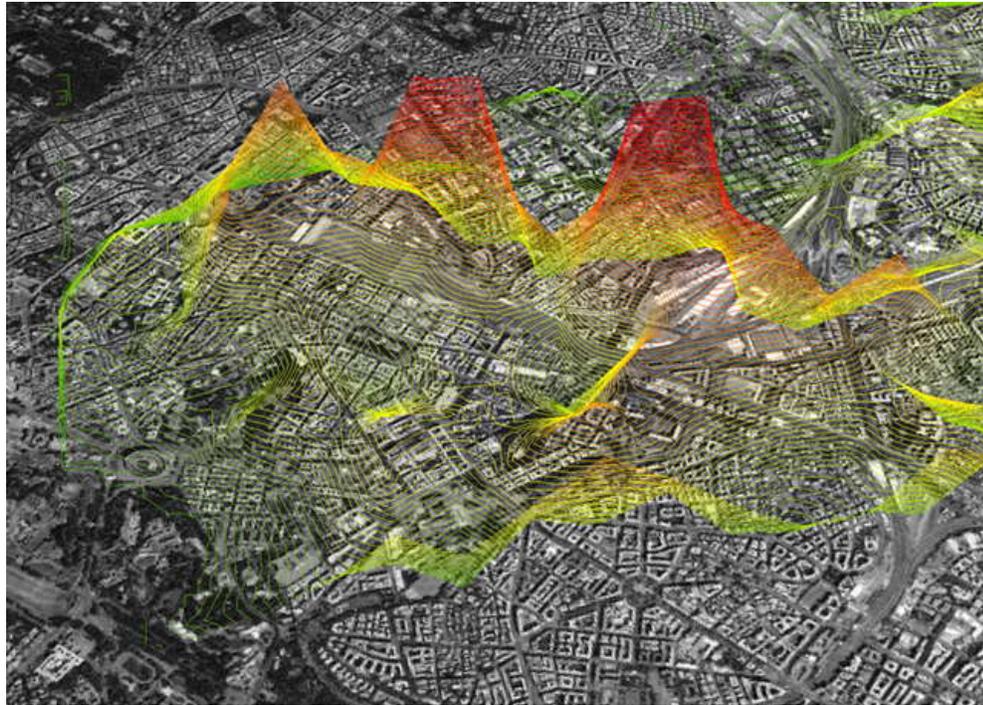


Figure 14: Number of cellular phone users around the Termini train station visualized as a three-dimensional interpolation (image by Real Time Rome, courtesy of Carlo Ratti)

²⁹⁸ Borges famously mocked the concept of mapping as representing space in his short story *On Exactitude in Science* (1975), where he describes an imaginary country whose scientists produced a map of its territory on a scale of 1:1. Naturally - since the map was such a precise representation that it actually *was* the territory - the citizens quickly realised that they might as well just follow the territory and ignore the map. Borges' point was that a map is never a *representation of* but a *key to* a topos.

Another example of mapping the performance of spatiality is provided by the *Real Time Rome* (RTR) project created by the MIT SENSEable City Lab as a contribution to the 2006 Venice Biennale.²⁹⁹ The project aggregated data from cell phones, buses, and taxis in Rome to trace dynamically and in real time the intensity and rhizomatic topology of human locatedness in the city. RTR captures movement characterized by the visibility of the intensities of displacement (Figure 14); here a train station appears as a much more intensely human topos than the surrounding streets.³⁰⁰ In that, perhaps it would be fair to discuss the *humanity* of the train station, just as the colonel from the first chapter was discussing the *inhuman* condition of staff sergeant Talon. In both cases the layering of attachments creates a transformation, and RTR makes that transformation visible.

The more network mapping tells us about connectivity, the more we find we are actually studying versions of metadata. Network mapping tells us that connectivity is not virtual at all. (van Weelden, 2006: 29)

Furthermore, once we start approaching spatiality as a performative process, nothing stands in our way to trace a topology of desire, emotion and affect. For example, Christian Nold's *Biomap* project performs topology as an emotional plait. His 'knowing location' consists of a tool recording the Galvanic Skin Response (a handheld indicator of emotional arousal) and the GPS position of the person wearing it (Figures 15-17).³⁰¹ Humans equipped with the devices were asked by Nold to perform their daily routine around the city. By recording and interpolating their emotional states with the topology – represented in this case by a Google map – the project performs a simple yet powerful spatiality of affect.

It charts the spaces performed by individual emotions, and by superimposing those spatialities allows to create a fantastic topos where streets argue, laugh, and worry about

²⁹⁹ The RTR website can be accessed at: <http://senseable.mit.edu/realtimerome/>.

³⁰⁰ The project also shows the spatial intensity of entertainment through an interpolated map of a Madonna concert in Rome.

³⁰¹ The Biomap project website can be accessed at: <http://biomapping.net/>.

traffic. *Biomap* shows that space is always also emotions and desire; it demonstrates that “a map is not a copy of a space but a way of opening up space through information” (van Weelden, 2006: 28), that it is a way to add potentialities to space.



Figure 15: The Biomapping devices – a Galvanic Skin Response detector and a GPS receiver (image by Christian Nold)

We have grown accustomed for too long to read space as a grid of latitudes and longitudes, while forgetting how this compromise came to being, and why. We demand a lived, performative space, free from the homogeneity and domination of instrumentality, while simultaneously forgetting that the topoi surrounding us have never stopped being lived and performative. There is no dialectic of instrumental flows and lived places – just circulations of attachments, all the way up and down, opening potentialities in spatial interfaces. The cartography of attachments shows us spaces as negotiated alliances around which rules of cohabitation spring up; it creates an image with aesthetics

ranging from the quotidian to the weighty semantics of lived experience, all latent within the ground upon which we traverse. (Bleecker & Knowlton, 2006)

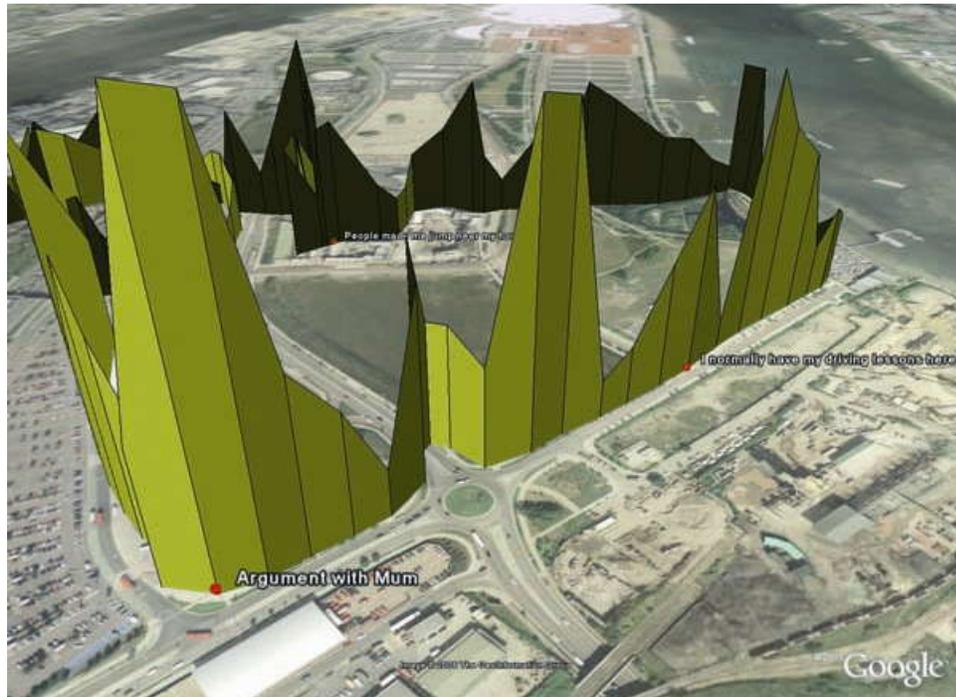


Figure 16: An emotion map in Greenwich. ‘Argument with Mum’ performs an otherwise banal t-section into an emotional centre of the walk (image by Christian Nold)

Unlike state maps, annotated with ‘official’ points of interest, or unveiling maps upholding the dialectic of domination and oppression, these immersive maps permit users to inscribe space with their own shared desire. The focus of this cartography is the production of space; in it maps are inscriptions on, extensions and stratifications of space; they are preoccupied with the tracing of associations of attachments. The more centred they are on the individual actor as a ‘producer of space’ the better. It is the ‘producers of space,’ or ‘knowing locations,’ already long ago declared lost in Castells’ “space of flows” and “timeless time,” which locative media is preoccupied in finding. True, ultimately, that is the goal of counter-cartography as well. However, as I argued, what differentiates the two practices and justifies the dichotomous relationship between *mapping as unveiling* and *mapping as attaching* are the spatial projections within which they operate. The positing of a homogeneous and a priori spatiality obfuscates the entire field of attachments, which conspire to produce the *effect* of homogeneity.

In this section I hoped to demonstrate that the cartography resulting from this projection has all the characteristics of a panorama, which *displays* everything and yet sees nothing (Latour, 2005b: 187). Furthermore, by juxtaposing two spatial projections and the mapping approaches they effect, I do not suggest that counter-cartography is not critical enough and in need of an even more autonomous ‘new critique.’ On the contrary, I argued that the problem originates with the spatial projection that sees only totalities in need of unmasking, rather than effects in need of tracing and explaining. It was argued that this stance is a priori incapable of perceiving that homogeneity and domination are not a context out of which the individual in search of autonomy has to extricate herself, but, to the contrary, are a rare and ephemeral effect of an aggregate that has to be constantly upheld.



Figure 17: Another Greenwich emotion map – this time a busy traffic crossing provides the intensity of the ‘lived’ experience (image by Christian Nold)

The most serious problem with this projection is that while reifying presence and absence it makes it impossible to see, trace, and understand how spacings are produced,

how difference emerges and recombines itself in the networks of circulation we have been always building. While taking rare effects as always present givens, it blinds itself to the enormous heterogeneity of the world it leaves outside. When it encounters global networks of command and control it would always find it hard to explain the cost of exercising stability and would instead take them for granted features of the landscape to be traced and eventually resisted. Indeed, the haste to which the quote opening this section alludes has nothing to do with speed, or time, and similar banal associations, and everything to do with the iconoclastic impulse impatient for purity from attachments. This impulse makes itself blind to the richness and complexity of the world, so as to be able to perceive everywhere only the caricature dichotomy of autonomy and domination.

The cartography of attachments in turn was found to display very little but to see it well, because it allows tracing the logistics of performativity, that is, the series of spacings involved in any given space. When tracing attachments one never encounters the subject or the thing alone; the thing, the slab of cheese, is always attached to humans, and so in an endless chain. It is my contention that network cartographies can only hope to unlock the enormous complexity of network topologies if they literally repopulate their maps with the plenist ontology of agencies, with the rich performativities of subjects never detached from things. Counter-cartographies can be successful, as I hoped to demonstrate, only when they stop mistaking effects for already-present contexts, and instead concentrate on tracing how, through what transformations, detours, assemblies, and alliances are those effects produced. As Latour writes, “the critic is not the one who debunks, but the one who assembles” (2004d: 246).

Following the establishment of a projection capable of tracing the logistics of association and dissociation of publics, this chapter clarified the steps needed to enact an agency over a distance, perform control over an assemblage, and establish a network of domination. It was argued that throughout this process a crucial role is played by the measuring scale indicating the stability of an assemblage in space and time. Spatiality was argued to appear as a result of the performative shifts of agencies, and the stability of assemblages to be the effect of inscriptions circulating between frames. The spatial

extension and stabilisation of those circulations was argued to result in the effect of domination; while the traces left by the circulating entities, when inscribed into a frame and then assembled in a knowing location on yet another frame, were shown to produce maps acting as keys for unlocking agency. Therefore, the chapter explored the notions connected to the spatial formation of network publics, the cost of spatial stability, the issues of control and domination over a surface, and the production of ‘knowing surfaces’ standing in for a wider topos. With that, the exploration of the notion of network space approaches its limit and gives way to the complex issues surrounding network time – the object of the next chapter.

Chapter 3

Edges: from attachments to affinities

The two previous chapters approached the politics of networks through a series of argumentative detours. First, the bifurcation of nature was shown to inscribe a dichotomised discourse of mastery in the relations between entities; to that, the thesis offered an alternative ontology of plenist relationality. Furthermore, contrary to the established positioning of technology as autonomous instrumentality, technicity had to be positioned as a shifting of agency, and technical networks as an enfolding of multiple spatio-temporalities. Informed by these arguments, the second chapter approached the notion of network space as a performative effect of the circulation of agencies; established that politics similarly appears as the performative effects of the circulation of publics, and then explored the questions of control, domination, and representation of network agency.

What remains to be added to this ‘panorama’ of network politics is a temporal dimension. So far, the argument has tried, as much as it was possible, to omit questions of time from the narrative in order to allow the problematic to be fully explored below. Following the shift from the concept of actors to that of attachments, the first section of this chapter argues against isochrony; that is, the appearance of a temporality which *seems* homogenous even when presented with an amalgamation of spacings.

In a development symmetrical to the argument about space, the section argues against the conception of time as a homogeneous container enveloping the agencies circulating *within* it; instead, the section proposes a conception of temporality as a multitude of timings. The term *timing* aims to indicate the processual and performative character of temporality and to point to time as an *effect*, rather than a cause. The particular temporality of information networks is accordingly argued to result from a stabilised chain of timings; similar to the stabilised spacings encountered in the previous chapter.

While one could call this particular sort of timings virtual, because of their peculiar opacity and apparent homogeneity, the argument terms them as *deep*, because their distinct characteristic is the effect of spatial depth, where there are only interpolated surfaces. Following Latour, the section identifies the elements allowing the appearance of a deep timing in the figure of *immutable mobiles*; agencies stable enough so as to avert deformation yet circulate and shift chunks of timing-spacing. The section argues that by stacking up a set of timings and spacings brought from *afar* through stable networks of circulation one can achieve the effect of depth; thus – deep timings and deep spacings.

The second section in turn, takes the notion of deep timings achieved through the arranging of immutable mobiles, and shifts it to the metaphor of *an internet of things*. The section first explores how networked objects, or rather – networked timings and spacings, allow to see what until now has remained invisible – the movements of immutable mobiles through time-space. Such objects are termed, after Bruce Sterling, as “spimes”; these are entities carrying *a spacing* and *a timing* through networks. This particular stability is possible because they are immutable mobiles made visible, and therefore even more stable, through inscription. Furthermore, the notion of network is found too simplistic to describe the flux and complexity of timings and spacings in circulation.

This discovery leads to the final section in which a third conceptual shift is performed. It is a shift from the notion of networked attachments to that of durable affinities, where the latter stands for the chain of associations allowing a public to be traced through both space and time. It is argued that while the notion of attachment was and is good enough to account for the tracing of a public through a set of spacings, such a public is always already fluid *in time*, and that is where the notion of attachment loses its usefulness. The section argues that when we start accounting for timings as well as for spacings, we can trace the *depth* of the alliance allowing for the stability of publics. It is concluded that if we tried to map deep timings and spacings through which the public coagulates,

we could call this stability *a durable affinity*. The chapter concludes that such an assembly inscribes itself through the processes of isosthenic negotiation and fragile inter-patience in a total locality.

01

Deep timings

The garden of forking paths is (...) an infinite series of times, a growing, dizzying net of divergent, convergent and parallel times. (It is) a network of times which approach one another, fork, brake off, or are unaware of one another. (Borges, 1970: 53)

In line with the arguments of the previous two chapters, this section approaches the notion of time as a problem of two projections, one of which inevitably leads to a bifurcated view. In resemblance to the situation encountered in the analysis of the notion of network space, here too ‘the plague of looking below’ appears as a projection seeing only homogeneity, or, in the case of time – isochrony. It is argued that the alternative projection construes temporal homogeneity as a rare *effect* of the circulation of entities within stable assemblages; and that rather than one uniform and homogenous time, plenist ontology involves a multiplicity of timings. Furthermore, the effects of temporal depth and temporal flow, as encountered in information networks for example, are argued to appear as an effect of the performative circulations of entities termed as immutable mobiles.

011

The question concerning time

For the ancient Greeks, time in all its aspects was known as a much-meaningful duality of concepts personified by the deities Chronos³⁰² and Kairos. In the pantheon of the pre-Socratics, Chronos was the god proper of time and stood for the time of repetition, while

³⁰² Although the correct Greek transliteration is *khronos*, the argument uses the Latinized version from which originates the root in words like *chronology*.

Kairos stood for the time of the fleeting moment. Chronos - the much better-known deity of the two - was considered responsible for the cyclical passing of the stars, and stood for time as an ordered duration. His was the symbolism of the calendar. He was the ruler of the wheel of the zodiac, and was often imagined as a three-headed snake eating its three tails – past, present, and future. His consort was Ananke – the goddess of inevitability, destiny, and unavoidable fate.³⁰³ In Orphic myths, he was also known as Aion - the god of eternity.³⁰⁴

He appeared as one of the first gods out of the primordial chaos and was seen by the Greeks as a divinity of a different order from the major gods of Olympus. He personified a temporality of passing numbered instances, which in turn were always a sequential, and recursive phenomenon. We could call this a temporality of the zodiac, time as quantity, as a passing of discrete measurements, time as ordered techniques.

Equally important for the argument however, is the time personified by Kairos, the god who “does not announce himself, and vanishes before we perceive him” (Kittler, F., 2006: 65). His is the time of the opportune moment, and Kairos was often portrayed with locks of hair growing around his face and a bald scalp on the back of his skull, symbolizing the passing of the event, never to be captured post-factum (Figure 18). Therefore, while Chronos stood for the sequential and linear time of succession, the time of technique that can be measured, in-scribed and de-scribed, Kairos stood for an indeterminate, fleeting event during which something non-sequential occurs. On the one hand time as repetition and memory, while on the other time as difference and unpredictability.

³⁰³ From Ananke’s Roman name – *Necessitas* derives our word ‘necessity.’

³⁰⁴ From the name of Aeon derives our word for immense amount of time – *eon*.



Figure 18: *Kairos* bas-relief, Museum of Torino, Italy

Furthermore, the Greek understanding of time encapsulated within the myth, is notable for the idea that Chronos emerges as the first entity out of chaos. In other words, before the recursive ordering of sequences there is nothing that can be known or experienced. Moreover, conceptually Chronos does not stand for all of time; the time of the event, the fleeing moment of opportunity that appears and disappears before it can be thought, is represented by Kairos, the bewinged fleeing god. Chronos and Kairos are therefore the two inseparable personifications of the same process of repetition and emergence of time.

Action concerning the former is chrono-logical and sequential, while action concerning the latter is the grasping of an instantaneity. Without Chronos, there is no Kairos; the process of repetition is the knowable aspect of the event. Only together, do the two aspects represent a full image of time, for without Chronos there is chaos, and without Kairos there is only the hell of meaningless repetition. In the unified conception of time presented within the myth, the appearance of repetition allows the fleeting kairotic moment to reach perception.

Therefore, conceptually Greek myth suggests that the time of the event seen as passing-becoming is inseparable from the time and logic of the sequential series; they are always-already the two extremities of time, and of any action-in-time. Accordingly, the only way to experience the event is literally as its series of repetitions; in that temporality too is inextricably knotted with technique. The very appearance of temporality in awareness is always already a repetition, a reverberation of a passing kairotic moment; and in encountering that moment in memory we encounter it as the technique of repetition.³⁰⁵ As Friedrich Kittler argues in a brilliant lecture from 1993, *Blitz und Serie – Ereignis und Donner* (Lightning and Series – Event and Thunder), to think the pure event, the lightning, we need the thunder and its echoes – the reiterating series which allows us to have time.

The time of the event and the law of the series are intertwined, lightning and the eternal rumble of thunder only two extremes that can both almost be wired. (Kittler, F., 2006: 70)

Crucially, temporality appears out of chaos as the return-through-series of the event; in that sense a non-event never returns. This is how Greek myth perceived the conundrum of time; on the one hand, a fleeing moment here and now which will never appear again, and on the other, a system of measurement, of repetition, inevitability, and numbers. The two concepts resemble the duality of agency, where the fleeing instantaneity appears together with its iterability and potential coagulation. Arguably, Western conceptualizations of time still oscillate between these two extremes;³⁰⁶ however, as the

³⁰⁵ In that, we encounter again the epimethean myth of technique as temporal re-turn, as theorized by Stiegler.

³⁰⁶ The discussion of time in this chapter is highly selective and subjected to the overall arguments. For example, the chapter does not mention among others the idealist position exemplified by philosophers such as J.M.E. McTaggart (1908), who posits that time as a notion is unreal, since there is an inherent paradox in our perceptions of its sequential and dynamic passing on one hand and its relational flow on the other (Gotved, 2006: 473). For a fuller account of the various concepts of time, see Dainton (2001).

preceding chapters already argued, where the Greeks saw a unity today lays a bifurcation.

Thus, already a radical duality in understanding time can be observed in the ideas of the two most important thinkers for medieval Europe - Aristotle and St. Augustine. Aristotle viewed both space and time as absolute ontological phenomena, which accordingly allowed for positioning any events absolutely in reality, within a static totality of celestial bodies. St. Augustine in turn held the radical view that time is a human construction, and bears no relation to the heavenly temporality – the only temporality that mattered. Human time according to him was a momentary obfuscation of a deeper ontological temporality intertwined with god’s plan.

Therefore, in contrast to the unity of Chronos and Kairos, a bifurcation emerged on the temporal plane. On the one hand Aristotelian absolute time resembling the Euclidean projection of a three-dimensional space where time is a pure absence,³⁰⁷ and on the other the Augustinian temporality as subjective projection of the human mind. In other words, and in already familiar metaphors, time as part of the passing of matter in its adventures through space, and time as a lived subjectivity projected on a cold inhuman nature. These are of course the sensualist and subjectivist principles of bifurcation encountered in the first chapter. The bifurcation was further reinforced by the two thinkers of time whose impact still reverberates today – Immanuel Kant and Isaac Newton.

The latter, Newtonian conception of time lies on the Aristotelian-Euclidean side of the divide. In it, time exists separately from the relations of entities, and is an objective part of natural creation, functioning as an ontological frame within which the other dimensions operate. It is primary to, and independent from, the performative circulations of Tardean subjects. As Newton argued in his *Philosophiae Naturalis Principia Mathematica* from 1687, it is in the essential nature of time that it flows equably without relation to anything external (Whitrow, 1972). In an extreme version of the Chronos

³⁰⁷ Or rather, a common sense uniform presence in no need of deliberation.

position, he regarded discrete temporal moments as instances following a continuous linear sequence.

Accordingly, the rate at which these instances succeed one another is independent of the universe and its processes. Therefore, the Newtonian projection sees time as a homogenous flow of discrete sequences functioning as a container for a three-dimensional dynamic space. It is a four dimensional projection but the time dimension is uniform, container-like and fixed, while all knowable, spatial events happen inside it. This quality of Newtonian time was already noted by Whitehead, and observed in the first chapter in the discussions of the bifurcatory projection of reality:

Thus the transition of time has nothing to do with the character of the material. The material is equally itself at any instant of time. Here an instant of time is conceived as in itself without transition, since the temporal transition is the succession of instants. (Whitehead, 1967: 50)

Kant's conception of time on the other hand, is a close resemblance of the Augustinian notion, and a radical departure from Newton's approach (Kant, 1934 [1787]). Kant viewed time as well as space as a priori notions of the mind, serving to apprehend reality in perception. Time and space, according to Kant, form an a priori synthesis, which is the condition for human experience (Elias, 1992: 4). Time and space are therefore categories of the subject, which she imposes on reality as a projection of subjective mental states. In other words, reality is knowable only because it is deployed in an a priori subjective time, projected by the mind, from one of the banks of the bifurcatory divide towards the other.

It should be obvious however, that there are important commonalities between both positions. Both take the existence of time as a category; for Newton it is part of an objective reality independent from the subject, while for Kant it is an a priori subjective category of the mind imposed on an otherwise un-knowable world. Another, related, commonality is the position of knowledge. For both projections, events are immersed in the flow of time and the difference is only what role knowledge of time plays - objective

or subjective. In pure bifurcatory fashion, either we are a mirror to reality or reality is a mirror unto us. The dichotomous position of temporality boils down to the bifurcation of nature so well described by Whitehead, and discussed in the beginning of the first chapter.

Informed by the discussion of technicity, one could argue however, that when applied to time the dichotomy exists today in two interlocked positions: as a double bifurcation along the break lines time - space and technical time - lived time. The bifurcation between time and space flows from the opposing positions of Newton and Kant, with the absolute and abstract Newtonian time said to be in opposition to a subjective and thus human Kantian space. Today, most often in critical theory, this bifurcation is played out as the conquering of place by a universalistic and inhuman 'power time,' or time as 'pure speed.'³⁰⁸

The second bifurcation in turn, and the one more sophisticated and thus more important from my perspective, is within time itself; it divides into the time of life, which is a primary ontological temporality, and the time of technical measurements and sequences, which is always in opposition to and an obfuscation of the primary temporality.³⁰⁹ The two bifurcations reinforce each other by a circular movement, from disjointed time-space to the triumph of time as instrumentality, which in turn causes the further diminishment of lived space (Figure 19). As with all other types of bifurcations, this one can be traced back to the one demonstrated and critiqued by Whitehead.

³⁰⁸ Paul Virilio and Anthony Giddens are the contemporary poets of this re-energized bifurcation.

³⁰⁹ Manuel Castells and Robert Hassan are the two prominent theorists holding this position. Both will be discussed in greater detail below, however, in the case of Castells it has to be said that he manages to combine both bifurcations in a unitary theory of doubly-divided network time-space.

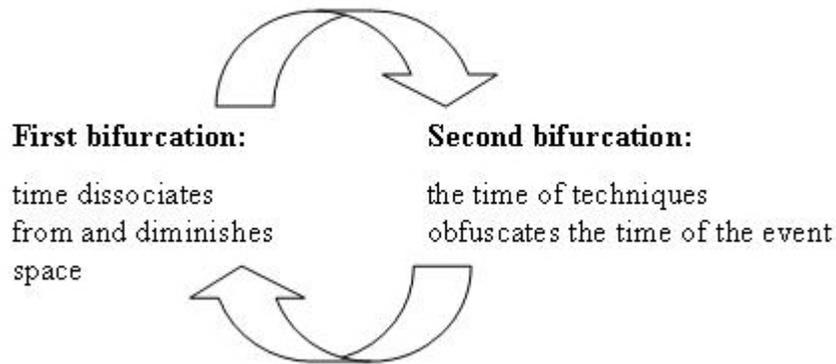


Figure 19: The two bifurcations of time: first, time is dissociated from space and positioned as an isochronic envelope known only through subjective experience, only to give way to a temporality of ordered technicity denying the subject the capacity to experience a lived, unordered time.

Underlying both extreme yet fluid positions, is the belief that in the modern world there exist two essentially opposite types of temporality. One is a human, social and lived temporality, the idea of which, when stretched, vaguely resembles the ancient Greek concept of Kairos. The other in turn is an anachronistic projection that sees the emergence, sometime in the middle centuries, of a radically inhuman form of temporality, which, since then, has gradually established itself as the primary temporality of the modern world. It is a temporal order theorized to have emerged in more or less the following sequence: medieval monastic order of time – the time of church bells – nascent capitalist production time – industrial production time – machine time – pocket watches – time is money – commoditization of lived time. This temporality in turn reads like an extreme and somehow vulgar remake of the position occupied in ancient Greece by Chronos.

The key issue in this second bifurcation, and one which this section has to confront, is the confusion between time and the measurement of time. In virtually all versions of this bifurcation, clocktime functions as an artificial addendum to a primary social and/or natural temporality. Simultaneously, clocktime functions as an always-expanding threat

to lived time; there is always the shadow of an ordering of lived time into a standing-reserve.

Heidegger's antipathy towards all technical mediations was discussed at length in the first chapter, but his position is a perfect illustration of this bifurcation. Accordingly, clocks create a specific clocktime, which unsurprisingly is a pure instrumentality, obfuscating temporality as emergence and substituting it with a temporality of orderings. This position views all technological objects (as opposed to things) as a 'Medusa gaze,' turning the deep lived unity of time, the body, and events, into stone. Accordingly, as Adrian Mackenzie demonstrates, the proponents of this position argue that "through modern technologies of timing, profound differences in history, tradition and hence cultural existence are lost" (2002: 92).

According to Robert Hassan, a theorist of time and proponent of this bifurcation, clocktime has had an enormous (and utterly negative) effect on human culture and society. Its effects are indeed supposedly so profound that we, firmly enmeshed in clocktimes, would find it almost impossible to imagine a time pure from the clock. Our modern understanding is always already "impregnated" by the logic of clocktime, which in turn, and here Hassan combines the Heideggerian with the Kantian positions, is a subjective "social construction" imposed on us by a convergence between capitalistic, scientific and all other kinds of power establishments (Hassan, 2005).

Even when the ominous language of domination is absent, and clocktime is viewed only as a social invention concerned with regulating and coordinating the repetition of social phenomena - as in the temporal theorizations of Norbert Elias - clocktime is still an imposition upon a primary temporality. For Elias, clocks essentially represent "a socially standardized sequence of physical events" (1992: 1), born out of the need for identifying recurring patterns of reality and later using them as a measurement within the social context. Furthermore, time as a concept refers, according to Elias, to "a relating together of positions or segments within two or more continuously moving sequences of events" (1992: 10). In other words, time functions as a coordination technique imposed upon a

dynamic temporality of emergence. It is in effect a tyranny of Chronos over Kairos. The position is best summed in the words of Adrian Mackenzie, when he writes that:

In Heidegger's 'the more exact the clock, the less occasion to give thought to time', and Elias' 'we read the clock as symbols of instances in the flux of incorporeal time', clocktime always remains secondary to a more primary ontological or social reality (Mackenzie, 2002: 95).

The first of the bifurcations described above demands that we always already have to choose between the feeling of time, and the world as an external reality with its own spatial structure. A popular version of this position is the rise of temporalities of speed and the obliteration of natural lived space by the instantaneity of clocktime (Gleick, 1999). The disembedding of time from space and the subsequent obliteration of natural lived space by the effects of an unhinged temporality of pure speed is the favourite subject of Paul Virilio for example.³¹⁰ The same purported disembedding of time and space is also one of the most important tenets of Anthony Giddens' sociology.³¹¹ Here time and space are categories transcended both by structuration on the one hand, and by the arrival of the modern condition on the other; the latter being the crucial element causing the disembedding of humanity from time and space.³¹²

Another of the important proponents of this position is David Harvey, who described a similar break between time and space in his very influential book – *The Condition of Postmodernity* (1989). This disembedding is, in his opinion, caused by the rampant excesses of neoliberal dogma unleashed on an unsuspecting world. According to him, space and time not only have always had "objective qualities," but these are being compressed and revolutionized (1989: 240) to the extent that this compression forces the altering of all traditional relations in the world.

³¹⁰ For an account of Virilio's argument, see Virilio (1986, 1993, 1995, 2005).

³¹¹ For an account of Giddens' argument, see Giddens (1984, 1990, 1991).

³¹² For a more detailed analysis of Giddens, see Gotved (2006: 467-468).

However, if we manage not to fall into the trap of bifurcating processes as either only in time or in space, we are obliged in turn to fall into the second bifurcation - the trap of an imaginary and long lasting war between Kairos and Chronos. From the point of view of the argument, this is the more important of the two divisions, because, as will be demonstrated below, it directly effects theorizations of information networks and the internet in particular. This bifurcation usually separates the temporal plane into a dichotomy between some sort of primary “timescapes,”³¹³ or lived instances of time, and industrial clocktime. It is a bifurcation, which sees the advancement of modern society and industrialization as the final deadening of the human-scaled time.

When time is discussed as a specific phenomenon, as something more than the Newtonian container for space (thus avoiding the first bifurcation), it is usually positioned as a choice between authenticity and instrumentality, between a lived experience and an imposed non-lived order. On the one hand there is time as immanence, an always present source of potentialities, and on the other the instrumental time of machines, industrialization, commoditization, order, oppression, and power (Gotved, 2006: 472). The latter is always in opposition to the former, it is a negation, a perfect mirror image. It is a strangely accurate recreation of the Augustinian opposition between the city of men and the city of god, ancient Manichaeism introduced to Christianity and western philosophy by Augustine-the-convert himself.³¹⁴

According to Robert Hassan, there is an immanent multiplicity of lived temporalities residing in nature and society (2005), and this multiplicity is a potentially “unified temporal whole.” In contrast to the multiplicity of lived temporalities however, Hassan views clocktime as “an abstract and empty social construction that has dominated our relationship with time since the industrial revolution” (2005). Time is therefore

³¹³ Barbara Adam, among others, has exhaustively argued about the existence of “timescapes” of ontological time, which intermingle with and permeate human reality but are being simultaneously displaced, marginalized, and sublimated by industrial clocktime; see Adam (1995, 1998, 1999, 2003, 2004).

³¹⁴ For a magisterial account of the development of Manichean ideas in the west, see Runciman (1982).

immanent, but obfuscated by instrumentality, Heidegger's shadow looming in the background.

These timescapes of temporal immanence exist in lived reality, in social formations, in nature and in humans. Hassan argues, in agreement with Barbara Adam, for a taxonomy of these immanent timescapes which would involve the tempo of speed, the timing of synchronization, the time point of instantaneity, the pattern of cycles, and the duration of continuity. Accordingly, these divergent timescapes are dependent on the context of their emergence and form a dynamic kaleidoscope of temporal change.

It is my contention that we still only vaguely intuit the timescapes of nature, of culture, of context and of our own biology, because they have been sublimated, displaced and dominated, to an ever-increasing degree - since at least the end of the Middle Ages - by industrialized clock time. (Hassan, 2005)

In other words, clocktime represents the triumph of machinic instrumental reason; the machinery of power unleashed upon the diversity of natural time in order to measure, order, and subjugate it. The creation of temporal potentialities and lived timescapes through culture and context is, according to Hassan, constantly and increasingly thwarted by the power time of capitalist industrialism (2003). According to Hassan, the time of lived human experience, of localities and diversities, cultures and contexts, morphs into a universal sameness, a numbering, ordering, and oppression. This transformation of time was, according to a standard trope in critical theory, forced by and for the interests of global capitalism and its quest for dominance and commoditization. Furthermore, this is a process of colonization in which "power time" conquers "potential time" (Alliez, 1996), and sublimates all complex temporalities into a uniform sameness. In a cycle of repetition-as-domination, emergence is being conquered by instrumental control and power, yet again reinscribing the trope of autonomy and the discourse of mastery so crucial to critical theory.

However, the key to this process is, according to Hassan, the technique of temporal synchronization, which, as a necessary prerequisite of control, serves to obliterate

difference. Therefore, the internal logic of the clock device destroys emergence and difference in the name of rationality and commodity creation. According to Hassan, the process of synchronization creates a counter-process of “dyschrony,” which is caused by the reaction, as it were, of the multitude of organic temporalities suppressed by the clock. In other words, this is a rather crude transposition of Heidegger’s theorisations on technology to the problem of time.

Furthermore, underlying most contemporary accounts of time and its dual bifurcation is the problematic influence of information networks on the two dichotomies. By far the most broadly discussed and most important account of this tendency can be found in the already encountered work of Manuel Castells, for whom “timeless time” and the “space of flows” are the characteristics of the “network society” (2000: 13). As was already discussed at the end of the first chapter, in this understanding information networks have an autonomous logic constituting an entirely new paradigm (2004), which enframes (in the sense of Heidegger’s *Gestell*) the social. “Lived time” is “annihilated” into an instrumental “timeless time” and space is de-linked from its geographic locatedness into a “space of flows” by the all-pervasive web of information networks and the time of simultaneity they carry. As is the case with the position of Robert Hassan, the key for Castells is the issue of temporal synchronization, of simultaneity obliterating difference.

According to Castells, information networks undermine traditional geography and instead install a “space of flows,” which appears in tandem with a new time of pure speed annihilating traditional time-as-sequence in order to install the simultaneity of “timeless time.” Castells’ approach is symptomatic of what could be described as the Scylla and Charybdis³¹⁵ problem of approaching issues of network temporality. Here time is approached either as a loss propelled by the instrumental logic of network

³¹⁵ The two sea monsters from Homer’s *Odyssey* guarding the sides of a narrow sea straight – sailors had to confront either one or the other to pass through. According to Homer, Odysseus passed through by following a white pigeon which knew how to time its flight between the clashing rocks. Continuing the association, perhaps there is a way to avoid the rocks of the two bifurcations, by tracing a timing which is always located and never separated from the event.

technology, or as an obliteration of ‘embodied subjectivities’ and their local social relations. As the last section of the previous chapter demonstrated, there is a persistent belief that information networks and the visual surfaces they produce (network maps), somehow multiply space at the cost of time (especially ‘lived time’). As media theorist and activist Coco Fusco argues, “viewing the world as a map eliminates time, focuses disproportionately on space and dehumanizes life” (2004). This belief stems from a particular understanding of clock synchronization and its influence on time and space.

Accordingly, the end-point of the process of temporal synchronization in information networks is simultaneity, which, according to Hassan, implies the arrival of non-time, a final and ultimate voiding of lived experience and the “death” of time (2005). It is the cancelling-out of temporal duration between events and a complete obliteration of space since simultaneity, or real-time, removes the shackles of place and introduces time as Virilio’s pure speed. At this stage of his argument, Hassan rightly points out that such a singularity of time is impossible, and the problem is caused by a literal reading of technical terminology by thinkers not really aware of the intricacies of the jargon.

Specifically, what is used in technical terminology to mean the illusion of simultaneity (yet is in reality just co-ordination³¹⁶ faster than human capacity to discern oscillations) is taken by theorists to mean a literal and absolute lack of time difference. Furthermore, as it would be pointed below, so-called simultaneity is only a convention, for the theory of relativity expounds that as long as two events are separated in space they cannot be simultaneous in absolute terms.

It is interesting to note, that the symptoms which for Castells meant the arrival of no-time mean the exact opposite to Hassan, even though, as his position makes clear, he starts from the same bifurcation as Castells. Hassan positions himself in opposition to Castells’ notion of “timeless time,” arguing that instead of destroying time, the arrival of

³¹⁶ As in cooperative-ordering; there seems to be a strong case that the French word for computer – *ordinateur* is much better at capturing the essential role of the clock at the heart of the central processing unit, and much less misleading than the English *computer*. The processor does not compute anything.

a network society actually creates an entirely new ecology of space-time. This process is promulgated by the dispersal of digital technologies in our daily life, the thickening of interconnectivity, and above all the arrival of the internet.

The difference between their positions is borne from the fact that for Hassan, even though network time still remains a digitally compressed clocktime, its diffusion into all kinds of gadgets and networked objects creates an ecology where control cannot be exercised and there is an opening for lived time to appear (Hassan, 2003, 2005). He further argues that network temporality undermines the power of clocktime and its logic of pure instrumentality, and creates a space of flux and disorder, bringing in potentialities that can give birth to temporal autonomy. Such potentialities are, according to Hassan, immanent in the network (2005).

To reassess, for the bifurcators time as a product of a technique always remains secondary to a more primary ontological or social reality. Simultaneously, when technical time is seen as a deadening of “lived time,” all the technical objects and assemblages that structure themselves around it are excluded. Likewise, the temporality of machines, or machine-time perceived as pure speed, is often seen as inhuman and non-lived. It is the speed of technical operations, the misunderstood synchronicity of the components and assemblages building the machine that causes it to be seen as a deadly enemy to human experience of time. As the section on technicity demonstrated, there is a strong Ludist undercurrent in this view of technology, and critical theory seems only too eager to combine it with the dark prophecies of Heidegger in a potent cocktail of Manichean millenarianism.

[Critical theory] reduces temporal complexities, memory and subjective experience to attenuated abstractions, to non-lived spaces and times, to intervals and orderings that are inimical to human lifeworld structures. (Mackenzie, 2005c: 2)

The question concerning time culminates with the issue of network time. For some, information networks are harbingers of the arrival of a time of death – pure “timeless

time,” while for others networks carry the promise of redemption from the uniformity of industrial clocktime. These views however are variations of the two bifurcated positions described above. Networks are purportedly either the final stage of technicity, fulfilling the annihilation of space started by clocktime, or, they provide an opening for the return of “lived time” in its struggle with technicity. For both positions, there exists a primary ontological reality engaged in a titanic struggle with an evil *other*. Furthermore, as the first chapter already pointed out, the task of tracing network time is often complicated by the fact that in theorizing the effects of the internet on collective temporalities there is a tendency to rely on a separation between social and technical strata, or to view the technical as somehow secondary to, and detrimental to, the social proper.

How to avoid the bifurcations of time? Is there a way to hold both space and time together in a unified non-bifurcated ontology, and if there is, how to avoid a division into lived and instrumental temporalities? Undoubtedly, one of the most basic experiences in human existence is the irreversibility of time, its inevitable passing. That is why mythological Chronos-time weds Ananke-inevitability. However, the paradox and the problem of time is that “as temporal beings nothing is denied more to us than to know time” (Kittler, F., 2006: 64). We recognize time only as a repetition, only as that which returns; we behold the event only as a copy, an echo, a re-appearance. Our capacities for anticipation and recollection – Promethean and Epimethean - are our only ways to apprehend time, and, as the first chapter pointedly insisted, both are borne out of technique. On this, I allow myself to quote a fragment of Kittler’s thought-provoking lecture at length:

In order to know what something is, we need time to recognize it, thus we always miss when it happened; if, conversely, we want to know when something happens, there is no time left to say what it was. Either we don’t know when something was, or we don’t know what was what. Before a deep organ tone can turn into an event, many high trebles have already been recognized. If our ears could descend into the vibrations caused by sea and earthquakes, we could hear them approach. If, on the other hand, our eyes could ascend the scale and reach those frequencies that produce colors we could play with light as we do with tones, that is, with lightning as we do with thunder. But just as the

gods confined us to finite lives in the temporal domain, our bodies restrict us to a limited spectrum in the immeasurable range of frequencies. We are completely dependent on quantities that enable our filters (eyes, ears, and so on) to tell the difference between quantity and quality. (2006: 71)

The Promethean gift of technique allows the appearance of the capacity for anticipation of time, as well as the capacity for memory, recollection, and repetition. As the detours of the previous chapters suggest, avoiding the bifurcations and approaching temporality in all its complexity could be achieved by tracing the series of technical practices involved in producing time. A performative projection would avoid both temporal bifurcations and would see temporality as the effect of the shifts of agencies. These involve, among others, traditions of record-keeping, institutions, histories, inventions and trials. Nowhere on the way of this tracing would we discover an ontological time posited in a referential relation to a mind thinking it (Latour, 1997). In plenist ontology timing is always an in-scription to a place, never a substitution from it; timing is part of an always-already lived reality of hybrid agencies.

Furthermore, as Latour argues in an influential essay on formalism and time, the difference between all synchronizations and timings concerns their intensities, and those in turn, are a function of the relation between the two simultaneous vectors of transportation and transformation (1997). The effect of speed is accordingly the result of how much transformation an object undergoes during the trial of transportation. If the network transporting it is stable enough and allows someone or something else to transform instead, then the effect of seamless transportation without transformation occurs. As the argument illustrates further in the next section, the speed and seamlessness of internet flow is precisely such an effect. What is important to note here though, is that the idea of a speed inherent in technology, in some supposed instrumental logic, is just an illusion.

Latour illustrates this relation with the example of two travelers, one sitting comfortably in a bullet train, the other hacking her way through a jungle. Both travelers move, yet they exist in radically different spaces and times. According to Latour, that is because

while the first is transported without any visible transformation, that being in turn delegated and handled by a large support network of rail institutions, electrical power stations, technicians and machinery, the second traveler undergoes transformations with every step. While she has to undergo a series of transforming trials provided by the wilderness of the jungle, the former traveler can revel in the *effects* of a seamless flow of speed. What differentiates the flow of this traveler's movement from the discrete spacings of the jungle-explorer is not some fundamental difference between the techniques employed by the former and the body of the latter, but the intensity, the ratio of transformation-to-transportation resulting from their movements. Accordingly, timings and spacing are produced by these intensities, and not the other way around.

Furthermore, instead of one linear space-time projection, along which the intensities can be located, there are "as many spaces and times as there are types of relations" (Latour, 1997: 175). This allows keeping time and space firmly together and following the intricacies of time-as-measurement instead of denouncing it as an inhuman usurpation of lived time. The relational approach to temporality can be illustrated by the relativity-simultaneity theories of Albert Einstein and Hendrik Lorentz. For the purposes of the argument, the most important tenet of Einstein's relativity theory is that we can only work with chunks of time-space which in turn are always-already products of our measurements; they are literally timings-spacings. Timing and its effect – time, are always the result of a technique of measurement, never a substance primary to this technique.

The product of transformation and not the containers for transmission, spaces and times are outcomes of the combination and recombination of a full world. (Bingham & Thrift, 2000: 289)

We could call this third way the relational projection, for it deals with space-time events related by a measurement. In Einstein's words: "we have to take into account that all our judgments in which time plays a role are always judgments of simultaneous events" (Galison, 2003: 18). That is, our judgments of time should always be thought of as co-

ordination between an object within an event and a measurement within another, simultaneous event. As this tracing of time within events is always a measurement, we could call it spacing and timing. Moreover, timing and spacing are always tied together; they are terms depicting the same manoeuvre, the same projection. This relationship is expressed by Hendrik Lorentz's³¹⁷ principle of relativity, also known as the relativity of simultaneity, or Lorentz's principle of local time:

Events simultaneous according to clocks coordinated in one frame of reference would not be simultaneous if measured by clocks coordinated in another. (Galison, 2003: 302)

Accordingly, time and space in this projection are always the effects, the results of a convention and a procedure. Moreover, the simultaneity abhorred by the bifurcators as the arrival of no-time, is nothing more but a convention; it is achieved through the coordination of clocks by a looped exchange of electromagnetic signals, while taking into account the time the signal takes to travel the distance between the clocks (Galison, 2003: 306). Time is literally produced through a procedure of timings, or, returning to the metaphor used earlier, Kairos springs up once Chronos comes into being.

As the historian of science and physics Peter Galison convincingly shows in his book on Einstein and Poincare, the universal time we know today was constructed and produced through a slow and perilous process of measurements, political haggling, accidental discoveries, brave expeditions, and multiple compromises. To send an electromagnetic signal over the Atlantic, long copper cables had to be laid a mile under the ocean by special ships, the cables made extremely heavy by their coating made of heavy gutta-percha isolation. At the coast the cables had to end in wooden shackles where they entered

³¹⁷ Following the special theory of relativity formulated by Einstein in his famous 1905 article, Lorentz introduced the term 'local time,' which is also known as the relativity of simultaneity. Its basic argument is that simultaneity is not absolute, but dependent on the position of an observer. That is, one cannot measure in absolute sense whether two events occur at the same time if those events are separated in space.

brass tubes with fragile, suspended mirrors transferring the signal to a needle which, if Hermes the messenger god so wished, would register a slight movement.³¹⁸

The lesson concerning time is that techniques fold, deform, and shift relations between timings; they mediate and transform time-space. Time and space are not folded out of the social by the technical, but are literally produced by technical shifts amplified by machinic assemblages. As Adrian Mackenzie suggests, machine time is a mosaic of relations and orderings of actions brought into proximity. This means apprehending clocks as a technique, which

does not measure or administer a pre-given social *or natural* time or space, but which constitutes a regime of timings and spacings from which society and nature, time and space unfold. (Mackenzie, 2002: 95)

Furthermore, timings are not constituted only by the technicity of clocks – as if the technique of measurement on a scale had any unique instrumentality – but by the shifts of techniques in general; as Kittler argues for example, writing could be seen as the first technique for manipulating time (Kramer, 2006: 96).³¹⁹ As the first chapter established, every technique is the suspension of time, the ability to relate an action back and forward in time. When a stone is in-scribed upon, there is henceforth a measurement attached to it which makes it the producer and emitter of *a timing*. The bifurcations have established a rift between the symbolic ordering of repetitive and synchronized sequences of some phenomena, with the social kairotic events which those sequences represent.

³¹⁸ For a wonderful rendition of the relationality of time in an un-bifurcated reality, see Griffin (1986).

³¹⁹ Although, as the first chapter demonstrated, every technique is a manipulation of time by virtue of displacing agencies. Kittler then, is wrong - the first hand to grab a stick was already manipulating time. In that sense, the opening sequence in Stanley Kubrick's *2001: A Space Odyssey*, where a shot of a bone thrown in the sky by one of the first humans is succeeded by a shot of a spacecraft, seems to capture perfectly that relation.

The very existence of time is a result of this technique of numbering sequences and then relating them to phenomena in order to display, behold, anticipate, modulate, and channel an event. The separation of these complex timings into ‘objective’ and ‘subjective’ is like “taxes exacted on what peoples the world” (Latour, 1997: 172). When these taxes are abolished, instead of sequential obliteration of place into a uniform timeless time, there appears a chaotic multiplication of cohabitations, a veritable multiplication of times. As Mackenzie argues, a good example of the multiple, mosaic nature of machine time can be found in the proliferation of different timings within information networks. He lists

seek time, run time, read time, access time, available time, real time, polynomial time, time division, time slicing, time sharing, time complexity, write time, processor time, hold time, execution time, compilation time, and cycle time. (2005c)

The list could go on into the ever increasing complexity of database timings,³²⁰ wireless frequencies, signal-to-noise ratios, the timings of routing tables and so on and so forth. These timings, black-boxed within the network whose intermediaries they are, are invisible to us, unless of course they metamorphose from intermediaries to mediators. Their effect is a stable convention of timings, a series of “temporal displacements” (Grosz, 2001: 88-89) and enfoldings through whose “interstices” (Mackenzie, 2005c) percolates what we can only perceive as the flow of time. The complex interrelations between these timings and the times they produce will be discussed in the next section.

Here it suffices to say that in examining a given timing one first needs to trace just *what* and *who* comprise the collective producing the timing, and therefore *what transformations* and *intensities* are being examined. Therefore, a tracing of the effects of

³²⁰ Databases produce extremely interesting timings, as was probably already realized by Derrida, proved by his interest in the institution of the archive. Alan Liu proposes (2004) viewing the database as a transcendental data-pour, but the enfolding of data is not by any measure transcendental – it is a forking of space – it is I think much better imagined as Borges’ “garden of forking paths” mentioned in the quote opening this chapter.

time, and network time in particular, should arguably start with a tracing of the actors comprising the collectives and the assemblages producing the time.

Information networks such as the internet are mobile; they translate and are translated, they collapse into a singular node, but also expand a single connection into a vast web of hierarchies and peers. Hence, network situations and identities are never stable enough to fit the straight and totalizing roles prescribed to them. In addition, temporality in itself is first and always a measurement. The measurement in turn is always on a surface, and networked surfaces not only do not obliterate time, but allow for more time than we can ever handle. Euler's famous solution to the Konigsberg bridge problem is a good example of time-as-surface. Here the timing of every action is flattened into space and all possible nodal links, existing at different points of sequential time, are visible at once, as different surfaces of space. Euler's model places networks in a space of duration; when flattened into space, the entirety of a time can be visible in the present. Such a construct however does not form an ontological totality somehow separate from 'lived,' embodied time-space. "If we can see everything from all sides it is because we are inside a room in which the illusion is mastered, and not outside" (Latour & Hermant, 2006).

As long as the internet was, generally speaking, limited to a network of screen surfaces, we could pretend that there exists a virtual space de-linked from geographical locales and even believe in "timeless time" and a "space of flows." When the network assemblage starts spilling into smaller and smaller objects, and enfolding pieces of silicon flying into geostationary orbit, it becomes harder to think of "timeless time." Instead of a virtual temporal homogeneity, we are confronted with an ever-expanding multiplicity of temporal events that somehow refuse to be homogenised in any stable way. The challenge in approaching time when envisioned in this way, is that more and more actors spring up into the assemblage - objects start blogging³²¹ (Blecker, 2006b), things become spimes³²² (Sterling, 2005), the ability to *find* becomes ambient (Morville,

³²¹ For blogging 'objects' see <http://www.pigeonblog.mapyourcity.net/>; this example will be discussed in the next section.

³²² The concept of spimes will be discussed in the next section

2005a), and *where* turns into *wear* (Greenfield, 2006).³²³ To think this change in terms of time we cannot use totalities of the sort of “imperial grid” or dualities such as those of lived versus instrumental. The internet is much messier, much less stable, much more challenging.

This is today the question concerning time - instead of obliteration of subjectivities by one global network isochrony³²⁴ we have a proliferation of myriad of times - Second Life time, Warcraft time, MySpace time, and countless others. The effect of isochrony is produced and upheld by a chain of stable actors (Latour, 1997), extending from a properly configured screen on a desk to a properly configured server in a rack at the other end of the world. This chain and its effects are always located, never disembodied. Such chains function as key-points from which timings and spacings unfold as an effect. In other words, instead of an isochronic network flow, a “timeless time,” we should approach network temporality as a multiplicity of times derived from relations between different elements (Latour, 1997).

The problem we face is to find ways of measuring the intensities and transformations involved in producing the uneven, strange, and heterogeneous timings emerging within information networks. Specifically, internet timings are never ‘transcendental’ or anything resembling William Gibson’s *virtuality-as-consensual-hallucination* (1984). Rather, ‘virtual’ space-time is the result of a multitude of spacings and timings performed by complex assemblages of humans and non-humans. In other words, time-as-flow is an always local effect, where local stands for *constructed* within the topos of a network of entities. Each timing could be represented as a trace on a surface, which, when posited in a chain of surfaces, creates the effect of a flow; thus time flows when it is constructed to this effect. What we perceive as a temporality decoupled from space,

³²³ The complex intermeshings of network timings and spacings would be discussed in detail in the last section of this chapter.

³²⁴ The term *isochrony* denotes homogenous time

with speeds seemingly annihilating the ‘human’³²⁵ out of the picture, is a construct with enough spacings to allow its seemingly a-spatial qualities.

The question of network time has to be addressed not by bridging the bifurcations (as if that was possible!), but by leaving them to their own devices. The war between Chronos and Kairos is an illusion – there has never been a breach between lightning and thunder. Furthermore, there is not one primary ontological time - isochrony is the effect of a temporality which only *seems* homogenous even when presented with an amalgamation of spacings. To avoid the bifurcations it has to be argued that there is not one uniform and pre-existing time but a multitude of times. Times have to be seen as time-in-production, time-as-an-outcome, and simultaneously time-as-a-trace. The effect of flow therefore appears from the chain of these timings; and the effect of depth to be discussed below – from the chains of spacing-surfaces carried by them.

012

Timing depth, immutability, and movement

It was established above, that in approaching time we have been forced to choose between two bifurcations. The first one argues that space and time are respectively isotopic and isochronic in their nature, and that either reality is made of these homogeneities, or they are imposed on the world by our minds in order to make sense of reality. The second bifurcation in turn establishes the relations of human sociality in contrast to objective time-space and phenomena like techniques and machines. This second division sees the relations of human sociality as immanence present in the world, which is occluded by the relations produced in techniques.

The alternative to the bifurcations, which my argument proposed, is to ignore the divisions and start where no division can be observed; namely, with relations between

³²⁵ ‘Human’ in this sense is critical theory’s dream of a subject of ‘pure essence’ left after its separation from the machinic or technological stratum.

space-times where humans and nonhumans equally conspire to produce and uphold the timings in circulation. This approach, based on the insights of the relational projection outlined above, and on the writings of Latour, is mainly concerned with measuring who and what produces the timings and what is the intensity of the transformations undergone for its production.

Unlike the bifurcated positions outlined above, where stable time and space are the starting point of movement, in the position I take they are a rare and contingent result, the process of whose creation has to constantly be accounted for. The theorization of this tracing would lead me in turn, to propose that network timings and spacings in circulation conspire to produce the effect of depth where there are only *surfaces*. This section then would, following the work of Latour on *immutable mobiles*, propose a theoretical approach to network timings which, instead of seeing isochrony, sees circulating surfaces, traces which arrange themselves to create the perspective of depth, and kairotic immanence.³²⁶ This approach in turn, would allow fully accounting for the circulations in information networks and, in the last section, for the construction of a theoretical interface for apprehending network politics.

How do timings circulate? How does difference in size, speed, timing, and location appear, how does this difference move, and most importantly, how does it conspire to produce homogeneity? The short answer is – because it circulates in networks where size, speed, timings, and location are matters of connection. It is the quality and quantity of the others to which a spacing-timing is connected which defines it, and allows it to enfold, displace, and ‘dominate’ others. “When objects are constituted then spatial relations are simultaneously being performed” (Callon & Law, 2004: 4). The network of connections in this sense is always already performed by the circulations of objects, while stability is ensured when objects move without transforming in return. How does that happen? First, through the delegation of the transformation to some intermediary,

³²⁶ There is a clear parallel between this argument and the argument on frames and spatial control in the second chapter. Where the effect of stability was a question of alignment of frames, here the effect of depth is a question of alignment of surfaces.

and second through the linking of spacings followed by the circulation of control bringing them together.

Following Latour, we can position the elements allowing the appearance of circulating timings and spacings in the figure of *immutable mobiles*. To have a stable space-time means to be able to act and exercise control over a distance, that is, to be able to move events, places and people without transformation in them. According to Latour, this can be achieved by first inventing means that render these events and spaces mobile so they can be moved; followed by inventing means to keep them stable thus avoiding transformation so that “they can be moved back and forth without additional, distortion, corruption or decay”; and finally, render them combinable so that “whatever stuff they are made of, they can be cumulated, aggregated, shuffled like a pack of cards.”

If those conditions are met, then a small provincial town, or an obscure laboratory, or a puny little company in a garage, that were at first as weak as any other place will become centers dominating at a distance many other places. (1987: 223)

The results of this tripartite process are “immutable and combinable mobiles” (Latour, 1987: 227). By stacking up a set of timings and spacings brought from *afar* through stable networks of circulation, we can achieve the effect of homogeneity and depth. The radical difference between the reasoning leading to immutable mobiles, and the reasoning leading to bifurcations, proceeds from the role given to space and time. If space and time exist as containers providing a grounded referential matrix inside which events occur, then inevitably one ends with bifurcations.

This is the reason that critical theory sees everywhere either the ghastly landscape of isochrony, or its mirror image – the ghost of pure autonomy paired with a discourse of mastery. This belief makes it impossible to see, trace, and understand how times and spaces are produced, how difference emerges and recombines itself in the networks of circulation we have been always building. If however, time and space are seen as

outcomes, as products in a long chain of actions, then suddenly, instead of dealing with homogeneity, we are faced with a field of immense complexity.

It is the circulation of space-times made immutable, which allows recombination, emergence, and stability. Therefore, denouncing the results of always local and contingent isochrony is like declaring that passengers sitting in an airplane are somehow in possession of a miraculous force allowing them to dominate the humans on the ground below. When Michel Serres humorously exclaims “my address is A340; DJ298; 14F” (1995a: 64), he alludes precisely to this process of circulating immutability. Passengers in airplanes are a good example of immutable mobiles; a transportation lasting only a couple of hours and virtually no trials, will take days and a multitude of trials if undergone on foot, outside of the networks of circulation whose tiny immutable mobiles have addresses like 14F. Therefore, the question of importance is how to maintain immutability through transformations? What are the logistics of the circulating immutable mobiles (Latour, 1987: 237)? Once we direct our studies in this direction we see actors, intermediaries and events which otherwise would always already be hidden from us.

Furthermore, returning for a moment to Paul Virilio’s dreams of “pure speed,” is not speed actually the effect of transportation without transformation? Is not speed an effect, a carefully upheld dynamic balance? The only ‘pure’ thing about Virilio’s speed is how well is the transformation displaced, how skilfully it is blackboxed, stabilised, and controlled. What would be much more interesting to study, are the techniques of stabilization that allow speed to appear, the logistics involving long networks of intermediaries keeping the width of the jump from one frame of reference to another as uninteresting and immutable as possible.

Thus slow time and fast time, the ratio of transformation to transportation, of timing to spacing, are “the consequence of alliances and no longer the fixed, regular framework within which the observer must tell a tale” (Latour, 1991: 119). The results of these alliances are immutable *and* mobile because something else, some other chain of actors

undergoes the transformations on their behalf. A most relevant example of just such an alliance involves online avatars in multiplayer ‘virtual’ environments such as the World of Warcraft mentioned earlier, or the world of Second Life.³²⁷ Sitting in front of computer screens we deal with immensely long chains of intermediaries producing the effects we take for somehow extra-temporal and a-spatial virtuality. But is virtuality really so removed from the time-spaces occupied by our bodies? What, for example, is the carbon dioxide (CO₂) imprint of a ‘virtual’ avatar from Second Life? In other words, what is the cost of its immutable mobility?

As it happens, such a calculation was already performed by Julian Bleecker (2007c). According to Bleecker, a Second Life avatar produces 1,685 pounds (roughly 758 kilograms) of CO₂ per year, while an acre of ‘virtual’ territory in Second Life produces 99 tons of CO₂ per year.³²⁸ Information networks are not immaterial; they are the offspring of the same process of timing and spacing which produced the first universal time, described by Peter Galison. They involve transoceanic fibre optic cables, copper cables hanging from light posts or buried in the ground, signal switches, exchanges and routers in server rooms, and an immense amount of toxic elements released in the atmosphere during the production of the circuitry that gives birth to the circulating digital bits. Atoms are the intermediaries allowing for the immutable mobility of digital bits.

The conclusions from this example are twofold; firstly, by studying the logistics of immutable mobility we can discover very new, and unsuspected transformations, and

³²⁷ Second Life is an online multiplayer virtual world owned and operated by Linden Lab Inc (<http://secondlife.com>).

³²⁸ Additionally his calculation is, as he admits, fairly conservative. The process by which he reaches those figures is as follows: “if serving this page took the CPU on my modest web server 0.1 second to serve to you, it probably consumed 0.004 watt (assuming the CPU consumes 100 watts + 50 watts for overhead). [The result is] about 6 micrograms of CO₂, not counting whatever your PC contributed to the production of CO₂” (2007c). The calculation is fairly conservative because it does not take into account the energy consumption of the relays on the network road taken by the bits from his server to mine. Additionally, most computers today demand much more than 150 watts of electricity.

secondly, the array of timings involved in producing even the simplest ‘internet time’ is immensely vast. What this suggests is that multiple times, or polychronicity (Lee, H., 1999), are involved in each and every technique, and that, concomitantly, immutable mobilities rely on “multiple pleats” (Ma, 2000) of spacing-timing in order to circulate. Michel Serres calls this multiplicity of spatio-temporal pleats “the garland of time” (1995a), for it enfolds in order to unfold, it solidifies series of pleats-surfaces into depth and stability in the same way in which it allows the accessing of a variety of differential timings and spacings.

In this sense the stable time-space of a technique or an object could be viewed in reverse, as a long process of assembling of timings-spacings of varying intensity, all conspiring towards the production of this technique-object. The totality of the existence of the object is a network of localities, while simultaneously each locality is a total event in space-time. In the words of Latour:

There is nothing less local, less contemporary, less brutal than a hammer, as soon as one begins to unfold what it sets in motion; there is nothing more local, more brutal and more durable than this same hammer as soon as one unfolds everything implicated in it. (2002b: 249)

The total process of folding-unfolding implicated in the ‘garland of time’ is in other words local, and locally total to that. Every always-local assembly or network is steeped in polychronicity and the time which is produced by it is the result of the connections among the entities involved in the assembly. “The connections among beings alone make time” (Latour, 1993: 77). We will return to this problematic in the last section of this chapter.

For the purpose of this section it suffices to restate the argument that technology enfolds both various places, various times and various agents. Furthermore, when we observe a displacement of an event, a human, or a nonhuman, without them undergoing a transformation on the way, it is because there are intermediaries aligned and offsetting the transformation on behalf of the immutable mobile. Therefore, when we compare an

airplane passenger and an intrepid explorer using her own two feet to cross the same distance, we are not comparing two *subjective* perspectives of time-space, and neither are we comparing two *objective* displacements *through* time-space.

Instead, the difference is between the amount and intensity of other members of the assembly involved in the displacement. In the case of the airplane passenger those others are stable and invisible intermediaries involved in a constant offsetting of the transformation that is being generated by the displacement – that is why the passenger located at 14F is steeped in the boring and uneventful time of airline food, the murmur of the couple in the row behind and the distant buzzing sound of the engines. Not so the intrepid explorer, who's every step is a trial defined by mediators with their own terms.

As Latour argues, the fact that a mobile is being displaced without changing in the process is so rare and expensive to produce, that it has to be accounted for and explained in detail (1997). If we start tracing what allows and upholds the uneventful trip of passenger 14F, we will discover international agreements, standards, time zones, bureaucracies, humongous technical assemblages, corporations, oil rigs, refineries, ships, little humans with flags running on the tarmac of airports, infrastructures, radio towers and so on and so forth. As Latour humorously quips, if, after witnessing this multitude, one still persists in thinking that time is somehow unrelated to it, it would mean arguing that passenger 14F could suddenly jump out of the plane yet continue the present trajectory and safely land.³²⁹

Arguably, the difference between the two travellers gives birth also to the conceptualization of bifurcated time we encountered earlier. The smooth ride of passenger 14F gives the illusion of time and space that are fixed and container-like, and from this flows out the perspective in which timing and spacing function as just a measurement of objective or subjective reality. Meanwhile, the travails of the intrepid explorer, her constant negotiation with mediators, leave the taste of a lived time and populated colourful local space – in rapid contrast to poor 14F who can only think of

³²⁹ Only Latour is not as radical and uses a bullet-train as his example.

herself as an individuality diminished to a mere number. If these conclusions were someone's starting point, then instruments and clocks start looking like unnecessary additions to an already fully-formed and lived time and fully immanent space. Yes, the airplane passenger is steeped in sameness, while the explorer has to deal with nothing but difference, yet those are caused by the qualitative and quantitative relation between intermediaries and mediators. It is their role that makes the timing isochronic or polychronic.

The speed of the movement in turn depends on the quantitative ratio of intermediaries to mediators; time literally passes or not dependent on their numbers and alignment. Therefore, if we experience a disembedding, a bifurcation between time and space, it is not because such a bifurcation exists as an ontological frame of reality, and neither is it because we subjectively produce it a priori in our minds. Rather, the separation of time from space is locally produced and upheld by a number of intermediaries – the higher the number, the higher the ratio of movement without change, the higher the effects of isochrony and isotopy. The effects of an alliance with intermediaries, or of dealing with mediators, are always *both* in space and in time. If there is an event – it is a time-space, if there appears the effect of obliteration of time, there also appears the effect of compression of space; but, at the risk of repetition, this effect is always *within* a carefully balanced frame, always *the result* of the delegation of displacement and difference to something or someone else.

This, in my opinion, is the relevance of the quote by Borges at the beginning of this chapter. A labyrinth of topoi-kairoi would be a maze of events, for every topos-kairos is an event upon itself, while the tracing and alignment of those events is the task of chrono-logy.

Deeper than time and space there is another question about who or what counts. Which actants can interrupt, modify, interfere, interest which others, thus producing as many topoi- kairoi? (Latour, 1997: 179)

Information networks are no different – any network topos is necessarily a network kairos. When we behold the multiplicity of these times, the depth of topoi-surfaces they create, how can we be so arrogant as to lump them all together into one no-time divorced from ‘lived’ place (as if non-lived places have ever been possible)? Therefore, when we speak of network flows, we always already speak of intensities of space-time circulating because something else transforms *for* and *in* place of them. Deep within the resulting time-flow lies a difference between the timing intensity of the screen-surface on which these words are observed, and that of the router which intermediates their departure or arrival across networks.

Perhaps if there is any sense at all in talking of a peculiar internet temporality, it is to demonstrate that here too, in the presumably cold space of virtuality, time is added, constructed, sorted and upheld by mediators and stake-holders. “It is the sorting that makes the times, not the times that make the sorting” (Latour, 1993: 76). The time of graphics processing units, the lag-time³³⁰ of online battles in the World of Warcraft or Starcraft, the time of ‘First Life’³³¹ time zones and Second Life deals – are all equally ‘lived’ and dynamically in-sorting. What makes this understanding even more compelling is the fact that on the internet the object, its components, and any semantic inscription or commentary on that object “exist contemporaneously and conceptually in the same place/non-place of the network” (Lunenfeld, 2005: 95). Taking into account this reality, and the ‘spill-over’ of the internet onto the everyday, requires us to dig into the temporality of internet data “as if all the past were still present” (Latour, 1989).

³³⁰ In online multiplayer games, like Blizzard Entertainment’s legendary *Starcraft* for example, the game is distributed dynamically to all the peers taking part in it, and the timings of their connections to the game server assemble to create the actual game-speed time. In practice this means that the player with the slowest connection speed drags down the overall game speed of everyone else – in game parlance this phenomenon is called *lag*.

³³¹ Following Bleecker (2006a), I use ‘First Life’ as a stand-in for the everyday reality, in a somewhat playful opposition to the internet reality symbolized by the Second Life online world run by Linden Labs. However, as will be argued below, this separation is becoming more and more tedious and untenable.

That is because the entire assemblage of constantly re-deployed technical mediations holds together not one homogenized time-space, but a multitude of individual instantiations, a plethora of differences. The effort of the researcher here should be precisely to avoid the illusion of primary homogeneity, and instead approach the internet as a chaotic multiplication of cohabitations and times. If there appears the effect of a totality of space-time presence, “it is obtained through a process of summing up, itself localized and perpetually restarted, whose course can be tracked” (Latour & Hermant, 2006). In other words, the effect of a local homogeneity of time is a constantly upheld event, behind which works a multitude of actors. Temporality, technical network or not, is perpetually enmeshed with a topology.

As Mackenzie argues, the time of the technical mediations involved in information networks emerges “from specific articulations of materials in relations on widely varying scales – semiconductor fabrication, network protocols, licensing agreements, quotidian rhythms of work, branding, marketing, travel and consumption” (Mackenzie, 2005c). Furthermore, contrary to the arguments of Alex Galloway, even computer code does not escape the relational alliances of timing and spacing. Each and every algorithm is an operational inscription translating between radically diffuse timings and spacings. For example, in his extensive analysis of the Viterbi algorithm, Mackenzie argues that algorithms fold time and space and create durations and paths for events to travel in. In the example he provides, this folding of time

takes us away from algorithm understood as a linear sequence of steps to be carried out mechanically, to algorithms conceived as establishing relations between things that are disjointed, by concatenating events in paths. (Mackenzie, 2005c)

Therefore, the challenge posed by network time is that of measuring an always-constructed *intensity* rather than revealing an always-occluded *being*. Furthermore, as with every collective intensity, the question to be asked first is, returning to the previous chapter’s argument - who, what, how and where comprises the collective? Accordingly, instead of positioning it under the auspices of a warring Chronos, the time of a

networked actor could be viewed as Kairos, not linearly isochronic, but to the contrary, a multitude of difference resembling this little-known Greek deity with a body both in the past and in the future. However, the only way to know and hold this kairotic multitude is in a series of measurements presided over by Chronos. Chronos provides the networks along which Kairos circulates.

We could call this particular sort of timings virtual, but I choose to call them deep, because their distinct characteristic is the effect of depth, where there are only surfaces. The idea for ‘Deep Time’ originates with the German philosopher of media and technology Siegfried Zielinski, who, in his *Deep Time of the Media: Towards an Archeology of Hearing and Seeing by Technical Means*, argues for an approach to historical time that would avoid the “lazy linearity” of simple genealogies of technical progress (2006: 3). Against anachronistic teleology, and motivated by a desire to explore different media in an evolutionary model, Zielinski aims his deep time perspective towards an archaeology of technical mediations that would uncover forgotten or hidden heterogeneities of time. As he admits, an early impulse for this perspective was provided by the work of Bruce Sterling³³² on ‘dead media’ – techniques that lost the evolutionary game and either transformed into intermediaries or were discarded.

For this argument however, the most important element of the deep time perspective is the invocation of *an archaeology of the present*, which could uncover depth where until then there were only surfaces, and series of surfaces where until then there was teleological depth. Therefore, the deep time of the thesis argument involves an assembled series of timings, where depth is achieved through literally stacking a chain of plaits-surfaces. What does this mean? A good example is provided by archeological practice, which always operates by measuring layers, each layer a different timing-spacing plateau. In any archeological dig, the depth of the displaced ground (space-time) is measured as a series of time-surfaces, within which the enfolded presence of assembled objects and humans is located. Moreover, archeology recognizes intensities of time flowing out of the interstices of the alliances of objects and humans frozen

³³² Sterling will be discussed in detail in the next section.

within a surface; it is capable of tracing simultaneously the intensities of both temporal emergence and decay.

The archaeological experience of ruin, decay and site formation processes reveals (...) the symmetry of people and things. (Decay and ruin) dissolve the absolute distinction between people and the object world. (Shanks, 1998)

According to the archeologist and historian Michael Shanks, the past “recedes in an indefinite, perhaps infinite series of galleries” (Shanks & Tilley, 1993: 7), which the archeologist explores, traces, maps and re-assembles. The time of the past is not gone, but rather suspended, still present in series of broken, disassembled plateaus with a potentially infinite series of timings enfolded within. Decay is accordingly understood as a process uncovering layers of in-scriptions, of timing surfaces which are traced regardless of whether they reveal a human or a thing. The spaces and times carried forth by objects and humans reveal their life-cycles, and because of the capacity of techniques to enfold time and space, they hold the imprint of the networks within which they circulated (Shanks, 1992).

This capacity of archeology to re-construct spatio-temporal depth, both literally and in the metaphorical sense - as surfaces and access timings long gone, transformations long transported, is what I aim for with the perspective of deep timings. This approach allows measuring the intensities of timings, the accidentality of inscriptions on surfaces, and inspecting networks of recombinations. The scratches and marks on an old pot “are often also a form of writing, attesting to the history the pot has witnessed, its own historicity” (Shanks, 1998).

In a radical symmetry between humans and nonhumans, archeology approaches the time of a technical object as if it was the story of a human; it demands a flattening of the difference between the human and nonhuman and views their voices as having equal strength. Indeed, and in alliance to Tarde’s arguments from the first chapter, things are found to *have denser* associations and be part of *bigger* networks than humans.

Furthermore, the objects with which people surround themselves are often found to reveal much more about the complexity of timings and spacings involved, than the humans themselves ever could. Crucially, the continuity of timings and spacings involved in information networks *as well as* in archeological digs, shifts between arrays of surfaces – from simple to complex – irrespective of the humanity of the intermediaries and mediators involved.

Another illustration of the way in which surfaces construct the effect of depth is provided by philosopher of communication Vilem Flusser's discussion of the difference between line and surface. Lines, he argues, function as projections of points, representing the world as series of successions which have to be traced, that is followed step-by-step. Lines are like a page³³³ of written text which must be followed sequentially in order to unfold the timing enfolded within, while surfaces are like a painting whose much more complex timing *arrives before* we trace it.³³⁴ Lines exist under the auspices of Chronos, while surfaces are Kairotic.

And this points to the difference between the one-dimensional line and the two-dimensional surface: the one aims at getting somewhere; the other is there already, but may reveal how it got there. This difference is one of temporality, and involves the present, the past, and the future. (Flusser, 2002: 23)

It may reveal how it got there. This insight expresses how depth appears out of a series of surfaces; the *plait* is a repository of temporality - it enfolds a density of timings. Once it is stabilised, the plait black-boxes the various timings within it, and presents their stacked surfaces as depth. The resultant time, arriving before we trace it, appears as an effect. To a bifurcatory projection this temporality would seem as a monstrous decoupling, as a free-flowing symptom. However, in plenist ontology it should be always remembered that a surface *may reveal how it got there*. The reason for this effect

³³³ The word *page* derives from the Latin *pagus* – the field ploughed by the farmer. The farmer moves in lines, just like the gaze of the writer-reader.

³³⁴ For a detailed view of Flusser's complex and fascinating account of the relationships between objects, archeology and shapes, see Flusser (1999).

is that the very construction of a surface is *because* of a temporality, which is after all a function of connecting entities. If we change the surface-frame, the classification principle according to which we measure events, we will receive a different temporality on the basis of the same events.

The question concerning network temporality is therefore in many ways a function of the constantly reappearing search for a time-space existing in opposition to the instrumental. The internet, in its perceived isotopy and isochrony is just the latest assemblage to be suspected of ‘pure’ instrumentality somehow denying ‘lived’ experience. However, there is no point in looking to isolate a non-instrumental aspect of time. The issue is rather that of addressing the “modalities of instrumentality” (Stiegler, 1998: 206) as such. In other words, the time of information networks is assembled, upheld and unfolded with particular local *intensities*, and it is these intensities that need to be explored, not the illusionary dialectics of instrumental and ‘lived.’ For to construct such a dialectics one has to obliterate an entire multitude of intermediaries that construct both the ephemeral instrumental and the *kairos*, the *event* that wants to be thought as ‘lived.’

Reassessing the argument so far, the temporal intensity we seek to trace and measure, is a function of the relation between transportation and transformation (Latour, 2004d), and it is revealed by the extent of the travels of immutable mobiles. Viewing objects and technical assemblages as active participants and intermediaries in the production of time and space, opens the possibility of viewing temporality as perpetually enmeshed with a topology that has to be traced, studied, and engaged. In addition, approaching internet time as a multitude of always local intensities, which are produced and upheld by assemblages of human and non-human actors, allows us to account for a rapidly proliferating group of networked objects which embody a temporality of their own. This in turn opens the way to approach temporalities of different intensities *within* the internet assemblage, and engage time based on a comparison of intensities rather than a dichotomy between instrumental and social. This does not leave researchers blind to

studying human subjectivities but rather allows a fuller account of time seen as an event bringing together *both* human and nonhuman actors.

Most importantly, such an approach involves taking risks with time, because it brings forth objects as mediators and intermediaries in the construction of time. To view network temporality as the recombinant time of Chronos and Kairos, of the event and its measurement, is to involve intermediaries, techniques and unknown chains of stakeholders in a motion allowing its author to withdraw and testifying in her place (Stengers, 2000b). Contrary to obliterating time, this motion creates a multiplicity of times, histories mashing together, surfaces touching each-other, exchanging semantic commentaries and in-scriptions and continuing on their way.

Spimes: spacing the internet of things

Humanity begins with things. *Michel Serres* (Serres & Latour, 1995: 166)

We are exchangers and brewers of time. *Bruno Latour* (1993: 75)

The previous section established a working relational and performative projection of time, where timings are the result of the circulation of entities, and the flow and depth of time are the effects of immutable mobiles. This section first explores how networked surfaces, or rather - deep timings and spacings, allow us to see what until now has remained largely invisible – the semantics of immutable mobiles within networked space-time. Secondly, the section takes the notion of deep timings achieved through the arranging of immutable mobiles, and shifts it to the metaphor of *an internet of things*, where the networks of circulation are always visible thanks to the capacity to read the inscriptions carried by *spimes*. Following that, the notion of network is found too simplistic to describe the flux and complexity of timings and spacings in circulation.

Spimes

The 2005 International Telecommunication Union (ITU) internet report entitled *The Internet of Things*, states that the thickening of connectivity in information networks demands the connecting and therefore enfolding into the network of a rapidly growing amount of everyday objects and devices (ITU, 2005). As was already discussed, things enfold timings and spacings, and from the perspective of information networks every timing-spacing is a surface layer of data to be enrolled, traced, processed, and recombined. As the ITU report argues, in the interest of seamless integration of objects

into information networks and databanks, it is crucial to in-scribe objects with a standardized set of markings which will both identify them and allow them to be *visibly* traced. That is, the identification of objects by a standardized networked semantics will allow their circulations to become visible. The report proposes this identification to be based on radio frequency identification (RFID) tags³³⁵ which, while constantly beaming a positioning signal in the radio spectrum, can be tracked and re-combined from a distance.

Furthermore, to increase functionality and control, such a system should be able to detect transformations in the displacement of objects through in-scribing an additional layer of information on them, called by the report an “embedded intelligence.” What this means when translated in the terminology of my argument, is that objects already enrolled in the network and in-scribed with a surface to identify them, further gain a surface which *makes visible to others* their timings, while enrolling them in further networks of circulation.³³⁶ Finally, the report argues, embedded intelligence will allow objects to become active participants in the network thus transforming them from mediators to intermediaries.

As was already argued earlier, we can always only trace techniques involving *both* humans and nonhumans. The roles to be played in any network are therefore always distributed in a chain of hybrid actors which has to be studied as a “setting” (Akrich & Latour, 1992), because that is the only way in which the roles and timing-spacing intensities of the actors can be determined. As the first chapter argued, when understood this way a setting is always a set of in-scriptions which when successful make themselves invisible – they intermediate. Until the arrival of pervasive information networks explicitly designed to make *some* settings visible, the way to reveal a setting was through a reverse process of de-description.

³³⁵ RFID tags are casually referred to as ‘arphids.’

³³⁶ For example, for a perspective on urban space as a mixture of software and bricks, see Amin & Thrift (2002).

As Madeline Akrich and Bruno Latour argue, this process is possible only if there is an event somehow disturbing the invisibility, and the stability, of the setting. This, in their words, is “a crisis” reversing the direction of the translation occurring between object and inscription – “from things back to words” – and allowing the tracing of the movement within the setting “from words back to things” (1992: 260). According to Akrich and Latour the crises are usually caused by the following situations:

the exotic or the pedagogic position (we are faced with a new or foreign setup); the breakdown situation (there is a failure that reveals the inner workings of the setup); the historical situation (reconstructed, traced or imagined); the deliberate experimental breaching (either at the individual or the collective level). (1992: 260)

Therefore, unless there is some other way to make a setting *explicit*, it cannot be traced or even located without a crisis of mediation. Without a trial to reveal the existence of a setting and its participating actors, it remains invisible and untraceable. That, not accidentally, is also the situation of the enormous majority of objects and techniques involved in our civilization – invisible and untraceable. The arrival of pervasive networks of information however promises to change that.

Information networks pervade both what we call physical and social space – they tie together the practices of humans and nonhumans alike, and create what can be called a “hybrid space” (Kluitenberg, 2006: 8). What is more, as the ITU report suggests, information networks exponentially ‘spill over’ spaces which until recently were explicitly information network-free.³³⁷ Until recently when one wanted to say that one is ‘on’ the internet, one had to attend to a very specific and carefully constructed spacing which provided the interface to the information network. That is, a computer terminal connected to the wider infrastructure through a simple cable, or at most through the radio spectrum.

³³⁷ For an analysis of the complexities of newly informationalised environments, see Burrows & Ellison (2004), and Burrows & Gane (2006).

However, already today the same person is ‘on’ the internet wherever she goes thanks to her constantly connected mobile phone. The carefully constructed spacing of the interface terminal has been made mobile and immutable enough, so that it can be carried by one’s body at all times. Furthermore, a radically new situation appears when the process of extending the immutability and mobility of the interface stops centring on the body of the few humans around, and starts enfolding the much more numerous and data-loaded objects – from trees, to grass, to vacuum cleaners.



Figure 20: Normally an urban nuisance at best to be ignored, when in-scribed with an interface surface giving them a timing and spacing, pigeons become active participants in discussions of CO2 emissions. They literally re-make the city with the flapping of their wings, and what is more, that is because their wings were enrolled to flap in the internet as well as in the polluted air (image courtesy of Beatriz da Costa).

The deep timing of objects is a transition from fixed mediation to mobile intermediation – from ‘on’ the network to ‘of’ the network, from flat to thick inscriptions involving the

making *explicit* of the rich semantic spacing-timing between humans and nonhumans.³³⁸ This spilling over and enfolding of objects portends a rearrangement of “the rules of occupancy and patterns of mobility within the physical world” (Bleecker, 2006b), because when objects are enrolled as explicit actors their circulations become explicit too. An early conceptual example of this process is provided by Julian Bleecker in the form of the ‘blogject’ (Bleecker, 2006b). A blogject is, according to Bleecker, a conceptualization of an object that blogs information about itself and its surroundings.

And so, a blogject incorporates the tenets of the ITU report quoted above; it tracks and traces its location in space-time, stores this information to an explicit interface surface for others to access, and most importantly, blogjects participate in social discussions until now exclusively reserved to humans as speakers. A working example of a full-scale blogject in action is Beatriz da Costa’s *Pigeonblog* project³³⁹ (Figure 20).

This project confirms physically the abstract argument of the previous section – the pigeons become active because their spacings and timings were made *deep* through the arrangement of a series of surfaces. Because of *that* arrangement pigeons can now reveal not only *how they got there*, that is – the logistics of their travails, but also enrol a whole new set of spatio-temporalities. They were in-scribed with a GPS layer, a chemical reaction layer, an optical layer, and a satellite link layer. So many networked surfaces brought together by a pigeon! This brings the argument to the conclusion, that the metaphorical separation between a First Life and Second Life (Bleecker, 2006a) suggested in the previous section, is a taxonomy that does not separate things into real and virtual, but rather into networked and very-ostensibly networked; into less attached and more attached.

³³⁸ A similar argument appears in (Crang & Graham, 2007), when they argue, “the opacities of mobility and the hidden geographies of memory are now being rendered visible” (p. 791).

³³⁹ The *Pigeonblog* project can be found at <http://www.pigeonblog.mapyourcity.net/>. It equips urban pigeons with GPS enabled electronic air pollution sensing devices capable of sending real-time location based air pollution and image data to an online mapping/blogging environment.

The information networks which we delineate with the umbrella-term *an internet* enfold both humans and nonhumans in a more and more explicit sociality, which, as was argued earlier, has always existed but becomes only now explicitly visible. While actor network theory has insisted from its inception on the existence of these messy assemblages, the spill over of the internet into the, until now ostensibly, First-Life world, forces us to declare these assemblages visible. What is even more important, and this is the object of the last section of this chapter, these objects-made-visible join us to form a new *res publica*. A *res-publica* literally means in Latin *a public thing*, and how public really these *things* are; a multiple, mobile, recombinant, and transformative public. In other words, a public which, theorised by Tarde and defended by Whitehead a century ago, finally becomes visible.

As the Australian media theorist and philosopher of technology Belinda Barnett has argued, this development of information networks turns them into a global mnemotechnical system (2005), the memory-extension tools of Leroi-Gourhan and Stiegler having made their deep timings visible. In such a system, the human ‘wrangler’³⁴⁰ or any wrangling actor is a mobile surface of timings and spacings to be constantly re-inscribed. It is a series of deep timings evolving semantics of data-location-time which in turn fold-in the retention layers of the network. In the words of Barnett:

The places I visit become ‘smart’ by virtue of my presence. I bring information with me to this place, and this information mediates my experience; the territory surrounding me serves as surface of projection for data. (2005)

Furthermore, the networked object is not simply a recording device for expanding human subjectivity, but an active participant, a mediator co-constructing the event being enfolded. Such an object is among other things “a production device, a device for the production and distribution of memories” (2005). The networked object can *be* all these roles simultaneously firstly because, like a blogging pigeon, it is enrolled in many

³⁴⁰ A term suggested by Bruce Sterling – more on that below.

networked surface-plaits simultaneously. But deeper than that, it is because through these in-scriptions the networked thing becomes aware of its context; it gains the ability to explicitly space and time its context, to collect, discard, locate, measure, store inscriptions. In other words, its program of action enrolls the networked object in the semantical world of humans.³⁴¹

The problem in theorizing or even fully imagining the flux of this system is that nothing seems to remain stable long enough so it can be assigned a classificatory position. In some ways this is because, as Latour suggests in an interview, the modernist approach to space, starting from the Renaissance, has been to transport objects in a three-dimensional space matrix without them undergoing any transformations, thanks to the ‘god-eye’ position of perspective. However “if *you* move or if you move the Ding, it doesn’t stay the same. It shifts completely” (Latour in (Katti, 2006: 107). The constant circulation of things and the uncertainty as to what/who is observer/observed is the projection we have to deal with.³⁴²

What complicates things³⁴³ even further, is that because different networks of circulation have diverging projections as to which newly enfolded and mobile objects should be immutable, each of these projections produces different spacings and timings (Latour, 1988b: 25). Media theorists Anne Galloway and Matthew Ward imagine these objects and the surface-data they circulate as the cultural artefacts which the archeologist collects, examines and stores into archives for future processing, much in the same way as servers and databases recombine and store digital data (2006).

British philosopher of human geography Nigel Thrift in turn, in a fairly polemical essay on the thought of Donna Haraway, analyses networked objects from the point of view of

³⁴¹ A similar argument appears in Dana Cuff’s concept of “cyburgs” (2003), which are “spatially embodied computing, or an environment saturated with computing capability” (p. 44). According to her, “cyburgs” produce an enacted space, relocating agency in the world.

³⁴² For an analysis of the ethical dilemmas of this projection, see Dodge & Kitchin (2007).

³⁴³ The pun on things is intended

emerging temporalities (2006: 191). According to him the integration of objects into information networks (he labels them ‘metasystems’), has very interesting effects on these objects’ spatiality and temporality. When a thing is enfolded into a metasystem it becomes part of that things’ existence, while this already augmented existence is being mapped by the metasystem in question. These metasystems gain depth through the stacking of object-surfaces (what Thrift calls “gaining a capacity to morph over space and time”); the morphing, or depth, allows the metasystems to control the mobility and immutability of the circulating actors and to trace “what sort of space and what sort of time has been thus *designed*“ (Latour, 1988b: 25). Accordingly, this additional layer of metasystemical data-retention and recombination creates an entirely new class of objects.

Such objects, called *spimes* because they are *things* carrying a *spacing* and a *timing* through networks, have been extensively theorized by Bruce Sterling in his influential book *Shaping Things* (2005).³⁴⁴ In what is part technology pamphlet and part design manifesto he argues that spimes are a new class of technical objects, with the characteristics described above, that will put into question our entire technosocial condition. His argument is worth discussing in detail, for he develops the first more or less coherent concept-matrix for understanding the role of humans and nonhumans alike in the internet of things.³⁴⁵ What makes his argument different from the now omnipresent discourse on ubiquitous computing, is the positioning of humans and objects in a common hybrid-like technosocial dynamic.

In this dynamic the bifurcation between human and technological gives way to a constantly evolving technosocial relation with ever-changing roles ascribed to humans

³⁴⁴ Bruce Sterling is a legendary science fiction novelist who together with William Gibson is considered the founding father of cyber-punk. He is also the founder and leading theorist of the viridian design movement (<http://www.viridiandesign.org/>), a contributor for *Wired Magazine* since its inception, a blogger (<http://blog.wired.com/sterling/>), a futurist (Sterling, 2002), and a prolific conference speaker among others.

³⁴⁵ For an analysis of spimes as a concept for re-locating knowledge within a performative spatiality made visible, see Beer (2007).

and objects. Sterling claims that while “it is mentally easier to divide humans and objects than to understand them as a comprehensive and interdependent system” (2005: 8), this division prevents us from fully understanding how change in the object-human relationship occurs.

Furthermore it blinds us to possible ways of intervention, thus creating the illusion of technological determinism. Armed with the motto “the future composts today,” Sterling traces a slowly evolving object-human relationship in which both objects and humans create and support each other in a series of technological transitions. He coins the *spime* concept in an effort to express a crucial quality of, according to him, a looming technological condition - the *explicit* embodiment of space and time in an object. According to him, technosocial development leads to a point where spimes emerge as the dominant form of objects; they are the “material instantiations of an immaterial system” (2005: 11).

The main argument of the book rests on the separation of the technological history of humanity into five chronological stages: artifacts, machines, products, gizmos and spimes. A particular stage dominates until new technical developments lead to a point called a “Line of No Return.” This is the point where a new technosocial condition has become so established that it cannot voluntarily return to the previous condition. The changes from one stage to another succeed in ever-more-rapid succession as technological developments bring demands for new objects, new infrastructures to support them, and new types of humans to create and populate those infrastructures. Therefore each of these stages is differentiated by a human-object relationship of growing complexity.

According to Sterling, the arrival of information networks marked the advent of gizmos – highly unstable, multifeatured, networked objects with a brief lifespan and baroque functionality. Gizmos exist in a networked environment and because of that should not be considered to be stand-alone objects but interfaces, which in turn create their own type of humans - the End-User. Gizmos are more intertwined with humans than the

earlier type of objects because their infrastructure demands “extensive, sustained interaction” which actively involves End-Users in a multitude of roles.

This development in turn leads to the latest technocultural development, which, according to Sterling, dawned in 2004 with the introduction of radio-frequency ID labels (RFID) on US military supplies.³⁴⁶ According to Sterling, arphids come as the functional heirs to barcodes; they are “tiny computers with tiny radios,” which when embedded in a gizmo-world object will provide it with a noticeable identity. Accordingly, the advent of arphids signalled the appearance of the first, albeit primitive, spimes – objects existing in a data-infrastructure traversing space and time. Today they are objects precisely traceable in space and time and carrying their history with them. In the future when they cross the “Line of No Return” into a spime world, they will be “a set of relationships first and always, and an object now and then” (2005: 77).

A set of relationships first and always, and an object now and then. This also is the definition of immutable mobiles, as well as of every *thing*. Spimes then, appear as the instantiation of an enormous information infrastructure which enfolds humans into a yet another role - that of data wranglers. The stability allowing them to project a new role for humans is possible because they are immutable mobiles made visible through inscription, and therefore even more stable. We have always been wranglers of timings and spacings, but now this process is becoming visible through the stability of circulating inscriptions.

According to Sterling, what distinguishes spimes today from the previous object-human technocultures is this ‘making things public,’ the making explicit of the entire industrial process, from composition to decomposition. According to him, spimes proper are still long way off, but when they finally arrive the core activity humans will be involved in

³⁴⁶ For an analysis of the cultural and social aspects of RFID tags, see Kluitenbrouwer (2006). Because of the primacy of the US military in developing the conceptual environment for RFID implementation, it is interesting to note that in their analysis ‘arphids’ aim to provide “identity dominance” on the battlefield through data saturation (McCue, 2005).

would be “a constant negotiation over the nature of one’s stake holding” (2005: 24) within the spine-network. Sterling argues that, unlike previous objects, spimes will actively (or, as I argue - *visibly*) enfold space and time into themselves.

They will not only be tracked anywhere at any time, but will carry around their entire existence as a layer visible in space and time. A spine-object will store the entire chronology of its travel in physical space with the multitude of implications it may have had for its surroundings; in effect it will carry its bill of existence and through that, it will carry a discernible subjectivity. It will explicitly represent the entire production network which brought it into being, and upon expiration it will be reabsorbed into that network.

This will be made possible first by the embedding of arphids into the object and the creation of a therefore historical (traceable in time) object-identity, and second by the utilization of sustainable materials. Such an object might be a wine bottle made uniquely traceable from the moment of composition of its elements to its final decomposition. This will be a wine bottle that informs its handler of the entire process of its development - from geography, climate, grape variety, and type of labor utilized, to amounts of carbon dioxide discarded into the atmosphere during its transportation and reabsorbing techniques used for the recycling of the glass and the cork. Needless to say, the spine-bottle will also exist as the centre of an enormous network of other useful information such as exact chemical and particle contents of the liquid, links to support centres, experts, amateur enthusiasts etc.

In effect, objects will become dynamically updated databases existing in a wider network of other such databases. In addition, they will have unique identities that will compel humans to recognize them as actors for the entirety of their existence. Accordingly, what is missing for the arrival of real spimes is the “Line of No Return,” when infrastructural critical mass will force the transition of our technoculture into a spine-Wrangler relationship. Sterling argues that the backbone of the already developing spine infrastructure is the mass proliferation of networked arphids, the

capacity for rapid prototyping and fabrication of objects, and the ecological sustainability of the production process.

This is a very broad and concept-heavy argument which can be problematized on many levels. There is the obvious problem with the teleological periodization of technosocial stages and the role of objects within a technosocial network. A hammer is an artefact from prehistoric times, yet it is used in the same technosocial network as a computer. A technical object is never stable enough to fit only one of the roles Sterling ascribes to it. If we are to use Sterling's terminology we must make the condition that an obvious product such as a Coca-Cola bottle is also a machine and an artifact.³⁴⁷ A spime would enfold all of the previous objects and would necessarily exhibit different object-identities in different actor-networks. The boundaries in the technosocial are much more fluid than it appears from Sterling's analysis. Yes, "tomorrow composts today," but today's compost enfolds all the past tomorrows.

The spime neologism comes with its own set of problems. An obvious critique is that spimes will signal the arrival of total surveillance, complete information exposure, and absolute control. What happens with the wine bottle once it is discarded; how many work-hours were needed to produce the grapes and how much did the grape-pickers make; what glue was used for the label and how much carbon dioxide was released in the atmosphere when the bottle was shipped to the local store? These questions are hollow in a civilisation based on a bifurcated nature populated by mute objects and subjective human actors, yet the information wave of *making things visible* makes these questions pragmatic. Spimes bring to light a special category of techno-social issues which are tragically absent from the issue-network of today's objects – the unknown knowns, and unknown unknowns of our civilisation.

The issues listed above are important but one could excuse Bruce Sterling for not addressing them. What I think actually exposes *Shaping Things* to valid critique is its underlying uncertainty as to the nature of technical objects. What exactly are the things

³⁴⁷ As depicted in the hilarious movie *The Gods Must Be Crazy* (Uys, 1980).

we are to shape? As it is, Sterling's argument requires that things-objects exist both in a dynamically-shaped compost with humans, and as a stable form of continuous instrumentation. According to Sterling, progress and change in the human concept of time are not caused by philosophy but by instrumentation. For the project to work, time and the logic of the instrumental must exist independently of each other. Unfortunately this situation is, to use his terminology, unsustainable.

On the one hand, Sterling takes a theoretical approach already charted by Latour, in his description of objects as always-in-relation with humans (1993). Sterling's call for making the space and time enfolded within an object explicit is similar to what Latour has called 'making things public' in a framework of genuine politics of things, or 'Dingpolitik' (Latour & Weibel, 2005). His description of the human-object technosocial compost has been part of arguments in science studies made by Isabelle Stengers (2000b), Michel Callon (1986a), and Latour (1999c) among others. In addition, Sterling's demand for history to be "etched into the very texture of the technosocial," that is, to be recognized as a part of each and every object, is in many ways similar to Bernard Stiegler's theorization of technology as a memory extension (1998).

On the other hand however, Sterling declares instrumentation to be a determining actor in human development and with that ascribes it a role not dissimilar to the logic of instrumental reason one finds in Heidegger (1977). One of the two has to go. Either objects have instrumental nature separate from humans, or object-humans are completely intertwined. The spine idea will be vulnerable to charges of technological determinism until it resolves this tension. The political, which has no explicit place in Sterling's narrative, has to be made explicit.

If instrumentality is dropped, we are left with a compost of objects-humans in which things have never ceased carrying and enfolding space and time. Objects have always been spines, but we have always denied them the full rights of identity. We pretend the wine bottle ceases to exist the moment we put it in the trash bin. This is not a design choice but a political choice. The change which Sterling deems to be instrumental is

actually political – it is the recognition of the basic fact that things exist in a chain of associations which we have to fully recognize in order to live in a sustainable future. To paraphrase Latour, Sterling’s project will succeed when objects migrate from being matters of fact into being matters of concern (Latour & Weibel, 2005). As the thesis has argued in each of the three chapters, only when things are recognized according to the archaic meaning of the word ‘thing’ - as an assembly of symmetrical representatives, will their agency gain the capacity to remake the commonly held world. What the possible advent of spimes in an internet of things actually embodies is a whole new concept of the self. When objects gain a dynamic networked identity they become recognised agencies. They create an entirely new politics. This then is the main issue to be explored regarding the internet of things.

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An internet of things³⁴⁸

What is the politics of things? What would the politics of networks look like once things visibly gain their actorial rights? From the perspective of objects, the internet has always been predominantly ‘of things’ and only in small degree ‘of humans.’ In fact, the arrival of ‘an internet of things’ stands for the humanization of the network, through making the semantics of circulating mobiles readable for and visible to humans. Yes, by granting the rights of agency to things, by making their bills of existence visible, we make the setting *more humane* – just as the colonel from the first chapter discovered in the case of staff sergeant Talon. The internet of things then could be viewed as a conceptual matrix for imagining, describing, and tracing the behaviour of things which become active through inscription and attachment to networked surface-plaits.

It allows us to visualize the compost of spacings and timings produced by objects-as-participants. As information networks “soak through physical geographic space”

³⁴⁸ A work-in-progress bibliography on the ‘internet of things,’ compiled by Anne Galloway, can be found here: <http://www.purselipsquarejaw.org/2006/03/internet-of-things-working.php>.

(Bleecker & Nova, 2006: 2), the objects until now rooted in this space in *visibly* fairly fixed and passive roles, gain new ways to produce not only their own spatio-temporal depth but mould ours as well. The ability, for the first time in history, to in-scribe, track and recombine mobile chunks of space-time relations “as they wander through” (Morville, 2005b), has profound influence on the way we project ourselves in the world.

As was already noted above, this plenist ontology involves flux of a complexity we can hardly visualize with the conceptual tools of a period which sees a bifurcated time-space, and a dead instrumental logic, where there is nothing but a Bakhtinian carnival of difference. Handicapped by such deficiencies in understanding, we are entering a world of our own devising, in which spimes often provide deeper and more important insights than humans, and in an interface readable by humans to that. A world resembling Borges’ *Garden of Forking Paths*, where we “step easily between trees and text in transmedia experiences where wayfinding, retrieval, learning and decision making are indistinguishable” (Morville, 2006). What kind of politics does such a milieu produce?

What, in other words, is the politics of technosocial composts populated by spimes and human wranglers? Issues of surveillance and control are only the tip of much more profound questions of agency and embodiment, not to mention the implications for the painfully contingent and human concepts of space and time. What kind of publics appears after we have managed to trace and keep together both timings and spacings simultaneously? To answer that question, we need another detour towards the problems that an internet of things generates for the concept of networks. In other words, before we attempt the tracing of fully mobile publics, we need to have a projection allowing the unencumbered observation of their mobility.

Network metaphors have proven very useful for conceptualizing the social in a range of disciplines, from sociology to internet studies. The problem concerning network projections however is that they rely on an ordering of the social into a more or less stable pattern of ties, or attachments, which cannot deal with a public assemblage rapidly fluctuating in time and space. Even when we discuss the potentialities of inscribed and

visible network-like mobiles we need a conceptual projection illustrating that they are in the end precisely that – mobiles, allowing, among other things they do, for something else to circulate as well. Each of these mobiles is an attachment, a dynamic assembly. The problems posed by the network projection when it comes to following mobile publics, are not for the first time discovered here, and have been extensively analyzed before.³⁴⁹ That is why instead of networks, which always indicate a certain formalism of abstract and stable shapes, we could, for the sake of the argument, talk of reticulations.

The word *reticulate* derives from the Latin *reticulatus* and denotes something with a net-like pattern, while the root of the word derives from the word for sieve. To be reticulated then suggests more than being networked. It suggests being in the process of sorting – an identity of mobility and unpredictability, of fluctuating dynamics. It indicates a process, something existing in circulation. Therefore, an entity does not exist *and* circulate, but it circulates and *therefore* we can say it exists; to exist is to differ. The reticulum-sieve moves us closer to the conceptualisation of mobile publics as durable affinities which is introduced in the last section of this chapter.

The sociologist Mimi Sheller argues in her recent work that the traditional separation of public and private spheres into social networks “limit the ways in which we might imagine the dynamics of public formation” (2004: 39). Publics, according to her, are mobile because the *issues* which bring them together move as well. Notice the perfectly fluid and performative relationality of this statement – the publics move, but that is because their issues move too. It is this mobility of publics which, unsurprisingly, poses problems for our understanding of networks.

Networks are stable and useful as a projection when we work with a bifurcated definition of the social involving only humans (not to mention the simplistic positioning of space-time, and technique). Furthermore, as has been argued in the previous chapters, the concept of networks has been used as an already-existing model, or structure, waiting to be recognized in an always-already present social. However, when publics are

³⁴⁹ See, among others, Cohen & Arato (1992), Fraser (1992), and Emirbayer & Sheller (1999).

seen as relational settings to be explained, networks appear as too rigid and inflexible concepts for the task.

To examine the politics of an internet of things, we need to understand or at least to trace the mechanisms, the logistics, by which publics coalesce and “unbundle” (Sheller, 2004: 40). According to Sheller, the pervasiveness of information networks and the changes in communication, transportation, work, entertainment, and all other aspects of everyday life, have important implications for the way we understand publics, and the way we follow their mobility. If such publics are being traced according to the traditional bifurcated projection, then no mobiles become visible and the transformations that become explicit would only be contributable to an unknown and a-social force.

Therefore, publics must be constructed, and traced, according to a projection including all kinds of things that circulate, be they events, ideas, institutions, infrastructures, objects, or pure data. Sheller argues that this projection needs to move beyond the network metaphor in its thinking about the publics of circulating mobiles, because, above all, the network metaphor is “limited by its reification of the grounds for presence and absence” (2004: 40).

The Eulerian projection, which gave birth to our network metaphors, was created to understand a problem of action by a hypothetical agent shifting in time and space. Its beautiful simplicity serves well to transform actions in time into edges on a surface, but it is too rigid, and its vocabulary too poor, in accounting for what is a fluid problematic. The alternative to network metaphors, whether reticulation or not, has to have the capacity to represent the ‘messy’ assemblies as what they are – messy.³⁵⁰ Additionally, the alternative model has to present a way to avoid the bifurcation into included-excluded, and its corollary discourse of mastery, which so often finds its way in discussions of network politics.

³⁵⁰ For a detailed analysis of the problem of mess in the social sciences and humanities, see Law (2004a), and Pickering (1995).

Networks, even if you add the idea of virtual modes of tracing, leave an image in space that is almost too stable. But if you immerse it in time, this network itself is going to fluctuate, become very unstable, and bifurcate endlessly. (Serres & Latour, 1995: 109)

Analyzing networks in terms of exclusion and inclusion makes sense as long as they are stationary structures to be ‘on;’ in that case it is sensible to talk of access, protocols of control and so on. However, if the process we analyze is not one of structuring but folding-in, projections built on the metaphor of inclusion or access lose their meaning. Instead, we need a vocabulary able to describe processes akin to archeological decay and site formation, of fluids reticulating through a sieve, imperfect, crumpling, messy and mangled moments of “contingent gelling” as Sheller calls them³⁵¹ (2004: 46). As Sheller argues:

whereas networks connect smaller units into larger entities, and such entities in turn form their own networks which constitute still larger social organizations, a gel is something in which such levels are not distinct. (2004: 47)

A gel is a good metaphor, because it points us towards the liquidity of the mobile publics. It is also a good stand-in for approaching the worlds described by actor network theory. A gel’s uncertain internal make-up, its fluidity and stickiness, presuppose a heterotopy of forms enfolding various textures of socialities and space-times, and actors involved in constant wrangling and maneuvering between mixed plateaus and semantic surfaces. It also allows us to position actors as relationalities, as relational effects. Sheller supports her argument with similar examples to the ones discussed above.

Mobile and contingent mediations, conversations which have become deliciously asynchronous but mobile, yet stable. A communication system resembling no more a network but a viscous liquid, and persons formatted by their mobility. Furthermore, she posits the problematic to be addressed first in this new morphology and in my opinion correctly, in the very fabric of liquidity. Primary to the issues of surveillance and

³⁵¹ In using the gel metaphor she draws on the work of sociologist Harrison White (1992).

identity is the potential for emergence inherent to a formation that folds space and time in ways we are conceptually poorly prepared to trace. The fluctuating surfaces discussed earlier have the capacity to interface action and translate mobiles over space and time.

The task then, is first, to have a vocabulary capable of imagining the publics generated by these mobilities, and a ‘hermetic trick’ capable of revealing their dynamics while taking into account at the same time that it is part of the dynamics too. The publics emerging from the discussion so far are qualitatively different from the ones the second chapter started exploring. These new publics are not determined by the thickness and number of their bifurcated social ties and neither are they stable enough to be located by a rigid network model. What is more, it has emerged that the publics of an internet of things are different from the publics of network theory explored in the first chapter, whatever their degree of distribution. The reason being that, unlike in the social networks we study, here humans are a tiny part of the multitude of actors. Moreover, change here does not occur by way of simply adding new nodes, but by the circulation of mobiles with trajectories almost impossible to predict; as if reticulating through a sieve. In the words of Sheller:

Mobile publics can perhaps best be envisioned as capacitors for moving in and out of different social gels, including the capacity to take on an identity that is able to speak and to participate in specific contexts. (2004: 50)

At this stage of the enquiry, the argument has established that the network concept runs into trouble when trying to account for mobile publics comprised from humans and nonhumans on equal footing. Our problem with picturing fluid publics of the kind described above is that we can account for space quite well using network metaphors, but we are incapable of accounting for time in a stable way. Time, comprised of innumerable timings, myriads of fluctuating surface-plaits, is simply too liquid and porous for the vocabularies used so far. How can we truly start accounting for time?

Durable affinities

[To] no one did it occur that the book and the maze were one and the same thing. *Jorge Luis Borges* (1970: 50)

[Time] does not flow, it percolates. *Michel Serres* (Serres & Latour, 1995: 58)

Up to this point, the chapter's exploration of network temporality established that circulating timings result in the effect of temporal depth and linearity, and that when these timings are stabilised and inscribed into things, their circulations and logistics become visible. This led to the conclusion, that an internet of things questions the utility of the network concept in approaching hybrid and complex temporalities assembled from the labyrinthine shifts of humans, nonhumans, and other entities. This section aims to chart a conceptual approach to the 'garden of forking paths' formed by the spacing and timings of an assembled public.

If coherent, this approach should be able to account for the complexity involved in tracing mobile publics, without a priori inscribing rigid hierarchies and structures into the projection. To that end, the section assembles the arguments made so far in the thesis into a conceptual approach termed *durable affinity*; a projection capable of assembling and framing simultaneously timings, spacings, and emotive affect. It is argued that this projection is best equipped to explore the plenist ontology argued for by Tarde and Whitehead, and account for the opaque shifts of techniques, the circulations of immutable mobiles, the logistics of stabilising spatial frames and the intensities of timings involved in complex assemblages.

Finding publics in affinities

In the sections above, it was established that a performative and relational projection sees time as the result of timings and spacings shifting in a heterogeneous gel of entities. It was argued, that the depth of time appears as an effect out of a series of stabilised timing-surfaces, connected by immutable mobiles. Moreover, it was argued that when immutable mobiles gain a surface of in-scriptions making them visible to humans, they become spimes; in other words, fully fledged *visible* actors capable of producing new publics not to be ignored. Furthermore, network metaphors, useful if we understand the social as a set pattern of ties or a relation between an actor and an underlying framework within which the actor operates, were shown to be poor for dealing with a social understood in the way Gabriel Tarde did – as a fluctuation of totally heterogeneous and un-bifurcated assemblies. The invocation of Tarde is useful as a reminder that the social, and its publics, does not have to be seen as a structuring of relations, or a frame of reference, but as the rare product of circulating assemblies whose circulation has to be explained.

Furthermore, while the notion of attachment was and is good enough to account for the tracing of a public through a set of spacings, such a public is always already fluid *in time* and, as I argue below, that is where the notion of attachment loses its usefulness. When we start accounting for timings as well as for spacings, we can trace the *depth* of the alliance allowing for the stability of publics, while at the same time retaining the unpredictability of the fluctuation. The network projection, as was already discussed, struggles to retain and ‘understand’ a public comprised of humans, nonhumans, events, institutions and ideas, fluctuating in a myriad of spacings *and* timings. It is not well prepared to account for instability, decay, uncertainty and unpredictability (Galloway, A., 2006). It is simply not kairotic enough.

This seems to be the case because the network projection still allows itself to serve as a referential framework - the beloved structure of Durkheimian sociologists.³⁵² Circulations however, disallow the stable positioning of a bifurcatory referent and instead demand a tracing of fluid (and *plenist*) logistics. In pragmatic fashion, since the tasks change so should the tools; or, as in Sheller's example – if the issue moves, so should the public. In other words, it is not that we need better ways to describe the movement from the individual to the frame or from actors to referential structures that define them, but rather better interfaces describing varying forms of circulation. This discovery has direct resonances for our conceptualizations of publics. As was already argued, a referential projection always defines its publics in relation to a stable referent, which by definition exists *outside* of the publics – that is what makes it stable;³⁵³ but who should a fluid carnival of circulating mobiles refer itself to? As Stengers argues:

If it is 'reason' or the 'logos' that dominates, then politics itself will be subordinated and judged by the quality of its relationships with a nonpolitical authority, the Good or the True, which allows discordant and uncertain opinions to be silenced. The sophists, experts in the logos that reorients, arranges, and creates opinion, must be condemned. (2000b: 60)

³⁵² To remind the reader, Law makes a similar argument in his essay *After ANT: complexity, naming and topology* (1999a), mentioned in the introduction. The same volume contains a fascinating reply by Latour (1999b), who in turn argues that while the concept of networks has become increasingly superfluous in understanding complexity – “another nail in the coffin,” the notion of relationality needs to be retained. He reasons that the concept of networks was useful as long as it denoted transformational shifts of agencies, yet the moment networks came to stand for movement without cost they became a conceptual obstruction to understanding the complexity of movement. Both thinkers are of course right – as long as networks are understood through a relational projection, they are useful, but the moment they become a stand-in concept for the plague of looking below, they become “another nail in the coffin.”

³⁵³ This of course is the essence of critical theory's constant drive for the 'space of critique.' This space epitomizes the desire for a stable observation point *outside* of the imaginary cave of the discourse of mastery, from which to *pretend* to be able to see *inside* through the illusion of perspective, yet remain unaffected by the circulations of those critiqued.

As Stengers argues, traditionally we have stabilized the political by reference to a non-political authority or frame – the logos, God, reason, science. Some would argue that the British use the royal family for that very purpose to this day. As was already mentioned in the previous section, Latour attributes the invention of this position to the Renaissance invention of perspective – transportation without transformation at the cost of a *pretended* fixed point (1998a). As the previous two chapters demonstrated, in the last century cultural theory swapped the non-political referential authority with a context-frame which is always already political, and with an a priori discourse of mastery as its narrative trope. This context-frame usually termed as the social, or power, is always behind the curtains and occupying the position of the pure referent.

From the Ptolemaic to the Copernican system, the need for reference, around which modern science and philosophy are consolidated, does not change, even at the price of the immolation of Bruno, whose conception of cosmic infinity makes him the first modern enemy of referentiality: the monadic infinity glimpsed by Bruno, even before Cartesianism's affirmation of reference and the foundation of the science of regularity, unequivocally concluded with a *damnatio memoriae*. (Polizzi, 2000: 250)

This stabilization, what Latour calls the modern contract, is false, because it rests on the occlusion and silencing of a multitude of unruly actants. We have already seen that when transportation without transformation occurs, *something* or *someone else* transforms instead. The referential perspective however simply does not show us who or what else is undergoing the transformations. Thus appear the illusions of isochrony, isotopy, and the myriad other bifurcatory flavours of the day. The entities of the performative projection are not fluid because of their (imaginary) fluid substance, but because of their inability to relate in a stable way to the fixed context-frame of reference. Therefore, in the case of our circulating publics, by dropping the referential framework and its tools we will potentially acquire the capacity to trace logistics and assemblies until now remaining firmly in the realm of the invisible.

As was already observed in the previous chapter, politics, contrary to being an explanatory stratum structurally embedded in social reality, is actually the rare effect of

a public assembling around a thing (in Heidegger's sense of the word). In other words, if we do not treat the political as a pre-existent fixed frame, and take instead our starting point from the formation of a public around a matter of concern, a completely new formation appears. This formation, a collective, is co-created around an issue by the gathering of things, humans and all kinds of what we could call after the science of complexity - strange attractors. Therefore, tracing the boundaries and formations of circulating publics requires us to both acquire a new vocabulary, a new projection, and to look at the pragmatics that brings the publics together in a new way.

The seamless coupling and uncoupling of mobile publics, suggested by Sheller and discussed in the previous section, suggest common spacings of a very liminal kind.³⁵⁴ This in turn suggests again that the archeological approach to *sites*, and particularly to *partially present* timings and spacings, is useful in exploring mobilities. As Anne Galloway suggests, the heterogeneity of agencies and forms entangled in the attachments we trace, results in hybrid time-spaces involving decay, partial presence, and other dissociative forces (2006).

This hybridity in turn, is representative of a quality of circulating publics which by now should seem clear. Circulating publics overflow the clean breaks between local and global, micro and macro – they shift too often, too unpredictably, and most importantly – too locally. Indeed, as was already discussed, the shifts of publics are always local – and so are their spatial attachments and temporal duration. The gel metaphor suggested by Sheller, while suggestive of “soft, blurred boundaries of social interaction” (2004: 47), still does not allow us to trace all the timings and spacings involved. True, a gel-like projection of publics accounts for chains of action-association-affinity, which are fairly contingent and can fall apart under ‘heat,’ yet it does not account for the generation of immutability and depth.

³⁵⁴ In anthropology a liminal space is considered to be a transitional time-space between divergent plateaus. A cemetery is a liminal space, and so is a bus-stop; both mark a transition between two modes of being, two displacements in space-time. As was already suggested, technicity also possesses a liminal quality.

Therefore, we need a different apparatus to construct a projection describing purely mobile publics consisting of all kinds of mutable and immutable mobiles, of different flows of circulation, different timings and spacings, synchronies and strange attractors. The affirmation of reference creates firm referents; paraphrasing the quote with which this section starts – the book is always the maze. If however, we abandon the problem of reference (another bifurcation to be left to itself) we recognize multiplicities wherever we look, simply because the only projection left is the one which Michel Serres has been employing all along:

the ambivalent oscillation of the pluralistic, unstable play of translation and of interferences, of decentered, nonreferential, genuinely structural ways of thinking.
(Polizzi, 2000: 250)

How can such publics be traced? It is by taking account of the percolations of timings, spacings, immutability, and depth and thus opening the possibility for the introduction of a multitude of *other* variables. Allowing for the movement of percolation, as if through a sieve, opens the possibility for anticipation, for the gathering of more participants, observers, quiet ones, shadows. The projection appearing if these conditions are met is conceptually perhaps best captured by Julian Bleecker’s *durable affinity* project.³⁵⁵ For Bleecker, durable affinity is a conceptual tool allowing to visualize “the simultaneous accumulation of time, motion, and touch” (2007b) in a technical object (Figure 21). His project aims at creating “a human-scaled semantics for objects” (2007a) by in-scribing a mobile object with surface-plaits carrying the capacity for memory retention (time), spacing (motion) and a rudimentary register of affect (touch).

Bleecker’s intention is to explore the building of a spine-like interface for objects,³⁵⁶ which will smooth-out the human-nonhuman divide. The durable affinity project is

³⁵⁵ The project can be accessed on Bleecker’s website:

<http://www.nearfuturelaboratory.com/2007/01/23/an-api-for-durable-affinity/>

³⁵⁶ Or rather for humans, since objects are doing just fine without it.

essentially a “computer-human interface syntax” (2007a), providing the object with means to make explicit a different timing-spacing, and a capacity for breaking the affect barrier which supposedly separates humans from machines.

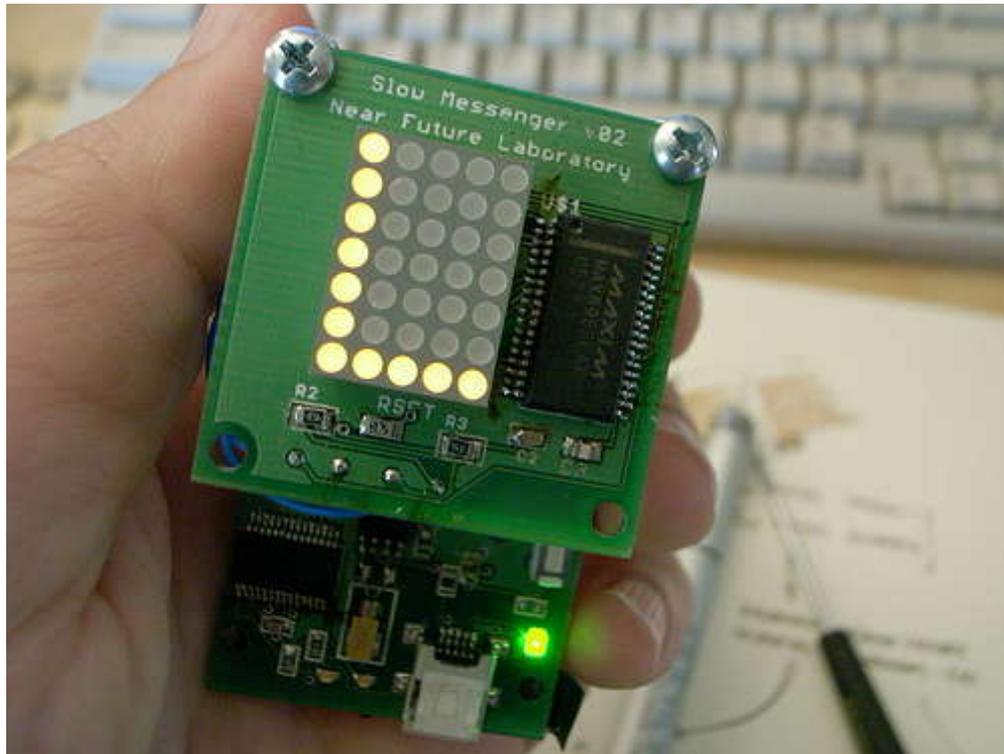


Figure 21: The durable affinity project: *Slow Messenger v.02* - spacing and timing affect explicitly for humans (image courtesy of Julian Bleecker).

To illustrate the concept, Bleecker designed a *Slow Messenger* gadget with a deliberately *deepened* timing. The gadget registers time in days rather than the standard computer-seconds, therefore inverting the illusion of instantaneous clocktime and producing a deep time of duration.³⁵⁷ Further, the device registers motion only through the sustained movement of the body of its wrangler in space-time, therefore producing a spacing of continuous flow rather than discrete referentiality. Finally, the *Slow Messenger* registers body-touch only as a sustained physical contact (in time) of much higher intensity than

³⁵⁷ With that, the *Slow Messenger* silently mocks Virilio and his all-consuming ‘speed.’

the contact usually demanded by technical appliances.³⁵⁸ The gadget works as an email client, but unlike any other client, it reveals the message slowly and almost capriciously. The email reveals itself over days and only through a sustained interaction with the wrangler who has to carry the gadget and provide it with affect if the message is to be revealed; thus uniting time, space and touch.

The brilliance of Bleecker's concept of durable affinity is in making visible the *constructedness* of temporality, the capacity of techniques to enfold space-time, and to be inscribed with layers of new agencies such as affect. Bleecker's slow messenger enfolds its human wrangler in a deep timing, where spatiality and affect conspire to carry across information. By in-scribing an object with a semantic interface for human affective intensities, Bleecker also illustrates the earlier arguments about techniques and the shifting of agencies across entities; the beauty of the example lies in the questioning and deliberate exposure of the fallacies of all the encountered bifurcatory tenets. In *durable affinity* humans, nonhumans, techniques, space, and time are finally united in one plenist ontology. Therefore, informed by Bleecker's project, this section uses the conceptual projection of a *durable affinity* to enable the simultaneous gathering of timings (memory), spacings (shifts), and publics (affect, touch).

The projection presupposes an unstable, contingent and carnivalesque gathering of heterogeneous mobilities, networked surfaces, and depth. It implies a locality, a shared matter of concern; and, most importantly, it is always an event involving both humans and nonhumans. The vocabulary of this projection is predicated on the ability to locate a public, establish who and what belongs to it, and to trace its timings and spacings in a durable *setting*. The term *affinity* commonly stands for a close connection between two entities caused by qualities or futures that they share. The word *affinity* however, derives from the Latin *affinitas*, meaning neighbourhood, something adjacent, and originates from a root indicating a border, an end. Therefore, affinity allows us to *space* publics in surfaces where they are adjacent, liminal, but also connected because of commonalities.

³⁵⁸ Such as touch-phones for example; unlike them, Bleecker's gadget has to be squeezed and caressed for days if it is to register the touch.

Simultaneously, it allows us to delineate publics which surround themselves for whatever reasons with *ends*, bordering with nothing. Durability in turn allows us to capture the depth immutable mobiles assemble, the stability of networks of circulation, and the always-present process of transformation-transportation.

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Durable affinities: plenist ontology revisited

At the beginning of this chapter, it was discussed how the dual temporal bifurcations force us to see in information networks a dichotomy in space and time, and another dichotomy between two opposing times. It was argued, that these dichotomies are false and they blind us to potentialities of engagement and emergence. Furthermore, the argument illustrated that the realities of information networks, and our own physicality, are not as stable or bifurcated as we might think, and that increasingly this last bastion of the technology-humans bifurcation so dear to Heidegger becomes untenable. Bleecker's project exposes the illusionary separation of a First Life physicality of affect and a Second Life world of 'consensual hallucinations,' by literally enfolding *a body* and a surface-plait of the internet into a public of durable affinity. What conditions the durable affinity vocabulary's appeal, is the ability to locate a setting, establish who and what holds stakes in a public, and trace the timings-spacings of the public.

The preceding chapters already outlined these vectors of movement in the form of argumentative shifts rather than a smooth zoom. First, the total view was shown to be a locally produced and upheld artifact, its popular form of circulation being the map. Second, the local setting was shown to be the site where all possible circulations could percolate into. It was discovered that whenever a distant mobile visits the local setting, it is because it was transported there by a chain of intermediaries. Thus the local is also total, because it gains the capacity to extend its locality in whatever direction, through the extension of networks of circulation along which move immutable mobiles.

Moreover, it was argued that all timings and spacings produce only a local setting and this locality is all there is.

Therefore, the concept of durable affinity creates a projection which *sees only local* spacings and timings; when faced with global or total frames it treats them as the effects of a local setting of circulating immutable mobiles. For durable affinity *locality is total and totality is local*. Furthermore, the process by which this plenist ontological projection looks for a public is one of radical symmetry, a ruthless semiotics which follows and recognizes as actors, intermediaries, or mediators all kinds of entities – humans, things, institutions, ideas, places etc. A public always begins with a thing, in the sense that Heidegger gives to the word *thing*, and the thesis has so far outlined an approach to assemblages of techniques which recognizes their thing-ness, their capacity to gather. The public thing, the *res publica*, depends on this capacity to make the thing appear *in* and *as* public.

The projection that has been traced up to now, and which the shift from attachments to affinities defines, allows publics to be discerned not by their human-ness but by their active-ness, their capacity to gather, mould, and transform. Furthermore, this projection allows tracing the logistics of immutability, the process of capturing, stabilizing, and displacing entities *by* and *in* a public. As charted throughout the thesis, the process of stabilising an entity and making it visible is of essential importance to the appearance of publics; in the words of philosopher Peter Sloterdijk:

The *res publica* arises from this act of capturing objects. If you do not possess suitable techniques for arresting them, then you cannot stabilize fleeting events and cannot give voice to them in the political domain. (2005: 949)

A further strength of the projection enabled by the durable affinity concept is therefore akin to a rule from the ancient Greek polis - *isosthenia* - the equal strength of statements.³⁵⁹ According to this rule from the agora, the statements of all participants in

³⁵⁹ The rule of *isosthenia* is also elaborated by Sloterdijk in his concept of “atmospheric politics” (2005).

the public debate must have an a priori equal strength – this allows the assembly of the public. As was already argued, for the ruthless semiology practiced by actor network theory all entities are in radical symmetry and have a priori equal voices. An entity's relations, movement, and transformations enable the projection to discern it from the flux. No regime of spacing and timing is privileged *before* we establish who moves and what is transformed in her place.

The tracing of movement and transformation suggest the final strength of the vocabulary of durable affinity. Tracing the modalities of an entity allows establishing the logistics behind a setting, that is, not only its locale, and not only who or what belongs, but how the entire assembly changes in time, what transformations does it undergo under trials during movement. From the perspective of the network builder, or the entity assembling a public, the act of tracing transformation over space is that of inculcating a setting with time, thus introducing unpredictability and percolation. In that sense a setting becomes enriched with a layer of *anticipation*; in the same way in which Bleecker's object gained affect. Furthermore, anticipation, when present on behalf of the entities producing the public, presumes the willingness of participants to *stick* together, it presumes an affinity that is stable enough to be durable.

The capacity for anticipation resembles a condition of politics which Sloterdijk calls *inter-patience between publics* (2005: 950). This capacity to anticipate together, allows publics to last over time; it stands for the willingness of all mobiles, human and non-human alike, to be brought together around an issue. An example of inter-patience is the durable-affinity device built by Bleecker – it *slows down* a public so that an affinity might develop. Or perhaps inversely – it slows down affect so that a public might come to being. Indeed as Stiegler argues, the slowing down illustrated by Bleecker's *Slow Messenger*, is also crucial for the link between humanity and technics. Furthermore, for nonhumans the concept of inter-patience has a particular meaning because, as it was shown in the first chapter, it is technics that bring “the advent of a capacity of anticipation” (Stiegler, 1998: 166).

[The appearance of language] is only possible (...) from the advent of a capacity of anticipation, which is also the capacity of putting-in-reserve, of memorization qua the possibility of being affected by a *past that lasts* - and this is why the word, like the tool, 'is preserved to be used on later occasions'. (1998: 166)

Techniques as memory-retention devices are not and have never been simply tools for holding large bits of data in one place. Memory-retention conditions the behaviour of publics, it allows anticipation and the participation of timings-spacings enfolded far away, both in space and time. *The past that lasts* literally appears through this capacity to slow down and retain it. The procedures for slowing down, for inter-patience, are made visible as a durable affinity which provides a surface for things, entities, mobiles which otherwise are left invisible, folded-in.

Sloterdijk suggests that the capacity to slow down and lend a spatial dimension to speech, as well as make discourse appear and feel as sequences of space, predates and conditions the appearance of democracy. Space takes time (to cross or narrate), and it is the introduction of time, both as a series of timings and as a list of members of the public, which changes the public narrative and, according to Sloterdijk, "implies constant training in patience" (2005: 950). To illustrate this point he re-tells an anecdote from the Peloponnesian wars between the tyrannical state of Sparta and the democratic polis of Athens. An Athenian ambassador visited the Spartan camp and delivered an eloquent and rhetorically masterful speech, to which a Spartan leader replied: "We cannot reply to your long speech, because now, at the end of it, we have forgotten what you said at the beginning." The fixed referential perspective of tyranny has no use for rhetoric or the ability for anticipation that predates it, just as it has no capacity to see multiple publics.

The shift from attachments to affinities, traced in this thesis, is also a shift in vocabularies; it allows projecting a public in flux, and imbuing it with a sense of its own contingency. In my opinion, Stengers expresses the atmosphere of this projection brilliantly when she develops her concept of a *Cosmopolitics* – a politics of the cosmos, of every *thing*. Her *Cosmopolitics* is

a matter of imbuing political voices with the feeling that they do not master the situation they discuss, that the political arena is peopled with shadows of that which does not have a political voice, cannot have, or does not want to have one. (2005a: 996)

However, the shift from attachments to affinities affects the conceptualization of time the most. So far, the notion of time traced in the argument has been of timings in chaotic circulation, with contingent series of surfaces arranged as time-space depth. What would be the overall metaphor of such series of timings? How to imagine it is an image? One clue is the already discussed notion of surfaces. The argument has already demonstrated that timing is also always a surface, and that measurement is always the invocation of Chronos; of depth through series of surface-timings. This figure however leaves a far-too structured image in the mind – an endless plait of surface-stacks in circulation. But why should these surfaces be imagined flat and not crumpled, torn, “peopled with shadows,” pierced, as a sieve?

If I take a sheet of paper and crumple it, what emerges is a multi-vectoral topology, along which time would not flow in one direction and neither would it circulate in some flat fashion; in this foldable-surface topology time would move in the same way as someone tracing the ups, downs, and foldings of the surface (Figure 22). Its movement would resemble percolations in an endlessly foldable plait. In other words, the very notion of outside and inside, of space and time as somehow working together but still separate notions, would dissipate into a new temporal topology of interiors.

Another way to visualize this is through the pattern of movement of the circulating mobiles, which is not towards an illusionary depth, in relation to a deeply fixated referent, but across a surface, in relation to other mobiles-surfaces. *All movements are surface-movements; there are no zooms-in-depth, only shifts-across-a-surface.* Therefore, paradoxically, when we account for time in the formation of publics, we lose all depth, and gain surfaces, interiors. Everything, as Michel Serres argues, becomes an interior – “there are no more exteriors” (1995a: 67).

The illusion of exteriors, of the platonic cave of fixed external referents, is gone. Again, everything is an interior because we lose the illusionary external referent, but gain the richness and relationality of fluid mobiles-across-surfaces. In other words, we gain “visible surfaces not obscure depths” (Galison, 2003: 316). At this stage, it is of course impossible to retain a meaningful network frame which will account for the complexity involved in these surface shifts. The reified presence-absence projection, the referential need for an exterior, always deduces a vantage point (what Hilary Putnam calls the God-eye seat). Accordingly, representation becomes the key issue for this projection. However, percolating surfaces are devoid of this problematic; for plenist ontology representation exists only as re-presentation, only as the shifting, transforming, translating, detouring, of an agency across surfaces.

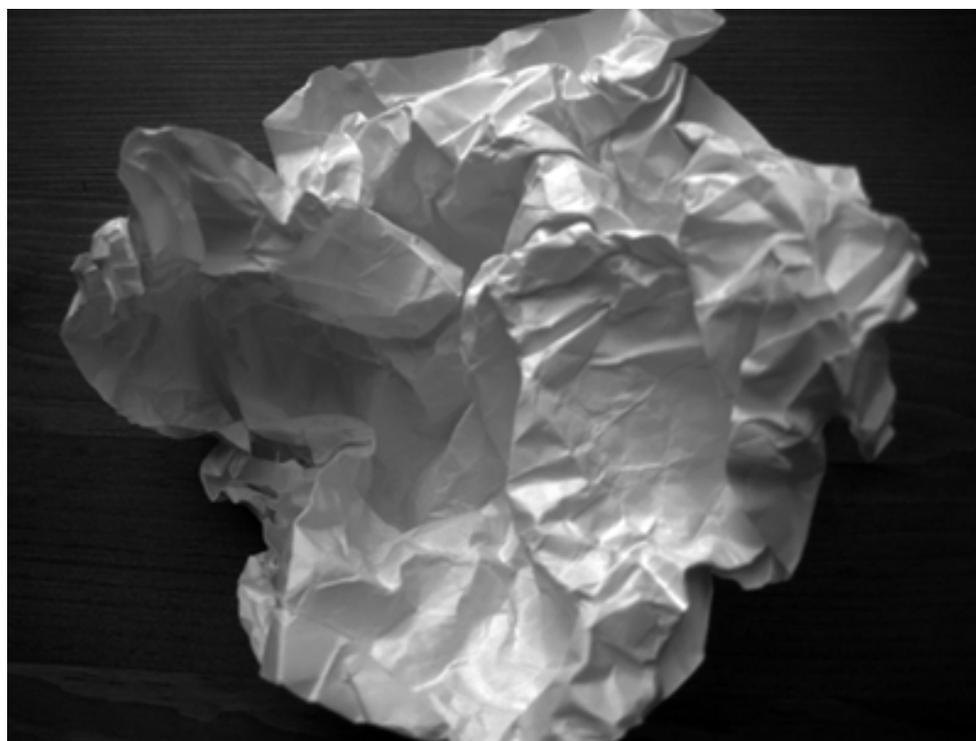


Figure 22: Time as a surface.

The time of durable affinities percolates in a movement “as though it reflected stopping points, ruptures, deep wells, chimneys of thunderous acceleration, readings, gaps - all

sown at random, at least in a visible disorder” (Serres & Latour, 1995: 57). It reflects a multivectorial “sheet or field” (Ma, 2000: 242), which according to Serres is a spatially foldable and paradoxical twisting. He imagines it as the moves of a flame, interrupted, partial, and unexpected. As a crumpled, percolating series of spacings, it is a depth of “temporal nearness” (Ma, 2000: 244) in constant flux. In this projection time emerges as a mosaic of fluctuating spacings, like the percolating waters of a stream; reticulated, diverse, twisted and multivectorial, “following a fortuitous flux in a fortuitous round” (Polizzi, 2000: 245). The timing of the emergent publics then is capable of being discrete and flowing, serialized and enfolded, sieve-like and sheet-like. In the words of Serres, time:

(..) at times, is composed of instances, and . . . at times, it flows by, devoid of units. It is discontinuous and it is continuous. It passes and it does not pass. It comes back on itself, sometimes, and, sometimes, it lapses or is lost, absented. More than present, through this redundancy, and more than vanished, in its lability. Time becomes expansive and contracts, all at once dense and soon spread out. Full, empty, intense or flat, vertiginous, banal, cut quite lengthily by an abrupt fault, uniformly full, blank continuously. . . . Time is lacunary and sporadic, it is a badly stitched tatter, it passes, loose, a mosaic. Time is a pure multiplicity. (1995b: 115)

As the projection of multiple timings in circulation such time is also multi-spatial, and of many shifts. It is built of spatial-plaits; each one of them an interior “crossing inside-out through the surfaces which delimit our surroundings” (Teyssot, 2005: 81). From the perspective of finding and tracing publics, such time-space emerges as a baroque multiplicity of co-presences. The movement across the foldable surfaces of this time projection can be best illustrated I believe, with a painting by Dutch baroque artist David Bailly (Figure 23). His *Still Life* from 1651, finished six years before his death, was conceived as a memento, a testament, and a display of his craft. It manages to be both a typical period painting combining all the requisites and symbolism of a memento mori and a still life, as well as a curious artistic testament made special by its enfolding and treatment of time.



Figure 23: David Bailly, *Still Life*, 1651. Stedelijk Museum “de Lakenhal,” Leiden, the Netherlands.

The painting is, at first sight, a veritable durable affinity of fluctuating time-spaces generated by a crowded offering of objects, an assemblage of materials, and a catalogue of artifacts (Alpers, 1984: 103). While serving as a personal memorial and a legacy, the work is also a celebration of the artist’s skill, displayed in the form of a self-portrait in which the crafting of art and of self is presented as a seamless whole. The first striking feature of the painting is that the artist introduces himself as a portrait within the portrait, on par with all the other objects. From the perspective of the in-scribed gaze of the author there is no exterior; the gaze of the author is from the inside as part of the collective!

In other words, the author positions himself (and his sense of self) inside and amongst the objects, as if to define a public, to delineate a folded world of which he is an equal, symmetrical part; a human amongst nonhumans, a painter amongst techniques. This positioning, contrary to the standard perspective of representation, has its explanation in

the regional Dutch mannerism of the period which, inspired as it was by Francis Bacon's project of natural philosophy, had as its aim "to deal as serious with plants as with the human form" (Alpers, 1984: 89). As historian of art Svetlana Alpers argues:

The eye of the northern viewer inserts itself right into the world, while the southern viewer stands at a measured distance to take it all in. (1984: 85)

The eye inserts itself right into the world, to deal with plants and things in a manner symmetrical to the way it deals with humans! Notice the Tardean break with the bifurcated world – in this *memento mori* Bailly seems to say - I exist, because I *have* and I am *had* by all those others surrounding me. Moreover, once the collective joined by the painter starts to be traced, we discover that all these objects construct the story of a lifetime which is based not on a linear time-space projection, but rather on a series of shifts and percolations. And so, following my anthropocentric (how else) gaze, I discover two contingent starting points - a youth (Y) and an old man (X). The old man is, as we already know, Bailly himself, while the youth is presumably the author in earlier times or a young student apprentice groomed to continue the tradition.

Circumstantially, we know that the youth is certainly a painter, albeit a beginning one, because he is holding in his right hand a tool indicating his position as an apprentice. The positioning however is odd, because the usual flow of time is inverted. Linear temporality demands the old man holding an image of a youth, reminiscence of a time long lost – 'I was this youth of which now only the image remains' - but certainly not the reverse (Figure 24). Here it is the youth that holds the memory of an old age, and yet, it is this very old age that brought the composition to being! In other words, the old Bailly has inserted a faithful reproduction of himself in the hands of a much younger self. It is an inversion of the flow of time.

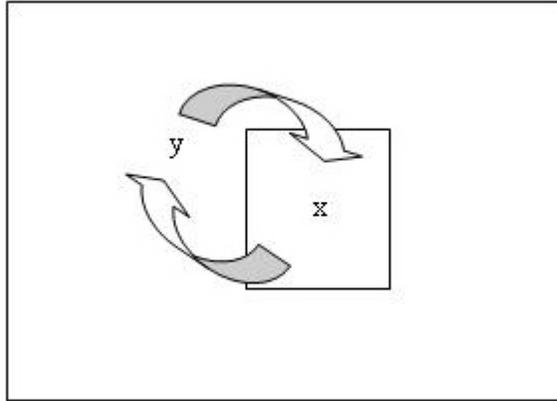


Figure 24: Inversion of time flow: The standard flow of time would have the youth y in the frame of the painting within the painting, while Bailly x would pose as his old self – time would flow linearly from y to x . Here however, the time flow is first inverted and then looped – from old, to young, to old again.

This inversion of time's linear flow however, is followed by a completely different movement, as if a shift sideways across the surface. It is generated by the soap bubbles floating in the air - around them time is brought into a sharp focus, into a stillness of expectation. From a time of although inverted yet still linear flow, we trace a shift to a time freezing in stillness. Indeed soap bubbles are a symbol of the kairotic nature of the event, their curved surfaces reflecting an unstable and contingent timing; a liminal time captured at its very becoming.

Simultaneously, a candle is extinguishing and its thin column of smoke mixes with the bubbles to create another vector of temporal movement – a vertical and even more unstable timing, serving to bring the kairotic nature of the scene into an even sharper focus. The momentous stillness of in-becoming is mixed with the stillness of passing away. The longer we trace the public in-scribed in this supposedly two-dimensional surface, the more enfolded surfaces we discover (Figure 25).

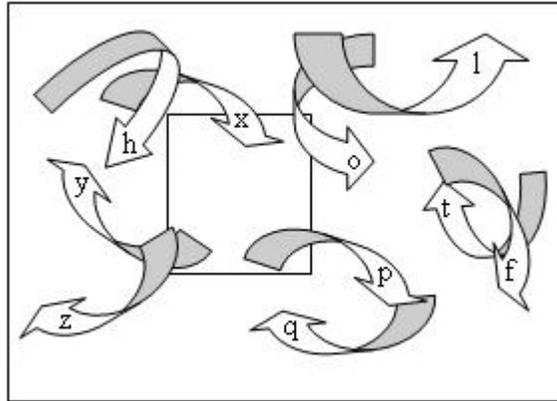


Figure 25: Percolating time: a durable affinity of agencies *folded-in* together

The timings traced so far are perturbed by the inscription to vanity at the lower right corner, with its allusion to yet another timing vector – a long time of memory, decay, and death. This vector in turn is supported by the human skull at the table and the fading image of a woman on the wall – perhaps a love long gone. Each object present at the scene however, as I already argued earlier, is an instantiation of *a timing* and *a spacing*; and so the multitude of objects from varying materials produce a reticulating surface, a durable affinity of agencies of which Bailly is a symmetrical part.

Perhaps the surface providing the most representative allusion to the movement within the painting are the multiple folds of the curtain hanging in the upper right corner. It suggests what the movement has already confirmed - the artifacts serve as a sieve through which time percolates and *folds* within the frame. From the initial linear flow, temporality has shifted into a multiple series of whirls. We observe a “rapid multiplication of vortices” (Alpers, 1984) across a two dimensional surface. It not only reveals, in Flusser’s words, *how it got there*, but also a durable affinity of timings folded-in.

Crucially, Bailly’s gaze does not reify any of the bifurcatory manoeuvres; there is no discourse of mastery, no human–nonhuman, and human–technique bifurcations, no disjointed space-time. Instead, the collective of Bailly’s life presents a true public

gathering, a true *thing*. Furthermore, from the perspective of the argument it is interesting that his memento mori would introduce a stand-in in the place of his *body*; it is as if the fixation on identity is dispelled through a forceful shifting of the gaze of the spectator towards the *others* who co-constituted Bailly's bill of existence, towards *their* agency through which he *had* his. For plenist ontology the agencies come first, and their materiality, spatiality, and temporality only second; and they come second because they appear *as a result* of the relational performativity of that agency. As in the isosthenic Münchhausen theorem, the agency performs and is performed, it *has* and is *had*. As Latour argues in an article on the body in scientific discourse:

[To] have a body is to learn to be affected, meaning 'effectuated', moved, put into motion by other entities, humans or non-humans. (2004a: 205)

Just as in Bailly's painting, to *have* a body in this case is also to *be had* by all those others affecting and *effectuating* that very body. *Having* a body is learning to be *affected*,³⁶⁰ to be in a durable *affinity*. *Everybody* is always *in spacing* and *in timing*, in the process of Tardean existence-as-difference; and that means *everybody* is a gathering of time, motion, and touch - a durable affinity. The longer the bill of existence, the more difference it enfolds; the more programs of action are present on it, the more publics it re-presents. Learning to be a member of a *res publica* is in that sense *becoming* more and more effectuated by others, enfolded, attached, and affected even further. The argument against bifurcations and the rigid network projection applies here as well. The metaphysical reification of presence-absence obfuscates a complex spacing by imposing on it a simple delineation.

Just as it was the case with the complex moves of immutable mobiles, so it is with bodies – what needs to be traced is not a simple dichotomy but “the various ‘folds’ our bodies weave with the world” (Teyssot, 2005: 81). A body in that sense resembles somewhat a baroque Dutch painting in which the gaze is not only on the inside, on the *interior*, but is also a relational hybrid of all kinds of objects and *their* timings too. It is

³⁶⁰ John Law and Anne-Marie Mol term the same conceptualisation as “the body-we-do” (2004).

always already an ambient, atmospheric environment, a multiple surface-plait, an interface and a surface “where the relation of self and the world are put into play, atmosphere” (Teyssot, 2005: 81). What this argument implies is that the body, just like any other surface, is the production locale of spacings and timings.

A similar conceptualization of the body has been suggested for example by artists and architects Shusaku Arakawa and Madeline Gins.³⁶¹ Starting from a projection which, similarly to a durable affinity, sees the body as always-already enmeshed in a temporal topology, they develop the notion of a “landing site.” A landing site is, according to them, the gaze landing on the world, “simultaneously an event and an event-marker,” a “heuristic device for mapping how a person forms the world and situates herself within it” (1994: 19). It is a projection of pure relationality which, moreover, sees action *isosthenically*, as a simultaneous constitution of an affinity. Arakawa and Gins’ reasoning is simple and similar to the one outlined in the projection proposed on these pages – it is the logistics of whatever it is that emerges that need to be traced and taken into account. Therefore if the body is considered part of a spatial environment, it needs to be considered *as* that – “the body proper plus the architectural surround” (1997: 12). Furthermore if this body is one of affect, of time-motion-touch, then it is the encounters producing, sustaining, and resulting from the affect that define it. As they argue:

What generates landing sites? The movement and power of the body. Through where does the body fall? Not through spacetime but through landing sites. In what does architecture have its origin? In the movements and exertions of body. (1994: 150)

The body moves, falls, climbs, and runs not through space-time but through landing sites! The landing sites of Arakawa and Gins are similar to the *setting* of Latour and Akrich; as a projection both conceptualisations presuppose an always already affective space and time. The body, as it moves through the foldable nearness of landing sites generates and is being generated by its affinity with others. That is not because the body is somehow endowed with special affective powers, but because surfaces are not, and

³⁶¹ A fascinating discussion of the work of Arakawa and Gins can be found in (Hansen, 2002).

have never been, neutral a priori containers for displaced mobiles. Surfaces literally become, or are in becoming, because of a passing mobile, which in turn, *is* and is mobile because of the surface in question. The body here is not the Cartesian caricature stuck in an absolute referential projection, but, as Thrift suggests, something “extended and mixed” (2006: 192).

What I have been consistently labelling as a mobile spacing, or circulating surfaces, can also be labelled – as philosopher of technology Mark Hansen does – a “wearable space” (2002: 322). It is a mobile surface consociated by the affectation of spacings, and the spacing of bodies from which the affect originates. The effectuating surface is both an origin and destination; it *is*, because it triggers the new spacing of a passing entity and also *is*, because it is triggered by the affect of that entity. The world of this projection is, as Donna Haraway poetically describes it - “a knot in motion” (Haraway, 2003: 6).

In her conception of the reticulated body, voiced in a *Companion Species Manifesto* bearing all the marks of a durable affinity, beings do not pre-exist their relations but are defined by them. She argues that it is through their spacings and timings that bodies constitute each other and the surfaces around them. It is the debilitating view created by our bifurcations that forces us to take contingent outcomes for stable foundations, and local arrangements for global settings. In her view there are no pre-configured subjects or objects, intermediaries or mediators, roaming the world in some dream of a priori settings; there are only “bestiaries of agencies, kinds of relatings, and scores of time” (2003: 6). To reassess, the durable affinity projection lets us discover that mobile actants such as

humans, angels, doves, planets, steam engines, are not *in* space and do not age *in* time. On the contrary, spaces and times are [...] generated by the movement of mobiles; they do not frame those movements. (Latour, 1988b: 25)

In this scenario, the public functions not as a static representation of spatio-temporal relationships, it is not a representation at all in the usual sense of the word; it is rather a

mobile assembly producing regimes of timings and spacings that might re-present a distant mobile brought close at great expense. The last shift, from attachments to affinities, displaces the projection towards a timing of percolation and a spacing of reticulated mobile surfaces. It projects a public of contingent affinity yet capable of duration and depth. It presupposes objects rich in space and time, enfolding multiple entities near and far.

Moreover, this projection demotes the reified dichotomy of presence and absence, into an always local setting of circulation.³⁶² It allows for durable affinity but also, for *durable disunity*, heterogeneity, and decay. The projection is content seeing a setting partially, and in decay, while retaining the capacity for anticipation, and it knows that scale is an only rarely and locally useful concept in a temporality of foldable nearness. It sees the big as small, located within others, and the small as big, located within others too. Its poet should be Giordano Bruno, who died at the stake for articulating an infinite universe.

Everything, then, no matter how minimal, is under infinitely great Providence; all minutiae, no matter how very lowly, in the order of the whole and of the universe, are most important; for great things are composed of little ones, and little things of the smallest, and the latter, of individuals and of minima. I am of the same opinion concerning great substances as concerning great efficacies and great effects. (Bruno, 1964 [1584]: 137)

The shift is perhaps best summarized and explained by the metaphorical distinction of two complexities – romantic and baroque, used by philosopher of science, technology, and society Chunglin Kwa. According to him, there are two ideal types illustrating our approaches to complexity. On the one hand is the romantic projection, which “sees an underlying unity in a world of heterogeneous objects and phenomena” (2002: 24). It always looks towards identifying commonalities where there is difference; it always

³⁶² Moreover, its accompanying discourse of mastery is demoted into a secondary question to be asked *after* the setting, or the public, is traced.

looks for networks, which in turn must always be shown to display some sort of unity above heterogeneities. The baroque projection on the other hand sees heterogeneities within heterogeneities, endless series of surfaces within a single surface.

The romantic projection is always an integration of complex messy entities into a higher ordered framework. Even though it allows for heterogeneity, it looks to explain it at a higher level than the one on which it is occurring; “Romantic holism looks up, baroque complexity down” (2002: 25).³⁶³ The romantic projection exclaims: show me at least three actors, events, ideas, places, issues, etc, and I will show you that these are nodes in such and such a network, with such and such quality and quantity of ties.³⁶⁴ As Law argues in a commentary on Chunglin Kwa’s metaphors, the most fundamental difference between the two projections has to do with their handling of emergence (2004b: 15).

The romantic conception sees everywhere parts conspiring in their emergence to form a whole, which is by definition greater than the parts. Moreover, it sees immanence in every relation, a whole in every sum of relations, and a reality in every whole that is different from the sum of relations and knowable only through a zoom-out to the whole. The natural movement of the romantic paradigm is to zoom up to a higher-order,³⁶⁵ in a fluid and seamless remake of the Platonic ideal ascent. Seeing things as a whole, qualitatively different from the logistics and transformations that produced the thing, is its only way to understand a complex assemblage (Law, 2004b: 16). Romantic complexity *sees* by connecting lines between entities which are always smaller and insignificant compared to the emergent structure (Kwa, 2002: 27).³⁶⁶

³⁶³ Perhaps Kwa’s metaphor of ‘looking up’ captures better what I have been trying to express as ‘the plague of looking below.’ In any case, both metaphors aim to point at the same holist maneuver looking for a God-eye view.

³⁶⁴ After all, as was already argued, if connectivity is an a priori given dynamic, then stability and *being* are a one-off expense; and network theorists would be the first to point out that everything is connected.

³⁶⁵ Or, at least to *unveil* that order.

³⁶⁶ Unsurprisingly, control is what emerges as the most important element of the romantic model of complexity; as each of the chapters discovered, the discourse of mastery inevitably knocks at the door. Accordingly, systems are necessarily seen as control devices constantly attempting to prevent their

By contrast, the baroque conception sees assemblies in turbulent motion, whose patterns are short-lived; it sees *all totalities as local*, and *all localities as total*. It sees totalities as always already poorly formed and small, contingent and dependent on elusive logistics of circulation. It looks down and, like Leibniz, observes the mundane crawling and swarming of matter.

Every bit of matter can be conceived as a garden full of plants or a pond full of fish. But each branch of the plant, each drop of its bodily fluids, is also such a garden or such a pond. [Leibniz quoted in Kwa (Kwa, 2002: 26)]

Within baroque complexity there is no possible projection that will allow treating the whole as homogeneity somehow different from its parts. Romantic complexity in turn “tends to homogenize the environment and [produce] a world of networks or flows” (Law, 2004b: 21). The baroque projection looks down, and the totalities it produces are always fluid and local – like allegories; however what is allegorical to the baroque projection can only be a symbol, or an empty signifier for the romantic. For the baroque projection, which alludes to durable affinities, uncertainty and unpredictability are ontological features of the surface-plaits it deals with, while for the romantic sensibility uncertainty can be only of epistemological quality – to be explained by a larger whole (Kwa, 2002: 47).³⁶⁷ The baroque projection affirms the earlier insight concerning the position of the body – it sees performative relationality where romantic networks see discrete nodes.

When applied to publics, the baroque sees partially, and in terms of hermetically opaque multiplicities, while the romantics are always tempted by the appeal of higher-order structures. The latter see the hidden forces of this or that explaining the misfortunes of

dissolution; they are in constant struggle against the second law of thermodynamics. So, also, by necessity, the machinic-systemic view of complexity prevails in a romantic model.

³⁶⁷ In that, the romantic projection is a perfect copy of the bifurcation of nature attacked by Whitehead. Here too the role of epistemology is to keep the mirror of nature clear from the dust of uncertainty.

ordinary social actors, while the former sees partial and tentative connections, local dominations which are so contingent and unstable that have to be constantly repaired; and a multiplicity of circulating mobiles turning everything on its head.

For in looking down (to the electromagnetically regulated clock networks), we see up: to images of empire, metaphysics and civil society. In looking up (to the philosophy of Einstein and Poincare's procedural concepts of time, space, and simultaneity) we see down: to the wires, gears, and pulses passing through the Bern patent office and the Paris Bureau of Longitude. We find metaphysics in machines, and machines in metaphysics. (Galison, 2003: 328)

The durable affinity projection suggests a public that is reticulated and mobile. It looks at a public's size and sees it as a feat of logistics of displacement that has to be examined and explained, rather than taken as an a priori referential background. It treats certainty and stability as precious and contingent achievements and strives to explain them. Where others see depth as an envelope of ontological quality, it sees depth made of a series of surfaces stacked to create an effect. Its time is a rare product of multitudes of timings, and a percolating one at that; its space folds and reticulates endlessly while emerging around the bodies that fold-out from it.

Finally, durable affinity projects a space populated by coexistences (Law & Mol, 2002a: 8), where both 'up' and 'down' point the gaze towards landing-sites of affect, populated by affinities in unstable and mostly rare duration. In looking up it sees a setting to be traced, in looking down it sees the same setting, on the same surface of foldable nearness. If the projection had to adopt a political motto, it would probably sound something like this:

No common world may be achieved if what is common has already been decided.
(Latour, 2004a: 223)

Politics cannot appear before a public coalesces around an issue, and to decide what is common one needs the durable affinity of a public. Who then, is to belong to the public,

and what is the common *thing*? The three chapters of the thesis aimed to trace the answer to this, one all-important question, and in doing that, to build a setting where that answer would make sense. The first chapter established a projection argued to be capable of answering that question and tracing the logistics of association and dissociation of publics. The proposed projection was argued to be capable of seeing an un-bifurcated world, plenist ontology of performative agencies. The second chapter in turn clarified the steps needed to make that public durable over distance; to perform a locale, enact agencies from afar, and stabilise a public as an assemblage. The chapter argued that in assembling publics a crucial role is played by the measuring scale on which the bill of existence of a public is being constructed.

Finally, this chapter developed the temporal dimension missing from the argument so far. The chapter established that for plenist ontology temporality cannot be bifurcated, or taken as a screen *against which* the shadows of beings appear. Instead, temporality was argued to be, in conjunction with spatiality, a performative effect of the being of entities. From that conclusion followed the argument that isochrony is the effect of an array of timings positioned in depth; similarly to the case of isotopy, which was argued earlier to be the effect of a series of spacings arranged in a stable way. To unify the vocabularies of the two chapters, the argument posited that timings be understood as traces on a surface, which, when arrayed in a chain, create the effect of depth and flow. It was further argued that timings circulate in a performative world where qualities such as size, speed, timing, and location are effectuated by the relational being of the agencies in the setting.

The resulting conception of deep timings was proposed to describe well the temporality of information networks, where the effect of depth was argued to appear as an effect of the circulation of immutable mobiles. It was proposed that the logistics of immutable mobilities inevitably lead to an internet of things, a setting where the multitude of so far invisible and unacknowledged publics of things finally become visible. The resulting projection of mobile publics was found to be too complex for the network concept to

carry, and the argument proposed the notion of a durable affinity as a better conceptual tool for the projection.

Durable affinity was argued to capture both the spatial and temporal shifts of agencies, and to allow the projection to constantly see plenist ontology without deciding what the *common thing* is beforehand. Finally it seems, the thesis has established a proper setting for assembling a public, and answering who belongs and what is the common thing. In doing that however, the thesis seems to have discovered that the setting for the answer, and the answer itself, “the book and the maze,” are one and the same thing.

Conclusion

The distance to be researched is not that between the observer and the observed – this would be cheap exoticism – but that between the contents of the world before and after the inquiry. So neither distance nor empathy is a sure guide that a good science has been concocted, but only this criterion: is there now a distance between the new repertoire of actions and the repertoire with which we started? (Latour, 2004a: 219)

This thesis started with a bifurcated world the contents of which consisted of a plain populated by social actors, and a natural/technical plain signified by social action. It ended with plenist ontology of in-becoming entities, viewed through a durable affinity projection. The distance crossed between these two repertoires seems in hindsight both long, and minuscule. Long, because it involved the explication and abandonment of numerous bifurcations of the world, in the process of which the thesis formulated an alternative projection to approach the politics of networks. Minuscule, because, as the thesis argued, the world has always been multiple and plenist; techniques have always been coagulations of agency; networks have always been traces of transformative shifts; spatio-temporalities have always been the result of the constitution of entities, and all the argument needed to do was to avoid the bifurcations encountered on the way of exploring these elements of the projection.

The new repertoire suggested by the thesis, re-constructs network politics as the outcome of the spatio-temporal shifts of publics within plenist ontology. After this enquiry, network politics are populated by assemblages constantly struggling for survival against dissociative agencies, within settings permeated by multiple spatio-temporalities. The entire range of logistical manoeuvres performed by public assemblages, from framing a topos to establishing distance and domination, was revealed to be an indivisible part of the bill of existence of those publics, and their politics. The projection constructed by the argument was argued to be both *durable*, in

that it sees temporal depth, and *affinitive*, in that it is capable of seeing partial formations in a fragmentary world.

In the context of internet studies, the importance of this new projection concerns the ability to hold together a plenist world of agencies; that means tracing the shifts of agencies as they cross from human, to nonhuman, technical, imaginary, and partial entities. In turn, the ability to hold these heterogeneous entities in the same projection, allows tracing them in a potentially common assemblage, and establishing them as a public. From that perspective, internet studies become capable of tracing the intricate logistics of network public assemblages, without ever falling into a discourse of mastery; that is an important achievement.

What about the role of critique? One of the major points of contention with ANT has been its purported inability to allow a space for critique. However, as the thesis aimed to demonstrate, instead of denouncing mediation in a desperate search for an imaginary real, it would be better to immerse the whole arsenal of critique in the very politics of mediation. In plenist ontology the main question of critique would be “what should be kept constant through which sort of transformations.” Making visible the costs of stability, tracing, and mapping the layers of coagulated agency – these are the labyrinthine shifts of network politics in which critique is apt to excel.

The late Richard Rorty once quipped in an interview, that a new vocabulary has redemptive powers, in that it allows substituting one set of questions with another, and thus constituting a new world, a new beginning. He said that in the context of his substitution of the vocabulary of analytical philosophy with the ‘liberal ironist’ vocabulary of pragmatism without method. In my opinion the same rule applies to the repertoire of ANT; its redemptive powers reside first with the earthquake it causes in the mindlessly monotonous landscape of a social populated by the daemons of critical theory, and second, in the even more important gift of new vision – seeing all those whom the discourse of mastery ‘disappears.’

The new repertoire for approaching the politics of networks, suggested by the thesis, opens a variety of avenues for further research of the internet assemblage. Important areas to be examined include the complexities involved in the notion of an internet of things, and the spill-over of visible affinity to all manner of nonhuman entities. In addition, another potential route for enquiry comes with the notion of spimes, and the effects of circulating objects in-scribed with a visible spacing–timing on human sociality.

Another, and already busily explored, potential area of enquiry concerns locative cartography; never before have the attachments and affinities of entities been so visible as today. ANT's conceptual toolkit lends itself easily to studies of urban spatialities – the main topos of locative mapping – because its plenist projection renders faithfully the complex plaits of city-space. Another fascinating trope of research, and one the author intends to follow, concerns the application of Serres' philosophy to the study of mobile publics, leading to a further explication of the durable affinity projection.

What, therefore, is the politics of networks in the end? It is the common assembling of space and time, the *res publica* where the *res*, the thing, is any agency capable of existing, and the *publica*, the public, is any assemblage of agencies capable of existing and therefore of *differing*, of *having*, of *concreting* in space and time. Read me that public's program of action, and I will tell you what its politics is. Is that definition absurdly vague? Yes, if one needs a definition of politics serving as the metaphorical mallet with which to beat one's opponents, and no, if one needs a definition where politics is understood as the constitution of a common good. No one knows what the common good is in advance, *before* it is even decided just *who* constitutes the commons. When the ancient *thing* assembled, and it was established who has the right to speak, *then* the constitution of the common good began, *then* the public took shape and started *having* politics.

In that, there is a role for critique too – the critic is the one who traces, assembles, and *makes visible* the collective, the public. The critic does not deconstruct, denounce, or

unveil, but re-constructs – the critic shows how the assemblage, the orchestra, is *composed*, how that composition plays as a program of action. Is that role demanding? Yes, enormously so, because there is no easy ‘space of critique’ left, only the noisy, dirty, decomposing here and now. To imagine that role is to visualise what the role of critical theory would be in archaeology.

Where else is the space of the critic but in the muddy pit of opaque clues, re-constructing the public presenting itself to her tools and eyes? How is the critic to have her discourse of mastery if she does not even know who and what speaks in that muddy opacity surrounding her? The critic has two choices: to take out her stick of dynamite and blow the past to smithereens in the hope of exposing the pot of gold which may or may not be there, or to take out her pen and notebook and start carefully re-constructing that past, lovingly re-assembling the programs of action of all those agencies quiet for so long. If the critic takes the first route, she should be rightly denounced as a barbarian and locked away for destroying and forever silencing the beings of so many entities. Should she take the latter choice however, she might re-construct and re-assemble the untold politics and strange moralities of some entity’s being, and thus bring difference to the world.

References

- Adam, B. (1995). *Timewatch*. Cambridge, UK: Polity Press.
- Adam, B. (1998). *Timescapes of Modernity: The Environment and Invisible Hazards*. London: Routledge.
- Adam, B. (1999). Industrial Food for Thought: Timescapes of Risk. *Environmental Values*, 8(2), 219-238.
- Adam, B. (2003). Reflexive Modernization Temporalized. *Theory, Culture & Society*, 20(2), 59-78.
- Adam, B. (2004). *Time*. Cambridge, UK: Polity Press.
- Akrich, M., & Latour, B. (1992). A Summary of a Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies. In W. E. Bijker & J. Law (Eds.), *Shaping Technology / Building Society: Studies in Sociotechnical Change* (pp. 259-264). Cambridge, MA: The MIT Press.
- Alliez, E. (1996). *Capital Times: Tales From the Conquest of Time* (G. Van Den Abbeele, Trans.). Minneapolis, MN: University of Minnesota Press.
- Alpers, S. (1984). *The Art of Describing: Dutch Art in the Seventieth Century*. Chicago: University of Chicago press.
- Alpers, S. (1998). The Studio, the Laboratory, and the Vexations of Art. In C. Jones & P. Galison (Eds.), *Picturing science, producing art* (pp. 401-417). New York: Routledge.
- Amin, A., & Thrift, N. (2002). *Cities: Reimagining the Urban*. Cambridge: Polity Press.
- Andrasfai, B. (1977). *Introductory Graph Theory*. Bristol: Adam Hilger.
- Arakawa, S., & Gins, M. (1994). *Architecture: Sites of Reversible Destiny*. London: Academy Group.
- Arakawa, S., & Gins, M. (1997). *Reversible Destiny—Arakawa/Gins*. New York: Guggenheim Museum.
- Armitage, J. (2006). From Discourse Networks to Cultural Mathematics: An Interview with Friedrich A. Kittler. *Theory, Culture & Society*, 23(7-8), 17-38.

- Arquilla, J., & Ronfeldt, D. (1996). *The Advent of Netwar*. Santa Monica, CA: Rand Corporation.
- Arquilla, J., & Ronfeldt, D. (1998). *The Zapatista "Social Netwar" in Mexico*. Santa Monica, CA: Rand Corporation.
- Arquilla, J., & Ronfeldt, D. (2001). *Networks and Netwars: The Future of Terror, Crime, and Militancy*. Santa Monica, CA: Rand Corporation.
- Assad, M. (2000). Language, Nonlinearity, and the Problem of Evil. *Configurations*, 8, 271-283.
- Ayers, M. (2003). *Cyberactivism: Online Activism in Theory and Practice*. London: Routledge.
- Barabasi, A. L. (2002). *Linked: The New Science of Networks*. Cambridge, MA: Perseus Publications.
- Barnes, B. (2001). The Macro/ micro Problem and the Problem of Structure and Agency. In G. Ritzer & B. Smart (Eds.), *Handbook of Social Theory* (pp. 339-352). London: Sage.
- Barnet, B. (2003). *The Erasure of Technology in Cultural Critique*. Retrieved 16 Nov, 2005, from http://journal.fibreculture.org/issue1/issue1_barnet.html
- Barnet, B. (2004). *Technical Machines and Evolution*. Retrieved 06 November, 2005, from www.ctheory.net/articles.aspx?id=414
- Barnet, B. (2005). *Infomobility and Technics: some travel notes*. Retrieved 06 November, 2005, from <http://www.ctheory.net/articles.aspx?id=492>
- Barney, D. (2000). *Prometheus Wired: the hope for democracy in the age of network technology*. Sydney: University of New South Wales Press Ltd.
- Barney, D. (2004). *The Network Society*. Cambridge, UK: Polity Press.
- Barry, A. (2002). The anti-political economy. *Economy and Society*, 31(2), 268-284.
- Barry, A., & Slater, D. (2002). Introduction: the technological economy. *Economy and Society*, 31(2), 175-193.
- Barry, A., & Thrift, N. (2007). Gabriel Tarde: imitation, invention and economy. *Economy and Society*, 36(4), 509-525.
- Baudrillard, J. (1995). *The Gulf War Did Not Take Place* (P. Patton, Trans.). Sydney: Power Publications.

- Beer, D. (2007). Thoughtful territories: imagining the thinking power of things and spaces. *City*, 11(2), 229-238.
- Benford, R. (1988). Ideology, Frame Resonance, and Participant Mobilization. In B. Klandermans, H. Kriesi & S. Tarrow (Eds.), *From Structure to Action: Comparing Social Movement Research Across Cultures* (Vol. 1 International Social Movement Research, pp. 197-217): JAI Press.
- Benford, S., Flintham, M., Drodz, A., Tandavanitj, N., Adams, M., & Farr, J. R. (2006). The Design And Experience Of The Location-Based Performance Uncle Roy All Around You. *Leonardo Electronic Almanac*, 14(03).
- Beniger, J. (1986). *The Control Revolution: Technological and Economic Origins of the Information Society*. Cambridge, MA: Harvard University Press.
- Benkler, Y. (2006). *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven, CN: Yale University Press.
- Bennett, W. L. (1998). The Uncivic Culture: Communication, Identity, and the Rise of Lifestyle Politics. *PS: Political Science and Politics*, 31(4), 741-761.
- Bennett, W. L. (2003a). Lifestyle politics and citizen consumers: Identity, communication, and political action in the late modern society. In J. Corner & D. Pels (Eds.), *Media and the restyling of politics: consumerism, celebrity and cynicism* (pp. 137-150). London: Sage.
- Bennett, W. L. (2003b). New Media Power: the internet and global activism. In N. Couldry & J. Curran (Eds.), *Contesting Media Power: Alternative Media in a Networked World* (pp. 17-37). Lanham, Maryland: Rowman & Littlefield.
- Bey, H. (1992). *Temporary Autonomous Zones*. Retrieved 21 June 2004, from <http://www.hermetic.com/bey/>
- Bey, H. (1997). *A Network of Castles*. Retrieved 21 June 2004, from <http://www.hermetic.com/bey/>
- Biggs, N. L., Lloyd, E. K., & Wilson, R. J. (1976). *Graph Theory 1736 - 1936*. Oxford: Clarendon Press.
- Bingham, N. (1996). Object-ions: from technological determinism towards geographies of relations. *Environment and Planning D: Society and Space*, 14, 635 - 657.

- Bingham, N., & Thrift, N. (2000). Some New Instructions for Travellers: The geography of Bruno Latour and Michel Serres. In M. Crang & N. Thrift (Eds.), *Thinking Space* (pp. 281-301). London: Routledge.
- Bleecker, J. (2006a). *Networked Objects and The Internet of Things*. Retrieved 12 June, 2007, from <http://www.nearfuturelaboratory.com/2006/10/27/networked-objects-the-internet-of-things/>
- Bleecker, J. (2006b). *Why Things Matter: A manifesto for networked objects - cohabiting with pigeons, arphids and aibos in the internet of things*. Retrieved 10 March, 2006, from <http://research.techkwondo.com/files/WhyThingsMatter.pdf>
- Bleecker, J. (2007a). *An API for Durable Affinity: Engineering Interfaces That Matter*. Retrieved 15 May, 2007, from <http://www.nearfuturelaboratory.com/2007/01/23/an-api-for-durable-affinity/>
- Bleecker, J. (2007b). *Time, Motion, Touch*. Retrieved 10 February, 2007, from <http://www.nearfuturelaboratory.com/2007/01/30/OLD294/>
- Bleecker, J. (2007c). *When 1st Life Meets 2nd Life: The 1685 Pound Avatar and the 99 Ton Acre*. Retrieved 10 February, 2007, from <http://www.nearfuturelaboratory.com/2007/02/09/when-1st-life-meets-2nd-life/>
- Bleecker, J., & Knowlton, J. (2006). Locative Media: A Brief Bibliography And Taxonomy Of Gps-Enabled Locative Media. *Leonardo Electronic Almanac*, 14(03).
- Bleecker, J., & Nova, N. (2006). *Blogjects and the new ecology of things*. Retrieved 25 June, 2007, from <http://tecfa.unige.ch/~nova/blogject-lift06.pdf>
- Bogard, W. (1996). *The Simulation of Surveillance: Hypercontrol in Telematic Societies*. Cambridge, UK: Cambridge University Press.
- Bogard, W. (2007). The Coils of a Serpent: Haptic Space and Control Societies. *CTheory: Theory, Technology and Culture*, 30(3).
- Boltanski, L., & Chiapello, E. (2005). *The New Spirit of Capitalism* (G. Elliott, Trans.). London: Verso.
- Bolter, J., & Grusin, R. (2000). *Remediation: Understanding New Media*. Cambridge, MA: MIT Press.

- Bonnett, A. (2006). The Nostalgias of Situationist Subversion. *Theory, Culture & Society*, 23(5), 23-48.
- Bono, J. (1995). *The Word of God and the Languages of Man: Interpreting Nature in Early Modern Science and Medicine, vol. 1, Ficino to Descartes*. Madison: University of Wisconsin Press.
- Bono, J. (2005). Perception, Living Matter, Cognitive Systems, Immune Networks: A Whiteheadian Future for Science Studies. *Configurations*, 13, 135-181.
- Borch, C. (2005). Urban Imitations: Tarde's Sociology Revisited. *Theory, Culture & Society*, 22(3), 81-100.
- Borges, J. L. (1970). *Labyrinths: Selected Stories and Other Writings* (D. A. Yates & J. E. Irby, Trans.). Harmondsworth: Penguin Books.
- Borges, J. L. (1975). On Exactitude in Science (N. T. de Giovanni, Trans.). In J. L. Borges (Ed.), *A Universal History of Infamy*. London: Penguin Books.
- Boxer, C. R. (1969). *The Portuguese Seaborne Empire, 1415-1825*. London: Hutchinson.
- Braidotti, R. (2006). Posthuman, All Too Human: Towards a New Process Ontology. *Theory, Culture & Society*, 23(7-8), 197-208.
- Brate, A. (2002). *Technomanifestos: visions from the information revolutionaries*. New York: Texere.
- Bredenkamp, H. (1995). *The Lure of Antiquity and the Cult of the Machine: The Kunstkammer and the Evolution of Nature, Art and Technology* (A. Brown, Trans.). Princeton: Markus Wiener.
- Breger, C. (2006). Gods, German Scholars, and the Gift of Greece: Friedrich Kittler's Philhellenic Fantasies. *Theory, Culture & Society*, 23(7-8), 111-134.
- Bruno, G. (1964 [1584]). *The Expulsion of the Triumphant Beast* (A. D. Imerti, Trans.). New Brunswick, N.J.: Rutgers University Press.
- Buchanan, M. (2002). *Nexus: small worlds and the groundbreaking science of networks*. New York: W.W. Norton.
- Burrows, R., & Ellison, N. (2004). Sorting places out? Towards a social politics of neighbourhood informatization. *Information, Communication & Society*, 7(3), 321-336.

- Burrows, R., & Gane, N. (2006). Geodemographics, software and class. *Sociology*, 40(5), 793-812.
- Byrd, D. (2005). The Emergence of the Cyborg and the End of the Classical Tradition: The Crisis of Alfred North Whitehead's Process and Reality. *Configurations*, 13, 95-116.
- CAE. (1996). *Electronic Civil Disobedience and Other Unpopular Ideas*. Retrieved 21 June, 2004, from <http://www.critical-art.net/books/>
- CAE. (2001). *Digital Resistance*. Retrieved 21 June 2004, from <http://www.critical-art.net/books/>
- CAE. (2003). *Framing Tactical Media*. Retrieved 6 June, 2007, from http://www.n5m.org/n5m4/dox/n5m_reader.pdf
- Callon, M. (1986a). The sociology of an Actor-Network: the case of the electric vehicle. In M. Callon, J. Law & A. Rip (Eds.), *Mapping the Dynamics of Science and Technology: Sociology of Science in the Real World* (pp. 19-34). London: Macmillan Press.
- Callon, M. (1986b). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc bay. In J. Law (Ed.), *Power, Action and Belief* (pp. 196 - 233). London: Routledge and Kegan Paul.
- Callon, M. (1991). Techno-economic networks and irreversibility. In J. Law (Ed.), *A Sociology of Monsters: Essays on Power, Technology and Domination (Sociological Review Monographs)* (Vol. 38, pp. 132-164). London: Routledge.
- Callon, M. (1998a). An essay on framing and overflowing: economic externalities revisited by sociology. In M. Callon (Ed.), *The Laws of the Markets* (pp. 244-269). Oxford: Blackwell.
- Callon, M. (1998b). *The Laws of the Markets*. Oxford, UK: Blackwell.
- Callon, M. (2002). Writing and (Re)writing Devices as Tools for Managing Complexity. In J. Law & A. Mol (Eds.), *Complexities: Social Studies of Knowledge Practices* (pp. 191-217). Durham: Duke University Press.
- Callon, M., & Latour, B. (1981). Unscrewing the big leviathan: how actors macrostructure reality and how sociologists help them to do so. In K. Knorr Cetina & A. Cicourel (Eds.), *Advances in Social Theory and Methodology:*

- Toward an Integration of Micro- and Macro-sociologies* (pp. 277 - 303). Boston, MA: Routledge and Kegan Paul.
- Callon, M., & Law, J. (1997). After the individual in society: lessons on collectivity from science, technology and society. *Canadian Journal of Sociology*, 22(2), 165-182.
- Callon, M., & Law, J. (2004). Absence - presence, circulation, and encountering in complex space. *Environment and Planning D: Society and Space*, 22, 3 -11.
- Callon, M., & Law, J. (2005). On qualculation, agency, and otherness. *Environment and Planning D: Society and Space*, 23, 717-733.
- Callon, M., Law, J., & Rip, A. (1986a). *Mapping the Dynamics of Science and Technology: Sociology of Science in the Real World*. London: Macmillan Press Ltd.
- Callon, M., Law, J., & Rip, A. (1986b). Putting texts in their place. In M. Callon, J. Law & A. Rip (Eds.), *Mapping the Dynamics of Science and Technology: Sociology of Science in the Real World* (pp. 221-230). London: Macmillan Press.
- Campbell, M. B. (1999). *Wonder and Science: Imagining Worlds in Early Modern Europe*. Ithaca, NY: Cornell University Press.
- Capra, F. (2002). *Hidden Connections: Integrating the Biological, Cognitive, and Social Dimension of Life into a Science of Sustainability*. New York: Random House.
- Casey, E. S. (1996). How to Get from Space to Place in a Fairly Short Stretch of Time: Phenomenological Prolegomena. In S. Feld & K. Basso (Eds.), *Senses of Place* (pp. 13-52). Santa Fe: School of American Research Press.
- Castells, M. (1996). *The Rise of the Network Society* (Vol. 1). Cambridge, MA: Blackwell Publishers.
- Castells, M. (1997). *The Power of Identity* (Vol. 2). Cambridge, MA: Blackwell Publishers.
- Castells, M. (1998). *End of Millenium* (Vol. 3). Cambridge, MA: Blackwell Publishers.
- Castells, M. (2000). Materials for an explanatory theory of the network society. *British Journal of Sociology*, 51(1), 5-24.

- Castells, M. (2004). Informationalism, Networks, and the Network Society: A Theoretical Blueprint. In M. Castells (Ed.), *The Network Society: A Cross-cultural Perspective* (pp. 3-48). Cheltenham, UK: Edward Elgar.
- Celletti, M., Leong, S., Mitew, T., & Pearson, E. (2008). The Question Concerning (Internet) Time. *New Media & Society*(forthcoming).
- Chang, M., & Goodman, E. (2006). Asphalt Games: Enacting Place Through Locative Media. *Leonardo Electronic Almanac*, 14(03).
- Chesher, C. (2002). *Why the Digital Computer is Dead*. Retrieved 05 August, 2005, from <http://www.ctheory.net/articles.aspx?id=334>
- Chesher, C. (2003). Layers of Code, Layers of Subjectivity. *Culture Machine*, 5(The E-Issue).
- Chesher, C. (2004). Neither gaze nor glance, but glaze: relating to console game screens. *Scan Journal of Media Arts Culture*, 1(1).
- Chun, W. (2006). *Control and Freedom: Power and Paranoia in the Age of Fiber Optics*. Cambridge, MA: The MIT Press.
- Cioran, E. M. (1996). *History and Utopia* (R. Howard, Trans.). London: Quartet Books.
- Clifford, J. (1997). *Routes: Travel and Translation in the Late Twentieth Century*. Cambridge: MA: Harvard University Press.
- Cohen, J., & Arato, A. (1992). *Civil Society and Political Theory*. Cambridge, MA: MIT Press.
- Copeland, B. J. (2004). *The Essential Turing: seminal writings in computing, logic, philosophy, artificial intelligence and artificial life, plus the secrets of Enigma*. Oxford: Clarendon Press.
- Couldry, N. (2004). *Actor-network theory and media: do they connect and on what terms*. Retrieved 12 May, 2008, from www.lse.ac.uk/collections/media@lse/pdf/Couldry_ActorNetworkTheoryMedia.pdf
- Coyne, R. (1999). *Technoromanticism: digital narrative, holism, and the romance of the real*. Cambridge, MA: MIT Press.
- Crang, M., & Graham, S. (2007). Sentient Cities: Ambient intelligence and the politics of urban space. *Information, Communication & Society*, 10(6), 789 - 817.

- Cuff, D. (2003). Immanent Domain: Pervasive Computing and the Public Realm. *Journal of Architectural Education*, 57(1), 43-49.
- Cussins, A. (1992). Content, Embodiment and Objectivity: The Theory of Cognitive Trails. *Mind*(101), 651–688.
- Dainton, B. (2001). *Time and Space*. Montreal: McGill-Queen's University Press.
- Daston, L. (1998a). Nature by Design. In C. Jones & P. Galison (Eds.), *Picturing science, producing art* (pp. 232-253). New York: Routledge.
- Daston, L. (1998b). The Nature of Nature in Early Modern Europe. *Configurations*, 6(2), 149-172.
- Daston, L. (2004). *Things That Talk: object lessons from art and science*. New York: Zone Books.
- Daston, L., & Park, K. (1998). *Wonders and the Order of Nature, 1150 - 1750*. New York: Zone Books.
- Davis, E. (1998). *Techgnosis: myth, magic, and mysticism in the age of information*. New York: Harmony Books.
- De Chardin, P. T. (1965). *The Phenomenon of Man* (J. Huxley, Trans.). London: Collins.
- Debord, G. (1988). *Comments on the Society of the Spectacle*. London: Verso.
- Debord, G. (1994 [1967]). *The Society of the Spectacle*. New York: Zone Books.
- DeLanda, M. (1991). *War in the Age of Intelligent Machines*. New York: Zone Books.
- Deleuze, G. (1992). Postscript on the Societies of Control. *October*, 59(Winter 1992), 3-7.
- Deleuze, G. (1993). *The Fold: Leibniz and the Baroque* (T. Conley, Trans.). Minneapolis: University of Minnesota Press.
- Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: capitalism and schizophrenia* (B. Massumi, Trans.). Minneapolis: University of Minnesota Press.
- Derrida, J. (1996). *Archive Fever: A Freudian Impression* (E. Prenowitz, Trans.). Chicago: The University of Chicago Press.
- Dery, M. (1996). *Escape Velocity: Cyberculture at the End of the Century*. New York: Grove Press.

- Descartes, R. (1972 [1662]). *Treatise on Man* (T. S. Hall, Trans.). Cambridge, MA: Harvard University Press.
- Dickson, D. (1986). Technology and the Construction of Social Reality. In L. Levidow (Ed.), *Radical Science Essays* (pp. 15-37). London: Free Association Books.
- Dodge, M., & Kitchin, R. (2005). Code and the transduction of space. *Annals of the Association of American Geographers*, 95(1), 162-180.
- Dodge, M., & Kitchin, R. (2007). "Outlines of a world coming into existence": pervasive computing and the ethics of forgetting. *Environment and Planning B: Planning and Design*, 34(3), 431-445.
- Donk, J., & Wim, B. H. (2004). *Cyberprotest: New Media, Citizens and Social Movements*. London: Routledge.
- Donnelly, H. (2008). Preparing Combat Forces for the Electromagnetic Spectrum: Interview with Major General William T. Lord Commander Air Force Cyberspace Command. *Military Information Technology (Online Edition)*, 12(3).
- Downey, J., & Fenton, N. (2003). New media, counter publicity and the public sphere. *New Media & Society*, 5(2), 185-202.
- Eco, U. (1998 [1980]). *The Name of the Rose* (W. Weaver, Trans.). London: Vintage.
- Egginton, W. (2003). *How the World Became a Stage: Presence, Theatricality, and the Question of Modernity*. Albany: SUNY Press.
- Elam, M. (1999). Living Dangerously with Bruno Latour in a Hybrid World. *Theory, Culture & Society*, 16(4), 1-24.
- Elias, N. (1992). *Time: An Essay*. Oxford: Blackwell.
- Ellul, J. (1964). *The Technological Society* (J. Wilkinson, Trans.). New York: Vintage.
- Ellul, J. (1980). The "Autonomy" of the Technological Phenomenon. In R. Scharff & V. Dusek (Eds.), *Philosophy of Technology: the technological condition: an anthology* (pp. 386-397). Oxford: Blackwell.
- Elmer, G. (2003). A diagram of panoptic surveillance. *New Media & Society*, 5(2), 231-247.
- Emirbayer, M., & Sheller, M. (1999). Publics in History. *Theory and Society*, 28, 145 - 197.

- Feenberg, A. (1996). *Heidegger, Habermas, and the Essence of Technology*. Retrieved 30 January, 2006, from <http://www-rohan.sdsu.edu/faculty/feenberg/kyoto.html>
- Feenberg, A. (2002). *Transforming Technology: a critical theory revisited*. Oxford: Oxford University Press.
- Feenberg, A., & Hannay, A. (1995). *Technology and the Politics of Knowledge*. Bloomington: Indiana University Press.
- Flusser, V. (1999). *The Shape of Things: A Philosophy of Design* (M. Pawley, Trans.). London: Reaktion Books.
- Flusser, V. (2002). *Writings* (E. Eisel, Trans.). Minneapolis: University of Minnesota Press.
- Fraser, N. (1992). Rethinking the Public Sphere. In C. Calhoun (Ed.), *Habermas and the Public Sphere* (pp. 109-142). Cambridge, MA: MIT Press.
- Freed, M. (2003). Latour, Musil, and the Discourse of Non Modernity. *Symploke*, 11(1-2), 183-196.
- Freedberg, D. (2002). *The Eye of the Lynx: Galileo, His Friends, and the Beginnings of Modern Natural History*. Chicago: University of Chicago Press.
- Fusco, C. (2004). *Questioning the Frame: Thoughts about maps and spatial logic in the global present*. Retrieved 20 June, 2006, from <http://www.inthesetimes.com/site/main/article/1750/>
- Galison, P. (1998). Judgment against Objectivity. In C. Jones & P. Galison (Eds.), *Picturing science, producing art*. New York: Routledge.
- Galison, P. (2003). *Einstein's Clocks, Poincare's Maps: Empires of Time*. New York: W. W. Norton & Company.
- Galloway, A. (2006). *Of Seams and Scars: Tracing Technological Boundaries and Points of Attachment*. Retrieved 12 March, 2007, from http://www.purselipsquarejaw.org/papers/galloway_fleshingout.pdf
- Galloway, A., & Ward, M. (2006). Locative Media As Socialising And Spatializing Practice: Learning From Archaeology. *Leonardo Electronic Almanac*, 14(03), 23-24.
- Galloway, A. R. (2004). *Protocol: how control exists after decentralization*. Cambridge, MA: MIT Press.

- Galloway, A. R. (2005). Global Networks and the Effects on Culture. *Annals*, 597(January), 19-31.
- Galloway, A. R. (2006a). *Gaming: Essays On Algorithmic Culture*. Minneapolis: University of Minnesota Press.
- Galloway, A. R. (2006b). Language Wants To Be Overlooked: On Software and Ideology. *Journal of Visual Culture*, 5(3), 315-331.
- Galloway, A. R. (2006c). *Warcraft and Utopia*. Retrieved 18 March, 2007, from www.ctheory.net/articles.aspx?id=507
- Galloway, A. R., & Thacker, E. (2004). *The Limits of Networking: A reply to Lovink and Schneider's "Notes on the State of Networking"*. Retrieved 25 March, 2004, from <http://www.nettime.org/Lists-Archives/nettime-l-0403/msg00090.html>
- Galloway, A. R., & Thacker, E. (2007). *The Exploit: A Theory of Networks*. Minneapolis: University of Minnesota Press.
- Gane, N. (2005). Radical Post-humanism: Friedrich Kittler and the Primacy of Technology. *Theory, Culture & Society*, 22(3), 25-41.
- Garreau, J. (2007, Sunday, May 6). Bots on The Ground: In the Field of Battle (Or Even Above It), Robots Are a Soldier's Best Friend. *The Washington Post*.
- Gibson, W. (1984). *Neuromancer*. New York: Ace Books.
- Gibson, W. (1987). *Count Zero*. New York: Ace Books.
- Giddens, A. (1984). *The Constitution of Society*. Cambridge: Polity.
- Giddens, A. (1990). *The Consequences of Modernity*. Cambridge: Polity.
- Giddens, A. (1991). *Modernity and Self-identity: Self and Society in the Late Modern Age*. Cambridge: Polity.
- Gleick, J. (1999). *Faster: The Acceleration of Just About Everything*. New York: Abacus.
- Goffman, E. (1974). *Frame Analysis: An Essay on the Organization of Experience*. Cambridge, MA: Harvard University Press.
- Gomert, E., & Hennion, A. (1999). A sociology of attachment: music amateurs and drug addicts. In J. Law & J. Hassard (Eds.), *Actor Network Theory and After* (pp. 220-247). Oxford: Blackwell.

- Gotved, S. (2006). Time and Space in Cyber Social Reality. *New Media & Society*, 8(3), 467-486.
- Graham, S. (2004). Beyond the "dazzling light": from dreams of transcendence to the "remediation" of urban life. *New Media & Society*, 6(1), 16–26.
- Graham, S., & Thrift, N. (2007). Out of Order: Understanding Repair and Maintenance. *Theory, Culture & Society*, 24(3), 1-25.
- Greenfield, A. (2006). *Everyware : The Dawning Age of Ubiquitous Computing*. Berkeley, CA: New Riders Press.
- Griffin, D. R. (Ed.). (1986). *Physics and the Ultimate Significance of Time: Bohm, Prigogine, and Process Philosophy*. Albany: SUNY Press.
- Grosz, E. (2001). *Architecture From the Outside: Essays on Virtual and Real Space*. Cambridge, MA: The MIT Press.
- Habermas, J. (1998). *The Inclusion of the Other: Studies in Political Theory* (C. Cronin & P. De Greiff, Trans.). Cambridge: Polity.
- Halewood, M. (2005). A.N. Whitehead, Information and Social Theory. *Theory, Culture & Society*, 22(6), 73–94.
- Hanafi, Z. (2000). *The monster in the machine: magic, medicine, and the marvelous in the time of the scientific revolution*. Durham: Duke University Press.
- Hansen, M. (2002). Wearable Space. *Configurations*, 10, 321-370.
- Harada, T. (2000). Space, materials, and the 'social': in the aftermath of a disaster. *Environment and Planning D: Society and Space*, 18, 205 - 212.
- Haraway, D. (1989). *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. New York: Routledge.
- Haraway, D. (1991). The Actors are Cyborg, Nature is Coyote, and the Geography is Elsewhere: Postscript to "Cyborgs at Large". In C. Penley & A. Ross (Eds.), *Technoculture* (pp. 21-26). Minneapolis, MN: University of Minnesota Press.
- Haraway, D. (1994). A Game of Cat's Cradle: Science Studies, Feminist Theory, Cultural Studies. *Configurations*, 2(1), 59-71.
- Haraway, D. (2003). *The Companion Species Manifesto: dogs, people and significant otherness*. Chicago: Indiana University Press.
- Hardt, M., & Negri, A. (2000). *Empire*. Cambridge, MA: Harvard University Press.

- Hardt, M., & Negri, A. (2004). *Multitude: War and Democracy in the Age of Empire*. New York: The Penguin Press.
- Harrison, S., Pile, S., & Thrift, N. (2004). *Patterned Ground: entanglements of nature and culture*. London: Reaktion.
- Harvey, D. (1989). *The Condition of Postmodernity: an enquiry into the origins of cultural change*. Oxford: Blackwell.
- Hassan, R. (2003). *The Chronoscopic Society: Globalization, Time and Knowledge in the Network Economy*. New York: Lang.
- Hassan, R. (2005). *Timescapes of the Network Society*. Retrieved 15 June, 2007, from http://www.uta.edu/huma/agger/fastcapitalism/1_1/hassan.html
- Hayles, N. K. (1994). Boundary Disputes: Homeostasis, Reflexivity, and the Foundations of Cybernetics. *Configurations*, 2(3), 441-467.
- Hayles, N. K. (1999). *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. Chicago: University of Chicago Press.
- Hayles, N. K. (2002). *Writing Machines*. Cambridge, MA: The MIT Press.
- Hayles, N. K. (2005). Computing the Human. *Theory, Culture & Society*, 22(1), 131-151.
- Hayles, N. K. (2006). Unfinished Work: From Cyborg to Cognisphere. *Theory, Culture & Society*, 23(7-8), 159-166.
- Haythornthwaite, C., & Wellman, B. (2001). *The internet in everyday life*. Thousand Oaks, CA: Sage Publications.
- Heath, J., & Potter, A. (2005). *The Rebel Sell: Why the Culture Can't be Jammed*. Chichester, England: Capstone.
- Heidegger, M. (1967). *What Is a Thing?* (W. B. Barton Jr. & V. Deutsch, Trans.). Chicago: Gateway Books.
- Heidegger, M. (1972). *Of Time and Being* (J. Stambaugh, Trans.). New York: Harper and Row.
- Heidegger, M. (1977). *The Question Concerning Technology, and Other Essays* (W. Lovitt, Trans.). New York: Garland Publishing.
- Hetherington, K., & Lee, N. (2000). Social order and the blank figure. *Environment and Planning D: Society and Space*, 18, 169 - 184.

- Holmes, B. (2003). *Imaginary Maps, Global Solidarities*. Retrieved 31 August, 2006, from <http://pzwart.wdka.hro.nl/mdr/pubsfolder/bhimaginary/>
- Holmes, B. (2004). *Drifting Through the Grid: Psychogeography and Imperial Infrastructure*. Retrieved 13 June, 2006, from http://www.springerlin.at/dyn/heft_text.php?textid=1523&lang=en
- Holmes, B. (2006a). Counter Cartographies. In J. Abrams & P. Hall (Eds.), *Else/Where: Mapping New Cartographies of Networks and Territories* (pp. 20-25). Minneapolis, MN: University of Minnesota Design Institute.
- Holmes, B. (2006b). *Flowmaps, The Imaginaries of Global Integration*. Retrieved 8 September, 2006, from <http://pzwart.wdka.hro.nl/mdr/pubsfolder/bhflowmaps/>
- Horkheimer, M., & Adorno, T. (1972). *Dialectic of Enlightenment* (J. Cumming, Trans.). New York: Continuum.
- Huizinga, J. (1955). *Homo Ludens: A Study of the Play-Element in Culture*. Boston: Beacon Press.
- Ingold, T. (1995). Building, Dwelling, Living: How Animals and People Make Themselves at Home in the World. In M. Strathern (Ed.), *Shifting Contexts: Transformations in Anthropological Knowledge* (pp. 57-80). London: Routledge.
- Ingold, T. (2000). *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill*. London: Routledge.
- Ito, M. (2006). Introduction: Networked Publics. In K. Varnelis (Ed.), *Networked Publics*. Los Angeles: Annenberg Center of Communication, University of Southern California.
- ITU. (2005). *International Telecommunication Union Internet Reports 2005: The Internet of Things*. Retrieved 22 June, 2007, from http://www.itu.int/osg/spu/publications/internetofthings/InternetofThings_summary.pdf
- Jensen, C. B. (2004). A Nonhumanist Disposition: On Performativity, Practical Ontology, and Intervention. *Configurations*, 12, 229–261.
- Jordan, T. (1999). *Cyberpower: the culture and politics of cyberspace and the Internet*. London: Routledge.

- Jordan, T., & Taylor, P. A. (2004). *Hacktivism and Cyberwars: rebels with a cause?* London: Routledge.
- Kahn, R., & Kellner, D. (2004). New media and internet activism: from the 'Battle of Seattle' to blogging. *New Media & Society*, 6(1), 87-95.
- Kanigel, R. (1999). *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency*. New York: Penguin Books.
- Kant, I. (1934 [1787]). *Critique of pure reason* (J. M. D. Meiklejohn, Trans.). London: Dent.
- Katti, C. (2006). Mediating Political "Things," and the Forked Tongue of Modern Culture: A Conversation with Bruno Latour. *Art Journal*, 65(1), 94-115.
- Kauffman, S. (1995). *At home in the universe: the search for laws of self-organization and complexity*. New York: Oxford University Press.
- Kauffman, S. (2000). *Investigations*. Oxford: Oxford University.
- Kay, L. E. (2000). *Who Wrote the Book of Life? A History of the Genetic Code*. Stanford: Stanford University Press.
- Kellner, D. (1989). *Critical Theory, Marxism, and Modernity*. Cambridge: Polity Press.
- Kellner, D. (1995). *Media Culture*. London: Routledge.
- Kellner, D. (2001). *Grand Theft 2000*. Lanham, Md.: Rowman and Littlefield.
- Kellner, D. (2002). Theorizing Globalization. *Sociological Theory*, 20, 285-305.
- Kellner, D. (2003). *Media Spectacle*. London: Routledge.
- Kellner, D. (2005). Media Culture and the Triumph of the Spectacle. *Fast Capitalism*, 1(1).
- Kelly, K. (2005, August 2005). We Are The Web. *Wired*, 13.08.
- Khong, L. (2003). Actants and enframing: Heidegger and Latour on technology. *Studies in History and Philosophy of Science*, 34, 693-704.
- King, J. (2006). The Node Knows. In J. Abrams & P. Hall (Eds.), *Else/Where: Mapping New Cartographies of Networks and Territories* (pp. 44-49). Minneapolis, MN: University of Minnesota Design Institute.
- Kittler, F. (1992). *Discourse Networks, 1800/1900* (M. Metteer & C. Cullens, Trans.). Stanford, CA: Stanford University Press.

- Kittler, F. (1997a). *Literature, Media, Information Systems* (J. Johnston, Trans.). Amsterdam: G+B Arts International.
- Kittler, F. (1997b). There is No Software (J. Johnston, Trans.). In J. Johnston (Ed.), *Literature, Media, Information Systems*. Amsterdam: G+B Arts International.
- Kittler, F. (1999). *Gramophone, Film, Typewriter* (G. Winthrop -Young & M. Wutz, Trans.). Stanford, CA: Stanford University Press.
- Kittler, F. (2006). Lightning and Series – Event and Thunder. *Theory, Culture & Society*, 23(7-8), 63-74.
- Kittler, W. (2002). The Dioskuroi: Masters of the Information Channel. *Configurations*, 10, 111-127.
- Klein, N. (2000). *No Logo*. New York: Flamingo.
- Klein, N. (2007). *The shock doctrine: the rise of disaster capitalism*. London: Allen Lane.
- Kluitenberg, E. (2006). The network of waves: living and acting in a hybrid space. *Open*, 11, 6–17.
- Kluitenbrouwer, K. (2006). RFID & agency: the cultural and social possibilities of RFID. *Open*, 11, 50-59.
- Knorr Cetina, K. (2005). Complex Global Microstructures: The New Terrorist Societies. *Theory, Culture & Society*, 22(5), 213-234.
- Kramer, S. (2006). The Cultural Techniques of Time Axis Manipulation: On Friedrich Kittler's Conception of Media. *Theory, Culture & Society*, 23(7-8), 93-109.
- Kroker, A. (2002). *Hyper-Heidegger*. Retrieved 20 September, 2005, from www.ctheory.net/articles.aspx?id=348
- Kroker, A. (2004). *The Will to Technology and the Culture of Nihilism. Heidegger, Nietzsche, and Marx*. Toronto: University of Toronto Press.
- Kubrick, S. (1968). 2001: A Space Odyssey. USA: Warner Brothers.
- Kwa, C. (2002). Romantic and Baroque Conceptions of Complex Wholes in the Sciences. In J. Law & A. Mol (Eds.), *Complexities: Social Studies of Knowledge Practices* (pp. 23-52). Durham: Duke University Press.
- Lash, S. (2002). *Critique on Information*. London: Sage.

- Latour, B. (1987). *Science in Action: how to follow scientists and engineers through society*. Milton Keynes, UK: Open University Press.
- Latour, B. (1988a). *How to write 'The Prince' for Machines as well as for Machinations*. Retrieved 13 September, 2005, from <http://www.ensmp.fr/~latour/articles/article/036.html>
- Latour, B. (1988b). Opening one eye while closing the other: a note on some religious paintings. In G. Fyfe & J. Law (Eds.), *Picturing Power: Visual Depiction and Social Relations (Sociological Review Monographs)* (Vol. 35, pp. 15-38). London: Routledge.
- Latour, B. (1988c). *The Pasteurization of France (with Irreductions)* (A. Sheridan & J. Law, Trans.). Cambridge, MA: Harvard University Press.
- Latour, B. (1989). The Enlightenment without the critique: a word on Michel Serres' philosophy. In A. P. Griffiths (Ed.), *Contemporary French Philosophy* (pp. 83-98). Cambridge: Cambridge University Press.
- Latour, B. (1991). Technology is society made durable. In J. Law (Ed.), *A Sociology of Monsters: Essays on Power, Technology and Domination (Sociological Review Monographs)* (Vol. 38, pp. 103-131). London: Routledge.
- Latour, B. (1992). Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts. In W. E. Bijker & J. Law (Eds.), *Shaping Technology / Building Society: Studies in Sociotechnical Change* (pp. 225-258). Cambridge, MA: The MIT Press.
- Latour, B. (1993). *We Have Never Been Modern* (C. Porter, Trans.). Cambridge, MA: Harvard University Press.
- Latour, B. (1995). A Door Must Be Either Open or Shut: A Little Philosophy of Techniques. In A. Feenberg & A. Hannay (Eds.), *Technology and the Politics of Knowledge* (pp. 272-281). Bloomington: Indiana University Press.
- Latour, B. (1996). *Aramis: or the Love of Technology* (C. Porter, Trans.). Cambridge, MA: Harvard University Press.
- Latour, B. (1997). Trains of thought: Piaget, Formalism and the Fifth Dimension. *Common Knowledge*, 6(3), 170-191.

- Latour, B. (1998a). How to Be Iconophilic in Art, Science, and Religion? In C. Jones & P. Galison (Eds.), *Picturing science, producing art* (pp. 418-440). New York: Routledge.
- Latour, B. (1998b). *On Actor Network Theory: A few clarifications (part 1)*. Retrieved 13 September, 2006, from <http://www.nettime.org/Lists-Archives/nettime-l-9801/msg00019.html>
- Latour, B. (1998c). *On Actor Network Theory: A few clarifications (part 2)*. Retrieved 13 September, 2006, from <http://www.nettime.org/Lists-Archives/nettime-l-9801/msg00020.html>
- Latour, B. (1999a). *Factures/Fractures: From the Concept of Network to that of Attachment*. Retrieved 12 May, 2006, from <http://www.ensmp.fr/~latour/articles/article/76-GB-RES.html>
- Latour, B. (1999b). On recalling ANT. In J. Law & J. Hassard (Eds.), *Actor Network Theory and After* (pp. 15-25). Oxford: Blackwell Publishers.
- Latour, B. (1999c). *Pandora's Hope: Essays on the reality of science studies*. Cambridge, MA: Harvard University Press.
- Latour, B. (2002a). Gabriel Tarde and the End of the Social. In P. Joyce (Ed.), *The Social in Question: New Bearings in History and the Social Sciences* (pp. 117-132). London: Routledge.
- Latour, B. (2002b). Morality and Technology: The End of the Means. *Theory, Culture & Society*, 19(5-6), 247-260.
- Latour, B. (2002c). What is iconoclasm? Or is there a world beyond the image wars? In B. Latour & P. Weibel (Eds.), *Iconoclasm: Beyond the Image Wars in Science, Religion, and Art* (pp. 14-37). Cambridge, MA: MIT Press.
- Latour, B. (2003). The Promises of Constructivism. In D. Ihde (Ed.), *Chasing Technology: Matrix of Materiality* (pp. 27-46). Bloomington: Indiana University Press.
- Latour, B. (2004a). How to Talk About the Body? The Normative Dimension of Science Studies. *Body & Society*, 10(2), 205-229.
- Latour, B. (2004b). Nonhumans. In S. Harrison, S. Pile & N. Thrift (Eds.), *Patterned Ground: entanglements of nature and culture* (pp. 224-227). London: Reaktion.

- Latour, B. (2004c). *Politics of Nature: how to bring the sciences into democracy* (C. Porter, Trans.). Cambridge, MA: Harvard University Press.
- Latour, B. (2004d). Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern. *Critical Inquiry*, 30(2), 225-248.
- Latour, B. (2005a). From Realpolitik to Dingpolitik, or, How to Make Things Public. In B. Latour & P. Weibel (Eds.), *Making Things Public: Atmospheres of Democracy* (pp. 14-43). Cambridge, MA: MIT Press.
- Latour, B. (2005b). *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
- Latour, B. (2005c). What is Given in Experience? *Boundary*, 2(32), 223–237.
- Latour, B. (2005d). *What is the style of matters of concern? Two lectures in empirical philosophy*. Retrieved 7 November, 2006, from <http://www.bruno-latour.fr/articles/article/97-STYLE-MATTERS-CONCERN.pdf>
- Latour, B., & Hermant, E. (2006). *Paris: Invisible City*. Retrieved 19 July, 2006, from <http://www.bruno-latour.fr/virtual/EN/index.html>
- Latour, B., & Weibel, P. (Eds.). (2005). *Making Things Public: Atmospheres of Democracy*. Karlsruhe and Cambridge, MA: ZKM and The MIT Press.
- Latour, B., & Woolgar, S. (1979). *Laboratory Life: The Social Construction of Scientific Facts*. London: Sage.
- Law, J. (1986). On the Methods of Long Distance Control: Vessels, Navigation, and the Portuguese Route to India. In J. Law (Ed.), *Power, Action and Belief* (pp. 234-263). London: Routledge and Kegan Paul.
- Law, J. (1987). Technology and Heterogeneous Engineering: The Case of Portuguese Expansion. In W. E. Bijker, T. P. Hughes & T. J. Pinch (Eds.), *The Social Construction of Technological Systems: new directions in the sociology and history of technology* (pp. 111-134). Cambridge, MA: The MIT Press.
- Law, J. (1992). Notes on the theory of the actor network: ordering, strategy and heterogeneity. *Systems Practice*, 5, 379 - 393.
- Law, J. (1997). *Topology and the Naming of Complexity*. Retrieved 12 July, 2007, from <http://www.comp.lancs.ac.uk/sociology/papers/Law-Topology-and-Complexity.pdf>

- Law, J. (1999a). After ANT: complexity, naming and topology. In J. Law & J. Hassard (Eds.), *Actor Network Theory and After* (pp. 1-14). Oxford: Blackwell Publishers.
- Law, J. (1999b). *Materialities, Spatialities, Globalities*. Retrieved 5 July, 2007, from <http://www.comp.lancs.ac.uk/sociology/papers/Law-Hetherington-Materialities-Spatialities-Globalities.pdf>
- Law, J. (2000a). *Ladbroke Grove, Or How to Think about Failing Systems*. Retrieved 25 April, 2007, from <http://www.comp.lancs.ac.uk/sociology/papers/Law-Ladbroke-Grove-Failing-Systems.pdf>
- Law, J. (2000b). *Networks, Relations, Cyborgs: on the Social Study of Technology*. Retrieved 15 July, 2007, from <http://www.comp.lancs.ac.uk/sociology/papers/Law-Networks-Relations-Cyborgs.pdf>
- Law, J. (2000c). On the Subject of the Object: Narrative, Technology, and Interpellation. *Configurations*, 8, 1-29.
- Law, J. (2000d). Transitivity. *Environment and Planning D: Society and Space*, 18, 133 - 148.
- Law, J. (2002). Objects and Spaces. *Theory, Culture & Society*, 19(5-6), 91-105.
- Law, J. (2004a). *After Method: Mess in Social Science Research*. London: Routledge.
- Law, J. (2004b). And if the global were small and noncoherent? Method, complexity, and the baroque. *Environment and Planning D: Society and Space*, 22(13-26).
- Law, J., & Bijker, W. E. (1992). Postscript: Technology, Stability, and Social Theory. In J. Law & W. E. Bijker (Eds.), *Shaping Technology / Building Society: Studies in Sociotechnical Change* (pp. 290-308). Cambridge, MA: The MIT Press.
- Law, J., & Hassard, J. (1999). *Actor Network Theory and After*. Oxford: Blackwell Publishers.
- Law, J., & Mol, A. (2002a). *Complexities: Social Studies of Knowledge Practices*. Durham: Duke University Press.
- Law, J., & Mol, A. (2002b). Local entanglements or utopian moves: an inquiry into train accidents. In M. Parker (Ed.), *Utopia and Organization* (pp. 82 - 105). Oxford: Blackwell.

- Law, J., & Singleton, V. (2000). Performing Technology's Stories: On Social Constructivism, Performance, and Performativity. *Technology and Culture*, 41(4), 765-775.
- Law, J., & Singleton, V. (2003). *Object Lessons*. Retrieved 2 July, 2007, from <http://www.comp.lancs.ac.uk/sociology/papers/Law-Singleton-Object-Lessons.pdf>
- Lee, H. (1999). Time and information technology: Monochronicity, polychronicity and temporal symmetry. *European Journal of Information Systems*, 8, 16-26.
- Lee, N., & Brown, S. (1994). Otherness and the actor-network: the undiscovered continent. *American Behavioral Scientist*, 37, 772 - 790.
- Lenoir, T. (1994). Was the Last Turn The Right Turn? The Semiotic Turn and A. J. Greimas. *Configurations*, 2(1), 119-136.
- Lenoir, T. (Ed.). (1998). *Inscribing Science: Scientific Texts and the Materiality of Communication*. Stanford, CA: Stanford University Press.
- Leroi-Gourhan, A. (1993). *Gesture and Speech* (A. B. Berger, Trans.). Cambridge, MA: The MIT Press.
- Lessig, L. (2001). *The Future of Ideas: The fate of the commons in a connected world*. New York: Random House.
- Lessig, L. (2004). *Free culture: how big media uses technology and the law to lock down culture and control creativity*. New York: Penguin Press.
- Lessig, L. (2006). *Code: And Other Laws of Cyberspace, Version 2.0*. New York: Basic Books.
- Liang, L. (2004). *Guide to Open Content Licences*. Rotterdam: Piet Zwart Institute.
- Lippmann, W. (2002 [1927]). *The Phantom Public*. New Brunswick and London: Transaction Publishers.
- Liu, A. (2004). Transcendental Data: Toward a Cultural History and Aesthetics of the New Encoded Discourse. *Critical Inquiry*, 31(August), 49-84.
- Liu, H., & Maes, P. (2005). *InterestMap: Harvesting Social Network Profiles for Recommendations*. Retrieved 10 August, 2006, from <http://web.media.mit.edu/~hugo/publications/papers/BP2005-hugo-interestmap.pdf>

- Lotman, Y. (1990). *Universe of the Mind: A Semiotic Theory of Culture* (A. Shukman, Trans.). Bloomington: Indiana University Press.
- Lovink, G., & Rossiter, N. (2005). *Dawn of the Organised Networks*. Retrieved 14 October, 2005, from http://journal.fibreculture.org/issue5/lovink_rossiter.html
- Lunenfeld, P. (2005). *User: InfoTechnoDemo*. Cambridge, MA: MIT Press.
- Lüthy, C., Murdoch, J. E., & Newman, W. R. (Eds.). (2001). *Late Medieval and Early Modern Corpuscular Matter Theories*. Boston: Brill.
- Ma, M. (2000). "The Past Is No Longer Out-of-Date": Topological Time and Its Foldable Nearness in Michel Serres's Philosophy. *Configurations*, 8(2), 235-244.
- Mackenzie, A. (1996). Undecidability: The History and Time of the Universal Turing Machine. *Configurations*, 4(3), 359-379.
- Mackenzie, A. (2002). *Transductions: Bodies and Machines at Speed*. London: Continuum.
- Mackenzie, A. (2005a). The Performativity of Code: Software and Cultures of Circulation. *Theory, Culture & Society*, 22(1), 71-92.
- Mackenzie, A. (2005b). The Problem of the Attractor: A Singular Generality between Sciences and Social Theory. *Theory, Culture & Society*, 22(5), 45-65.
- Mackenzie, A. (2005c). *Protocols and the irreducible traces of embodiment: the Viterbi algorithm and the mosaic of machine time*. Retrieved 12 May, 2007, from <http://www.lancs.ac.uk/staff/mackenza/papers/Mackenzie-algorithmic-time.pdf>
- MacKenzie, D. (1984). Marx and the Machine. *Technology and Culture*, 25, 473-502.
- Manovich, L. (1999). Database as Symbolic Form. *Convergence*, 5(2), 80-99.
- Manovich, L. (2002a). *The Language of New Media*. Boston: The MIT Press.
- Manovich, L. (2002b). *The Poetics of Augmented Space: Learning from Prada*. Retrieved 10 June, 2006, from http://www.manovich.net/DOCS/augmented_space.doc
- Manovich, L. (2006). The poetics of urban media surfaces. *First Monday*(Special Issue 4).
- Marcuse, H. (1964). *One-Dimensional Man*. Boston: Beacon Press.

- Marres, N. (2003). *As power becomes traceable: raising the stakes on critique*. Retrieved 24 October, 2005, from http://www.n5m.org/n5m4/dox/n5m_reader.pdf
- Marres, N. (2005). Issues Spark a Public into Being: A Key But Often Forgotten Point of the Lippmann-Dewey Debate. In B. Latour & P. Weibel (Eds.), *Making Things Public: Atmospheres of Democracy* (pp. 208-217). Karlsruhe and Cambridge, MA: ZKM and The MIT Press.
- Martin, A. (2005). Agents in Inter-Action: Bruno Latour and Agency. *Journal of Archaeological Method and Theory*, 12(4), 283-311.
- May, J., & Thrift, N. (2001). *TimeSpace: Geographies of Temporality*. London: Routledge.
- McCue, C. (2005). Data mining and predictive analytics: battlespace awareness for the war on terror. *Defense Intelligence Journal*, 13(1-2), 47-63.
- McCullough, M. (2006). On Urban Markup: Frames Of Reference In Location Models For Participatory Urbanism. *Leonardo Electronic Almanac*, 14(03).
- McQuillan, M. (2001). Spectres of Poujade: Naomi Klein and the New International. *Parallax*, 7(3), 114-130.
- McTaggart, J. M. E. (1908). The Unreality of Time. *Mind*, 17, 457-474.
- Miller, D. (1990). The Myth of the machine: I. Technics and human development. In T. Hughes & A. Hughes (Eds.), *Lewis Mumford: Public Intellectual* (pp. 152-163). Oxford: Oxford University Press.
- Mitew, T. (2005). Beta-Utopian Order. *M/C Journal*, 7(6).
- Mitew, T. (2006). *Book review: Shaping Things*. Retrieved July, 2006, from <http://rccs.usfca.edu/bookinfo.asp?ReviewID=396&BookID=323>
- Mitew, T. (2008). Repopulating the map: why subjects and things are never alone. *Fibreculture Journal*, 2008(13).
- Mol, A., & Law, J. (1994). Regions, networks and fluids: anaemia and social topology. *Social Studies of Science*, 24, 641 - 671.
- Mol, A., & Law, J. (2000). Situated bodies and distributed selves: enacting hypoglycaemia. In M. Akrich & M. Berg (Eds.), *Bodies on Trial: Performances and Politics in Medicine and Biology*. Durham, NC: Duke University Press.

- Mol, A., & Law, J. (2004). Embodied Action, Enacted Bodies: The Example of Hypoglycaemia. *Body & Society*, 10(2-3), 43-62.
- Mol, A., & Law, J. (2005). Boundary variations: an introduction. *Environment and Planning D: Society and Space*, 23, 637 - 642.
- Morris, S. (1992). *Daidalos and the origins of Greek art*. Princeton: Princeton University Press.
- Morville, P. (2005a). *Ambient Findability*. Sebastopol, CA: O'Reilly Media.
- Morville, P. (2005b). *Ubiquitous Findable Objects*. Retrieved 31 October, 2006, from <http://www.oreillynet.com/pub/a/network/2005/11/17/ubiquitous-findable-objects.html>
- Morville, P. (2006). *A Garden of Forking Paths*. Retrieved 31 October, 2006, from <http://www.asis.org/Bulletin/Feb-06/morville.html>
- Mumford, L. (1966). Tool-Users vs. Homo Sapiens and The Megamachine. In R. Scharff & V. Dusek (Eds.), *Philosophy of Technology: the technological condition: an anthology* (pp. 344-352). Oxford: Blackwell.
- Mumford, L. (1967). *The Myth of the Machine: technics and human development*. New York: Harcourt.
- Murdoch, J. (1995). Actor-networks and the evolution of economic forms: combining description and explanation in theories of regulation, flexible spetialisation, and networks. *Environment and Planning, A*(27), 731-758.
- Murdoch, J. (1997). Inhuman/nonhuman/human: actor-network theory and the potential for a dualistic and symmetrical perspective on nature and society. *Environment and Planning D: Society and Space*, 15, 731 - 756.
- Murdoch, J. (1998). The spaces of actor-network theory. *Geoforum*, 29, 357 - 374.
- Ong, W. (1982). *Orality and Literacy: the technologizing of the word*. London: Routledge.
- Oshii, M. (1995). *Ghost in the Shell*. Japan: Bandai Visual.
- Oshii, M. (2004). *Ghost in the Shell: Innocence*. Japan: Bandai Visual.
- Oshii, M. (2006). *Ghost in the Shell: Solid State Society*. Japan: Bandai Visual.
- Pandya, V. (1990). Movement and Space: Andamanese Cartography. *American Ethnologist*, 17, 775-797.

- Pels, D. (2002). Everyday Essentialism: Social Inertia and the 'Münchhausen Effect'. *Theory, Culture & Society*, 19(5/6), 69-89.
- Pels, D., Hetherington, K., & Vandenberghe, F. (2002). The Status of the Object: Performances, Mediations, and Techniques. *Theory, Culture & Society*, 19(5/6), 1-21.
- Penrose, B. (1952). *Travel and Discovery in the Renaissance, 1420-1620*. Cambridge, MA: Harvard University Press.
- Phillips, A. (1999). *Darwin's Worms*. London: Faber and Faber.
- Pickering, A. (1995). *The Mangle of Practice: Time, Agency, and Science*. Chicago: University of Chicago Press.
- Polizzi, G. (2000). Hermetism, Messages, and Angels. *Configurations*, 8(2), 245-269.
- Porush, D. (1985). *The Soft Machine: cybernetic fiction*. London: Methuen.
- Poster, M. (1995). *The Second Media Age*. Cambridge, UK: Polity Press.
- Poster, M. (1997). Cyberdemocracy: The Internet and the Public Sphere. In D. Holmes (Ed.), *Virtual Politics: Identity and Community in Cyberspace* (pp. 212-228). London: Sage.
- Poster, M. (2001a). The Being of Technologies. In M. Poster (Ed.), *What's the Matter with the Internet?* (pp. 21-38). Minneapolis: University of Minnesota Press.
- Poster, M. (2001b). *The Information Subject*. Amsterdam: G+B Arts International.
- Poster, M. (2004). The Information Empire. *Comparative Literature Studies*, 41(3), 317-334.
- Poster, M. (2005). Who Controls Digital Culture? *Fast Capitalism*, 1(2).
- Rheingold, H. (1993). *The Virtual Community: Homesteading on the Electronic Frontier*. Reading, MA: Addison-Wesley.
- Rheingold, H. (2003). *Smart Mobs: The Next Social Revolution*. Cambridge, MA: Perseus.
- Richardson, J. (2005). Recombinant ANW: Appetites of Words. *Configurations*, 13, 117-133.
- Rogers, R. (2006). *Why Map? The Techno-epistemological outlook*. Retrieved 20 August, 2006, from <http://pzwart.wdka.hro.nl/mdr/pubsfolder/whymap/>

- Rolnik, S. (2005). *Sentimental Cartography*. Retrieved 31 August, 2006, from http://distributedcreativity.typepad.com/submap/2005/03/sentimental_car.html
- Rorty, R. (1979). *Philosophy and the Mirror of Nature*. Princeton: Princeton University Press.
- Rorty, R. (1982). *Consequences of Pragmatism*. Minneapolis: University of Minnesota Press.
- Rorty, R. (1989). *Contingency, Irony and Solidarity*. Cambridge: Cambridge University Press.
- Rorty, R. (1991a). *Essays on Heidegger and Others: Philosophical Papers II*. Cambridge: Cambridge University Press.
- Rorty, R. (1991b). *Objectivity, Relativism and Truth: Philosophical Papers I*. Cambridge: Cambridge University Press.
- Rorty, R. (1998). *Achieving our Country: Leftist Thought in Twentieth-Century America*. Cambridge, MA: Harvard University Press.
- Rorty, R. (2001). Justice as a Larger Loyalty. In M. Festenstein & S. Thompson (Eds.), *Richard Rorty, Critical Dialogues* (pp. 223-237). Cambridge, MA: Polity.
- Routledge, P. (2008). Acting in the network: ANT and the politics of generating associations. *Environment and Planning D: Society and Space*, 26, 199 - 217.
- Runciman, S. (1982). *The Medieval Manichee: a study of the Christian dualist heresy*. Cambridge: Cambridge University Press.
- Russell, B. (2003). *Headmap Manifesto 3 Redux*. Retrieved 20 September, 2006, from http://www.banffcentre.ca/bnmi/programs/archives/2003/wireless_laboratory/presentations/wireless_head_map_banff.pdf
- Serres, M. (1982). *Hermes: literature, science, philosophy* (J. Harari & D. Bell, Trans.). Baltimore, Maryland: Johns Hopkins University Press.
- Serres, M. (1995a). *Angels: a modern myth* (P. Hurd, Trans.). Paris: Flammarion.
- Serres, M. (1995b). *Genesis* (G. James & J. Nielson, Trans.). Ann Arbor: University of Michigan Press.
- Serres, M., & Latour, B. (1995). *Conversations on science, culture, and time* (R. Lapidus, Trans.). Ann Arbor: University of Michigan Press.
- Sha, W. (2005). Whitehead's Poetical Mathematics. *Configurations*, 13, 77-94.

- Shanks, M. (1992). *Experiencing the Past: on the character of archaeology*. London: Routledge.
- Shanks, M. (1998). *The life of an artifact*. Retrieved 10 September, 2006, from <http://traumwerk.stanford.edu/~mshanks/traumwerk/index.php/The%20life%20of%20an%20artifact>
- Shanks, M., & Tilley, C. (1993). *Re-constructing Archaeology: Theory and Practice*. London: Routledge.
- Shapin, S., & Schaffer, S. (1985). *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton: Princeton University Press.
- Shardlow, M., Fletcher, M., & Boden, R. (2002 [1989]). Blackadder. England: BBC Worldwide.
- Sheller, M. (2001). *The Mechanisms of Mobility and Liquidity: Re-thinking the Movement in Social Movements*. Retrieved 12 May, 2007, from <http://www.comp.lancs.ac.uk/sociology/papers/Sheller-Mechanisms-of-Mobility-and-Liquidity.pdf>
- Sheller, M. (2004). Mobile publics: beyond the network perspective. *Environment and Planning D: Society and Space*, 22, 39-52.
- Silverstone, R. (1994). *Television and Everyday Life*. London: Routledge.
- Silverstone, R., & Hirsch, E. (1992). *Consuming Technologies*. London: Routledge.
- Slater, D. (2002). Making Things Real: Ethics and Order on the Internet. *Theory, Culture & Society*, 19(5-6), 227-245.
- Sloterdijk, P. (2005). Atmospheric Politics. In B. Latour & P. Weibel (Eds.), *Making Things Public: atmospheres of democracy* (pp. 944-951). Karlsruhe and Cambridge, MA: ZKM and The MIT Press.
- Snow, D., & Benford, R. (1992). Master Frames and Cycles of Protest. In A. Morris & C. M. Mueller (Eds.), *Frontiers in Social Movement Theory* (pp. 133-155). New Haven, CT: Yale University Press.
- Stalder, F. (2005). *Open Cultures and the Nature of Networks*. Novi Sad: New Media Center_kuda.org.
- Stalder, F. (2006). *Manuel Castells and the Theory of the Network Society*. London: Polity Press.

- Star, S. L. (1991). Power, Technology and the Phenomenology of Conventions: On Being Allergic to Onions. In J. Law (Ed.), *A Sociology of Monsters: Power, Technology and the Modern World* (pp. 26-56). Oxford: Basil Blackwell.
- Stengers, I. (2000a). Another Look: Relearning to Laugh. *Hypatia*, 15(4), 41-54.
- Stengers, I. (2000b). *The Invention of Modern Science* (D. W. Smith, Trans.). Minneapolis: University of Minnesota Press.
- Stengers, I. (2005a). The Cosmopolitical Proposal. In B. Latour & P. Weibel (Eds.), *Making Things Public: atmospheres of democracy* (pp. 994-1003). Karlsruhe and Cambridge, MA: ZKM and The MIT Press.
- Stengers, I. (2005b). Whitehead's Account of the Sixth Day. *Configurations*, 13, 35-55.
- Sterling, B. (2002). *Tomorrow Now: envisioning the next 50 years*. New York: Random House.
- Sterling, B. (2005). *Shaping Things*. Cambridge, MA: MIT Press.
- Stiegler, B. (1998). *Technics and Time, 1: The Fault of Epimetheus* (R. Beardsworth & G. Collins, Trans.). Stanford, Cal.: Stanford University Press.
- Strathern, M. (2002). On Space and Depth. In J. Law & A. Mol (Eds.), *Complexities: Social Studies of Knowledge Practices* (pp. 88-115). Durham: Duke University Press.
- Strathern, M. (2004). *Partial Connections*. Walnut Creek, CA: AltaMira.
- Tamen, M. (2001). *Friends of Interpretable Objects*. Cambridge, MA.: Harvard University Press.
- Tarde, G. (1969). *On Communication and Social Influence: Selected Papers* (T. N. Clark, Trans.). Chicago: University of Chicago Press.
- Tarrow, S. (1998). *Power in movement: Social Movements and Contentious Politics*. Cambridge: Cambridge University Press.
- Terranova, T. (2001). Demonstrating the Globe: Virtual Action in the Network Society. In D. Holmes (Ed.), *Virtual Globalization* (pp. 95-113). London: Routledge.
- Teyssot, G. (2005). Hybrid Architecture: An Environment for the Prosthetic Body. *Convergence*, 11(4), 72-84.
- Thacker, E. (2004a). *Networks, Swarms, Multitudes v1*. Retrieved 10 June, 2005, from http://www.ctheory.net/text_file.asp?pick=422

- Thacker, E. (2004b). *Networks, Swarms, Multitudes v2*. Retrieved 10 June, 2005, from http://www.ctheory.net/text_file.asp?pick=423
- Thompson, L., & Cupples, J. (2008). Seen and not heard? Text messaging and digital sociality. *Social & Cultural Geography*, 9(1), 95 - 108.
- Thrift, N. (1996). *Spatial Formations*. London: Sage.
- Thrift, N. (1999). The Place of Complexity. *Theory, Culture & Society*, 16(3), 31-69.
- Thrift, N. (2000). Afterwords. *Environment and Planning D: Society and Space*, 18, 213 - 255.
- Thrift, N. (2006). Donna Haraway's Dreams. *Theory, Culture & Society*, 23(7-8), 189-195.
- Toews, D. (2003). The New Tarde: Sociology after the End of the Social. *Theory, Culture & Society*, 20(5), 81-98.
- Touraine, A. (2004). On the Frontier of Social Movements. *Current Sociology*, 52(4), 717-725.
- Turing, A. (1950). Computing Machinery and Intelligence. *Mind: A Quarterly Review of Psychology and Philosophy*, 59, 433-460.
- Turnbull, D. (1989). *Maps are territories, science is an atlas: a portfolio of exhibits*. Geelong, Victoria: Deakin University.
- Turnbull, D. (1991). *Mapping the World in the Mind: An Investigation of the Unwritten Knowledge of the Micronesian Navigators*. Geelong: Deakin University Press.
- Turnbull, D. (2000). *Masons, Tricksters and Cartographers: Comparative Studies in the Sociology of Scientific and Indigenous Knowledge*. Amsterdam: Harwood Academic Publishers.
- Turnbull, D. (2002). Construction of Places and Objects, Spaces and Knowledges: The Case of the Maltese Megaliths. *Theory, Culture & Society*, 19(5-6), 125-143.
- Tuters, M. (2005). *Locative Space: Situated and Interconnected*. Retrieved 23 May, 2007, from http://netpublics.annenberg.edu/?q=mtuters/blog/locative_space_situated_and_interconnected

- Tuters, M., & Varnelis, K. (2006). *Beyond Locative Media*. Retrieved 12 February, 2006, from http://netpublics.annenberg.edu/locative_media/beyond_locative_media
- Urry, J. (2005). The Complexity Turn. *Theory, Culture & Society*, 22(5), 1-14.
- Uys, J. (1980). *The Gods Must Be Crazy* [Motion Picture]. Botswana: Sony Pictures.
- Van Der Ploeg, I. (2004). 'Only Angels Can Do Without Skin': On Reproductive Technology's Hybrids and the Politics of Body Boundaries. *Body & Society*, 10(2-3), 153-181.
- van Weelden, D. (2006). Possible Worlds. In J. Abrams & P. Hall (Eds.), *Else/Where: Mapping New Cartographies of Networks and Territories* (pp. 26-29). Minneapolis, MN: University of Minnesota Design Institute.
- Vandenberghe, F. (2002). Reconstructing Humants: A Humanist Critique of Actant-Network Theory. *Theory, Culture & Society*, 19(5/6), 51-67.
- Varnelis, K., & Friedberg, A. (2006). *Place: Networked Place*. Retrieved 12 June, 2007, from <http://networkedpublics.org/book/place>
- Virilio, P. (1986). *Speed and Politics* (M. Polizzotti, Trans.). New York: Semiotext(e).
- Virilio, P. (1993). The Third Interval: A Critical Transition. In V. Conley (Ed.), *Rethinking Technologies* (pp. 3-13). Minnesota: University of Minnesota Press.
- Virilio, P. (1995). *The Art of the Motor* (J. Rose, Trans.). Minneapolis: University of Minnesota Press.
- Virilio, P. (2005). *Negative Horizon: an essay in dromoscopy* (M. Degener, Trans.). London: Continuum.
- Wachowski, A., & Wachowski, L. (1999). *The Matrix*. USA: Warner Brothers.
- Watts, D. J. (2004). *Six Degrees: The Science of a Connected Age*. New York: W. W. Norton & Company.
- Webster, C. (1982). *From Paracelsus to Newton: Magic and the Making of Modern Science*. Cambridge: Cambridge University Press.
- White, H. (1992). *Identity and Control: A Structural Theory of Social Action*. Princeton, NJ: Princeton University Press.
- Whitehead, A. N. (1920). *The Concept of Nature*. Cambridge: Cambridge University Press.

- Whitehead, A. N. (1938). *Modes of Thought*. Cambridge: Cambridge University Press.
- Whitehead, A. N. (1967). *Science and the Modern World*. New York: Free Press.
- Whitehead, A. N. (1967 [1933]). *Adventures of Ideas*. New York: Free Press.
- Whitehead, A. N. (1978 [1929]). *Process and Reality: An Essay in Cosmology (Gifford Lectures of 1927–8)* (corrected ed., David Ray Griffin and Donald W. Sherburne ed.). New York: Free Press.
- Whitrow, G. J. (1972). *What is time?* London: Thames and Hudson.
- Wiener, N. (1950). *The Human Use of Human Beings: cybernetics and society*. New York: Anchor Books.
- Wilson, M. I., & Corey, K. E. (2000). *Information Tectonics: Space, Place and Technology in an Electronic Age*. Chichester: John Wiley & Sons.
- Winner, L. (1980). Do Artifacts Have Politics? *Daedalus*, 109, 121-136.
- Wise, J. M. (1997). *Exploring Technology and Social Space*. Newbury Park: Sage.
- Woolgar, S. (2002). After Word? – On Some Dynamics of Duality Interrogation, Or: Why Bonfires Are Not Enough. *Theory, Culture & Society*, 19(5/6), 261-270.
- Yates, F. (1966). *The Art of Memory*. London: Routledge & Kegan Paul.
- Zielinski, S. (2006). *Deep Time of the Media: Towards an Archeology of Hearing and Seeing by Technical Means* (G. Custance, Trans.). Cambridge, MA: MIT Press.

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