SPACES, SPATIALITY AND TECHNOLOGY
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Spaces, Spatiality and Technology

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1. AN INTRODUCTION TO SPACES, SPATIALITY AND TECHNOLOGY

PHIL TURNER AND ELISABETH DAVENPORT

What are the concerns of those who investigate spatiality across domains and across media? What is significant in these concerns – particularly for the design and evaluation of technology? How are these concerns presented and represented? Can discourse from one domain inform work in another? These are some of the questions addressed in this volume. It is based on a series of papers presented at a research seminar in Edinburgh in December 2004. As the volume shows, the responses to our call for submissions were wide ranging, and the resulting meeting, we believe, opened up new avenues for exploring spatiality, spaces and technology.

THE ORGANIZATION OF THE BOOK

In structuring this volume, we have had to make decisions about clustering the contents. We start with a section on 'Philosophy of Information'. This opens with Coyne's chapter on the 'Digital Uncanny', a paper on the fundamental strangeness of computers that questions many of the prevailing tenets of design and analysis of virtual worlds such as design premised on familiarity and the everyday or the drive to photorealism in visual representation. Coyne suggests that our uneven grasp of virtual worlds is due as much to language as any essential qualities of the medium. This richly textured paper draws on a wide set of sources: phenomenology, psychoanalysis, aesthetics, design. It brings forth themes that are shared with other texts in our volume: the extent to which and ways in which space is socially shaped; the status and nature of our notions of infrastructure.

In the text that follows we explain our decisions in sorting the chapters, while, we hope, mitigating the possible bias in the discussion that ends the chapter of possible cross-links across the sections. We suggest that an important theme is the current re-working of notions of infrastructure - and the emergence of a different lexicon to describe relationships across multiple modalities. The 'new vocabulary' may need to accommodate a spectrum of activities rather than describing them in terms of opposites: ubiquitous computing that surrounds the body with devices or immersive computing that encloses the body; engineering based on artefacts for collaboration or communication for collaboration; Heidegger or Merleau-Ponty. We have, for the nonce, clustered the contents which come after Coyne's paper as follows: 'the social shaping of space'; 'infrastructure'; 'hybrid space'; 'virtual space'.

THE SOCIAL SHAPING OF SPACE

As we note above, a number of the contributors investigate ways in which space may be constituted by social practice, taking elements of the built environment as
technology. Brown and Laurier (chapter 3) discuss ways in which practice makes space in three case studies: the canal network in 19th century USA, the world of mobile workers and the work of a warehouse for storing parts. They call their chapter a 'meditation on Castells', and observe 'the wonder of how people stitch together networks from their own practices'.

Davenport and Buckner (chapter 4) discuss the social shaping of a very large computerised teaching laboratory, and the evolution of rules and norms that allow students and teachers to re-configure elements of classroom presence to accommodate an emerging primary agent - the machine.

Goulding, in contrast, in chapter 5 considers the public library as a Habermasian space where civic presence is nurtured and created. Her discussion is not totally utopian, however, as she expresses some misgivings about the idealistic visions that are summarised in the first part of her chapter in revealing the potential for conflict in multi-modal provision of services. There has been much discussion in the library domain about the civic status of public libraries.

McDougall (chapter 6) discusses the world of the 'new office space' and questions some of the naïve assumptions of planners who have failed to anticipate the effects of social shaping. Bucheker in chapter 7 shows that the local public place fulfils basically the same needs or functions for the local residents as the private home, in particular the regulation of identity, social interaction and social emotions - but on a more social level. This theme of the social shaping of the community or village space is continued by van Dorst in chapter 8 in the context of municipal planning. His focus on the notion of 'hosts' redresses an imbalance in discussions of territory that privilege 'occupation'.

Two chapters consider the shaping of space from the specific perspective of communication in science. Cronin addresses the relationship between intellectual and physical proxemics, an area that has been neglected by information scientists (with some notable exceptions such as Allen), though, as McDougall's paper indicates, it has been the focus of recent work in knowledge management. The technique that is the focus of Cronin's paper (chapter 9) - citation mapping - is one of the oldest applications of social network analysis, and the ways in which such maps impinge on practice are relatively under-explored. A further exploration of the 'transformation of a complex network into a linear sequence' is provided by Warner (chapter 10) in a discussion of writing and text ('surface') and elaborates on ways in which computing can more accurately support the social processes of science (discovery and justification, for example) by allowing us to juxtapose in multiple ways and thus identify consistencies and inconsistencies across related groups.

INFRASTRUCTURE
It is difficult to separate discussion of infrastructure from discussion of the philosophy of space, and it might be better treated as a subset of the latter. Traditionally, design of interface and infrastructure has taken place in separate worlds, as it were, with computerised work evaluated in terms of actors ('users' of 'artefacts') moving across a 'surface' that has been blackboxed as 'infrastructure',
separated by the exigencies of the design life cycle into another compartment, that makes invisible the (prior) technical work of engineers that is not directly pertinent to the application work of practitioners. More recently (and notably after the work of Greisemer and Star) the black box has been opened and infrastructure has been discussed in terms of the social relations of an extended group of actors that includes developers. Ethical and political issues are involved (cf accountable computing).

Writing broadly within this context, Day (chapter 11) proposes that the concept of 'surface' can assist us to explore space as the product of 'power and the affective and expressive role for materials', rather than the background to this. Surfaces are the 'variously textured...sites for mixtures between bodies', and are thus the 'sites for events'. The notions of 'folding' and 'foldability' and 'unpacking' are discussed at length, as metaphors that account for the interactions of bodies in space across time. Some of the contributors to this volume focus on ways in which we may experience multiple infrastructures. Dix and his colleagues, for example, in chapter 12 explore a complex of models - of spatial context, of 'mixed reality boundaries' and of human spatial understanding across a number of field projects that make up the Equator project to explain the ways in which co-existing multiple spaces are experienced.

HYBRID SPACE

Summerfield and Hayman (chapter 13) present an approach to representing visual context that is based on detailed physiological understanding of the physical role of lighting (as daylight is inherent in our experience of buildings) in what they call veridical synthetic imagery, or VSI, one of a range of simulations that are used to predict the performance of a building in context based on its specifications. Iacucci and Wagner (chapter 14) discuss the narrative configuration of design ideas within a physical environment, in a presentation of a teaching medium, inspired partly by project techniques from stage lighting, for architecture students. Technology here is part of a distributed cognition system, an approach almost diametrically opposed to that of Summerfield and Hayman. Ciolfi and Bannon (chapter 15) are interested in 'a concept of space that includes the way it is experienced by people' which is their way of defining 'place'. Their concerns are integral to the design of ubiquitous computing environments. Context is different from infrastructure as it is not something to be 'captured' but as something that is constituted by people within their specific activities and is thus not pre-computable. They have implemented these concepts in museum environments where technology contributes to experience in ways that are radically different from their role in conventional 'informatising' displays. Grasso and her colleagues (chapter 16) discuss technological support for informal communication and ad-hoc work in distributed, mobile teams. While these teams necessarily have fewer established opportunities to interact, smart, ubiquitous technology is sufficiently mature to augment the physical space to keep distributed groups connected. Smyth's paper (chapter 17) is similarly concerned with people's sense of space on encountering a novel landscape form in an Edinburgh public gallery. He concludes that the body is a 'key element in terms of how it mediates the comprehension of spaces and the layered meanings that transform them into spaces'
- cf Whitehead’s observations regarding the role of the body in integrating our perceptual experiences.

VIRTUAL SPACE AND PLACE

Zhang and Furnas unapologetically discuss ‘virtual space’ in chapter 18, and present a new model for design that is based unreservedly on the work of Benford et al. on spatial metaphors; Zhang and Furnas propose that multi-scale virtual environments (mVEs) as the 'next space', that will allow users to be 'gigants' or 'nanants' as circumstances require. Users can observe important characteristics of structures at different scales, and act on objects with different sizes easily. The parameters of avatar design for such environments are described together with the established vocabulary of interaction, namely, aura, nimbus and focus. Zhang and Furnas make a clear distinction between artefact-oriented and communication-oriented environments, and place their work in the context of collaboration in the former. Turner and his colleagues in the final chapter consider the challenge of recreating real places using virtual reality technology. They begin by discussing some the philosophical and empirical issues regarding relationship with place, focussing in part on the problematic role of the body. The metaphor of tourism is suggested as a means of dealing with the demands of recreating a real place.

CONCLUSION

Can we see the beginnings of an emerging interdisciplinary field of ‘spatiality studies’ in these contributions? We note above that many of the contributors are participants in the Presence research programme in the which may in itself prove to be a stimulus in the development of an interdisciplinary field. This shared background may explain a group of recurring HCI sources (e.g. Dourish, Dix, Carroll; Rogers, Agostini) that are cited across papers from the relevant contributors. A further group of recurring sources (e.g. Augé, Merleau-Ponty, Heidegger, Tuan and Bachelard) is cited in papers by Presence authors but also by writers with different disciplinary backgrounds. Lewis Carroll is one of this group, as the author of two texts that furnish examples to developers of cyberspaces and to designers of ambient computing devices. Carroll was first invoked in the HCI context by John Walker in a 1988 analysis of interaction ‘generations’ that exposes, with great prescience, a complex of issues that are highly pertinent to this collection.

REFERENCES

RICHARD COYNE

2. THE DIGITAL UNCANNY

INTRODUCTION

It is common to describe digital systems in spatial terms. In so far as these spaces are configured geometrically, they frequently exhibit properties that present as exaggerated, other-worldly, and disorienting. This can be by design or accident. One thinks of the mysterious and unsettling spaces expertly created through digital effects in films, the 3d environments of computer games, and putative virtual architectures (Lynch, 2002). For all the skill and artistry in such creations these spaces are capable of presenting in a manner that readily identifies as “uncanny.” This term was popularised by Freud (1990) in his description of certain unsettling aspects of everyday experience. It was taken up by the surrealists, and also developed independently in the phenomenology of Heidegger (1962). More recently, concepts of the uncanny have been investigated in the realms of spatiality and architecture by Vidler (1995) in his book The Architectural Uncanny, Augé on the theme of non-place (1995), Zizek (2002) on surveillance, and by Lovink (2002) and Waldby (1997) in the context of digital media. It seems that with the computer it is easier to create “uncanny environments” than their converse: spaces that are homely and familiar.

THE FAMILIAR AND THE UNFAMILIAR

Designers of 3d environments may actively pursue the uncanny. Arguably, the uncanny as a spatial category provokes and beguiles, and is presented to great effect in film and even mainstream architecture. Spatial representations that excite our curiosity as technically and aesthetically ingenious or spectacular in some sense flit along the boundary between the familiar and the unfamiliar, the calming and the anxious, the safe and the dangerous, conditions that have also been developed in aesthetic theory as pertaining to the sublime (Kant, 2000; Lyotard, 1986).

The tendency to manufacture the uncanny is particularly evident when observing the products of those new to the techniques of 3d computer modelling. Students readily produce scenes populated with platonic shapes hovering and colliding in space, richly patterned, photo-real in their shading, but surreal in the perfection of their edges, the independence of their elements, and resort easily to swirling forms, a strong separation between background and foreground, and arbitrary transparencies, that depict an other-worldly disturbance, the juxtaposition of the familiar with the unfamiliar. The tools seem to prescribe this, and if the effect sought is one of familiarity then it is only achieved against substantial resistance from this tendency towards the uncanny.

P. Turner and E. Davenport (Eds.), Spaces, Spatiality and Technology, 5-18.
Freud (1990) drew attention to the common understanding of the uncanny, as a feeling where something artificial presents to us as living, as in the case of a realistic doll or puppet (p.347). Digital effects in films, photorealistic computer rendering, and three-dimensional computer games can prompt us to remark on the uncanniness of the resemblances they invoke. We commonly describe as uncanny situations in which the imaginary presents to us as real, as in the case where a mechanical object seems to come to life, or in a situation of suspicion, where the innocently inert presents as malevolently living. This applies equally to visual and literary presentations (Kitchin and Kneale, 2001). We will subsequently draw out the role of terms such as “peculiar,” “similar,” “different,” “unfamiliar,” “real,” “spectacular,” and “suspicious.” It seems that any representation that relies for its impact on peculiar similarities and differences can be uncanny.

Are other media any more homely? Though childish and naïve art can present as strange, the inexpert and the primitive is not automatically uncanny. Familiar media such as photography, drawing, and modelling in clay have their acceptable amateur manifestations. They are media accessible to most, employing a language and subject matter that is already understood as familiar: family portraits (Rose, 2002), the child’s drawing adhered to the refrigerator, sculptures in plasticine, replete with finger prints. Of course, digital media can be used to mimic these, but in so far as computer graphics and modelling copy manual media they come across as even more alien, parodic and unsettling. Bolter and Grusin (2002) refer to these manifestations as re-mediations: one medium of representation informs another. Here my argument is that where this process is not yet absorbed into a well-established and familiar mode of practice then it can produce an outcome that is uncanny. As designers in the new medium of computer spaces it is difficult to resist the tendency to create or represent in ways that are disembodied, distant or surreal, in other words, as presentations of the uncanny.

I have been referring to three-dimensional representations of space on a flat screen or printout, but the same applies to other spaces: the space of interconnections that is the world-wide web, cyberspace as a vastly interconnected network, the social spaces and the implied environments of chat forums, the contracted and distorted telematic spaces of video conferencing, putative telepresence, and the oft times uncanny space of the computer desktop.

We began with a proposition about how an observer or creator might respond to depictions of space in digital media as uncanny. Even more controversial is the proposition that all media participate in the uncanny. Unfamiliarity is a key aspect of the interpretation of images in any case. Interpretation involves negotiation across a distance. The image, computer-generated or otherwise, already has aspects that are alien, unless or until, we become inured to the provocations they pose. Because computer imagery is still new, it helps to highlight the alien aspects of all media.

For Freud, wax museums, doll shops and mechanical experiments were insufficient for revealing the sources of the uncanny. In what follows I demonstrate the extent to which the uncanny aspects of the computer image can be said to reside in mimicry, repetition and suspicion, and how these are related. They are each subject to the workings of interpretation.
CONTrollable Spaces

The current state of computing is often presented as falling short of some ideal (Coyne, 1999). In the future, our interfacing with computers and their environments will be immediate, engaging, seamless and "real." So perhaps the weird, alien and uncanny aspects of computer graphics imagery represent a transient phase, pending more powerful machines, broader bandwidth, and better interfaces. The implication here is that photographic realism is the ideal, and is inhibited only by technical limitations. In the case of digital imagery the realism sought is generally of a mathematical and logical kind. But in so far as digital spaces are devised as exercises in Cartesian geometry they already present as uncanny. (For a discussion on Descartes and the uncanny see McCallum [2003]) It is the quest for reality that is strange. In other words the pursuit of realism inevitably produces an uncanny effect.

The alien character of Cartesian geometry is well presented from the viewpoint of the countervailing phenomenological understanding of space and spatiality. From a phenomenological viewpoint space is always to be understood pragmatically, ahead of any mathematical construction, or at least mathematics as a privileged representation. In fact the various mathematical and logical means for understanding space are pragmatic, but the modes of praxis in which they are developed and appreciated are limited. So it is to particular ends that we think of space in terms of the mathematical constructions of coordinate geometry, where everything is related to an origin, and where parallel lines do not converge. Similarly, the Cartesian and logical position presents space in logical or set-theoretic terms, as pertaining to containment, with a series of transitive relationships: if A is in B and B is in C, then A is in C. Or there is the symmetry of: if A is next to B then B is also next to A. The phenomenological position asserts that the spheres of relevance of these logico-mathematical understandings are limited. In any case such constructions are either so self-evident as to be trivial, or they are surpassed even in their own theorising. One thinks of non-Euclidean geometries for example, where basic axioms about space are abrogated (for example, in that parallel lines are allowed cross over one another).

Cartesian geometry also fuels an inflated view of the power of the computer, whose spaces clearly breach the received "rules" of spatiality: in digital spaces several different solid objects can occupy the same coordinates, large objects can be contained by smaller spaces, spaces can be "hyperlinked" in denial of formal spatial relations. But the Euclidean and Cartesian rules are already breached by our experience of space, and by Riemannian, fractal, and other geometries (or mathematical practices), and do not require digital media to effect the disturbance.

A cloud of suspicion also hangs over the privileging of logical and mathematical formulations (Lefebvre, 1991). Perhaps the utility of Cartesian geometry in the control of construction (engineering, architecture) processes is beyond doubt, but it also suggests a degree of control where there is none, a presumption that we can capture and tame the world, by subjecting everything to scrutiny under the same methods (mathematics, logic), the same constituents (objects, measurements, time, space), or rational denominators. Formal geometry excludes other concerns (body, placelessness, the whole social realm), and this scientific imperialism promotes
political agendas. One thinks of the role of maps and measuring devices as objective means of delineating claims on space, particularly against those who use different and less acceptably verifiable means of demarcation. The prevalence of CCTV, GPS and other surveillance technologies as a means of collecting objective evidence provides similar grounds for suspicion. So certain representational schemas (particularly the mathematical and the logical) serve the ends of control, within particular realms of practice.

This tendency towards control enables not only the representation of existing spaces, but also spaces of our own invention, possibly recalling the imaginative play of the child, where a cardboard box becomes a rocket ship, a chair is a fort, a cupboard is a house. This sense of control is akin to magic. Objects hover without support, we can penetrate vast and tiny spaces, make objects appear at will, and solid objects appear as if transparent. The creation and manipulation of digital environments brings recollection of a less sophisticated state of mind, where cause and effect were not so well developed. In other words there was an infantile stage when we believed in magic caves, visitations from benevolent beings (Father Christmas, the tooth fairy), spells, ghosts, monsters, and our own omnipotence. Freud links such childhood recollections to the Oedipal condition, which pertains to a longing to return to the primal condition with the mother, and all she comes to represent: comfort, unity, wholeness (against the estrangement of the father). For Freud, the momentary realisation of strange encounters in adult life is the shock that after all, those infantile beliefs were true: you can will objects to move around in space from a distance, fly, make things explode by pointing at them, all the effects of digital media. This is the one aspect of the uncanny for Freud. It is not restricted to watching magic tricks or spectacular digital effects, but is present wherever the familiar turns into the strange. It is abetted by the supposed realism of computer imagery.

THE SPACE OF LANGUAGE

Digital media certainly have the capacity to unsettle the familiar realms of spatial experience. We can fly, control at a distance, and preside over vast spaces and complex structures. But even more remarkable than the degree of control we can exercise over this mathematical space is the fact that we are prepared to describe such widely varied and surreal encounters as spatial at all. In working with, designing for and using computers we are dealing with complex systems, with properties in excess of simple spatial formulations. Yet we are still prepared to use the metaphor of space, even though we entertain the thought that the relations they exhibit can defy the usual mathematical properties (transitivity, co-ordinate geometry). Spaces that fold in on themselves, volumes made up of space-filling curves (fractals), and geometries in the complex number plane, are spatial by virtue of cultural convention, not the innate authority of mathematics.

From a phenomenological point of view our everyday world is basically still intact with these strange formulations of space. The challenge they pose is a linguistic one. Having defined space in mathematical terms we now find that we can
still use the term “space” in many contexts where the definitions no longer hold. Whereas this leads some to propose that the computer challenges everything we take for granted about space, a more sophisticated response is to recognise that the computer helps us realise further the nature of language and sign systems: the provisional and contextual nature of terms like “space” and their definitions. For many theorists language needs this loose and jarring function in order to be of use, ie to participate in meaning. So the uncanny character of computer spaces is already subservient to the uncanny, if not the tricky, nature of language (Hyde, 1998).

As exercises in language, the discourses on “virtuality” and “cyberspace” privilege idealist and empiricist views of space. The pragmatic dimension is usurped by the apparent authority of calculation, complexity, interconnectedness, and trajectories of improvement. For some the computer invites projection of hope that technology will rescue us from current social problems. Social progress is equated with technological trajectory. The computer of the future assumes the role of mother (in the sense used by Freud), a welcoming realm that invites us to participate in unity and wholeness, a reconnection with global community, the reconciliation of art, machine, humanity and nature. (The concurrence of digital utopianism and motherhood is not lost in the revival of terms such as “the matrix” in digital discourse.) On the one hand computer spaces challenge what we formerly took for granted, but they are now to be the object of our hope. The shortcoming of any such transcendent philosophy is the neglect of the here and now. People ignore the contingency, the clumsy interface, the uneven access, and project all promise of improvement to the safe distance of the future. Everyone knows that technologies have a habit of letting us down, a flaw that is all the more exasperating as they are the objects of such hope (Hardill and Green, 2003; Coyne, 2002). The digital medium introduces a mismatch between expectation and reality. It brings into sharp relief a particular concept of reality. In fact, reality seems to be a bi-product of the impetus to represent, not the object of representation, and what is representation but an exercise in language!

THE SPACE OF IMITATION

The quest for reality in digital spatiality is also a variant of the theme of mimicry, which receives provocative treatment in Roger Caillois’ (1984) study into the adaptive behaviour of insects. Writing in the 1930s, his paper on mimicry and legendary psychasthenia was an acknowledged influence on subsequent interpretations of Freud. For Caillois, mimicry is a propensity found in all of nature, but most peculiarly in insect species that imitate aspects of their environment (other insects, plants, birds and rocks) ostensibly to ward off or escape predators, but apparently with effect in excess of immediate need, and though the ploy seems to be ineffective in some adaptations. It seems that nature’s evolutionary, adaptive processes work towards mimicry, opposed to other strategies for survival. There are several important applications of Caillois’ curious presentations about mimicry on the quest for spatial realism.
Caillois sees the peculiarities of mimicry in animal species as spatial. The creature is positioned in space, at the edge of a leaf, oriented at just the right angle, inert to just the right degree, in order to effect this camouflage, and in doing so is at the mercy of spatial determinants. Apparently the creature succumbs to “a real temptation by space” (Caillois, 1984: 28).

Caillois sees this mimicry as a disturbance in the perception of space. The creature is dislocated. It is at the mercy of its environment, rather than an agent of choice, with the privileged position of the independent subject. This condition is apparently manifested in human beings in the case of legendary psychasthenia: a psychological disorder characterized by phobias, obsessions, compulsions, or excessive anxiety. It is a disturbance between personality and space. People with this condition say they know where they are but do not feel as though they are there.

By this reading the quest for realism is already an indication of a pathological condition, a strange relationship with our environment. We cannot avoid copying and mimicking other things (our environment, spaces), and this already indicates a lack of control, a subjugation to the dictates of our environment, as though on entering a building we are led to assume a particular posture, move in a certain way, gravitate to certain points. This is not so much an analysis in support of “environmental determinism” as an indication that we, and those who design our environments, are not in control. The propensity to mimic has the upper hand over independent agency and subjectivity, and is already suggestive of disorientation.

Mimicry is also a specula (and spectacular) phenomenon, i.e. pertaining to reflection and vision. The impulse to mimic privileges the visual field. Clearly, the propensity towards photorealism in computer graphics is of a different order of technical and reflective sophistication than the impulse within insects to mimic their environment. But the strong implication of Caillois’ polemic is that the impulse to visual mimicry is ubiquitous, and in excess of the need to reproduce structural, sonic or tactile properties, and already carries within it aspects of the uncanny, for image specialists as for the rudiments of nature. It does not take much to extend Caillois’ argument to the other senses (particularly the aural sense), though here the uncanny is primarily given a visual treatment.

Caillois also highlights the bleakness of these environmental spaces, as appropriated by the organism under the spell of mimicry. In so far as the emphasis is on the visual, uncanny spaces are dark spaces, which penetrate and pass through us. For Caillois, dark space envelops and penetrates deeper than light space. There is also a propensity towards reduced existence, the animate appears as the inanimate. Caillois also relates this reduced experience to magic, which recalls Freud’s argument about certain events exorcising infantile beliefs, and further invokes thoughts of the covert, and of night.

In all, by this reading mimicry is a dark practice, beyond the pale of rationality, subject to the exercise of suspicion. Digital spaces are uncanny in so far as they participate in this shady art of mimicry.
2. THE DIGITAL UNCANNY

THE SPACE OF REPETITION

Freud links reminding and recollection to the processes of repetition. Repetitive situations remind us of the infantile conditions of loss and recovery. Mimicry is also a repetitive operation. The current situation is a repetition of an original situation, or a copy of a copy.

Spaces can repeat. The repetitive sequence of lines in the ubiquitous (Cartesian) planning grid is one conspicuous system of spatial organisation. Repetitive sequences of columns are arrayed on grids. There is the repetition of windows across a façade, and the floors in a multistorey office block. Repetitions are countable and lend themselves to mathematical treatment as constituents of ordered spatiality.

Games too are characterised by repetitive actions. The combatants repeat in order to train for the contest. The footfall of a runner, the roll of the dice, the skipping rope, and the banging of saucepan lids, whatever the game, all speak of the repetition of play. Computer games make conspicuous the repetitive processes of moving, advancing and retreating, aiming and shooting (Kline, 2003; Coyne, 2003). As in computer games the objective is sometimes to retreat from a situation of repetition to a less anxious position, where repetition has ceased, or beginning again with a new object, as in the progression through levels in a game. Repetition is linked to reward.

On the other hand, repetition is the reward. According to Freud we enjoy, or at least indulge, a propensity to repeat, well understood in demonstrations of repetitive behaviour: obsessive hand washing, fidgeting, pacing the floor. In fact to repeat is to re-enact the basic childhood trauma of loss and retrieval, particularly of the mother’s company. Apparently, subsequent enactments, voluntary or otherwise, of the repetitive urge, remind us in some way, or are perhaps purgatives, of this primordial condition of loss. The repetitive element of Freud’s account is in the company of recovery. The process is of loss and recovery, in succession. The mother leaves the room, but returns, only to depart again, and so on. Irrespective of the source of this propensity, Freud’s speculations point out a fascination with repetition, even if we are unconcerned with what it is that is being repeated, or even the first event that is being repeated.

In fact the force of Freud’s argument (and that of the tradition that draws on him) is not that there are many sources of the uncanny, but just this one, repetition (Nietzsche, 1961; Deleuze, 1994). Or at least, any other sources can be taken back to repetition. Alienation means what it does by virtue of being a repetition, or by reminding us of repetition.

But then what is reminding, if not mimicry? The current situation is seen as mimicking a previous event. The repetition of the cotton reel game (one of Freud’s primary examples of an obsessive game) is a copy of an infantile trauma; subsequent repetitions are copies of previous repetitions.

This is the condition of the uncanny, that peculiar quality we encounter in spaces that are unsettling, where we do not feel at home, and abetted by notions of repetition and mimicry. So being lost in a labyrinth has this character, where we are disturbed by the repeat encounter with the same fork in the path, or pass the same landmark. Spatial experience is not confined to the first spectacular view, but the
repeat visit, to habituation, to having already seen (déjà vu). In the film, *The Blair Witch Project*, the young investigators realise they are travelling in circles, though they had set off with the intention of travelling in a straight line. This is surely one of the main determinants of the uncanny in the film, including every other repetition it and other horror films portray: the return of the repressed (Tudor, 1997).

The spatial repetition, of the horror film and the computer game, recalls Freud’s (1990) example of his own mundane experience of the uncanny when lost in an Italian town: “I hastened to leave the narrow street at the next turning. But after having wandered for a time without inquiring my way, I suddenly found myself back in the same street, where my presence was now beginning to excite attention. I hurried away once more, only to arrive by another detour at the same place yet a third time. Now however a feeling overcame me which I can only describe as uncanny.” (p.359) Lest we are tempted to ascribe the uncanny to extraordinary sources, the radical point of Freud’s study is that repetition will suffice.

**BENEATH THE SURFACE**

We commonly associate the uncanny with suspicion. Uncanny spaces are those in which we find, or suspect, something lurking behind the walls, under the manicured lawn, lurking in the woods. Suspicion as a source of the uncanny also succumbs to an account in terms of repetition.

We may think that the repetitive operation can be tamed and directed, as if in retreat from the uncanny. Deleuze and Guattari (1993) posit the concept of striated space, the successive layering of spaces in a regime of order and control, typical of institutional and bureaucratic modes of organisation, and their spaces. Here, space is controlled and controlling, as in the ideologically-inspired urban spaces of imperial cities: the grand gesture of Versailles, Moscow’s Red Square, the Mall of Regency London. Deleuze and Guattari’s identification of striated space recalls the suspicion engendered by all adoptions of Cartesian spatial schemas.

Computer systems are no less prone to organising space in this way, as one thinks of hierarchies of menus, access privileges, firewalls, and in computer games, megalomaniacal and imperial architectures, the appeal to levels of engagement, from beginner to advanced, simple to more difficult, or simply progressing through staged environments to some inner sanctum or goal. This is an ordered variation in repetition, a neo-platonic progression to higher planes and positions of power. The progression is often through discrete states and plateaux, and across thresholds.

Arguably, the quest for greater realism also constitutes a progression through levels within the research and development community. Computer graphics is on an upward trajectory to greater and greater realism, transparency and seamlessness.

Progression implies improvement, and greater degrees of sophistication, and advance in a particular direction, up or down, higher or deeper, from which there is no going back. But the process of ascent/descent is already permeated with suspicion. We may be suspicious of the adoption of formal spatial schemas, but there is also suspicion between the various ranks. Hierarchy can present an environment where inferiors and superiors do not trust each other. Any structure
based on the rigid separation of roles simply sets up a condition of otherness. Where sociability is confined to rank, level or spatial confines, the other position, stratum or region becomes all the more problematic, either as an object of exclusion, fascination, desire or suspicion. This is one of the manifestations of what Deleuze and Guattari (1993) call “the rhizome”: the invading network of discontent and contradiction that surges up from within or amongst the roots of the hierarchical tree, and subverts its ordered connections.

The rite of passage from one level in a hierarchy to another is also a progression through stages of increasing suspicion, as when Alice advances across the chessboard. The movement is from naivete to suspicion, or perhaps greater discrimination of and trust in one’s suspicions. By various Freudian readings this is a movement away from the narcissistic phase, away from captivity with one’s image, to dealing with anger at parents, finding a substitute object of desire, and so on.

In the computerised Dungeons and Dragons game, the higher levels to which one may progress include the orbit of wizard, the level at which one is entrusted with the design and manipulation of different aspects of the game itself, and the ability to influence the game play of others. Progression to higher levels can imply access to secrets. Of course, the ultimate secret is that there is nothing there after all, or the ultimate progression is to the realisation that there is no higher stratum, ultimate depth or inner core. Whether or not the progression (in the game, story, organisation, or political structure) is carried through to this conclusion, the suspicion may be there. It is sometimes said of organisations that major decisions are made by the most junior staff (Laurence, 1969), as really hard problems so often defy authoritative resolution. In the absence of a decision the outcome defaults to the routine practice of some junior who decides the matter, or acts in her or his own local interest. Irrespective of the generality of this principle the suspicion within organisational structure, bureaucracy, and hierarchy is endemic.

So levels engender suspicion, or at least, suspicion and the problematisation of trust are implicated in such formulations. The concept of surface, or layers, also engenders suspicion of what may be lying beneath. Freud’s concept of the unconscious, where the obsessive repetitions are but a surface manifestation of a deeper, underlying cause is already a narrative about suspicion. Repetition is not what it seems, but betrays an underlying condition: a need, a longing, a desire, a first trauma that is being repeated. According to Derrida (1978), what should strike us as remarkable is not the propensity to repeat, but the persistence of our belief in a first time, an original trauma. It is strange to think that there is a first time, a cause to the repetition. The resolution to a primary cause is tantamount to the cessation of the repetition. The repetition unsettles us; so too the thought that it might cease.

We do not require suspicion to induce the uncanny. Repetition will suffice. But is a row of columns, the beat of a drum, or running in circles, sufficient to induce the uncanny. The account that the uncanny resides simply in repetition removes the imperative to look to the dark recesses of cyberspace for its sources, but repetition alone provides an insufficient account of the uncanny. The determination that a space is uncanny is after all a matter of interpretation. It is one aesthetic judgement amongst many possible judgements, dependent on a number of factors. That
seasoned film buffs can be indifferent to the cliché of the haunted house or other
devices of the horror genre already indicates that we can be inured to situations that
might traditionally be described as uncanny, and creative effort needs to be directed
at overcoming the cliché, inducing the uncanny effect by progressively more
devious and sophisticated means.

PLAY SPACE
Exploring the space of play will further help decipher the relationship between
repetition, interpretation and the uncanny. Play strikes us as uncanny when it is used
to disguise something distressing, when the torturer in Reservoir Dogs “plays” with
his victim, or a murder takes place in a circus tent. But play does not need to be
coupled with innocence.

Play takes place in a space. One thinks of the arena, the game board, the tabletop,
the playground and the playpen. But the space of play is not only a container in
which play takes place, or the geometricaly ordered checkerboard, but also the
space of negotiation, the leeway that protagonists give one another, the distance
participants traverse in meeting each other and the objects of the game, the
environment of trust that develops, the world of the imagination that is in process,
and the possibilities presented. There is a state of play, the space of game states.
What is the character of this space? For some theorists of the game (Gadamer, 1975)
this space is characterised as the site of a to-and-fro movement, in which the players
are absorbed rather than standing back reflectively. It is a non-objectivist realm of
engagement. In fact we need not think of the combative game, with its rules,
protagonists and spaces, but rather the absorbed actions of a child playing with
saucepan lids, animated conversation, the play of waves on the seashore. There is a
sense in which play is not played by players, but players are manipulated by the
play. By various readings (Huizinga, 1955), play becomes the paradigm for
understanding the human-world relationship (commerce, politics, law, war, but also
our everyday interactions). In this light, space as understood formally or
mathematically is something that emerges as an object when we choose to withdraw
from the play, and think in other terms, of containment, measurement, and control.
(Perhaps the predator playing with his prey disturbs us because it equates the play
element with indifference to (normal) homely modes of human engagement.)

For some theorists this is the nature of interpretation: unselfconscious
engagement. It is an engagement with a text in a situation of reading, or of
appreciating a performance or admiring a picture. But it also extends to any mode of
interaction in which we think of understanding or application as the outcome:
diagnosis, deciding a legal case, being a professional, a scientist, computer
programmer, creating a work of art, or design (Snodgrass and Coyne, 1997).
Designers create spaces, and they may think of spaces (physical or “virtual”)
intended to inspire and transport us to other realms. They may also take spatial
design as the logical manipulation of forms, use measurement, mathematics,
computer-aided design and geometrical modellers. But designers also talk about
design as a space, and in this participate in the space of play.
What is the relationship between interpretation and repetition? Interpretation invariably involves re-visiting, renewing acquaintance with and re-presenting the object or situation under scrutiny. The computer game is played again, the designer revisits the design task, the audience attends the performance again, the performers offer repeat performances. From a hermeneutical point of view repetition is important, though not just as the duplication of events. Repetition provides an opportunity to exercise difference. Each encounter is potentially different from the last, simply because the performer, designer, viewer, and the user are undergoing transformation. When interpretation is doing its work then every encounter provides a challenge to the interpreter’s position, her background, world view, or horizon. In this sense interpretation is a journey, where each step is a moment of starting again. Another way of looking at interpretation is as an excursion, followed by the return home, but the home has changed. We see it in a different light, perhaps a darker light. Until we are inured to the effects of interpretation, and it presents as mere repetition, interpretation presents as a homeward journey to the habitual, but one in which the familiar has become less so. In other words, effective interpretation incorporates the ¥ and narrative, Ricoeur (1999) highlights the different meanings of mimesis, the most typical being where the interpreter enters into the situation of interpretation: the reader’s particular background and circumstances impinge on what is being read. An interpretation, at its best, is never just a copy. What about the mimetic behaviour of insects? By this reading perhaps the appearance and posture of an insect is an interpretation. The insect, or perhaps the species, or the process of natural selection, constitutes an environmental interpretation, which is to say an application of response mechanisms or codes to an environmental condition. The response of the predator species presents as a similar mode of interpretation. We do not have access to the interpretive capabilities of insects, but we are intimate with Cailloux’ interpretive practices as a theorist and writer. He, and we, interpret the situation of the insects as one of mimicry. The spatial disorientation implied takes place within the space of our interpretation. The predator and prey are engaged in the game of life and death, with move and counter-move. Where we find this uncanny it is by virtue of our renewed awareness of the seriousness of play. Play presents to us as other than we expect, as other than innocent.

What is the relationship between interpretation and suspicion? As an alternative to the layering metaphor of knowledge, Ricoeur (1970) investigates the proposition that what we have is never simply a peeling back of layers, as if getting to the truth, but rather various interpretations vying for prominence and authority. Interpretations are not layered, where every repetition should take us closer to some objectively true situation. Interpretations meet resistance. From the point of view of our argument here, resistance is revealed as the uncanny. Is there space for suspicion of play, a suspicion of interpretation? Interpretations are available for scrutiny, which is to say they rub against rival interpretations: play as innocence, play as engagement, play as frivolous, play as life and death.

So interpretation involves distance. According to a slight variation on this reading, the interpreter begins with an expectation. The situation presents as alien in so far as there is a mismatch between our expectations and what is presented to us. Interpretation requires the negotiation of this distance.
The uncanny is everywhere in interpretation, but what prompts us to declare that a particular situation is uncanny, that computer graphics imagery is uncanny in a way that a photograph of a flower, or a child’s finger painting, is not. Anything can strike us as uncanny when viewed in a light that makes it so, by being moved to a foreign context: a grandfather clock in a desert, the sound of a steam train on a mountaintop, a building on a cloud, a liquid wall, entomology in a paper about the image. In so far as computer spaces strike us as out of place, or we cannot immediately find our place in them, then they participate in the uncanny.

Freud’s characterisation of the uncanny as a situation of reminding is also a story about interpretation. The uncanny is also a situation where we are reminded of the boundaries of interpretive practice, of the inside and the outside, the presence and absence of unreflective engagement; the whole and the parts, the rapture of union and the rupture of articulation and separation. Any situation can remind us of this, though it is not just a reminding, but an ongoing condition, without beginning or end, or perhaps a reminding of a condition that is always with us.

CONCLUSION

The uncanny is a de-privileged category in writing about digital media, giving way to realism or flights of the imagination. The legacies of research and development in digital spatiality privilege sameness, familiarity, realism, correspondence between image and object, or transcendence from these: virtuality, fantasy, other worlds. The philosophical tradition, particularly the phenomenology of Heidegger, Bachelard and others, and the theories of interpretation (hermeneutics) also favour the homely, the importance of being situated in the world, but this is a restless condition. We are also in search of a home, caught in a nomadic condition between the familiar and the alien.

So all media participate in the uncanny. It is a key aspect of interpretation in any case. The image, computer-generated or otherwise, already has aspects that are alien and unhomely. Because computer imagery and the spaces it invokes are still new, they bring the alien aspects of media into sharp relief, and reveal the dark side of interpretation, language and spatiality.

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REFERENCES


3. EN-SPACING TECHNOLOGY

Some Thoughts On The Geographical Nature Of Technology

INTRODUCTION

Italo Calvino’s book “Invisible Cities” is a book of stories about places far away (Calvino, 1997). The explorer Marco Polo visits the court of the Mongolian emperor Kahn. As they sit, resting or smoking opium, Polo tells fantastic stories about the different cities he has visited. Each chapter is about a different – imaginary – city: cities where every travellers memory lives on beyond the life of the city, or the inhabitants worship different gods depending on if they live below or above ground. Calvino’s dream like images pass by as Marco Polo tells us of his cities both spectacular and dull. Yet, each chapter is not strictly about a city. Instead they reveal an observation, a comment or description. Calvino describes to us how our memories live on, yet the original observation dies, or that we always wish and dream for what is distant when the monotony of the present seems unbearable.

Indeed, the format of the book – the tales told by Marco Polo – is itself an observation on how we experience and think about places. We have all told stories of places far away, making connections using stories of the distant and the near. The here and now is easily connected, by a comment or an explanation, with somewhere else. “In China, they do this.”, the American’s story might start, at once connecting himself with supposed events far away. Guidebooks take this to the extreme: stories of different places are arranged together and standardised. You can stay here, you can eat here. A wall of standardised guidebooks tells the story of the world, or the tourist world, and stories of the consumption of places (Brown & Perry, 2002; Urry, 1995).

This chapter is about how we make those connections between places and the wonder or ‘dazzling’ nature of those stories. What Calvino’s book retains, even as it focuses on the connections and stories, is the power of specifics. As the world is connected together but we must never lose sight of who is connecting what. In particular, it is a paper about how the connections which technology supports can lead towards a slight dazzlement towards networked practice. This dazzlement can cause researchers to ignore the more mundane details of technological usage. Although the modern computer networks are something of a cause celebre, technology connects and changes in many different less dazzling ways. The number 67 bus, or the frills-free budget airline can also cause innovations in the connections

P. Turner and E. Davenport (Eds.), Spaces, Spatiality and Technology, 19-30.
we sustain between places, if without much glamour or ‘spectacular’ impacts. Yet to truly avoid technological determinism we need to focus on the mundane uses of technology, and how individuals use technology in specific settings, rather than offer generic answers to how technology ‘impacts’ a specific country, or even the world.

In line with this criticism, this chapter develop a critique of approaches to the ‘spaces’ of technology which abstract way from the details of what is done in specific places to produce ‘generic’ accounts of network and technology. While notions such as ‘the space of flows’ have great impact and drama, they leave much of the work of actual connecting unexplicated. To understand that we have to look at more mundane activities such as how mobile workers struggle to make a workable environment in a café, or how a computer database is used to order truck spare parts. Castells talks about “flows”, and Latour about “rhizomes”, each of them finessing the network as their metaphor of choice for understanding the world (Manuel Castells, 1996; Latour, 1999a). Yet we still have Microsoft Powerpoint, text messages and HTML to deal with. Taking a broad approach to connections give great power, yet it end up in a strangely deterministic position, linking together places and events far away, with little understanding of how these connections are actually supported in those places.

CASTELLS AND CANALS

Castells is perhaps the easiest to critique here, although he is not alone in charting a course for a new sociology of networks (with different authors giving very different accounts – e.g. Law, 1994; Law & Urry, 2002; Urry, 2000). In his encyclopaedic treatment of the ‘new economy (and much else besides) his three volumes aim high. Yet even though comprehensive much is lost is the overview given by Castells. In particular, we find little in his account which helps us understand how the networks he narrates come into existence. Castells uses the term ‘space’ to bring out some important abstract processes that are involved in the geographic organisation of the world, and how technology changes that organisation. When Castells describes the “space of flows” (Castells, 1996) as the “new industrial space [...] organised around flows of information that bring together and separate at the same time”, he is not talking about literal geometric space. He is exploring the abstract processes that contribute to the geographical organisation of the physical world. In this case Castells argues that the world is increasingly organised in the form of flows. These are geographical organisations of work and leisure such that there are flows of material, people, money and information around distributed geographic networks. Or as Castells puts it, flows are “purposeful, repetitive, programmable sequences of exchange and interaction between physically disjuncted positions held by social actors in the economic, political and symbolic structures of society”. The arrangement of these circuits comes to dominate the organisation of activity in individual places. That is, the site of a place on a network and its relationship with other nodes comes to dominate over the importance of the characteristics of that
place itself. The network comes to be more important than the individual place - space dominates over place.

One example that Castells uses to explain this is the network of narcotics production, distribution and consumption by drug cartels. The raw plants of narcotics are grown in countries like Peru, sent to refineries and management centres in Columbia, precursor chemicals come from production centres in Switzerland and Germany, using money which has passed through financial centres in Miami, Panama, Cayman Islands, distributed through centres such as Tijuana, and finally bought and sold thought-out the western world. For a “space of flows” like the illegal drugs industry it is the ways in which individual places fit into this space – how they fit together for the job of distributing drugs - that is more important than the characteristics of the places themselves. The network dominates over the individual nodes.

Castells’ use of the word “space” here highlights the abstract features of work, and the ways in which the flows of money and produce across the world effect individual places. There is much power in his account, in particular for how specific activities come to be important not just for what they are in a particular place, but how they interface with actions across the globe – how they fit into the space of flows. Yet what is missing is how these networks and interdependencies between people, technologies and places interact with the situated aspects of action within those places.

The space of flows is not an identifiable place, but rather a concept of how work and action increasingly contribute to abstract and standardised flows across the world, from country to country. Yet this move away from a specific place is at the danger of loosing grip of what is being studied. The notion of space can becomes something of a playground for structures ‘behind’ the world (in his case the rather devastating sounding “flows”, which wash away individual places in dominating networks). This looses sight of the activities which make spaces, which connect together the places.

Without knowing about the story itself, knowing that stories of China are told in America is little help. What stories are told? And by who? With talk of ‘space’ it is easy to become dazzled by the scope of the story. It is indeed impressive – even Latour’s scientists in the Boa Vista need to ship soil samples around the world to gain their views (Latour, 1999b). For Castells tables of aggregated statistics take the role of ‘actual events’.

To see something of what Castell’s descriptions miss out, let us look at a historical example. In 1800s America there were two – famous – transport revolutions right after each other. The advent of canal and railroads changed fundamentally the connections between places in the US, firstly in how long it took to get between places, but in much more besides. Yet understanding the changes in flows needs more than just the network itself: this change was dependent on a change in practice.

Figure one shows some of the changes in terms of how long it took to get between different places in the US. In their textbook of economic history, Attack and Passel argue that the advent of the canals had huge effect on the development of the US (Attack & Passell, 1994). In the 1800s most of the population of the US lived
on the eastern seaboard – in cities such as New York and Boston. Before the canal much of the food for these hungry masses came overseas from Europe, or was locally grown in New England. While the canals change the time it takes to get between places, they also change the cost in moving goods. With the canals, the massively fertile lands in the mid-west could now be farmed, and corn shipped along the canals to the eastern seaboard.

**FIGURE 1. Time to travel from New York, 1800 and 1830 (Attack and Passel, 1994)**

At first appearance this is a very Castellsian story. The ‘flows’ of grain enabled by canals means that it is the relationship of places to each other (the fertility of the mid-west, the hungry masses in the east) which is more important than the properties of these places *per se*. However, this would neglect a second important element: the mobility of crops depended upon an important change in the practices which took place – a change in how crops themselves were seen. All these flows rely on a second revolution – that of the standardisation of crops and weights.

As it became cheaper to ship food around the US the relationships between buyer and seller change from personal relationship to commoditised relationships through markets, such as the grain markets in Boston and Chicago. Theodore Porter (T. Porter, 1992; T. M. Porter, 1993) points this out when he describes the advent of standardisation in the Chicago and Boston trade markets. The first step in standardisation came from the efforts of the Boston board of trade to enforce the use of a 60-pound bushel of wheat, over the old bushel stack, which was unsuitable for the new grain elevators being introduced. While this standardised weight of wheat was moderately successful, it produced another problem for the Boston board of trade. Since it was the elevator operators who selected what was suitable wheat to be
transported, farmers began to mix their wheat with dirt and chaff, since they could receive the same price for it. Soon, the price of wheat from Boston fell to 5 to 8 cents below that of Milwaukee. To prevent this, the Boston board of trade began subdividing its wheat into grades based on quality, eventually training inspectors to certify the grade of each shipment of grain traded on the wheat exchange. To this was added laws against mixing wheat of different grades. Bureaucrats managed to create what had never existed in nature: uniform categories of natural produce.

Now we have a radical change – practice plus technology plus markets. It is with the combination of these three which changes the flows of food around the US – of the commoditisation of food and its movement in massive transport networks. Yet before we are dazzled too much with the changes let us not forget that the networks themselves only exist because of what people do. It is not just the network which is important here, but the changes in practice, in this case how they see food as a standardised object. The flows do not exist without the bureaucrats, it is the bureaucrats counting, tabulating and measuring, who make the flows possible.

**SPECIFICS OF NETWORKS**

“The highway bridge is tied into the network of long-distance traffic, paced as calculated for maximum yield. Ever differently the bridge escorts the ingering and hastening ways of men to and fro . . . The bridge gathers, as a passage that crosses, before the divinities–whether we explicitly think of, and visibly give thanks for, their presence, as in the figure of the saint of bridge, or whether that divine presence is hidden or even pushed aside.” (Heidegger, 1971)

The argument I am developing here is that by focusing on the networks it is easy to loose sight of the specificities of how connections are made in particular places. While Heidegger was hardly an avid enthusiast for ethnography, as Dreyfus points out (Dreyfus & Spinosa, 1997), his comments on technology hint at the tension concerning the details of specific technologies in specific places. The quote above describes a highway bridge ‘paced for maximum yield’. Yet Heidegger hints at how this very technological of bridges might do other than simply enframe, or exclude, humanity. In the last line of the quote the highway bridge gathers together aspects of our being. This reveal something of how in technology Heidegger saw the possibility of savour as well as danger – not always, not everywhere, but a possibility. In this example it is in how that bridge connects with the history of other bridges which Heidegger uses to hint at its ‘saving power’. These sorts of subtleties are lost when one only sees the flows of traffic across the bridge, the bridge as a “network of long-distance traffic” rather than as a “passage that crosses, before the divinities”.

So how might we start on studying some of these aspects of technology in the particular? There are two of technology which I have worked on which are perhaps relevant here. Each study looked at a different aspect of network flows in some detail – in the first the focus was the movement of people, in particular mobile workers and their use of paper, laptops and mobile phones. This study looked at how different environments such as trains and cafes would be adopted by mobile workers to be ‘workable’(1) (Brown & O'Hara, 2003). Hardly Heidegger’s terrain, but an