Media, Cognition and Life

The mutation of ‘cognition’ and the end of ‘modern culture’

Andrew Murphie

<a.murphie@unsw.edu.au>
<http://media.arts.unsw.edu.au/homepage/staff/Murphie/>

If you turn the following comments into questions, they sum up my concerns, regarding -

1. The Politics of Cognitive Models

'Whoever controls the metaphors controls thought' (?) (Becker)

[NEXT SLIDE]

2. The Context of Cognitive Models

'nature itself is unfinished and full of micro-differentials that periodically accumulate to generate new things' (?) (Connolly - after Deleuze: 24)

[NEXT SLIDE]

3. Technics and Thought

'Technics and its translations in social structures constitute memory supports which are not found in the brain and without which the brain is nothing at all' (?) (Stiegler: 2003)

What follows is a series of fragments, sketches and questions. I must admit that I'm out on several limbs at once, and thus, for now, I'm not going to even attempt to justify much of what I'm going to say in any depth. Consider it a kind of idiosyncratic survey.

And I'm well aware that this is a huge project on which many others are working/have worked (Hayles, Edwards, Dupuy, Tofts et al, Boden, for a start…).

Introduction

While philosophers, engineers and neuroscientists continue to explore models of cognition – as yet without resolution - culture puts models of cognition to work. Stengers and Latour might point in turn to the broader, if specific, ecology of practices or actor-networks in which the exploration of cognition takes place.

I'm not a philosopher. I'm interested in new conceptual and practical network ecologies, themselves composed of ecologies of cognition, perception, media ecologies, and ecologies of self, socius and environment. In other words, I'm interested in the important questions at the junction of culture and models of cognition, models of living (and modes of living), and models of mediation, all in the light of what is best called a pre-social collisions of bodies.

I shall argue that much of the very conception of a functional model of "cognition" is modern. At the same time, I shall argue that some recent models of cognition, such as Andy Clark's extended/embodied mind, challenge the essence of the modern (and therefore of "cognition"), and that this is exacerbated by the "global technics of memory" (Stiegler, 2003).

Theoretically, my departure point is an acceptance of "extended mind" (many theories of cognition arrival – belatedly – at extended mind). And, I'm afraid, outright hostility to "cognitivism" (for want of a better coverall term) – largely because I think cognitivism is based on historically specific models of communication/information that are -

1. out of date
2. only relevant to certain contexts. These contexts include, of course, warfare. Or more generally, they might include specific formulations of the modern and derived practices – notably in modern philosophies (Descartes, Kant, etc we might even put someone like Derrida here), technologies, and institutions (notably the university). Although this means that cognitivism might work in these contexts, this might only be because it assists in the production and maintenance of these contexts.
3. Profoundly metaphysical (in a bad way – I don't mind metaphysics) outside of these contexts, not to mention that
4. There are zillion more interesting models of media and communications around … if I had time I would go into Shannon's model of information and what's wrong with it (but we've all been there – and of course, it's not his fault, it's a brilliant piece of engineering).

I'll try and sum up the main points in two "list" – one short, one long.

[NEXT SLIDE]

Attempt # 1: 2 Central Points

1. Models of Cognition, Media and Life

Our models of mind (cognition), media, and life are not just supplements to "real events", but feedback into them – "cybernetically" or otherwise. In short, these models are themselves technics at large in the real ("technics" is a term which for me included technologies, techniques, rules, rituals, concepts etc). Computing is of course central to this. As Paul Edwards has noted –

> Not only as tools but also as models and metaphors, computers connect cognitive psychology and artificial intelligence to high-technology warfare and to the institutional structures of the modern state. (Edwards: xv)

2. Co-evolution of Models of Cognition, Media and Life

These models of cognition, media and life co-evolve and differentiate but are closely associated with each other. As a media theorist it is tempting to suggest that the prevalent and popular models for both cognition and genetic "communication" are derived from several basic media models (notably Shannon). That there are many problems with these models is well-known. One that I have tried to draw attention to in media theory is that it is less possible to describe a limited series of categories of media forms (TV, film, radio, the internet, "mass media", etc), with similar modes of operation. Rather we have a proliferation of differential media (Murphie, 2003) in specific and multiple network ecologies. There is perhaps some relation here to Karola's (Stotz) description of the effect of transcription in the genome (or to Neil Thiese's recent work on nonlinearity in Stem cell development).

To get back on track, as everyone knows, there might be "similarities" or common histories between models of cognition, media and life. More importantly, however, there are active network ecologies and specific differential individuations of the relations between them. For me, the differential relations involved are primary, and "objects" or perhaps even "events" are secondary.

Life as a whole is increasingly "worked" by these differential/relational individuations – by which I mean that life is worked -

- via biotechnologies
- via cognitive interventions into performance and productivity
- via often globalised media interventions into perception, action of thinking
- that is, via all of these into modes of living.

In response to this, rather than a model of transparent, linear communications and neat processing of information, I follow a model of "differential media" (Murphie, 2003).

John Sutton perhaps sums this up some aspects of this well –

> The biggest challenge, then, in constructing a genuinely dynamic framework to analyze the cognitive life of things in memory, is to acknowledge the diversity of feedback relations between objects and embodied brain. Just as architects can occasionally be too confident that buildings or monuments can act as simple analogues or substitutes for memory (Forty 1999), so cognitive anthropologists and psychologists can too easily neglect the sheer variety of the forms of media and exograms which humans have developed since the Palaeolithic emergence of notations and external symbol systems … different external media hold information in quite different ways, on quite different timescales, and interact quite differently with individual memories. (Sutton:138)

Applied to theories of extended/embodied mind, thinking through differential media might mean something like thinking through the ongoing micro-constitution of "inside/outside", or often neither of these but some other micro-constitution. It might mean thinking through the ongoing creation of differences, fuelled by real differential intensities that persist in micro-constitutions. It would mean thinking about, as Bernard Steigler puts it, the constant defunctionalisation and refunctionalisation of the brain in relation to body, organs (and libidinal drives) and world (and the affects involved in being in the world) (Stiegler, 2004). It would mean thinking fully through what Andy Clark has called 'biological plasticity' (2004:1).

This biological plasticity allows not just for bringing the body back into cognition, but for what we might call "potentialised bodies" in circuits - with metaphors and models as some practices amongst the larger network ecologies of practices that deals with these potentialised bodies (Stengers, 2002a). It is these circuits among network ecologies of practices that are my main interest today.

BUT – a more detailed attempt to outline my concerns …

[NEXT SLIDE]

Attempt # 2 - 19 Central Points

1. "Cognition" is a product of quintessentially modern concerns (this does not mean the cognition is a fantasy, but it does mean that "cognition" is a historically specific assemblage of ideas and practices – one that might be different in a few years).
2. At the same time much of the drive within the modern has been concerned with problems that could be seen as problems of mind/cognition.
3. The formulations of these problems during the last 50 or so years have been tremendously diverse … but when we talk about "cognition" we tend to mean a particular set of approaches that sometimes, and only sometimes, see themselves as fringed by other approaches …
4. Many of the ideas and practices about "cognition" in its late modern formulation have become colonial – I don't mean this necessarily in a bad way, but they have colonised other areas: lately the arts for example (the "cognitive turn"), but for a long time the military, corporations, performance management, (even ironically audit and research funding, with its inputs, outputs and "proper processes" perhaps).
5. Much of the "science" in cognitive science is often assumed in these "cultural" areas in a kind of debased manner (thank God for the work of Andy Clark et al!). Moreover, the history of the assemblages of notions important to cognition (such as "information", "representation", "cognitive processing") gets lost – the terms become more absolute than they are meant to be.
6. Yet we well know the historical contexts in which "cognition" has arisen. For example, there is the fact that the problem of "noise" and "communication" we now take as transcendental really was a problem of literal noise and communication during WW2 – in the Psycho-Acoustic Laboratory. This was to prove to be one of the places from which cognitive psychology emerged (Miller and Licklider both worked there), and can easily be seen as precursor to Shannon's information theory (Edwards, Ch.7) or parallel to the wartime work at Bell. As Paul Edwards points out, human beings were "machines in the middle" of other machines in a unique manner during WW2 (see also Bowers on cognitivism and the Strategic Defence Initiative or "Star Wars"). Such specific contexts are misapplied when generalised as the entirety of communicational contexts. Moreover, the powerful metaphors or models that emerged from these specific contexts are quite different "machines" to those dealing with specific contexts, bigger, more abstract – we could say more "potentialised".

7. These "metaphors", "models" or "machines" have been very successful, especially in their cognitivist mode. At the moment we could argue that culturally, there is a triumph of the concept and practices of "cognition". But I also see this triumph as the final hurrah of a Kantian formulation of the modern in terms of functional approaches to mind.
8. Enter extended mind, importantly, within cognitive science and philosophy. However, I think that "extended mind" as a model enters the field in a manner that turns "cognition" into something else. It is, of course, not only extended mind per se that signifies this turning. There are other parallel critical and constructive accounts of things that are very much like "extended" and /or "embodied" mind. Here (personally) I mean the work of people like Brian Massumi, Bernard Stiegler, Liz Wilson, Isabelle Stengers, Bruno Latour, Anna Gibbs and many others (some of whom we've heard this week), Simondon, etc etc ….not to mention Freud … who seems to me to clearly be a major figure behind all sides of this (from the outside, cognitivism seems incredibly in denial re Freud – institutionally and probably conceptually – cognitive psychologists, for example, as you might see from my mad diagram - are heavily indebted to Freud for providing them with work) …
…
9. In challenging notions of information processing "in the brain" as central to the metaphysics of a certain set of cultures, I think that all these new models indicate a shift not only in models of cognition, but in practices to do with "thought" and "body". This shift occurs in tandem/competition to the colonisation of the world by cognitivism and its "world of neat outcomes, performances and communications". This raises political problems (in a playing out in culture of the conflicts between models and their different "powers"). As Katherine Hayles and others have pointed out, the variations on cognitivism sit well (if often in self-contradiction) with neo-liberalism and so on. This is possibly not the case with extended/embodied mind. Without a concept of "soul", or at least of "thought in the brain" (what I call the "brain-magic" that replaces the soul [Murphie, forthcoming], most theorists of embodied mind say something similar) you can't have the individual decision maker, or neo-liberalism etc, or maybe democracy as consensus between individuals? What does this make education, for example – group therapy?
10. We can say similar things about both media theory and the life sciences (genetics etc – in fact, Karola Stotz did say something like this this week).
11. Is this the end of the modern? By which I mean – have the models that were central to the modern produced so many variations and mutations that they are now producing something else. This is an urgent political question, one of adaptation perhaps.
12. Is this also the end of the current concepts/practices surrounding "cognition", "mediation", "living", so that new concepts are needed. (For example the "dead memories – technical memories - we find at the heart of

"living" memory complicate our conception of life at the level of the genome, the soma and culture –see Stiegler, 2004).

13. One reason I think that "cognition" might be challenged is that it is almost impossible for it to escape the history of the concepts and practices of symbolic processing. I, like many others, find symbolic processing to be ill-founded for many reasons, but one of these is that we can find sense elsewhere than in symbols. Sense is perhaps pre-social, if we take "social" to mean information or symbolic processing and rules etc – that is, a matter of bodies (taken in the broadest sense – that is, human, microbes and celestial bodies, etc). Likewise, code might be a matter of cuts and flows in relations between bodies – at least initially (on both these ideas see Bogard, 1998). To fully accept embodied mind is to start here, not with the body as support, and occasionally interference with, representations and symbols. Important alternative concepts and practices to "cognition" might involve the differential and the virtual (here the real significance of VR technologies which should not, however, be confused with the broader virtuality of the world [see Murphie, 2002; Massumi 2002]. The virtual is a philosophical concept quite different, if related, to the concepts of telematics etc. Very simply, the virtual is about an increased understanding of connect-ibility, not just connections, as Massumi puts it – see below). Other alternative concepts might be the affective, the dissolution of the culture/nature divide (Latour, Stengers, Whitehead), the possibility of sense and code at the level of the interaction of bodies (Bogard, Deleuze, etc), … and crucially, a thorough understanding of the immersion of the "human" in technics and vice versa (Steigler). In short, it may be that cognitivism, like any other proposition, is "incapable of stating its own sense" (Luhmann in Bogard), despite this often being its foundational claim (which could be seen as precisely to the origin of sense). If so, this is because its sense perhaps lies elsewhere, and symbolic processing, if anything at all, is a secondary effect (and one much more mobile – we might say mobilised [Stengers, 2000:114] – than normally assumed. That is to say, symbols, inputs, "processings" and outputs might be subject to much more radical variation than would be tolerated by models needing to predict how things will turn out). This leads to a very different understanding of cognition, HCI, the interface, etc. As Andy Clark notes with regard to perceptual coupling (with perception as a transformative relation rather than a "channel") –

> "Instead of using sensing to get enough information inside, past the visual bottleneck, so as to allow the reasoning system to 'throw away the world' and solve the whole problem internally, it uses the sensor as an open conduit allowing environmental magnitudes to exert a constant influence on behaviour." (Clark, 2004, 7)

14. All of which leads us to consider what I am calling network ecologies –

drawing on Stengers notion of "ecologies of practices", Guattari (and Bateson's) three ecologies of self, socius and environment, cognitive ecology, media ecology, and so on – all in relation. We need to be wildly interdisciplinary (not just robotics plus AI plus perhaps a little phenomenology) – not that this means abandoning specificity, quite the opposite. In fact, we need to be transdisciplinary – by which I mean that the practices involved relate differentially and are changed, but not into one or the other of the pre-existing practices. The transdisciplinary is quite different to the much milder inter-disciplinary.

15. Apart from the career problems, what if we were, as many here are, to retreat from "cognition" (without losing sight of the sciences of the nervous systems, technical development etc)? Andy often seems to drift close to this but I know, has decided there are good reasons for not going this far? Others have not been so reticent?

16. Then we might understand more about the brain, and more about technics, especially in the context of network politics (Tiziana Terranova).

17. Andy Clark's "brain, body and world" are crucial to all this – an amazing contribution to thinking to pull us back to body and world (and of course away from the Kantian basis of cognitive science). More amazing is that the body and world are not just there, as in some accounts, to save us from information, symbolic processing, or to save these things themselves. Rather they problematise the whole series of concepts..

18. This is perhaps because of the question of forces and intensities. We might locate these somewhere between body (that is, "solid" bodies which of course are anything but) and information. This is where I perhaps differ a little from Katherine Hayles excellent account of the posthuman (who at times seems to oppose the body and information, pattern and presence, randomness and absence). Crucial to this is undoubtedly a philosophy of the event. But just as crucial as a counter to notions of symbolic processing are notions of the "asignifying semiotic" (and a move away from representation and mediation). Nothing stands for anything else, and nothing is only a mediator. Or perhaps everything stands for everything else, and everything is a mediator. The important terms here might not be symbols or information so much as relay, modulating, transduction – I prefer these technical terms for what is happening in what is traditionally called "communication", "mediation" or even HCI. Here cognitive science has much to learn from poststructuralism and the like (and not just from phenomenology where it so often seems to stop in its engagement with "continental philosophy").

19. Ironically, even as many of the models involved here mutate, it is many of the achievements of information theory, cognitive sciences, cognitivism that are now challenging the "modern" models of mind – here I tend to mean technical, media, or social achievements (that is, not just philosophical or scientific achievements). In particular, I mean what Stiegler calls, 'Global

mnemotechnics' [the global technics of memory] (2003). Such technics might even challenge what we thought were given cognitive processes. Stiegler suggests that consciousness itself – in its modern formations is challenged.

> .. the [global] industrial synthesis of retentional finitude [via tele-technologies or mnemotechnics]…directly challenges consciousness as such, in so far as it may have been able to apprehend itself during an era that is precisely the era of cosciousness – also called philosophical modernity.
>
> (Bernard Stiegler, ‘Our Ailing Educational Institutions’)

Stephen Muecke reinforces the point that debate about the nature of consciousness (in the absence/ambiguity perhaps of the soul) is a departure point for modernity. This is a debate about temporalities, about processing, about functions and locations of thought – and is instantiated in its modern form largely (but not only) at the turn of the eighteenth century, which not only in philosophy but in revolution and the rise of democracy, saw 'the rise of and the crisis of human consciousness', this being the very substance of 'the quarrel between the Ancients and the Moderns' (25).

In short, 'what’s at stake here is an ecology of the mind' (Bernard Stiegler, ‘Technics of Decision’, 166).

Stiegler, Technics, Memory Synthesis

One way to sum all this up might be as follows. We can see modernity as a differential series of heterogeneous complex systems – that are now at a critical threshold. I don't necessarily mean we are coming into another "period" unless this is the period of differentiation.

I'm interesting in thinking about "cognition"'s role in this – but not (only) from the point of view of science or even philosophy. What interests me are cognition and related formations as a machinic assemblage of ideas, institutions, bodily intensities etc (again, this is not to say that these things are not real – quite the opposite).

I'm more interested in technics here than philosophy per se (or better, I am interested in philosophy as one important technics amongst others). How does technics change these modern systems? In two quite different if related ways. First, because a different awareness of, and different ideas about, technics change the world. Secondly, more obviously, because different

technics themselves change the world. (These two points are not the same and the first is often forgotten).

Here I shall briefly follow bank robber-philosopher Bernard Stiegler's mammoth discussions of technics and culture.

Steigler sees technics as always already at the heart of the human (see especially Stiegler, 1998). There is not/has not ever been, a "human" that is not technical. Technics is not even just a profound extension of human abilities. It has instead defined the human mode of being in the world from the beginning. Four central points:

1. Technics for him, what he calls organised inorganic beings, are the manner in which life pursues life by means other than life ('Technogenesis pursues the conquest of mobility, that is, of life, by means other than life' [Stiegler, 2001:248]).
2. What we often think of as life or thought involves a mixture of the forces of technical being and organic being.
3. So what we think of as living, always already involved the dead.
4. The same with thinking. William E. Connolly discusses this in terms of the inseparability of technique and thinking – along with the difficult we have in thinking it through (herein lies the seat of many of our problems).

He writes

> Is it possible that you cannot get through the day without presupposing the difference between thinking and technique, but that, also, you cannot find a sufficient criterion by which to disentangle the one from the other without appealing to a juridical model of the transcendental field itself open to contestation. (25)

It is this contradiction that perhaps drives the continuity of Kant concerned with judgement into the transcendentalism of the concepts of symbolic processing, etc.

Stiegler (2001) goes on to discuss a number of important modern thinkers and rethinks them via technics. Thus Husserl's notion of memory is able to contain primary retentions (the sense of the flow of present to past) and secondary retentions (recollections). But also cannot allow tertiary, that is technical, retentions, as real memory. Stiegler thinks these tertiary retentions increasingly dominate primary and secondary retentions (the argument is complex and there's no space for it here).

He also poses what he calls a "fourth synthesis" (Stiegler, 2003). This is the interference of technical syntheses in Kant's syntheses of understanding, imagination and reason (and of course intuition). This is the end of the functional separation of world and mind. Stiegler calls the resulting situation the "hypermodern" (which I think is no longer the modern, precisely because of its departure from what were the signature problematics of the modern (of agency for example).

Stiegler is also interested in Freud but thinks that Freud poses too much as functionally inside the head. Stiegler rather sees the unconscious and even consciousness as networked. For him, this means that the brain is a relational organ that individuates in relation to other organs and world, transductively – that is to say in productive relation to.

Stiegler makes the following comments on the brain, memory and media (forgive the long quotes).

> The mathematical theory of the abstract machine is a mathematical idealisation that excludes any genetic explanation of knowledge. And, moreover, that excludes the possibility of thinking the machine. There are only concrete machines, that is to say finite ones. The brain is not an abstract machine, on the one hand because abstract machines do not exist, and on the other because this organ is in no respect a machine. A machine is not a living organism and therein lies its force. The brain is a living memory – that is to say a fallible memory, in permanent process of destruction, constantly under the sway of what I call retentional finitude …This biological living memory is, however, only one memory among others… alive, it is nevertheless nothing outside its inert memories, that is to say its technical memories. The essential point being the relation between what is living in the brain and what is dead in its technics qua memories. The aim … is to focus on this relation between the living and the dead as constitutive of libido as well. (2004)
>
> [more Stiegler quotes]
>
> The brain here is an organ used to make decisions, an organ which from the standpoint of this general organology, with regard to which such decisions can in fact be made, can only be understood as such. Which is to say that decisions can be made with this organ only in transductive relation to other organs. This organ nevertheless plays an especial role of regulation, and not only of decision. It is at one and the same time, the seat of processes of regulation, of the liver, for

instance, and the seat from which phenomena proper, the consciousness as instigator of rules are constituted. And it is of course a seat of memory, and of the unconscious, where the experience of the sensible and of the singular constitutes itself, and through that experience, desire in turn. Can the brain be the seat of all that by itself? Certainly not. In so far as the brain is the seat of the unconscious, that is of desire, it is in a relation to the other organs, and to partial zones of the body in general through the mediation of technical objects outside of the body. Furthermore, this relation to technical objects depends on, or rather is inscribed in the relationship to social organizations, constituted by the other systems, and in which the rules of the superego inscribe themselves such that the brain has no other choice than to internalise them without playing a part in their constitution. The brain is, then, a particular organ in a circuit, which implies the liver, for example, a circuit whereby interactions are produced, pleasure and jouissance of the body, a circuit of desire therefore. A streetcar named desire, if you want, which is itself action, that is, a libidinal economy of affective relationships and instrumental practices under a horizon of technical artefacts and traces, words, etc, which constitute a social horizon of organizations that concretise social organisms, themselves individuating…. Such a project is comprehensible only from out of an organology of memory as the history of what I have called epiphylogenesis. Briefly recount, this concept highlights the fact, that with the human living being, that is to say the technical living being, individuation, qua negentropic differentiation, is no longer played out only between germinal and somatic memories, but is quite literally overturned by the appearance of a third memory, and artificial and objectal one (2004)

> However, we answer that question, it is, according to Leroi-Gourhan, the moment of emergence of the funereal and ecstatic practices. From this moment on, a process of functionalisation of the brain is set in place, which is no longer piloted by the characteristics of the brain itself, and this is a moment when the brain terminates its opening up of the cortical fan and therefore stabilises itself through the articulation of the brain, qua living memory, with technical prostheses, qua dead memories, which from the Neolithic age onward will become mnemotechnics and calculating prostheses in the strict sense of the term. (2003)
>
> Suffice it to say that there is a defunctionalization and a refunctionalisation of the brain that is inscribed in the becoming of technics. And which must be thought in relation to the becoming of social organization. There is also a defunctionalization and a refunctionalistion of the social – a re-engineering if you want. (2003)
>
> Technics and its translations in social structures constitute memory supports which are not found in the brain and without which the brain is nothing at all. In so far as the social concretises this transductive relation between the dead and the living it makes possible, through the constitution of collective secondary retentions, the acquisition of new knowledge which [portends?] a sweep through cortical connections that take place as interiorisations of these collective secondary retentions. (I will explain after what is secondary retention). There are neurological translations of these transformations, these enlargings, these refunctionalisations in the shape of connections which can very well be analysed from a newer biological point of view. These operations of the brain are but the consequences, the traces of what is produced in essential and originary relation with the second organological level, technics, itself a system of traces, and the third organological level, the social, which selects among these traces that which is to be interiorised by bodies in the social bodies, through what I call retentional apparatuses, and which constitute psychical and collective individuation in the strict sense of the term. (2003 – my emphasis)
>
> [end Stiegler quotes]

In general, Stiegler also gives an interesting critique of the notion of the 'a priori' – as in for example, an 'a priori' cognitive system, or even in the notion of 'cognitive processing' as 'a priori' what cognition will be "about". He thinks that the practices based on the metaphysics of the 'a priori' enforce this

technically, that is, often a posteriori. Technics is usually seen as a series of prosthetics that come "after" but in, for example, the distribution curve applied to student grades, it operates (transcendentally perhaps) on the before. On the other hand, this indicates what he calls the technical power of the 'pseudo a priori' (e.g. the very notion of a relatively fixed cognitive system as deployed in culture), or the 'a-transcendental'. On the other hand, the whole situation regarding before and after – with regard to technical practice – i.e. the linear (something clearly seen in many naïve models of information and communication flow, for example), starts to look misconceived.

What world results for Stiegler? As noted, it's one of –

[NEXT SLIDE]

> hyper- or ultra-modernity in which, far from entering a supposedly 'post-industrial' society, we instead are witnessing a process of hyper-industrialisation: namely, the submission of all retentional devices, including biological ones, to industrial exploitation; and thus the submission of conscious time and its bodily support to the new markets opened up by technoscientific developments. (Stiegler, 2003).

Now we have perhaps explained more fully why Stiegler thinks that there is a 'crisis' in a ecology of mind (and, following Parisi, life, not to mention the media and its deployment of aging models of communication, information, etc), except that even the concept of crisis is now inadequate to describe what is happening. This is because the crisis occurs at the fundamental level of belief, and that's not necessarily about belief in God. As Deleuze would say, it's about belief in the world, here and now. Stiegler writes, 'belief and fidelity today assume such as convulsive form as to nothing but announce the advent of total incredulity and infidelity' (2001: 238). In this situation of incredulity and infidelity it's hard to experience a "crisis" in that we're no longer sure what exactly the crisis is about, or exactly where it's situated. There is a shift in basic models of cognition, memory, faith, belief, judgement – models that have got us through the modern, for better or worse – but today have become impossible, partly because, or largely because of the intervention of technical systems.

This leads us to trauma, and although I don't really have time to go into this (except briefly towards the end), I think there are obviously cultural aspects to this trauma of which we are only too aware. At the same time, it is what I call a "quiet trauma" in that our modes of registering and experience trauma, such as they are, are also being fairly dramatically modulated by this "hyper-industrialisation of retentional devices".

Here I think that the political side of deconstruction is important. As John Protevi puts it in relation to the inadequacy of Husserl and phenomenology in general – the task is to pursue 'the point at which consciousness and its phenomenological articulation in what we call the 'conscious body politic' opens out onto a world of force' (Political Physics: 20).

I'm going to run through some of the consequences very quickly.

[NEXT SLIDE]

External/Internal – Open/Closed etc …

> The human is not a bubble, an interiority facing its outside, seen as an other to be remade in human likeness. It is the interval, a relay, between outsides. (Massumi, 1995)

Alternatives to cognitivism are often guided by the external or internal "problem" (that is, they raise the question of whether things are external or internal, or both), or other questions such as the open/closed. In doing so they do tend to suggest two important things:

1. Things are at least open as well as closed – and often both at the same time (Simondon and individuation).
2. Things are never, however, just closed, singly located, etc – if someone says to you – lo and behold, this is the system at last – don't believe them. They are false prophets.
2. Things are contingent and specific (and as Phil pointed out in his talk this week, there are nearly always 'unintended consequences'). Another way to put this is to say that media, embodied/extended cognitive processes are, and life itself are differential – in Deleuze's terms they are ongoing individuations of heterogeneous series (which are not linear in that they constantly fold back on themselves [Stem cells - Neil Theise]). It is normal, of course to use differential notions and calculations (differential calculus!). Differential and integral calculus have powered the technical revolution for hundreds of years. However, we still haven't learnt the lessons of the calculus (this especially includes Sokal and Bricmont in their misrepresentation of the

history of calculus in Intellectual Impostures). We still think the differential, for the most part, in the (secondary) service of closure and identity. For me, the case is the opposite. Productive differentials and produced difference come first – in fact, that's all there is. Individuation, communication, the emergence and interaction of systems, information (as formulated by many information theorists of course), are assemblages of events of ongoing heterogeneous differential series (thank God!).

Which is not to doubt that there are different things performance by what we call the "inside" and "outside". At the same time, any such relation is riddled with actual and, much more powerfully, potential (or virtual) difference. There are many simple consequences.

For one thing, as John Sutton puts it, "we don't need to identify internal with external resources" (132). For another, Andy Clark has pointed towards a fragmented internal and perhaps fragmented external. At this point, although we can mark the borders as they move, we might say that internal and external become not so much arbitrary as re-assembled constantly, contingently and specifically. And not always (or even that often?) as inside and outside. [– see Whitehead (in my iLife article) on the self-enjoyment that is constituted through assemblage of events … (here is what "dynamical systems" means – not a fixed system, but what Stiegler calls an epiphylogenesis of systems …)]

Thus we leave behind another of the modern problematics, as described by Muecke.

> … as Bruno Latour says, 'we moderns' (who 'have never been modern') have a continuity with the premoderns; it is just that our historicism keeps us busy drawing and redrawing the boundaries between nature and culture. As Jane Bennett, drawing on Latour, says,
>
> > Modernity, as inconsistent and paradoxical combination of claims about nature and culture, passes itself off as the clean, enlightened alternative to a messy, primitivistic cosmology that confuses the natural with the cultural, mixes the animal with the human, mistakes the animate for the inanimate, and contaminates the moral with the prudential.
>
> Latour reminds us that modernity too is a kind of cosmology… Latour and Bennett use the morphing of hybrid beings as evidence for the messy complexity of both the modern and the ancient worlds. I prefer

> to stress the spatiotemporal complexity of processes [such as the international workshop], such as rituals that condense and intensity moment of (total) primitivity or disperse into that pluralisation that marks modern social inventions such as inventions [or cognitive science]. (26)

Massumi takes this further –

> For content is no longer in opposition to form, any more than form is in opposition to force. And digitality is no longer in opposition to analogy. And means are no longer in opposition to ends. And closure to openness. And interiority to exteriority. And resemblance to difference. And face to interface. And human to machine. And use-value to information-value. And simplicity to complexity. And production to circulation. They are all in transformative co-adaptation to one another, in a space of non-exclusion. They are all stases in a continual variation that transformatively links their differences. Everything is in relay, and every relay expresses, retains, and varies a difference in nature. There is no purity. Even space itself differs in nature, its primary differentiation being between extensive (inert, matricial/containing) Euclidean space, and intensive (active, infolding/expressive) [blob-space] … (Massumi 1995)

That we can now – or least Massumi can now – think this way, is another indication for me that the modern is drawing to a close. The modern, although happy to constantly argue about these boundaries, needed the notion of some such boundaries. The redrawing of boundaries is one of the major features of modern discussion – together with the subsequent necessary for interfaces, communication, information flow etc.

Let's be modern for a minute and look at some boundaries in a kind of mad sketch – the main point here is that if one abandons the assumed "logical" links between ideas, and their assumed transcendence of their contexts, you see a very different picture. For example, a major figure according to one way of looking at this becomes Freud's double nephew, Edward Bernays.

[NEXT SLIDE]

Discuss

[NEXT SLIDE]

Bernays and Social Context of Production of Cognition and Cognitive Models

> 'Public relations was about fashioning and projecting credible renditions of reality itself.' (Stuart Ewen)

I'm not saying Bernays is single-handedly responsible for all these links – just that he indicates a certain mid-twentieth century systemic emergence in the areas of media/cognition/politics/life, one that is to lead out of the modern perhaps … and ironically it all goes back to Freud!

In 1928 Bernays wrote –

> In almost every act of our daily lives, whether in the sphere of politics or business, in our social conduct or our ethical thinking, we are dominated by the relatively small number of persons ... who understand the mental processes and social patterns of the masses. It is they who pull the wires which control the public mind. (1928)

Bernays helped his career along by telling potential clients he was Freud's nephew, and that he would therefore be able to apply methods such as Freud's to the masses (in the process he publicised Freud throughout the U.S.). This he did. For example, working for the tobacco industry, he was assigned to get more women smoking (at a time when this was more or less socially unacceptable). He went to one of Freud's American disciples and asked, 'what do cigarettes mean to women?'. The answer was 'freedom'. He then aligned smoking with women's rights, organised a bunch of women to light up at a specific event and at a pre-arranged time, had photographers ready, and so on. So Bernays began what became known much more recently as the co-opting of the "cool" in the service of consumerism.

Bernays is the c20th learning to manipulate elections, overthrow foreign governments, and promote social sciences, sciences and psychology for the 'engineering of consent' as Bernays called it, Crucially for me, Bernays was one of the first people to invent institutions to drive the relays between all of these in particular directions (e.g. Trucking Information Service, the Trucking Service Bureau and Better Living Through Increased Highway Transportation (client: Mack trucks).

It is these kinds of institutions, think tanks and so on that help provide the links between sciences, thinking, politics and corporations.

Once again, there is a whole ecology of practices involved in the production of ideas and practices surrounding "cognition" as well as cognition … One of these practices, for example, might involve refutations of "deviations" of the symbolics processing model – famously Minsky and Papert's Perceptrons.

As everyone knows, this was quite a victory for "symbolic processing". But symbolic processing is a web of ideas – it implies symbols, processing, obviously, but also a certain constancy of systems, a constancy of representation (at least functionally but often more than this). It is drawn from and extends; the sender, message, receiver, and communication/noise paradigms. It quite simple assumes something like "mediation" – and thus the interface can be conceived in terms of information processing – even the body becomes a kind of interface or mediation between brain and world, brain and technics.

Let's talk about this interface briefly.

Now – a 20 second interval! (ocean)

[NEXT SLIDE]

And now I'm going to leap unapologetically to the interface.

[NEXT SLIDE]

Interface

How do we conceive of the interface on what Massumi (in 1995) called 'the eve of the age of the interface'.

John Sutton has pointed out:

> These concerns might seem remote from cultural history and theory. But the methodological revolution implied by these new sciences of the interface, which must combine cognitive science and media theory, is far-reaching. (Sutton: 132)

Cultural history and theory have much to learn from the expanded mind. Of course, the opposite is also true (for example on the nature of representation, information and communication, not to mention networks and so on).

Sutton goes on to quote Clark on "nothing less than a new kind of cognitive scientific collaboration involving neuroscience, physiology and social, cultural, and technological studies in about equal measure" (Sutton: 132)

Of course, one agrees entirely with this.

However, I think interface is not mediation – by which I mean the concept of ideas/symbols just flowing through these complex webs of practices and bodies and sometimes getting corrected as they approach "the truth" is highly problematic. In fact, the whole notion of mediation of any kind might be problematic. The interface is both more than and less than a medium. As Massumi puts it – although we might be on the "eve of the age of interface", there are some ways in which we should not obsess over interface (noise/signal ratios for example).

> because every aspect of the process is a transformative variation on every other aspect of it … there is no privileged site of mediation--there is no mediation, only mutual transformation. [The transformations cross gaps that transmit or express force, rather than repeating form. The human doesn't get caught in the double bind of control, because the space with which it works is entirely different. It is highly differentiated, and that heterogeneity is respected. There is no either/or. No: either mastery or control. No: either me, human, or you machine (or was it the other way around?). No: either homogeneous or isomorphic. No: either immersion or imposition. No: either formlessness or form. No failed imperialism of the human over the machine. What there is instead is co-adaptation.]- (1995 – my emphasis)

In short, extended mind, taken co-adaptively, and distributed throughout the practices involved, might imply massive increases in differential intensity (some might call this more noise but that is not the only way it seems to be working out culturally [here one need only think of the cognitive science that "proved" that the brain prefers classical music!]). Every phase of extended mind events implies pre-social intensities involving body and world, and all of the aspects Shannon's model all at once. If "we" "- by which I mean the ongoing differentiation of relations that actualise the events by which we live out "we" – if we are extended minds we are our own media, senders and receivers, pre-social assemblages of bodies and the sense that this gives rise to. What the message that is being transmitted might be somewhat inconsequential (not always inconsequential, but even if not, it is just one player amongst others, and itself differential intensity).

In short, if the interface is something, it is not so much as medium as a modulator for processes of transformation. Interfaces modulate "memory" and protention – delay and anticipation. I think we have been somewhat limited in our understanding of interfaces because we think they are only media. To think about this another way, we might look more usefully to interfaces as deployed in, for example, electronic music (Murphie, 2003) rather than in limited forms of communication, or targeting in warfare, in order to understand what is going on.

Andy Clark puts this well when he writes that "It does not seem correct … to insist that flow across the interface be simple" (Clark, 2004, 6).

But if not simple, and perhaps not a matter (at the least, not only a matter) of the transfers of messages or symbols, what is going on via the proliferation of interfaces that we are now immersed in?

The answer is perhaps found in the concept of the virtual.

[NEXT SLIDE]

Virtuality, Extension, Embodiment

The nature not only of the actual but also of the virtual becomes crucial (Murphie, 2002; Massumi, 2002; DeLanda, Pearson, Deleuze:170ff.). We need to understand the (ecological) claims the virtual makes upon rethinking the inside/outside, therefore on extension of the mind, or better on the body as potentialised, or as a series of intensities. Massumi is crucial here but there's not time for him.

I will skip through this, but I will say that the virtual has a long history. John Sutton has pointed out, that even for Descartes there was an inflection of this in that 'memories … are "stored" only superpositionally and implicitly' (134) – which is more or less what Massumi is saying of the intensities of the body (which play a far greater role in perception and "cognition" that usually allowed – to the point that Massumi seems sometimes to have trouble with the very concept of "cognition" – see especially the 'Strange Horizons' chapter of Massumi, 2002). Parisi writes reasonably simply that 'virtualization' is the 'acceleration of potential tendencies' (147). Massumi writes (you can here see why the interface is crucial, and how it can be thought differently to a "medium"):

> "What is the virtual is the connectibility: potential (the reality of change). It cannot be overemphasized that the virtual is less the

> connection than its –ibility." (Massumi, 2001:1080-1) (in Parisi)

This does not just demand a rethinking of media theory, cognition and perhaps the life sciences (in which the notion of potential is perhaps most obvious) – it also implies a network politics which is also a politics of the virtual. As Parisi points out regarding what Deleuze called "Control societies" – these are societies in which technics are deployed not just to control what is actually going on, but to intervene in the virtual, in potential. Parisi writes: 'Control societies are defined by the capacities of biodigital machines to capture all variables of reproduction through an immanent modulation (selection) of information potential' (129).

Andy Clark gestures to what is at stake in terms of extended mind/body/modes of living when he writes of "biological plasticity" (2004:1) and incorporation, with regard to which we have to think of potential connectibility and transformations, as much as current connections and reasonably static systems for symbolic processing.

Andy writes that "human minds and bodies are essentially open to episodes of deep and transformative restructuring, in which new equipment (both physical and 'mental') can become literally incorporated into the thinking and acting systems that we identify as minds and persons" (20042-3). Crucial here is performance, a loaded term in the contemporary world. Andy quotes Carmena et al who, with regard to their monkeys -

> propose that the gradual increase in behavioral performance… emerged as a consequence of a plastic re-organization [Carmena et al (2003) p.205]

This performance (the politics of which was long ago described by Marcuse and Lyotard) is perhaps another aspect to the virtual politics of networks. In short, plasticity, like Massumi's connectibility or various notions of ecologies – directed as all are towards the virtual – contain better concepts for thinking through contemporary events than concepts and models such as symbolic processing, but this is not to say that all is rosy in the garden of the virtual. Parisi (as above), Melinda Cooper, Brett Nielson, and Paulo Virno, among others, warn about a virtuality that is increasingly colonized (for example by the speculative capital to which we are all more and more subject in applications for research grants). I have previously mentioned the colonial tendencies of the cognitive, and this gives this a broader context.

I'm not saying this as an argument against extended mind – it is not something to oppose. Indeed, I am arguing quite the opposite – that an

understanding of extended mind is necessary to understand the network ecologies into which the modern is currently dissolving.

[NEXT SLIDE]

Networks and Globalisation: Cognition, Media, Life and Labour

I had a horrible realisation this week (not for the first time, but I keep repressing it). This was that I was sacrificing most of my pleasures – listening to music, meditating, running, going to films, going to the pub, just mucking about, to working. It's not that I was giving all these pleasures up. Rather I was using all these pleasures to keep me going through work … Here Bernays and Paulo Virno might explain a few things.

On top of everything else, our friend Edwards Bernays was also one of the first to intentionally create a "global media event", in 1929 (The Titanic going down was arguably the first of these events – see Sconce:62ff.). Sponsored by General Electric, Bernays declared a global celebration of the fiftieth anniversary of the electric light. This globalisation is a profound shift in paradigms – by which I mean, with Isabelle Stengers, 'not a way of "seeing" things or of posing questions but a way of "doing"' (2002a:49). The global "way of doing" has come a long way. Paulo Virno writes that –

> The entire realm of productive forces is pre-individual. It is social cooperation in the form of action in concert, the totality of poietic, ‘political’, cognitive, emotional forces. (78)

This sounds nice – but Virno doesn't like it. It’s not just the normal worry about global media – although it is this (that is, as Becker puts it, in information processing terms, that 'The development in electronic communication and digital media allows for a global telepresence of values and behavioral norms and provides increasing possibilities of controlling public opinion by accelerating the flow of persuasive communication. Information is increasingly indistinguishable from propaganda, defined as “the manipulation of symbols as a means of influencing attitudes”.') Virno goes further. He calls this a "general intellect", which is

> … social knowledge turned into the principal productive forces; it is the complex of cognitive paradigms, artificial languages, and conceptual clusters which animate social communication and forms of life. (87)

In short, we are subject to the network, even in terms of potential, by clusters of ('pseudo a priori') cognitive paradigms, artificial languages, and

conceptual clusters (one of which links media, cognition and life perhaps). Stiegler is again relevant. He writes of the end of the modern relationship between a modern "we", perhaps of the nation, of a class, of an interest group, etc, and modern I's who individuate this "we" (2003). Instead there is the over-arching abstraction provided by global mnemotechnics – perhaps in the service of Virno's "general intellect".

Andy Clark puts this perhaps more positively when he writes, 'who we are is in large part a function of the webs surrounding structure in which the conscious mind exercises at best a kind of gentle, indirect control' (Andy Clark, Natural-Born Cyborgs, 174). And I think Andy is right to have escaped the clutches of full-blown, but never actually realised, modern agency here, in favour of a differential immersion and "nudging participation".

How are we to take both sides of this into consideration? Here Isabelle Stengers suggests a "cosmopolitics" for the new networks. In this, the aim is -

> …an ecological production of actual togetherness, ecological meaning that the aim is not an unity beyond the differences, reducing those differences through a goodwill reference to any kind of abstract principles of togetherness [as in many cognitive paradigms employed in the name of the general intellect], but the creation of concrete interlocked, asymmetrical and always partial graspings. [To take the very example of what Deleuze calls "double capture", a concept Whitehead would have loved, the success of an ecological invention is not having the bee and the orchid bowing together in front of an abstract ideal but having the bee and the orchid both presupposing the existence of the other in order to produce themselves.] (Isabelle Stengers, 2002b)

In this ‘ecology of practices’ Stengers is not concerned with essences of self or so on. She is concerned rather with 'how different forms of knowledge and cultural practices work' (2002a). She is also 'not concerned with individuals but with practitioners' (2002a: 262).

In relation to these specific ecologies of practices, Massumi makes the crucial point that globalization, thought it might generalize and abstract, also must 'actualise' locally. Massumi here allows for a force of individuation. In describing the virtual, he is not describing an undifferentiated and utopian merging with the world. Rather –

> As part of the same global transformation by which the human body becomes planetary, its humanity is translated into a local force. It is only as local force that the properly human is registered, becomes conscious (operationally present) to the worlding network. (2002:130)

Another aspect of this of course, is a new politics of the non-human. As Latour asks:

> 'Is it possible to navigate one's way towards a non-modern definition of politics that shifts its centre of gravity from humans only towards the inclusion of non-humans?'
> (http://www.mc.pitt.edu/overview_Resources.asp)

[NEXT SLIDE]

Conclusions - Trauma and Design

As briefly mentioned above, we don't have to look far to see a trauma involved in all this. We are traumatised in that we cannot bring these events and concepts into our more habitual modes of experiencing the world. They change our modes of experiencing the world themselves quite dramatically.

So I am being “post-Freudian”, if you like, in that I am posing a fundamental trauma to the new network ecologies. As also mentioned previously, this is a “quiet trauma”, although it is easy enough to hear all around us when we listen for it. I call it a “quiet trauma” firstly because our older structures of experience and the models of modernity simply can’t register its existence, or have trouble doing so. Secondly, perhaps, it is a quiet trauma because it involves whatever it is that is the network ecology version of primary repression, but I won’t go into this any further.

I shall just make several comments on this "quiet trauma".

Stiegler specifically defines traumatypes as those secondary/tertiary ("tertiary" is my qualification; he calls them secondary) retentions within a networked system that are 'repressed' and if 'recollected' might rapidly reorganise the whole “system” – in a rapid defunctionalisation and refunctionalisation. In short, the release of traumatypes in a system releases a potential for new individuations. In dynamic systems this is ongoing. At its worst this challenges particular – historically important (modern) - forms of individuation. The very nature of memory and the synthesis of experience are not only changed, but constantly changing. There is no ultimate structure to be

found, but rather a delicate (and we might say ethical) balance somewhere between individuation and the pathogenic.

I like to think of design as the answer to this trauma, or whatever it is. Indeed, we often think of cognitive science, the study and critique of media, or even genetics, as about the pursuit of the truth. In fact, all of these are much more concerned with what are best termed design issues. This might seem like a throwaway idea, but actually, it's almost the (real) central point. Cognitive science, even in Kant, has always been about design – synthesis and production. In fact, whatever we think it is that we now call cognition – then design is very simply the capture of this, the attempt to redirect the flows of experience, open them out or close them down.

Thus coding, as I've pointed out via Deleuze and Guattari and Bogard, is not a matter of information processes so much as cuts and breaks and re-arrangements of flows in the movement and intensities of bodies. Bernays on the "engineering of consent" perhaps needs to be interpreted now via Erik Davis as the "engineering of experience" (a very different model of media, cognition, and life). It is in this context of design/engineering – in which we find the birth of what will become contemporary network society – that we need to think "ecologically"; with Guattari, Bateson (at the crucial moment we find Bateson), Stengers, media ecologies, cognitive ecologies, but also of course ecologies of the human in relation to the environment (let's not say "nature"), and forms of social production (let's not say "culture").

In short, cognitive philosophy, and whatever it becomes is design philosophy – engineering and reverse engineering but also invention and design. So that one question becomes – not what is the truth of cognition, but how do various models produce events, intervene in the real? In this light, which models so we want? For my money I'm happy to sacrifice many of the pillars of modernity – such as the problematic of agency – for Clark et al's embodied/external mind, something more like Massumi's virtual intensities, or Stengers' ecology of practices.

Cognitive science, as an ecology of practices, in fact marks the merger of all these in a crucial form of design/synthesis of experience with regards to time. And we must finally remember that many of the problems of intelligence are those of time, or in simple terms, of speed, the relative time it takes to organise guns against the time of an attack, or to warn and organise in relation to a Kamakazi attack and vice versa (Edwards). But as well the relaxed time of dancing the night away to electronic music, the time to organise one's participation in networked ecologies differently.

So I will say that I think design – as the creative re-structuring of experience within network ecologies (like music for dancing), can respond to the trauma. In this respect, Richard Slaughter talks of a 'the emergence of a "deep design" in every field' (276). This deep design will have to involve itself with networked ecologies in a profound way. It will have to accept technics as central to the human – as it already tends to, though, as Stiegler writes, it will have to 'think technics differently'. Then it might deal with trauma, perhaps promoting new ecologies of affect. (in this regard, Virno points to the political use of dread – a combination of specific fears and unspecified anguish, as a reactionary component of the new political ecologies. This raises a design problem of the most urgency.)

Design might therefore – as it so often has in the past – produce a different set of structural imaginings. I define "structural imaginings" in two ways. First, as those structures of imagination that limit what is possible. Second, as those imagined structures that re-work what is possible. Design, in sum, is in a very good position to embrace an 'ethics of Transduction', to take responsibility for the what and how of translations of forces within networked ecologies …

This will involved a literal technical reconfiguration of life – via a rethinking of interaction as a mode of organising lived perception. Life becomes what Alfred Whitehead called the possibility of 'self-enjoyment' in assemblage (Whitehead, 1938: 150, Murphie, 2004).

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