

“Brain-Magic”: Figures of the Brain, Technology and Magic (Draft)

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In the early days of cyberculture, VR technologies seemed to promise an engagement with the non-sensory, perhaps a trip inside – or at least via – a brain separated from the problems of the body. The brain was phantasised as a magical place through which we could tour the entire world – a world that was entirely under our control. These phantasies of enhanced mind have a prehistory, one that is well recounted in the work of Darren Tofts and Erik Davis.

To take just one instance, which both Tofts and Davis relate, Renaissance intellectual and neo-Platonist Giordano Bruno believed in a mechanistic cosmos in which 'the astral forces that govern the outer world also operate within, and can be reproduced there to operate "a magico-mechanical memory"' (Davis:202). Here there is a correspondence between the mechanical and the magical, or between 'symbolic logic' and 'the divine attributes of God', between the complex movement of the cosmos and the complex movements of memory in the mind. Yet even as these correspondences give powers over the cosmos to the mind (and by extension, in contemporary terms, to the brain) they undermine the divisions between mind and cosmos, mechanics and magic. In Frances Yates' well-known *Art of Memory* the correspondences of this magico-mechanical complexity find their contemporary setting in the development of computers. For example, Werner Künzel's computer language COBOL came out of the symbolic logic borrowed by Bruno from 'the thirteenth century Catalan mystic Raymond Lull'.

The development of these correspondences attempts to spatialise or technicise the mind, turns spirit into mathematics and symbolic logic. In doing so, such developments try to avoid – even as they draw attention to – the virtual complexity of networks, that which slips through such logics. Too quickly, the brain becomes the house of rational, symbolic calculation, and thus the house of a thought that can (eventually) be controlled down to the smallest detail. Yet at same time, the attempt itself demonstrates that cognition remains central to what has famously been termed 'Techgnosis' by Erik Davis¹. This is a 'term that recognizes the intersection of cyberculture and ancient, occult magic – "the expansion of consciousness by whatever means necessary"' (Tofts:81)². This expansion is not just a matter of symbolic processing by the brain. It is also a matter of the networking in which the brain is immersed.

In cyberculture the network complicates the idea of the expansion of consciousness (and processing of all kinds) with the complexity of the interactive world, with 'imploded singularities unified around the concepts of immersion, interactivity and navigation' (Tofts:74). It is in the network – not symbolic processing – that we perhaps see the technical mirroring of the complexity of the world most profoundly. When considered as a (perhaps *the*) crucial component of cognition, the network challenges 'anti-magical' views of cognition and its place in the world. This challenge arises from the echoing of magic (as work upon the incorporeal, the distributed and unlocatable, the complex) within the technologies

that assist (or create new forms of) cognition. I shall begin to approach this challenge by reviewing some recent reconsiderations of figures of the brain, technology and society in the light of networked complexity.

The cultural theory of the brain that emerges will also require us to rethink the relations between a techno-materialist culture and magic, ritual and force. In the process, we might be able to accept the role that metaphysical thought plays in culture (no longer relying on a metaphysics of the brain hidden within a materialist denial of metaphysics).

Magic as Force/Techne

Let us define magic for these purposes. Generally, magic will be considered as the force of transformation, as active participation in the unknown (if not immaterial), or as the intensity of social actions that mediate different aspects of the material world (in particular the known and the unknown, that which we can control and that in which we have no choice but participation, despite our lack of control). To put this a little differently, I am posing magic as based on the presupposition that we have to work – everyday – with the unknown, at the junction of the known and the unknown, or simply with perceptions about which are constantly unsure. Magic not only accepts the unknown, it celebrates play or work with it. On the other hand, most forms of what I shall call non-magical practice only predicate action upon what is capable of being predicted or known. Because magic allows more scope for action, it is more able to marshal forces in the world.

At this point, I shall also suggest that in some sense at least the common connection of technology to magic in general culture is a valid one. Magic has always been about power - over life and death and illness, over transformation, over appearance and disappearance. This is what technology is increasingly about as well. Although the discourses surrounding technology and the sciences are often derogatory when it comes to magic and metaphysics, one should be suspicious about this when they seek to take over exactly the powers previously ascribed to these areas. In short, all these terms need to be conceived *in terms of the forces they marshal* rather than their enduring claims on absolute truth.

Before considering magic as the marshalling of forces, however, we perhaps need to reconsider the dangers of reification in this area. Indeed, we need to rework the notion of reification itself (in all its ambiguity). To do this, we shall turn to Michael Taussig's exploration of this question in his book *The Nervous System*.

Spiritual Flip-Flopping

In *The Nervous System*, Taussig first argues for the importance of not reifying social and other forces, not turning forces and relations into 'natural things' (83). In relation to the signs and symptoms of disease, for example, to deny 'the human relations embodied in symptoms, signs and therapy' is to 'not only ...mystify them' but to 'reproduce a political ideology in the guise of a science of "apparently" "real things" - biological and physical thinghood' (84). For Taussig -

...medical practice inevitably produces grotesque mystifications in which we all flounder, grasping ever more pitifully for security in a man-made world which we see not as social, not as human, not as historical, but as a world of a priori objects beholden only to their own forces and laws...(89)

Uncertainty and relationality, the very motive forces of cognition, are excluded in favour of mystifying and absolute knowledge on one side (for the medical system), psychological pain on the other (for the patient). And as Taussig points out, what is precisely lost in such a medical approach is *the singular cognitive process of the patient* - which here includes the patient's own memory, experiences and the sensual/affective relation to others and the environment. It could be suggested that what is often lost in the hospital is just as often the focus of magic and ritual.

Yet this is to assume that the hospital is able to keep ritual at bay. This is far from the case. In the hospital we have, not science versus ritual, but what is best described as an ultimately undecidable contest of ritual activities designed to bring different events/contexts into being (the rituals of medical science, the rituals of the singular cognitive process of the patient). Thus we should not necessarily valorise magic and ritual as politically radical in themselves. They can just as easily reinforce given social processes. Taussig notes Levi-Strauss' idea that 'the rites of healing readapt society to predefined problems through the medium of the patient; this process rejuvenates and even elaborates the society's essential axioms' (109). That these essential axioms now include the cognitive has been noted by many from Lyotard to Taussig himself.

Such contests are not restricted to the application of "hard" sciences. They are also common in social sciences. In the latter respect, we could take as an example the ritual ("magical" or metaphysical) use of critical terms, even those such as "reification" (which, itself a nominalisation of a process, is necessarily "reifying"). The term reification has found many different uses in different technical contexts. It can simply mean mistaking things for the real processes behind them. On the other hand it can mean taking abstractions (even those describing processes) as adequate to complex material reality (which might include complex things). It is also a common critical term (often used pejoratively along the lines of "revisionist" or "splitter"). As useful as this critical term has been, the word's use as a critical term has tended to ignore the precise contexts of criticism. The problem is in part that a cry of "reification!" may always be correct (for example, "the brain" is a reification if ever there was one, and the discussion of the brain as object of objects one often still finds in cognitive science deserves all the criticism it gets!). However, the valorisation of an alternative position to that denounced as reified (for example, "the workers", as opposed to "capital", or for example, "realism" as opposed to "idealism"), not of course seen as itself reified, is rarely as justified. One reification is often simply opposed to another. Rather than moving us closer to the "truth", I would rather see such statements as techniques - part of the magic of bringing critical positions, indeed whole disciplines, into being.

Of course, any term in any position is necessarily a reification. That is, "reification" describes an unavoidable aspect of human language and psychology - namely naming, forming nouns, the use of abstraction as a technique for dealing

with complexity. Seen technically, this is not very problematic. Indeed, “reification” is a useful technical terms in linguistics, psychology, and even computer programming (generally meaning the conversion of some kind of complexity into a form in which it can be satisfactorily parsed or, more simply, entered into via techniques of thought). More philosophically (which in this context still means technically), this might imply that, rather than leaping to critique on every occasion when confronted with the dreaded reification, a more interesting problem might arise. This might be how to work around the disciplinary pretence of avoiding the reification of which we accuse others, while still preserving important distinctions. These are distinctions between complexity and nominalisation, process and things (as individuations of process), abstraction and material reality (which however should not be opposed in any simple way), ideas (or even “spirit”) and matter (again not to be opposed as they almost always are) More important distinctions that are not simple oppositions but be those between *known and unknown, our techniques of knowing and their ultimate inadequacy, if technical usefulness*. Another way of putting this is that we need be able to take into account the material reality and force of abstraction, ideas and so on, interaction and “things” as individuations. As Alfred Whitehead put it so neatly, ‘each fact is more than its forms, and each form “participates” throughout the world of facts’ (20).

In sum, for me, the term “reification” points to an undecidable. When taken up as *as a critical term* in the context of an undecidability, disciplinary practices have often assumed that we must decide one way or the other. Ritual, and forms of ritual magic, also deal with this undecidability, but differently – sometimes without having, immediately at least, to decide between the antinomies involved. And while ritual does use what in other contexts we would call “critical terms”, in fact happily engulfs quite contradictory terms and reifications within its processual assemblages, the ritual puts these to work within a context where critical terms are assembled with *other* techniques. The ritual does not stop with critique. It wants to live!

Taussig acknowledges all this and moves on to the more 'provocative' political conception of a 'flip-flop from spirit to thing and back again' (5). This, for Taussig, is 'where the action' is, where what he calls a general social Nervous System 'was put into gear, was in between, zig-zagging back and forth in the death-space where phantom and object stare each other down'. In terms of the discussion about the brain as thing or species of event, we are talking about a theory that mobilises both conceptions. It also addresses mobility on its own terms.

It seems to me that without this mobility between dynamic networks and the singularities that form within them, we will never get close to a cultural theory of the brain. With this mobility we will get closer to understanding the brain in its contexts. There is a real sense in which the brain is both the most contingent of processes and also the 'thing of things' - as well as the 'thing' which justifies other forms of haziness such as the perception of the other outside my head (the body, the other person) as a lesser 'thing'. The brain is then the exemplary, literal embodiment of the entire problematic of reification – one that the magic of medical science is charged with solving for us. And it is properly a matter of medical *magic* rather than medical *knowledge*. Indeed, this leads us to the general

point that beyond science but even there, it could be suggested that magic - as the practical question of how to both acknowledge and deal with forces beyond our ken - is, rather more than knowledge itself, the theme of our age (thus once again suggesting the passing of the 'information age').

Yet the reality of magic as social, forceful and thematic transformation is a *hidden* theme. It is hidden first because it is not really a theme - but rather the player and reorganizer of themes. Even considered as material process, magic is esoteric. It is hidden, more mundanely, because in its contemporary material ritual practice (including that of sciences, social sciences, the state and Capital) magic is necessarily more effective if cloaked behind fixed 'realities' and given knowledges - or at the least given methodologies. Even structuralist, deconstructive and critical *methods* have something to answer to here. Stephen Muecke insists, for example, on the falseness of academic 'negative theology' (9) (which we could find in some structuralist or deconstructive methods) and 'intellectual detachment' (which we could find in critical methods). For Muecke, 'no hermeneutic tradition' or 'ritual...has to be taken on its own terms' (10). Rather, such tradition is *inter alia* - 'it means what it does via immediate relations between objects, things, feelings, words, music'. How these relations play out is - in large measure - a matter of the cultural performance of magic.

Muecke writes that the cultural performance of magic occurs 'in ways structuralists could never have imagined' (2). For Muecke, this magic is as much a question of 'inflected' forces as codes, as much about the forcing of codes as the coding of forces. Moreover it is not so much a matter of '*formal*, textual, transformations beloved of structuralists'. Rather, it is about '*cultures which work to enhance life forms*' (my emphasis). In short, magic is about life - the multiply-forced and coded life that exceeds the text. Magic is the amalgamation of forces and signs so that forceful acts of transformation and organization take place. The sign's function within this is not the communication of meaning but its work with other forces. This means that 'the presence of the sign is not an identity but an envelopment of difference, of a multiplicity of actions, materials and levels' (Massumi quoted in Muecke: 8-9).

As all culture continues to work 'to enhance life forms' (for better or worse), we should not be surprised to find, with Muecke, that "'primitive" magico-religious forces are at the heart of nation-forming ceremonies [and elsewhere] in contemporary state society'. For example, Muecke writes that the 'state, relentlessly secular in its definition, remains none the less the highest form of the sacred-in-death' (3). This not only throws light on the ambiguous cultural status of the figure of the brain, but also on the brain in relation to the state - the brain as relentlessly secular, materialist and also the very metaphysical home of the forces by which state materialism is convened (not to mention the brain as definer of life and death). Muecke, writing about both Aboriginal Australian and European state rituals, suggests that some of the 'crucial relationships' here are between 'body and country' (5).

I shall follow Muecke to Jose Gil's ideas of magic and force, as the arguments of both are crucial to an understanding of "brain-magic".

“Brain-Magic”

For both Muecke and Gil magic is real - materially real - in so far as it is a reorganization of forces and energies (and therefore of bodies and signs). It is the focus in Gil's work on 'practical effects', the 'forces' that symbols can 'draw on or shore up', and the 'mechanisms...likely to trigger certain effects' that attracts Muecke to Gil. Gil writes that 'it is not a question of studying forces (magical, religious, prestigious or whatever) according to their representational contexts, but to grasp them in the way they function in their own right' (in Muecke: 11) within, and in the creation of, what we might call “force fields”.

The first of these magical force fields is the body. Gil, using the term 'exfoliation', describes the way in which 'the body opens into the spaces it can occupy or articulate with' (in Muecke: 13). Through exfoliations the body is 'diversified' as a 'volume in a perpetual state of disintegration and reconstitution'. Although it is of prime importance to our relations within the world, especially to the relations of forces that make up cognition, exfoliation 'only really makes itself visible in pathological or magical experiences' (Gil in Muecke: 13) (Once again, the 'hidden theme is the hidden theme', as Derrida has noted in other contexts.) Magic - whether used by the State or to escape the State/a state - is important here because its ritual is concerned with bringing about the extraordinary as a kind of socially-organised pathological experience.

The extraordinary allows a more dramatic reorganization of relations within space than that presented by everyday life. In the ritual of the extraordinary, exfoliations occur that allow the body to create relations with forces in space in a transformational manner. And it is important to note that we are not dealing here with a 'unitary body driven by a total self-image or central motor' (14). These ritual exfoliations, even if they present themselves as unitary, are never quite so. Neither are they ever innocent. Rather they could be seen as a basis for the subsequent ethical evaluation of transformations in culture and the possibilities of experience.

I would suggest that Gil's account of magic and ritual, signs and forces, allows us to consider the brain as one figure - perhaps *the very* figure - of magical transformations of forces in the West. In conservative transformations, the figure of the brain gives a sacred (hidden and metaphysical) underpinning to the ongoing reformation of states (from the deployment of pharmaceuticals in the cognitive setting to ritual performativity in the workplace involving what Paul Virilio has called 'cognitive ergonomics' (Virilio and Madsen:80)). This perhaps explains both the proliferation of *disciplines* surrounding the brain and the political need to work between these disciplines, to break them down.

Indeed, in the contemporary world these disciplines are indeed beginning to talk to each other. When they talk about the emergence of cognition 'via immediate relations between objects, things, feelings, words, music' (Muecke:10), they might begin to ask questions about the “brain-magic” towards which we have been heading throughout this essay. We could ask them, not about work on improving symbolic processing, but about the 'envelopment of difference, of a multiplicity of actions, materials and levels'. (These questions are of course increasingly central to research into cognition within connectionist and dynamicist approaches.) We

could ask about the various topologies of the brain – whether true, false or half-true - and their organization and transformation of forces in the world. We could see the brain *as body*, and thus as exfoliating (including, as with the body, a series of diverse "infoliations"). The exfoliation of the brain in space would occur both with regard to the rest of the body (and nervous system) and with regard to the world, as best summed up perhaps in dynamicist theories of cognition such as Andy Clark's notion of 'extended mind'. Such questions would suggest once again that, as with the body in the midst of forces, we are not dealing with the brain as either central motor or as a unity. At the least, as Taussig writes about the nervous system as a whole –

Even while it inspires confidence in the physical centerfold of our worldly existence - at least that such a centerfold truly exists - and as such bespeaks control, hierarchy, and intelligence - it is also (and this is the damndest thing) somewhat unsettling to be centered on something so fragile, so determinedly other, so nervous. (2)

'Extended Mind'

There are some contemporary conceptions of thought as more and more dispersed, leaving a more and more fragile 'centerfold'. Andy Clark, in his convincing argument for the significance of embodiment to the brain, and for what he describes as 'extended mind', compares the movement of thought through the world to that of tuna through the water. These fish appear, like many others, to be able to generate more speed and power than their muscular structure should allow, primarily because they ride the eddies and vortices they create with their own tails. As Clark writes,

Ships and submarines reap no such benefits: they treat the aquatic environment as an obstacle to be negotiated...[while] tuna...profit profoundly from local environmental structure...This simple observation has, as we have seen, some far-reaching consequences...gone is the neat boundary between the thinker (the bodiless engine) and the thinker's world... it may for some purposes be wise to consider the intelligent system as a spatio-temporally extended process not limited by the tenuous envelope of skin and skull. Less dramatically, the traditional divisions among perception, cognition, and action look increasingly unhelpful (219-221).

Extended mind, extended and distributed brains, thought as distribution - and none of these given once and for all. They are all in an active co-emergent series of what Varela et al call 'structural couplings', but which are obviously not limited to 'couplings'.

One consequence of this interactive activity is that many authors point to the importance of 'technique' within judgement and thought (Connolly 2002, Clark 1997). Technique involves the manner in which we bring together distributions and structural couplings, transform them, pull them apart, work through them or, better, learn how to participate in them. Marcel Mauss (1992) noted that anything to do with the use of our bodies involves technique, as long as this technique was effective and traditional (it could be passed on), with the result that 'we are

everywhere faced with physio-psycho-sociological assemblages of series of actions' (473). Thought is of course immersed in these assemblages, with the brain as part of the technical body, and the local world as extension of both. Indeed, the question of technique within thought now arises with some urgency. In general, it is not just that thought is revealing itself more and more to be based upon a series of techniques. It is also that it needs more of these techniques, and invents more and more of them to negotiate fragile assemblages of cognition, thought and worlds, conscious and unconscious. Perhaps another return to something like Freud's unconscious might now be occurring via Clark's tuna and their vortices (although this is not, of course, an unconscious created by repression as conceived by Freud). It appears that the gap (or threshold) between conscious and unconscious, or one could say between consciousness and world, is again turning out to be the most profitable ground for thinking about thought, even for directing thought via technologies and techniques. Connolly (1999), for example, takes a wonderful turn on Kant, based on the half-second delay between sense and consciousness. He wonders whether this implies a re-situation of Kant's transcendental 'supersensible domain...in the corporealization of culture and the culturization of corporeality'. He proposes an 'immanent naturalism...in which the transcendental is translated into an immanent field that mixes nature and culture'.

Again there appears to be an immanent virtuality to this that is necessary to even begin to understand the basics of thought. For Connolly, this is because thinking is 'irreducible to any of the ingredients that enable it, but is also affected profoundly by the infrasensible media of its occurrence'. In other words, thought is embodied interaction and when interaction is primary, we are in the realm of the virtual. Connolly's project in his recent *Neuropolitics* is precisely to point to techniques that can both acknowledge and work with this fullness and excess. As shall be seen, it is here that I would locate the reality - and technics - of magic and ritual. We may need magic and ritual more than we acknowledge within the cultures of cognition.

Brain Ethics

Let us, then, tentatively extend Gil's ideas about the body to the brain - the brain conceived as 'interval' (Bergson) or 'screen' (Deleuze). If the brain is a host of magic in any real sense, it is precisely such a host by virtue of becoming a component of the body's exchange of codes and energies without itself signifying. To put this in other terms, the brain perhaps signifies so much within culture precisely because it does not work through signification itself. It works not as a storer and regulator or recaller (in memory) of "held" forces, or as a calculator of systems, but as empty active exchange of energies. As Gil writes of the body, the brain 'does not speak, it makes speech...it provides language with a virtual and silent "grammar"' (111).

This very real "brain-magic" gives itself to what we might call an "ethics" of the brain. It allows for new powers related to the brain. It also explains current powers of brain-magic that arise when understandings of the brain are turned into disciplining sciences that in turn facilitate the sciences of attention, distraction and cognitive ergonomics. There is much at stake here. For a start, the more that is claimed for the central powers of the brain, or for what might be "held" within the brain, the more the brain seems subjected to pre-arranged powers (as opposed to *participation* within them). In this regard, Gil writes of a body not allowed any play

in the release of coded energies. This is a body subjected to "state magic" - to a space of pre-coded energies and spaces or topologies.

The already organized space, the discourses, the ritual sequences submit the body to a spatial discipline. It does not translate codes, codes are translated in it; it does not exfoliate, exfoliations are already given in space. Ritual action, on this level, consists in forcing the body to go from one space to another, to follow a translation already realized in myth and space. (119)

Such a reactionary deployment of ritual is, perhaps sometimes despite itself, still creative (and unpredictable). Indeed, even in this context, we can understand the function of magic as the translation of forces and energies *in creating the very notion of magic, or the sacred itself*. For Gil, this involves the production of a "sacred" or "magic" unconscious' (142). Within 'state magic' this is an unconscious in which the hidden theme is created *as* the hidden theme - in which operational magic and the sacred are not only repressed by discipline, but *produced as the repressed of the state* at the same time. In the regime of the disciplinary, one must not only mind one's thoughts, but the very conception and topologies 'wherein' they are supposed to take place. Which is to say that one must (impossibly) reject any singular access to the virtual and the affective precisely as discipline requires. In state magic, at best, 'the affective energy, for which the myth is that ultimate metaphor, must be reinvested on the body of the adept' (143) in the appropriate manner. As Gil points out, the prime aim of 'symbolic efficiency' is the effective 'remote control' of affect and the forces involved - not necessarily the 'improved rationality' of the general populace.

This argues more generally for the crucial work of affect (here considered as the movement of forces and so on, their impact upon each other in time and space), even within the realm of the brain. Indeed, such ideas can be found in the more dynamicist side of the cognitive sciences and philosophies. Yet Gil's understanding of magic has a great deal to contribute as well, not only to the cognitive sciences, but to any disciplines that assume cognitive processes as foundational to disciplinarity. An example is media studies. Here media is conceived as containing some kind of science of communications (and not only within media departments in universities but within the whole world of media, which is awash with assumptions about cognition, message, producers and receivers, symbolic processing and affect...). As Gil writes, all such "sciences" are always already caught up in the tensions involved.

...the first pathways of science are traced in a permanent tension and amalgam between old resurgences of magical and religious thought and the logic belonging to the new requirements of rationality and experimentation. (149)

Where does this tension leave us? Perhaps arguing for a mix of post-connectionist, dynamicist understandings of the brain and an anthropology or ethology of the techno-social and other ecologies within which the brain works. These are ecologies in which affect and the heterogeneity of the world (or worlds) bring us back to the importance of magic as work with forces. Understanding these ecologies of the brain is more and more crucial to a useful engagement with many

aspects of culture (the media, politics, work, play). Yet at this crucial moment, we face the twin obstacles of our denial of magic and the forces involved on the one hand, and on the other a tighter and tighter embrace of universalising techno-scientific assumptions in an increasingly number of arenas of cultural production, from forms of leisure to carefully controlled ongoing research activity and pedagogy (of the type that is so anxious about “outcomes”, for example). It seems that we want to contain cognition the more, the more we realise how very uncontained it may be.

To put this differently, we are not our brains, as we often assume or are told. We are rather the rhythms of the world that our brains only partially modulate with their own rhythms. This makes the brain a somewhat delicate assemblage, one we can admire the more for its incompleteness and for its magic. Moreover, this suggests that there should be a delicacy of ethics surrounding the brain, something that might encourage us to think carefully about the fragility and uniqueness of positions – temporal and, in their engagement with others, ethical assemblages - immersed in the world. These positions again call for magic if by this we mean the work of transformation and connection.

In briefly reconsidering the ethics of networks surrounding cognition, we have reconsidered the ethics of the brain and the transformational and connective assemblages in which we find it. Networks are an attack on the very conceptual foundation of older media, and with these, older forms of social organization based upon representation. They also call out for a subtler, pragmatic and more ethical approach to a world that comes before, will come after, often perhaps despite representations and stable frameworks. Virilio has referred to this complex as the virtuality of images (59), and often laments the emergence of this virtual (and technical) complexity in the place of the images we once knew. His criticisms should be taken seriously, yet not all is lost. It could be argued that the virtual complexity of the network – even and especially that within and around the brain - takes the senses more seriously than ever before. We need to do more than just posit their loss in the face of the worlds that new technologies make us begin to think.

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¹ Of course, the primary text about the indissoluble binding between magic and technology is Erik Davis' *Techgnosis*, although other important texts are David Noble's *The Religion of Technology* and Jeffrey Sconce's *Haunted Media*. All of these texts attest to the fact that far from being the enemy of science, magic is the mediator between science and its other (whatever that other may be). And far from being the enemy of the spirit, technology is the mediator between spirit and its other (which in this case often seems to be science). From a cultural analysis point of view, all these books attest to something like Latour's actor-network theory.

² And here also, lest we forget, the task in understanding the brain, cognition, and its relation to the world, and to technology, is not just 'discovering it' through brain scans and so on. We are always constructing 'the brain' as we go, and this is a process that shall perhaps remain unfinished, as new archive after new archive emerges from the virtuality of the archival itself (thus the opposition between those such as Dennett who claim to 'explain' consciousness minus a few details, and those such as neuroscientist Susan Greenfield, who though they enjoy the chase, often profess a doubt as to whether we will ever 'understand' our processes of understanding).

Tofts cleverly rearranges the term 'vaporware' to illustrate this. From a functionalist, actual point-of view, vaporware is derided because it does not come up with anything substantial. Tofts points, however, to one of the most important pieces of vaporware ever to be thought up - Ted Nelson's Xanadu project (an important but fuller realization of the potentials of networked computing and the Net - one which has arguably contributed much to very idea of the Net). As Tofts remarks, 'This is the thing about vaporware. It is a form of simulation, of virtual envelopment' (82).

Nothing positions itself so fully between 'vaporware' in this sense, and actual function, as the ideas and technologies of the network.