

## 1. Communication is fundamental:

### THESES

#### 1.1

The unit of humanity is the community. Anything human is communal, whether it be a village, a society or the global complex in which we find ourselves today. We are born not only prematurely, but incompletely, our presumably genetic disposition to language and mentation (reason, emotion and so on) is a disposition to commune. Steven Pinker explains that 'Rather than selecting for a completely innate grammar, which would soon fall out of register with everyone else's, evolution may have given children an ability to learn the variable parts of language as a way of synchronizing their grammars with that of the community' (Pinker 1994: 243), offering as example, the babbling stage of acquiring speech, during which babies 'must be sorting sounds directly, somehow tuning their speech analysis module to deliver the phonemes used in their language' (ibid: 265). The peculiar bias of cognitive psychology towards individuals — a concentration on the brain (even extended through the nervous system to the whole body) — necessarily correlates with an ideology of individualism. But the same evidence can lead to an opposite conclusion: that the function of the language instinct is precisely to socialize the species.

#### 1.2

Individuality is an effect of community. It is neither universal nor necessary, and it does not form the foundation of anything larger than itself. Rather, individuality is a product of specific historical circumstances, which I would align with the specifics of capital. What we experience as individualism, personal properties, are in fact just that: properties. You 'have' a self: you 'are' not one. The phenomenon we experience as selfhood is an epiphenomenon of community, and of the cascading consensual or conflictual combinations of communities. The parallel processor of the mind is not the brain but society.

#### 1.3

Nobody speaks 'deep structure'. The a priori which characterise Kantian and post-Kantian attempts to identify human universals, whether identified empirically or transcendental, bottom-up or top-down, if they are indeed the case, explain no more than the possession of hands explains a Benin bronze. A specific case is Kant's introduction of the a priori division of space from time, which we have had to reassemble painstakingly through general relativity and quantum mechanics, and in human sciences through the circuitous reinvention of geography by Henri Lefebvre (cf Lefebvre 1974, 1958, 1968) and others. Chomsky's universal grammar (eg Chomsky 1957, 1965, 1966, 1972), Greimas' universal narratology (Greimas 1966, 1970, 1976), Habermas' universal discourse ethics (cf especially Habermas 1984, 1993) and the Grail of cognitive science, a universal science of perception, where they have survived critique and experiment, all come to the point at which they must admit that there can be no understanding of human behaviour which does not take into account the full complexity of the human environment. Chomskyan linguistics is

the most persuasive of these attempts, yet it has failed not only to produce a semantics, but even to formulate a workable text- or discourse-grammar beyond the scale of the sentence. To summon up 'context-dependency' is a cool way of dropping to your knees and beating the earth with your fists

#### 1.4

Consciousness inheres in communities, just as semantics and textual syntax belong not to statements and sentences but to discourse. Consciousness, that process which means, is environmental from the point of view of the individual. It belongs in the world which we come to inhabit, the human world of discourse and communion. This may be read as taking the Minsky-Dennett analogy between consciousness and distributed processing to its logical extent (Minsky 1985; Dennett 1991). It can also be understood as the beginnings of a critique of the Dawkins-Dennett theory of memes (Dawkins 1989; Dennett 1991) as inherently conservative. Consciousness only emerges in socialised humans, and is only observable in their communications, as social action and language.

#### 1.5

The fundamental attribute of communication is mediation. The question of representation, as discussed by both semioticians and cognitive scientists, is misguided because it seeks a) a presence locatable in some single centre of consciousness, which neither science nor semiotics can identify, and b) representability as a defining quality of 'the world' otherwise defined as that which is not representation. Since logically there can be no equivalence between sign-stuff or mind-stuff and external, objective reality, the impasse of representational theories leads to the solipsistic nihilism of Baudrillard, and the grim obstinacy of a cognitive revolution imprisoned within the pale of its own premises. The reference of any community is to the lifeworld which it inhabits, and which its discourse describes, as a compass describes a circle. This is how what we think of as a shift in perspective occurs when someone throws into a discussion observations derived from another community, like asking cognitive humanists about gender, or an Israeli where Palestinians come from. What changes is not the perspective on the world, but the lifeworld that is being defined as the one shared in the conversation. This kind of clash is a vital factor in the evolution of communities.

#### 1.6

Communication implies mediation, and mediation needs a medium. A community is an ecology, which keeps traditions alive (Gadamer's [1989] concept of language, which here seems very close to Dawkins on memes); serves for social coordination (Habermasian communicative rationality); socialises needs (Mead's [1934] social anthropology); and provides the possibility of new meanings arising. The medium nurturing such evolution is mediation itself: the material practices of signification. Mediation is the second vital factor in the evolution of communities. Each medium itself produces, by accidents and by the endless creativity of syntactic permutation, the grounds for new meanings. As such, discrete communities are unstable internally as well as externally. Without them, perhaps individuals would exist, as individual orang utans exist, apparently incapable of the speed of evolution which is specific to humans (at least among the primates).

#### 1.8

The function of art is to participate in and foment this instability, to militate against such self-stabilising and anecological, unevolutionary formations as the so-called 'free' market's monopoly tendencies, the planned futures of corporations and the model of individuality as self-equilibrating and

self-perpetuating system. Art is a form of aberrant encoding that precipitates internal shifts within a communicative world, whose innovations ignite trails of knock-on effects, and whose accidental grammars can collide with and interfere in neighbouring discourses.

To resume:

Community is more fundamental than individuality.

Mediation is more fundamental than representation.

Consciousness is mediated and communal.

Communities evolve consciousness through internal and external mediation.

Anyone interested in communication must insist that communication is more important to humanity than any other mode of interaction, and that other interactions derive from it. From communication we can derive exchange and economics; rituals, status and power; curiosity, technology, science and dominion; risk and conflict; ethical concern and sexualities; or any other form of analysis you like. It is absurd for anyone in communications to start anywhere else than in the most obvious, universal thing about human beings — we communicate.

In what follows, I will be testing a further principle based on these theses:

### 1.9

That communication most closely approaches the object world when it is most mediated. The transition from one lifeworld to another is perhaps the most heavily and consciously mediated of all discursive moments. At such extremes of mediation, mediation reveals that it can never be, as Godel showed of mathematics mathematically, both coherent and complete (cf Nagel and Newman 1959; Penrose 1995). It is at such moments that we can glimpse the existence of an object-world at the horizon of the clash of lifeworlds. Mediation is not against realism: it is its necessary cause.

## 2. Distance Engineering and Community

In an utterly interdependent world, where it is no longer possible to live alone, the dominant facts of culture are diaspora and hybridity: the scattering of peoples and their meetings in new spaces that they have had to invent or reinvent for themselves. In a curious historical irony, digital sound and recorded images have emerged in the century of diaspora as the mechanical models of scattering and sowing, plucking tones and light from one place, splitting them into their tiniest elements, and reassembling them elsewhere, translated into a new context. The problem facing communication arts in the era of digital networks is to engineer systems which are capable of evolution: systems which disable such characteristic tendencies of the contemporary capitalist mode of communication as centre-out broadcasting, long-range planning, economic monopoly and hyperindividuation. And to do so in a world whose core experience is that of distance.

I take the term 'distance' to refer to the flexible, human lifeworld of space-time, especially as this has arisen in modernity through the process of imperialism.

The European and, more recently, North American and Pacific empires are qualitatively different from the empires that preceded them, firstly because of their global reach and secondly because of the rapidity of their communications. The communicative principle tends towards global interaction. But the vicissitudes of history have so mangled the instinctual reach to others that only the perverse communications of domination and exploitation have guided its most

visible planetary spread. Imperialism scattered peoples, by slavery, transportation, the movement of armies and bureaucracies, political, ethnic and religious persecution, and economic migration. The early empires did not produce such massive population movements, and therefore did not require the complex communications technologies of the 19th century. The Great Khanates of the 13th and 14th centuries, which required a month of hard relay riding to cross, or the British outposts in India at the time of Cromwell, when ship-borne messages took a year to travel from Westminster to Surat, ruled without speed.

The new empires of the 19th and 20th centuries did demand speed, and for two reasons: for reasons of state, and for reasons of exile. Though state and commerce built the telegraph nets, they could not close them to traffic between citizens. The millions who left Ireland during the Great Famine of the 1850s could do so knowing that cheap and regularised steamship-borne mails and, within a decade, transatlantic cable, would make it possible to remain in touch with the home culture.

In the mass migrations of the late 19th century, the distance effect runs parallel to and in some senses despite the uses of communications technology for purposes of rule and economic manipulation. In the land-based cultures of European feudalism, departure on even such a relatively short journey as a crusade would mean years without contact with home. In its more methodical dislocation of people from places, capitalism produced the necessity for a network of globalised communications. But in the telegraphic net, interstices of the official service provided a ghost web of nodes, in the twenty per cent or so of traffic accounted for by private use, the first forerunner of a new mode of distance engineering.

In these modern empires, geography was experienced as time. Processes of mediation allowed for virtual presence, virtual community, but the differences in bandwidth between letters and telegrams, and later photographs and recordings, compared to that of social interaction, gave mediated messages a privileged status in the scattered community. The Irish in Australia, for example, both credited the home country with the more authentic culture, and eagerly awaited each newspaper or shellac disc; but at the same time, the Australian Irish began to evolve their own variants on the home culture, variants that would, within decades, evolve into complex feedback loops with it.

The purpose of information-based models of communication is to ensure the safe arrival of a message, as uncorrupted as possible, in the hands of the receiver. And it is axiomatic in information theory that the medium, the channel, is immaterial to the communicative process, completely subordinated to the message. Such is information in the imperial mode. But in the communicative feedback of the African, Italian, Irish, Chinese, Indian and other diasporas, the medium of communication is a living part of the message, its materiality evidence of connectedness. The arrival of news or art from home only began its circulation within exile communities, where stories, speeches and songs were translated from the distance media to the high-bandwidth ones of conversation, gossip, sing-songs and décor. This translation model undoubtedly adds noise and redundancy to corrupted messages. It fails to conserve the tradition, because it treats the message as raw material for life, not as its goal.

You cannot define the diasporas of globalised society by what they are not — as resistance, subversion or critique. That would be to define them only in terms of a global culture to which they have been subordinated (defining the vic-

tim in terms of the oppressor) And besides, there is little evidence of a globally coherent culture to resist (cf Pieterse 1995). Nor is it particularly fruitful to define diasporas by what they are — as roots, identities (cf Gilroy 1993) Diaspora is by definition a process — of hybridisation, of multiple influences from home and exile. Diasporan communities must be understood by what they do, and what they do is communicate.

Evan Eisenberg notes that, 'Whereas Bessie Smith had to go on the road with Ma Rainey in order to learn from her, Victoria Spivey and Billie Holiday and Mahalia Jackson could learn from Bessie Smith by staying put in Texas or Maryland or Louisiana and playing her records' (Eisenberg 1988: 116). What is noticeable about this tradition is how profoundly different are each of the vocal styles produced in the multiple confluences and mutual influences of popular musics in the African diaspora. Technique is acquired in order to evolve it. Contrast this model of diasporan communication as a translation from source to action with the fate of the European symphony in the age of sound recording. Refined and defined increasingly rigidly into a hierarchy of forms dependent on faithfulness to a written and preserved score (according to Michael Chanan 1995: especially 116–136), the orchestral repertoire ossifies. The associated cult of authenticity in tempi, instrumentation and interpretation curtails radically the emotional range of classical performances. Here the integrity of the message triumphs at the expense of the intensity of engagement and, what amounts to the same thing, the evolution of the culture.

The cult of tradition grows from belief in the integrity of the message. The messier messages of mediation have not that solidity and preciousness. They are porous, and indistinguishable from their media. Media and messages evolve together as communication. And from the point of view of an evolving communication, in diasporan translation, people are media. The evolution of communications is the evolution of the species.

### 3. Conditions of Sound

Music and information dominate the mode of hearing of the 20th century, and their dialectic has only recently begun to evolve a third mode of hearing, the soundscape. Music from Russolo to Cage strips itself of unessentials — melody, harmony, counterpoint — to encompass all hearing, transferring the musician's mode of listening to the sounds of the world (cf Kahn 1990). Information structures movie soundtracks, the temporal and public functions of broadcasting, and much of telephony. In the audiovisual media, the dialectic of music and information has produced the multi-channel soundscape as a novel synthesis, the kind of soundscape in which music and dialogue are reduced to sound effects, and the sound approaches parity with the image, as it does in films like *Se7en*. But even this resolution is premised, like the personal stereo's headset, on a Cartesian aesthetics of hyperindividuation, Dolby and THX geared toward a sonic architecture at whose centre is the position mapped out for the isolated hearer.

Though some contemporary installations challenge this closed dialectic (cf Cubitt 1996, available on request), what I have found so far on the net does not. Terminals are extremely expensive telephones and radios, and sound work is predominantly in music or information-led movie soundtrack style. Experimental radio work of the kind promoted by Kahn and Whitehead (1992), Augaitis and Lander (1994), Weiss (1995) and Strauss (1993), when it appears at all, is still searching for an understanding of the differences between network communication and broadcast (though see Soundsite at <http://sysx.apana.org.au/soundsite/>). Most

of all, the end-user is constantly repositioned as the vanishing point of sound perspective, an impossible goal of pure consumption. What follows is an attempt to describe something that does not exist: a network sound aesthetic. It seems appropriate to begin its description in silence.

### 4. Lacuna

The sound which has just vanished is the building block of music, but what of the silence before the first note? We rely on short-term memory to position notes, and words, in relation to each other, and, especially in speech, silence is a palpable and meaningful element of dialogue. Or rather, it is several. A silence between phrases signals some kind of struggle to bring an idea into conversation. There is the silence between friends or lovers who do not need to fill it, the silence of refusal . . . But in music, silence has only two functions: as beginning, and as end. Cage's '4'33"' is music, not silence, because it begins and ends, and what precedes and follows it is inaudible.

The chatter of the projector fills the silence of a 'silent' movie, especially without musicians or commentary, but the image itself is a flat field without sound, that Lumière cinematographe that Gorky saw as a world of shadows bereft of the substance of sound (in Leyda 1983). That silence is reconvened when one of our machines breaks down. A hi-fi or video deck that loses a channel suddenly produces a cone of silence, marked now as where a sound should be. Depending on how much you have riding on it, this gap in the world can make you sweat. Once, we resoldered all the ancient, brittle connections on a giant Westrex theatre speaker at the Rio Cinema in Dalston just before a screening of *The China Syndrome*. At the climax, a nuclear reactor is about to blow, and the bass rumble from our ten foot woofer repeatedly bounced the soft connections apart. At the back of the auditorium, the Chief and I, in higher states of terror than he most involved of the audience, heard each static interruption as a vast wave of silence poised over the roaring soundtrack. Such silence has been a trope of science fiction since Orson Welles' reporter, his voice fading into a sea of static, repeats 'Is there anyone out there? Is there anyone?' Silencing a broadcast is like having your ears filled with earth: no wonder *The War of the Worlds* drove audiences to suicide.

At such moments, you feel yourself strain to hear, forcing your ears open, back, out, like an urbanite condemned to a night in a country cottage. Silence, in such a moment, is a pressing engagement with where you are. Suddenly, you are where a sound should be. The effort to hear is simultaneously the effort to define a place. That place, in turn, is a function of disconnection from the endless extension of space. The arts of networked sound will need to address this dialectic of space and place.

A further and more troubling silence only becomes noticeable when it is over, not as memory, but as a gap in memory, the silence produced by intense concentration or intense vagueness, the state you describe when you suddenly prick up your ears and say 'Sorry, I wasn't listening'. Though we talk of it as an absence, it is a position of absolute place. Virilio has a different take, describing both picroleptic moments of lost consciousness and the pathological auto-erasure of the hermit Howard Hughes in terms of 'ubiquitous absence', which he analyses as a bid for universal authority (Virilio 1991: 25). This is, I believe, only the case in the hyperindividuated world, and in sound terms in a mode of hearing in which the self is the centre of acoustic perspective, the infantile narcissist at the middle of the world. I want to argue for a different aesthetic, one in which the erasure of the self is the condition for the arrival of commu-

nity.

This vanishing point of sound is not attributable to our devices or cultures, but only to the withdrawal of attention from the world, even the world of your own sensorium, to a dimensionless point where, as there is no dimension, there is no time. If time be missing, there is only place. If such a silence can be defined as timeless, then sound must be defined in terms of time as well as height, depth and width. Obsessed with speed, we shut our ears to the spaces speed produces. Hungry for perception, we spit out the silence of pure coordinates. The art of network sound can commence in the moment of abstraction. A degree zero of involuntary withdrawal, that erases the self and the familiar world that permeates it, this absence draws the shape of sound around it, a magnetic rose in the iron filings. Soundspace comes as no surprise: sound is a vibration. Acoustics is the science of spaces in time. What intrigues me is to imagine an art not of space, but of place, an art of the alteration of sound at the place of perception.

The silent abstraction into which all of us have fallen in our communings via Internet are usually described in terms of a diffusion of the self, but today I want to think of it as the kind of silence that might overcome a mariner, the souging of the wind in whose rigging has become as homely as a heartbeat, and who listens not at all to the caulking as it creaks, floating in a vessel he can always call home, no matter the immensity of the ocean, and listening to the silence of the stars. Such silence has only an oblique relation to the silence of an interlocutor, or the dumb refusal of a server, and everything to do with this intensity of being, neither expecting nor remembering, but here, in the terminal place.

In the Western tradition, sound is sourced in the environment, and the auditor has only to listen. (In the special case of hearing your own body, we benefit or suffer from the separation of body not only from mind, but from perception itself). Cage's unplayed piano is the musical source for an aleatory but environmental composition which we have only to hear. Like broadcasting, even this zero degree of music is centre-out, dominated by an origin beyond the perceiving body. The challenge is to define the rose in the steel-dust so, that the magnet appears at its heart. A network sound aesthetics will be centred in the hearer, not the producer or the technical medium of distribution. I use the metaphor of the lost moment to isolate the central quality of such a sound art: that it treats the hearer not as a goal, not as the defining point at which sound reassembles, but as a conduit, a hollow passage, a medium through which sound flows onwards, but retuned by its passage, translated.

## 5. From Broadcast to Translation: Virtual Acoustics

Desert Storm, even after these years, still reverberates in the public imagination. The Garden of A——, the installation by Pervaiz Khan and Felix de Rooy from which the video loop just shown is extracted, is an archeology of that imagination. As meticulously as the discoverers of Tutankhamun's tomb, Khan and de Rooy brush away the millennial and daily piles of sand to uncover the centuries-old foundations of a meticulously executed act of cultural assassination. It's not that Hussein is a good bloke, but that the Ba'ath regime was first resolved into a single figure and then deliriously coloured with all the accumulated caricatures evolved since Napoleon's Egypt adventure. The people of Iraq, indeed of every Arab country and many, like Iran, that are not, could be subsumed into that one crazy picture of the vainglorious, magically powerful, ludicrously overblown, farcical despot. The desert war was and remains a war of oxymoron.

The installation is a labyrinth at the heart of a great pyramid of truisms, summoning genies from the database of clichés. A glowing touch-screen mandala, provoking arabesques from the Star of David, serves up a menu of categorical errors at a touch. A pyramid of screens accumulates patterns from the video loop, swept into apocalypse by a digital wind like the one that carried the 'smart' bombs, and ferried their triangular gunsight views to the televisions of the world. And here, in the very heart of the contradiction, where Western dream meets Eastern reality, you walk through an electronic desert projected on the floor.

Standing in this keystone of light as it shivers and roils, you hear sounds that have been with you all through the labyrinth, roaring, booming, chattering, flowing into one another. Move through this space now, hearing how the sound sources pool their resources, flood into one another's spaces. This is not cinema, where the image dominates the sound, forcing the aural world into its pursuit of the absolute truth — whodunit? Instead here are cycles and volumes, masses of sound and music, clouds and weighty hunks of vibration to permeate your body as you wander through.

These sounds, and this electronic drift, the storm of visions and vibrations wafted up into the air as thick as the blaze from the ignited oil wells — what otherness can we maintain in front of them? As Kuwait burned, so, in the snatches of old films, the minarets explode, and Babylon flares in its spectacular decimation across the screens. The Gulf War, it is almost jejune to announce, was a spectacle, a televisual action flick, a fictional depiction of actual strife. We crave that spectacle. Only the images from the bombed bunker, the photos from the napalmed convoy, urged a sudden calm in the turmoil of victory, and those images were never shown in the USA. Just as the Algerian footage and sounds, of a mother waiting for her incinerated child in the empty bunker, never made it onto British screens. That wailing, mixed into the exotic, the martial and the cinematic, is the pulse that anchors all the humour of *The Garden of A——*, the synchronisation of you, in these rooms, with the spectacle of the blazing Orient. That voice, its agonised repetitions of a single cadence, drums in the mind's ear like your own mother, bereft, stripped back to the bone and nerve of suffering.

So spatial is this sound affect that it reinstates the sense of the cinematic as a journey, like the old Hale's Tours railway carriages in which audiences were rocked to the clackety clack of a steam engine while films projected landscapes rushing by on the windows. But this time, it is the audience that moves, and while the images revolve in structured patterns, redefines the multiple soundtrack sources. The mix is not in the tapes but in the movement through their overlapping, their centre not a stereophonic focal point but a fluid permeation of playback and body, the sound perceived not only through the ears but the soles of the feet, the bones and the chest cavity, resonances recalibrated constantly as you wander through. Sifted powders, forming and reforming in endlessly new combinations, sounds become undirected motion, a *dérive* towards an otherless future.

## 6. Some inferences

Broadcasting, stereophony and movie soundtracks sculpt a single, and a solitary position from which alone they are audible. Installation sound has the option of dispersing that integrity, atomising and scattering it, and in so doing shifting perception's centre of gravity from the disembodied mind to the physique as a whole, and through the material of the body as medium, to communicative community from which the hyperindividuation of interface design has thus far

debarred network comms Short-circuiting the commodified form of information transfer in favour of a nomadic process of translation, prizing the remaking of materials into new hybrids over the conservation of integral tradition, network sound may be the gateway for electronic diaspora, the nomadism of global exile from which a true communications democracy can evolve

Information theory fails insofar as it commits its faith to the message. It is the lack of a class system that separates senders and receivers. We are all receivers first, even if the legal fiction of intellectual property serves to staunch the flood of intercourse, just as feudal fealties did a thousand years ago. Intellect cannot be owned, neither by individuals nor by corporations. What a translator translates is not an original, but a hybrid hovering between source language and destination language. Here information is merely a local case among the universals of human communication — introspection, storytelling, poetry, gossip, humour and the others (cf Tooby and Cosmides 1992) — and one which is marked by its refusal of evolution. Conservation of the message, conservation of the individual (as sender/receiver role): diasporan translation models do not do away with these functional forms of quotidian administration; nor do they seek to subvert them. They replace them, operate a parallel communications world, in which the mutual interpenetrations of media and messages are both the goal and the modus operandi of mutual evolution. The first step will be for us, makers, to eradicate our selves by trusting in our media, from which, in the end, we are indistinguishable, and our audiences, who are ourselves. The critique of sound suggests that we have potentials normative corporate media have not dreamed of. The first step will be to smash the terminal.

## REFERENCES

- Augaitis, Daina and Dan Lander (eds) (1994), *Radio Rethink. Art, Sound and Transmission*, Walter Phillips Gallery, Banff
- Chomsky, Noam (1957), *Syntactic Structures*, Mouton, The Hague
- Chomsky, Noam (1965), *Aspects of the Theory of Syntax*, MIT Press, Cambridge MA
- Chomsky, Noam (1966), *Cartesian Linguistics*, Harper and Row, New York
- Chomsky, Noam (1972), *Language and Mind* (enlarged edn), Harcourt Brace Jovanovich, New York
- Cubitt, Sean (1996), 'Video Installation and the Neo-Classical Soundtrack', paper given at the Screen Conference, University of Glasgow, July
- Dawkins, Richard (1989), *The Selfish Gene*, 2nd edn, Oxford University Press, Oxford.
- Dennett, Daniel C (1991), *Consciousness Explained*, Penguin, Harmondsworth
- Gadamer, Hans-Georg (1989), *Truth and Method*, Second Revised Edition, trans Joel Weinsheimer and Donald G Marshall, Sheed and Ward, London
- Gilroy, Paul (1993a), *The Black Atlantic: Modernity and Double Consciousness*, Verso, London.
- Greimas, A J (1966), *Semantique structurale*, Larousse, Paris.
- Greimas, A J (1970), *Du Sens*, Seuil, Paris.
- Greimas, A J (1976), *Semiotique et sciences sociales*, Seuil, Paris
- Habermas, Jürgen (1984), *The Theory of Communicative Action Volume One — Reason and the Rationalisation of Society*, Polity Press, Cambridge.
- Habermas, Jürgen (1993), *Moral Consciousness and Communicative Action*, trans Christian Lenhardt and Shierry Weber Nicholson, MIT Press, Cambridge MA
- Kahn, Douglas (1990), 'Track Organology' in *October* 55, pp 67–78
- Kahn, Douglas and Gregory Whitehead (eds) (1992), *Wireless Imagination. Sound, Radio and the Avant-Garde*, MIT Press, Cambridge, MA.
- Lefebvre, Henri (1958), *Critique de la vie quotidienne*, L'Arche, Paris.
- Lefebvre, Henri (1968), *La vie quotidienne dans le mode moderne*, Gallimard, Paris
- Lefebvre, Henri (1974), *La production de l'espace*, Anthropos, Paris

- Leyda, Jay (1983), *Kino: A History of the Russian and Soviet Film*, 3rd edn, Allen & Unwin, London
- Mead, G H (1934), *Mind, Self and Society*, University of Chicago Press, Chicago
- Minsky, Marvin (1985), *The Society of Mind*, Simon and Schuster, New York
- Nagel, Ernest and James R Newman (1959), *Gödel's Proof*, Routledge Kegan Paul, London
- Penrose, Roger (1995), *Shadows of the Mind. A Search for the Missing Science of Consciousness*, Vintage, London.
- Pieterse, Jan Nederveen (1995), 'Globalization as Hybridization' in Feathstone, Mike, Scott Lash and Roland Robertson (eds) (1995), *Global Modernities*, Sage, London, pp 69–90
- Pinker, Steven (1994), *The Language Instinct The New Science of Language and Mind*, Penguin, Harmondsworth.
- Strauss, Neil (ed) (1993) *Radiotext(e) (Semiotext(e) #16, v VI n 1)*, New York
- Tooby, John and Leda Cosmides (1992), 'Psychological Foundations of Culture' in Barkow, J.H., Leda Cosmides and John Tooby (eds), *The Adapted Mind Evolutionary Psychology and the Generation of Culture*, Oxford University Press, New York.
- Virilio, Paul (1991), *The Aesthetics of Disappearance*, trans Philip Beitchman, Semiotext(e), New York
- Weis, Allen S (1995), *Phantasmatic Radio*, Duke University Press, Durham NC

This paper is available online on the *Leonardo Music Journal* website (<http://www.mitpress.mit.edu/Leonardo/journal/hplmj.html>) and is forthcoming in *Leonardo Music Journal* Volume 7 (1997). ©1996 Leonardo/ISAST. Republished with permission.