

Several infinities (an emblem book)

The emblem book is a quirky kind of hypertext that reached its peak in Europe in the mid 17th century.¹ Each emblem is frequently composed of three elements: a motto or quotation, a visual symbol and some epigrammatic prose that proceeds to amplify the theme, often of a religious nature. This assemblage of poetic, visual and literary spaces invites personal reflection on the various analogies to be made between its separate components. As a form it invites readings from several directions, and offers the possibility of each reader coming to their own individual conclusions. The various metaphors, symbols and digressions allow room for internal flight within the space of interpretation. There is freedom to travel back and forth.

http://www.essentialart.com/sw/Leonardo_da_Vinci_The_Annunciation.jpg

Every metaphor has within it a potential for reversibility. The two poles of a metaphor can play the role of the real and the ideal alternately.

(Bachelard, 1988, p. 55)

In my appropriation of the emblem book I've made a few adjustments: there is only one visual reference throughout and only one secular author for the quotations. My writing, you may be glad to hear, is neither a religious tract nor an attempt to make a case for rectitude in electronic music. But I remain naively evangelical about the inherent 'magic' of electronic sound.² As a writer and composer, I am convinced that electronic sound as part of music can contribute uniquely to metaphors for immeasurable space, and that these metaphors can issue from images embedded in the medium, or more properly in the ways we listen to it. I believe that through these images our listening can be developed and deepened to provide metaphors of great strength and meaning.

So this emblem book is an essay on spatial metaphors: it is about metaphoric images for space that are inherent to electronic sound; it is about sonic metaphors for flight that have nothing to do with movement, it is about music as a metaphor for an other, infinite space and it is about some metaphoric associations between the space of electronic sound, acoustic sound and visual images. In a roundabout way, my writing is also an attempt to create a literary metaphor. Like the other texts in this book, this writing tries to be what it is about (I am speaking metaphorically of course). My aural emblems come from works by Ferrari, Harvey, Ceccarelli and Niblock.

But this is also an essay about a painting.



At http://www.essentialart.com/sw/Leonardo_da_Vinci_The_Annunciation.jpg

Figure 1: *Annunciation*, Leonardo Da Vinci
c. 1472-3, Florence, Uffizi.

EMBLEM: a broken wing

...if we want to study objects that truly produce motion and that are truly the initial causes of movement, we may find it useful to replace a philosophy that deals with kinematic description with one that studies dynamic production.

(Bachelard, 1988, p. 255-6)

The angel in Leonardo da Vinci's painting, *Annunciation*, has got a terrible pair of wings. In fact this is hardly Leonardo's fault, since the wings have been tampered with. Somebody – in a fit of restorative embellishment, or perhaps as a mistaken 'improvement' – appears to have added extra length, colour and weight at a later stage. You can still just see the outline of the originals, which would have been quite perfect for flying; they were neatly tucked in, with the right kind of muscles and not too much extraneous decoration - great for buzzing around the heavens, and they wouldn't get tangled up in your robes; (perhaps they still flex impatiently, underneath the paint). But even the original wings were a bit of an over-rationalization, borrowed from Leonardo's observations of real birds. The winged figure seems grounded by the didactic symbolism of religious iconography. Paradoxically, the flowers that tickle the angel's feet are obviously painted from life.

So it appears that Leonardo³ was content to opt for a familiar off-the-shelf metaphor for his narrative religious painting. Birds have wings, birds can fly, flying is what angels do, so angels must have wings. In this quick-fire chain of associations it is easy to forget why we decided that angels could fly in the first place.

Metaphors are often fleshed out by contemporary preoccupations, and their images shift and slide to accommodate this. In the 1600s the mind was seen as a theatre, in the 1970s it became a computer (and it has only recently begun to lose that metaphoric image, as we realise computers aren't quite that brainy)⁴. Although the winged angel remains potent as a lasting icon, many mass media angels turned secular a while back, and they are more likely to be 'good' than specifically 'godly'. After all, since most mainstream movies are narrative films, hell-bent on our immersion in the cinematic diegesis, we need to be able to identify with a kind of reality. So the angels that alight in Berlin in Wim Wender's *Wings of Desire* are kind, compassionate and all-round nice guys, whereas the divine messenger from God that da Vinci depicts wasn't selected on personality (perfection was a given). The contemporary feature film angel is frequently wing-less, though perhaps with a disconcerting tendency to disappear and appear at will since today dematerialisation claims that frisson of tentative possibility. In film, flight is 'real', frequently placing the viewer in the pilot's seat, *doing* flying - as in the beginning of *Wings of Desire*⁵ where, gazing through the camera's prosthetic eye, we glide effortlessly from one place to another, swooping and dipping above and into the life of the city.⁶

But as a defining principle, whether flying down from the heavens or appearing in a cloud of pixels from an alternate reality, an angel hails from another place, and continues to contribute to a metaphor that is to do with a displacement from there to here and, by reversed implication, with our desire to go from here – to there.

Alien timbres, moving pictures

From at least Louis and Bebbe Barron's soundtrack for *The Forbidden Planet* onwards, electronic music – in particular synthetic timbre - has impersonated alien worlds in film. Those sounds are so strange that we just can't envisage where they come from. But now that the 'amazing', 'unreal' timbres of electronic synthesis have become familiar and acquired their own integrity, that particular connotation has waned somewhat. Contemporary sci-fi films are more likely to be bathed in opulent orchestral tonality (Luke Skywalker may be the new Siegfried, but too much chromaticism still makes us choke on our popcorn?). Even so, a whole truckload of ambient 'space music' shows the extent to which electronically created timbre continues as an easy - some would say devalued - metaphor for otherworldly states.⁷

Analogue burbles or syrupy strings are just one side of the metaphorical coin. The phrase 'Cinema for the Ear' regularly crops up as a title for electronic music concerts and appears to cover several bases, in alluding to sitting in the dark, and to pre-recorded rather than 'live' and also to the dynamic movement of sonic 'images'. But this metaphor has shifted a bit. Increasingly, it is adopted to refer variously to an emphasis on aural rather than visual matters, or to a distinction between 'audio art' and 'music', or even just to electronic music performed in a cinema rather than a conventional auditorium. As the tagline for *Modulations*, a documentary on techno and its roots, it provided – along with nods to Pierre Henry and Stockhausen – some high art authenticity.⁸ Another reason that, I think, the cinematic metaphor has become somewhat weakened is because the imaginative metaphors that we create from aural and visual experience are frequently incomparably different, and particularly so when it comes to specifically musical processes and sound. Perhaps 'cinema for the ear' is a confused metaphor in the first place, that sometimes seeks to be a term rather than an allusion. For this reason, I venture to suggest, it has become a little heavy, and no longer flies. It is not a metaphor that springs directly from our listening to electronic sound. Instead it can tend to treat that sound as a musical soundtrack for a silent (and invisible) narrative.

CD[3] *Presque Rien avec Filles*, by Luc Ferrari (excerpt)

Luc Ferrari's *Presque Rien avec Filles*⁹, opens with an insistent, slow and low-pitched beat, over which there is a high-pitched sound reminiscent of flapping wings, and another, unidentifiable fast, tapping or 'whipping' sound – perhaps a rope or a ribbon, buffeted by the wind? - plus a bit of general 'outdoors' ambience (see how description fails). After a minute or so, background sounds of wind in the trees and birdsong become increasingly apparent. There is nothing to see. The sounds are not about seeing. This passage makes the open space of 'the outdoors' audible through allusions to wind and sky. The aural cues speak of movement in an unconstrained place. But several musical constraints enrich and enlarge these airy metaphors, and point to the fact that this place is different from the real world. The 'flapping wings' sound is only *reminiscent* of birds since now it is a looped rhythmic pattern that becomes an ostinato for the drumbeat. The difference between the low-pitched beat and high-pitched timbre of the other sounds places the wings, metaphorically, 'above' the listener. Because there is nothing explicit in this allusion to birds, the aural metaphor points away from real wings towards the movement of flight. We do not see birds (the abstraction of the sound removes even tenuous assumptions as to the shape, weight or nature of the body producing the sound), but we hear them move above us, in another place, where flying is possible.

An image of another place can provide a metaphor for flight.

An image of flight can provide a metaphor for another place.

EMBLEM: a moving ribbon

When we accept slight amazement, we prepare ourselves to imagine great amazement and, in the world of the imagination, it becomes normal for an elephant, which is an enormous animal, to come out of a snail shell. It would be exceptional, however, if we were to ask him to go back into it.

(Bachelard, 1994, p. 105)

Flight, as Leonardo might well have written, is difficult to describe. Perhaps this is because the essence of the achievement lies not in wings but in that amazing plunge from one state to another. And that instant of transition is hard to capture. Leonardo had an earlier dream for his angel's flight. In Oxford there's a little preparatory sketch for the *Annunciation*, taken from his Notebooks – a study for an angel's sleeve. It is just an arm in a sleeve: the ability to fly is taken as read.¹⁰

And maybe you can see a hint of this understated assumption in the painting, if you look from a different perspective and concentrate on detail. Take another peek. Nothing moves – the trees are upright and motionless, the boats in the background are becalmed, and the Madonna sits frozen and (not surprisingly) aghast. There is evidently no activity, and the day is still. But yet, on the angel's sleeve, a ribbon flutters backwards in a gust of air: perhaps this angel is caught in the moment of moving from there to here. It would be quite normal, in such circumstances, to create a bit of a breeze.

In his philosophical consideration of air, dreams, and the dynamics of imagination, Bachelard remarks that '...in the dream world we do not fly because we have wings; rather, we think we have wings because we have flown.' (Bachelard, 1988, p. 27) In our dream, he avows, we instinctively lift ourselves off the ground without particular effort, by the slightest of impulses¹¹. But on waking our attempts at expressing this dreamed ability, through words, images or other creative means, demand some kind of rationalization. We know that birds can fly, and so we appropriate their wings in our description. But really, all it took was a little push from within, and it is not an expression of the *motion* of flight that matters, but the expression of the *ability*, that Bachelard suggests we 'know' in dreams.¹² A metaphor for that ability involves images about what flight means to us: the amazing *difference* between being here and then, suddenly, being there. (And don't we intuitively sense this when we take a plane journey? It's that moment when the wheels stop rumbling on the tarmac and the plane is suddenly aloft that makes our heart skip a beat.) And a metaphor for this amazement may itself contribute to a larger metaphor for unfettered travel; once you're off the ground, the sky's the limit. But finding an image for the metaphor is the first task.

Electronic sound frequently employs metaphors of dynamic movement in a very direct manner – through timbre, pitch and, especially, spatial trajectory. Consideration of dynamic gestures, at both macro and micro levels, continues to prove particularly attractive to composers and theoreticians working from post-Schaefferian¹³ principles that – it would appear – evade the more ingrained methodologies of note-based music. An upward glissando can be a fine means of indicating ascent, and can be enriched by learnt or symbolic sonic associations along the way, but there are limitations to this

visual-aural transliteration. Even if a composer extends or amplifies a glissando's metaphorical 'reach' by making it travel around the auditorium, the sound still slides continuously up or down in pitch, and may or may not remind us of a police siren. Of course sometimes that is exactly what you want. Yet I would like to delve about here for some other images from which to compose metaphors. We don't need to rely on borrowed wings. Pushing off the ground is a shift, not a slide – a sudden change of state without any continuity – and this is an awareness of difference. And it is also a great amazement, which may benefit from a bit of preparation.

CD [4] *Birds*, by Luigi Ceccarelli (excerpt)

Luigi Ceccarelli's '*Birds* for bass clarinet and tape with clarinet and bird sounds', is an extrovert piece with a fast, regular tempo that might well encourage a listener to move about a bit. But despite both this and its title, *Birds* initially seems far removed from any metaphors of bodily ascent. The timbres of bass clarinet and, later, of birds, are not changed significantly – a fact the composer makes a point of emphasising in both title and program notes – and the piece has a sectional structure that eschews transitions or other musical conventions for 'growth'. And to make things worse, a bass clarinet is a slightly elephantine beast that might appear a little low on the list of believable aerial beings. But *Birds* is, I think, a piece that cuts straight to the detail and goes beyond the surface of some of the more worn-out sonic metaphors for flight. Instead there are stronger, more subtle allusions to the ability to take off and inhabit another space, and these allusions are built through an accumulation of 'differences'. These are layered to provide a patinated image that has depth and endurance. A gradual collecting of 'slight amazements' contributes towards an underlying drama in which we, listening, become attuned to appreciating change. Ultimately, it only requires the smallest, almost inaudible impulse for a bass clarinet to take flight.

Some slightly amazing differences

... between acoustic and electronic sound

Electronically produced sound and acoustically produced sound are different in terms of *where* the sound appears to come from. Surely this simple listening distinction precedes any theoretical deductions as to how we might comprehend apparent origins for *concrète* sound, or any complex analysis of directional cues? This ordinary, only slightly amazing difference is something we pick up very quickly indeed when the acoustic and electronic sounds coexist. It has more to do with our sensitivity to spatial position than any awareness of amplification. For this reason sound reinforcement of acoustic sound is a delicate psychoacoustic art since we are easily discomforted when the visual source and its sound are unintentionally split apart.¹⁴ On the other hand the deliberate amplification of acoustic sound can separate performers and sound in an intentionally aggressive manner so that the sound 'hits' our ears as a force to be contended with rather than as the distant result of activity from the mere mortals on the stage. Contemporary ensembles such as (in my recent experience) 'Icebreaker' or the 'Bang On a Can All Stars' frequently amplify their acoustic sound to an extremely high

level, imitating rock band scenarios, but for acoustic instruments. The effect is a 'wall' of amplified sound that dissociates performers and sound. This is perhaps a politicised aesthetic of enlargement as inclusivity, where amplification is regarded as synonymous with appeal and energy.¹⁵

In *Birds* Ceccarelli is conscious of wanting to maintain the spatial distinction between acoustic and electronic sound, even when using some necessary sound reinforcement in order to achieve an audible balance. The distinction between acoustic and electronically produced sound is also, as he recognizes, infiltrated by an obvious visual difference in performance:

... with regard to the live clarinet, it would also be possible to move it around, from an acoustic point of view, but in general it seems to me that, especially in a piece where there are sounds reproduced from a tape machine (therefore without a visual correspondence), it is more appropriate to maintain the spatial correspondence between the instrument's sound and its image.
(Luigi Ceccarelli, email correspondence)¹⁶

... between performance and emanation

But when live acoustic and recorded electronic sound are combined, the difference between them contributes to a another difference - between a performer on stage producing sound directly, through visible, physical effort from a fixed point, and a simultaneous effortless 'emanation' of sounds appearing 'invisibly' from speakers. The latter may be moved around a space at will, but the spatial dislocation between electronic sound and the antics of someone at a central mixing desk means that the liveness of that 'will' is of no real concern to the average audience member.

...between performer and tape¹⁷

A work for instrument and tape invites us to listen to a live performer enacting 'living in another space', and sometimes that other space feels a great deal larger than the concert hall. Even the most active electronic tape part offers, I suggest, an image for another space, rather than being perceived as another, off-stage performer – and this sonic metaphor is strengthened through the differences described above.

A soloist's position in relation to a pre-recorded tape is, I think, perceived somewhat differently from that of an ensemble and tape. As listeners we tend to identify with the soloist's presence, and perhaps we try to put ourselves in their position, as they listen to the electronic world around them. We are denied this 'projection' in relation to an ensemble where perhaps more often the taped material comments, or extends away from the group's self-sufficient interactivity (as with the example to come, from Harvey's *Bhakti*). In fact there are relatively few pieces for small ensemble and tape though there are probably more involving the additional interactivity of live electronics. I am, of course, leaving aside the use of recorded electronic material as a support or 'backing' to a soloist or band, or as more straightforward descriptive theatrical sound design.

... between them and us

Perhaps also the space of the tape part can be perceived in this metaphoric way because we are ourselves not immersed in *its* spatial dimension. We remain apart: we listen *to* a piece that is itself a theatrical enactment of the difference between ‘live performer in time’ and ‘recorded sound in space’. But if we rustle our programme inadvertently, the fluttering pages reverberate in the space of the auditorium, which is somewhere else again. Yet the tape part’s ‘fictional’ universe is just a part of a totality that reaches our ears via the ‘real’ space that is an inescapable fact of perceiving sound. When the space conveyed by the tape part – a fictional, possibly infinite, world - physically *surrounds* our listening, then perhaps the space of the auditorium can become infused with its immensity. In this sense, then, real space is always a player that takes an acting role within a dramatic scenario, a possibility to which Ceccarelli is evidently sensitive:

My long experience of working with sonorous space has convinced me even more that each space possesses its own particular sound and that each space substantially influences the music. This realisation obliges me to think of how a certain ambience will ‘sound’ or how the music will be or ‘live’ within it...

... ..We perceive the sound through the space and therefore we sense the sound of the sounding space exclusively, and never directly perceive the ‘pure’ sound, that in reality can’t exist in those terms. (Luigi Ceccarelli, email correspondence)¹⁸

... between live and recorded

In the repertoire of works for soloist and tape there are certainly many pieces that emulate a live cause and effect relationship between acoustic and electronic sound, but this is less common now that reliable and affordable technology enables the real thing. More often the ‘tape part’ is there to provide a universe for the live performer to inhabit. (When this is not the case, the metaphor is often being reversed for a reason, as in the Harvey example). The tape part’s universe is temporally pre-ordained, and I remain convinced that this relates in some way to the persistence of ‘instrument and tape’ as a name for a *genre*; we are hanging on to the end of that metaphorically spooling ribbon of time, even though today it’s more likely to be a CD, and no doubt tomorrow it will be some other means of delivery.

A universe needs to offer some attraction to prospective inhabitants. As is often the case, the tape part in *Birds* makes use of sounds sampled from the solo instrument. But in *Birds* the timbres do not serve to take over where the instrumentalist’s abilities leave off. The taped clarinet sounds do not – as the composer is clear to point out – lose their original character. Rather the *performative* behaviour of the bass clarinet has been extended upwards and downwards – in pitch, timbre, and place of origin – through a kind of ‘lamination’ made from layers of pitch (essentially a single pitch at various octaves), timbre and spatial position. The bonding of tape and live performer is highly successful in that it is difficult to hear which is which, but it is also difficult to forget that there is a tape part ‘going on’ around a live player who appears to have stepped in to a huge, expansive ‘bass clarinet’ space. We are set up to expect this a tight relationship between soloist and tape, and for several minutes these expectations are fulfilled. This makes a sudden difference all the more noticeable.

...between up and down

A dynamically moving sound can certainly activate a space, just as a torch can suddenly illuminate the dimensions of a pitch-black cave. But *Birds* seems more concerned with an ongoing illumination of spaces created by 'static' minimalist textures. Perhaps it is not 'ascent' but the 'ability' to ascend that is being prepared for. A metaphor for suddenly being *able* to ascend requires images that strengthen the difference between being in the air and being on the ground.

The piece starts with a short passage of fast, breathy squeaks and rhythmic activity from both taped and live bass clarinet. There is very little pitched material in this passage. After 20 seconds or so the prevailing loud, dense and much lower-pitched texture made from layered bass clarinet articulations commences suddenly. What was the role of that strange opening section, which started in the stratosphere but didn't explore any flighty connections with birds, and was brief and introductory? I would suggest that it triggered our awareness of the ground that followed. This difference between 'up' and 'down' prepares us for a subsequent difference between 'above' and 'below'. It does so through metaphoric images from pitch, timbre and also 'effort' (breathy squeaks as opposed to the subsequent earthy, full-throttle minimalist patterns).

At about 2 minutes 30 seconds (well into a piece of around 9 minutes in duration) these patterns stop abruptly, in mid flow. We hear birdsong. Although regular tempo is abandoned (or rather, is ambiguous due to the naturalistic birdsong rhythms) the birdsong fragments are still layered in the same kind of temporal vein, so that when a rhythmic pattern starts up within the birdsong it is barely noticeable for a few seconds. Although it is clarinet based (squeaks and 'breath' sounds, as in the opening seconds) there is initially some aural confusion between birdsong and bass clarinet sound, due to the similarity of timbres: they are however, in both cases, 'natural' and unmodified). At around 2 minutes 56 seconds the loud, layered, low bass clarinet patterns return suddenly and the live bass clarinet and tape re-embark as before.

...between slight and great amazement

The birdsong is the apotheosis of a metaphoric image that has been prepared for through several differences.

Birdsong is, of course, an immediately recognizable source, with immediate associations for everyone. It is, in real life, invisible and in space. We may occasionally look to try and find the singer, but more often we are content to be aware of this sound above us that emanates from an aerial place. So birdsong is at home emanating from speakers – in fact it is one of few 'real world' sounds that might appear completely and convincingly 'real' in this situation. But it is not a sound particularly associated with flight, since birds tend to stand still while performing their recitals. And this is not a cinematic image since birdsong is not an aural transliteration of a visual trajectory. If anything, birdsong is an image of an invisible space that it is beyond our reach. Here, that space is derealised through use of a slight reverberation, and the absence of any 'real world' outside ambience. These birds enable the fruition of a metaphor for that moment of difference between being 'on the ground' and being 'in the air'. Up' and 'down' have already been established in terms of the clarinet's aural universe. Now – suddenly – there is no ground beneath the performer's feet, and the only sound is an unequivocal 'above-ness' that is *more* than the relative difference between high and low. The bass clarinet sounds re-emerge, in a breathy pattern that mingles ambiguously with the sound of birdsong. It is quite difficult to hear each as a separate entity (despite the fact that they are not processed electronically), but it is

clearly evident that they occupy the same place. The bass clarinet is no longer on the ground. And it only took a slight impulse to achieve this moment of great amazement.

An image of another place can provide a metaphor for amazing ability.
An image of amazing ability can provide a metaphor for another place.

EMBLEM: a distant point

In order to hear things that belong to infinite space, we must reduce to silence all the noises on earth. ... All profound contemplation is necessarily and naturally a hymn. The function of that hymn is to go beyond reality and to project a world of sound beyond the silent world.
(Bachelard, 1988, p. 49)

The vanishing point in Leonardo's *Annunciation* is somewhere beyond that brief patch of open sea that's just visible between the trees. This is the place where all lines of sight converge and disappear into oneness. Viewed alternatively, this is the point from which all lines emanate towards us, towards where the image is finally reassembled and becomes meaningful in our eyes. Either way, some important journeys are taking place.

Yet in a painting, the view keeps still (we're not at the pictures, you know). Leonardo's *Annunciation*, like the sun, 'does not move', but we do; our sight follows the dimensions of the space he represents and takes in the story. In a narrative painting such as this is, the vanishing point is often a way of throwing a spotlight on the dramatic 'high point' of the tale – it directs the viewer to the lovers' lips, the dagger in the hand, the Christ-child's face, or to the astonishment of an anointed virgin.

But Leonardo leads us into the sea, and then onwards to an invisible destination where the horizon melts and the distant hills are shrouded in haze and mystery. The objects in the distance are, of course, depicted as much smaller, but he also conveys distance through aerial perspective, painting the furthest objects as more blue and indistinct. This mimics how we see in real life, so we perceive his analogy and interpret accordingly. But the vanishing point itself is apparently beyond even the blurred horizon, at a place we cannot see at all. In this vision the angel and the virgin are just the beginning of the story.

Bachelard's call for us to hear the 'things that belong to infinite space' is all very well, but of course he is not talking about sounded music, or even sound. He is working towards some kind of image for the internalised dynamic of a transcendent, poetic contemplation. Our experience of listening informs us that to hear the 'things' is to know their space, since all sounding objects signal information on both where they are, and how near they are to our ears. But what are the 'things' that belong to infinite space? Though the things may be inconceivable, our experience of auditory perspective allows for some educated guesses, just as our experience of visual perspective in real life enables us to appreciate a Leonardo. So perhaps it is possible to have a go at imagining some audible qualities for a space with no walls, no barriers, and no further obstruction. How can we aurally represent a thing, or a presence, in a space that is 'going on for ever'? You'll be needing a long reverberation time for that.

To go back to visual analogies: in real-world experience we cannot see forever. Even if blessed (or cursed) with superhuman eyesight, we'd eventually encounter an

object in our visual path. Perhaps Leonardo's vanishing point gets around that barrier because it's possible to imagine that we could, had we the stamina, stand in front of the *Annunciation* forever; staring onwards into his representation of unobstructed infinity until – at the sound of the last trumpet – we encountered something worth waiting for. In the mean time the visual representation would remain before our eyes (well, at least for the foreseeable future) to guide our imagination.

We allow ourselves a little reality. We make a deal with the two-dimensional representational perspective painting that, given sufficient encouragement, we will respond to the clues that indicate three-dimensional space *as if* this image *is* a three-dimensional space. The painting's illusion is assisted by the fact that all images enter the eye as two-dimensional images in any case. And although we will not generally regard the things or the space represented in a painting as 'actual', 'here' or 'real' we can be fairly easily fooled by optical tricks of various kinds.¹⁹

There is no direct sonic analogy to this infinite contemplation of Leonardo's invisible vanishing point. You can't stand in front of a sound that disappears endlessly into the distance because all sounds end eventually, or are in the process of ending. Certainly repetition or stasis, or any kind of apparent 'incessant-ness', can offer a kind of listening experience of transcendence, or of being in an infinite or boundless environment. But this is a metaphor for being *in* no-time, rather than of standing apart and appreciating infinity as an other, unknown and endless. Perhaps the representation of infinite space is difficult to convey metaphorically in sound because we are inclined *not* to hear sound as a representation of a place, but instead as evidence of an object's activity. It is quite easy to 'fool' the ear with a recording of a closing door, an exhaling sigh or a chorus of twittering birds. But these things do not represent the space itself. A huge amount of time is spent on discussing how various perceptual confusions and congruities that arise in listening might define an aesthetic for electronic music, especially that flavour of musique concrète that relies on a history of disembodied doors and sighs. But let me come at this from the perspective of a naïve realist for a moment and suggest that, although all this is of extraordinary interest to our listening to transformed sounds, we don't perceive that much of a difference between the meaning of a recorded door sound and a live door sound if both are disembodied. (This is perhaps why the sound of a stool falling to the ground in Normandeau's multichannel acousmatic work, *Malina* has everyone looking to see who fell off their chair, and the sound of the invisible voices in a performance of Beckett's experimental radio play, *Cascando* might be either a recording or a live performance, we'll never know which unless the lights go up). And the space created by the sounds may be fictional – fooling the ear with added reverberation and spectral cues – but it is 'finite'. Because if we are to build an aesthetic governed by the movement of objects in space, we'll need to measure distance. Things can't go on for ever. And this, I think, is why electronic music of this 'referential' kind has a difficulty when it comes to finding strong sonic metaphors for the infinity that lies beyond things.

But strong sonic metaphors do exist elsewhere. I would like to take make a very detailed journey, into an aural space that extends to infinite dimensions.

CD [5] movement IX from *Bhakti*, by Jonathan Harvey

Ultimate contraction of pitch, expansion of spirit. Three massive G's, mostly electronic, enlivened by internal manipulations of the spectrum. Each lasts a whole minute, and the last reverberates into space.

‘The quarters of the sky live on the oceans that flow out of her in all directions. The whole universe exists through the undying syllable that flows from her.’
1.164 (Rig Veda)

(Jonathan Harvey, liner note to *Bhakti*, movement IX)

Bhakti, a large-scale piece for 15 instrumentalists and quadraphonic tape, is about devotion as a way to approach the presence of eternity. In the ninth movement of this work, Harvey’s sonic metaphors for infinite space become explicit and unequivocal. And his metaphoric image is an illusion that plays on and with the ‘rules’ we apply when perceiving space from a sonic point of view. The three ‘massive G’s, mostly electronic’ are made from a single accented G from ensemble, with an electronic ‘G’ that continues long after the initial instrumental attack.

Some rules that are made to be broken

...sounds begin and end

Our visual perception of a ‘thing’ continues until we choose to close our eyes, but sounds start and finish, and then are gone. By starting, a sound infers that it will end. But Harvey is trying to express the sound of travelling sound in a world with no beginning or end.²⁰ His ‘massive G’s’ do not pass in and out of existence in this disconcerting way because they were always there – G is the pitch around which pitches gather at the very opening of the work. These G’s are never-ending. Certainly each of them articulates time (more on that later) but they are not a surprise. They have already started sounding in the previous movement, where the pitch emerged from a texture, and they will continue to inhabit the fabric of the movement that follows. Although we cannot close our ears, we can turn our attention towards and away from the presence of a pitch – and in music it’s common practice to encourage that shift of perspective. So this appears quite normal. The G’s merely come forward and take centre stage for an infinite minute or three, before returning to being still.

...timbre indicates proximity and effort

There are two opposing rules here.

1. The closer a sound is to us, the more intense its spectrum, or timbre. As the sound moves further away, the higher frequencies within its timbre will appear to diminish. When sounds reverberate in space the higher frequencies tend to fade out first.
2. For naturally produced sounds, a louder sound tends to have a brighter spectrum or ‘colour’ than its softer counterpart.

In practice, we prioritise. If a loud sound is produced at some distance from us, we will decide that it is louder, even though the volume, or energy, indicates otherwise.²¹ So the trumpet shall sound, but a distant trumpet played loudly will be perceived as louder than a muted trumpet played up close, even if they both register exactly the same decibel level, since the distant but loud sound will have a brighter timbre. Changes of timbre within a note provide strong auditory cues for proximity; they tell us where we are in relation to a sound. Harvey’s treatment of timbre sabotages that cue.

After an initial attack, each of the electronic G's changes its timbre continuously, through an unpredictable swelling and contracting of its inner spectrum (as Harvey describes in his programme note). This might well make perceptual sense for a sustained orchestral texture lasting a minute or so, but various contributory factors lead us to think of this sound as belonging to a single 'being' or presence, *in addition* to that presence indicating a virtual 'space'. Each 'note' is indeed centred *around* a specific pitch, although the actual timbre encompasses a wider range. This 'single' note is not behaving in the same way as a sustained orchestral unison: the timbre is undergoing a continuous and unpredictable variation, shaped by a single 'envelope' in terms of both volume and spectral change. It sounds as if 'one thing' is making the dynamically evolving sound. That thing has human connotations because the timbre has vocal qualities (through the use of spectral characteristics peculiar to the human voice) and yet it cannot possibly be perceived as human, because the timbral evolution and the duration precludes this likelihood. And an inhuman, endlessly evolving breath that nevertheless has some human associations is difficult to envisage, because it is unknowable. And we don't know *where* it is either because, in terms of auditory perspective, it indicates a space that is all around us, in quadraphonic space, and yet one that cannot exist in the real, external world. If this were a drawing, perhaps we'd give it wings.

... the sound indicates the nature of the space

Normally, these cues for auditory perception fuse to provide an aural picture of the shape, size and the type of walls for a space.

The first two G's each stop abruptly, after fading and swelling in unpredictable ways. Between each of these G's there is a short 'outburst' from the tape, which at first seems so incongruous as to be even an 'error' perhaps. Between the first and second G there are three very short bursts of sound – one a snippet of the timbre just heard, the following two higher transpositions of the same kind of sound. Between the second and third G there is just a single burst of similar timbre. Are these perhaps the 'things' that create an impulse for some kind of decay? But the long electronic G's extended from an instrumental ensemble 'attack' and then faded into the distance, whereas these bursts of sound appear to *follow* the G's, since there is no outburst before the first G (but on the other hand there is no outburst after the last G either). These apparent interruptions have such presence that they appear almost to reach out and touch us: both loudness and intensity indicate proximity. And I think that although these interjections indicate space, they have been taken out of time. They have been dissociated from the 'decay' of the long notes, and they have also been dissociated from 'before' and 'after' because they do not measure anything except a kind of 'now'.

In the external world that we know, these various aural cues are inseparable, (and we know this too). But in this space, there is time. In fact this frozen time is reinforced by another separation. Those bursts of sounds are indicated as cues for the conductor and players to 'adopt motionless positions as if just about to play'.²² So the sudden aural activity from the invisible tape coincides with a drawing of attention to the sudden 'absence' of live performance in our real-time present. This absence is indicated visually, but the visual image is a metaphor for a lack of sound. There are two places. There is the place that is here. And there is the place that is there. After each outburst there is a silence of a few seconds (after the first G, 7 seconds, after the next G, 12 seconds). This complete absence is an empty place where even the G no

longer is. As the poised performers visually suggest, it is a space full of desire for the G's return.

...a reverberation will fade

When a sound reverberates in space it will eventually decay to nothing. It will fade out gradually. This may seem obvious, but that is precisely because this cue is so vital to our understanding of dimension.

The first two long G's do fade; it takes a full minute, but eventually the sound drains away to nothing. The endpoint of the sound in both cases is actually rather abrupt with an unexpectedly short reverberation (if it seemed to short, we must have been expecting something else). And each of these G's is, of course, followed by a continuation of what came before, with the short bursts of sound in the interim. The last G stops abruptly too, but the reverberant, echoing repetition that follows tells us that this massive G - this 'thing' - is resounding in a vast place. However, the sound is decaying. If that massive G had continued as an 'ever present' drone, always at the same demanding level of intensity, we wouldn't be thinking about this other vast space, we'd simply feel ourselves to be *in* the space (a feeling on which my next example relies). But then again, although the G fades, it doesn't go away. In fact the next movement begins with horn calls over and across the same immensity that we are hearing now, and in the spaces between this movement's instrumental antiphony the echoes of that G will continue to reverberate, for ever

The electronic sound surges up and down in both dynamic and timbre, moving from quasi-orchestral to quasi-vocal timbre, without being identifiable as one or the other. In this sense it is disconnected from the acoustic instrumental sound that issues from the stage. Yet it is also perceived as the decay that proceeds from an initial attack in which acoustic and electronic forces combined, as did the spaces that they inhabit.

While the 'undying syllable' of the G's on the tape does not fade, the live ensemble does. A staggered falling away of live presence bids a careful farewell to worldly space. For the first G the instrumental attack – covering a wide registral space - comes from clarinet, bass clarinet, horn, crotales, harp, piano, and solo strings. The G is grounded by the middle and lower register being sustained for 20 seconds or so. In consequence the electronic G appears to relate to the 'real world' of the live ensemble. For the second G the clarinet and bass clarinet are absent. The first instruments to depart are breath-based ones, capable of holding a long, sustained note, and whose complex timbres perhaps relate most closely to the tape timbre. So the second tape G has fewer earthly ties. By the last G only crotales and harp remain, and even the lower octaves of the harp attack have gone. The last G has virtually no relationship to real space: the crotales and harp that colour the attack are very loud, but their presence is unearthly – these timbres are already venerable sonic metaphors for transcendence. They are soon subsumed into an endless reverberation.

An image of another place can provide a metaphor for measureless dimension.
An image of measureless dimension can provide a metaphor for another place.²³

EMBLEM: a gap in the wall

There will always be someone who will do away with all complications and oblige us to leave as soon as there is mention of space – whether figurative or not – or of the opposition of outside and inside. But if reduction is easy, exaggeration is all the more interesting, from the standpoint of phenomenology.
(Bachelard, 1994, p. 97)

Leonardo sets out his story with the assistance of some traditional devices. The angel has brought along white lilies – symbol of the Madonna’s purity and grace, and also indicative of the Easter to come. And the Madonna is receiving the heavy news whilst seated in her own enclosed garden (it must be hers, she has the furniture): that garden is another poetic metaphor for virginity.²⁴ All in all I’d say the angel has got the girl - apart from one thing that bothers me a little; there’s a gap in that solid wall that divides background from foreground.

Mary, or rather the lilies that represent her, is poised in that gap between the enclosed garden and the real world that continues on the other side of the wall. In the garden time has stopped, and the only movement is a vestige of eternal flight. But in the real world there are indications that time goes on regardless: ships travel from one harbour to another and a river flows away to meet the sea – these both have aspirations that may repeat indefinitely but are symbols of life, not of infinity. But whether this virgin ultimately has a choice or not, perhaps there’s enough time for her to feel she could make a wise decision; she is caught in a moment of suspense in the gap between two spaces - between her desire and her destiny. Now, she just might look towards us and declare ‘you know, I’d rather not today, if it’s all the same to you’. Because we are there *too*: in this large-as-life²⁵ painting the flowery lawn extends towards our feet and the foreshortened perspective implies our participation inside the narrative frame. We are merely out of shot for the moment.

That was a personal, slightly exaggerated, point of view (a metaphoric emblem for this book perhaps). I want to turn the sound down low for quite a few moments, and pass the visual image under several expert pairs of eyes before thinking on how metaphors for this gap might be drawn out of a composed discrepancy between sonic and visual spaces.

Looking, and its analysis through perspective techniques, was a Renaissance cross-disciplinary obsession that painters grabbed with gleeful alacrity. At last, surround vision! (well, almost). Alberti’s influential thesis on the subject of perspective in painting would have been Leonardo’s well-thumbed guide, and no doubt Alberti’s proclamation that the canvas was to be treated as ‘an open window’ was quoted *ad nauseam* by diligent young artists.²⁶ There is another *Annunciation* in the Louvre – for a while also attributed to Leonardo. This one takes Alberti rather at his word: the edges of a fictional window appear at the corners of the painting, and we look through this window to observe a similar angel meeting a similar virgin. But Leonardo has a photographer’s eye: he is looking for a more involved spectator.²⁷

Stanley Cavell sets our reception of painting and photography (including film) in opposition, and suggests that the photograph maintains ‘the presentness of the world by accepting our absence from it’ while ‘to maintain our presentness, painting accepts the recession of the world.’ (Cavell, 1979, p. 23). In observing the photograph we understand and *feel* it as an image of a ‘present’, but only because we are set apart from it, in an ‘outside’ present that is now. But the painting, in Cavell’s view, doesn’t deal with fixing that sense of presentness. We do not feel that the painting extends outwards beyond the frame as any kind of previous or transfixed reality. There is a present ‘inside’ the painting, but that present was never ours.

But wait a minute. When there's an opportunity to step through the frame onto the painted lawn, I would say we are going into a situation where our 'now' is flickering precariously. We are now perceived (by ourselves) as a presence in the image that we view. Our feet on the grass are implied, and although we are invisible to ourselves we feel we might be seen. The rationalization for our invisibility involves some kind of belief that the image is directed from our eyes, and is thus a representation of *our* 'looking'. The painting takes on our time, so when we see that gap in the wall, we feel we came across it in the course of looking around. *We* move, just as we feel *we* move when the film camera pans a scenic view around us. It's almost real, it's just that our sense of reality is rather different and the space is a little strange.

Michael Kubovy is my last witness. His thesis on the psychology of Renaissance art considers 'the spectator's experience of his or her location in space with respect to the physical surface of the painting and with respect to the room in which the painting is viewed.' We do not always look at an image full on, and in taking a sideways glance we may catch a hidden detail from the corner of our eye.²⁸ Perhaps that's when that particular something can look out across the gap and address us, personally. Barthes, talking about photographs, called that something the 'punctum'²⁹ – that point, perhaps a miniscule detail, that seems to leap out from the image and strike the person looking as unexpectedly poignant or moving (something as trivial as a wing, a ribbon or a spray of lilies). And in perceiving that personal, mysterious emblem, we are suddenly brought back to our *feeling* of time and space.

Kubovy contends that Renaissance painters 'deliberately induced a discrepancy between the spectator's *actual* point of view and the point of view from which the scene is *felt* to be viewed'. Certainly Leonardo's *Annunciation*, with its vanishing point technically 'too high' and to the right of the composition, and a foreshortened perspective that lands the viewer in the grass, does invite us to *feel* as if we are standing in the garden, perhaps nearest to the Madonna; and we are looking – significantly – upwards, and onwards to the distant sky. Of course we're not *actually* looking from that position. (We're probably in a rather crowded gallery surrounded by other sticky tourists.) But I would like to take issue with Kubovy's rather flamboyant claim, that 'the result is a spiritual experience that cannot be obtained by any other means' (Kubovy, p. 16). This kind of spiritual experience may well employ discrepancy to build images for a metaphor of transport to another, transcendent space, but discrepancies of perspective can arise in other media as well. A discrepancy requires an opposition, and perhaps there is even more scope for composing discrepancy into a work when there are two types of media involved. If the opposition between these two media is exaggerated as part of the work, then there are bound to be sparks when the two are drawn together by an unexpected detail. The difficult task is leaving us with the *feeling* that there's still an element of personal choice when it comes to minding that gap.

CD [6] *China*, by Phill Niblock (audio excerpt from audio-visual work)

Phill Niblock's *China* is a work in which nearly 45 minutes of documentary film is presented simultaneously with a musical work, separately titled *Winter Music*³⁰. Everything in Niblock's work is somehow larger than life – the duration of the work, the nature of the music, the size of the images. In performance, Niblock's videos are often 'multi-channel' with more than one film running simultaneously on large screens;

and the music is *extremely* loud, produced through speakers set up around the space. Often the musical element is a combination of live performance and multi-tracked tape, with both recorded instrumental and sampled sounds. Sometimes there is no live component (as in this video version of a work). Performances differ: you may be able to walk around, or you may be seated in a concert or theatre space. Often, Niblock's live events go on for several hours, and always at the same intense level of visual and aural amplification.

In *China*, as is usual for Niblock's videos, the original footage is 16mm film of people performing ordinary, manual tasks – here it is Chinese peasants in the fields, sawing trees, picking crops, making baskets, sorting fruit, catching fish, herding goats. The filmed images concentrate on the physical actions required by these tasks, frequently going into close-up to concentrate on the movement. The camera just 'watches', it never moves in any overtly planned trajectory, other than to shift to get a better view of what's going on. In opposition to the dramatising urge of the movie-director, whose editing makes 'a contrast that is sharper than the contrast between successive events in real time.' (Sontag, 1982, p. 360), Niblock seems intent on making no contrast at all. He is certainly not interested in constructing a distinct narrative from these ordinary observations of seemingly ordinary things. The editing is virtually non-existent, and Niblock generally presents lengths of footage in the order they were shot, without much intervention other than intermittent cuts. There are no fades, no superimposed images and there is no location sound. Yet the documentation of the physically taxing tasks is mesmerising. It's almost as if the subjects' endurance and fortitude is being projected onto our endurance in watching these yards and yards of film.

The images may appear silent and wilfully 'un-directed', but the sound is deafening. The music is a multi-tracked, and in performance multi-speaker, drone that is spatially all enveloping. It is built from recordings of long notes on flute, bass flute, string quartet and sampled synthetic sounds. A huge E natural, distributed over several octaves, completely saturates aural space and obliterates any sense of natural dimension – unlike Harvey's G's, it implies no space at all. The sustained notes, continuing unabated for long periods, and the volume level appear to leave no room for any other aural component. Microtonal tunings between different overdubbed drones impose their own time scale, and encourage us to turn inwards. These loud microtonal clusters create beats, or difference tones, with the result that the sound is not only almost unbearably loud but has artefacts that invade even inner listening space through an aural hallucination.³¹ The overwhelming effect of the music is an obliteration of list any possibility of listening to anything other than its presence: there are no gaps, and there is absolutely no escape.

Within each medium, there is an opposition between our normal (i.e. learnt) expectations for the medium, and what we get. A 45-minute, relentless, microtonally tuned drone that only descends by a tone in the last few minutes (by then a momentous event) is not what we expect of a soundtrack. A long patchwork of documentary footage is not what we expect of a narrative film, yet neither does this film declare itself unequivocally as purely an ethnographical record. And the complete opposition *between* music and film strengthens this subversion of their conventional respective roles. There are no points of contact between music and image other than those of our own composition. The filmed images are not only of people whose lives are culturally remote to our experience (in the majority of cases), but they are individually remote to us too, obliviously performing everyday routine tasks, and getting on with living their present. Like the photograph, they are a recorded image of a past 'present'. And for us

it is a very distant present since we are completely engulfed in the huge presence of the music. Unlike a movie music soundtrack, where the non-diegetic ‘mood music’ draws us in to the emotional world of the film, here the music sets us apart behind a screen of sound. But even while the searingly loud music invades the senses, it is almost impossible to ignore the even louder silence on the film. Film and music do battle to occupy the forefront of perception.

As with much of Niblock’s work, *China* is, I think, so entirely built on discrepancy that it is in an almost *continuous* state of being able to offer each of us a gap – a punctum, or a metaphorical moment of infinite awareness. When you notice a gap - when one space crashes against another - the bridging of those discrepancies will be an achievement that deafens all else. The moment will be different for everyone. Here’s mine.

A glance across the auditorium

...close-up of a man weaving a basket. This cuts to a shot of a herd of goats walking along a lane, moving from left to right across the screen. There are no people. Two young male goat-herders come into view, walking left to right, a third man and then a fourth come into partial and then complete view, as they all stroll across behind the goats. As they pass the camera the men look at it in a mildly curious way, but without stopping or slowing down. The last man to leave the shot turns his head slightly to keep his eye on the camera as he walks past. There is a brief shot of the empty lane, then a cut to a view from behind of them passing on down the road, walking behind the herd...



Figure 2: stills from c. 8:30 *China*, Phill Niblock (by permission)

When that man turns his head and gazes back at the camera, I feel as if he has noticed me watching him, and of course he has indirectly, via the recording presence of Niblock and his camera. The opposition of two spaces is heightened by this revelation of a sudden gap in the wall when, it *feels* to me, that he and I meet in a moment out of time. For me, and quite possibly only for me, this is a ‘punctum’ in this work: suddenly the wall interposed between myself and the image is made explicit. The camera’s interposing ‘frame’ is revealed; the distance between my presentness and the presentness recorded in the work is heightened by the overwhelming presence, but only in *my* present, of sound. (I feel as if the music is suddenly more noticeable at this point, and although it doesn’t change significantly there has been a more obvious semitonal inflection). The discrepancy between my world and the world of the work is so exaggerated as to be completely dissonant. In real terms the discrepancy between my

existence and this man's existence are also 'brought home', as is the discrepancy between the intents of documentary record and art.

In trying to think what might induce this particular significance for me I can suggest several contributory reasons: this moment is preceded by the first footage to feature animals en masse, without human presence, and the men are also the first to show a very noticeable 'group' awareness of the camera; the men come into shot gradually and – unusually – they walk across the shot rather than remaining in one position while they complete a task; they move nearer until they are in close-up, and this sense of changing perspective is also unusual. Aurally, by this stage in the work the electronically projected sound has become my world – I have lost the ability to think in gradated terms of loud and soft. I have long ago abandoned any conscious attempt to find, or create, a relationship between the music and the film. Instead my attention is split – continually traversing listening and viewing, but never synthesizing the two. However, the music is very much closer than the film. It is, literally, inside my ears. The film is further away. I am not expecting any connection between myself and the other place in the film. When I find one, it's a shock.

I could go on interpreting, but there is obviously no decision on Phill Niblock's part to make this particular moment stand out. The lack of any narrative intent, or any association between the two media, puts the onus on the listener/viewer. The possibilities are immense, and as Bachelard suggests, 'since immense is not an object, a phenomenology of immense would refer us directly to our imagining consciousness.' (Bachelard, 1994, p. 184)

An image of another place can provide a metaphor for a break in the wall.
An image of a break in the wall can be a metaphor for another place.

Every metaphor has within it a potential for reversibility. The two poles of a metaphor can play the role of the real and the ideal alternately. With these metaphors, the most time-worn expressions, like the flight of ideas, can take on a bit of material substance, a bit of real motion.
(Bachelard, 1988, p. 55)

¹ An online collection of facsimile reproductions of various English emblem books can be found at <http://emblem.libraries.psu.edu/> (URL visited January 2003)

² Electronic sound here includes the electronic projection of recorded sound (of any kind), the digital or analogue manipulation of recorded sound and the synthesis of sounds through electronic means.

³ Although the painting is probably more of a collaborative effort, it is generally agreed by experts that Leonardo da Vinci's involvement was significant. But anyway, this is not so important to my metaphor: the 'Leonardo' I refer to was never flesh and blood, he is my by-line for a construct I have put together, he's a fictionalised artist whose (apparent) motivations validate my somewhat quirky reception of *Annunciation*, a painting executed (mostly, we think) by a man whose name was Leonardo da Vinci.

⁴ For a detailed exploration of metaphors for the mind see Draaisa, Douwe (2000), *Metaphors of Memory: A History of Ideas About the Mind*, Cambridge, UK: Cambridge University Press.

⁵ *Wings of Desire*, dir. Wim Wenders, 1987. (More information at www.imdb.com)

⁶ It is not only in fictional reality that film attempts to give us wings. In the BBC series *Supersense* (1988, dir. John Downer) specialist camera techniques enabled the viewer to experience flight from the bird's perspective and this kind of 'as if you were really there' filming has become the mainstay of much natural history documentary work.

⁷ You can tune in, space out at spacemusic.com (web page visited April 2002)

⁸ *Modulations*, dir. Iara Lee, 1998. (More information at www.imdb.com - URL visited January 2003)

⁹ I wrote an extended piece on this particular work, in relation to narrative and space, in a previously published chapter. I'm resuming briefly from a different perspective. The original chapter is Norman, Katharine, 'Stepping outside for a moment: narrative space in two works for sound alone' (in Emerson, 2000).

¹⁰ Study of a sleeve, pen and ink, 7.8 x 9.2 cm. Oxford: Christ Church.

¹¹ 'Only the slightest impulse is needed to activate this lightness that prefaces his whole being. It is easy, and very simple: striking the heel lightly on the ground gives us the impression of being set free. This slight movement seems to free a potential for mobility in us that we had never known, but that our dreams revealed.' (Bachelard, 1988, p. 29)

¹² 'A clear awareness of being able to fly develops in the dreamer's soul.' (Bachelard, 1988, p. 20).

¹³ Pierre Schaeffer's theoretical work on classifying sound 'objects' according to a complex system of typology is still of great significance to the 'acousmatic' school of electroacoustic composition. His three significant publications are *A la Recherche d'une Musique Concrète*, (1952); Paris: Editions du Seuil; *Traité des Objets Musicaux*, (1966); Paris: Editions du Seuil; *La Musique Concrète*, (1967); Paris: Presses Universitaires de France.

¹⁴ For a clear discussion on how this affects listening, see John Pierce, 'Hearing in Time and Space' (in Cook, Perry R., 1999). The 'precedence effect' requires a loudspeaker to be behind the (human) speaker, so that it is further away from the audience. 'If the amplification isn't too great, the audience tends to hear the speaker's voice as coming from the speaker's mouth rather than from the loudspeaker' and, as Pierce goes on to clarify, it also encourages a visual association with the speaker's moving lips.

¹⁵ Whole repertoires are selected with that 'in your face' proximity in mind. Information provided by the British group Icebreaker is clear in outlining political and practical requirements for would-be composers:

'Since the band aims to deliver energetic performances that will appeal to a broad audience, pieces which are predominantly loud, aggressive and fast are preferred to those that are perhaps more introverted. ... The music is always amplified, enabling the blending of instruments that don't balance acoustically. The mix is essentially static, however...' (http://www.icebreaker.org.uk/ice_comp.pdf)

¹⁶ Per quanto riguarda il clarinetto dal vivo, anche quello si potrebbe muovere nello spazio dal punto di vista acustico, ma io ho una grande attenzione per il rapporto tra strumentista e suono, e in genere mi sembra che, soprattutto in un pezzo dove ci sono suoni riprodotti da macchine (cioè senza una corrispondenza visiva), è più giusto mantenere la corrispondenza spaziale tra suono e immagine dello strumentista. (Ceccarelli, email correspondence with Katharine Norman, March 2002. Trans. Katharine Norman)

¹⁷ I will use the word ‘tape’ throughout to refer to the electronic part. More often today this is in reality a CD or computer file, but the word, harking back to the reel-to-reel tape machines that were the first widely used means for playing these types of work, has become almost generic to indicate pre-recorded ‘non-live’ electronic music.

¹⁸ La mia lunga esperienza di lavoro sullo spazio sonoro mi ha sempre più convinto che ogni spazio possiede un suo suono particolare e che questo stesso spazio influenza in modo sostanziale la musica. Questa consapevolezza mi obbliga in ogni mia composizione a pensare a come effettivamente “suonerà” un certo ambiente e a come sarà, come “vivrà” la musica dentro di esso.

.... Noi sentiamo il suono attraverso lo spazio e quindi sentiamo esclusivamente il suono dello spazio sonoro e mai direttamente la fonte sonora “pura”, che in quanto tale non esiste. (*Catalogo Generale del Ravenna Festival 2000*, AA.VV, 2000, In *Die Resurrectionis*, conversazione con Luigi Ceccarelli - p. 144). Trans. Katharine Norman.

¹⁹ For instance, as in the experiments by Ames in which a restricted peephole view encouraged observers to think they were seeing a real chair, when in fact the ‘chair’ was a collection of unconnected pieces of wire hanging in front of a painted backdrop. (see Gombrich, 1960, p. 248)

²⁰ Harvey is acutely aware of the metaphoric significance of electronic sound, remarking elsewhere – in relation to his opera *Inquest of Love* ‘My initial idea was a sound of the sort only electronics can produce, a long static sound in which one could live’ (Harvey, 1999, p. 54)

²¹ See John Chowning’s chapter ‘Perceptual Fusion and Auditory Perspective’ pp 261-275 in Cook (2000) for a detailed explanation of auditory perspective cues.

²² They share this tendency with Stockhausen’s *Trans*, in which the near motionless activity of the ensemble, playing extremely long, sustained notes, is disrupted intermittently by the amplified sound that shuttles back and forth (in fact the recorded sound of a weaver’s shuttle). In both cases time, and space, is of the essence.

²³ After I completed the first draft of this chapter I sent it to Jonathan Harvey who pointed me to a passage in his book *In Quest of Spirit*. To my amazement and encouragement he there describes a dream of flight (pp 54 –55). Later, in relation to live electronics he remarks ‘When they lack connection to the familiar instrumental world, electronics can be overwhelmingly alien – other, inhuman, inadmissible, dismissable (like the notion of flying in a rational world).’ (Harvey, 1999, p. 62)

²⁴ As in “a garden enclosed is my sister, my spouse, a fountain sealed, a well of living water, a garden with the fruit of apples.” Cant. iv. 12, 13.

²⁵ The painting measures approximately 7 by 3 feet – which makes the figures pretty much life-sized, in terms of a viewer’s perspective, looking ‘into’ the depth of the painting (and of course assuming angels are of human proportion)

²⁶ In 1435 and 1436, Alberti published *De pictura* in Latin and *Della pittura* in Italian, which contains the earliest known geometric and optical analysis of linear perspective. The book was of great influence (and is cited by Leonardo da Vinci in his writings on perspective). ‘First of all, on the surface on which I am going to paint, I draw a rectangle of whatever size I want, which I regard as an open window through which the subject to be painted is to be seen.’ Alberti, quoted p. 42 of Edgerton, S.Y., Jr. (1975) *The Renaissance rediscovery of linear perspective*. New York: Basic Books. This ‘open window’ principle is often wrongly attributed to Leonardo da Vinci himself.

²⁷ There has been some discussion on whether Leonardo da Vinci did in fact have unusual visual abilities, from those seeking explanations of how – unaided by technology – he could have made such minute and accurate observations of, for

instance, the flight of birds. For instance: ‘These is no doubt that the nerves of his eye and brain, like those of certain famous athletes, were really supernormal, an din consequence he was able to draw and describe movements of a bird which were not seen again until the invention of the slow-motion cinema.’ Kenneth Clark, *Leonardo Da Vinci*, p. 191 (London: Penguin, 1988 – first published 1939)

²⁸ Some paintings *require* a sideways look, perhaps the most famous example being Holbein’s *The Ambassadors*, which employs anamorphic perspective to play a visual trick. (National Gallery, London).

There is a good online page about this painting at

http://webserver1.oneonta.edu/faculty/farberas/arth/ARTH214/Ambassadors_Home.html

(URL visited January 2003).

²⁹ Barthes, Roland, *Camera Lucida* (London: Vintage Books, 1993 – first published 1980), p. 49.

³⁰ The version I am talking about was specifically released on video for ‘home’ performance, although it is essentially the same format as his performed works.

³¹ Difference tones are aural artefacts caused when two slightly detuned pitches are played in unison, or more noticeably when across octaves. The artefacts represent the difference in pitch between the two, and so are inharmonically related to the played pitches. This précis of a detailed explanation by David Soldier indicates the physical nature of this auditory hallucination: ‘The fundamental pitches stimulate mechanoreceptive cells, the so called ‘hair bundles’ in the cochlea of the ear, by deflecting a mechanically sensitive ‘hinge’ on the cell... With the addition of a second frequency, the cells vibrate not only at the frequencies of the fundamentals and their harmonics, but also at the frequencies of sum, difference, and combination tones. The hair bundle’s new ‘hallucinatory’ vibrations are transmitted through the ear’s basilar membrane, activating other hair bundles in the region of the cochlea responsive to the new frequencies. The auditory nerve, and the cerebral cortex is therefore unable to differentiate between ‘real’ played frequencies and those arising from this special characteristic of the frequency responsive cells in the ear.’ David Soldier, leader of the Soldier String Quartet in liner notes to Niblock, *Five More Quartets Experimental Intermedia Foundation 1993 XI 111* (‘Further notes by Dave Soldier in his day job capacity as an assistant professor in the departments of neurology and psychiatry at Columbia University’).