

## 7. CASE STUDY: FILM SOUND, ACOUSTIC ECOLOGY AND PERFORMANCE IN ELECTROACOUSTIC MUSIC

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Typically, when we think of a live musical performance, our understanding of it is well grounded in the realm of the visual. When we go to a musical performance, for example, we *see* the musicians on a stage which acts as the locus of our attention. This attention to the visual presence of the performers offers a certain measure of validity to the uniqueness of the live event, and can direct our attention to aspects of the music's production that we may otherwise be unaware of. Yet this same visual engagement can call attention away from qualities of the sound being heard that reveal themselves only when they are attended to in their own right. Such visual engagement can also distract us from the way that music is behaving within the performance space itself.

The use of recorded sound as the basis for live performance blossomed in the second half of the twentieth century, and has raised many issues concerning the idea of what a musical performance should be. When performers began using recorded sound, many argued that a certain level of authenticity was removed along with the removal of conventional musical instruments. When we can no longer see what a performer is doing to create the sound we hear in a live setting, the notion of performance can be called into question. Nowhere is this more evident than the laptop performances that are so prevalent today in which, as Philip Sherburne has sardonically observed, 'a twitch of the wrist becomes a moment of high drama' (Sherburne 2002: 70). With the prevailing consensus that musical performances need to be visually stimulating, the sight of a lone, stationary figure stooped over a laptop computer is disappointing. Those working in the broad field of electroacoustic music – sound compositions

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presented through loudspeakers – have long based their idea of musical performance on the sounds being played rather than the people playing them. Live diffusion of acousmatic sound – sound presented in the absence of any visual source – provides the basic model for concerts of electroacoustic music. The sound itself is pre-recorded, but its particular treatment within a given space is left up to the diffuser, who moves the recorded sound through the sound system in real time using a mixing console or, more recently, specialised software. In this way the performance becomes context-specific despite the lack of musicians performing in real time.

A fair bit has been written on the art of live diffusion, but this writing tends to be from a technical and/or psychoacoustic perspective. What technologies can be used to move sound around space on the levels of both composition and playback? How does our understanding of space relate to the treatment of sound, and vice versa? How can spatiality be built into auditory composition? These are all important questions. But for present purposes I would like us to take a step back and consider the basic premise of live diffusion of electroacoustic material, which has so often been taken for granted: the desire to remove evidence of the source of sound as well as how it is being manipulated in a given performance.

This chapter will discuss the concept of the ‘acousmatic’ and the issues it raises when considering the idea of live performance as hinging upon an audience’s need for a visual point of reference as substantiation of a performer’s presence. The tradition of acousmatic music, pioneered by French composer Pierre Schaeffer, will be discussed as an ideal that challenges the visually based paradigm for music performance in Western culture, while, at the same time, calling figurative art into question through its insistence on total abstraction. The acousmatic ideal will then be posited against the ecological approach to sound awareness found in the field of acoustic ecology. Like the term ‘acousmatic’, the concept of ‘schizophonia’, coined by Canadian composer R. Murray Schafer (founder of the acoustic ecology movement), refers to the separation of sound from source. For Schafer, however, this separation is extremely negative, and it will thus serve as an instructive counterpoint to Pierre Schaeffer’s acousmatic ideal. Along the way we will flesh out key debates in the theories and practices of sound reproduction technology, most notably questions concerning the mediation of experience, the spatial contexts of sound reproduction, and the role of multi-channel systems in the presentation of recorded sound. Here it will become clear that many of these debates have crystallised in the field of film sound theory, and that the particular issues faced when thinking about sound in the cinema can yield productive ways of thinking about the questions raised by the concepts of acousmatic sound, schizophonic experience, and electroacoustic performance. The writing of Michel Chion will serve as the basis for connecting the thinking of Pierre Schaeffer to the world of film sound,

and, by extension, R. Murray Schafer's concern for the world's sound ecologies. Ultimately I will suggest that the ideologies behind acousmatic music and the notion of schizophonia are not, in fact, irreconcilable. The work of Hildegard Westerkamp will be discussed as an exemplary practice that merges the seemingly opposing ideologies of Schaeffer's acousmatic ideal and Schafer's context-based approach to sound awareness. Her piece *Kits Beach Soundwalk* will serve as a case in point, both in its approach to soundscape composition and in the way that it has been diffused in the context of electroacoustic performance. So let us begin by considering the basic ideologies underlying the concept of the 'acousmatic' in more detail.

### THE ACOUSMATIC

In *The Voice in Cinema*, electroacoustic music composer and film sound theorist Michel Chion describes the origin of the term 'acousmatic' in a story concerning Pythagoras from the 1751 *Encyclopedia* of Diderot and d'Alembert. Here the term 'Acousmatiques' is used to refer to those 'uninitiated disciples of Pythagoras who were obliged to spend five years in silence listening to their master speak behind the curtain, at the end of which they could look at him and were full members of the sect' (Chion 1999: 19). The reason for keeping the disciples in the dark may have been two-fold. In the context of his book on the voice, Chion uses this story to illustrate the idea that the voice without body is imbued with special powers of omniscience and ubiquity. Chion uses the term 'acousmètre' to refer to cinematic characters presented as voices without bodies that, being kept hidden from view, are seemingly more powerful than the average human being. This sense of power through an emphasis on auditory presence would certainly befit a master wishing to assert his status as such. Yet Pythagoras' strategy might also have been an early expression of what has been distilled to the more familiar 'principles before personalities' tenet held by many religions: focus on the message, not the messenger. Not until the message is understood can the distraction of exposure to the messenger be allowed, a point that Chion makes in *Guide des objets sonores* (Chion 1983: 19), his companion piece to Pierre Schaeffer's *Traité des objets sonores*, the latter composer's landmark work of theory in which he formulated his ideas about acousmatic sound. For Pythagoras there was clearly some value to the idea of presenting sound in the absence of a visual source, and a sense of this value remained intact through the twentieth century. Chion reminds us that in French the word 'acousmate' has come to designate 'invisible sounds', and it was writer Jérôme Peignot who 'called this term to the attention of Pierre Schaeffer' (Chion 1999: 19). It is once Schaeffer began using the term that its relevance to musical performance became especially charged.

Pierre Schaeffer was interested in how musical composition might gear itself towards just such an understanding of sound in its own right. He pioneered the

tradition of composition and performance referred to as acousmatic music, the basis of which is to present compositions recorded on a fixed medium and played back through loudspeakers. Yet it is important to understand that Schaeffer wanted to move beyond the physical detachment of sound from source offered by the loudspeaker, and into something more abstract. The designation ‘acousmatic sound’ can apply to any sound presented in the absence of a visual source. The designation ‘acousmatic music’ was, for Schaeffer, geared towards presenting sound compositions in which the audience is called upon to detach themselves from the need to think about the sources of the sounds they hear and focus on the sounds as self-contained objects. Schaeffer posited three main modes of listening: causal (listening with an ear towards the cause of a sound); semantic (listening for the meaning contained within the sound); and reduced (listening to the qualities of the sound in its own right) (Chion 1994: 25–34.) Schaeffer was most interested in reduced listening, and the ideal for acousmatic music is often thought of as the presentation of sound which fostered this kind of listening alone.

In acousmatic music, then, the idea of referentiality is not thought of in terms of a visual counterpart, for such a counterpart is done away with through the use of loudspeakers as the mode of sound transmission. The sound is necessarily detached from its original source, whatever that may be. The use of electroacoustical transmission is a crucial aspect of Schaeffer’s concept of acousmatic music. For reduced listening to take place, sound must not only be detached from source, it must also be fixed on a recording medium so that the sounds can attain ‘the status of veritable objects’ (Chion 1994: 30). No live sound is ever truly repeatable, so to analyse a given sound’s particular qualities properly it must be made repeatable through technologies of recording and transmission. In this way the sound is made ‘concrete’, and this is one of the principal tenets of the movement that came to be known as *musique concrète*.

To qualify as a composition upholding the ideals of acousmatic music the sound must be organised in such a way that it does not evoke a sense of its own causes; it must achieve a level of abstraction that allows the audience to attend to its status as pure sound rather than sound which emanates from something recognisable in the world. This is the essential difference between acousmatic *music* and acousmatic *sound*; the former is about an intentional removal of causal and semantic elements within a composition, while the latter simply designates a sound which has been separated from its source. We all experience electroacoustically transmitted sound on a regular basis, but most of this consists of music to which we attach a basic understanding of source: we hear the latest pop stars singing through the sound system in the local mall and we attach this voice to our knowledge of their being. This is acousmatic sound. When we hear a well-designed piece of acousmatic music, we don’t attach a sense of the sources to the sounds. We just hear them as they are.

The cinema, being an inherently audiovisual medium, sheds some interesting light on the concept of the 'acousmatic' and its relationship to the sense of sight. An examination of acousmatic presence in film will prove useful in expanding our understanding of the ideals and limitations of Schaeffer's thought. In his adaptation of the term 'acousmatic' for use in film sound theory, Michel Chion has led the way in bridging the gap between Schaeffer's world of acousmatic music and the role of sound in film. Needless to say, in a purely auditory medium, the idea of the 'acousmatic' means something quite different from how Chion has adopted it for use in the cinema. In *Audio-Vision: Sound on Screen*, Chion discusses acousmatic sound for the cinema in terms of 'passive' and 'active' modes. The passive mode would include ambient sound, such as bird song and traffic noise, which don't invite the listener to question their sources. When we hear birds chirping as part of the soundscape of an environment presented on screen, we don't ask where these sounds are coming from. Our reaction to them is passive. In the active mode, as you might imagine, questioning the source of an acousmatic sound occurs in the audience and/or characters in the film (Chion 1994: 33). We hear an unidentified sound that makes us ask: what was that? Where did it come from? Such use of acousmatic sound often drives narrative forward by engaging a character in the film to ask these same questions, and then to seek the answers.

In either the active or the passive mode, acousmatic sound in the cinema is a perfect example of the medium's necessarily audiovisual nature. As Chion makes clear: take the image away and there can be no such thing as an off-screen sound. Without the image we can never know whether or not the traffic sounds we hear emanate from the space that would be represented on screen, and any question as to the source of the sound would no longer be based on the presence or absence of accompanying visuals. The cinema thus reduces the complexity involved in the distinction between different conceptions of the acousmatic. Films focus on acousmatic sound without the intention of treating it as an abstract object to be extracted from the context that comes with knowledge of its source, the ideal in Schaeffer's conception of acousmatic music. In the end the cinema's simplification of the concept of the acousmatic is a function of well-established conventions of audiovisual synchronisation: if a given sound and image are synchronised on screen, then the source of the sound can be found in the image. Remove this synchronisation and we have an instant recipe for acousmatic sound, regardless of whether or not the sound itself is abstract or referential in nature.

The main difference between Pierre Schaeffer's original sense of acousmatic music and Chion's adoption of the term 'acousmatic' for the cinema is that, for Schaeffer, the main purpose of presenting sound acousmatically is to deflect attention from source while keeping the sound itself the object of intense scrutiny. This situation is impossible under the two categories of acousmatic

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sound that Chion identifies in film. Passive off-screen sound remains neutral, designed to be ignored by the listener. Active off-screen sound does exactly the opposite: creating a desire in the listener, and perhaps in a character in the film, to seek out the cause of the sound. In either case, sound is not the object of scrutiny in and of itself. So it might seem that Schaeffer's ideal is impossible in the audiovisual realm of the cinema. Later I will suggest otherwise. For the moment, let us take this premise as a given and position it against the performance of acousmatic music.

#### LIVE DIFFUSION OF ACOUSMATIC MUSIC

With recorded music presented to an audience in the absence of live performance, Schaeffer's ideal acousmatic situation is easily enough achieved. The problem then becomes how to integrate live performance into this acousmatic situation. We've probably all listened to music in the dark, and thus have some experience of something approaching Schaeffer's ideal acousmatic situation. Yet when we go to see music performed live, even by musicians manipulating recorded materials in real time, the model is almost always the same: the artists stand on a stage, and we all stare in their direction. Even if we close our eyes, there is no escaping the orientation of the listening environment to the stage as source of the sound we've come to hear. Enter the live diffusion model of electroacoustic performance: a person sits at a mixing desk amidst the audience, and as the piece is being played back this 'diffuser' decides how the recorded composition should be translated into the multi-channel speaker array specific to that particular performance space.

As Barry Truax has noted, in the traditional live performance model, the performing musicians are up on stage and the sound engineer, responsible for how the sound is presented in the concert space, is kept separate at the mixing desk on the house floor. Thus diffusion and performance are generally thought of as being separate (Truax 1998: 141). This separation actually suits the acousmatic ideal: when the performers are removed from the stage by presenting music recorded on a fixed medium, attention to the source of this sound can be averted. The position of the diffuser within the middle of the audience is also a necessity for the performance: the diffuser must have the perspective of an audience member so as to be able to manipulate the sound properly. This is why performers, when adhering to the conventional stage/audience divide, cannot properly gauge the way their performance is being heard by the audience. The live diffusion model in electroacoustic presentation conflates the performer and the sound engineer to solve this problem and help achieve the acousmatic ideal.

In most concerts of acousmatic music, the composer is not the one diffusing the composition. Concerts are often presented with a single diffuser responsible for interpreting each piece in the programme according to the particularities of

the performance space. Composers Adrian Moore, Dave Moore and James Mooney have addressed the potential conflict between an artist's intentions and those of the diffuser. So as not to be confused with an artist interfering with the original composition, the status of the diffuser has remained that of an engineer whose task it is to make the artist's work sound as good as it can without getting in the way of the composition (Moore et al. 2004: 317). Yet this causes the diffuser's art to disappear, which, while suiting the acousmatic ideal, doesn't do justice to the performative virtuosity of live diffusion. The ultimate solution may lie in having the composers perform the diffusion themselves, as does happen from time to time. Moore et al. have also talked about a 'more transparent' model for merging composer and diffuser by bringing the recording studio into the performance space. One of their arguments against this is that it would not be 'visually striking' (Moore et al. 2004: 318), again suggesting the need for a lack of obtrusive visual evidence of the performance within the acousmatic model. In this way the diffuser can remain unseen, thereby maintaining the spirit of the acousmatic ideal. So the problem remains: the idea of diffusing a recorded piece of music is not considered a performance art on the same level of respectability as musicians playing conventional instruments. This is largely due to a lack of understanding of what it is that diffusers do, as well as the association made between the diffuser at an electroacoustic music concert and the sound engineer at a conventional concert. It is partially the acousmatic ideal that keeps the art of the diffuser in the dark. So what is it that they actually do, anyway? And what issues arise when considering the art of diffusion in relation to the acousmatic ideal?

#### SURROUNDING THE SOUND-STAGE

What differentiates the diffuser within the field of electroacoustic music from the sound engineer who controls the sound in a concert venue is the real-time spatial interpretation of the music being presented. Generally speaking, a sound engineer at a concert involving performers on a stage is not spreading the sound across a multi-channel array on the basis of interpreting the performed composition in real time. Ideally, the sound engineer gets all the settings right during the sound check and then acts as a monitor to make sure things match this ideal as the show progresses. The diffuser's job, on the other hand, is to act as a kind of composer who, on the basis of the content of the original composition, creates a spatialisation of the piece specific to the conditions of that particular performance. Traditionally, this has meant translating a stereo recording into a multi-channel configuration. This poses many problems for the ideals of conventional musical performance.

We've addressed the desire for the diffuser to remain unseen so as to present the compositions according to the acousmatic ideal. To flesh out how presenting

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sound in a multi-channel array further challenges the notion of the traditional performance, we need to understand the concept of the sound-stage as it relates to the world of hi-fi stereo culture and the purist ideals held by the audiophile community about what makes a good recording of a performance, and what makes a good playback of that recording.

There are many people in the world who still prefer the sound of analogue media to that of newer digital formats. It seems that along with the 'analogue is best' mentality comes a particular philosophy about what kinds of music are best as well. It turns out that the best kinds of music are those which adhere to an understanding of music being something produced by musicians on unamplified instruments with no intentions of having their sounds captured and represented in any recording format whatsoever. In essence, the version of the audiophile ideal that I'm exploring here is that the best recordings are the ones that should never have been made in the first place. This seems like a contradiction, and of course it is. In my opinion, however, the kind of purism I'm describing is founded upon a very particular contradiction that Jonathan Sterne has called the 'vanishing mediator' in his book *The Audible Past*. Ultimately, Sterne observes that the goal of fidelity became part and parcel of this vanishing mediator, 'where the medium produces a perfect symmetry between copy and original and, thereby, erases itself' (Sterne 2002: 285). The basic idea is that any technologies of recording/transmission should vanish from perception when listening to the final product. This is more commonly referred to as 'transparency'.

At the heart of the idea of transparency is the concept of the 'sound-stage'. In audiophile parlance, there are two main things that this term refers to. One is the ability to understand the spatial position of every musician and their instruments in a recording. This is dependent upon designing the recording according to the ideal of music as performed live by musicians localisable within a single space, and maintaining the integrity of this ideal by placing any given instrument sound in a specific spot – and keeping it there. The other main feature of a good sound-stage is a system's ability to draw attention away from its sources, especially with regard to the position of a pair of speakers. Being able to tell where the speaker is positioned in the room is bad. Being able to tell where an imaginary musician is positioned in the room is good.

This mentality has spilled over into the realm of film sound production and exhibition, particularly where surround sound is concerned. One of the main principles behind surround-sound speaker placement is that of the sound-stage. No speakers, particularly not any of the side or rear speakers, should call attention to themselves. The sound field should remain stable and not disrupt the spectator's feeling of immersion within the soundscape of the film. Indeed, in the vast majority of films we find a tendency towards using sound to create the feeling of a stable environment even where the picture might suggest otherwise. This is most evident in the use of continuous soundscapes during scenes in



which the picture editing is intended to be as 'invisible' as possible. This is one reason why the standard shot–countershot scenario for conversation between two characters is not as disorienting as it should be. If a cut in the soundscape was heard every time a cut in the image was seen, the experience would be far more jarring, if only for the reason that we have not been trained to internalise the convention of abrupt sound edits in the way that we have come to terms with continuously changing shots on the image track.

The problem of jarring sound is explored by Michel Chion in *Audio-Vision* when he discusses the idea of 'in-the-wings' effects in surround-sound mixing. He notes that much more use was made of side and rear channels in the early days of the formats, but sound designers found that too much emphasis on these channels drew attention to them and away from the frame of the image. This situation was not conducive to the ideals of a cinema that seeks to keep the processes of its production hidden. I experienced just such a situation recently when I threw on my DVD of *Monty Python and the Holy Grail*. I had forgotten about the film's false start in which the credit sequence from a completely unrelated film is the first thing we see and hear. All of a sudden it stops, and from the right rear channel in the Dolby Digital 5.1 mix we hear the sound of the projectionist's voice grumbling about having put on the wrong film by mistake. The isolated position of this voice startled me at first, and I was jolted into an awareness of the system of reproduction, which was very appropriate for the reflexive nature of this comic routine. Of course, the 1975 film was originally mixed in mono, and so arguments can be made about whether or not this use of surround sound is faithful to the original concept of the film. I generally prefer to stick with whatever format the film was originally designed for, but in the case of this particular gag I prefer the updated multi-channel mix, as it suits their purposes splendidly. Chion suggests that this feeling of distraction by 'in-the-wings' effects may simply have gone away as people became used to the new sound formats, and that perhaps with some changes to picture-editing practices it could have spawned a new realm of productive audiovisual collaboration. 'So perhaps it was a mistake to have given it up so quickly' (Chion 1994: 84).

I suspect, however, that the ideals of the vanishing mediator are so deeply ingrained that no amount of pushing sound through the rear speakers would have undone the deeply held ideals of the audiophile community, whose Holy Grail it is to lose all awareness of the equipment responsible for the sounds it hears. My position, and it is by no means a new one, is that this equipment is as much an instrument of sound production as any of the 'real' instruments held in such high regard. This is the basic principle behind the idea of the 'scratch' in contemporary DJ culture, and long before that in the practice of scratching the surface of film found in much avant garde/experimental cinema. I believe that to ignore the instrument of sound reproduction is to lose a major part of what makes the experience of a great sounding system so profound. And of course,

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this is the very principle behind using the mixing console as an instrument of performance in the act of live diffusion of electroacoustic material.

So where live diffusion succeeds in erasing the performer from view and acknowledges studio equipment as instruments of performance, the movement of sound through space can actually distract from the ideal of acousmatic music. With no referentiality to speak of, these abstract sounds cannot disappear into an imagined context like environmental sound presented in the side and rear channels of a multi-channel cinema array. Because the sound can find no context but that of its own being, any movement through the performance space effectively becomes an 'in-the-wings' effect. Attention is thus diverted away from the sound itself and to the equipment used to reproduce the sound, as well as towards the space in which this sound is being reproduced: two faux-pas when wanting to keep attention focused on the sound in its own right.

This problem highlights the importance that we attach to our ability to contextualise our sensory experience, and the study of the contextualisation of sound within the environment is the domain of acoustic ecology. The goal of the acoustic ecologist is to foster awareness of sound within the context of environments in which we are necessarily making use of our other senses at the same time. To understand sound in context, to be able to attach it to a source, goes against the principle of acousmatic music as explained thus far. Yet there is much in common between the acoustic ecologist's quest for sonic awareness and Pierre Schaeffer's desire to pay sound the attention it deserves. It will now be useful to consider the issues raised by Schaeffer's acousmatic ideal in the light of its apparent antithesis: R. Murray Schafer's concept of 'schizophonia'.

#### SCHIZOPHONIA

As an ideal, the reduced listening situation of acousmatic music stands in stark contrast to the contextual grounding of sound within the environment sought by those working in and around the field of acoustic ecology. R. Murray Schafer was one of the pioneers of the field of acoustic ecology, a broad area of study that takes as its basic premise the study of the environment through attention to sound. Crucial to this study is an understanding of the way that humans are affected by the sound of the spaces they inhabit, to what extent these 'soundscapes' (a term that Schafer coined) are shaped by our behaviour, and to what extent changes in our behaviour can thus shape the sounds of our environments towards more positive ends.

Schafer invented the term 'schizophonia' in the late 1960s and elaborated upon it in his most famous book, *The Tuning of the World*. He uses the term to refer to 'the split between an original sound and its electroacoustical transmission or reproduction' (Schafer 1977: 90). For Schafer, the term has extremely negative connotations and is used to describe contemporary soundscapes that

have become rife with represented sound to the extent that the electroacoustic is drowning out that which is merely acoustic. The logical conclusion of this overabundance of represented sound is 'the complete portability of acoustic space' through technologies of recording and transmission: 'Any sonic environment can now become any other sonic environment' (p. 91). The fundamental fear underlying the experience of schizophonia is that we will lose our grounding in the context of the here and now, with 'machine-made substitutes' for 'natural sounds . . . providing the operative signals directing modern life' (p. 91).

From the outset it must be said that the experience of acousmatic music within the controlled circumstances of a performance event is not of the same order as the quotidian real-world dissociation of sound from source that Schafer uses the term 'schizophonia' to describe. So, in one sense comparing Schaeffer's acousmatic ideal to Schafer's concept of schizophonia is like comparing apples to oranges. However, though Schafer uses the word 'schizophonia' to describe negatively the dissociation that occurs at the hands of electroacoustic technologies within our daily environments, the ideology underlying his bias is also present within his work as a composer. In his own works of environmental theatre (see Schafer's *Patria: The Complete Cycle*), Schafer rarely makes use of electroacoustical transmission. He generally composes for purely acoustic instrumentation with the performance space in mind, allowing this space (often in the wilderness) to contribute as much to the composition as vice versa. It is a context-based approach that supports his use of the term 'schizophonia' as a negative, and illustrates his view that even within a space of performance, the decontextualised experience of electroacoustic transmission is not a good thing. For this reason, I suggest that positing these differing ideas against each other yields a productive way of thinking about both Schaeffer and Schafer that cannot arise when they are treated in isolation.

Schafer's bias is clearly directed towards the idea of a pre-industrial soundscape, one in which he supposes schizophonia could not exist. This bias is linked to his distaste for the idea of transcending the present tense, of losing touch with one's grounding in the context of the present moment. Yet the soundscapes that he would have us return to are a product of a distant past that we can only glimpse in today's world. He relies heavily on written ear-witness testimony from times past, a necessarily mediated perspective on experience to which he has no access. He has also pioneered the use of recording technology for the purposes of documenting, analysing and ultimately preserving a selection of today's changing soundscapes. With his appeal to technologies of representation in order to access the past, and preserve the present for the future, Schafer's line of thinking exhibits an incongruity with his stated distrust of such technology and its effects on our experience of both space and time. However, this incongruity is only apparent if the idea of schizophonia retains the negative connotations

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that he intended. I suggest that Schafer's apparent hypocrisy need not be read as such. Rather, we should understand Schafer's position of being caught between the past and the present as exemplary of the schizophrenic experience that he decries, and recognise that it is precisely this experience that has allowed him to explore environmental sound in the way that he has. If we approach Schafer this way, he need not be subject to the updating that many have suggested is necessary to make his work relevant to today's world. The relevance has always been there. It need only be recognised.

What is crucial to note about Schafer's concept of schizophrenia is that it is based on the idea that a represented soundscape can effectively replace an existing soundscape. I call this the 'space-replacement' model of schizophrenic experience, the idea being that the listener loses grounding within the context of the listening environment and enters the time and place of the recording rather than the space in which the recording is being transmitted. While something approaching this space-replacement model of schizophrenic experience might exist in very controlled circumstances, such as acoustically treated recording studios, in cinemas or when using headphones, the idea is essentially impossible in the context of our general experience of represented sound within existing soundscapes. No reproduced soundscape can ever fully replace the pre-existing soundscape of the place in which it is being transmitted. What does happen, however, is a layering effect whereby the soundscape of a given place is mixed with a represented soundscape, thus creating an interaction between the two that calls attention to itself as such. Schafer's version of schizophrenia posits an average listener that cannot separate the real from the represented, and thus representation should be banished lest this listener become confused, disoriented, and disconnected from the context of the environment. I propose a different model for the average listener, one whose experience of schizophrenia exemplifies an *increased* awareness of environment.

Our understanding of the way a space should sound leads to an awareness of how it sounds differently in the face of represented sound. If we can, in fact, maintain an awareness of what sounds emerge from technologies of representation within a given environment, and do not walk into a mall outlet fashion store and believe we have been transported to the recording studio of whatever pop star is blaring away through the store's sound system, then what we face is an experience of schizophrenia that is based on a grounding within the context of our environments, marked by an awareness of what aspects of this environment are the result of technologies of representation. This doubling effect is how I think the idea of schizophrenia should best be understood.

It is in Schafer's breakdown of soundscapes into the categories of 'hi-fi' and 'lo-fi' that I suggest the essence of my point about schizophrenia can be found. His use of these terms connects his thinking with the discourse of fidelity found in the audiophile approach to sound reproduction technology mentioned above.

For Schafer, the hi-fi soundscape is one in which sounds exist on a ‘human scale’. The main example of this is given in chapter 14 of *The Tuning of the World*, where he says: ‘There are few sounds in nature that interfere with our ability to communicate vocally and almost none that in any way pose a threat to the hearing apparatus’ (Schafer 1977: 207). Though Schafer’s claim here can easily be argued against, what is important to understand is his equation of high fidelity with what Jonathan Sterne refers to as ‘the spatiality of the unamplified voice’ (Sterne 2002: 342).

If we think about schizophonia in terms of Sterne’s vanishing mediator, we find two possible scenarios. The first is that Schafer believes in the possibility of technologies of electroacoustic transmission becoming transparent, thus allowing for the space-replacement model of schizophonic experience; a given space is replaced by a recorded invader when the mediating technology vanishes, leaving only the space of the original recording in its wake. The second possibility is that schizophonia actually suggests the impossibility of the vanishing mediator; space cannot be replaced, and schizophonic experience becomes an awareness of the mediating technology’s presence within that space. This second possibility involves understanding schizophonia as a marker of a particular kind of attention to soundscape, which comprehends the role of mediation. This awareness of mediation amounts to a sense of contextual grounding within one’s environment, while also being aware of the abstraction of that environment through the presence of electroacoustically transmitted sound.

#### SPACE REPLACEMENT AND THX

As suggested earlier, one of the few places where one might experience Schafer’s space-replacement model of schizophonia is within the sonically dead spaces of specially designed cinemas. It is within such cinemas that many concerts of acousmatic music take place, so it is useful to consider what issues arise when acknowledging the potential for such spaces to bring schizophonic experience to life.

The THX certification programme for cinema spaces and equipment has been at the forefront of efforts to try and reduce the differences between the controlled standards of the sound studio and the less controlled conditions of exhibition. The idea is to get all cinemas standardized to THX specifications with as little differentiation as possible. In theory, if a THX certified film is played back on THX certified equipment within a correspondingly designed space, there will be no difference between master and duplicate, original and copy (Johnson 1999: 104). This has extended into the realm of home cinema in recent years, with THX certifying home electronics and companies like DTS claiming that their process for encoding DVD soundtracks essentially clones the

master tracks, offering the original without any process of reproduction getting in the way.

One of the main problems with the THX ideal is that it requires not only equivalent equipment on both ends, but also equivalent spaces. What this means is that the only real way to guarantee that exhibition spaces will behave the same way as studio spaces is for the sounds of these spaces to be banished altogether. Cinema spaces become increasingly dead, with no architectural particularities that grant them a signature of their own. This is the space-replacement model of schizophonia at its most tangible: the sound of a space is literally replaced by a dead zone designed to be filled with a represented space from elsewhere. In this case it is not so much the represented space that is replacing a real-world space, but rather the cinema itself that has replaced any sense of a space grounded in the context of material reality. Space replacement has become the guiding principle for the construction of cinema spaces, and this is the main reason why the home cinema environment can only rarely live up to this principle: most people cannot afford to build a studio-level cinema space within their homes, and thus the listening experience, even on THX certified equipment, is always subject to the sound of the spaces in which people live.

Michel Chion has expressed dismay at the degree to which projects like THX have been extended. He laments the quest for sonic purification and banishment of coloration, and exhibits nostalgia for the sounds of the large acoustical spaces of older cinemas (Chion 1994: 101). Chion suggests that standardisation models for film sound eschew notions of sonic fidelity in favour of homogenisation (pp. 100–1). What is crucial here is that Chion's use of the term 'fidelity' refers to privileging the sound of the space of exhibition over that contained on the film's soundtrack: being faithful to the space in which sound is reproduced, not to an idea of the original sound from whence the reproduction has come. This is a reversal of the way that fidelity has been used in the discourses responsible for the ideal of the vanishing mediator to which THX subscribes.

Chion's desire for the sound of the acoustical exhibition spaces of old is, in the end, a desire for what I call concrete schizophonia, that in which a soundscape is doubled in the presence of reproduction technology, rather than the total soundscape replacement that Schafer fears and for which THX standards reach. Chion enjoys the interaction between electroacoustically produced sound and the space in which it is transmitted, a grounding in the here and now which allows schizophonia to exist without being fuelled by the desire to 'transcend the present tense' that Schafer suggests is characteristic of the schizophrenic experience (Schafer 1977: 91). Ultimately Chion's stance on this issue suggests a model for the kind of spatial awareness that I think the concept of schizophonia is most suited to: an awareness of the relationship between all the auditory elements of our environment that captures the spirit of acoustic ecology very well indeed.

SOUNDSCAPE COMPOSITION AND THE QUEST FOR AN ELECTROACOUSTIC  
 ECOLOGY

Chion's desire for the acoustic spaces of old cinemas offers a sense that one can experience contextual grounding when confronted with electroacoustically transmitted sound. Chion is positioned in the middle ground between Pierre Schaeffer's acousmatic ideal and the absolute banishment of electroacoustic technologies espoused by R. Murray Schafer. This is a middle ground explored by composers who have emerged from the discipline of acoustic ecology and are interested in the use of field recordings – once used only for documentation and analysis – as the basis for soundscape composition. Katharine Norman refers to such composition as 'real-world music', an approach that relies on a balance between the realism of the recorded environments that make up the compositional building blocks, and their mediation through technologies of electroacoustic recording and transmission. In her words, 'real-world music leaves a door ajar on the reality in which we are situated' while seeking a 'journey which takes us away from our preconceptions', ultimately offering us a new appreciation of reality as a result (Norman 1996: 19).

This 'real-world music' is suited to the idea of schizophonia as the experience of mediation rather than as the fear of space replacement, which, in turn, points schizophonia back to Schaeffer's acousmatic ideal. Katharine Norman's description of soundscape composition as real-world music suggests that total realism is impossible, even within a documentary approach to composition. If this is true, then surely the opposite is true as well: total abstraction from context is also an impossibility. I have argued that the idea of schizophonia as space replacement is essentially impossible. The reality is that the acousmatic ideal is no more achievable than schizophrenic space replacement. Rather, the reduced listening experience that acousmatic music induces is one of negotiation between listening modes. While seeking to appreciate the qualities of sound in its own right, the acousmatic ideal should not seek to divorce this sound completely from its context in the world. Rather, attention to the qualities of sound in its own right helps the listener discover the sound's context anew, what Katharine Norman refers to as 'reflective listening' (Norman 1996: 5); an alternative to the reductionism that many feel is inherent in Schaeffer's ideal listening situation.

As Rolfe Inge Godøy has recently pointed out, while reduced listening was Schaeffer's goal for acousmatic music, his *objets sonores* are impossible to abstract from fundamental images of movement that we necessarily build within our minds while listening. Godøy describes this relationship between reduced listening and visuality as being linked to '*embodied cognition*, meaning that virtually all domains of human perception and thinking, even seemingly abstract domains, are related to images of movement' (2006: 150). If we are constantly

referring auditory experience back to images of movement within our minds, then it might seem that the acousmatic ideal is a physical impossibility. And we are thus back to the conventional concert scenario with its performer/audience divide, where even with our eyes closed we cannot separate sound from an understanding of its source in some form of physical movement responsible for generating the sound events that we hear. So perhaps the condition of acousmatic sound as it exists in the cinema, whereby there is always an image accompanying a sound (regardless of whether or not this image is understood to represent the sound's source), is the only possible way that acousmatic sound can really be experienced. Chion claims throughout his writing on sound in film that the cinema is necessarily founded upon an artificial relationship between sound and image, where the sounds we hear are connected to the images we see as part of the process of filmic construction. If we adopt this approach, then the relationship between sound and image in film is inescapably abstract. So perhaps this abstract relationship emulates the process of embodied cognition, the images on the screen providing visual movement along with the sounds put forth by the loudspeakers. This could be thought of as a relationship less about cause and effect than about giving abstract domains anchorage through the concept of gesture.

Embodied cognition might seem like a problem for Schaeffer's acousmatic ideal, and suggests that the cinema may have got the concept of acousmatic sound as right as could be hoped, abandoning a total removal of sound from the context of its production and offering a model for listening while remaining visually engaged. However, Godøy also points out that in Schaeffer's original development of the idea of reduced listening he recognised the fact that listeners would not be able to eradicate attention to context or signification completely, and that the act of shifting attention in and out of the mode of reduced listening was a necessary part of the experience (Godøy 2006: 151). In essence, Godøy is arguing that Schaeffer's concept of reduced listening recognizes the real-world nature of human perception, and that this kind of listening is more about an awareness of the different ways of listening than about adhering to one particular way for an extended period of time. This is essentially the same argument that I am making about R. Murray Schafer's concept of schizophonia: it works best as a description of the awareness of the role of electroacoustically transmitted sound within our sonic environments, and an ability to shift attention between them rather than letting the electroacoustic soundscape dominate our attention at the expense of those elements that remain unamplified.

A soundscape composer who works actively with principles of shifting attention in soundscape awareness is Hildegard Westerkamp, one of the founding members of the World Soundscape Project with R. Murray Schafer in the early 1970s. In her 1974 article 'Soundwalking', she lays out the foundations for beginning the process of soundscape awareness:



Start by listening to the sounds of your body while moving. They are closest to you and establish the first dialogue between you and the environment. If you can hear the quietest of these sounds you are moving through an environment that is scaled to human proportions. In other words, with your voice or your footsteps you are ‘talking’ to your environment, which in turn responds by giving your sounds a specific acoustic quality. (Westerkamp 1974: 19)

Here she aligns herself with the ideals of human scale that Schafer holds so dear. She also shares Schafer’s profound interest in the contextual understanding of auditory environment. The title of a later article, ‘Speaking from Inside the Soundscape’, indicates her position that if one is to express properly the way that sound works within a particular ecology, one must speak from inside the soundscape to others who are also within that soundscape. She cites Gregory Bateson, who writes: ‘The problem of how to transmit our ecological reasoning to those whom we wish to influence in what seems to us to be an ecologically “good” direction is itself an ecological problem. We are not outside the ecology for which we plan – we are always and inevitably a part of it’ (quoted in Westerkamp 2001: 146). While her alliances with Schafer are thus clear, we’ll see that she does not equate human scale with a non-amplified existence. Further, her ideas about the give-and-take relationship of soundscape experience carry over very well to her compositional practices in the electroacoustic sphere.

Westerkamp suggests that, as children, ‘listening and soundmaking (input and output, impression and expression) were ongoing activities, like breathing, happening simultaneously, always in relation to each other, in a feedback process’ (Westerkamp 2001: 145). This simultaneity of listening and soundmaking is something Westerkamp would have us hold on to as adults. Westerkamp has an approach to ecology that reorders the ecological systems under observation in order to express their potential permutations in other contexts. Again, this is a model based on her notion of the soundwalk, which includes the practice of deconstructing the soundscape within our minds as we separate sounds that are often heard as one, and then sorting them into categories based on their pleasantness to our ears. The goal is to understand the soundscape as a composition so that we might compose better soundscapes in the future. This amounts to a psychological reordering of the heard environment that she emulates in her soundscape compositions. We’ve heard Derrida suggest that to read is to rewrite. For Westerkamp, to listen is to compose.

Westerkamp’s work is part of an ever-increasing tradition of soundscape composition that recognises one basic fact: that the experience of pure abstraction is impossible even if sound is presented in such a way that it deflects attention away from source and onto the properties of the sound itself. As human

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beings our minds are always in search of ascribing representational meaning to the world around us, so the best that we can achieve is a balance between our grounding in the materialism governed by our survival instincts and an ability to transcend that materiality through separation from source and abstraction from context. Thus whether such abstraction is seen as positive, as in Pierre Schaeffer's case, or negative, as in R. Murray Schafer's case, it must be understood as a negotiation between the abstract and the concrete, an engagement with the materiality of context that always informs any transcendence of this context. Westerkamp's piece *Kits Beach Soundwalk* addresses these issues directly, while also bringing together the wide range of issues that have been dealt with here. As such, a brief examination of the work will make a fitting conclusion to this discussion.

*Kits Beach Soundwalk* is a documentary, of sorts. We hear Westerkamp's voice as narrator describing the scene on Kits Beach (the colloquial term for Kitsilano Beach) in Vancouver, Canada. She calls attention to different aspects of the soundscape, and makes a particular distinction between the din of the traffic noise in the background, and the sound of the waves on the beach in the foreground. She suggests that, on the basis of where we focus our attention, we can replace background with foreground. As her voice explains this trick of the mind, Westerkamp manipulates the traffic noise on the recording to grow louder and quieter, and eventually to disappear as she moves us in for a closer listen to the details of the beach. She highlights the tiny clicks and pops of the barnacles, and begins to relate associations she makes between these sounds and others she has experienced in her life. She comes to rest on her memory of a piece by pioneering electroacoustic composer Iannis Xenakis: *Concret PH II*. As she describes the piece it is brought in for us to hear, gradually replacing the soundscape of Kits Beach with that of Xenakis's work, and by extension, that of Westerkamp's memory. We have slipped from a document of an existing soundscape to a work of acousmatic music, by way of the technological manipulation of a recorded soundscape which emulates the powers of human perception to compose our auditory environments through the acts of listening and remembering.

David Kolber has analysed Westerkamp's piece in some detail, illustrating how, through the shifting of perspective, she offers us a way to experience our sonic environments anew. He situates her work within acoustic ecology's mandate to offer ways of dealing with our increasingly noisy industrialised soundscapes, and suggests that through the act of listening as composition we can reclaim environments from which we have become alienated, that those aspects of our environment that tend to dominate our awareness are 'ultimately alterable by human desire and intent' (Kolber 2002: 43). Perhaps most importantly, he recognises how Westerkamp's engagement with electroacoustic technologies is a fundamental part of this reclamation process through their ability to change our habits of listening.

Westerkamp has used the technological component of soundscape composition as a way of dealing with the need to speak about soundscapes from inside of them, as well as a way to position her audience within the environments she wants to share. She has also demonstrated the impossibility of a technologically reproduced soundscape to give us a sense of what that soundscape is really like. By exposing the manipulation inherent in recording and playback, she calls attention to the mediated nature of the experience. And yet, as she does so, she makes a very clear point about how we all mediate our experience every second of every day of our lives, and how this mediation is related to our own personal histories. She narrates her own experience, connecting the sound of barnacles to the Xenakis piece, but she also leaves room for our own associations to develop. This is what happens in any piece of acousmatic music: we are always engaged in exploring associations within our minds and thus we can never experience sound on completely reduced terms.

*Kits Beach Soundwalk* offers what Andra McCartney has called the potential for an ‘electroacoustic ecology’, a balance between the use of reproduction technologies and an understanding of how these technologies fit within the rest of the world (McCartney 2002: 22). McCartney, who has written extensively about Westerkamp’s work, is a soundscape composer in her own right, and creates admittedly schizophonic pieces for galleries and the Internet in the hopes that, even though they present sounds that have been severely recontextualised, they may still offer some resonance for people within their own soundscapes and aid them in learning about their environments. This puts a positive spin on what, for Schafer, is an intensely negative aspect of modern society: the overrepresentation of sonic space, creating artificial spaces in which one context interferes with another.

Finally, the art of live diffusion in electroacoustic performance is an open acknowledgement of the act of mediation, calling our attention to space in a site-specific environment. When matched with composition that seeks to do the same, the result is a rich blend of the ideals of Pierre Schaeffer’s goal of reduced listening and the need for ecological awareness espoused by R. Murray Schafer. I have heard *Kits Beach Soundwalk* diffused on several occasions in concerts put on by the electroacoustic studies programme at Concordia University in Montreal, Canada. Each presentation translated Westerkamp’s stereo recording into a multi-channel array of at least eight loudspeakers, and sometimes more. The strategy used by diffuser Ian Chuprun for the placement of Westerkamp’s work in the space of Concordia’s Oscar Peterson Concert Hall speaks to the issues raised by the tensions between Schaeffer’s acousmatic ideal and Schafer’s distaste for the electroacoustical separation of sound from source.

In brief, Chuprun followed the conventions that have come to dominate surround-sound mixing in mainstream cinema: the sound of a voice speaking is anchored to the central plane, while ambient environmental sound is free to

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roam across all channels. When Westerkamp is heard narrating her experience of the soundwalk, her voice is kept to speakers at the front of the hall in an aesthetic acknowledgement of her 'presence', while ensuring a level of intelligibility that would be disrupted were her voice to be thrown around the space. This strategy keeps Westerkamp's voice grounded within the realm of human scale. During the moments when Westerkamp would stop speaking and let the environmental sounds shine through, Chuprun would open these sounds up to the full speaker array, much as ambient sound is allowed to surround the listener in the cinema. These moments would act as teasers that eventually lead to the moment when the Xenakis piece arrives. Westerkamp stops speaking for a stretch, and we listen to this piece of acousmatic music which points away from referentiality through its abstract treatment of sound, yet has been grounded for us through Westerkamp's association of this abstraction with the sound of the barnacles we heard just prior.

This simultaneous grounding and abstraction is complemented perfectly by the multi-channel treatment of Xenakis's piece here. No longer listening to naturalistic environmental sound, we are presented with acousmatic music which, because of its abstract nature, does not readily simulate a natural environment. So the fact that this music surrounds us means that we experience it as an 'in-the-wings' effect, calling attention to the apparatus responsible for its dissemination. Yet, at the same time, it has been linked to the environmental sound which earlier in the piece was allowed to surround us less conspicuously. As we are moved from the barnacles of Kits Beach to *Concret PH II*, we are moved from representation to abstraction on the level of Westerkamp's composition. Yet, as we make this shift, we are also moved from a naturalistic approach to multi-channel diffusion (that seeks to replace the space of the hall with the space of Kits Beach), to the diffusion of acousmatic music which draws us back into the space of the hall by rendering this diffusion 'visible'. Within the cinema, the passive mode of experiencing acousmatic sound in the surround channels is the domain of naturalistic ambient sound effects, and this is where the Kits Beach soundscape positions us. The shift to *Concret PH II* breaks us out of the passive mode by way of its lack of grounding in naturalistic context: we become aware of the speakers as the source of the sound, thus grounding the sound within the site-specific context of its exhibition. This shift maps out the transition from schizophonia as space replacement to schizophonia as awareness of the mediated environment within an electroacoustic ecology. Through her compositional strategies and their complementary diffusion, Westerkamp and her diffuser can speak to us from within this electroacoustic ecology, of which we are also a part.

The Xenakis portion of Westerkamp's piece thus becomes the nexus point where abstraction and representation merge. This is precisely the point that Westerkamp makes when she explains that the barnacles reminded her of

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*Concret PH II*: we are always at once grounded in the world and lost in our thoughts. This co-existence of the real and the imagined is at the heart of soundscape composition, in which the act of listening is a dialogue between us and our environments. The ultimate goal for Pierre Schaeffer, R. Murray Schafer, Michel Chion and Hildegard Westerkamp would seem to be that we become aware of our co-existing planes of attention and learn to focus on how and when we shift between them. It is in this awareness that we find our way out of the dilemmas posed by the acousmatic ideal, the space-replacement model of schizophrenic experience, and the distance between original and copy created through the electroacoustical transmission of sound.

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# MUSIC, SOUND AND MULTIMEDIA

From the Live to the Virtual

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