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Sound Diffusion in Composition and Performance: An Interview with Denis Smalley

This is the first of a series of recent interviews I have been conducting with leading composer-practitioners of electroacoustic and computer music whose contributions to the art and technology of sound diffusion have been key to its development and growing acceptance through the last four decades. These discussions cover the aesthetics of, compositional approaches to, and technological realizations of sound diffusion. Topics include the dynamics of sound diffusion; stereo and multitrack solo-tape diffusion with multispeaker configurations in composition and performance; spatial composing; the diffusion of “tape-plus” pieces; diffusion as drama or “aural cinema”; present and future developments in sound diffusion in loud-speaker orchestras and multispeaker diffusion systems such as the Acousmonium (Desantos 1997), the Gmebaphone (Clozier 1997), and BEAST (Harrison 1998); the Spatialisateur (Jot 1997); advances in the field of ambisonics and Digital Versatile Disc (DVD) multichannel systems (Elen 1998); and specialized multiple-speaker systems (Stockhausen 1996). The present interview with composer Denis Smalley (see Figure 1) took place at City University in London on 2 April 1998.

Denis Smalley, composer, is professor and head of the Department of Music at City University, London. He received his first degrees in New Zealand, specializing in composition and performance. He studied with Olivier Messiaen at the Paris Conservatoire and investigated electroacoustic composition with the Groupe de Recherches Musicales in Paris before moving to the UK, where he completed his doctorate at the University of

York. He was senior lecturer in music and director of the Electroacoustic Music Studio at the University of East Anglia prior to joining the City University Department of Music in 1994.

Smalley is known internationally as an electroacoustic composer, and his works have won a number of international awards, including the prestigious *Prix Ars Electronica*, in 1988. Many of his works are available on CD, including a solo release and a single. He is also known for his writings on aesthetic and analytical issues related to contemporary music. His research interests include electroacoustic music, particularly acousmatic music (composition, listening strategies, analysis, and performance practice), sound and environment, sound and space, music reception, and aesthetics of contemporary music.

The Dynamics of Sound Diffusion

Austin: For context, would you explain your understanding of what the term “sound diffusion” has come to mean for you as a composer and practitioner of computer music? A definition, if you will.

Smalley: Sound diffusion is the projection and the spreading of sound in an acoustic space for a group of listeners—as opposed to listening in a personal space (living room, office, or studio). Another definition would be the “sonorizing” of the acoustic space and the enhancing of sound-shapes and structure in order to create a rewarding listening experience.

Austin: So, the antiphonal music of the *cori spezzati* [broken choirs] in St. Mark’s Basilica in Venice during the 16th century was a kind of sonorizing of the cathedral?

Figure 1. Photo of Denis Smalley at a GRM concert in the Salle Olivier Messiaen in the Maison de Radio-France, Paris.



Smalley: Musics have always been composed for specific types of spaces, and church music is one of them. But electroacoustic music is not necessarily composed with the specific listening space in mind—not necessarily, and not usually. The music has to be adapted to suit the particular performance space.

Austin: Given your explication, then, what are the dynamics of sound diffusion for you as a composer of electroacoustic music? And let's limit that, at first, to electroacoustic music without live performers.

Smalley: First, I want any piece that I'm composing to sound good on a pair of loudspeakers, because that is the medium for CD listening. I therefore have to consider the conflicts and compromises between studio and home listening. The studio is perhaps the closest model to the home situation, but it's not a model close to the public situation. If you bear public listening contexts in mind, you think differently about monitoring in the studio.

You have to consider the dimensions and acoustics of the listening space, the size of the audience and their placement, the potential of the sound in-

stallation, the style of the music to be diffused—and that includes the spatial style—and the music's susceptibility to be spatialized. Of course, when it actually comes to diffusing a particular piece, there are many other considerations related to the musical detail: you can do harm as well as good. There are compromises involved. But the things that I've mentioned are the basic starting points: the space, the audience, the installation, and the music, remembering that your goal is to get the music across. People have come especially for the performance; in order to create a rewarding experience, you have to provide something more than what is possible when listening at home.

Austin: Or in the studio, for that matter, where you're hearing your piece in its optimum acoustical situation.

Smalley: Studios are different. Whether the studio is actually an optimum situation is another matter. Optimum for whom?

Austin: Optimally, do you want to recreate the studio experience in the concert hall?

Smalley: You have to realize that the studio experience is very particular. It's the professional working laboratory where the composer creates the piece. But people don't listen to pieces in studios, and pieces are not ultimately destined for studio listening. So, in transferring the listening experience from one space to another, there may be problems arising from the way one has dealt with detail and sound quality, for example. When I compose, I'm thinking of the possible concert contexts, and I bear them in mind when making compositional decisions.

Austin: So, it's the size of the hall, its dimensions, its resonance, as well as the absorption factors certainly of both the walls and the public. Those are the dynamics, as I call them. . .

Smalley: ...and the ambience of space, too: concert hall, church, and so on. And remember, I mentioned the audience: how many people there are, and where they're placed in relation to loudspeakers restricts your diffusion. Audience numbers and where they are placed in relation to the loudspeakers is another dynamic. For example, if you have no room around the sides of the audience, that limits the possibilities of setting up an efficacious installation. If you've got a long, rectangular space, and the audience stretches way back, you have a terrible problem to create satisfactory images both for those people sitting further forward and those sitting further back. The images can be drastically different, and that will affect how the music is received. That's part of the dynamics.

Austin: We're speaking here of stereo manifestations of your music. Since a hall is not only stereo but multidimensional, there are potentially multiple images you can create. In performance practice, how does that manifest itself?

Smalley: Historically, the stereo format has been the most widely used. One reason why an art of diffusion emerged was the need to expand the stereo image and to project it effectively in a large space. This means that you need to have the possibility of narrowing or widening the image in relation to the distance of the listener from the image. To create a good stereo image for people seated near a frontal loudspeaker pair, the speakers have to be close enough to each other so that a hole does

not open up in the middle of the image. For people who are nearer the back, these same speakers have to be wider apart so that the image is not squashed: the further away listeners are from the loudspeaker source, the narrower the image becomes.

Austin: So that's the reason for multiple speakers.

Smalley: That's one reason. Of course, we can't always manage to project a good stereo image from the front of a deep space...

Austin: ...so that an audience member sitting way back might lose that image.

Smalley: Yes, and it's not just a question of image loss. There are differences in loudness and impact and a loss of intimacy too. Being remote from the sound source has a number of disadvantages. You can widen the image, but that doesn't necessarily mean the sounds can or will be projected. There are going to be losses. The breadth of image needs to be capable of being varied within the semi-circle of the frontal visual perspective.

A second reason why diffusion is necessary relates to the composed space: there are varieties of spatial perspective composed into a piece. In a diffusion system, one should be able to expand these dimensions: in other words, make the distant more distant, exaggerate closeness, exaggerate distance, play with the height of the image, thereby adapting the space composed into the music to the dimensions of the listening space. You can do this both by placing speakers at varying distances from the audience and at a variety of heights, and by orienting them in different directions—pointing them away from the audience and making use of reflecting surfaces, for example.

In addition, there are atmospheres, contexts, and textures that could be considered more environmental in their feel. Even though in the studio you monitor them in front and think of them as being in the front, they could benefit from being diffused on or around the periphery of the space. We are talking about passages that do not need to be clearly localized in the listening space, which might benefit from being perceived almost as if they were physically living in the space or extending out beyond the space. So, we have the broadening of the image, variable distancing, and the possibility of creating peripheral images—an environmental situation.

Then there's the dramatization of the space. If you have loudspeakers placed to create a variety of perspectives, you can actually change the spatial texture and topology. The most obvious example is to create trajectories of sound that move from front to back—a dramatizing of gestures so that they become more spatial in performance than they are in their normal two-channel guise. And finally, a very important factor is the need to expand the dynamic range of the piece in a larger space. In a recorded format you can never achieve an ideal dynamic range that will suit all spaces and contexts; maybe it is not even ideal on two loudspeakers. And so you need to exaggerate or highlight the high end—lift the top levels up—and possibly drop the low levels down. Extending the dynamic range affects peoples' perceptions of the piece and permits an enhancing of the structural shape.

Stereo and Multichannel Diffusion

Austin: In terms of the recorded medium, we composers have thus far accepted stereo as the format for our compositions, don't you think?

Smalley: Yes, you're quite right. What we've done is accept what is commercially available and use it. When stereo first became available, composers didn't quite know what to do with it. In France, for example, what they were doing was two-track pieces on two separate tracks. Realization of the potential of the stereo format took some while to stabilize, and it was not until around 1960 that stereo become an established norm in French electroacoustic music. But there were a number of public experiences with more than two or three channels in the 1950s.

Austin: Stockhausen used five channels at one point in time.

Smalley: *Gesang der Jünglinge* (Stockhausen 1958) [for solo tape] was originally conceived for five loudspeakers, and subsequently reduced to four for the sake of convenience of format. But some of the concerts in Paris at this time had three channels: three tape machines, with the possibility in performance of moving sounds between the loudspeakers. Diffusion was therefore thought about in the

early 1950s. I suppose the stereo format came along and pushed that thinking out of the way. It really wasn't until the early 1970s that public [sound diffusion] systems were properly instituted [by the Groupe Musique Experimentale de Bourges with the Gmebaphone (Clozier 1997) and the Groupe de Recherches Musicales with the Acousmonium in Paris].

In the meantime, of course, we had quadrasonic sound. Quadraphonic sound probably failed because it wasn't commercially viable. People weren't going to have four loudspeakers in their homes: apart from anything else, they interfere with the arrangement of the furniture. So quadraphony was never commercially viable. My attitude toward quadraphonic sound was, and still is, that it is limiting. I like quadraphonic-based possibilities within a system (for rotations, for example), but I wouldn't like to limit myself purely to four speakers, because four speakers cannot achieve some of the things I've mentioned in relation to stereo-based diffusion. You have only two loudspeakers in front, not nearly enough for me to be able to do the things that I want. There are also problems associated with placement of the loudspeakers relative to audiences. In other words, it is difficult to create ideal listening circumstances.

Composing Spatially

Austin: How and when do these performance dynamics manifest themselves in the actual composing of a stereo tape piece, or, for that matter, a multichannel piece?

Smalley: It's something embedded in my thinking that I do fairly intuitively. When listening to sounds and when composing contexts, I am constantly turning over the kinds of considerations that I have talked about in relation to the art of diffusion—the possibilities related to drama, peripheral environments, clarity of image, and, I should add, the matter of frequency ranges and balances—all those kinds of things. Diffusion considerations even permeate the composition of spectromorphological detail. When dealing with spectral detail in the studio, you have to consider whether the spectral character-

istics and types of morphologies are going to retain their essential characters in a bigger space. So, there are technical matters related to the types of spectromorphologies, as well as one's feeling about the spaces composed into the piece.

In my article (Smalley 1997), I listed a number of elements that are going to change, like it or not, when a piece is taken from the space in which it is composed to be listened to in other spaces. The first of these elements is the intimacy of the sound: you lose intimacy in a larger space, and that's important. You are no longer so close to the sound, you no longer hear the details. The other elements are the size of the image, the breadth of the image, and the depth of the image. When you're working in a studio [or listening in private at home], some of the composed musical spaces may seem to create distanced environments that take you beyond the studio or room walls. This experience depends both on your psychological susceptibility at the time and on the spatial suggestions of the musical materials. When you hear this music in a larger acoustic space, those distanced images may appear to be in the space rather than beyond the walls. This is quite often the case. The piece is "living"—or being sonorized—in the public listening space, whereas in the studio or in private listening, you can more easily be transported out beyond the listening space. Two experiences of the same music can therefore be very significantly different.

Austin: Could there be, in fact, a performance version of a piece and a CD version?

Smalley: There can be, and some composers have produced different versions of their pieces for diffusion and for CD, where the composed space is adapted. I have some difficulties with this. As far as space is concerned, there is sometimes an assumption that the composed space can be controlled as a separate entity—as a sort of parameter—and therefore you can make spaces bigger or smaller at will when you're composing. But, quite often composed space is created through artifacts or spatial byproducts of the sounds, textures, and processing techniques you are using. For example, delays, phase changes, pitch offsets, or accumulation processes that give the sound more space also give it

more depth. You can't necessarily simply say, "Well, I want it to have less depth or more depth," because you'll be affecting the actual music, the spectromorphologies, not just the spatial setting. So, one has a limited power to control space as such, because the perception of space is the sum of many interrelated features. As far as listening spaces are concerned, ideally one would like to be able to create idealized versions, but the possibilities of spaces and systems are so diverse. Creating variable formats for a piece is a forbidding musical challenge.

Diffusing Tape-Plus Pieces

Austin: How and when do these dynamics of sound diffusion, as you've described them, manifest themselves in the composition of a tape-plus-instrument or voice piece?

Smalley: The same factors are present, but they are considered differently because the focus of a live performance visually and musically—and I am thinking about solo performance here—is the performer. So, I don't want to use as full a diffusion system as I do for tape pieces, because overdoing the diffusion will tend to undermine the carefully considered musical relationships between the live performer and the content of the acousmatic domain. In other words, there are important blends, important ambiguities of sound, which you destroy if you start over-diffusing the acousmatic component. One of the most important things about the relationship between an instrument and tape is the game of ambiguities, and I want to maintain and enhance this. Of course, I can dramatize the space to a certain extent, but I don't want to drive a cart and horses between what one sees being performed and what one doesn't see being performed. I've experienced quite a number of over-diffused performances where one becomes aware of an undesirable separation between the instrument and the electroacoustic environment.

Austin: You call for the piano to be amplified in *Piano Nets* (Smalley 1992) [for piano and tape], for instance. What are the considerations there when you amplify the instrument? First of all, why amplify the instrument?

Smalley: In order to bring it into balance with the electroacoustic sound and into the same acoustic presence as the electroacoustic sound—up front and stereo, where necessary, if necessary. And what I do and how I do it will depend on the space. Sometimes I might take the amplification out for sections of the piece if the piano projects well; I might also take out the piano amplification where the composed electroacoustic sound is distanced and can be made to appear as if coming from the piano or moving around it. We don't want the piano standing out up front in those situations. Essentially, amplification is to aid the piano-electroacoustic relationship. It is not to create a giant piano, spread around the auditorium. I certainly don't like that in this piece. It just doesn't work to have piano coming from all directions.

I think that visual fixity and visual focus is quite important in my thinking about mixed pieces. Sure, one can fling instruments around, if that's part of the piece and if the usage of the instrument lends itself to that. The same goes for my piece *Clarinet Threads* (Smalley 1992) [for clarinet and tape]. I can distribute the image of the instrument a little bit, if there is a sufficient number of loudspeakers. In the clarinet piece, however, the purpose of the amplification is quite different. It is there to bring out sounds that might not otherwise be heard—to bring out micro-sounds. So, amplification is compositionally essential.

I would add one thing that's come into my mind. We're talking about my pieces where there is one performer. If you have more than one performer, there are different considerations, because the visual and sonic weight in front, on stage, is increased. Therefore, I think that there is more for the eye to focus on and follow, and the acousmatic possibilities become reduced. For example, one can't have a lot of visual silences on stage, where people are sitting doing nothing.

Austin: Varèse did that in *Déserts* (1954) [for chamber orchestra and tape].

Smalley: And it doesn't work. Under these circumstances, where instrumental and electroacoustic media are juxtaposed, you are not encouraged to change your mode of listening from the visual instrumental to the invisible acousmatic.

Austin: In fact, it didn't work in the first performances that I've read about.

Smalley: It's not successful, no. It's an interesting piece, though, and it works quite well on recording, where the different qualities can be better balanced. Apart from the cost and the practicability of mounting rehearsals, there are musical reasons that might have influenced a certain lack of pieces involving larger instrumental ensembles. Above all, the acousmatic aspect, whatever its nature, must become more subsidiary, if one is going to be realistic about it.

Austin: In a sense then, in the acousmatic genre—at least as defined and practiced by Francis Dhômont (Dhômont 1991) and François Bayle (Bayle 1996)—the adding of a performer or performers is antithetical to the acousmatic experience. You're not supposed to see anything, only listen and experience aurally.

Smalley: That's right. By having that visual and sonic focus, you are orienting the listening of the piece. It's going to be centered on the performer, what the instrument does, what sounds the instrument makes. And there's no sense in trying to deny this. You've got to go with it. You can't say, "Well, I'm just going to have a tape piece, and I'm going to put a performer in it." That never works. If the performer appears subsidiary, people say, "Well, why's the performer there?" Let's say there are rules that come with the genre, and if you try and go against these rules you're likely to fail. That's one of the difficulties here.

Discovering Spatial Attributes

Austin: When composing a piece, what strategy do you invoke in placing sound events in a spatial sound texture? How you place sound events?

Smalley: It depends on which sound event it is. It could be a small sound, it could be a texture, it could be all sorts of things. It depends where it comes from—whether it's being created with recorded sound or whether you have synthesis possibilities. I suppose a short answer has to do with recognizing—in the very nature of the spectromorphology as recorded, created from

scratch, or transformed—the qualities of its space and its spatial implications. This is not necessarily an abstract matter. It often has to do with what sounds evoke: whether they evoke materials and whether because of certain spatial textures, certain spectral depths and heights, fragmentation or sustainment, etc., a particular type of space is evoked—a space inside the sound, an interior acoustic space, an outdoor space, a restricted space, a wide-open space, for example.... (A large bell in the City University clock tower begins tolling in background.)

Austin: ...much as that bell...

Smalley: ...much as that bell, right.

Austin: That bell in this room would be quite a different matter.

Smalley: Yes, exactly. It's those kinds of factors.

Austin: Work with the materials, and the materials tell you what to do.

Smalley: The materials hint at what to do, yes. So, for example, I have very rarely added reverberation to anything. I have in one or two pieces, though it's not always audible as such. I've used spatialization programs in order to create stereo images. But I also accept byproducts of the transformations, which is another way in which space is created, and I go with it.

Austin: Well, "going with it," as it were, that's to your taste?

Smalley: Yes.

Austin: And so you like the sounds as they are. And you record them with that in mind?

Smalley: I record them with that in mind. Sometimes I might record them using different microphone configurations, so that I can work with different proximities, if I don't want to transform them very much. But I also bear in mind they'll be totally different when I've transformed them, and I therefore take them into other spaces, metaphorically speaking. In my pieces, I'm certainly trying to put sounds in a spatial environment where our feelings about the space created are part of the listening experience: our feeling about possibly being in the space or possibly being transported to an imagined external environment...or the possibilities of an intimate relationship with detailed micro-sounds that are close to you. These are part

of the subjective experience, the psychological impact, the emotional experience, let's say, of a piece.

Austin: So, a spatial sound texture really grows out of the material and how it's processed and transformed—or not, for that matter.

Smalley: For me, that's the case. You have to realize that sometimes when I'm carrying out these transformations, I don't necessarily know what's going to occur. I find spaces, I discover things.

Austin: It might be an artifact of the original conception.

Smalley: It might be an artifact, yes. It's a question both of knowing and of discovery. An important factor for me is that I'm very rarely trying to evoke indoor spaces, and this is often subconscious. That's probably the reason I don't use artificial reverberation, because I am more interested in creating unbounded spaces, impressions of more open spaces.

Austin: Well, that's a consideration, then, of performance practice, isn't it? Because in the performance space, that compositional attitude would work quite well, it seems to me. Then you would have more control over it.

Smalley: Probably, yes. I want to create an environmental feel, regardless of the reality of the sounds, and I want to be able to do this in a performance space as well as in a personal listening space. In my pieces, I've not been keen on placing one reverberated space into another reverberated space, which is what can happen when taking your piece to a public space. You're placing a room of a certain dimension—which you perceive in stereo—inside another room. That's quite interesting...I'm not saying that one shouldn't do it. But composers need to realize that psychologically the question of dimensions of rooms within a room changes how that particular context might be perceived.

Diffusion as Drama

Austin: You've mentioned before the dramatic possibilities of simply moving the sound from the front to the back or from the back to the front. Composers like to do that, I've noticed, in diffusion. They'll have a big swell, then they have the sound coming from the back to the front, washing

over the audience. What are your motivations in performance practice with some kind of event—not that one necessarily—but let’s say these tiny sounds, these intimate sounds? Why would you move those sounds, if at all?

Smalley: Well, what you say is, “if at all.”

Austin: Yes. That’s important.

Smalley: One might create stable images in a piece. One is not always creating drama. It depends entirely on the musical material as composed—the type of spectromorphology, its changing spectral shape, its type and rate of change. If it is susceptible to “trajectorial” drama, one might add that as a dimension, provided this is not overdone. So, it’s a question of recognizing the implied or explicit spatial contexts and nature of the sonic images and trying to enhance them to best effect. The motivation is an aesthetic one.

Austin: We say, “if at all.” But let’s say you have decided, in fact, to move a sonic event or texture through the sounding space from point x to point y.

Smalley: The motion must be implicit in the sound itself or the texture itself or the context itself. I’m not going to add spatial movement to something that doesn’t suggest it, because that would totally go against the shaping of the piece, the spectromorphologies of the piece. For example, if I have a texture that’s bustling around, I might try and make it bustle more by changing its perspective, possibly using sets of frontal loudspeakers so that the image might expand or contract and maybe also play with a little distancing, depending on the nature of the texture. In other words, I’m designing and expanding on something that is inherent in the texture. But I wouldn’t go “woompf” and suddenly send all that stuff to the back, because that dynamic shape is antipathetic to that particular texture. So, I would never seek to contradict what is composed into the spaces and spectromorphologies of the piece. I seek to enhance them. Does that sort of answer the question?

Austin: It does, but you won’t give me any of your composing secrets and diffusion secrets? [laughing]

Smalley: Well, I don’t know that there are any.

You can find out the secrets by watching diffusionists. Composing secrets, in terms of space, are pretty difficult, because, were you to

question me about certain spaces in some of my pieces, I may not be able to remember how they were done.

Austin: In that connection, do you make a score of the sound diffusion for your pieces?

Smalley: Normally, yes, but it’s to aid others in diffusion when I’m not present. If they have a score in front of them and they know where the events are coming, they’re liable to do a better diffusion. (See score excerpt in Figure 2.) If they have to do the score for themselves, sometimes they won’t. With certain pieces, I will send a score with suggestions as to what needs to be done, particularly if levels need to be highly exaggerated—this can be done badly or well. And it depends on who is doing the piece and how trustworthy they are, if they have the right diffusion instincts. But these are suggestions. We can’t lay down the law...

Austin: ...in a way that you can’t necessarily lay down the law to a performer in the way he or she performs a piece.

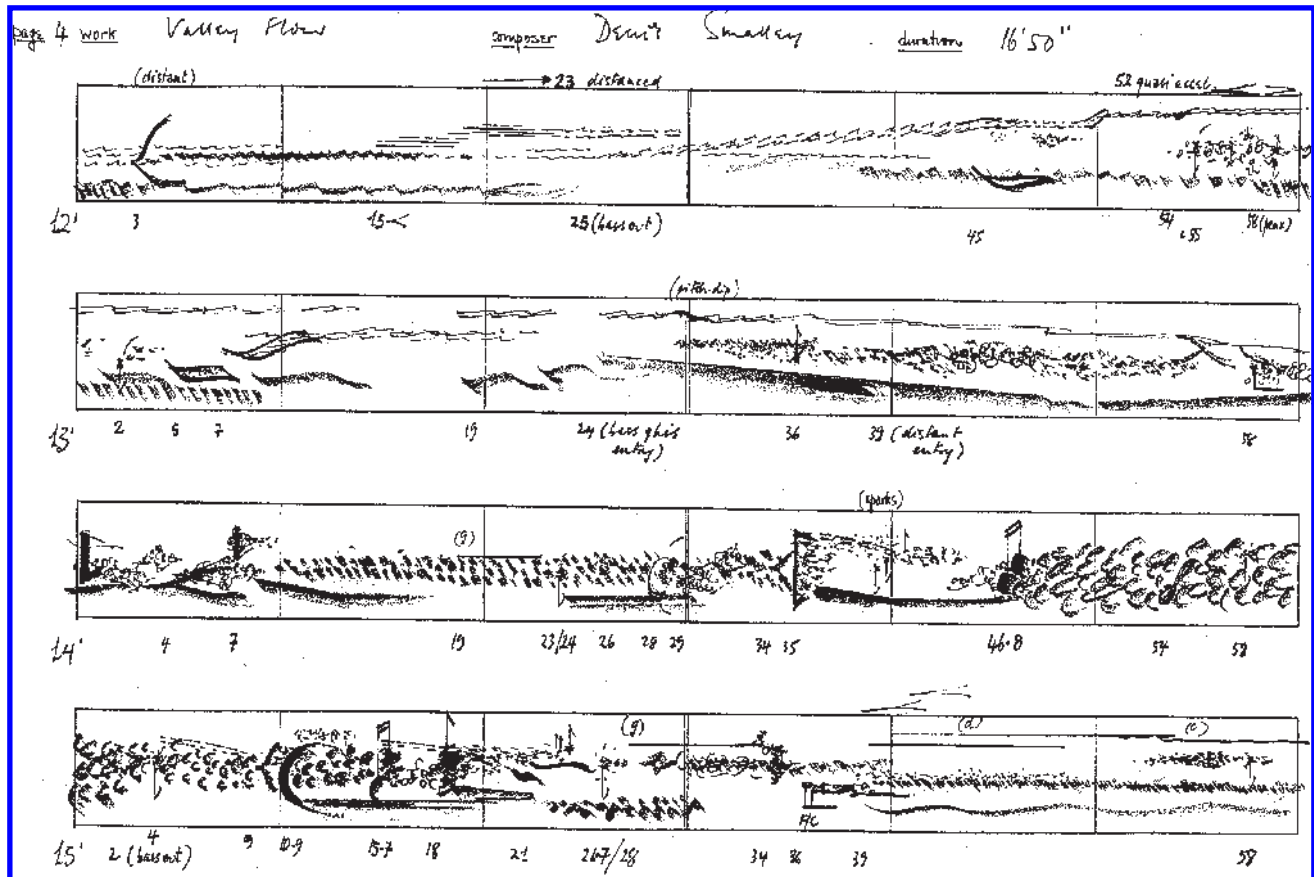
Smalley: No, you can’t. And anyway, you’re not there, you don’t know what the space is like, you don’t know what loudspeakers are being used, you don’t know what the rest of the program is.

Combining and Spatializing

Austin: How and when do spatial sound textures, as I’m calling them, manifest and interact—combine and spatialize—in a sounding space? I’m talking about the mix of events and materials and how they interact in the sounding space.

Smalley: First, let me say that in the composed spaces that I create for my sounds, most of the time I don’t want the listener to be aware of the loudspeakers as boxes. I’m dealing with the space in between the pair of loudspeakers, and not the loudspeakers themselves as physical emitters of sound. One might be aware of the speakers as pillars setting the limits, or not, of the space. (You can now take sound out beyond the speakers.) But I’m really concerned with the space in between—the relationship of the sounds in that in-between space, which of course recedes into the distance as well. My model is, perhaps, linear perspective vision, and

Fig. 2: Smalley sound diffusion score example from his tape piece, Valley Flow (Smalley 1991).



I have evoked the notion of the "stereo window." If the sounds themselves or their transformations or whatever I do to them suggest space types, then I have to decide which sounds can associate with each other simultaneously in these spaces.

So, I am creating spatial textures where sounds inhabit the same space, acting with each other, acting separately, or competing in the space. This is a compositional decision—a structural decision—and is not just a spatial question. It has to do with the personalities and types of spectromorphologies, their contrasts, their similarities, their potential relations. In fact, it's the totality of your piece, isn't it—deciding what sounds will be associated with each other, concurrently, and through time? That's what composition is about, isn't it?

Austin: Yes.

Smalley: One important factor is creating enough

to listen to in the various strata and in the simultaneity of events—in other words, being very careful about situations where you only have one sound. If you only have one thing to listen to, you've got to be sure that, in the context of the piece at that time, it's the right thing to do—for example, whether this single sound creates an impact, or has a certain atmosphere, or represents a moment of stability. It has to be sufficient unto itself, as opposed to other circumstances where there are more things going on, more things to be followed, where the ear is able to scan the various strands or events differently. I hope that such multifocal opportunities will be different at each listening to the piece. For me, that's an important factor.

Austin: It is, indeed, the composition of the piece.

Smalley: That's the thing, you see. The trouble with space is that it's the whole piece. It's the

sounds and everything. The impressions of space are created through the types of sounds and their temporal experience. Space is the whole thing. It is not usually something that people perceive as separate from the sounds themselves, although the composer, when composing, might consider space separately—might blot out certain aspects of the sounds to consider purely spatial factors. For the listener, they're all molded into one. That's why we end up talking about the piece as a whole, because the whole is the space or spaces of the piece.

Austin: Actually, the issue for me arises from my own experience recently with composing an octophonic tape piece (Austin 1997), where I have eight channels and multiple stereo images I can work with at once, moving and placing the images at will, composing the sound diffusion at composition time. It multiplies the compositional possibilities and creative decisions enormously...

Smalley: ...and the mental complexities for the composer, too. I myself might like to lay out a piece in eight channels to allow for variable diffusion possibilities. There are two types of complexity I can think of. There is the practical one of composing. If you are mixing on-screen with your graphical displays of tracks, then you have to consider exactly what goes on what track, which is not something one has to worry about so much in a stereo piece: you have the freedom to move things around.

Austin: That's what I've been confronted with in composing eight-channel pieces. That's one reason I'm asking these questions.

Smalley: So, you have to make decisions about track disposition. I imagine that's quite a severe constriction. The other complexity is in diffusion. It's pretty difficult, if you need to change things in performance. Let's say that some composers working with eight channels won't necessarily have a fixed idea about where their stereo combinations might be in the listening space—an eminently practical approach considering the variability of spaces and systems. Now, if you wish to deal with the performance space more actively and in a more improvisatory fashion, that creates an incredible mental complexity, because the diffuser's ear cannot possibly keep track of and follow multiple and simultaneous stereo images.

Austin: Not to mention the digits on each hand and the number of faders and everything else.

Smalley: It's a physical and mental, visual and aural confusion. The complexities really mount. It becomes compositionally more complex, and it becomes far more complex to deal with in a performance situation, hence the need to stabilize the loudspeaker setup.

Aural Visualization

Austin: Assuming a fixed loudspeaker setup such as Stockhausen's cube of loudspeakers for his *Octophony* (Stockhausen 1996), I am approaching my octophonic computer music composition as a kind of aural theater. You seem, by what you say, to consider sound diffusion as a kind of aural theater, don't you?

Smalley: Yes. Well, "theater" I find too confining a word, because theater implies indoors. Theater implies something on stage, in front. From that point of view, aural theater is perhaps slightly misleading. The idea of aural cinema is similarly slightly misleading, although in cinema, in spite of the frontal image, you are taken out beyond your watching and listening space—more a psychological engagement than a physical engagement with the performance space, though. In fact, sound in film is primarily responsible for this. Perhaps "aural cinema" is more apt than aural theater.

Austin: I've called a few of my pieces "sound movies," for instance.

Smalley: An important point: there's a sort of synaesthesia occurring here, because one does "watch" sounds; and in spite of their invisibility, sounds do have a potential visual character to them. Spectromorphologies do, even if one can't be explicit about it. They have dimensions. They're small, large. One can physically imitate the kind of textural movement, for example, in various ways. One can draw a graphic diagram of a texture, freeze it visually. So I think there is a relationship between the visual and the aural. And just think about the phenomenon of motion.

Austin: Well, just how do all these "visual" characteristics manifest themselves as dramatic strate-

gies in your pieces? Actually, it's metaphorical, because your pieces don't necessarily tell a story; they're not narrative in the traditional sense. But, of course, space itself can be dramatic, and so drama can be associated with some kind of experience that can, in a way, tell the story of an experience, as it were. People often listen that way, not just to the detail and material, but to the drama of that diffusion. And so maybe I've answered the question, if it was a question.

Smalley: Yes, you've answered the question. Certainly, my pieces are narrative, though not stories. They're narrative in the wider sense of "narrativity" in that there is some kind of logical progression through time of the sequence of events and textures, in the sense that sonata form or Western art music from pre-baroque styles onward is narrative. I don't try to undermine that by turning to a non-narrative music that tries to subvert the time frame. So, my pieces can be recognized as a series of events, environments: more stable, less stable, some more dramatic than others, settings in which certain things happen. That consideration of the psychology of time and how the spectromorphologies might be perceived as a...I was going to say as a byproduct of time, but they are not a byproduct. They are actually the substance of the psychology of time. In the perception of the piece, that is paramount.

A Uniquely Spatial Medium

Austin: I want to refer to your article which appeared in *Organized Sound* (Smalley 1997), entitled—

Smalley: "Spectromorphology: Explaining Sound Shapes."

Austin: You write, "Electroacoustic music can encapsulate a wide range of spatial experience, perhaps even a life-long experience of intimate and immense spaces, both of which can be compressed into the relatively short time span of a musical work. This makes electroacoustic music a unique art." I thought that was a telling statement. Of course, we don't go around as composers saying, "I'm doing unique art." On the other hand, the medium is special. Could you expand that in terms of the special nature of electroacoustic music as it relates to diffusion?

Smalley: The spatial experience of electroacoustic music is one of the particular aspects it has to offer that no other musical art has to offer in such variety or with such vividness...so, that makes it unique. I don't mean to say that every electroacoustic piece explores or exploits this uniqueness, but the potential is there. One will quite often find that the composer has ignored many of these possibilities or maybe has not been able to harness them, for all sorts of reasons.

Austin: Well, I was thinking of how it is the electroacoustic and computer music medium is unique from other music media, like the symphony orchestra, for instance.

Smalley: I try and emphasize its special nature, its unique things, but I also try and draw links with traditional ways of thinking about sound and the effects of sound and the structures of sound in Western music. After all, electroacoustic music—computer music—doesn't spring out of nothing. It springs out of our cultural experience, and it is derived from our experience of music of the past. One can, in that regard, consider all sorts of orchestral textures as spatial, even in tonal music. But they don't do it as well and can't do it with such vividness and, I would say, with such certainty and imagination, as electroacoustic music. However, from an orchestral texture, one can receive the impression of a space which is, metaphorically, an environmental space or an experiential space out in the wider world.

People quite often refer to spatial attributes in the images that are evoked by pieces. This can be explored and exploited to a far greater extent in electroacoustic music, because of the possibilities of textural and spectral motion that cannot be nearly so extensive with instruments, even in contemporary music. The best examples of really spatial orchestral music—where one forgets about the instruments, forgets that the sound is coming from people's blowing and scraping—occur in some of Xenakis's and Ligeti's orchestral pieces, which, to my mind, probably have not been outdone from that point of view. Things may have been done differently and developed differently, but they haven't necessarily been outdone in their capacity to create images or thoughts that transcend the physicality

of instrumental gesture. Electroacoustic music is not earth-bound. This is the point about it. Electroacoustic textures, sounds, and spectromorphologies can take off. They can leave the ground. They have this capacity for creating a far richer, imaginative, spatial experience.

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