

NAUSEA: AN APPROACH TO SONIC ARTS COMPOSITION BASED ON ASC

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ABSTRACT

This paper concerns research in the field of compositional methods for electroacoustic music. I discuss the compositional approach used for creating 'Nausea': a large-scale work of electroacoustic music presented in surround sound. The piece is part of a larger body of creative work in sonic arts carried out as part of the author's PhD research. These works explore the use of altered states of consciousness (ASC) as a basis for the design of sonic materials and structure. Sounds are created to reflect aspects of a hypothetical psychedelic experience, such as visual patterning effects or hallucinated entities. These sounds are then arranged in a manner that suitably reflects the progression of a typical psychedelic experience. Through discussion of the compositional methodology used, it is intended to demonstrate how ASC can be used to inform the design of sonic artworks. It is anticipated that this research will also contribute more generally to knowledge of possible approaches for the design of digital artworks that represent ASC. The emphasis of this paper is on the compositional process, and does not attempt to measure audience response to the music. Similarly, the process described should be seen as appropriate, but not absolute; implementations of this method involving slightly different subjective artistic judgements would be possible within the general framework discussed.

KEYWORDS

Music, Sonic Arts, Compositional Techniques, Electroacoustic Music, Altered States of Consciousness.

1. INTRODUCTION

Nausea (19:12) is a piece of electroacoustic music that was produced as part of my PhD research at Keele University. This research investigated the use of altered states of consciousness (ASC) as a principle upon which to base the design of sonic artworks. The resulting output was a large body of creative work, encompassing fixed media electroacoustic works in stereo and surround sound, audio-visual composition, live performance recordings, a video game hack and various facilitative software tools. This work was supported by a written commentary describing the theoretical basis for the work, and the creative approach that was utilised.

In general, the design of compositions produced during this research is intended to reflect ASC experiences of the type produced by hallucinogenic drugs, such as mescaline, LSD, DMT or psilocybin mushrooms. This is achieved by using conceptual models for typical hallucinogenic experiences, which are provided through reference to relevant literature. While it is beyond the scope of this article to give a detailed account of these resources, the brief explanation that follows is necessary to situate my work.

The model of consciousness that I use is that provided by Hobson [1], who discusses changes in the brain during dreams and hallucinations by plotting them on three-dimensional AIM (activation, input, modulation) axes. Under this model dreams and hallucinations alter our perception of strange visions and illusions; things we presume are internally generated and do not really exist in the physical world around us. The nature of these perceptual changes can then be considered through evaluation of various texts, such as Klüver's investigations regarding the effects of mescaline [2], Strassman's DMT studies [3], Leary's writings [4], the

large body of user-generated experience reports provided through the online database erowid.org [5], and Hayes' anthology of such individual accounts [6].

From these sources it is possible to identify common 'ASC features' of an ASC experience. For example, in such an experience one may typically perceive visual patterns of hallucination, such as vortex, spiral, tunnel or cobweb forms. Perception of time may become distorted, so that a single moment seems to last for much longer than usual, or seems to pass more rapidly. The experience may trigger various symptoms of euphoria or anxiety for the participant. In strong enough doses, the individual may experience encounters with strange entities or beings. All of these typical features can be used to inform the design of sonic materials, as I shall discuss during the course of this article.

Likewise a typical ASC experience that involves the ingestion of a plant or drug will be subject to gradual release as the human body metabolises the materials. The experience will therefore be reliably subject to a gradual onset, plateau and decay. Aspects such as this can be used to arrange sonic materials in a corresponding manner, to create an analogous musical structure, as I shall discuss.

Using this general process, ASC are able to provide a basis for compositional design in sonic arts. It has been suggested that electroacoustic music affords the possibility for the listener to perceive non-realistic spaces and journeys through listening [7]. In these terms, ASC may be considered to provide a useful basis for the design of sounds in order to create illusory audio spaces that are analogous to hallucinations. Since this study does not measure audience response, it is accepted that the interpretation of these works remains open. However I would conjecture that the design of compositions such as *Nausea* 'affords' (in terms of DeNora [8]) a possible 'psychedelic' interpretation for listeners.

It is beyond the scope of this article to discuss the various existing works of art, literature and music that are also relevant to this research. However we may summarise that *Nausea* draws significantly upon the electroacoustic repertoire and psychedelic forms of rock and electronic dance music.

2. CONCEPT

Nausea (19:12) has the longest duration of the works produced for this research, and addresses the challenge of creating a large-scale electroacoustic work that is based upon altered states of consciousness. The piece refines various processes that were developed through preceding compositions. *Nausea* progresses the compositional approaches used in the earlier works through the longer duration, and the 5.1 format. This gives the sounds more space, both in terms of duration and the possibilities for spatialised location.

The composition borrows its title from Sartre's novel of the same name. A passage from this describes a hallucinatory experience that occurs during a psychotic episode [9]. This serves as a point of creative departure only (the piece does not directly correspond to Sartre's writing). I used an ASC model containing features that would be typical of a mescaline hallucination to inform the basis for design of sonic materials and structure. Table 1 shows the material components of this model, which consists of ASC features (a subset of a longer list identified through the resources discussed previously), and corresponding sonic approaches (developed through previous work). The model includes ASC features that are appropriate to a mescaline experience, and for which suitable methods of creating corresponding sonic material had been devised.

Table 1. ASC features and corresponding sonic materials in *Nausea*.

ASC Feature	Corresponding Sound Category
Visual patterns of hallucination ('Entoptic Phenomena')	Spatialised rhythmic patterns ('Entoptic Sounds')
Distorted time perception	Time-stretched drones
Euphoria/anxiety	'Light' or 'dark' sonic materials
Physical/bodily sensations	Low frequency sounds
Hallucinated entities	Whispered voices

With these categories established, the exact realisation of these sounds was to subject to normal compositional judgements related to aesthetic preference. For example, I might create a range of sounds for the 'whispered voices', and from those pick my preferred examples. The materials were then arranged in accordance with an onset, plateau and termination structure, such as might be typical of an ingested drug experience. A more detailed explanation of the sounds and how they integrate into this structure is given in the following sections.

3. COMPOSITIONAL FEATURES

3.1. Entoptic Sounds

Nausea refines a process I developed through previous compositions, where streams of spatialised rhythmic sounds are used to analogously reflect visual patterns of hallucination. The 'entoptic sounds' label I use for these relates to Klüver's discussion of visual patterns of hallucination as 'entoptic phenomena'. Conceptually, these sounds adopt the premise that the spiral dot patterns seen in hallucinogenic experiences can be suitably reflected by using streams of rhythmic sound, which rotate in a circular manner around the spatial field.

I created these sounds in a variety of ways: using gated sounds (e.g. 0:20-0:30), material produced with a bespoke performance patch I designed in Max/MSP: the 'Atomizer Live Patch' (2:30-2:40), streams of bass drum rhythms (5:10-5:20), ring modulated sounds (9:33-9:43) and various reprocessed iterations of this material. Similar rhythmic material was also produced using a low-pass filter with a saw-tooth LFO controlling a filter cut-off envelope (5:00-5:10). This filtering process was applied to various other materials used in the composition.

The entoptic sounds are used in both 'dark' and 'light' sections of the composition (these sections will be discussed further in the structure section which follows). By 'dark' sounds I refer to combinations of sonic material with fast attack and decay envelopes (in terms of spectromorphology [10]), sometimes with distortion effects, such as those heard from 16:30-16:50. Usually these 'dark' sections will have lower spectral centroid; the bass drum sounds are an example. 'Dark' sounds were considered to reflect the more anxious phases of a psychedelic experience.

'Light' sounds refers to those sections which have higher spectral centroid, harmonic content and slower attack and decay envelopes, as heard at 0:20-0:50. This variation in frequency content is achieved primarily through the selection of source materials. Additionally, processes such as reversing the sounds give a 'softer' attack envelope, and the use of tape saturation (as provided by a Watkins WEM Copicat Mk.IV tape delay unit) provides an 'analogue warmth' [11]. These 'soft', 'light' and 'warm' characteristics were collectively considered as suitable correlates to euphoric sensations during a hallucination.

All entoptic sounds are spatialised in 5.1. As described, entoptic sounds are designed based upon the spiral dot patterns of light perceived in hallucinogenic episodes. Circular movement of

these sounds in the spatial field was considered to suitably reflect the circular forms of hallucinatory patterns. While my earlier fixed compositions were presented in stereo (and achieved this through stereo doppler processing), the use of multichannel was considered to provide a more suitable means to create these rotating spatial effects.

3.2. Drones

Drones are used in a similar way to previous compositions, and are considered as a means to reflect distortions to time perception. I use vocal drones during *Nausea*, since I have found that these work well for conveying distorted time perception. Vocal sounds tend to retain some recognisability even when time-stretched, which makes the distortion to their predictable form seem tangible (more than perhaps it might with other material where the source is less distinguishable).

As with the entopic sounds, drones are used to provide material for light and dark sections of the imagined hallucinatory experience. At 2:30-2:40 we hear a yell-like drone, this is considered as 'dark' material. From 6:20-7:10 there is a female drone, which is used as 'light' material. From 12:00-12:53 there is a series of dissonant layered tones, produced from heavily time-stretched sounds that are used elsewhere. The amplitude of this dissonant section increases over its duration; this section is viewed as a material that is based upon the rising sense of unease, which might be perceived during a hallucination.

3.3. Bass Sounds

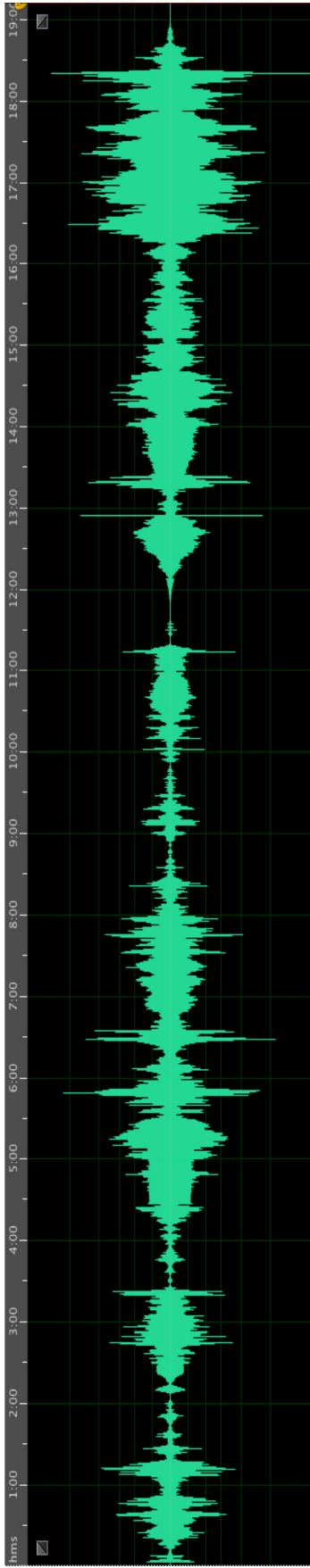
Bass sounds are used, in order to reflect the physical sensations that may be experienced in a hallucinogenic experience (for example, 4:27-5:00). Low frequencies can be felt (as well as heard), particularly in concerts where the diffusion of the piece may be at higher amplitude levels. Low frequency materials are used during the sections of music where physical sensations might be more noticeable in an analogous hallucinatory experience. For the purposes of *Nausea*, this sensory material is conceptualised in relation to physical sensations of unrest that may accompany an ASC experience. Pitch transformations of low frequency sound are used in accordance with the 'unrest' that may be experienced during such states.

3.4. Whispered Grains

Finally, whispered vocal sounds are used to reflect the presence of entities who speak a cryptic language, in the hallucination (for example 10:07-10:13). The whispering material is incomprehensible in its contents, but recognisable as whispering/mouth noises.

4. COMPOSITIONAL STRUCTURE

The compositional structure of *Nausea* is adapted in accordance with the concept of successive 'waves' of hallucinations. I have discussed previously the notion of hallucinogenic experiences that have a natural, organic onset, plateau and termination, which is mediated by human metabolism. The progression of these experiences can be conceptualised as 'waves'. Participants in Strassman's studies also describe 'breakthrough'; the sudden progression from a section of the experience into another which is substantially different. The concepts of 'waves' and 'breakthroughs' are used as a principle for adapting the structure of the composition and arranging the sonic materials described above. 'Waves' refers to sections of music, which may gradually transition into each other, while 'breakthroughs' refer to rapid transitions, either between waves or within them. Figure 1 indicates the structure of the composition and the arrangement of sonic materials. Note that the wave sections have been indicated as discrete blocks to show the structure as clearly as possible, though in most cases a gradual transition occurs between sections.



Onset → Plateau → Termination →

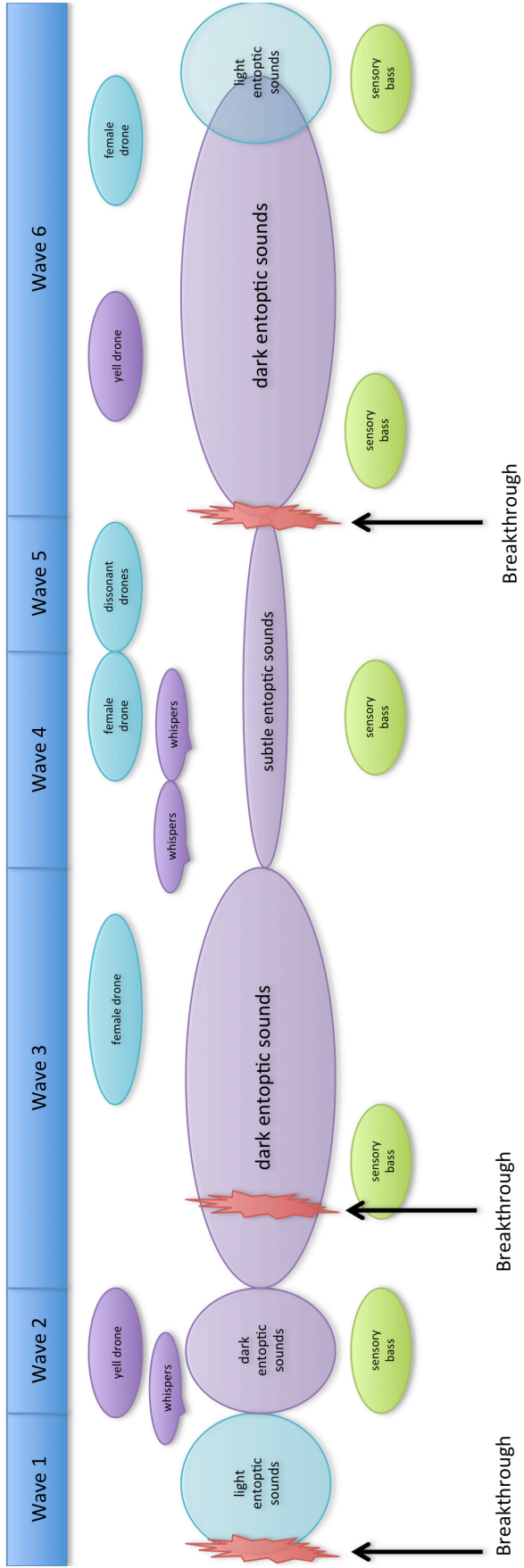


Figure 1. Diagrams indicating compositional structure of *Nausea* (previous page).

4.1. Wave 1

At the beginning of the composition we hear the initial breakthrough (0:02-0:12), based on the initial onset of an ASC experience. From 0:10-1:45 we then hear the first 'light' wave. This gradually darkens over its course; an effect that is achieved through pitch shifting and filtering of the higher frequencies. This wave is based upon the concept of a relaxed and euphoric phase of an ASC experience; therefore the spatial rotation of entoptic sounds occurs more slowly than it does in subsequent sections that relate to hallucinations with greater intensity.

4.2. Wave 2

The section from 1:40-2:06 contains reverberating metallic sounds and whispering voices. These are based upon the concept of perceptual distortions, as may be perceived in an ASC. Reverberant sounds are used in correlation with the hallucination of a large physical space. From 2:06-3:25 bass sounds are introduced. These relate to the concept of physical sensations that may be experienced in a hallucination. A droning yell sound is also heard.

4.3. Wave 3

At 3:25 the next wave commences, using similar reverberating material and entoptic sounds which gradually increase in amplitude. At 4:36 'breakthrough' occurs, in accordance with the rapid transitions that Strassman's participants describe. Following this, sensory bass material and 'dark' entoptic sounds are used (for example, 5:12). This wave is based upon the concept of intense visual patterns of hallucination. In order to reflect this, entoptic sounds are moved in a circular motion with increased velocity than is heard in previous sections. Note that the entoptic sounds frequently use little or no reverberation. This corresponds with the close range positioning (for example, in the eye) with which participants may perceive visual patterns of hallucination during an ASC. Various modulations of frequency are used so that the layers gradually morph between each other. This process is used in accordance with the concept of gradual shifts in perception, as discussed previously. At around 6:00, 'light' material is reintroduced to reflect the euphoric sensations that might be experienced during an ASC. This is accompanied by sensory bass sounds 6:50-7:00. The entoptic sounds return from 7:00-8:35.

4.4. Wave 4

Wave 4 commences as the entoptic sounds from the previous wave subside. Reverberating material (9:17), whispering voices (9:28) and subtle entoptic sounds are heard (9:44). Entoptic sounds created using ring modulator processing appear fleetingly with low amplitude levels. At 10:00 the vocal drone heard previously is reintroduced, accompanied by the sensory bass material. Wave 4 is constructed in accordance with the plateau phase of an ASC experience, where the participant may be transported to strange, mysterious spaces. This is reflected in the choice of sonic material by the use of whispering voices and reverberant material. During these phases, Strassman's participants usually describe having moved beyond the perception of entoptic phenomena as a dominant feature; likewise Klüver discusses the interpretation of entoptic phenomena as actual spaces, such as tunnels. In accordance with this, entoptic sounds are only present as a subtle feature of this section; instead voices are used in accordance with hallucinated entities, and reverberant sounds that result in a large, non-realistic space.

4.5. Wave 5

Wave 5 is designed in accordance with the concept of a rising sense of unease, as may be experienced during intense ASCs (11:20-12:54). A dissonant droning sound is heard which increases in amplitude.

4.6. Wave 6

A tearing sound is heard at 12:54; this is placed in accordance with the descriptions of ‘breakthrough’ in Strassman’s studies, where participants commonly hear a tearing sound at the point of breaking through. The final wave (12:54-19:12) builds intensity through successive layers of dark entoptic sounds and drones, culminating in intensity at around 16:28. Rapid rhythmic sounds and high amplitudes are used in accordance with the concept of an intense phase of psychedelic experience, which is accompanied by physical sensations that are analogously described using the ‘sensory bass’ material. During this section the circular movement of entoptic sounds occurs more rapidly than during previous sections, also in accordance with the concept of heightened intensity of an ASC. As in an ASC experience, effects gradually subside towards the end of the experience. During the passage from 18:10-18:28, filtering is used to reflect the subsidence of entoptic phenomena. Finally, the composition draws to a close with some final bass sounds, which are used in accordance with the concept of lingering physical sensations that may occur at the end of an ASC (18:28-19:12).

5. SUMMARY

Nausea demonstrates a possible compositional approach to sonic arts. Materials were designed according to categories of sound that correlate with particular aspects of a hallucinatory experience. The structural design of the piece is adapted in accordance with the onset, plateau and termination of a typical ASC experience.

The concept of a composition that is based upon the progression of an ASC experience in time was developed through the use of the ‘waves’ and ‘breakthrough’ concepts that I have discussed. These provide a useful means to conceptualise different sections of the music that are based upon the various physical and mental sensations, and hallucinatory illusions that one might experience during an ASC. This conceptual process assists with decisions regarding the arrangement of sonic materials.

The piece progresses my approach from previous works by exploring the use of my entoptic sounds in a multichannel context, spatialising the sounds in a circular, rotating motion. This approach was adopted to improve the correlation between the spiral funnels of dots that may be perceived during an ASC, and the spinning entoptic sounds that I have created for *Nausea*. The spatial impression of rotation is improved using multichannel sound, which strengthens the correlation with this ASC principle.

As a closing comment, the process of composition I have discussed in this article is one that I consider can be appropriately described as ‘adaptive’. Since these compositions do not reinvent the essential language of electroacoustic music or sonic arts, they simply provide a method through which to ‘adapt’ the design of compositions in accordance with ASCs. It is in this sense that I consider the process detailed here as one that could more broadly be applied to other creative mediums. It can be seen as either an approach to electroacoustic composition, or as an outline for transforming the design of other artistic projects in accordance with ASC. In my other writings I discuss the application of this process for video games [12] and audio-visual projects [13].

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