

SABINE SCHÄFER AND JOACHIM KREBS

*Deleuze and the Sampler
as an Audio-Microscope:
On the Music-Historical and Aesthetic
Foundations of Digital Micro-Acoustic
Recording and EndoSonoScopy as the
Process of Analysis and Production¹*

The properly musical content of music is plied by becomings-woman, becomings-child, becomings-animal; however, it tends, under all sorts of influences, having to do also with instruments, to become *progressively* more molecular in a kind of cosmic lapping through which the inaudible makes itself heard and the imperceptible appears as such: no longer the songbird, but the sound molecule.

Gilles Deleuze and Félix Guattari (1980/1987: 248)²

I

As early as the 1820s, one of the main representatives of German Romantic philosophy, Georg Wilhelm Friedrich Hegel, in his lectures on aesthetics, stated the following remarkable and far-reaching facts:

In certain stages of art-consciousness and presentation, the abandonment and distortion of natural formations is not *unintentional* lack of technical skill or practice, but intentional alteration which proceeds from and is demanded by what is in the artist's mind.

(Hegel, 1832–45/1975: 74)

About a century later, Walter Benjamin elaborated these ideas further in his epoch-making, visionary study 'The Work of Art in the Age of Mechanical Reproduction' and remarked that '[t]o an ever greater degree the work of art reproduced becomes the work of art designed for reproducibility' (Benjamin, 1939/1982: 226). He also stated that around 1920 the standard of technical reproduction had already succeeded in making the entirety of existing artworks its object, and that such reproduction would also have to find its own place among creative techniques, resulting in radical changes in the effect that artworks have (Benjamin, 1982: 221–2).

From the beginning, it was thus obvious to the visionary thinkers and artists of the time that those technological inventions and developments that are based on the principles of electricity should not be used merely to reproduce existing artworks in larger quantities for their commercial exploitation. Instead, they believed that the new technical opportunities should mainly serve the qualitatively intensified production of works of sound art specifically created for the electrical medium (the 'instrument') of the loudspeaker. Accordingly, the loudspeaker, for example, would become a mediator of music specifically produced for it instead of remaining 'just' an authentic intermediary for vocal and instrumental music.

The rapid developments that took place during the course of the twentieth century in the electrical creation of sounds, as well as the recording, broadcasting and communication of music – in diverse genres such as dance and popular music, film and video, electronic/electroacoustic music, and computer multimedia art – confirm this in many different ways. Electronically created sounds are today omnipresent as part of film, television, stage and radio plays, and also in their function as electronic signals, such as we find in mobile-phone ring tones and in acoustic design. (In this they are similar to the world-wide Anglo-American pop music, which is mainly created by electronic instruments and practically depends on technical media for its entire existence, communication and mass distribution.)

Hence, artificially shaped movements of air (sound waves – and what else would the art form of music be in a fundamental, physical sense?) that are, for example, directly and immediately produced by a singer or instrumentalist, and are *not* just generated through a resonating membrane, streaming towards us from loudspeakers, have today become a rare and 'exclusive' event. The manifold and new correlations and interdependencies between music and technological development, and the modified receptive behaviour of new types of listeners, caused for instance by the independence of space and time, have frequently been the object of research and description. These include interpretations that are adapted to this kind of listener, arrived at by interpreters who are 'playing it safe' in that they are more interested in a 'faithful rendition' of a work by means of recognisable similarities to their previously published interpretations, with which the audience is already familiar, than in taking up the position of a spontaneous and creatively emphatic '(inter)mediator' for the work. This essay will primarily consider the effects of technical progress on the *actual* process of creating the artwork.

Accordingly, if one searches the history of music for the beginnings and first examples of 'acoustical artworks' (in Benjamin's sense as briefly described above), which, for example, do not use electrical recording devices merely as an intermediary for the acoustical documentation *of* music(al performances), and do not demote loudspeakers to instruments used for 'musical coverage', but which above all employ 'the power of nature' phenomenon of electricity to produce the actual artificial tones, sounds and noises, one inevitably encounters two kinds of 'acoustic art' in the original realm of 'Central European Art Music' that emerged roughly at the

same time as applied art forms, including the radio play and film music. These are *elektronische Musik* as it first developed in Germany, and *musique concrète* with its French origins. Both represent the first genuine (and pure) categories and forms of music for the loudspeaker as an 'instrument'. Since in these genres composers/producers themselves are no longer in need of interpretative mediation for their acoustic artworks, which are fixed in their form and development through recording devices and storage media, the composer is always also the performer and interpreter, as it were, of his/her own work. Not only is s/he able to secure potential 'version(s)' of his/her work, which s/he records in an optimal way, and the greatest degree of authenticity in their performance, but s/he also has more flexibility and independence in making available and distributing his/her works of audio art.³

It appears to be a fact, too, that the so-called amateur is immediately able to grasp the 'coherence' of electronically produced sounds coming from a loudspeaker even upon first hearing, and the force of habit does the rest to create the impression that these are 'better' suited to the electrical instrument of the loudspeaker, when compared to instrumental sounds. And is it not curious indeed that piano music, for example, reproduced via a loudspeaker makes the latter sound like a piano, but not look like it? Instead, it still looks like a loudspeaker!

Admittedly, in all these cases the electromagnetic reproduction device will only 're-create' what was produced at an earlier time, but it does not 're-produce' anything that could exist without the former. Instead, it 'produces' the 'original' itself in conjunction with the loudspeakers. *Musique concrète* is a special case in this context. Based on the technologically grounded noise art of Futurism promoted by Filippo Tommaso Marinetti and Luigi Russolo around 1912–13, Pierre Schaeffer created the 'music of noises' in France from 1948 onwards (he himself referred to it as '*musique concrète*' after 1949). By contrast with the electronically created sound material of *elektronische Musik*, Schaeffer took his sound and noise material from all that is audible, recorded with electric microphones. In his collages of sound and noise, produced from all sorts of everyday noise, sounds of nature like the wind, rain, the rushing of water, and sounds of animals and humans, he sought 'direct' contact with sound material without any electrons as intermediaries (Schaeffer, 1952). Thus, in addition to the 'instruments' of the microphone and the loudspeaker, the techniques of manipulation and splicing by means of the tape recorder became relevant for creative production and performance. In this kind of music, even though the sound material was not produced electronically, we encounter more than just artificially arranged 'reproductions' of natural sounds and noises, as one might at first be inclined to assume. Instead, we find original and autonomous works of sound art that could only be produced with the help of the newly developed instruments, which in turn could not have been designed and built without appropriate technological developments in this field.

Composers and sound artists have always taken advantage of the various possible interactions and reciprocal relationships between the 'personal–abstract', i.e. the

imaginary in art production, and the 'collective–concrete', i.e. the materialised and continually progressive technical developments (such as instrument making), and their artistic inspirations have found expression in the creative implementation of these interactions. These radical developmental leaps have repeatedly presented sound art with new instrumental possibilities for the sonic realization of the purely imaginary, the 'utopian', and the (pre)thought. Thus, Robert Moog's invention and development of the synthesizer during the late 1960s was regarded as an intellectual and almost instrumental accelerator for the developments in electronic music.

This is neither the place nor the occasion to continue examining aspects of purely electronically created music, because in our joint TopoSonicComposition projects since 1995 we have consistently and consciously given up *purely* electronically produced sound material. The synthesizer as an instrument was regarded as *the* revolution in the field of electronic music, as an 'instrumental authority' that provoked radical changes. In contrast to this, the impact of the (acoustic) production process of digital sampling technology is still completely underestimated by many. This technology developed around 1985 in conjunction with computer-aided advances, and led to radical changes and the emergence of artistically innovative production possibilities. It proved to be truly 'epoch-making' for the production and distribution of music world wide. In this process, the central production unit is represented by the computer, in the form of an applied 'musical instrument' and a MIDI-controlled, digital sound processor: in short, a 'sampler'.

The sampler represents, as it were, a circular, closed and thus independent production unit for digital recording, storage, modification and reproduction of (analogue) sound events of any kind. It would, therefore, have been the ideal instrument for Schaeffer's above-mentioned *musique concrète*. However, after he started to include electronically produced sounds and noises in his works from 1956 onwards, Schaeffer in 1958 had already re-named his 'Groupe de recherches de musique concrète', founded in 1951, as 'Groupe de recherches musicales' (Eimert and Humpert, 1973: 215ff.; Riemann, 1967: 618–19). Some people, therefore, believed that the 'historic task' of *musique concrète* was more or less complete and that its short history spanning one decade should officially be declared as over. We completely disagree with that! For is it not true that once again the newly constructed, computer-aided instruments for the recording, production and re-production of sounds and noises – instruments based on the rapid digital-technological developments of the 1980s – were the ones that were able to provide the necessary innovative impact from mid-1980s onwards? The purpose was to create a new acoustic art form – a *purely* auditory art of sound – that solely consists of artificially arranged ('composed') natural sounds and noises. And is it not equally true that through the digitised process of production and ordering of events, these sounds and noises become, in their 'innermost' selves, synchronised, artistic elements to be placed in a network, since all media and instruments used for their production are based on the same logical, digital principles? (What a greatly enlarged opportunity!)

Unfortunately, the first developmental years of the sampler as a creatively usable instrument were the last years of the 1980s, and the first of the 1990s, a time when – similar to the previous developmental history of the synthesizer in the early 1970s – it was under the dictates of a commercially optimised exploitation of music through the minimisation of costs associated with production processes. Due to digitised and ‘pixel-exact’ access to all parameters of every abstractly imaginable and concretely available (or made available) audio material in all their acoustic dimensions and materializations, it became possible to generate, for example, so-called ‘acoustic clones’ of real instruments. These then serve as tonal surrogates for the now-superfluous musicians and their instruments. The imaginary presence of such ‘clones’ created ‘only’ through sound allows those cheap imitations to yield a very remarkable ‘real’ simulation of ‘authentic’ instrumental sound. (No more, but no less either!) Such presence is caused by physical (visual) absence, since it is only conveyed ‘indirectly’ through sound and loudspeaker (invisible, but audible (!) existence). The ‘misuse’ of the sampler as a superficial and simplistically ostentatious, pseudo-modern ‘sound producer’, exhibiting its continually available, cost-effective use in the computer generated creation of short-lived, mass-produced items for video, film and television that are manufactured solely with commercial aspects in mind, has also become the conventional practice of our time. In the still relatively short history of the evolution of digital sampling and sound-processing technologies, spanning barely two decades so far, there is no telling (even for a sound artist who thinks and works as a visionary) which artistic–dynamic–innovative potential for the future of music in general and sound art in particular is still dormant in the mechanical–artificial aspects of the sampler–loudspeaker ‘instrumental duo’.⁴

Elementary, direct, pixel-exact (‘particle-exact’) access to endogenous–acoustic (micro)dimensions of ‘sound’ in itself – whether pre-recorded ‘natural’ sounds or electronically produced ‘artificial’ sounds – was already suggested in other contexts and made possible by digital-technological developments. This gives the potential for networks of spatio-temporally synchronized, hierarchy-free complexes, and is due principally to the generally *unspecific* sound character of the sampler. For example, in contrast to the synthesizer and conventional musical instruments, the sampler itself does not create its own specific and individually identifiable sounds, timbres and colours. Instead, within all the aforementioned limitations with respect to the ‘faithful rendering’ of naturally created sounds via electroacoustic loudspeakers, it reproduces, preferably one-to-one, the analogue sound event, which was previously digitally recorded in the traditional way with the help of microphones (a record-and-playback machine, as it were).

By contrast to analogue recording technology, during the process of digital recording an analogue signal is transformed into a digital signal, and individual sounds are depicted as numbers and recorded as numerical codes. This results in not only a ‘linear’ and less-distorted sound quality, and thus a ‘higher’ fidelity of sound reproduction, but also in the availability for a highly differentiated creative

processing of the digitally stored sound materials, which at first appear unlimited regarding human thought categories. Unlike traditional tape technologies, artistic possibilities of access and production are hugely extended, and even amateurs immediately realize and understand these (quality-enhancing) dimensions when, for example, they compare the lack of potential for the modifications of their older, analogue photographs with what is offered in this connection by modern digital image editing programmes that can easily be realised nowadays with any PC and appropriate software.

Since the 1990s, technologies for the digital modification and computer generation of images became the standard in international, mostly commercially oriented, professional video, film and TV productions. However, there are comparatively few artistic examples in the field of 'pure' art music that utilise, in an artistically valid manner, the innovative–technological and, above all, the utopian–artistic possibilities for creating synergies between the production unit, the sampler, and the instrument of mediation, the loudspeaker. Still in its simplest form and with little memory, the sampler was used – if at all – rather sporadically from the mid-1980s onwards, mainly in live-electronic experimental jazz and improvisational music as well as in multimedia performance and action-art scenes.⁵

Mainly due to an improved technological development in the manufacturing of storage chips, and the resulting huge extension of memory capacities and production possibilities, the musician, composer and soundscape artist Joachim Krebs managed from the mid-1990s onwards (first mainly in his electroacoustic sound art project 'Artificial Soundscapes') to develop and formulate an extremely extended and therefore radically modified artistic and music–aesthetic approach to electroacoustic sound art – both in theory and practice – based on the now full-fledged and highly evolved technology of sampling.

To immediately counter any misunderstanding that might arise: naturally, we are not interested in an uncritical, exclusively affirmative relationship with technological development as such. We have no intention of supporting a solely mechanistically motivated, continually 'improving' concept of development marked by belief-in-progress, which surely appears infantile today in the twenty-first century, given the definitely negative global effects that are (also) happening. Much less should we want to advocate the thesis that 'new' music would almost automatically be generated through new technologies or new instruments. Quite the reverse: on the one hand, it took years of practice and experience with the artistic use of the sampler (since 1985) in many live concerts and studio productions, and on the other hand an intellectual–theoretical background formed by the writings and 'colossal' philosophical system of the great visionary French thinker Gilles Deleuze, to develop a 'pure' sound art directly in the musical tradition of, for example, the Italian Futurists from about 1910, of Dadaistic phonetic sound poetry of the 1920s, of tape-based sound/noise collages of French *musique concrète*, and of the electroacoustic compositions of Luc Ferrari and Iannis Xenakis, to name but a few. A purely 'acoustic art' that gives

precedence to the sensory impression involved in the sheer process of listening. And all this with the smallest contribution from the visual–performative and the multimedia character of installation, and finally combined and composed from natural sound and noise materials recorded and modified with the sampler.

II

So far, we have focused on the relationship between ‘autonomous’ production of art and technical progress, especially with respect to the radically innovative possibilities for recording, production and reproduction offered by digital sampling technology. Whereas the previous remarks were related rather more to historical–philosophical, music technological and music sociological thought, the following pages are mainly devoted to the above mentioned philosophical and theoretical foundations that, among other reasons, were behind the original development of the process of ‘EndoSonoScopy’ (interior sound representation), which we use in our work and describe below.

In 1920 Paul Klee (undoubtedly one of the most important twentieth-century artists) formulated that momentous – and soon-to-be-famous – principle about his quest for another (‘true’) reality that must be hidden behind the accustomed appearance of things, a quest that at first sight seems infantile: ‘Art does not reproduce the visible but makes visible’ (Klee, 1920/1961a: 76). With this statement, Klee pointed out the shortcoming that we described earlier, namely that the production of art – whether with or without the use of technology – would fall far too short of its aim if it stopped at *only* the purely illustrative reproduction of surfaces and superficial manifestations of nature or matter. It would attempt to doubly and unnecessarily imitate only those phenomena that could also exist without art (or technology), the result being never quite the same as the original. However, apart from the aspect of ‘making visible’ the previously ‘invisible’ (and that should not be imagined as a cheap magician’s trick), Klee first of all intended to point out the process-like and immanent movements inherent in the actual, artistically structured ‘event of making visible’ itself.

The main concern here is, therefore, the representation of dynamic ‘ways of becoming’, and not the static condition of ‘being’. For example, one should not reproduce the flower, but the ‘blossoming’,⁶ not the river, but the ‘flowing’, not the dog, but the ‘barking’,⁷ etc. At the same time, the following statement by Klee involves an important ‘utopian spark’, to use a term by Ernst Bloch: ‘Besides, I have no desire to show this man as he is, but only as he might be’ (Klee, 1956/1961b: 95).

Deleuze and Guattari, in whose writings Klee appears in various contexts, wrote in *A Thousand Plateaus*: ‘then, adopting an “earthbound position,” the artist turns his or her attention to the microscopic, to crystals, molecules, atoms, and particles, not for scientific conformity, but for movement, for nothing but immanent movement’ (Deleuze and Guattari, 1987: 337). This passage makes it very clear that

this is not only about things that are ‘concealed’ or another reality behind objects, but instead about (concretely, as it were!) the concealed, originating directly from the micro-dimensions of the ‘interior’, and about the dynamic process of setting free some intrinsic, hitherto ‘unthinkable powers’ and the ‘realization/externalization of inner intensities’.⁸

From their own (internal) centre, with a momentum and self-intensifying development, ever more extensive and consistent materials come into being, which in turn release ever more intensive powers and energy, or are able to create them in the first place. Consequently, the continuously varied generation of matter turns into an active, ‘synergetic–symbiotic’ and direct relationship of material and force instead of being solidified in a formal, static–mechanistic separation, a pseudo-dialectical ‘contrast of dichotomy’ – here: matter, there: form. ‘It is now a question’, as Deleuze and Guattari continue, ‘of elaborating a material charged with harnessing forces of a different order’ (Deleuze and Guattari, 1987: 342).

What might all of this mean for the physical medium of ‘artificially moved air’ and thus, in the broadest sense, for the art of music, which represents itself as a temporal–dynamic ‘acoustic time art/art of time’, characterised especially by and in the linearly directed flow of time? Deleuze, who repeatedly described in his writings the manifold kinds of relationships between his philosophical thoughts and the medium of sound, wrote the following in his chapter with Guattari titled ‘1837 – Of the Refrain’ from *A Thousand Plateaus*:

Music molecularizes sound matter and in so doing becomes capable of harnessing nonsonorous forces such as Duration and Intensity. *Render Duration sonorous.*

(Deleuze and Guattari, 1987: 343)

The molecular material has even become so deterritorialized that we can no longer even speak of matters of expression, as we did in romantic territoriality. *Matters of expression are superseded by a material of capture.* The forces to be captured are no longer those of the earth, which still constitute a great expressive Form, but the forces of an immaterial, nonformal, and energetic Cosmos...This is the postromantic turning point: the essential thing is no longer forms and matters, or themes, but forces, densities, intensities.

(Deleuze and Guattari, 1987: 342–3)

And in the context of compositional processes employed by the French–American composer Edgar Varèse, he wrote about

a musical machine of consistency, a *sound machine* (not a machine for reproducing sounds), which molecularizes and atomizes, ionizes sound matter, and harnesses a cosmic energy. If this machine must have an assemblage, it is the synthesizer. By assembling modules, source elements, and elements for treating sound (oscillators, generators, and transformers), by arranging microintervals, the synthesizer makes

audible the sound process itself, the production of that process, and puts us in contact with still other elements beyond sound matter.

(Deleuze and Guattari, 1987: 343)

Deleuze and Guattari wrote these statements in the 1970s. And as we described above, this was the first decade of the synthesizer's development. The (digital) era of the sampler, which began in the mid-1980s, had naturally not arrived yet. While developing the process of 'EndoSonoScopy' during the late 1990s, we quickly discovered how accurate Deleuze and Guattari's statements – concerning the synthesizer, for instance – were with respect to the instrument of the sampler, which was, obviously, completely unknown to them at the time. This specially designed micro-acoustic procedure for the recording and analysis of the largely unexplored and unknown (internal) micro-dimensions of 'naturally' created sounds and noises employs the sampler in an original, specific way, almost exclusively as a so-called 'audio microscope'.

The concept of a musical sound and consistency machine mentioned by Deleuze and Guattari, surely also in a metaphorical, even 'metamorphic' sense, and meant in a concrete and practical way related purely to electronically created 'sound matter', is realized here firstly in a 'real and practical' manner, and widened crucially by the extension of the term 'matter' to mean 'everything that sounds in this world', without limitations to 'man-made' sound matter that is generated usually electronically or instrumentally. Since the sampler generates the sound material, which is to be reproduced later, *exclusively* from acoustically 'foreign' materials that are previously digitally recorded – and does not create them itself like conventional instruments (this, of course, includes the synthesizer) – it is able, as an appropriate and central 'machine of sound molecularisation', to enter the omnipresent 'organic texture of sound' through a complex of computer-aided interfaces that can 'molecularise' – at least in acoustic terms – the fragment specimens (samples) taken from it. The sampler functions as a 'high-performance audio microscope' in this context, not only by digital 'internal sound' representation (EndoSonoScopy) and sound molecularisation, and making the 'inaudible' audible, but first and foremost, by rendering the process of sound production *itself* audible, and thereby preparing, even enabling, natural consistency formations, which the sound artist needs to produce artificially. Artificially creating the interdependent, natural–artificial consistency formations as a process of continuous variation, which permanently and dynamically fluctuates between the concrete and the abstract, is the prerequisite for evoking those unknown internal acoustic intensities and temporal permanencies. In their turn, these consistencies provide evidence of the existence of an imaginary–auditory landscape and vegetation that lives and thrives underneath the acoustical surfaces, as it were: the acoustically imagined habitat as an 'audio-sphere' for diverse 'audio-mutations' and acoustically oscillating, novel kinds of becoming and vanishing – a symbiosis between concrete naturalness and abstract artificiality.

It stands to reason that the basic audio materials for the creation of our *TopoSonicCompositions* should be taken from the spheres of nature, and especially from the animal world. And indeed, we received clear confirmation of the widespread scepticism many people display towards, for example, electronically produced sounds as 'synthetically dead material' even in our first trials with sound microscopy. For example, if you compare the internal richness of a grasshopper's 'song', which emerged over millions of years in a highly differentiated way, and is made audible for the first time by the process of sound microscopy, with the comparatively undifferentiated, monotonous and 'lifeless' sound signal of an electronic sound generator, or something similar, then, especially in the sound-microscoped, acoustical micro-levels of electronically produced sounds and noises, the lack of sound materials evoking 'inaudible-hidden' and 'unthinkable powers' becomes very obvious (clearly audible!). For the great opportunity of invoking those powers (at least acoustically) that are unthinkable for human beings is not to be found in the use of sound material imagined and produced by them in order to create audio artworks, but instead in immediately returning to the almost de-subjectivised material of expression existing in the diverse (sound microscoped) sounds of animals and noises of nature that lie beyond the imagination and productive powers of any human. The part of the production that is designated 'subjective and human' should then mainly be limited to the artistic-creative selection (what?) and artificial combination (when, where, who with whom / what with what?) of the previously molecularised, meticulously analysed and catalogued sound materials. In relation to this, one can listen to different sound examples on the attached CD. Tracks 1 to 3 feature, respectively, examples of the creative selection, and artificial combination of a single insect sound, which is layered with itself in a polyphonic mix in different degrees of augmentation. By contrast, track 4 is a *SpacesoundMilieu* with an artificial mixture of different kinds of animal and nature sounds.⁹

Another important advantage of utilising only the recordings of naturally produced sounds and noises from the three basic categories of natural resources (i.e. animal, nature and human) – particularly for the communication and reception our *TopoSonic art* – is the universal character of those sounds and noises with a natural origin, with which everyone is familiar and often intimate on an everyday basis. Despite the experimental and avant-garde aesthetic approach in all our *TopoSonic artworks*, this universal character allows many people spontaneous access to the actual *TopoSonicComposition*, without the need for certain previous, (nationally) marked, socio-cultural experience, let alone special expert knowledge that is often indispensable for an adequate reception of euro-centrally shaped new (classical) music.¹⁰

But what does one do now with all these sound materials one has selected, audio-microscoped, analysed, and catalogued according to artistic criteria (and which first appear to be rather diffuse and chaotic for human ears and minds) in order to create artificial elements out of them, and supply these with a potential for consistency,

permanently fluctuating between the 'natural–concrete', which is already available, and the 'artificial–abstract', which must be artificially produced? Deleuze and Guattari wrote on this subject:

Sometimes one overdoes it, puts too much in, works with a jumble of lines and sounds; then instead of producing a cosmic machine capable of 'rendering sonorous,' one lapses back to a machine of reproduction that ends up reproducing nothing but a scribble effacing all lines, a scramble effacing all sounds. The claim is that one is opening music to all events, all irruptions, but one ends up reproducing a scrambling that prevents any event from happening. All one has left is a resonance chamber well on the way to forming a black hole.

(Deleuze and Guattari, 1987: 343–4)

The material must be sufficiently deterritorialized to be molecularized and open onto something cosmic, instead of lapsing into a statistical heap. This condition is met only if there is a certain simplicity in the nonuniform material: a maximum of calculated sobriety in relation to the disparate elements and the parameters.

(Deleuze and Guattari, 1987: 344)

According to Varèse, in order for the projection to yield a highly complex form, in other words, a cosmic distribution, what is necessary is a simple figure in motion and a plane that is itself mobile; otherwise you get sound effects. Sobriety, sobriety: that is the common prerequisite for the deterritorialization of matters, the molecularization of material, and the cosmicization of forces.

(Deleuze and Guattari, 1987: 344)

Material thus has three principal characteristics: it is a molecularized matter; it has a relation to forces to be harnessed; and it is defined by the operations of consistency applied to it.

(Deleuze and Guattari, 1987: 345)

Following the molecularisation of sound material, and the accompanying process of 'making audible/making thinkable' the inaudible and unthinkable powers that are to be captured, which in turn served for the acoustic evocation of (inaudible) concealed inner intensities, the compositional processes of 'auditory elementarisation' and artificial consistency formation gain increasing importance in the artificial creation of harmonious, and almost organically proliferating, growing TopoSonic artworks from those amorphous–heterogenous sound and noise materials. The process of TopoSonic elementarisation takes place during an artificially initiated production phase of TopoSonic intensification. During this phase, the acoustic presence of each individual sound element is increased through an intensifying transparency

formation by selective partial amplification, attenuation or even elimination of individual acoustic parameters. Furthermore, the previously recorded particular 'acoustic aura (audio atmosphere)' surrounding each individual sound component gains noticeable plastic acoustic conciseness in the process of 'space microscoping' (or rather 'acoustic location microscoping'). One only retains and/or takes away the most elementary acoustic presences of the TopoSonic lines, locations, movements, durations, colours and velocities of the usable inner acoustic intensities in order to create naturally, and equally artificially, consistent TopoSonic habitats. This is achieved with the help of artificial blending of consistency formations that continue synchronous/asynchronous layering and the temporally successive series with a momentum of their own.

Even a TopoSonic environment first represents a condition of temporarily present and specific selection that appears static on the macro-structural level; it represents a blending and artificially composed combination of TopoSonic elements that are either similar or have been made similar to themselves, the latter via artificially created self-intensification (loops/warps) that have their own momentum, and via chains of repetition. The micro-structural internal levels of this TopoSonic environment of artificial and acoustically imagined habitats and artificially produced audio biospheres are, on the other hand, marked by a high level of 'internal' consistency that is also artificially produced. Such consistency is itself mainly characterised by the dynamic process of continuous variation of all vertical and diagonal 'harmonies', and simultaneously takes place in different time zones and dimensions with their own specific systems of time, relation and definition of speed(s).¹¹

With respect to the question of artificial production of 'consistency formations' that points far beyond natural consistencies, may we add the following remarks as conclusion: two of the most important requirements for those artificially composable *consistencies* which at first appear in a continuously fluctuating acoustic 'twilight zone' – between pure concreteness and pure abstraction – are the acoustic processes of deconstruction and transformation. On the one hand, there is the process of the (partial) dissolution of the (non)sonic, *solely* concrete material of content and meaning, and on the other hand, their conversion into a purely sonic but *not just* abstract de-subjectivised material of expression, as it were. Both take place in the production process of TopoSonic molecularisation through audio microscoping, and the ensuing TopoSonic fragmentarisation with the possibly self-intensifying formation of loops, as described in detail above. For example, if you start, as in a picture puzzle, exclusively from a small detail (a 'sample', a so-called 'fragment specimen'), and are to guess visually the (whole) object that is reproduced only through fragments, and when the identification of the object is further complicated by enlargements and selective visual depiction of details (that serve to render visible the unknown dimensions of the exterior, visual form and shape of the object), then

during the process of TopoSonic microscoping, the concrete acoustic material of content and meaning of the naturally created sounds and noises linked clearly to a living thing, to a natural (physical) phenomenon or a concrete object, is transformed into a *seemingly* different, concrete material of content, or often entirely dissolves – as the audio fragment becomes smaller and the magnification of sound microscoping higher – into more or less abstract material of expression:

In the mind of each listener, even beyond (extra)musical meanings and contents, in a ‘twilight zone’, individual, audio-inspired imagination can unfold, in permanent fluctuation between (!) pure naturalness and pure abstraction. This is achieved all the more successfully as, for example, animal sounds, natural noises or the human voice when singing also become ‘something else’: pure line, pure space, pure colour, pure sound, pure rhythm, pure movement, pure becoming... pure state of being... The aim is no longer to develop a form or to impose a shape on matter, but to create ‘ways of becoming’ of foreign internal intensities and de-subjectivised affects. Form(s) should dissolve, for example, to render audible the tiniest variations of speed *between* combined (composed) locations, and push fast or slow movements to the state of immobility (stillness). The TopoSonic soundscape artificially created by the TopoSonicArtist thus appears to be an ensemble of de-subjectivised material of expression in a space, time and sound matrix (layered in all directions) of ‘temporally’ horizontal and rhythmic, melodic TopoSonicFigure and the ‘spatially’ vertical and resonant harmonic TopoSonicStructure.

(Schäfer and Krebs, 2004)

Information about the sound examples on the accompanying CD:

Four Spacesound Milieus

Just as in all other works by the artist duo, these four SpacesoundMilieus focus on the predominantly unexplored and unknown micro-dimensions of animal and nature sounds. Applying their original process of sound microscopy (EndoSonoScopy), the SpacesoundArtists examine natural sounds and noises in order to trigger their intrinsic melodic, rhythmic and spatial ‘inaudible intensities’ and to realize the Spacesound composition on the basis of an artificially produced combination of consistencies that are found naturally and produced artificially. Every single SpacesoundMilieu is a small, closed – although open towards ‘the other’ at its margins – acoustic cosmos, ‘unheard-of’ sound worlds, which offers an extraordinary sound experience. For further information on the work: www.sabineschaeferjoachimkrebs.de

Notes

- 1 Translated from the German original by *ar.pege*, and edited by Ralf Nuhn, John Dack, and Mine Doğantan-Dack.
- 2 The authors wish to include here the German translation of this quotation from Deleuze and Guattari, which formed the basis of their chapter: ‚Der eigentlich musikalische Inhalt der Musik wird von Arten des Frau-Werdens, Kind-Werdens und Tier-Werdens durchlaufen, aber durch alle möglichen Einflüsse, die auch mit den Instrumenten zu tun haben, tendiert er immer stärker dazu, molekular zu werden, und zwar in einer Art von kosmischem Geplätscher, bei dem das Unhörbare hörbar wird und das Unwahrnehmbare als solches erscheint: nicht mehr der Singvogel, sondern das Klang-Molekül‘ (Deleuze and Guattari, 1992: 339).
- 3 The radically modified situation this brings about with respect to the possibilities of the production of music is often imperfectly understood, investigated and described in its aesthetic importance and relevance, by musicological philosophical research, for instance. In this new situation, the composer will henceforth be able to fix his completed artwork ‘authentically’ for posterity ‘ad infinitum’ – comparable to the man of letters or an artist. S/he no longer is dependent on the often ‘problematic help’ from interpreters to have his work come into existence in a sonic, materialised way.
- 4 Naturally, there are always the ‘interfaces’ of the human: a) as a sound artist (sender) and b) as an addressee (recipient). The human (sound artist) as the ‘sender’ forms a ‘symbiotic production structure’, as it were, together with the machine (production unit: sampler). And the loudspeaker as an instrument of mediation then forms a so-called ‘mediation and communication structure’ with the ‘recipient’ in the form of a ‘listening human being’.
- 5 Author Joachim Krebs realised multimedia projects on a larger scale between 1985 and 1994 – for the new art of music and media – at internationally important performance venues where the sampler was used in live performances (e.g. courses for New Music in Darmstadt in 1988, and the ‘Multimediale’ festival of the Centre for Art and Media Technology, ZKM Karlsruhe in 1991.)
- 6 A kind of ‘becoming a flower’ represented by the process of blossoming.
- 7 One way of ‘becoming a dog’ is, for example, represented by the acoustic act of barking. The process of barking is an expression, i.e. the ‘alienation’ of an *inner* movement that results in an *external* movement, a movement of the air among others. The air in turn reaches and enters the ear of the listening human or animal. And thus, artificially formed/deformed air, caused by affects, is transformed into sound in an almost imaginary way.
- 8 Paul Klee: ‘For we know that, strictly speaking, everything has potential energy directed towards the centre of the earth. If we reduce our perspective to microscopic dimensions, we come once more to the realms of the dynamic, to the egg and to the cell’ (Klee, 1961b: 5).
- 9 Three SpacesoundMilieus (Tracks 9–11) with audio-microscoped sounds of insects:

Track 9: 'Uromenus rugosicollis' (1'56")

Track 10: 'Metrioptera roeseli' (1'56")

Track 11: 'Myrmeleotettix maculatus' (2'10")

One SpacesoundMilieu (Track 12) with audio-microscoped nature atmosphere (3'07")

- 10 'The same goes for literature, for music. There is no primacy of the individual; there is instead an indissolubility of a singular Abstract and a collective Concrete' (Deleuze and Guattari, 1987: 100).
- 11 If the epistemological statement according to which only the relationship of objects to each other, and not they themselves, can be recognised as 'those being *as such*', and that they are also determined by the position and the perspective of the perceiver, and if Albert Einstein is correct in stating that space, time and mass depend on the *condition of movement* of the observer and therefore are relative categories, one can say with regard to music that the interior conditions of movement, the inherent affects caused by the music and the inner emotionalities of the listener/recipient make it possible to observe the 'temporal relationships' of the most diverse relations between speeds – in an almost mentally qualified way.

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