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## Sensing and knowing noises: an acoustemology of the chainsaw

Within sensory anthropology, scholars have for some time now developed ways to think with acoustic phenomena and to interpret the multiple meanings of sounds and soundscapes. Yet actual practices of listening and experiences of listening subjects feature rather less in that field. Drawing on a case study of chainsaw use in tree felling, this article presents listening as a mode of acoustic knowing that is both aesthetic and epistemological. This is achieved by combining a consideration of listening as a skilled practice with a problematisation of the notion of ‘noise’. Whereas noise is commonly conceived of as unwanted, chaotic and meaningless sound, skilled chainsaw use shows how a particular practice re-evaluates what is defined as noise and even takes it as an entry to acoustic knowing. Through a careful description and analysis of the process of tree felling, this article traces how skilfully mediated listening with the chainsaw develops from a felt, embodied sense of a sound world that is still indeterminate and ambiguous to recognisable ‘objects’ of clearly identifiable sounds. It is argued that through such a broader conceptualisation of listening as a form of sensing, we can more deeply investigate the sonic orders of sociocultural practices.

**Key words** aesthetics, listening, noise, skill, sound

### Introduction

The sound of the chainsaw is a visceral sound that seems to drive deeply into our bones. With a loudness of around 110 dB (challenging helicopters and jackhammers), it is often considered prototypical ‘noise’. Its peculiar dissonant sound signature makes the chainsaw a favourite for horror movies and – through this association – for Death Metal and Thrash Metal songs where it is used as background sound or even as an alternative musical instrument (e.g. in the work of *Jackyl* or *The Lumberjacks*). The noise of the chainsaw could be said to have the power to cut right through and disturb the aesthetics of everyday life ‘soundscapes’ (see Kelman 2010; also Helmreich 2010; Ingold 2011: 136–40). As an acoustic phenomenon, it displays ‘acoustic violence’ (Bosshard 2005; Goodman 2010) – both through its noise and the brute materiality of its cutting force.

Yet alternatively, noise may be considered as a route to investigating the effects of technologisation in regard to sound and listening practices, in particular to noise as produced by machines (Bijsterveld 2008; Cox 2013). However, instead of construing noise primarily as a (public) ‘noise problem’ (Bijsterveld 2008), I am interested

in the practice of ‘listening to machines’ (Bijsterveld 2006). If we thus consider the chainsaw from the standpoint of what Steven Feld (2005, 2015) named ‘acoustic knowing’ or *acoistemology*, its noise becomes a route to aesthetic knowing as skilled listening for skilled practitioners within certain sociocultural practices (like forestry). Undifferentiated noise turns into differentiated sounds. These ‘signal sounds’ indicate the flow or disturbance of work-in-progress. What is noise for most non-practitioners might even become a pleasant aesthetic sound if it indicates a well-running machine and noise might be re-interpreted as dissonant sound if it indicates a faulty machine or a breakdown in the process. Hearing the sounds of the chainsaw in this way does not come instantaneously but instead is a learned skill or a form of skilled listening (cf. Grasseni 2004) that requires a re-education of attention and a new sensitisation or fine-tuning of the ears (and indeed of the whole body, as I will show below). In particular, I consider skilled listening as a form of *sensing*, namely hearing *in statu nascendi* or as a felt, embodied sense of a sound world that is still indeterminate and ambiguous and not yet definable as recognisable ‘objects’ of clearly identifiable sounds (see Merleau-Ponty 2004; Csordas 1990). Taken together, I argue that a chainsaw-employing practice thus develops its own ‘hearing culture’ (Erlmann 2004) that structures the sonic order of the practice’s soundscape.

In a way, this article follows the call of Bull and Back (2003) to engage in *deep listening*, i.e. to think with sound and to tune in to the multiple layers of meaning in sound. As this brief definition of deep listening shows, however, this is not a strong call for studying the actual *practices* of listening or the *experiences* of the listening subject. My approach to chainsaw noise employs a ‘phenomenology of the listening subject’ (Petty 2015) in order to show how fruitful a detailed investigation not just of sounds (as the *what* of auditory perception) but listening as a skilled activity (the *how* of auditory perception) can be (Rice 2015). I conceive perception from the start as a relation to and orientation towards the world and thus ascribe to it an epistemological function to inform about that world (see Maslen 2015; Rice 2008). Situated and performed within practices, this approach further considers sensory perception as coupled with actions and therefore also the synergy of practitioners, tool (chainsaw), materials and environment (see Ingold 2011). And finally, the ambiguous nature of *sensing* draws attention to the *intersensoriality* of perception. As Steven Connor has put it: ‘The sense we make of any one sense is always mixed with and mediated by that of others. The senses form an indefinite series of integrations and transformations: they form a complexion’ (2004: 156). So although this article focuses on listening and sound it does not reduce the sensory engagement with the chainsaw to it. Instead, I propose to follow Ingold in his argument that ‘looking, listening and touching ..., are not separate activities; they are just facets of the same activity: that of the whole organism in its environment’ (Ingold 2000: 261). Hence, I will show how the intersensorial pattern transforms itself throughout the process of tree felling, resulting in ever-new meshworks to fit the current task.

In the following I will first briefly sketch the sensory history of the development of the chainsaw, pointing to those aspects relevant for the sensory engagement with the chainsaw and its sensory practices. In the main part of the article, I then describe how to fell a tree with a chainsaw. Going through different phases of the process, I show how sawing – as a practice of listening – structures and guides tree felling. In particular, I break down the noise of the chainsaw into distinguishable and task-relevant sounds that inform about the progress and state of the process of felling and the state of the

chainsaw itself. In the conclusion, I re-evaluate ‘noise’ from the insider’s perspective, whereby what is noise and what is not shifts – and even an aesthetics of noise can be recognised. A phenomenological approach to tree felling as a practice of listening shows that it combines the auditory skills of identifying signal-sounds as well as an intuitive sensing of the ambiguous dynamics of sounds.

## **A brief sensory history of the chainsaw and why it matters**

By revisiting the sensory history of the chainsaw, I present the tool as a ‘focusing medium’ (Grasseni and Gieser this issue) of tree-felling practice – one that is able to ‘reconfigure and transform whole practices, ecologies of relations, knowledges, senses and bodies’.<sup>1</sup> The following historical sketch thus situates the experiences of the listening subject within the ecology of practices of forestry work and the development of its material culture. In line with Don Ihde’s ‘phenomenology of human–machine relations’ (1974), I emphasise the ‘technological intentionality’ (Ihde 1990: 141) of things: their design and material configuration embody certain solutions to practical problems and suggest a certain way of handling and perceiving with them. In other words, they provide users with ‘affordances’ (Gibson 1979) and restrict the range of handlings theoretically possible. Although their ‘multistability’ (Ihde 1990) does prevent things from having only one particular way of handling, they ‘scaffold’ certain *sensory trajectories* for possible sensory engagements. If there is such a power of material things to delimit possible handlings, the power is not in the thing alone but in its embeddedness into ‘equipmental totalities’ and into skilled practice (Heidegger 1962; see Olsen 2010).

What is special about the case of tree felling with the chainsaw is that we deal with both a globalised tool and a globalised practice. Although produced in particular localities, the *Stihl*’s, *Oregon*’s, *Husqvarna*’s and other branded chainsaws can be found anywhere in the world. At the same time, forestry has developed into an international enterprise and industry standards regarding ‘best practice’, ‘health and safety’ and standard equipment have spread equally. Thus the sensory trajectory I am describing in this article is also a ‘standard’ one in the sense that I describe the normalised ‘best practice’ I have learned in my sensory apprenticeship (Pink 2009) during my professional involvement with nature conservation work in the UK. During that time (2008–2011), I took a week-long course to gain a City & Guilds NPTC (National Proficiency Tests Council) certificate for professional chainsaw use and another week-long NPTC course on felling trees. In my reading of Michel de Certeau (1984), training within national public institutional settings, according to official ‘best practice’ regulations, amounts to an enskillment in *sensory strategies*, i.e. scaffolding trajectories for sensory engagements framed by material and sociopolitical structures (of official discourses, institutions, regulations). These strategies are meant as general and basic trajectories that are adaptable to a variety of work practices and the particularities of their communities of practice and the vagaries of work and craft-related contexts.

<sup>1</sup> The inspiration for this article came from reading Tim Ingold’s (2011) essay ‘Walking the plank: meditations on a process of skill’ in which he thinks through how to saw a plank of wood with a hand-saw. In a way, I wanted to continue his thinking by asking myself: what happens if you saw not with a hand-saw but a motor-driven chainsaw?

Following the example of Dorinne Kondo (2005: 193), my description and analysis of a sensory strategy can be considered ‘a basic orchestral score’ that can be used ‘as an illustrative object for the methods used’. Like Kondo, my intention here is to suggest and elaborate on a new approach to describe the sensory experience of practitioners. It is not, however, ‘properly’ ethnographic, i.e. I do not describe the sensory experiences of particular practitioners, in particular localities and environments. I limit myself to the sensory trajectory that is embodied in the material thing and the ‘logic’ of ‘best practice’ training regimes. Yet this approach can equally be applied to ethnographies of *sensory tactics*, i.e. ‘glocal’ appropriations of sensory strategies that respond to and engage with the specificities of a given field. The unfolding sensory processes and patterns I describe here as a sensory strategy would then be situated in the fields of forestry, tree surgery, nature conservation or hobbyist chainsaw users in order to understand how practitioners who have learned ‘best practice’ adapt it to the circumstances of their work.

### *A brief history of the chainsaw*

At the heart of sensory strategies of tree felling is the chainsaw. In many parts of Europe, before the invention of the chainsaw and into the first half of the 20th century, tree felling was accomplished most commonly by axe or, increasingly towards the end of the 19th century, by hand-saw (first the axe would be used for felling and ‘delimiting’, i.e. removing branches from the stem, then the saw for ‘bucking’, i.e. sectioning the timber). Interesting for an acoustemology of tree felling is that the saw had been a favourite tool for wood theft as the loud clanks of the axe could be heard far, whereas the hand-saw worked much more quietly. Yet it was the increasing industrialisation and mechanisation of forestry work that drove the development of hand-saw technology (material, the form of the saw teeth, the form of the saw) and it was mainly forestry agencies and scientists who actively promoted the use of saws in forestry work among professionals (Fleischer 2007).

The first proto-models of motorised saws were steam-driven saw blades at the end of the 19th century. At around the same time, the actual chain design for the chainsaw was invented. However, early proto-models were still not practical for real forestry use as they were too big, too heavy and too limited in how they could cut. The first practical (two-man) chainsaws were developed in the 1920s and 1930s, and it was not until the 1950s that the one-man chainsaw as we know it today came on the market. So it is perhaps no wonder that the chainsaw did not become standard sooner than the 1950s and 1960s (first in North America, then in Scandinavia and finally in the rest of Europe).

Forestry work had always been hard, physically demanding work and although the chainsaw increased the speed of work and its output, handling a 40–60 kg two-man chainsaw or a 12–16 kg one-man chainsaw was still hard work and still is (even though the weight reduced to about 3–4 kg today). Apart from poisonous fumes smoking out of the engine, the machine’s volume and vibrations (leading to the so-called white finger syndrome) have, from the beginning, been major health and safety concerns (Mattes 1986). The further development of the chainsaw in the last 60 years has tried to find solutions to these problems by adding an anti-vibration system, mufflers to reduce

noise and exhaust gases, as well as by developing better personal protective equipment (PPE, see below).

Shortly after chainsaws became standard tools for forestry work, mechanisation reached a new stage in the early development of a new heavy forestry vehicle: the so-called Harvester, in the 1970s in Scandinavia (Haarland). Initially invented for clear-cutting large areas, the Harvester is a multi-functional wood-harvesting machine that features a tractor-like vehicle with a mechanical arm/crane ending in a 'head' with a chainsaw, 'delimiting knives' and an installation to grasp trees. Controlled from inside a cabin on the vehicle, the operator can fell, delimit and buck trees within minutes. The motivation behind this new development was both an economic one (to increase harvesting capacity) and a health and safety one. 'No feet on the forest floor' is the principle to keep operators as safe as possible by 'caging' them inside the cabin, away from the forest floor and the trees. Needless to say, a Harvester operator engages in a very different sort of tree felling and needs different skills than a manual chainsaw practitioner. Tree felling becomes an operation from a distance and its human-machine-tree interaction would be a research topic in itself. Yet manual chainsaw tree felling is still common and not completely replaced by Harvesters, especially in small-scale forestry, on difficult terrain or in diverse woodlands. In Germany, for example, it is not uncommon for Harvesters and manual chainsaw practitioners to work side-by-side.

When we look at this brief history of the chainsaw from a sensory perspective, it is striking that the efficiency of this new motorised tool was offset with 'sensory violence' in a variety of ways: poisonous exhaust gases threaten the smelling nose, vibrations threaten bodily feeling and the loudness of the machine threatens the hearing ear. Mitigating these sensory effects had therefore to be integrated in the handling of the chainsaw, both through changes in design and the development of (sensory) PPE. In regard to listening practices in particular, it may be argued that this problematic relation between sound/noise production on the one hand and listening on the other hand was primarily mitigated through material means (design and PPE) and less through adjustments in listening practices. These, in turn, had to change along the material transformations. Auditory skills had to be learned in order to be able to listen to the sounds of tree felling and to be able to listen to sounds of the machine and *through* the mediating PPE. This is the complex sensory meshwork as we encounter it today.

## How to fell a tree

With this brief history of the chainsaw in mind, let me now turn to the practice of tree felling as such. What I describe here follows the 'official' guidelines as I learned them during courses on chainsaw use and tree felling. It describes what I called above the *sensory strategy*, the 'proper' process as conceived by health and safety regulations of the relevant authorities (e.g. the National Proficiency Tests Council in the UK). Experienced, skilled chainsaw users certainly develop their 'short-cuts' here and there, and adapt the procedures to the particularities of their work situations (the *sensory tactics*). Yet what I describe here from the perspective of a novice with some skill with regard to noise and listening practices is still applicable to practitioners with more skill. In other words, my own sensory apprenticeship with the chainsaw has provided me with glimpses into the skilled listening of more accomplished practitioners.

Following Ingold (2011), we may consider tree felling as a process with recognisable phases: getting ready, setting out, carrying on and finishing off. Getting ready begins with putting on one's PPE: safety boots, protective trousers (and perhaps jacket), gloves, safety hard hat with visor or separate safety goggles, as well as some form of ear protection (ear plugs or ear mufflers). The chainsaw being fuelled up, we can start the chainsaw and check that it is running properly. As we set out to work, we check the tree to be felled (the direction it is leaning, damaged or diseased parts), the felling direction, wind direction and speed, and any potential obstacles. If there are any obstacles, they are removed and lower branches are cut to give some space around the tree to handle the chainsaw. Then the first two smaller cuts are made, the so-called *top sink cut* and the *bottom sink cut*, which remove a triangular piece of wood in the direction of felling. As we carry on, we make the final, big *felling cut*, cutting from behind the tree towards the felling direction. We leave a small hinge of wood between the felling cut and the sink cut to ensure that the tree falls in a controlled fashion. And as soon as we perceive the tree starting to fall, we quickly remove the chainsaw, engage the chain break and quickly move away from the tree. Once the tree has settled on the ground, we may switch off the engine of the chainsaw and remove goggles and ear protection.

This, in brief, is the procedure of how to fell a tree with a chainsaw. Let us now consider each phase in more detail from the position of the listening subject and the kinds of *sensing* involved in this practice of listening.

### *Getting ready to setting out*

The procedure starts with an intervention in the 'normal' way of perceiving. Wearing PPE, in particular safety goggles and ear protection, not only protects but – by its protective properties – also lowers the sensuous capabilities of the wearer. Listening to the surrounding soundscape of the forest is almost impossible, vision is impaired through the plastic goggles or visor, and feeling is impaired through the thick leather of gloves and thick layers of cut-resistant clothing. It seems a paradox that safety is increased by decreasing the sensory capacities of the wearer. It could be argued, however, that the PPE re-structures the way one perceives and moves when felling a tree (compared with felling with hand tools and without PPE). And this restructuring necessitates a re-learning of handling and sensory skills so that the drawbacks of the PPE as 'sensory barriers' can be compensated by adaptable 'techniques of the body' (Mauss 1973) and sensory techniques.

Having donned our PPE, we now start the chainsaw by engaging half throttle, switching on the machine and by pulling the starter cord sharply until the engine fires. Often, one needs more than one pull to start the engine and hear the continuous chattering of the engine. Instead, one hears a choked sound (listen to <http://www.sound-jay.com/mechanical/sounds/chainsaw-pull-cord-01.mp3>). To check that the machine is running properly, we test chain tension, the chain break and chain lubrication. Checking the chain tension is a quite simple matter of visual and auditory scrutiny. When the engine is on without an engaged throttle, the chain might be seen 'creeping' along the blade by itself, making a metallic rattling sound. This is caused by the chain being too loose and thus moving too much and clinking against the metal blade. So we do not want to hear a rattling sound at this stage. When checking the chain break



by engaging it with engaged throttle, the chain should stop immediately, accompanied by a choking sound. If the chain can still be seen moving and the sound is not the sudden but a prolonged revving getting slowly quieter, the break does not break hard enough (or at all). Finally, when checking chain lubrication we engage full throttle which results in a long-drawn loud revving of the engine (listen to <http://www.soundjay.com/mechanical/sounds/chainsaw-07.mp3>). The blade is held against a tree to see whether the bark becomes sprayed with lubrication oil. So, in this case, we are looking for visual evidence only. However, as this last test is usually the first time since we started the machine that it is run at full power for longer than a few seconds, the sound of the revving has to reflect the sound of the chainsaw at its best. Should there be any other problems with the machine, we can hear it now.

We approach the tree, scanning it visually up and down. How does the tree look? In which shape has it grown? Is the stem upright or leaning towards one direction? Where are its main branches and hence its main weight, which might affect where the tree wants to fall? With the continuous chattering sound of the chainsaw still in the background, we look around us to check the immediate surroundings. Would anything be in the way of the falling tree? Where should the tree fall? If there is any undergrowth directly around the tree, we cut it. If there are any lower branches on the stem, we cut them to have more room to handle the chainsaw. The stream of our concentrated gaze is punctuated by the brief revving of the chainsaw as we cut quickly through all these stick-size obstacles (listen to <http://www.soundjay.com/mechanical/sounds/chainsaw-05.mp3>). But listening is of minor importance at this stage, so we largely ignore the sounds unless they would signal a breakdown or problem of some sort.

Instead we concentrate on a measuring and orienting gaze of almost geometrical nature. Accompanied by imagination, we see the upright line of the stem, the line on the ground where it would fall in between the surrounding trees, we move around the tree, positioning ourselves and the blade of the chainsaw on the stem to mark out where to make the first cut. When we feel that we have found the right relationality between ourselves, the chainsaw, the stem and the surroundings, we make the top sink cut at an appropriate angle and height. Still measuring with our eyes, the chainsaw cuts into the wood with shorter bursts of revving, because it is a rather small cut that needs to be exact and thus demands repeated measurement and adjustment of the cut. The bottom sink cut is even more delicate because the lines of the two cuts have to meet up exactly. The finger on the throttle engages sometimes more, sometimes less, until the cut has been completed. Having completed the sink cut, we have determined (more or less) the tree's felling direction. The tree still stands and is in no danger of falling. We pause for a moment before beginning with the main felling cut.

As we can see, the sensory structure of the process of tree felling transforms throughout the first two phases. In the beginning, vision and hearing are equally important in getting ready. Often, one sense complements the other. In checking the chainsaw, for example, we might first see a problem before hearing it, or vice versa. Then, in setting out, vision takes over and listening retreats into the background as we engage in complex visual-imaginative orientations and measurements. This visual attention feeds into the synergy of body, tool and material (tree) that in turn informs the body's positioning and handling of the chainsaw in preparation for and executing the first cuts. During the whole time, the surrounding soundscape is more or less inaudible and irrelevant to the task at hand. The listening practices are focused on the sounds of the machine alone, which therefore becomes its own soundscape.

### *Carrying on and finishing off*

Back to the felling cut. Ending our short pause and re-gathering our attention, we reposition ourselves and turn to the tree once more, this time from behind – the sound of the chainsaw still chattering in the background. In trying to find a safe and firm stance, we half-lean on the tree and grip the chainsaw firmly, measuring with our eyes where exactly to make the cut in relation to the sink cut. We engage the throttle once more and the engine begins to rev. Now the machine has to work with full power, cutting through the whole diameter of the tree, (almost) all the way through. The revving now is not the revving we previously heard when testing the engine, i.e. the chain running through *air*; the revving now is the sound of the chain running through *wood*. The sound takes up the properties of the material it saws through: cutting through soft wood sounds different from cutting through hard wood, cutting through fungus-infected wood sounds different from cutting through ‘healthy’ wood. So the sounds we hear now inform us about the hidden dimension of the tree, the inside of the wood. We need to pay attention to these sounds because they guide the pressure with which we hold the chainsaw against the wood. We also might hear potential dangers to our task, for example, when we hear fungus-infected wood (which we have not noticed visually on the outside of the tree). Such wood might influence the point when the tree falls or even indicate that the stem might break through before it is cut through. A potentially dangerous situation for the chainsaw operator!

While we are cutting, our eyes are set on the line of our cut in relation to the sink cut. Are we still one or two inches above the line of the bottom sink cut? When have we reached the line just behind the sink cut that we need to leave as a hinge? The more we approach the hinge, the more our body becomes tensed, ready to respond quickly. At this stage, we do not only hear the sounds of the chainsaw-cutting-through-wood – we also *feel* its vibrations throughout the body, which is leaning against the vibrating stem. With Connor (2004), we could say that we are engaging in a synaesthetic ‘sonic tactility’ that goes beyond mere hearing: sound as sound waves encompasses both heard and felt sensations (sound vibrations). It is only a matter of seconds for the felling cut to be completed and within this short time span we are waiting and listening for this one moment where – in midst of the sounds of the chainsaw – arises a new sound, the sound of the tree beginning to move. The time around this moment reveals the nature of listening as *sensing* – a pre-reflective synaesthetic feeling-into and responding to a still ambiguous, undetermined world in formation. Listening as sensing is not the registering of clearly definable and identifiable ‘sound objects’ but an attentive and tentative process to sounds in their becoming.

As we are closing in on the hinge, we sense a *creak*, its beginning and swelling. The creak is caused by more and more strings of wood fibres being cut until the point when the tree’s own weight rips at the rest of the standing fibres that hold the tree upright. It is this ripping that translates into the creak that can be sensed, primarily through its sound and its vibration. Our body was prepared for this moment through its tension, providing us with a readiness to withdraw the chainsaw quickly right when the creak begins, the tree moves but is not falling yet. With a turning of the wrist, we immediately engage the chain break and move away from the now falling tree. The creak has



become louder and louder and has filled and now dominates our soundscape, until it ends with a muffled vibration of the tree hitting the ground, with leaves or needles raining down slowly on the tree as it settles firmly on the ground. We switch off the engine, remove goggles and ear protection. First, there is silence: no creak, no vibration, no engine noise, nothing. That feels good. Then, quickly, the forest soundscape re-establishes itself and engulfs us once more. Having had impaired hearing through the ear protection, its removal brings about a refreshed listening, sounds feeling more intense at first.

In contrast to the first two phases of the work process, carrying on and finishing off the tree felling reveals a significant change in the listening practice and its intersensorial pattern. As practitioners become more involved in the task at-hand and as they approach the most dangerous part of the task, we notice that the sensory engagement with the chainsaw becomes more and more synaesthetic. The rather intuitive *sensing* seems to be a kind of knowing that is particularly appropriate to dealing with difficult situations. When confronted with uncertainties, challenging complexity and the limits of rational, reflective planning of processes, *sensing* as a form of *knowing-how* or 'I can' (Merleau-Ponty 2004) provides the skilled listener orientation and a readiness to act through a close coupling of fine-tuned perception and response.

## Conclusion

To recapitulate, I started out with an exposition of prototypical noise which 'normally' connotes a form of pollution and violence, a danger to one's hearing capacity that necessitates protection. By switching the perspective and thus considering the sensory strategies of the listening subject before an analysis of sounds and soundscapes, noise was re-interpreted on the basis of a skilled, differentiated listening-to (instead of listening-away). I situated both the production and reception of sound within a specific context of practical engagement, focused on the chainsaw. Within the (globally envisioned) community of practice of chainsaw users, I have argued that learning to listen means (a) to familiarise oneself with the practice-specific soundscapes, (b) to develop the skill to identify certain practice-relevant 'signal sounds', (c) to develop an aesthetic sense for 'typical', 'to be expected' sounds as well as for 'disturbing' sounds, (d) to work under conditions of practice-specific material culture (e.g. PPE) and relevant discourses (e.g. health and safety regulations).

An acoustemological analysis of chainsaw 'noise' revealed task-relevant, identifiable sounds that are typical of the 'normal' running of machine and work, such as the chattering of the engine without an engaged throttle, the choking sound of the chain break or the revving of the engine at full throttle. A rattling (of a loose chain) or a slow choking sound (of the chain being stuck or of a dysfunctional engine) becomes 'noise' for the practitioner, because these are the problematic sounds one does not want to hear. In contrast to this noise, the chainsaw's loudest sound, the long revving, becomes the most beautiful sound of an engine running at full power. We thus have a complete inversion of what non-practitioners and practitioners consider noise and aesthetic.

Yet this case study has revealed more than identifiable sounds within chaotic noise. Noise became subsumed in the hearing culture arising out of an engagement with sound. Within this hearing culture, noise is part of an aesthetics of listening – aesthetics not as in a dis-engaged and dis-interested appreciation of sound, but as a skilled

practical sense that is coupled with the skilled movements of practitioners. Aesthetics and epistemology are thus one in an acoustemology of chainsaw-hearing culture. In order to show this overlap of aesthetics and epistemology, I have defined listening as sensing, a pre-reflective synaesthetic feeling-into and responding to a still ambiguous, undetermined world in formation. Rather than just recording *what* is perceived, sensing has refocused our attention to *how* we perceive. It conceives perception as a process of existential beginnings, developing within the synergy and dynamics between sensing and sentient body, tool, material and surroundings.

It is against this background of listening as sensing that the *knowing-what* of the chainsaw hearing culture (sounds) becomes more than mere constituents of a soundscape. It draws attention to the dynamic development of sound (not as an object but as a process, such as the creaking of the falling tree), coupled with the dynamic development of listening as a form of *knowing-how*. Consequently, we can expand Bijsterveld's notion of 'listening to machines', with which I introduced this article, with a 'listening *with and through* machines'. The chainsaw has turned out to be more than a tool to be used; it skilfully mediates the practical engagement with the tree within the wider ecology of practice. As a focusing medium, it organises this ecology of tree felling into a particular aesthetic and synaesthetic order.

Yet the detailed description of the process and phases of the practice has also revealed that it is hard to assign one particular pattern or regime to a given practice as a whole. Instead, tracing the unfolding of action showed an ever-shifting continuum of synaesthetic listening experiences along the lines of the transforming dynamics of sounds in their becoming. From phase to phase, the sensory meshwork of practitioner, focusing medium, equipment, materials and landscape reconfigured its entanglements in ever-new constellations. One sense shifted to the foreground of attention while others assisted in the background in ever-changing forms of intersensoriality, while modes of pre-reflective engagement shifted to modes of reflective pausing within the activity. Unravelling the depths of this sensory meshwork is the task of an acoustemology that is interested in 'deep listening' as an active, exploratory skilled practice.

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## Perception et connaissance du bruit : une acoustémologie de la tronçonneuse

Au sein de l'anthropologie sensorielle, des chercheurs élaborent depuis un certain temps diverses façons de penser à partir de phénomènes acoustiques et d'interpréter les significations multiples de sons et de paysages sonores. Néanmoins dans ces études figurent moins les pratiques réelles d'écoute et les expériences de sujets à l'écoute. S'appuyant sur une étude de cas sur l'utilisation de la tronçonneuse dans l'abattage d'arbres, notre article présente l'écoute comme mode de connaissance acoustique à la fois esthétique et épistémologique, en associant une définition de l'écoute comme pratique spécialisée à une problématisation de la notion de « bruit ». Alors que le bruit est en général conçu comme un son indésirable, intolérable, chaotique et dépourvu de sens, l'utilisation habile de la tronçonneuse montre de quelle manière une pratique particulière remet en question la notion même de bruit, s'en servant comme piste potentielle de connaissances acoustiques. A travers une description et une analyse minutieuses de l'abattage d'arbres, notre étude met en lumière le développement de l'écoute spécialisé médiatisé par la tronçonneuses à partir d'une perception incarnée d'un paysage sonore qui reste indéterminé et ambigu pour des « objets » de sonorités nettement reconnaissables. Il est suggéré qu'une conceptualisation plus large de l'écoute en tant que forme de perception permettrait une observation plus approfondie de l'ordre sonore des pratiques socioculturelles.

**Mots-clés** esthétique, écoute, bruit, compétences, son