Music and Noise: Towards a Politics of Sound Ecology

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Bern– 20 june, 2014

Starting points

- music is consumed
- listening "habitus": young vs. adult listeners
- overstimulation and overexposure
- role of technology: to be praised or to be blamed?
- influence on listening habits
- politics of sound ecology: intervention or freedom?

Presentation held at the 4th European Forum on Music in Bern, June 19 - 22, 2014.

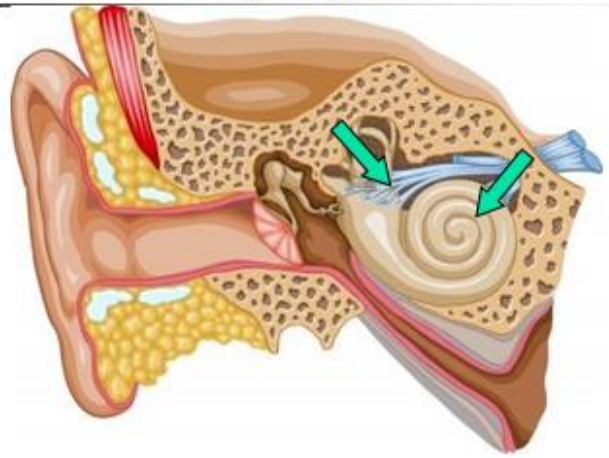
Listening today… the perception

- over-simplified (negative) picture
- terror of decibels / pornophony
- hearing damage (transitory/permanent)
- restlessness/aggression

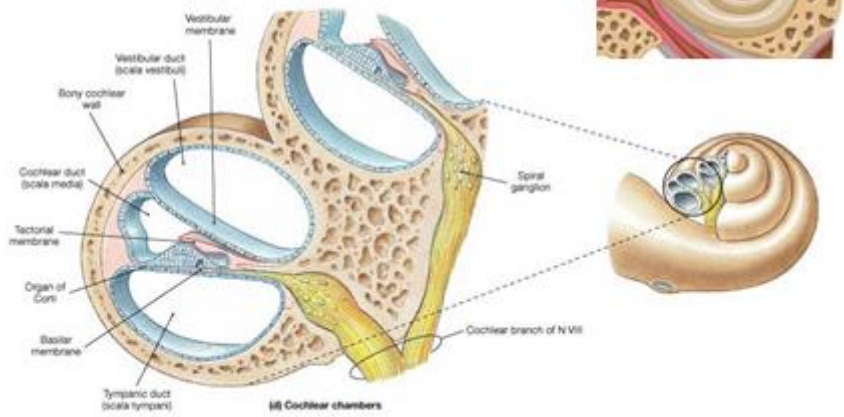
The facts…

- the hearing organ: limits, zone of discomfort, threshold of pain, damage
- noise-induced hearing loss:
  - known facts: hair cells
  - new findings: cochlear nerve, operating set points of homeostasis
- failing regulation (laws): prevention of permanent hearing loss at endemic level

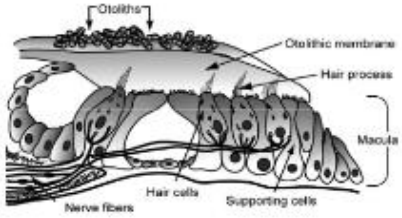
The hearing organ

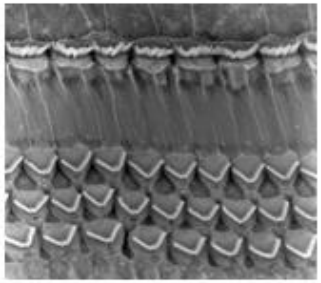


The hearing organ

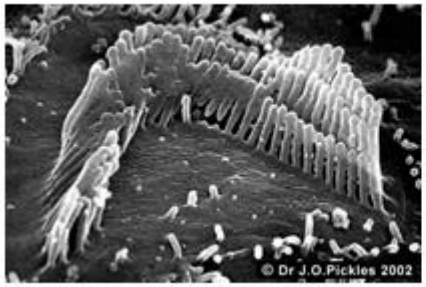


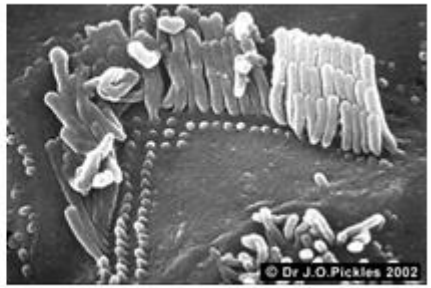
Organ of Corti: microphone of the body



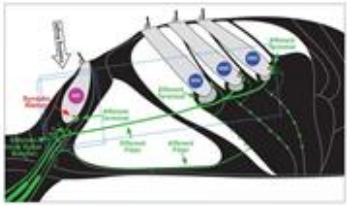


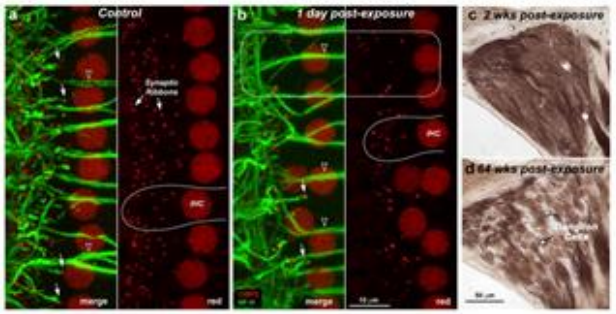
Damage of hair cells: known





Damage (acute and delayed) of cochlear nerve: new findings





Aim of contribution

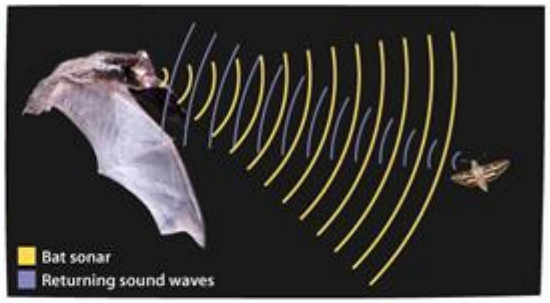
- overexposure to sound: (counter)arguments and facts
- beyond mere negative perception and appraisal of current listening behaviour
- possibilities of (sound) technology
- ecological way of listening

Technology

- no constraints
  - volume, speed, range
- disadvantages first, no limits
  - dynamite as paradigm case (Nobel)
- critical factor: dosage
- possibilities: expansion of natural tools
  - artificial tools
  - precision and power
  - three functions: perception, action and processing

Natural tools

red hawk



bat

Artificial tools

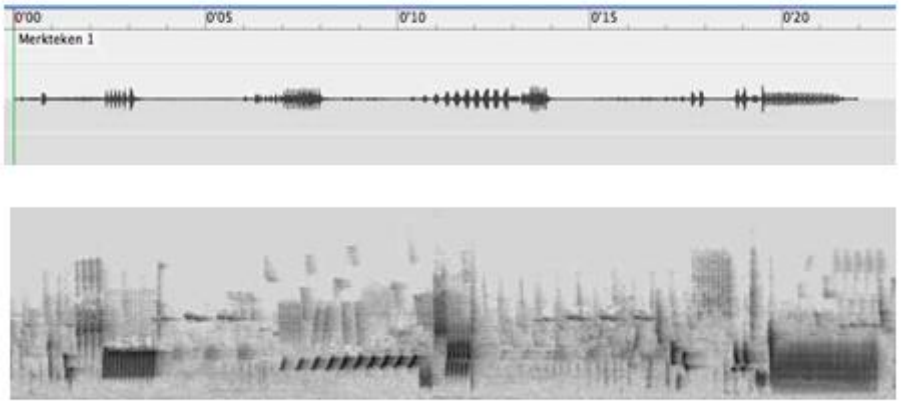
hammer, pincer, stethoscope, metal detector

Musical tools

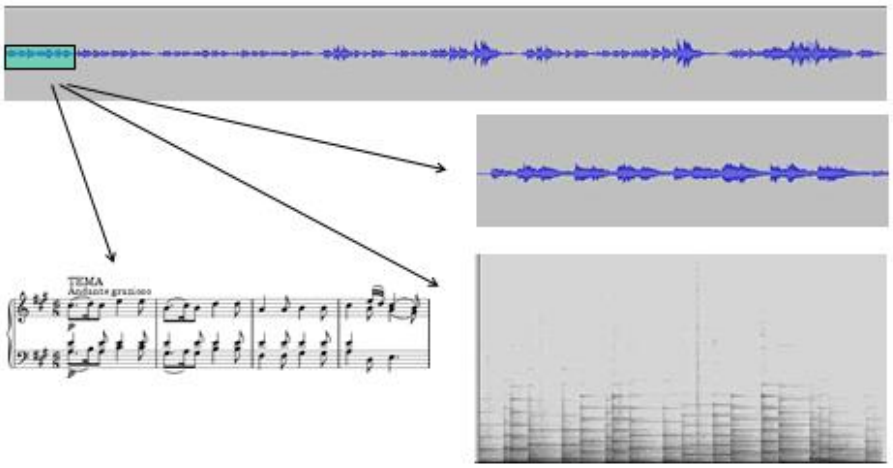
Sound technology

- production, recording and rendering of sound:
  - no technical limitations (speed of playing, volume of sound)
  - no musical limitations: virtual infinity of possible sounds
  - quality of rendering: tape –> LP –> CD
- interactivity:
  - level of production: modification and transformation of sound
  - level of perception: visualization of sonorous unfolding, navigation through the sound file, focal vs. synoptic view
  - interactive software: Audacity, Sound Studio, Audiosculpt, ...

Visualization: waveform and spectrogram (nightingale)



W.A.Mozart. Piano sonata K.V.441 Theme.



The technological turn in music: the beginnings

- Russolo: futuristic manifest, bruitism (1913)
  - modern urban landscape
  - speed, energy and sound
- Varèse, Cage: new sonorous palette
  - musicalization of noise
  - emancipation of noise
- musique concrète, electroacoustic music
  - Schaeffer, Xenakis, Stockhausen, Henry

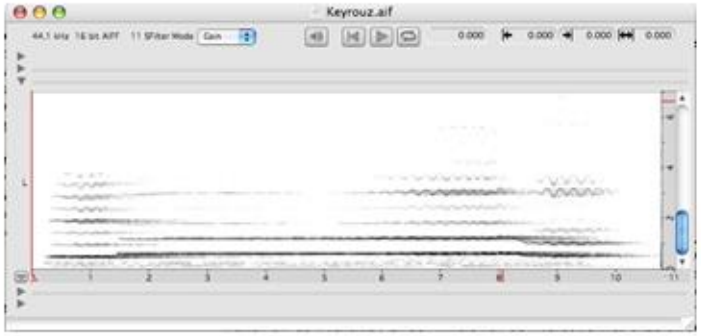
Russolo en Piatti: intonarumori

Pierre Schaeffer: phonogène chromatique (1953)

Actual situation

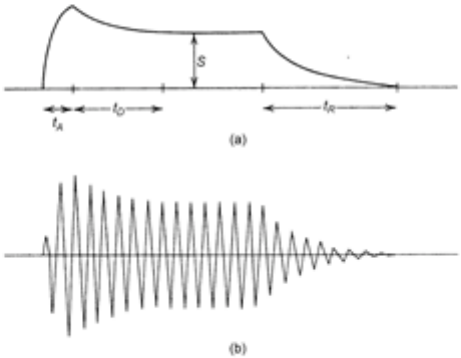
- bruitism: interesting experiment, no lasting influence, indirect influence (emancipation of sound)
- engineers/acousticians vs. composers:
  - technicity of production
  - coherence of sounding material
- distinction between music and noise?
  - regularity and harmonicity: overtone structure
  - possibility of identification and differentiation

Singing voice: Marie Keyrouz



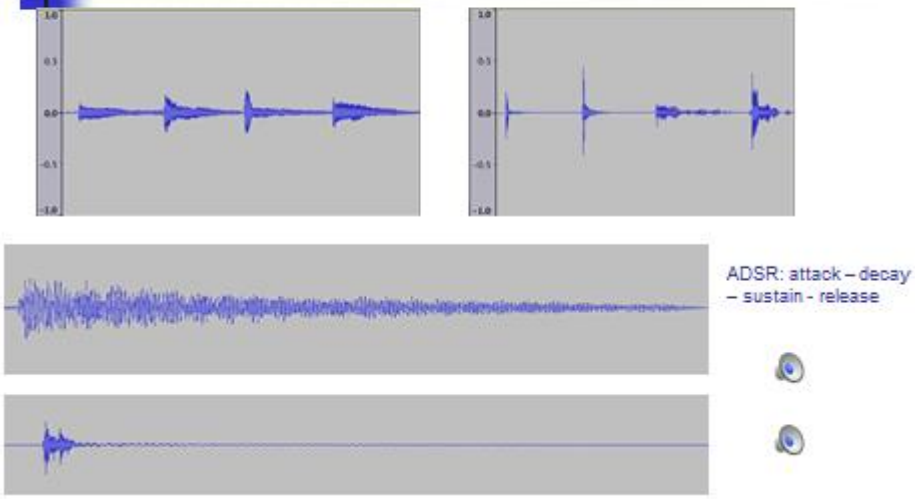
ADSR-curve (natural sound)

- attack
- decay
- sustain
- release



Example. Gurdjieff: “La grande prière.”

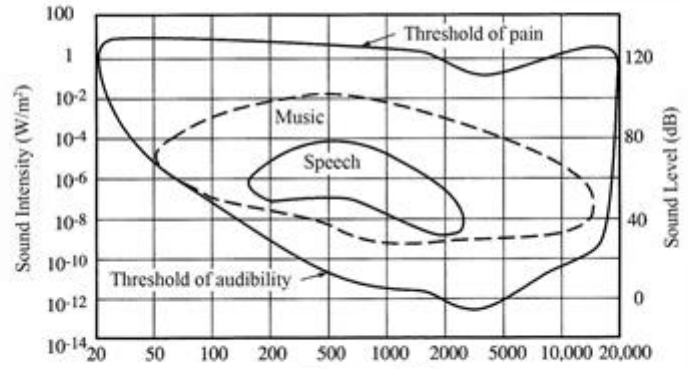
Sound versus music



Dealing with sound

- sensitivity of the ear: hearing range
- pitch range: 16 – 20.000 Hertz
- sound intensity: enormous range between hearing treshold and threshold of pain
- loudest sound one billion times stronger than the weakest one: 10^{12}

Hearing range



- 20 – 20.000 Hz
- loudest sound one billion (10^{12}) times stronger than weakest one

Functions of the ear

- sound detection
- stimulation of the body and the brain

Sound detection

- to create distinctions in wealth of sounds
- survival value: evaluation of environment (danger)
- hearing as detection apparatus: primary function
  - enormous sensitivity
  - size and distance of objects
- reactive behaviour:
  - startle reflex, arousal heightening

Sound ecology

- stimulation of ear in optimal range of stimuli (threshold of hearing <—> threshold of pain)
- ecological soundscapes (music and environment): Hi-Fi > Lo-Fi (Shafer)
- signal to noise ratio
- ecology of listening:
  - zone of comfort > discomfort
  - optimal level of stimulation

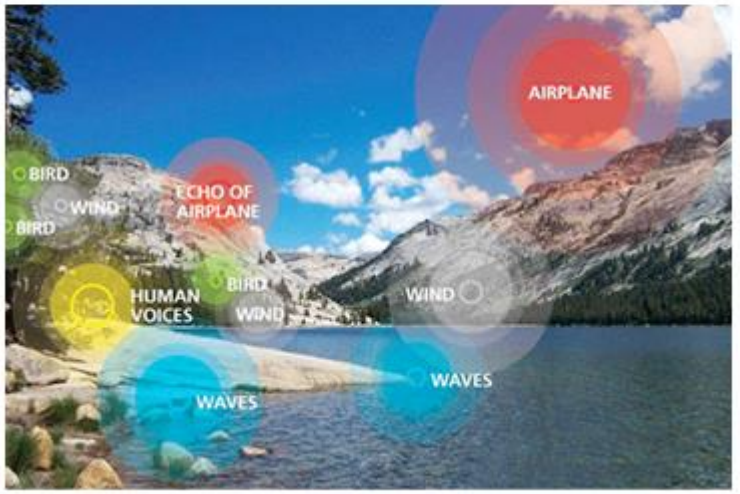
Hi-Fi and Lo-fi soundscape

"I A hi-fi system is one possessing a favourable signal to noise ratio. The hi-fi soundscape is one in which discrete sounds can be heard clearly because of the low ambient noise level. The country is generally more hi-fi than the city; night more than day; ancient times more than modern. In a hi-fi soundscape even the slightest disturbance can communicate interesting or vital information The human ear is alert, like that of an animal ."
(M.R.Shafer, The Music of the Environment, 1973)

Hi-Fi and Lo-fi soundscape

"In a lo-fi soundscape individual acoustic signals are obscured in an overdense population of sounds. The pellucid sound—a footstep in the snow, a train whistle in the distance or a church bell across the valley—is masked by broad-band noise. Perspective is lost. On a downtown street corner there is no distance; there is only presence. Everything is close-miked. There is cross-talk on all the channels, and in order for the most ordinary sounds to be heard they have to be monstrously amplified."
(M.R.Shafer, The Music of the Environment, 1973)

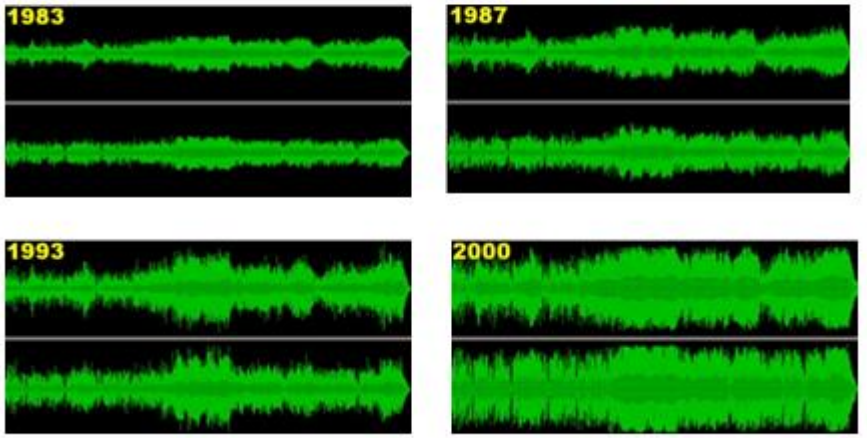
Soundscapes…



Sound ecology

- actual soundscapes are mainly lo-fi
  - bad conditioning: wrong balance in signal to noise ratio
  - continuous search of overstimulation, zone of danger of discomfort
  - decadence in medical sense: listeners like what their body doesn't like
- media-indoctrination: search for strong stimuli, mastering of sound (commercial music)

Mastering technique on CD: compression (same fragment)



Perspectives

- what is actually wrong?
- what could be better?
- what to do? which steps to be taken?
- politics of sound ecology

What's wrong?

- actual musical soundscape is lo-fi: too little musical sounds, too many noisy sounds
- abuse of some of the possibilities of sound technology: intensity level, problem of dosage and balance
- problem of overexposure and overstimulation: noise pollution, sound nuisance and danger of hearing loss

Which possibilies?

- beyond limitations of technical constraints (sound production)
- quality of sound recording and rendering
- virtual infinity of possible sounds:
  - natural and artificial sounds
  - manipulation of existing and new created sounds
- tools for better listening: richness of sound
- accessibility (recordings) of the musics of the world: broadening of listening horizon

Recommendations

- from lo-fi to hi-fi again
- to challenge the media: programming policy
  - too narrow, segmentation of the market
  - conform to social acceptance and shared standards of listening, limiting formats
- complementarity to media supply
- to intervene in what is supplied and the way how to deal with this supply
- role of educational institutions

Enculturation: what? where?

- enculturation: media as major player
- media and educational institutions: tension or complementarity?
- education of the skill of listening
  - attitude of precision
  - quality of the sound > activation and arousal
  - openness for unknown music
  - to base value and meaning on the structure of the music
- broadening of listening horizon

Steps to be taken

- regulation by law of sound pollution (definition and proposal for reduction)
- recommendations for the media: beyond restrictive programming
- challenging of current musical standards:
  - overstimulation as norm, revaluing of natural and ecological sounds, ADSR curve
- widening of the horizon and learning to make distinctions with more refinement and subtlety

from natural sound to noise and back: restoring the balance

Thanks for listening