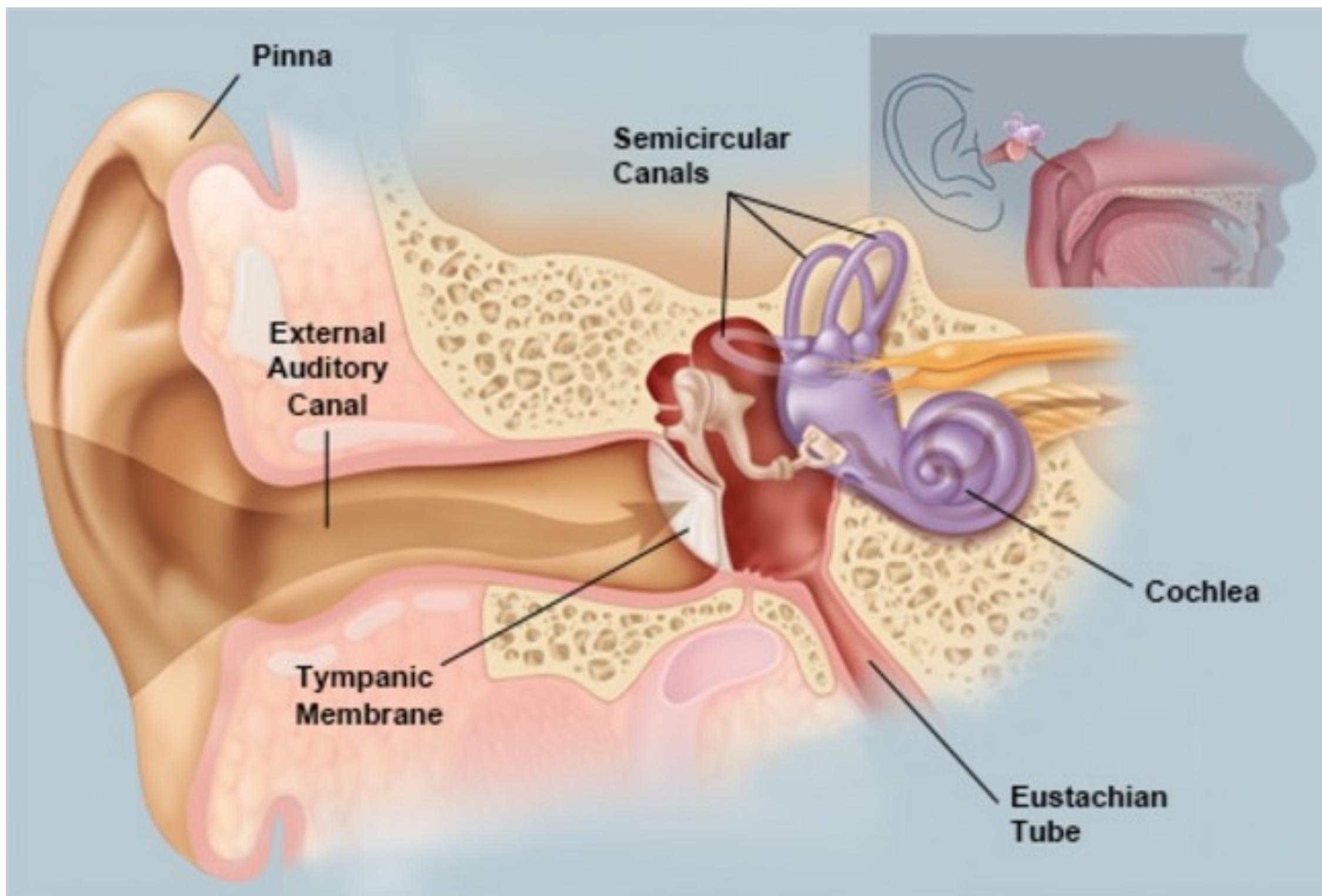


Auditory coding



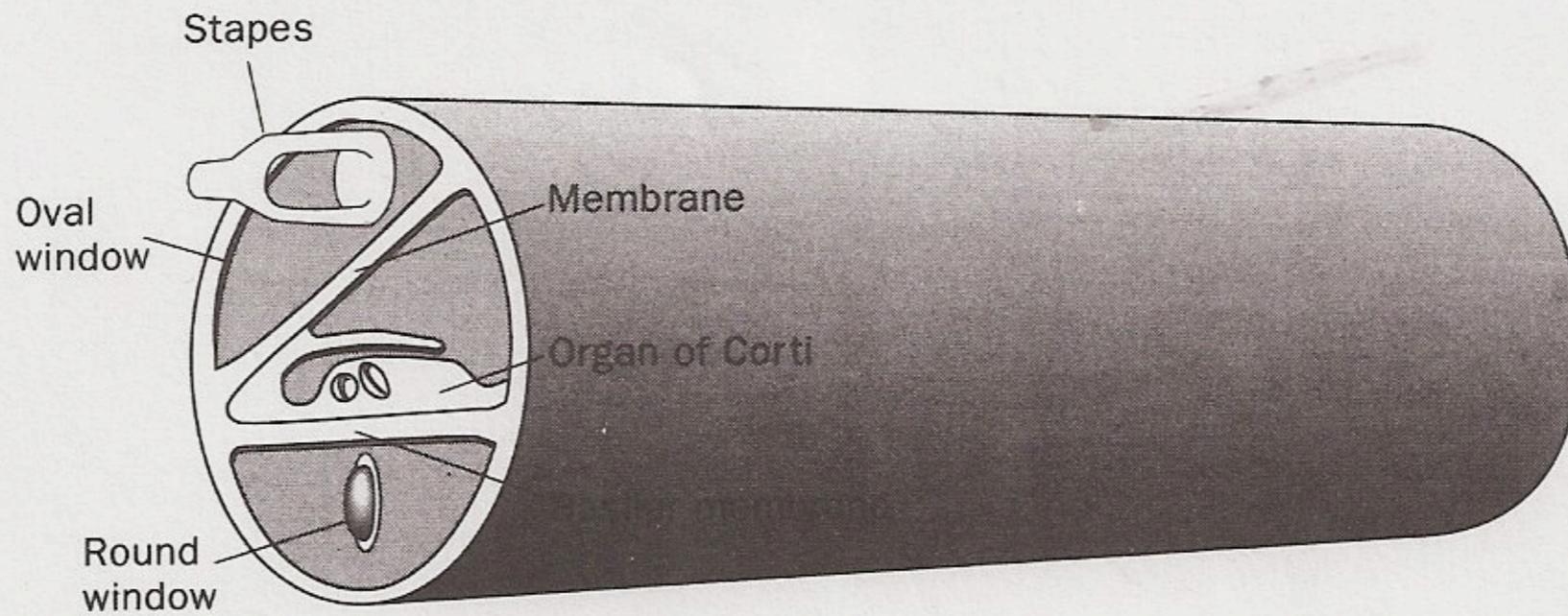
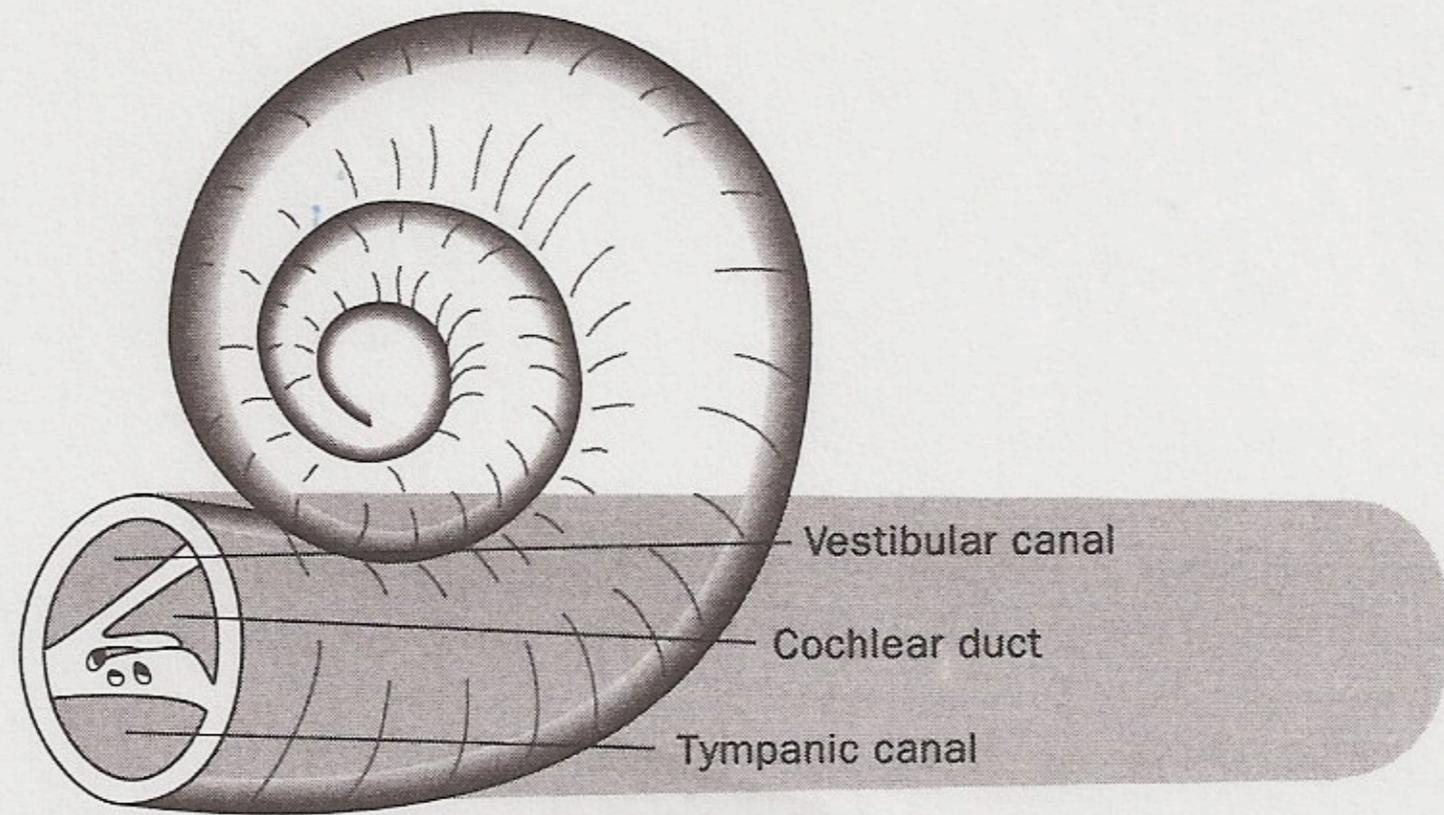
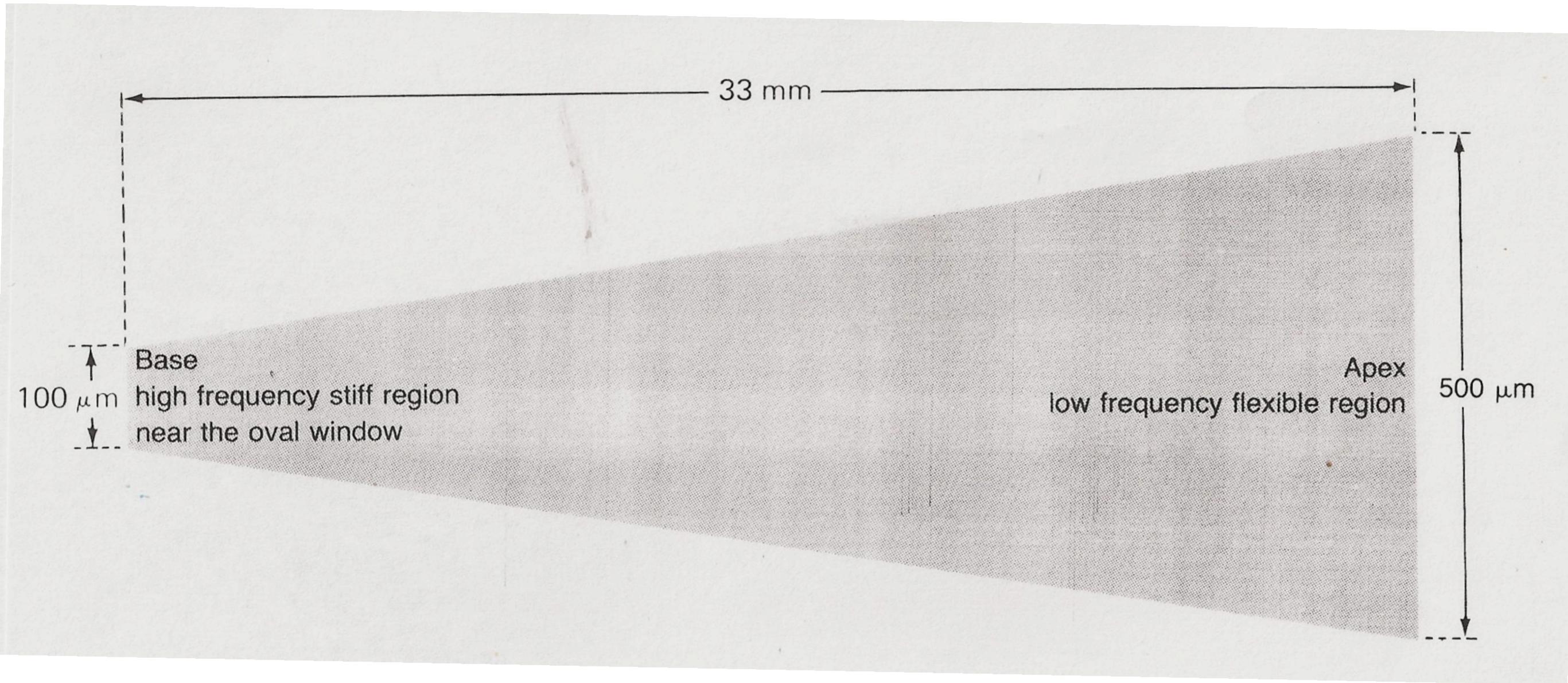
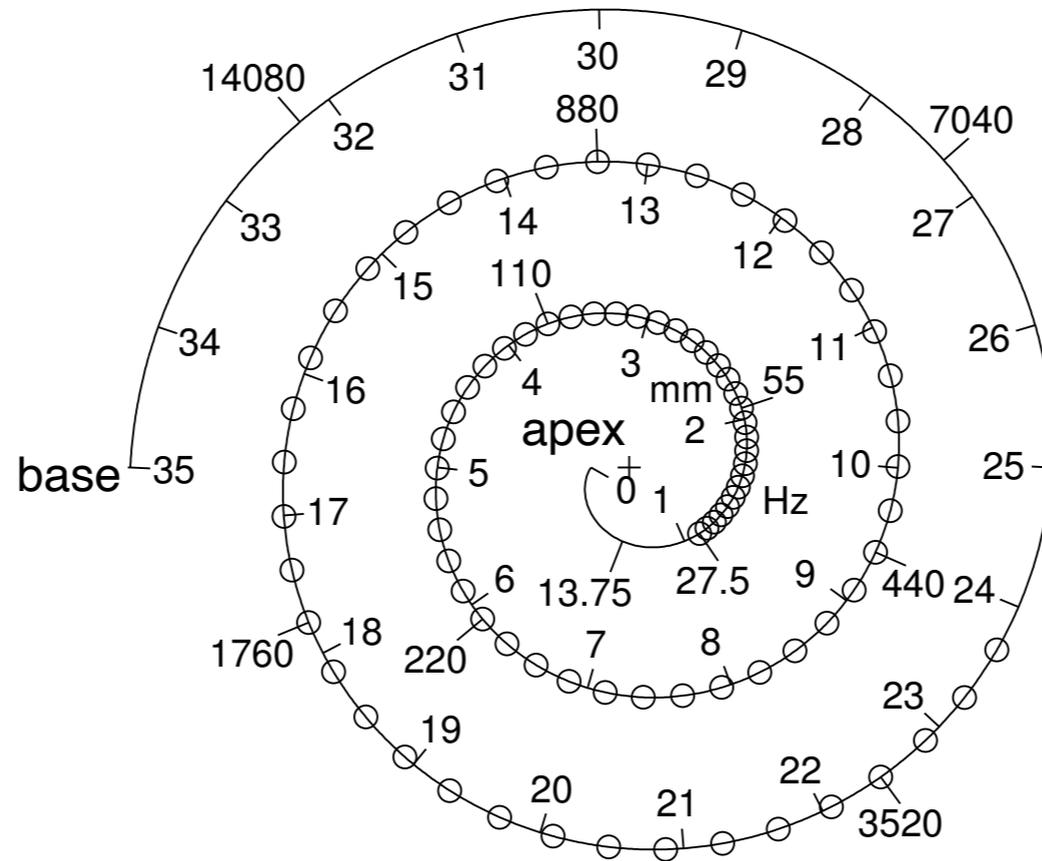
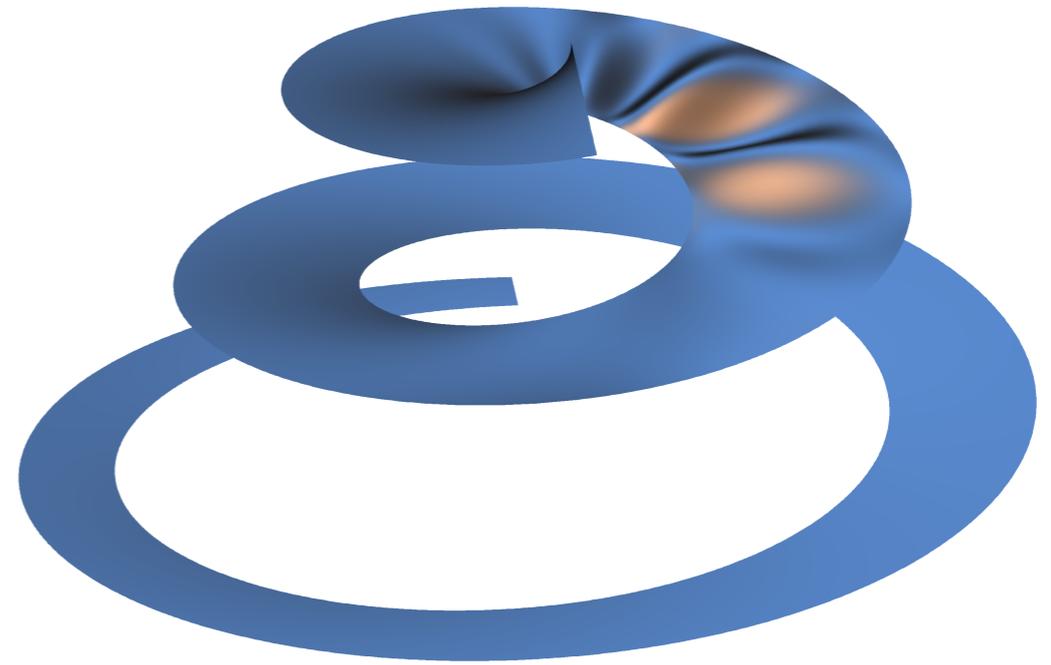
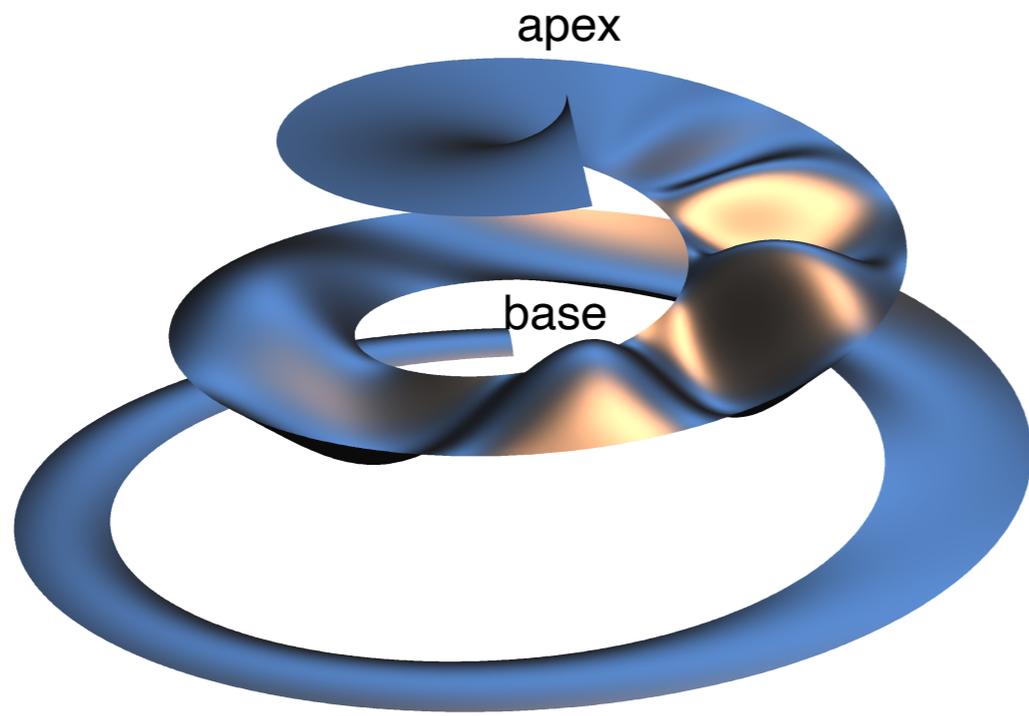


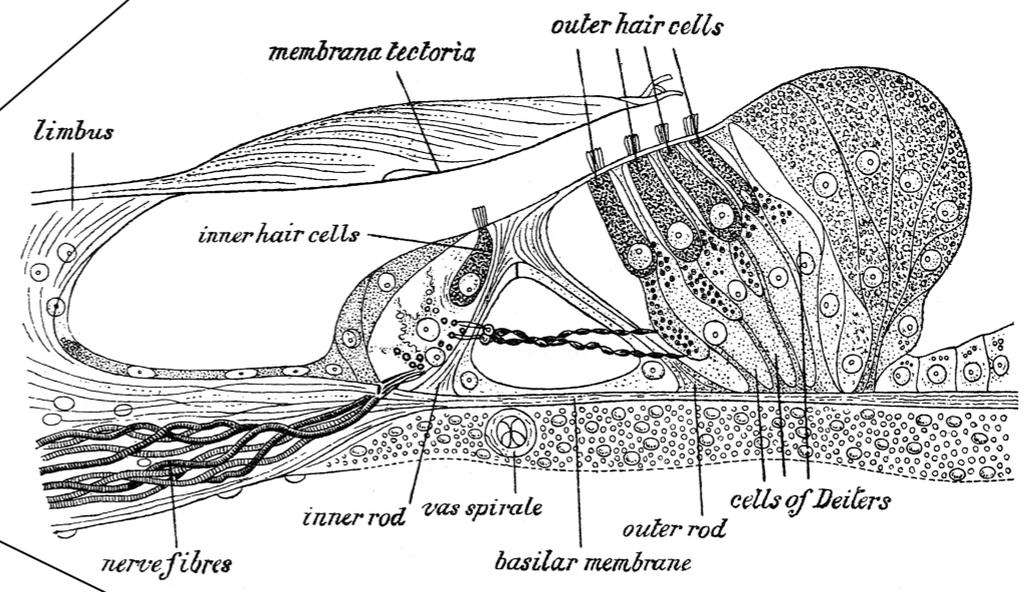
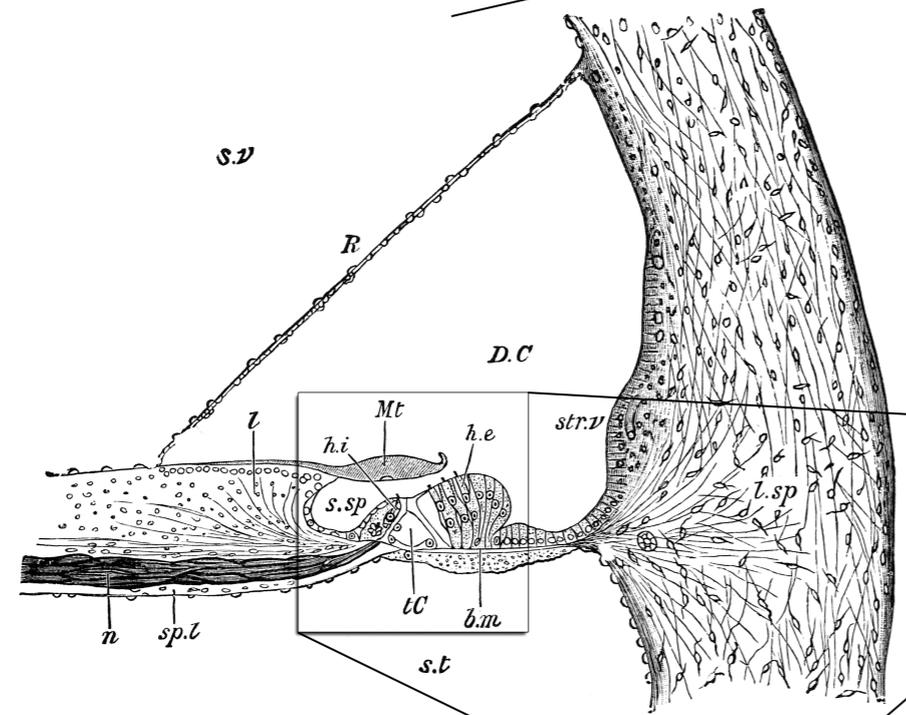
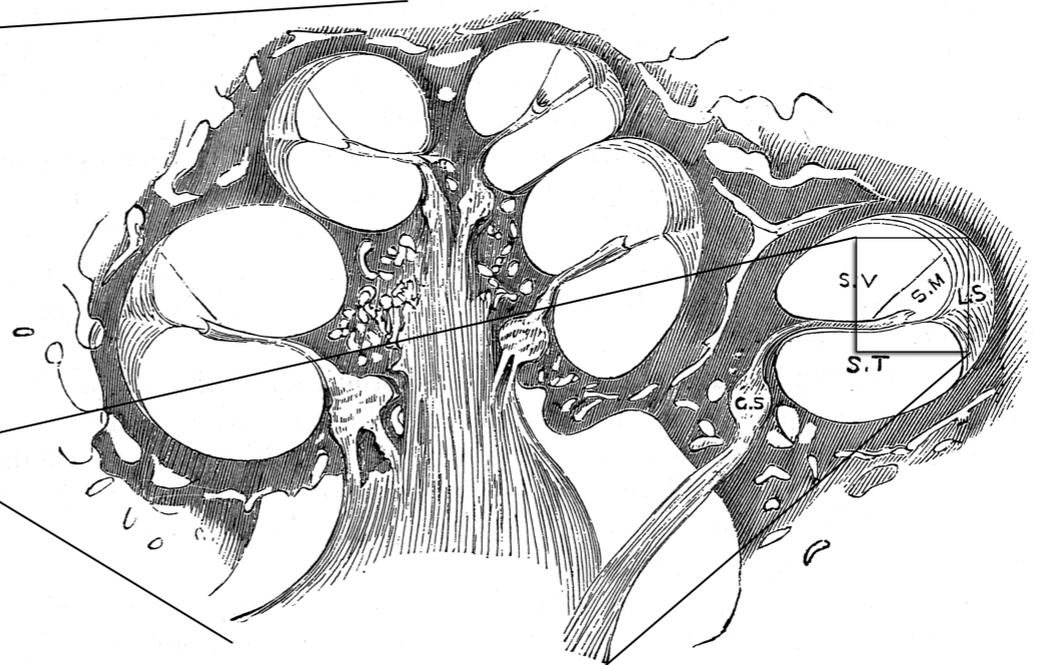
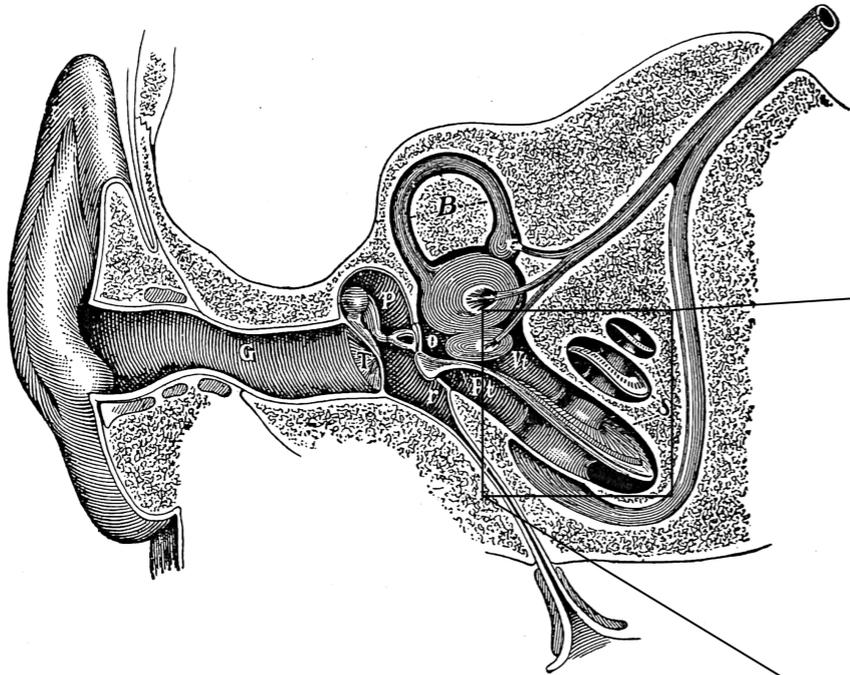
FIGURE 9.11 A section of an uncoiled cochlea.

Basilar membrane

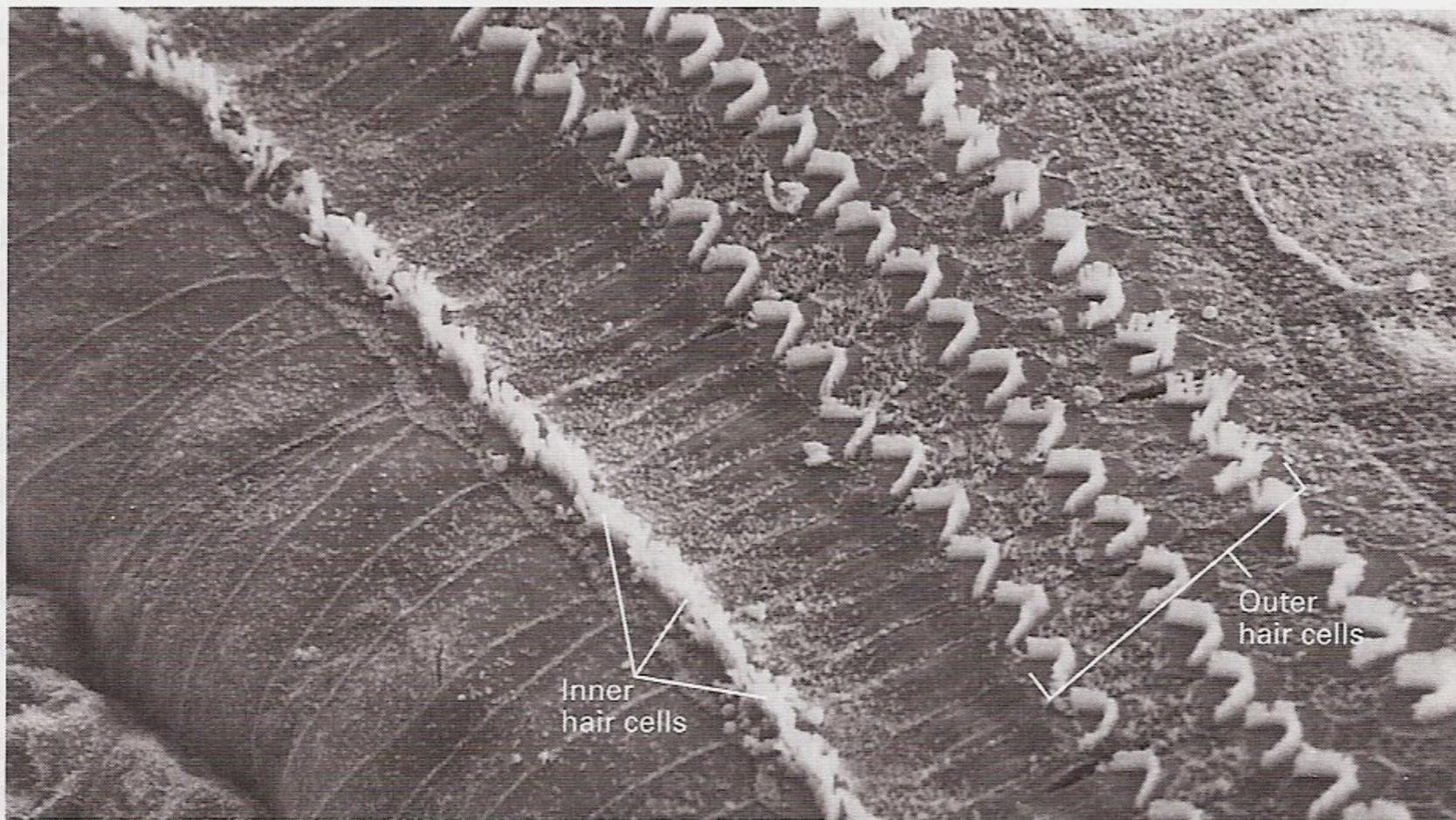




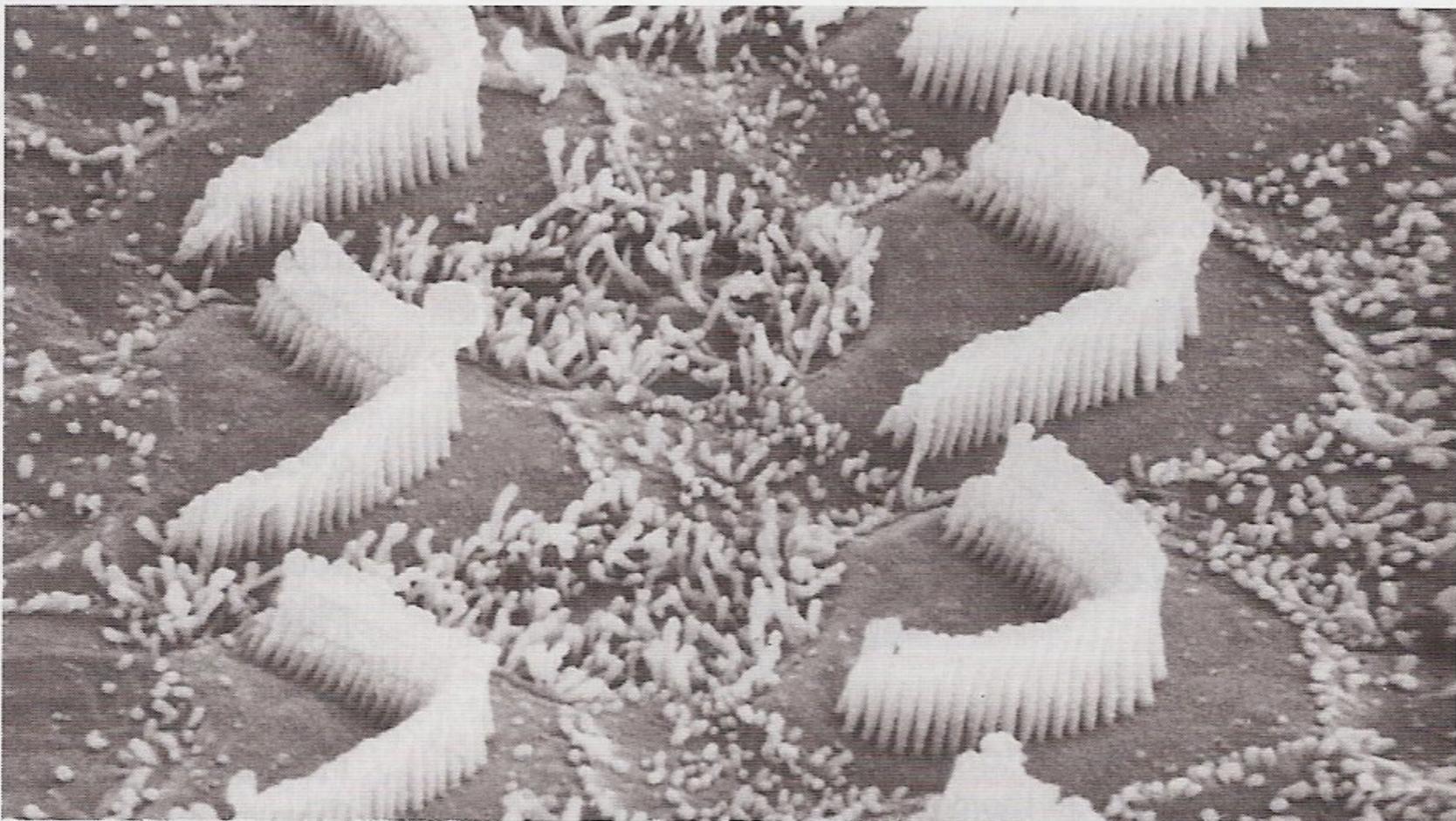
Logarithmic and linear frequency scales



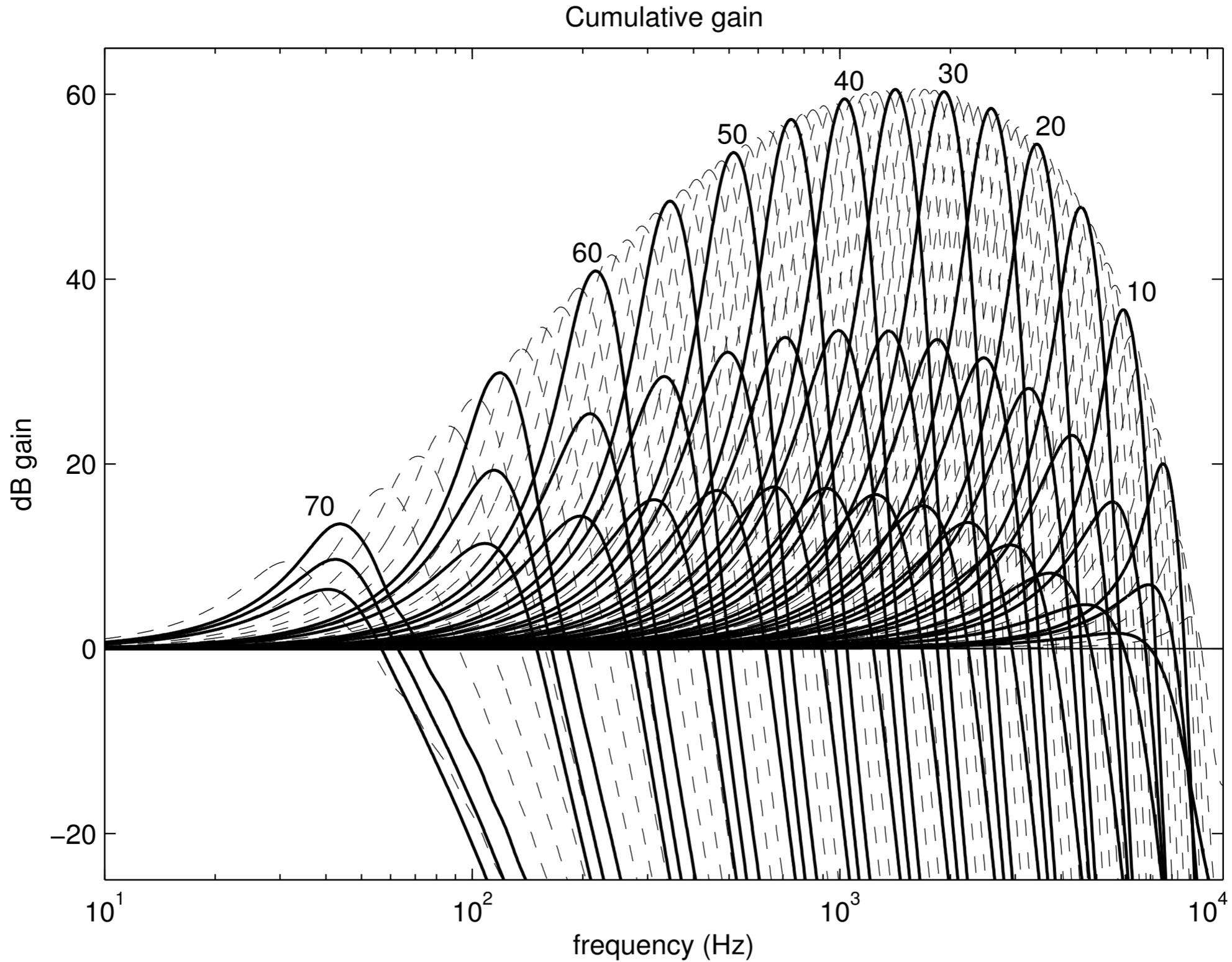
A



B

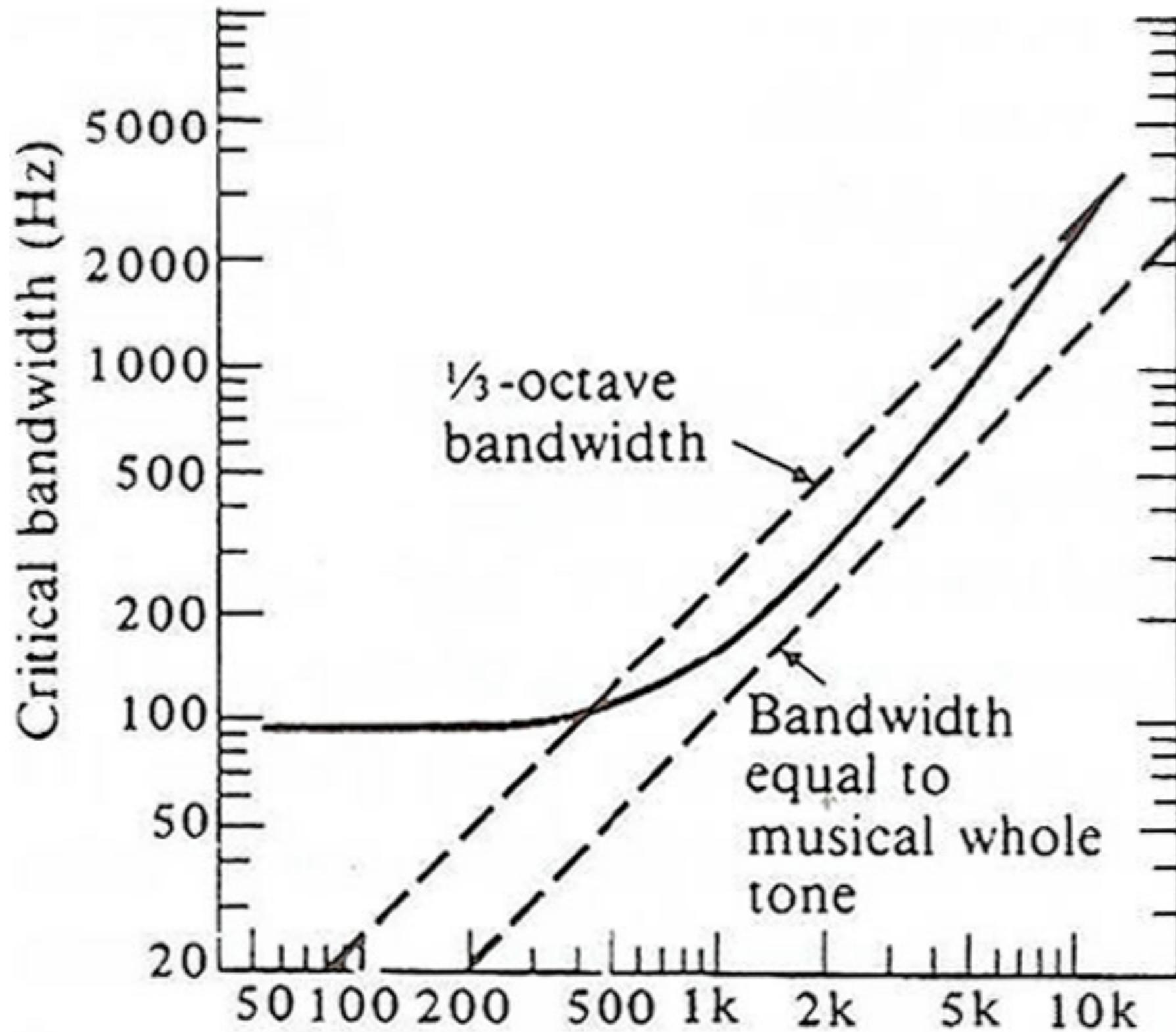


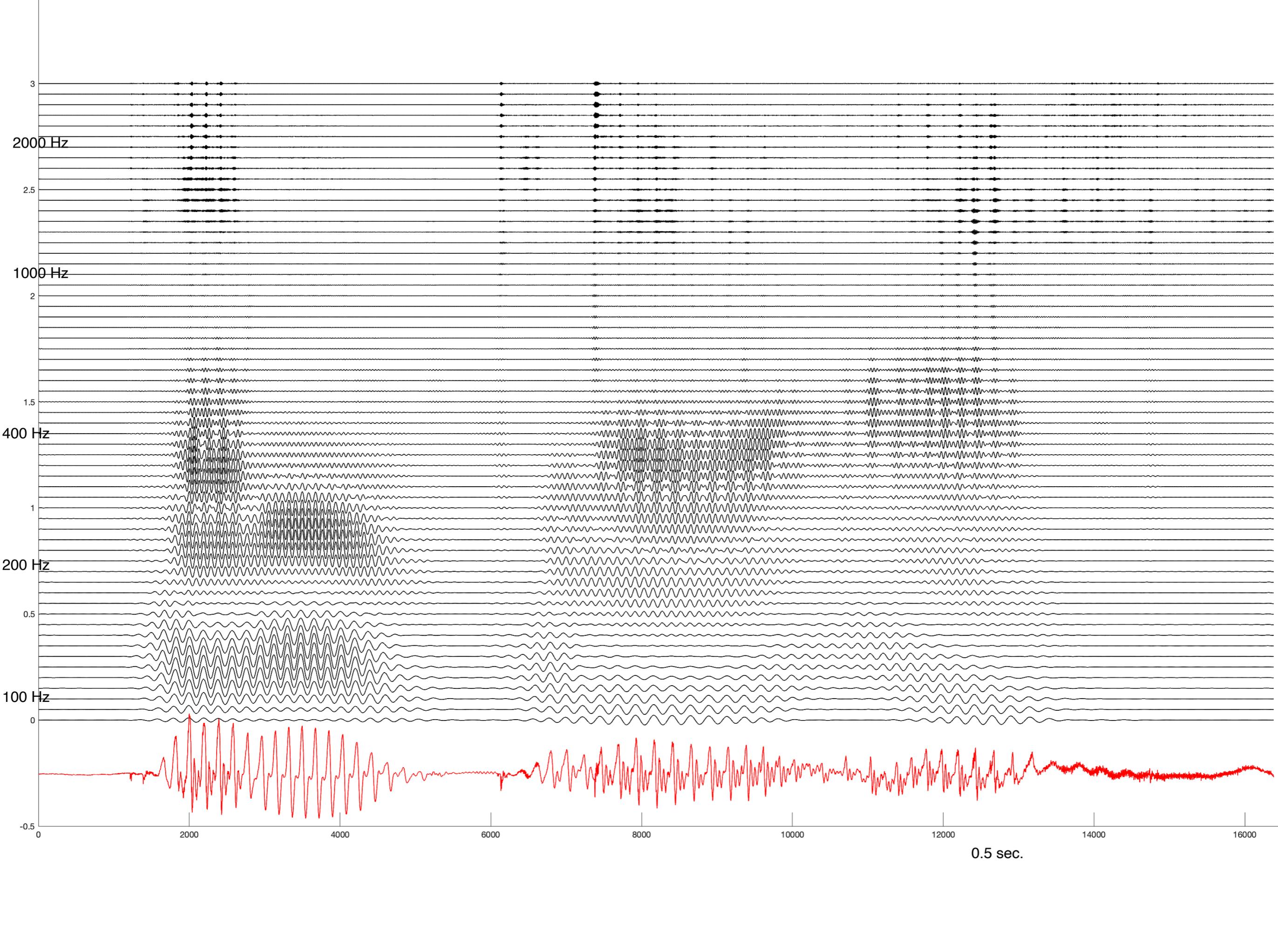
'Auditory Filters'



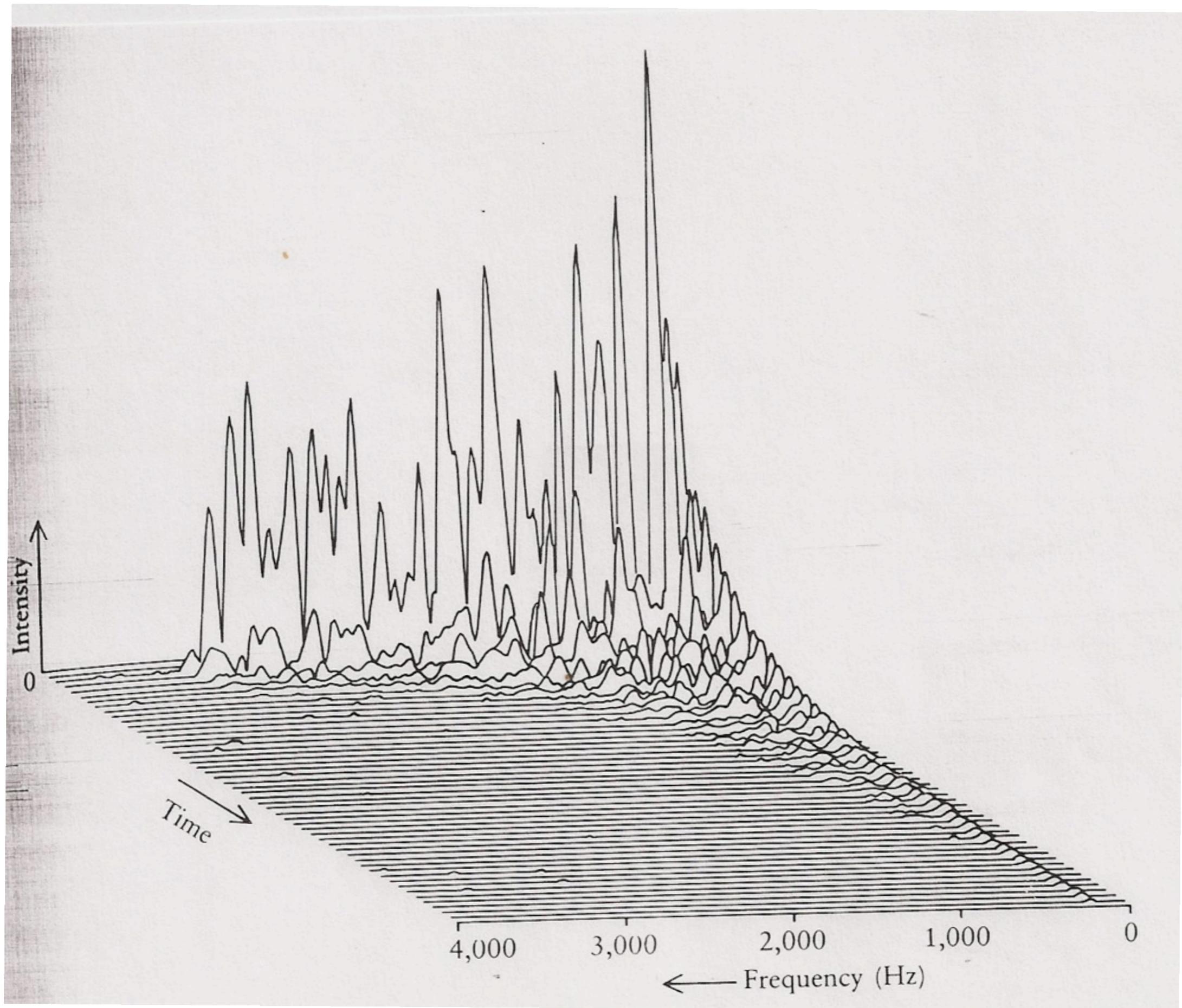
(from Lyon 2017)

Critical bands

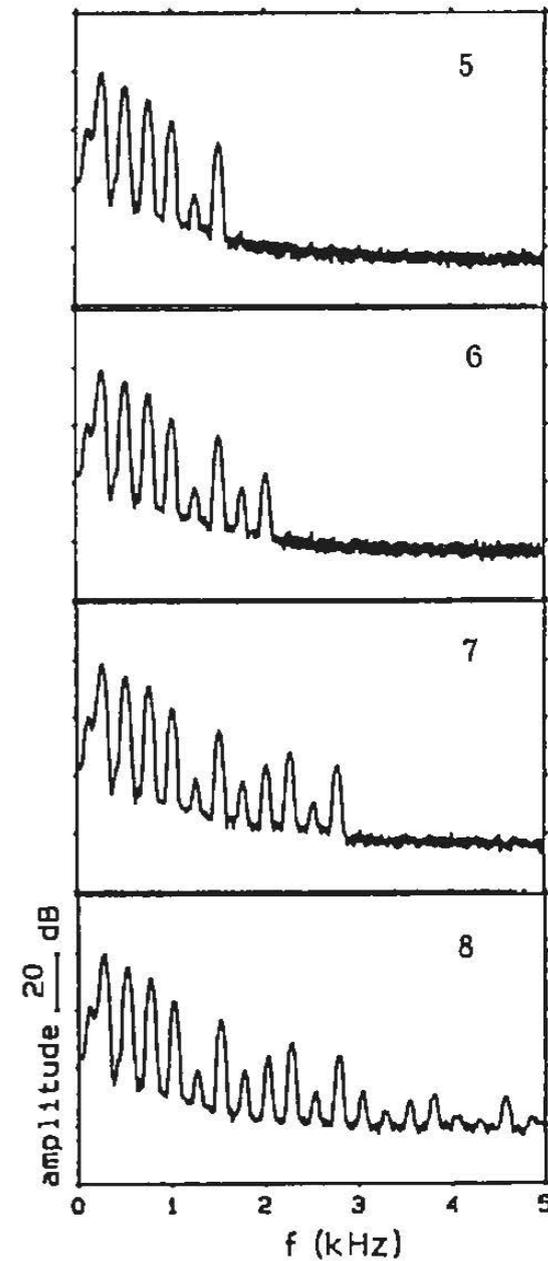
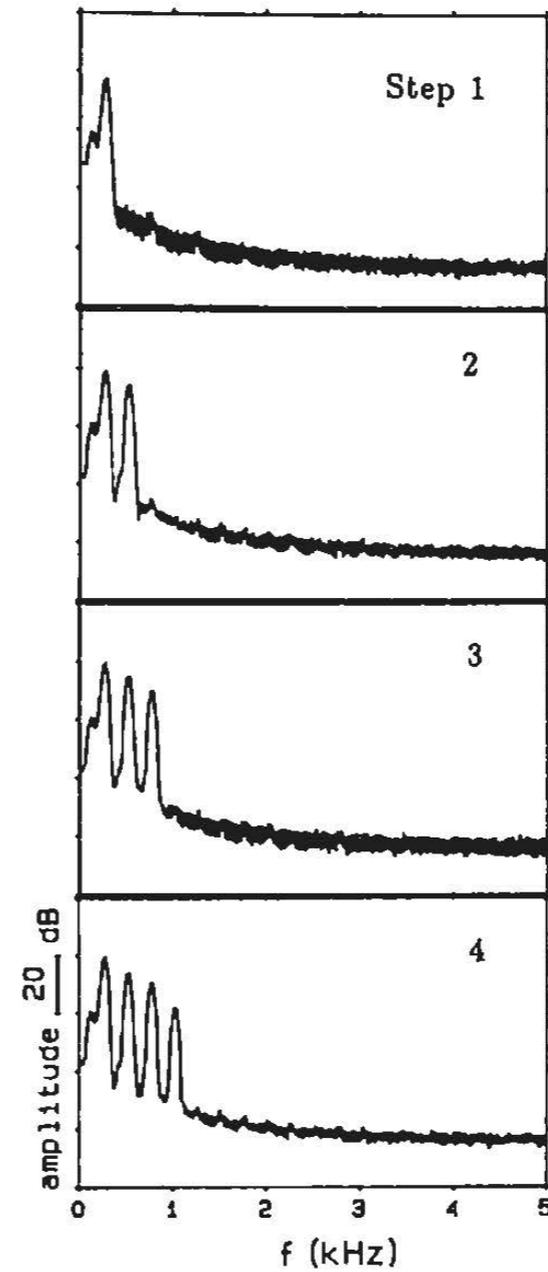
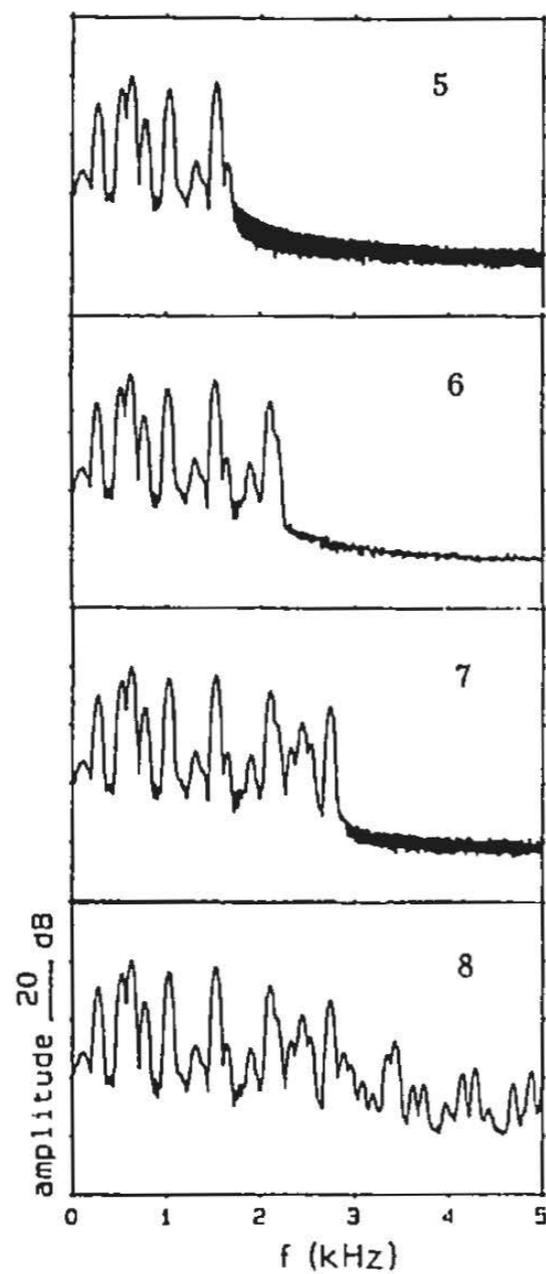
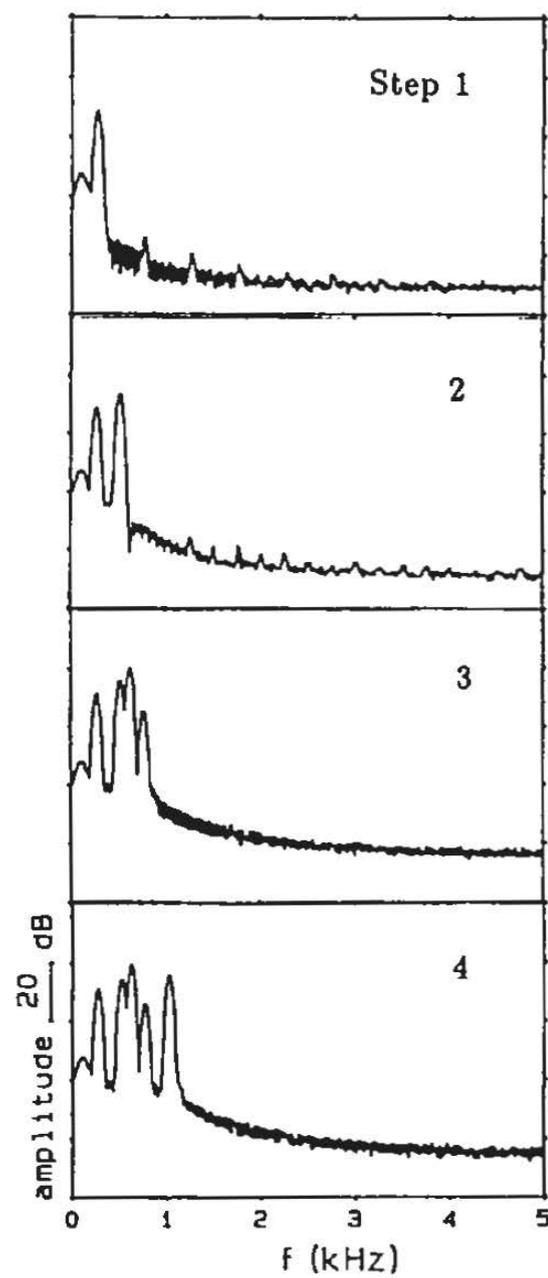




Fourier analysis
vs.
Time-frequency analysis



Effect of spectrum on timbre



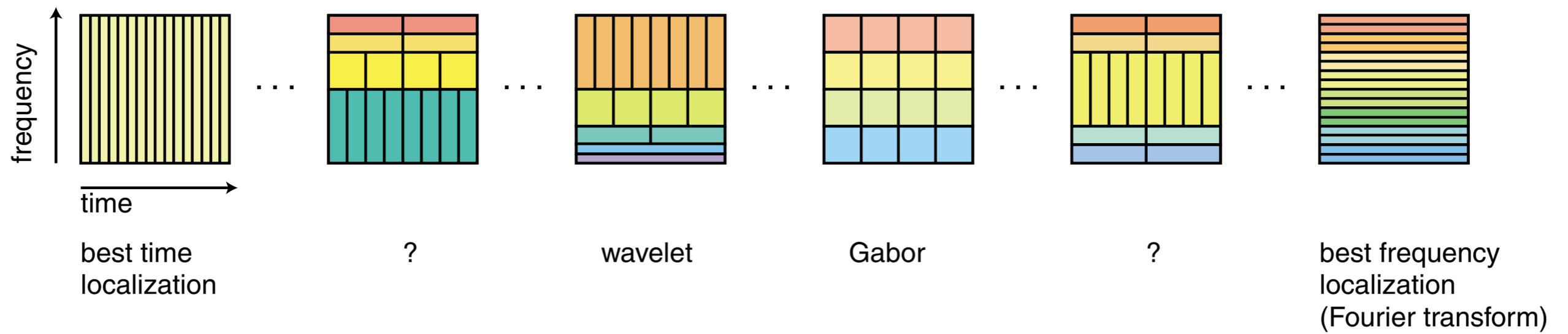
Effect of temporal envelope on timbre

(ASA auditory demonstrations CD, tracks 54-56)

Original

Notes played backward

Recording of notes
played backward,
played backward

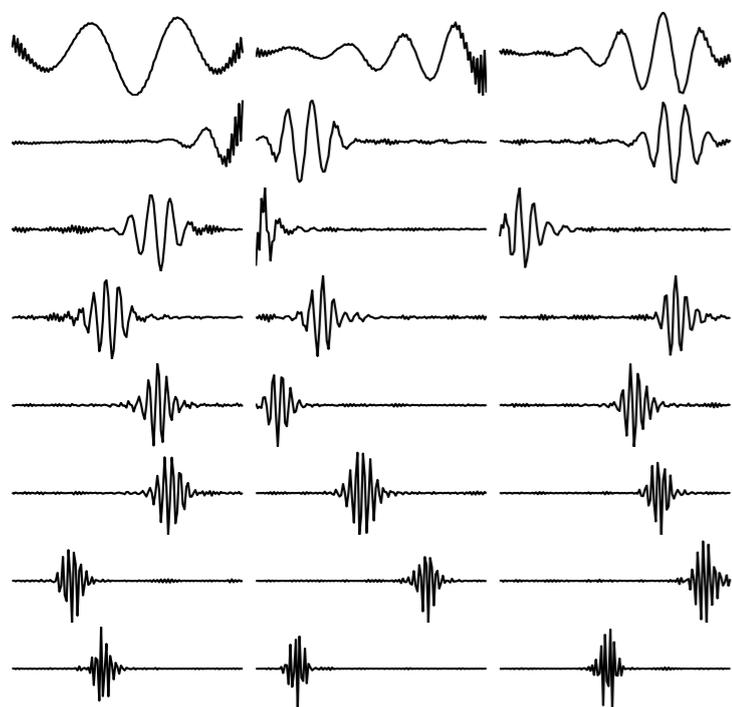


(from Olshausen & O'connor 2002)

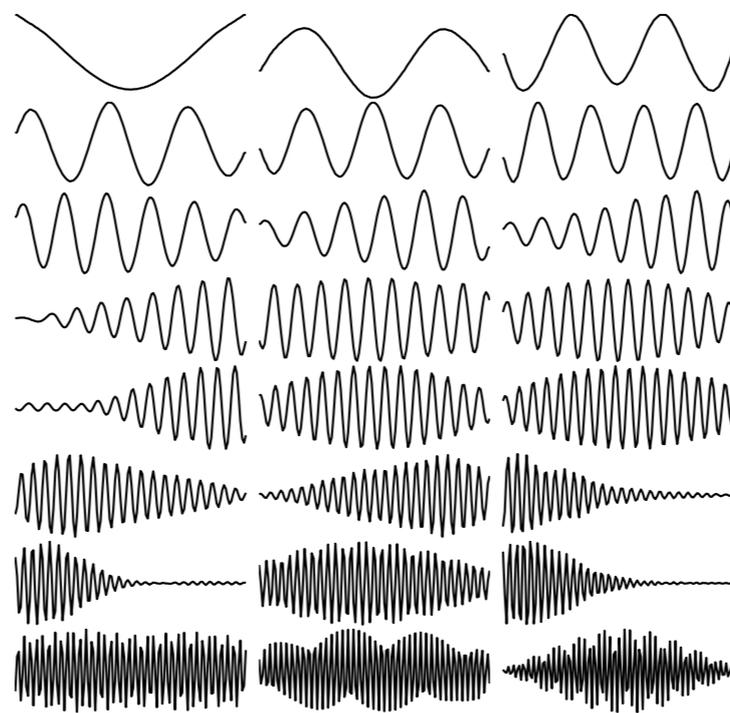
Independent Components Analysis (ICA)

ICA of natural sound (Lewicki 2002)

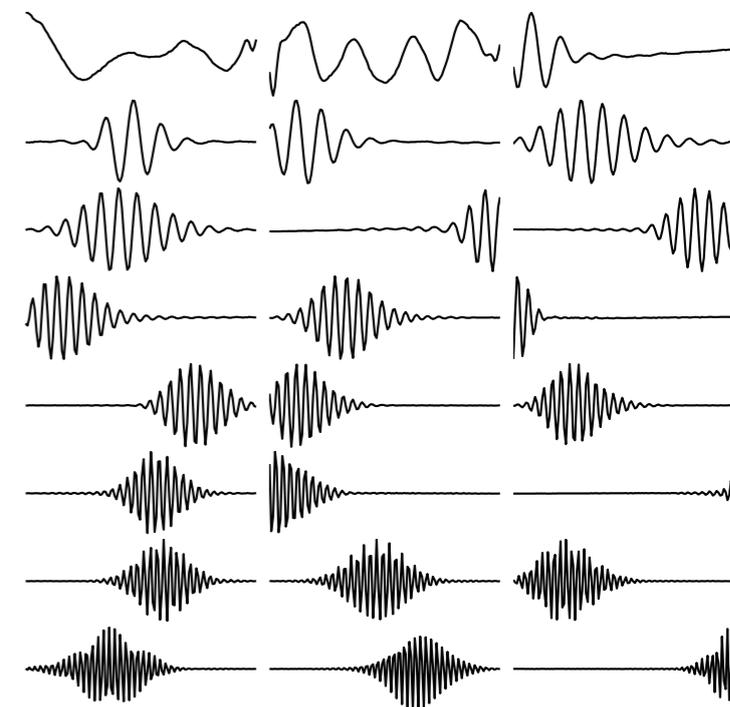
environmental sounds



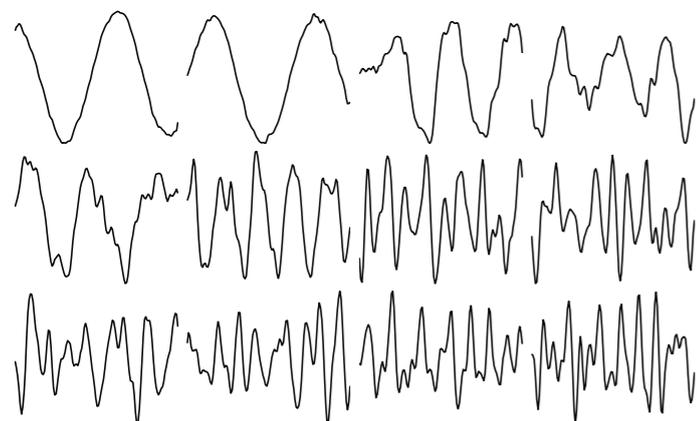
animal vocalizations



human speech

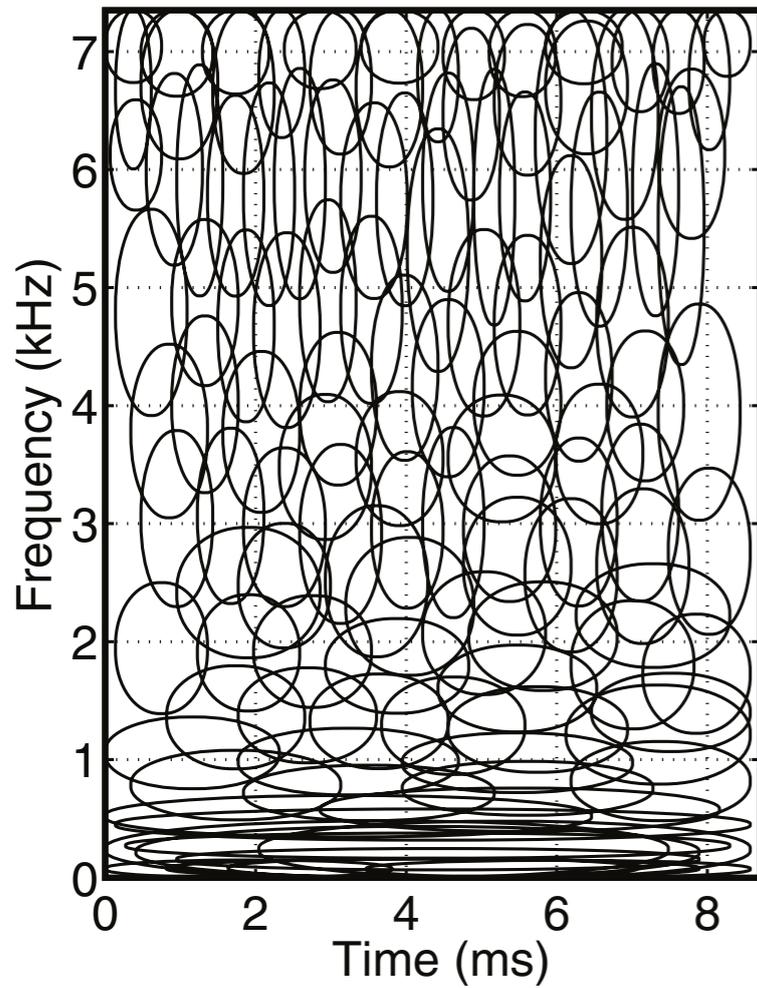


(PCA)

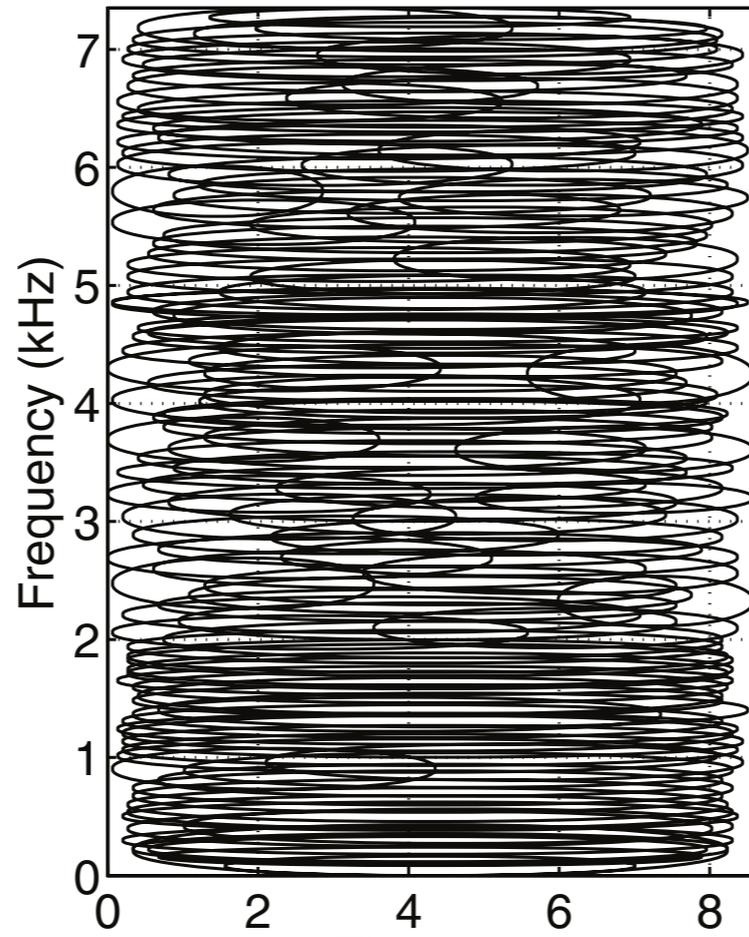


ICA of natural sound (Lewicki 2002)

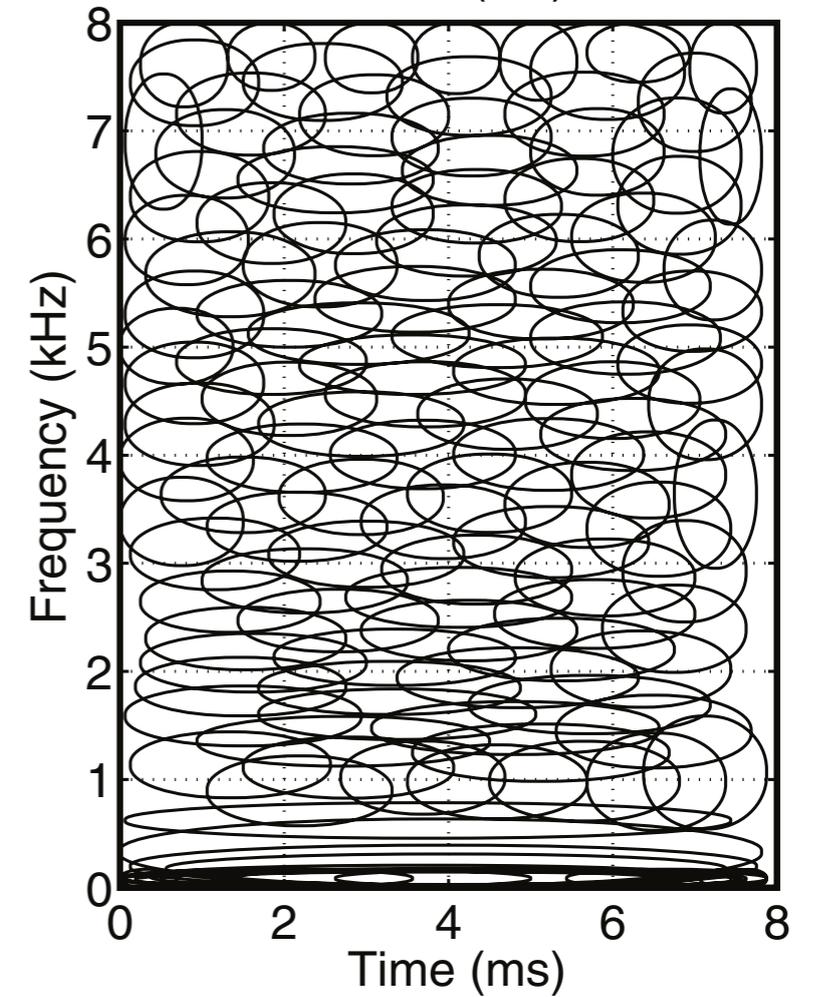
environmental sounds



animal vocalizations



human speech



ICA of natural sound (Lewicki 2002)

