

taleaudiometri

**Gratulerer**

**alle sammen!!!!!!!**



**Ca 70 år f kr. ( Cesar er ennå ung)  
var grekeren Apollonius Molon (Rhodos)  
talelærer for Cicero .**

**(han ble senere ble valgt til konsul pga god kjennskap  
til signal støyforholdproblematikken).**

**Øvelsene foregikk på en rullestenstrand.**

# Rhodos ca år 70 f kr



**Dette var det nærmeste han kom mumling fra 3000 tilskuere i friluft, eller bakgrunnstøyen fra flere hundre menn i samtale senatet.**

**Apollonius brukte altså en bakgrunnstøy som simulerte mange stemmer samtidig.**



# **Hopper nå til ca 1890**

**A G Bell var talelærer for døve.**

**Han ønsket å lage et instrument som synliggjorde talen for døve barn, slik at de lettere skulle lære å snakke.**

**Instrumentet var mislykket, men videreutvikling av dette førte til oppfinnelsen av telefon.**

**NYE PROBLEMER**

# Dårlige telefonforbindelser!



**De første testlistene ble  
utarbeidet ca 1910 (Campbell )  
for å teste kvaliteten på  
telefonlinjene.**

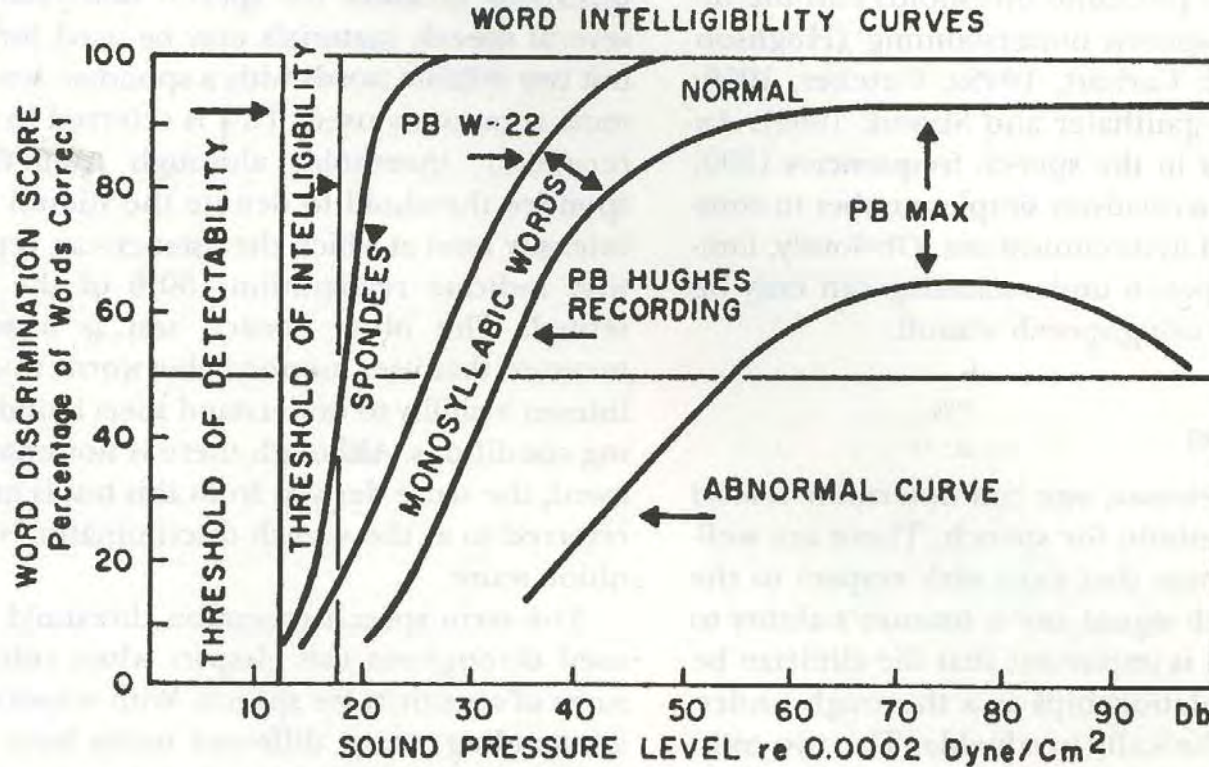
**Første innspilte taletest for  
å beregne taleferskel var:  
Fletcher (1929).**

**”Western Electric 4A” utviklet ved  
Bell Laboratories.**

**Denne ble revidert til 4C og brukt  
til å screene hørsel i vanlig skole.**

# **Dagens standard**

# FIGUR FRA KATZ



**Figure 10.1.** Articulation functions for the Rush Hughes, W-22, and spondee tests. Also shown is the articulation function as obtained for some pathological ears. Note that the curve passes through a maximum and the declines with increased intensity. The thresholds of de-

tectability and intelligibility for spondaic words are indicated. (Modified from Davis and Silverman (1960) by Goetzinger CP, 1972. Word discrimination testing, In J. Katz, ed. Handbook of Clinical Audiology, Baltimore: Williams & Wilkins.)

# NORSKE FORHOLD

# Q H 1965

Forholdet mellom det gjennomsnittlige hørseltap ved 500 - 2000 Hz og forståelsen av tostavelses ordlister uttalt med vanlig konversasjonsstemme, er omtrent følgende:

Gj.snitt hørseltap  
500 - 2000 Hz

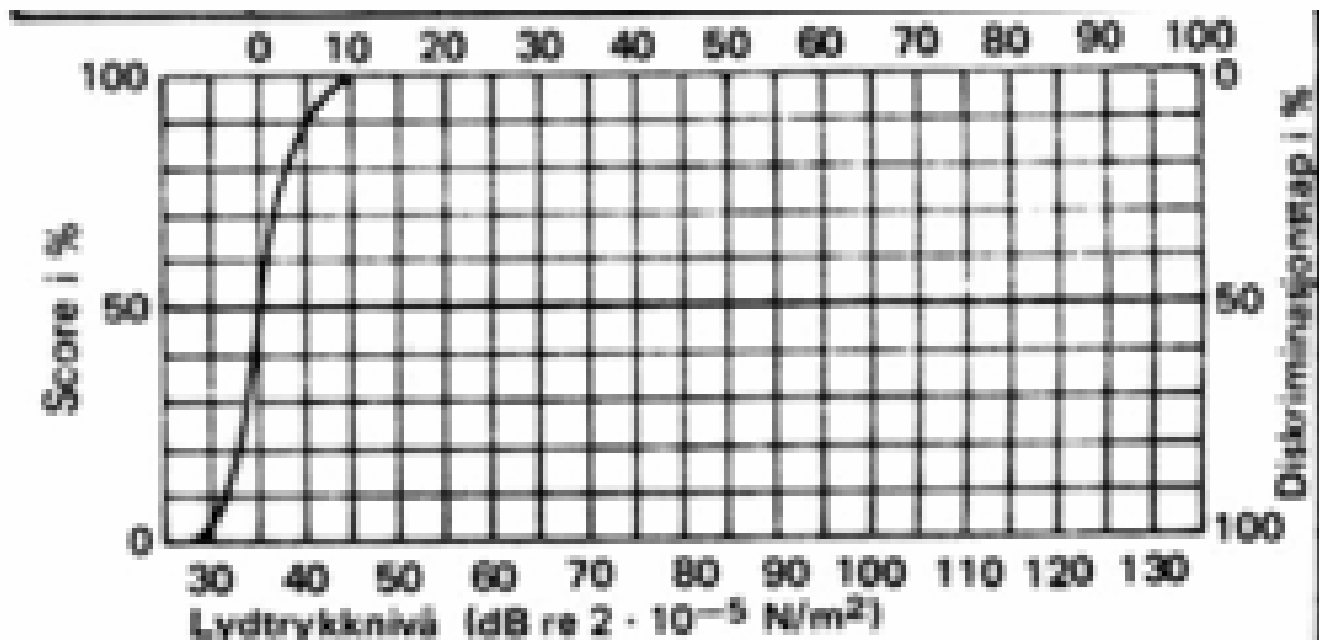
35 dB  
40 "  
45 "  
50 "

Høreavst. i meter for to-  
stav.ord. konvers.stemme

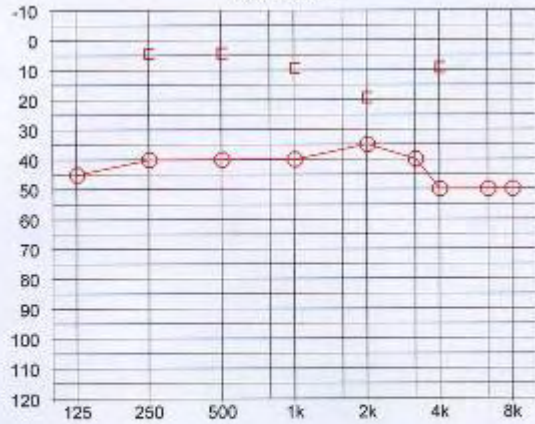
ca. 5 m  
" 2 m  
" 1 m  
"  $\frac{1}{2}$  m

### Hørseltap ved de forskjellige ordprøvene.

Normalthørende gymnasiaster og studenter oppfattet 50 % av tallprøven ved 18 - 20 dB over normal høreterskel for 1000 Hz., tostavellesordene ved 25 dB, og enstavellesordene ved 28 - 30 dB. Gymnasiaster og studenter er ikke representative for den alminnelige befolkning. Prøver med et mere allsidig utvalg av individer har vist at enstavellesordene oppfattes ved 30 - 35 dB over normal høreterskel. I vår taleaudiometri er 35 dB satt som grense for normal hørsel når det gjelder enstavellesord.

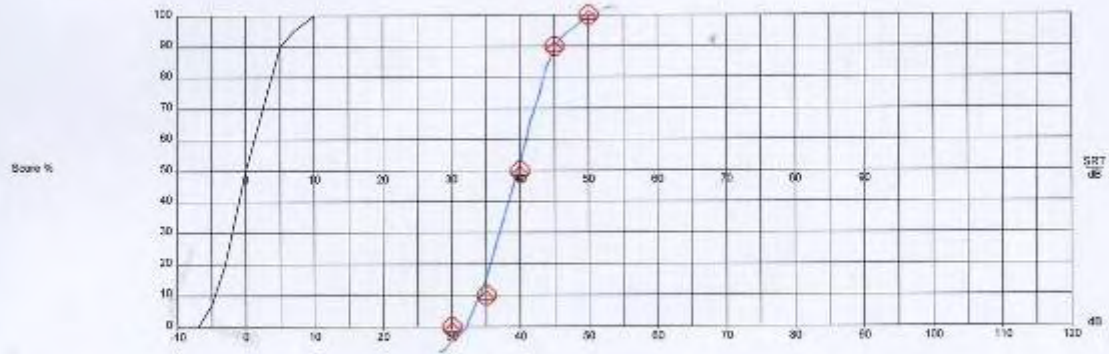


Høyre øre - HL



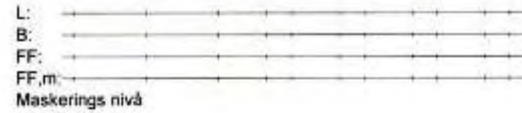
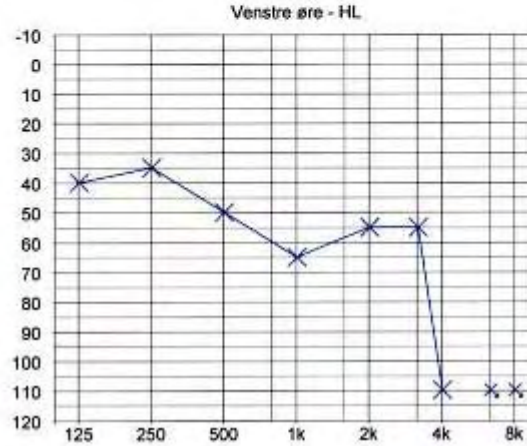
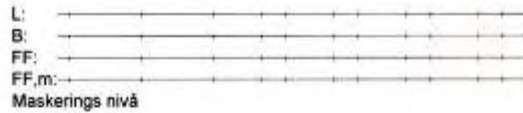
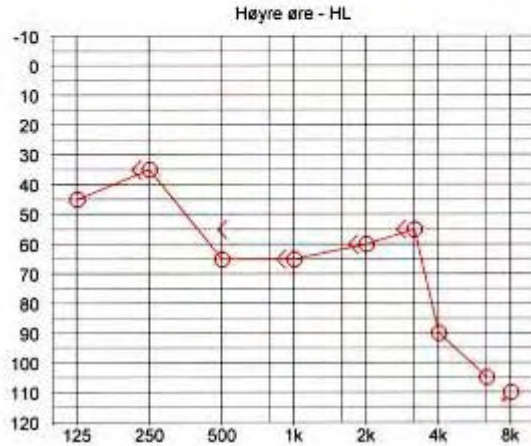
L: \_\_\_\_\_  
 B: 50 50 50 50 50  
 FF: \_\_\_\_\_  
 FF,m \_\_\_\_\_  
 Maskerings nivå

Høyre  
 PTA (A): 38 dB



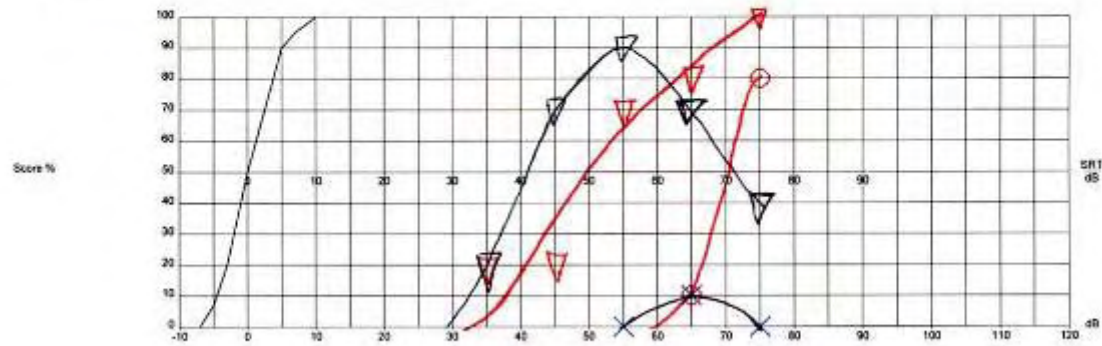
Noter

### Audiogram



PTA (A): Høyre 63 dB

PTA (A): Venstre 57 dB



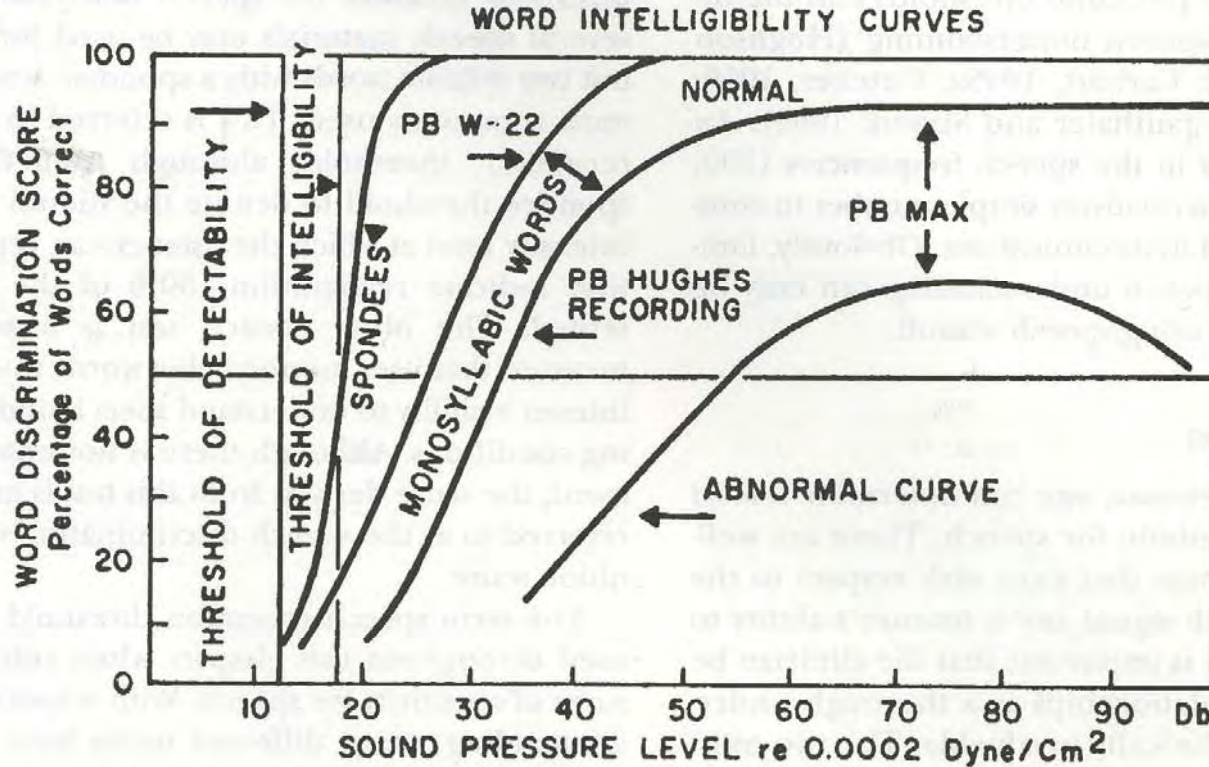
Noter

**Hva gir best uttrykk for  
hørselproblemer ?**

**Taleaud ( test over terskel) eller  
rentoneaud? (terskel test )**

**Er det noen sammenheng  
mellom prøvene?**

# FIGUR FRA KATZ



**Figure 10.1.** Articulation functions for the Rush Hughes, W-22, and spondee tests. Also shown is the articulation function as obtained for some pathological ears. Note that the curve passes through a maximum and the declines with increased intensity. The thresholds of de-

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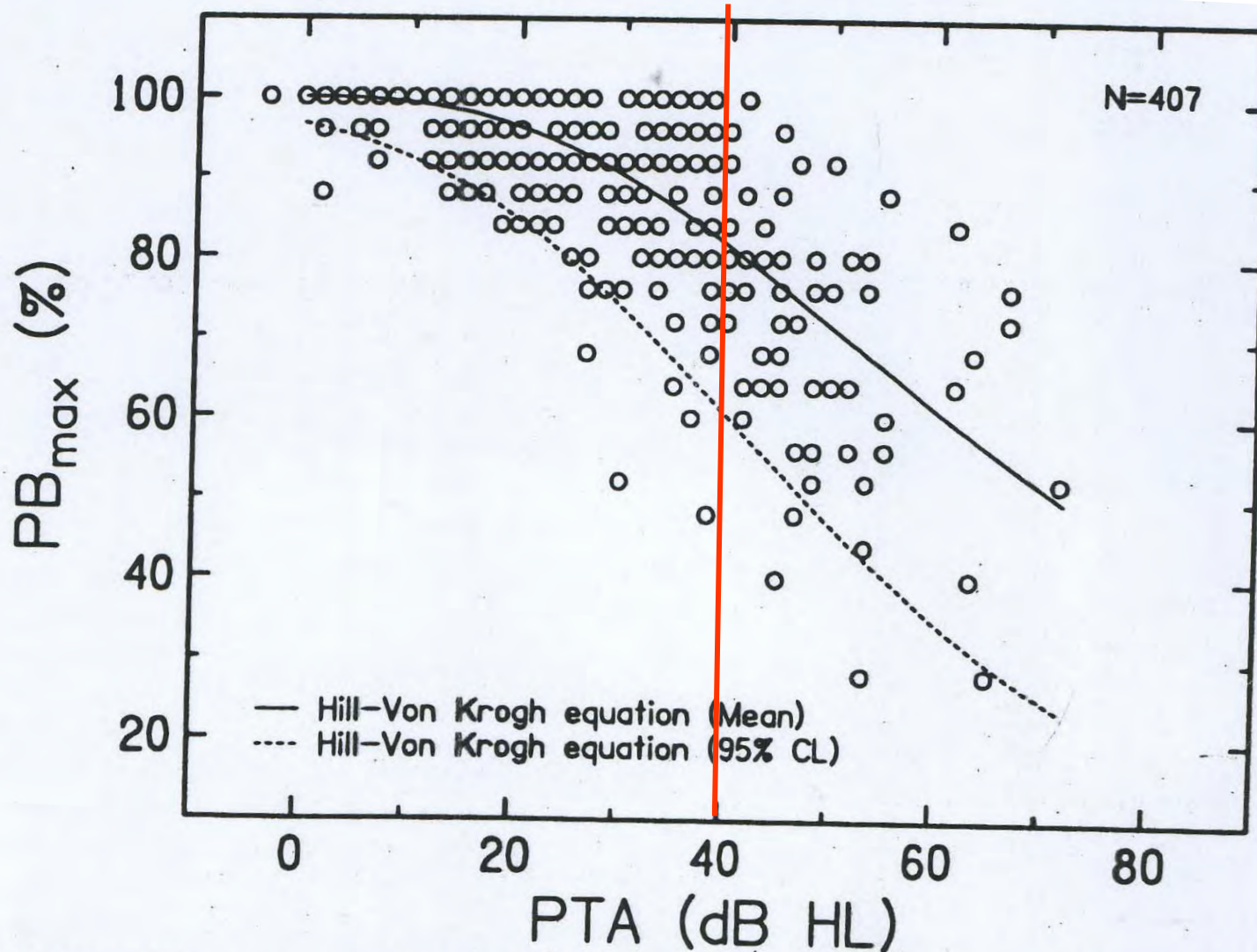
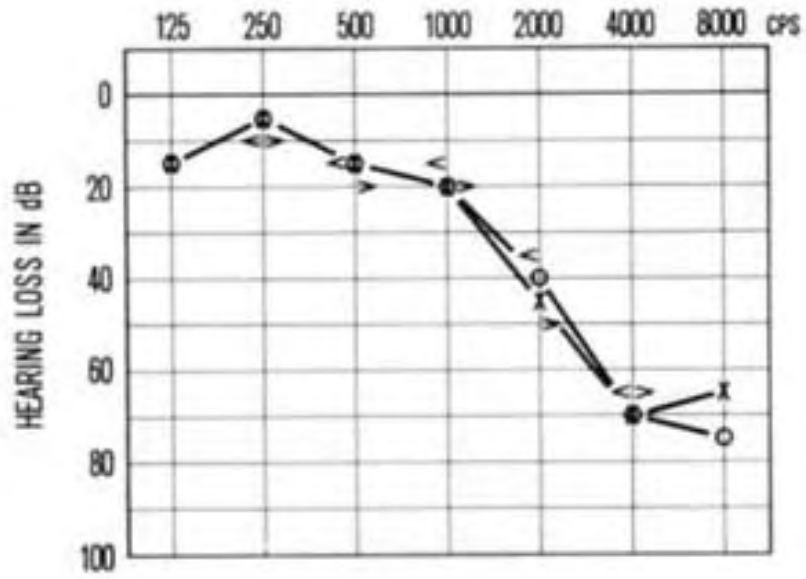
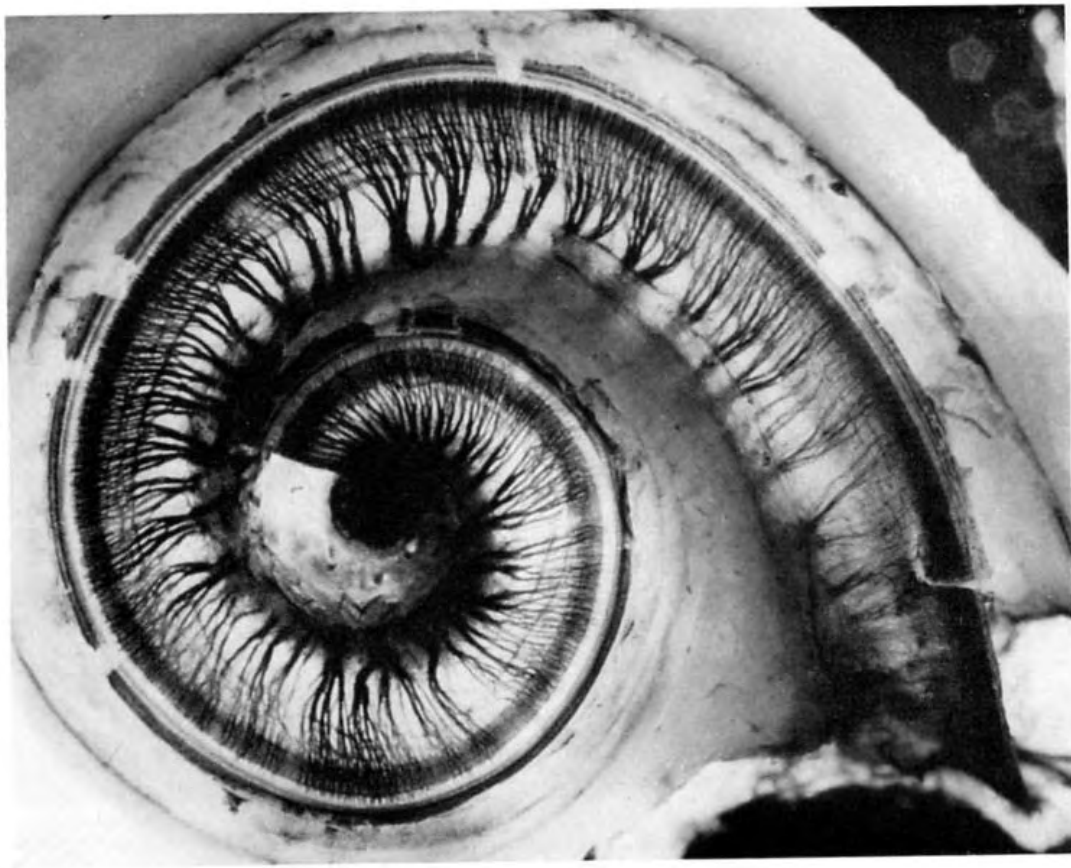
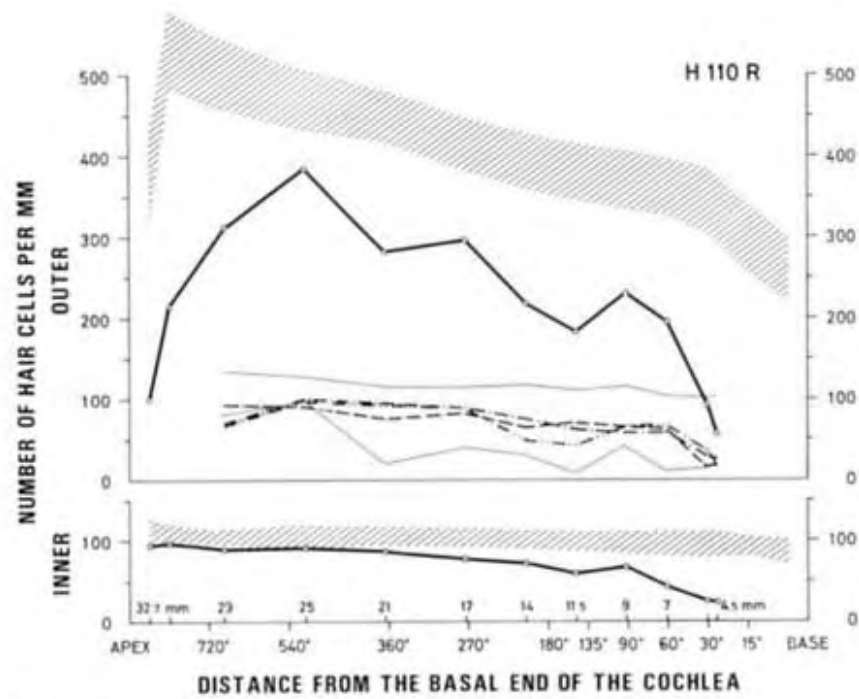


FIGURE 5.  $PB_{max}$  (in percent) as a function of pure-tone average (PTA, in dB HL) for 407 ears. The solid line is a curve fit to mean  $PB_{max}$  for 11 PTA groups, determined from simulation, as shown in Figure 4. The broken line is a curve fit to the 95% confidence limit (CL), also determined from simulation, as shown in Figure 4.

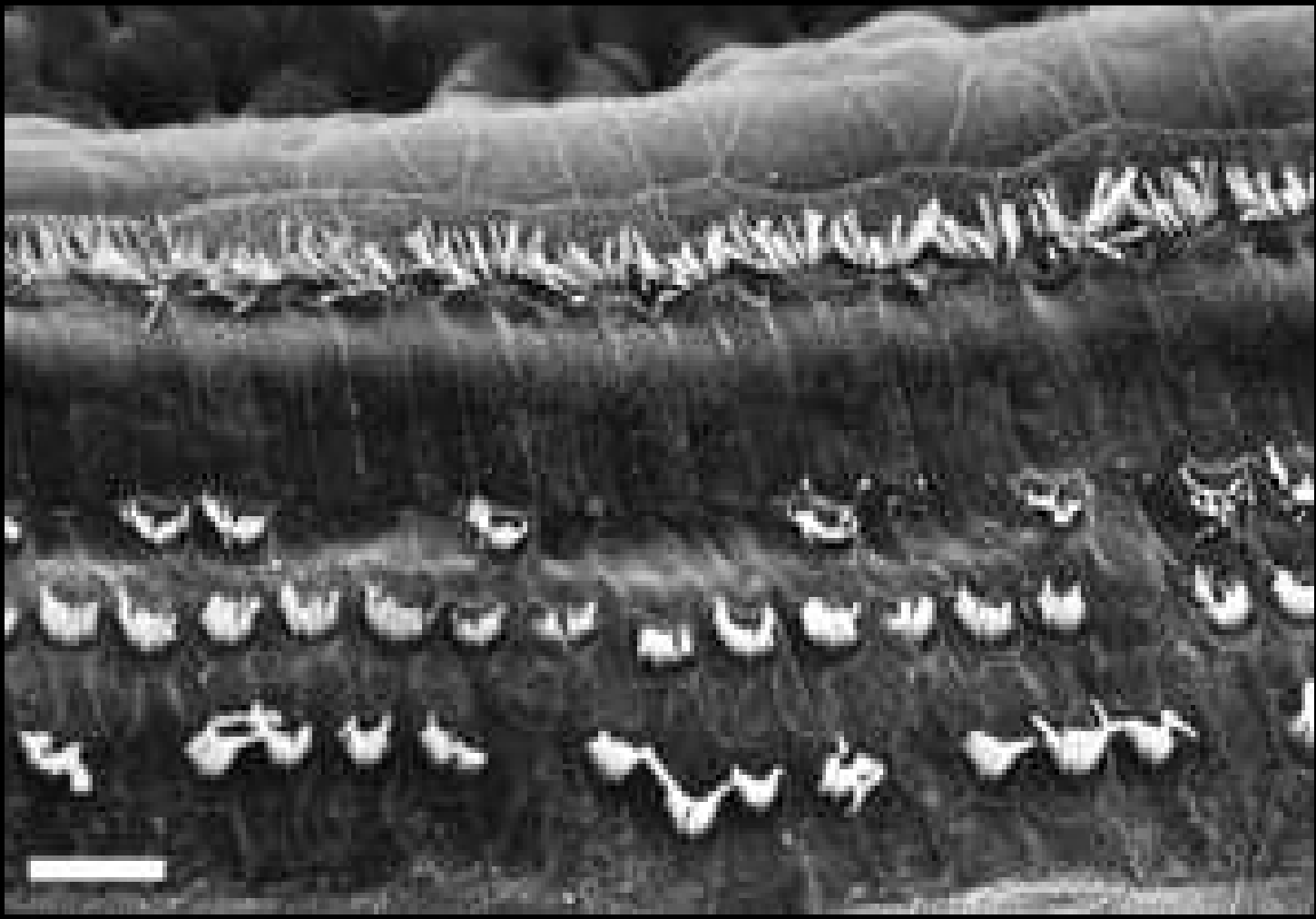
Hva skyldes denne spredningen ?







*Fig. 59.*



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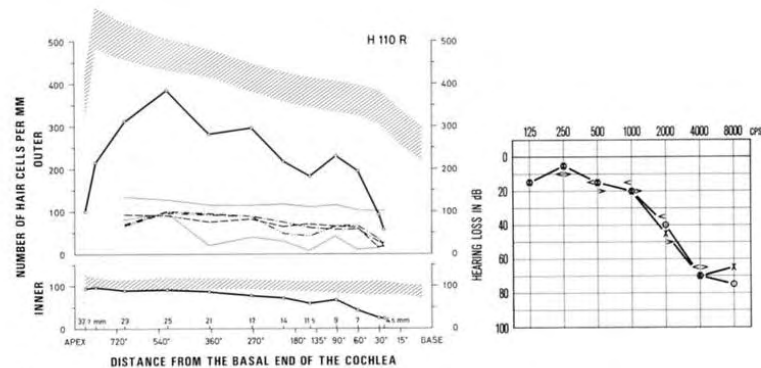
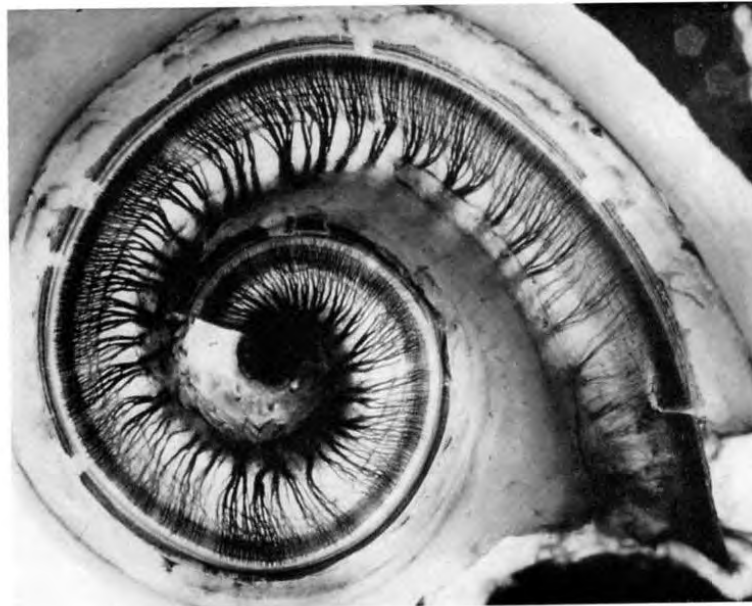
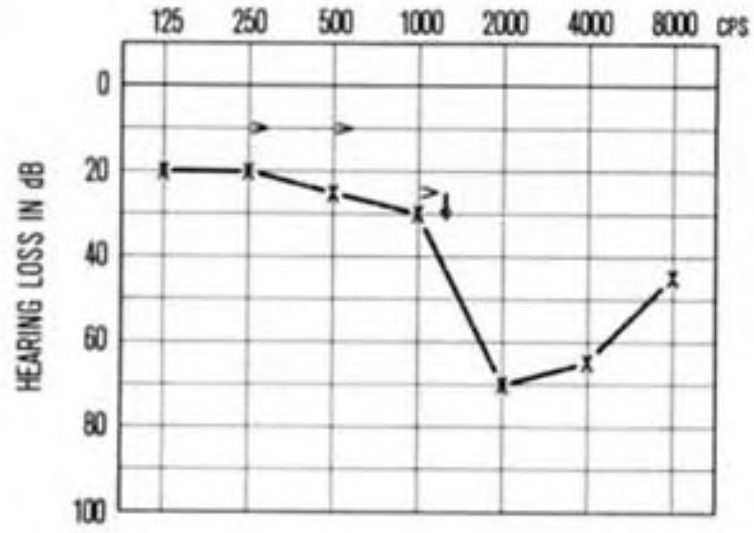


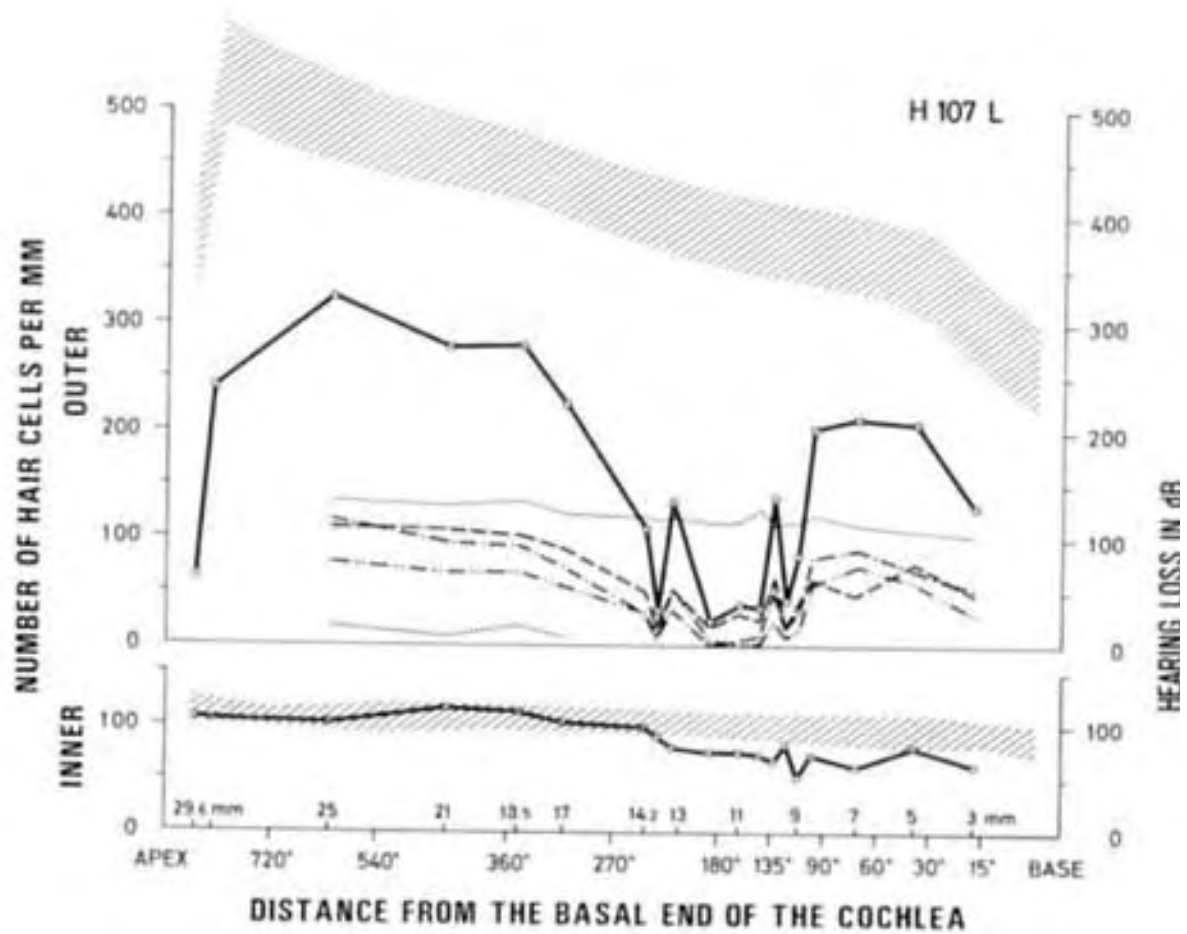
Fig. 59.

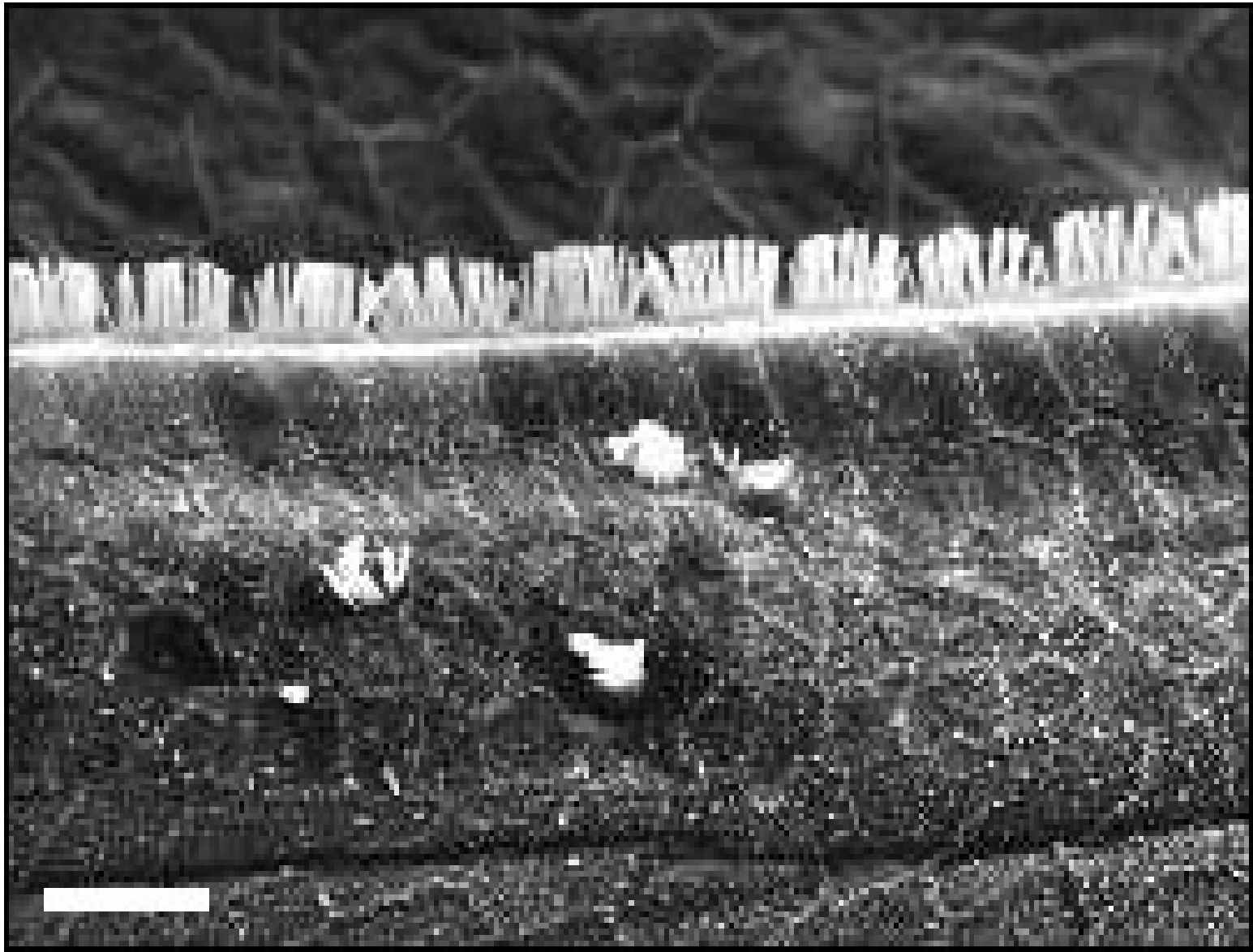
Figs. 59 and 60. Right and left cochleas from a man aged 81 years. No history of noise exposure or ear disease. Autopsy diagnosis: cancer of the oesophagus. Treated with a total of 1.2 g. Sendoxan.

Both cochleas show a pronounced patchy degeneration of nerve fibers throughout all coils. The sensory cell populations are well preserved for the age and do not show a similar patchy degeneration. Number of hair cells: right ear, outer, 7285; inner, 2205; left ear, outer, 6985; inner, 2260. Length of the organ of Corti: right, 33.7 mm; left, 33.8 mm.









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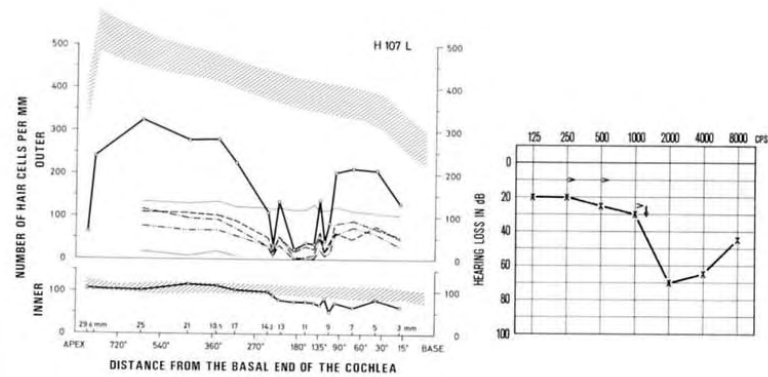
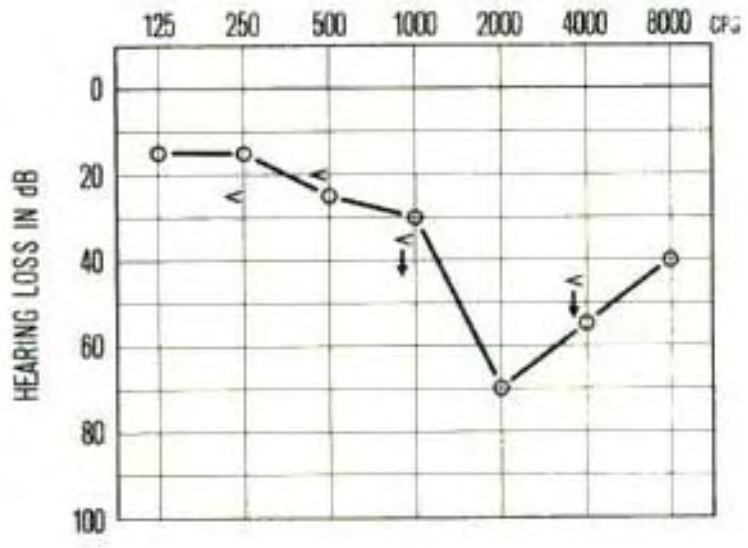
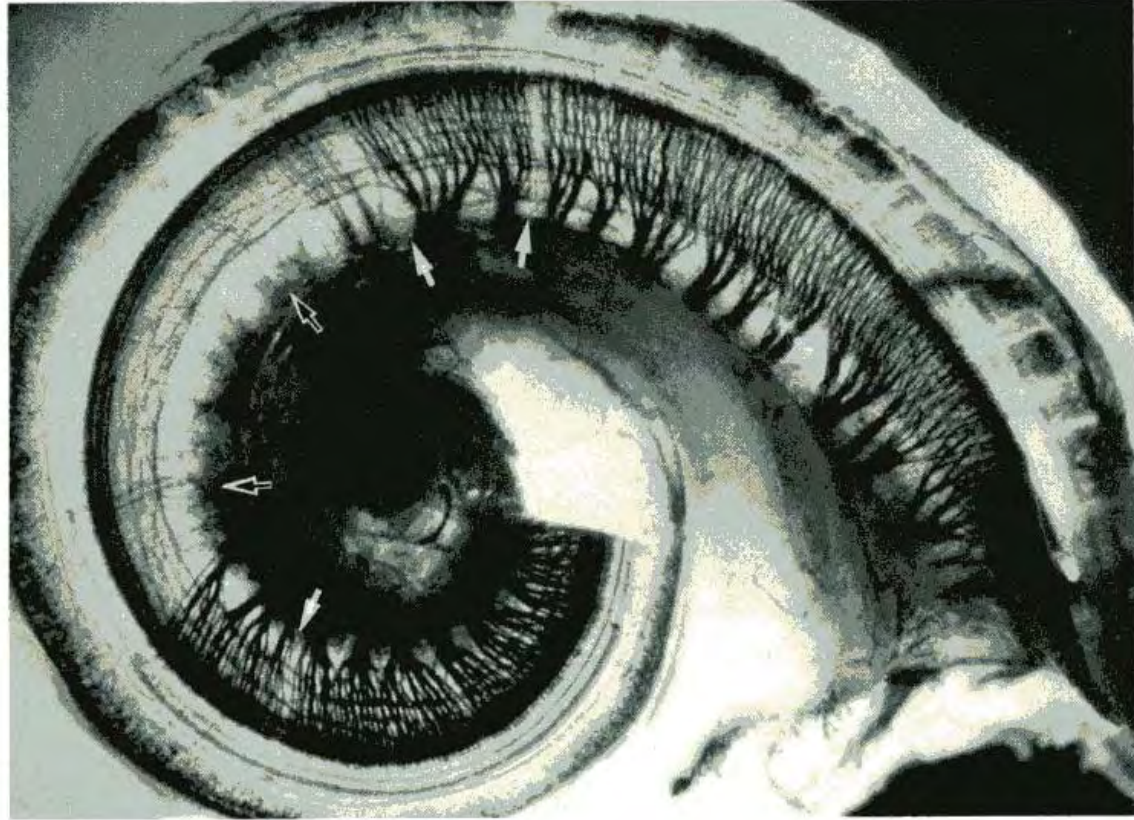
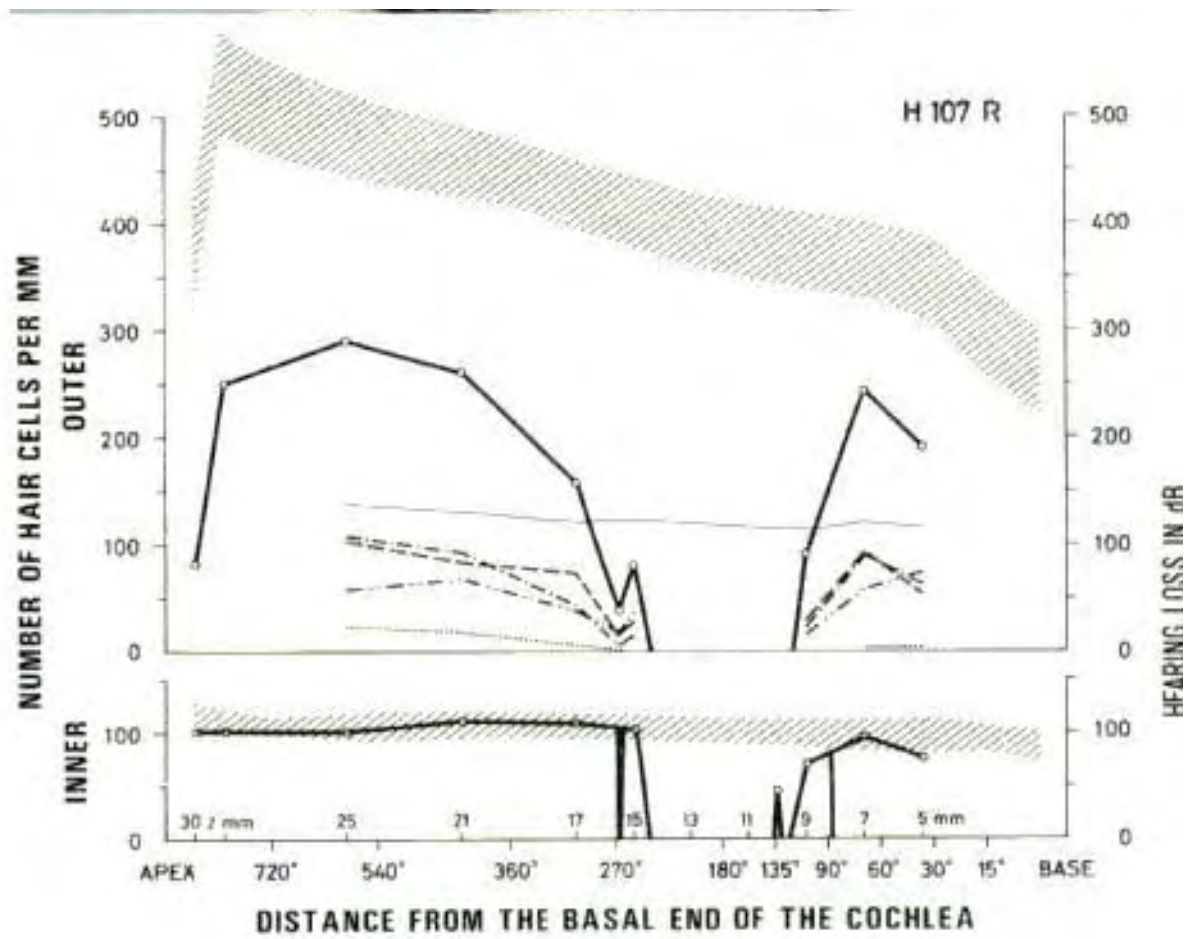
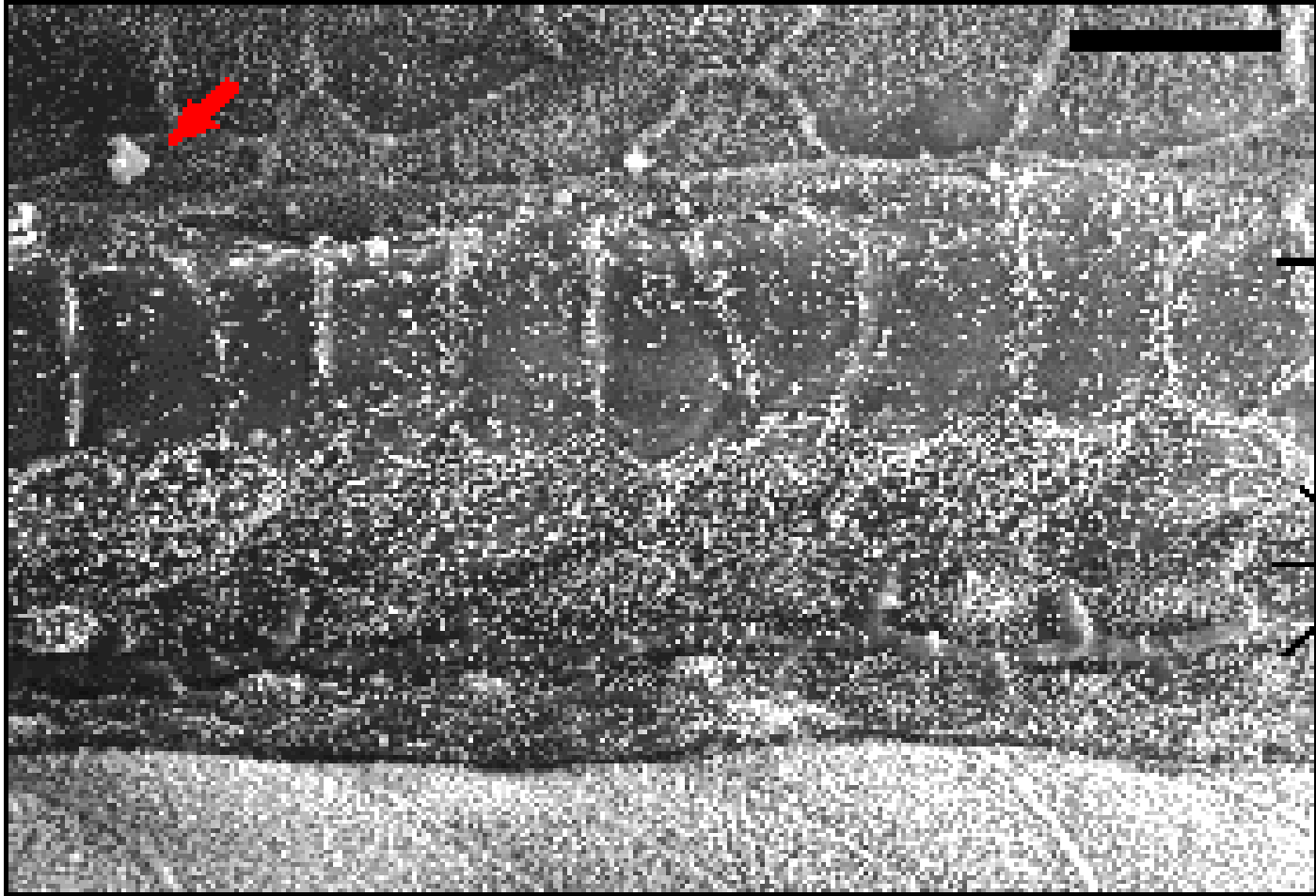


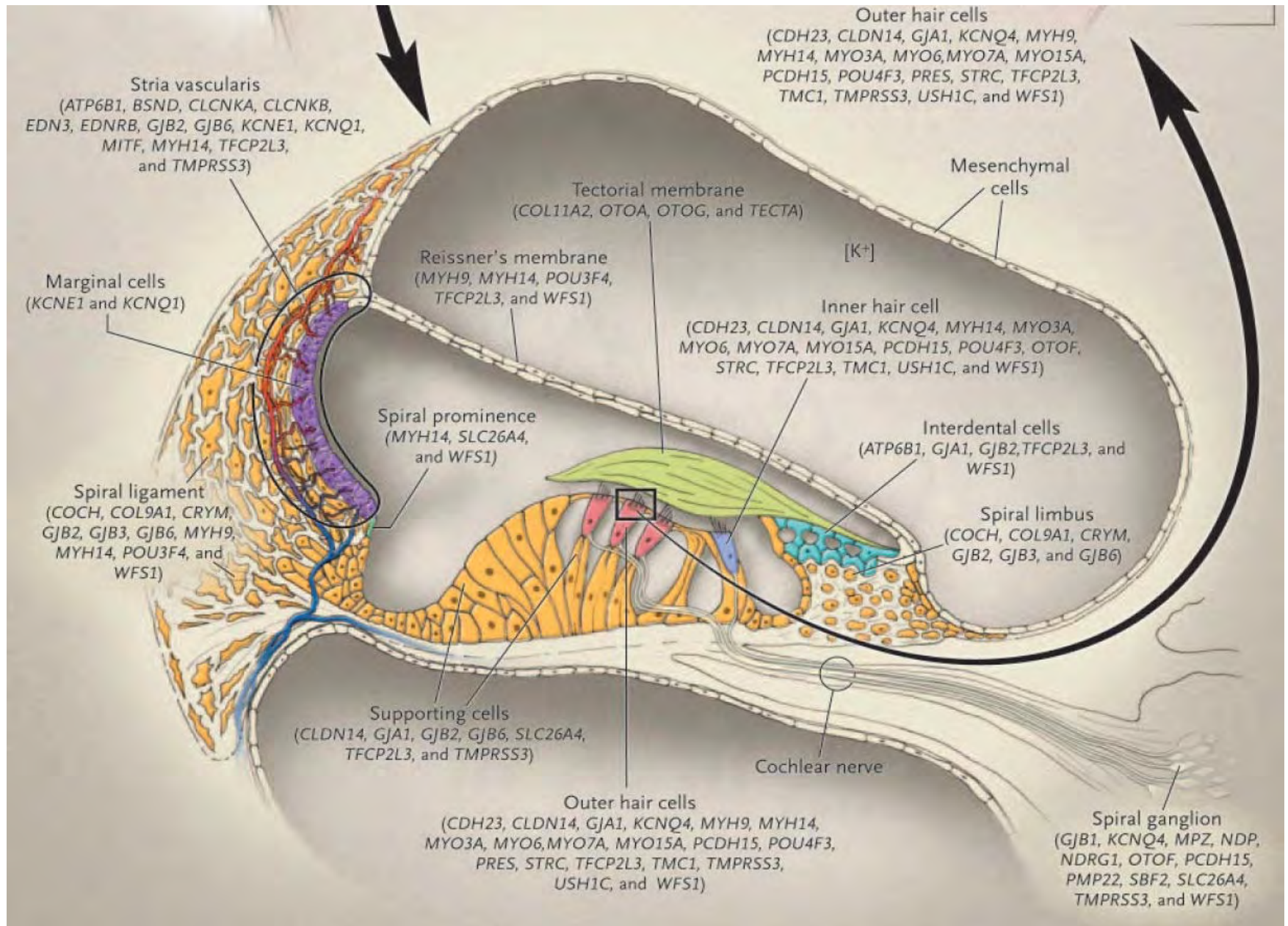
Fig. 58. The left cochlea from the same subject as in Fig. 57. The audiogram shows a hearing loss similar to that in the right ear. Note the striking difference between the two ears in the appearance of the nerve bundles in the osseous spiral lamina, with no circumscribed degeneration in this ear. In the population of outer hair cells, however, this ear shows a pronounced degeneration in the region corresponding to that of total degeneration in the right ear. Note that the inner hair cells show almost no degeneration in this area of the organ of Corti. Number of hair cells: outer, 5510; inner, 2590. Length of the organ of Corti, 33.8 mm.

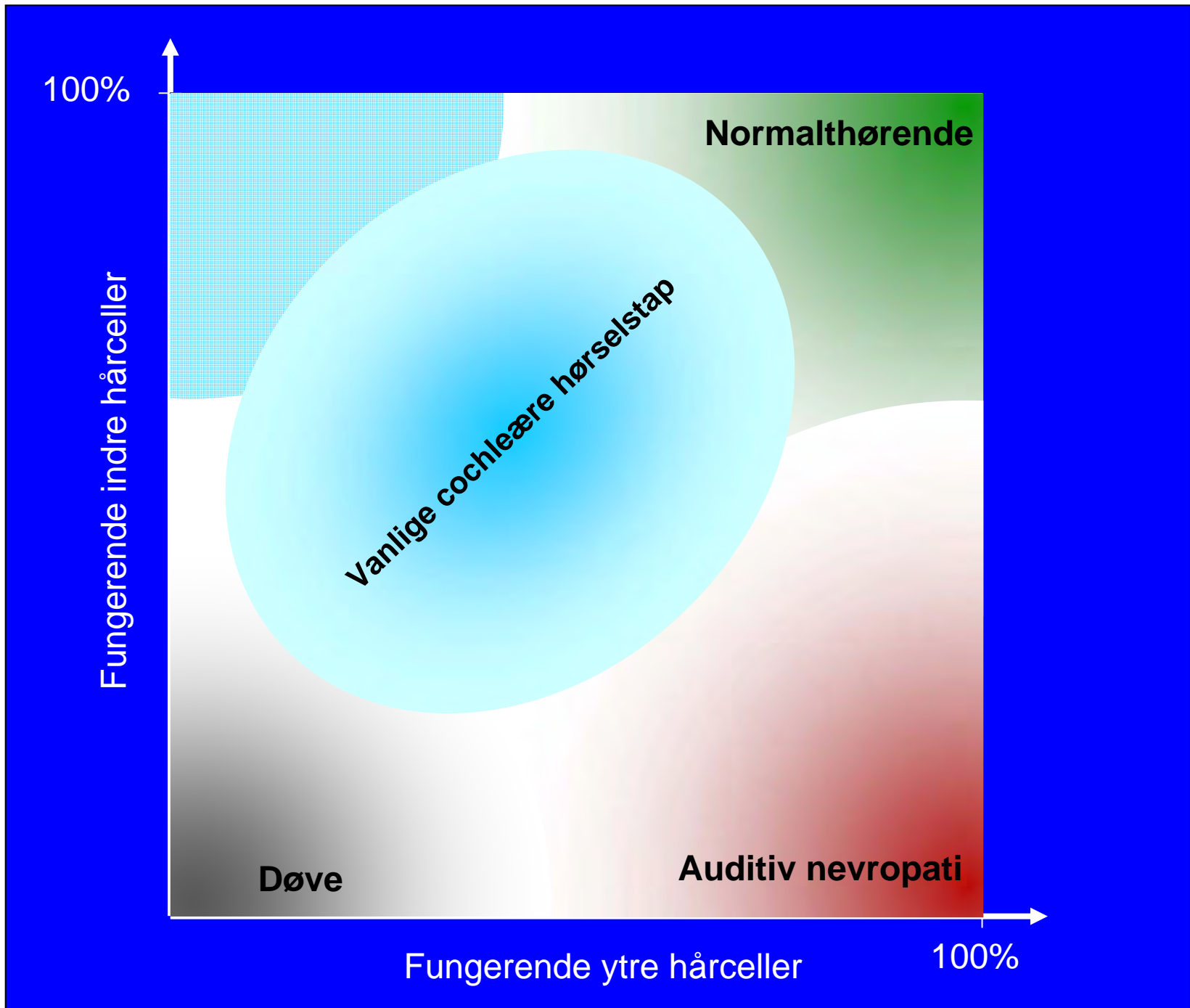












100%

Fungerende indre hårceller

Normalthørende

Vanlige cochleære hørselstap

Døve

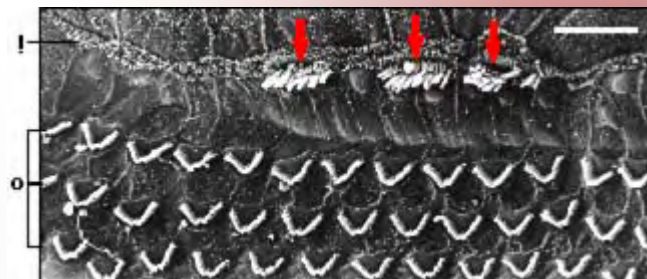
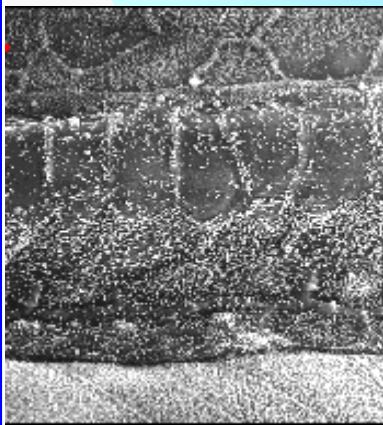
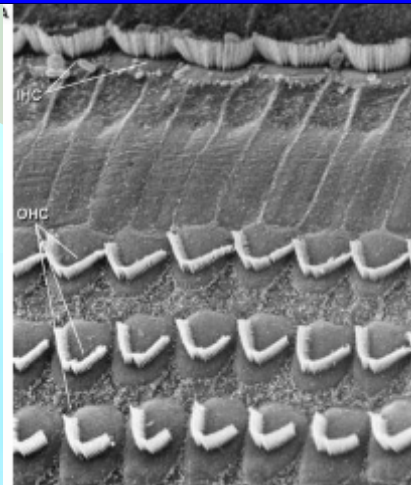
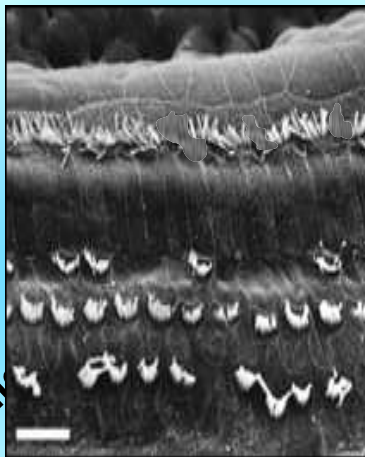
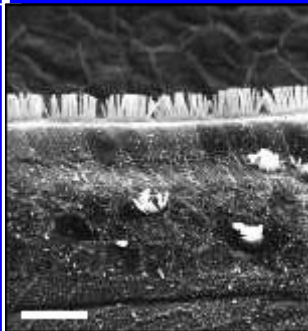
Auditiv nevropati

Fungerende ytre hårceller

100%

100%

Fungerende indre hårceller



Fungerende ytre hårceller

100%

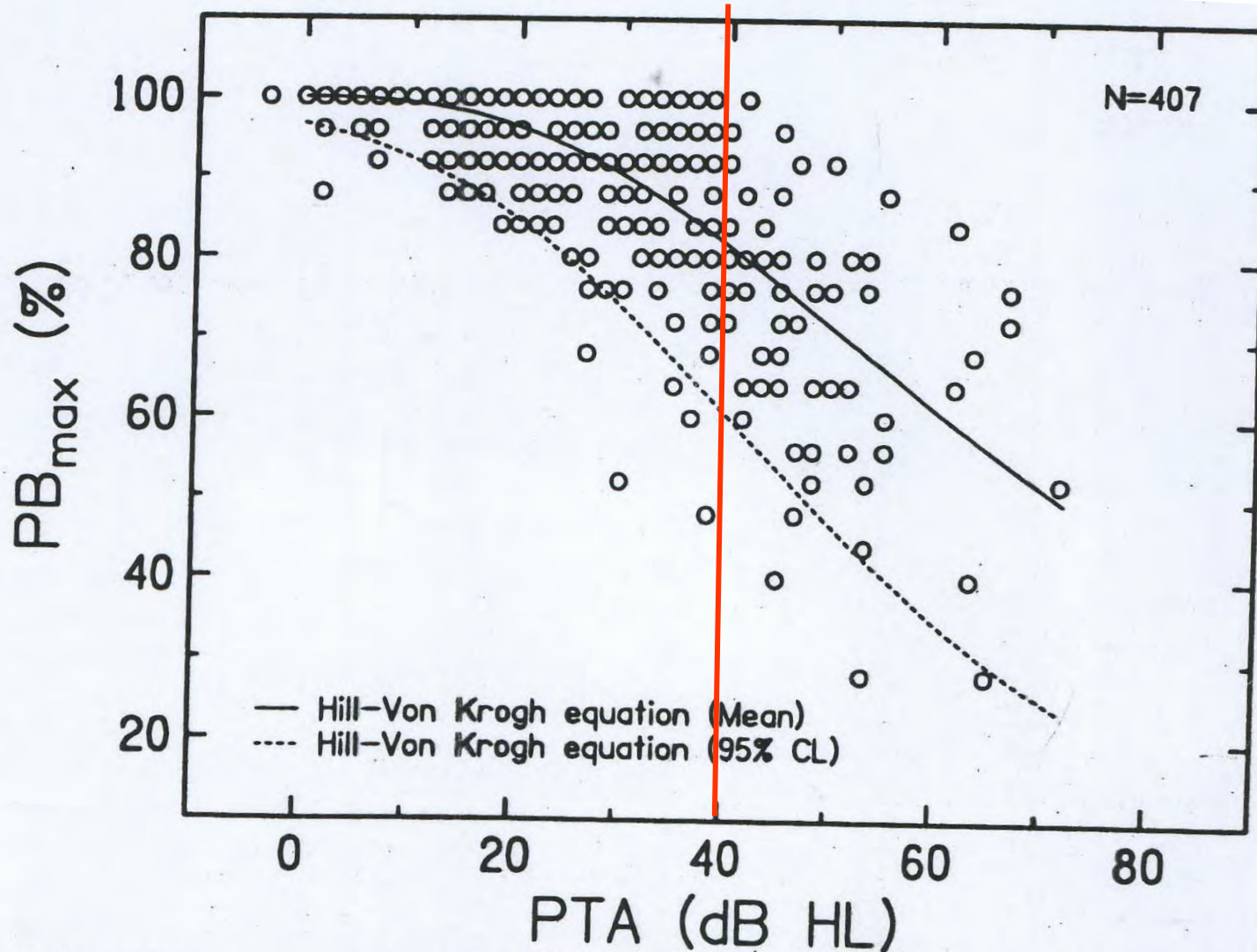


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# Fitting Hearing Aids Using Clinical Prefitting Speech Measures: An Evidence-Based Review

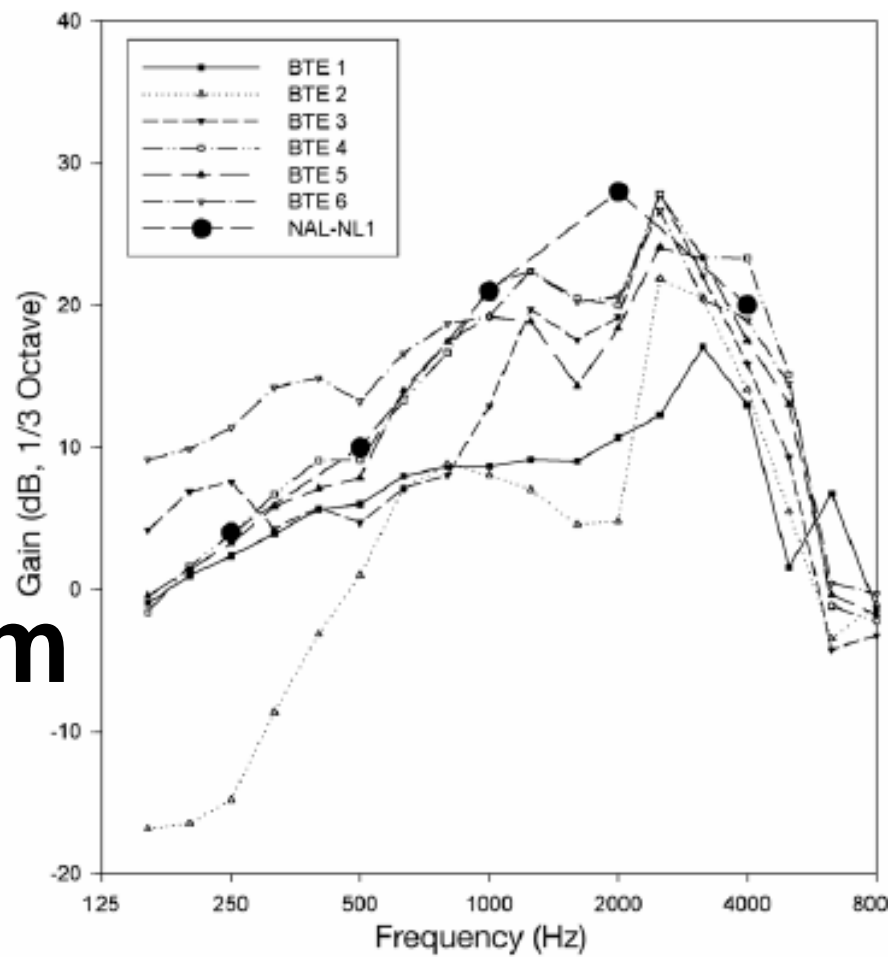
Mead C. Killion\*

Gail I. Gudmundsen\*

**Best sammenheng mellom  
tale i støy test (før ha tilpassing)  
og tilfredshet med ha etter  
tilpassing.**

**50 dB HL**

**flatt  
audiogram**



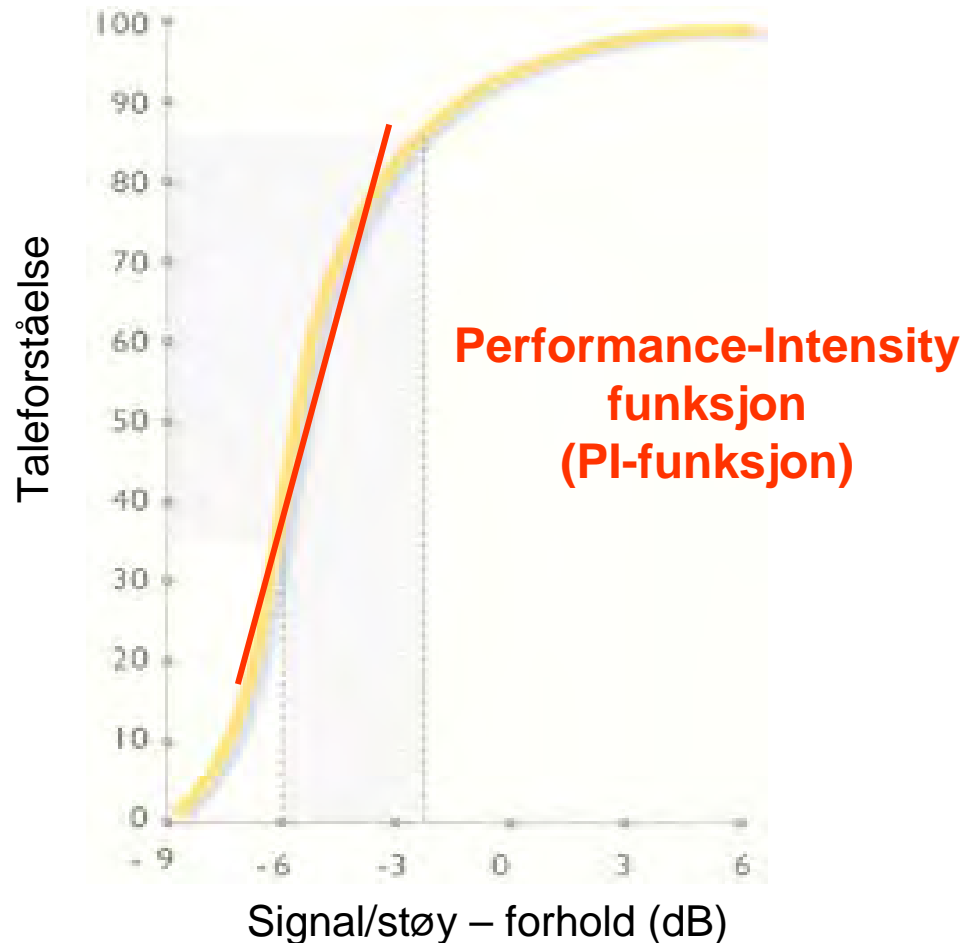
**Figure 1.** Display of 2-cc coupler gain for the “first fit” of the premier product from six of the leading hearing aid manufacturers. Hearing aids programmed to a flat 50 dB HL hearing loss. Input was one-minute segment of real speech of a male talker; average rms of 65 dB SPL. NAL-NL1 target for speech at 65 dB input shown for reference. From Bentler, 2004, used

# S/N-forhold

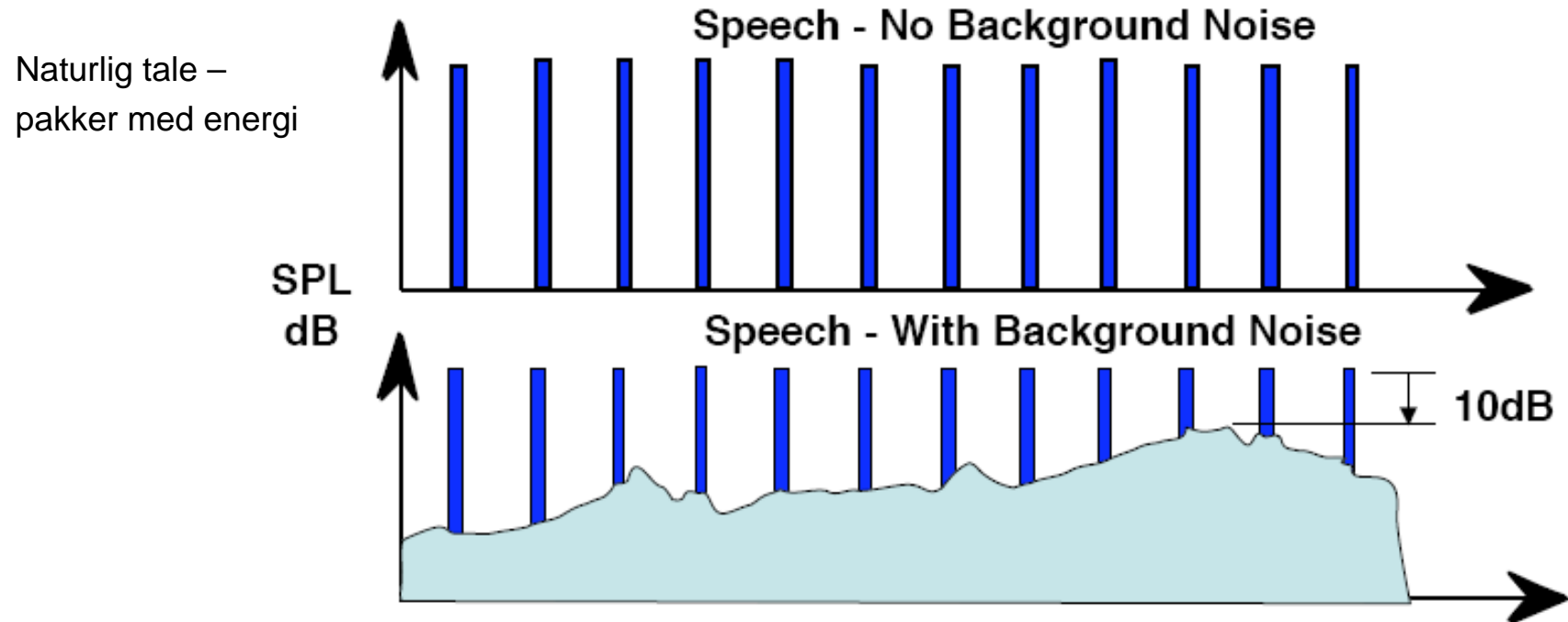
- Vi kaller det som vi ønsker å høre for "signalet" (S) og det som er uønsket lyd for "støy" (Noise -N)
- Lydstyrkeforholdet mellom disse to størrelsene kaller vi for signal/støy – forholdet
- S/N-forhold, SNR (N- Noise)

# Signal-Støy forhold og taleforståelse

- Det er anstrengende å oppfatte tale i et dårlig signal/støy – forhold, men hvis vi skjerper oss vil vi som normalthørende ha et slikt oppfattelsesforhold



# Effekten av bakgrunnsstøy



Reduksjon i taleinformasjon / taletydighet  
når S/N (Signal-støy-forhold) < 10 dB.

**TRENGER BÅDE VANLIG  
AUDIOMETRI OG  
TALEAUDIOMETRI. DE NESTE  
INNLEGGENE ER  
PRESENTASJON AV DE NYE  
TALETESTBATTERIENE DERE  
KAN (SKAL) BENYTTE I  
FRAMTIDEN.**