Figure 7-4  The cochlea “unrolled” and shown as a straight tapered tube. The cross section (at the right) is simplified to a circle with rigid inner projections that support the springy basilar membrane, whose width increases along the length of the cochlea, from the basal to the apical end. The longitudinal (end to end) section of the unrolled cochlea is shown at the left.

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A

Amplitude of traveling wave

← Stapes → Traveling wave → Helicotrema

B

C

D

E

30 Hz

F

200 Hz

G

800 Hz

1,000 Hz

Figure 7-5  Waves traveling along the basilar membrane from left to right: A, B, and C show the same wave as it moves toward the right; D, E, F, and G show the envelopes for waves of four different frequencies. The drawings in this figure are adapted from the work of Nobel laureate Georg von Békésy, who made measurements on the cochleas of cadavers. Subsequent work on living animals has shown that the response of the basilar membrane is narrower and falls off very sharply to the right (toward the apical end). Békésy’s drawings are used today chiefly because no other simple, cogent illustrations are available.