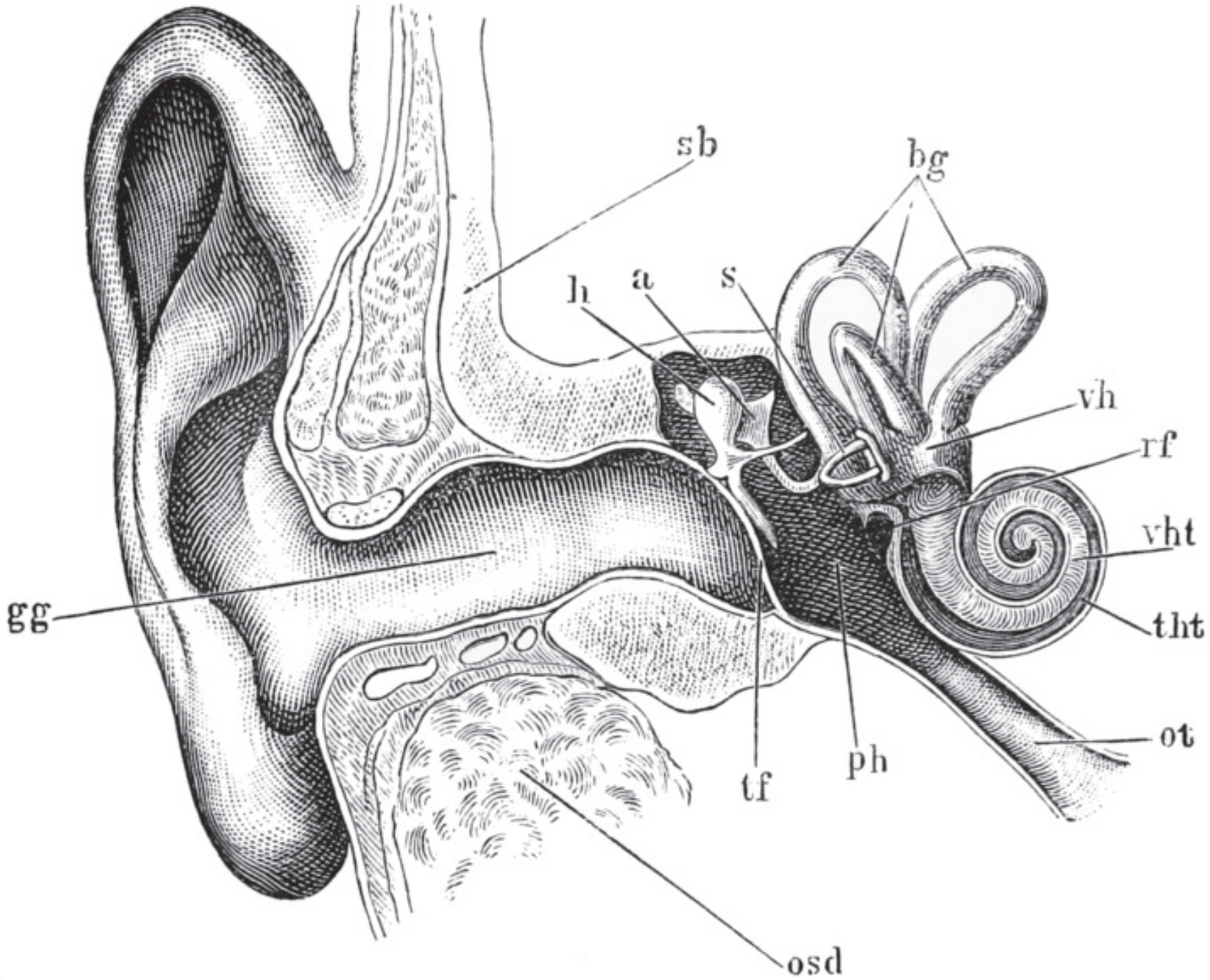
Sound

The ear



Sound Discussion

THE EAR

Outer: The pinna, the visible part of the ear, collects the sound waves, which as they travel further causes the eardrum (or tympanic membrane) to vibrate. The higher the pitch or frequency of the sound the faster the eardrum vibrates. The eardrum simplifies incoming air pressure waves to a single change with a certain amplitude. This allows for the differentiation of sound.

Middle: The vibrations then travel to the middle ear, an air-filled chamber that contains the ossicles (hammer, anvil, stirrup), three smallest bones in the body, where they are amplified.

Inner: From the ossicles, the sound waves/vibrations then pass through a small window to the cochlea, a spiral shaped, fluid filled tube. This sound waves cause movement of the cilia (or hair-like nerve endings) within, which trigger and electrical signal to travel to the auditory nerve and to the brain. The signal varies depending on the pitch of the sound and how loud it is. The auditory nerve carries messages from 25,000 receptors in your ear to your brain. Your brain then makes sense of the messages and tells you what sounds you are hearing.

SOUND & EMOTION

Music is one of the most if not the most powerful expression of our humanity. No culture lives without it," said museum curator Maria Isabel Garcia.

We may know nothing about music and the way it's created, formed, but we can easily describe the emotional resonance of a happy tune, or equally a sad, light, dark, eerie, jarring, spare, sensual, soothing.

Here are six psychological mechanisms (besides cognitive appraisal) through which music evokes emotions:

BRAIN STEM REFLEX an emotion is induced by music because one or more acoustical characteristics of the music are taken by the brain stem to signal something important and urgent. Sounds that are sudden, loud, or feature fast patterns induce arousal. Emotions are quite limited to the pleasant/unpleasant range. These responses seem to be hard wired in us prior to birth.

EVALUATIVE CONDITIONING an emotion is induced by music simply because this stimulus has been paired with other stimuli, positive or negative. You may have repeatedly heard a piece of music together in time with a specific event that always makes you happy such as meeting your best friend. Once a piece of music has been associated with a certain emotional outcome, this association may be quite persistent. You may not even be aware of the association between the music and your friend when the emotion is present.

EMOTIONAL CONTAGION an emotion is activated by music because you perceive the emotion expressed in the music, then 'mimic' this expression internally.

VISUAL IMAGERY An emotion is sparked in you because you conjure up visual images (for example, a beautiful waterfall or landscape) while listening to the music. The emotions experienced are the result of

a close interaction between the music and the images. We seem to conceptualize the structure of the music in terms of a metaphorical, nonverbal mapping between the music and image grounded in bodily experiences; for instance, hearing the melody as “moving upward”. We react to the mental images much in the same way as they would to the corresponding visual stimuli in the “real” world (e.g., reacting positively to a beautiful nature scene).

EPISODIC MEMORY Emotion is induced in a us because the music evokes a memory of a particular event in the listener’s life (the“Darling they are playing our tune” phenomenon). When the memory is evoked, so is the emotion associated with the memory, and this emotion may be relatively intense – perhaps because the reaction pattern to the original event is stored in memory along with the experience.

MUSIC EXPECTANCY refers to the process where an emotion is evoked in a listener because a feature of the musical structure violates, delays, or confirms our expectations about the continuation of the music. Thus, for example, the sequential progression of E-F# sets up the expectation that the music will continue with G#. If this does not happen, if we’re familiar with the music, we could become, say, surprised. The expectations are based on the our previous experiences of the same style of music.