

(1.) In the case of consecutive tones the pleasure of the sound depends on the transition from one note to the other. The emphatic notes at least must be related by familiar concords. This seems to arise from the fact that each preceding note lingers for a time either in sense or in memory after the following note has been sounded; and, as in the quality of single tones, unless there is a coincidence of the vibrations of the various tones with one another and with the fundamental tone, there will be discord.

(2.) The agreeable relation of simultaneous tones is called harmony. To understand harmony fully it is necessary to look at it from the standpoint of the physicist and the physiologist, as well as that of the psychologist.

(a) The physical cause of harmony is considered to be the fact, that there is a coincidence between the various atmospheric vibrations that produce the tones of the harmony. The simplest coincidence is produced in the case of two notes that form an octave. Here for each vibration caused by the sounding of any note, there will be two vibrations from the note an octave higher, so that the time required for the vibration of the first note is exactly taken up by the two vibrations of the second. In the same way there might be other simple ratios such as 1 : 3, 1 : 4, 2 : 4.

(b) The problem for the physiologist is to explain the action on the nerves, of harmonious or discordant tones. It might be observed that the proximity of the ear to the great nerve centre in the head makes the auditory nerve very short, and thus the connection between the sensitive surface and the nerve centre is more direct than that of any other organ of sense. And again, the vibrations of sound induce a sympathetic vibration in every nerve of the body, and when the sound is excessive the ganglionic centres all over the body are disturbed—the blood “curdles,” the spine “creeps” and the whole frame is often made to shake and tremble.

In the case of harmonious sounds it is supposed that the regular impact of coincident air waves on the drum of the ear, sets up a continuous nerve current, and this by analogy of other sensations is supposed to account for the pleasure experienced from such sounds; while, on the other hand, a discordant combination of sounds produces a jerky action on the nerves. A similar phenomenon is seen with respect to the sense of touch. Pass the hand over a smooth surface and the sensation is pleasant; but let it be passed over a rough surface and an irritation is produced on account of the intermittent shocks that are excited in the nerves by the rough, uneven surface. The sense