Undertone

Harmonics of a fundamental sound usually in simple divisions of 1/8, 1/4, 1/2, 1/3, *etc.*. of the fundamental, tone or sound.

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which seems to show that not only has one part of a vibrating string sympathy with another part of it so as to go into harmonic partials, as we have just seen, but as if the very air itself had sympathy with harmoniously vibrating strings; for Tartini observed that two harmonious sounds being produced and sustained as they can be, for example, by a strong bow on the violin, a third sound will be heard. Tartini's name for it was simply "a third sound." This is not an *overtone*, as Helmholtz has called the harmonic partials of one sounding string, but an ***undertone***, because it is a "grave harmonic," away below the sounds of the two strings which awaken it. The subject of these **undertones** has been carefully studied since Tartini's day, and more insight has been obtained since we are now able to count and register the vibration of any musical sound. Helmholtz has called these *third sounds* of Tartini's "difference sounds," because when awakened by two strings, for example, the vibration-number of the third tone is the difference of the vibrations-numbers of the two tones which awaken it. The note C with vibration-number 512, and another C whose vibration-number is 256, the octave, awakened no third sound, because there is no difference between the two numbers - the one is just the doubled or halved; but if we take C256 and G381, its fifth, the difference number is 128; this being a low octave of C256, it has the effect of strengthening the upper one. Helmholtz found this to be the *law of the third sound* as to its producing, and the effect of it when produced. This third sound, mysteriously arising in the air through the sympathy it has with all concordant things, is another among many more suggestions that the whole Creation is measured and numbered to be in sympathy one part with another. The Creation is a universe. [Scientific Basis and Build of Music, page 60]

See Also

1.23 - Power of Harmonics through Summation Tones
9.8 - Spontaneous Creation of Harmonic Series
9.9 - Sympathy or Harmony Between Harmonics or Overtones
Differentiation
Overtones Developed Musically
Figure 8.5 - Summation Tones
Figure 8.6 - Difference Tones
Harmonic
Helmholtz Subharmonic Series
Interval
Law of Harmonic Pitch
Law of Harmonic Vibrations
minor chord
minor scale
minor
Overtone Series
Overtone
Ramsay - PLATE XXII - Mathematical Table of the Twelve Major Scales and their relative Minors
relative Minor
Resultant Tone
Scale
subharmonic
Sympathetic Vibration
Sympathy