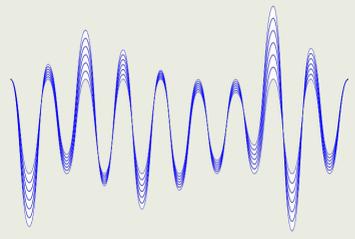


Creation Sings... ACOUSTICS

In this article I want to write about sound (acoustics)... it's all around us. But what really is it? Scientists describe sounds as a **WAVE**. So it's very friendly then? No, not that kind of a wave! Sound waves come in all different sizes and scientists describe them in a way we all recognise. Waves have a **peak** or crest and a **trough** and the difference is known as **amplitude**. How often any part of a wave passes a fixed point is known as its **frequency** and 1 wave per second is **1 Hertz**.



Technically, sound is defined as a mechanical disturbance traveling through an elastic medium – a material that tends to return to its original condition after being deformed. The medium need not be air; metal, wood, stone, glass, water, and many other substances conduct sound, many of them better than air.

There are a great many sources of sound. Familiar kinds include the vibration of a person's vocal cords, vibrating strings (piano, violin), a vibrating column of air (trumpet, flute), and vibrating solids (a door when someone knocks). It is impossible to list them all.

Sound can be described in terms of pitch – from the low rumble of distant thunder to the high-pitched buzzing of a mosquito – and loudness. Pitch and loudness, however, are subjective qualities; they depend in part on the hearer's sense of hearing. Objective, measurable qualities of sound include frequency and intensity, which are related to pitch and loudness. Sound is the energy things produce when they vibrate (move back and forth very quickly). There are obviously some “good vibrations!” There are two elements associated with sound: the physical vibration and the psychological process that happens inside our ears and brain which convert the incoming sound energy into sensations which we interpret as noise, speech and music.

Human hearing has a frequency range from 20Hz - 20,000 Hz and differs between children and adults, with children being better; adults lose this frequency range and so become hard of hearing. We use the phrase “blind as a bat” but bats would say (if they could!) “as deaf as a human” because they can SEE much more using ultrasound, above 40,000 Hz (we've managed to use ultrasound to see too – babies in the womb). Dogs too can hear above our range, up to 60,000 Hz, and so a proper dog whistle cannot be heard by humans, only dogs!



Some sounds can be modulated so that we can hear them, for example bat detectors (ultrasonic), the sounds of planets (subsonic).

The terms subsonic and supersonic refer to the speed of an object, such as an

airplane, in relation to the speed of sound in the surrounding air.

A column of air, as that in a trumpet, and a piano string both have a **fundamental frequency** – the frequency at which they vibrate most readily when set in motion. For a vibrating column of air, that frequency is determined principally by the length of the column. (The trumpet's valves are used to change the effective length of the column.) For a vibrating string, the fundamental frequency depends on the string's length, its tension, and its mass per unit length.

“Sounds good” you say! But what can this teach us beyond mere facts? I came across this illustration when reading recently: **TRUTH is like a dog whistle, not everyone can hear it**. From the above, technically no one should hear it, but I’m reminded of the phrase in the Bible which says, “he who has ears to hear let him hear”. I think it speaks of the two stage process – physical and psychological – we may ‘hear’ the Word but ignore it or never correctly interpret what it is actually saying and so it just becomes “noise”.

We spoke about frequencies and I’m reminded that God in times past spoke through the prophets...sometimes as in Eli’s day (1 Sam.3:1) and between the Testaments God’s word was rare in those days, not frequent; God says His Spirit shall not always speak or strive with man, Gen 6:3. How frequently do you hear the voice of God speaking to you? We must **ALL listen attentively** to Him and not just hear!

Sound is a complex mix of **overtones** but each instrument, for example, has a characteristic sound known as **FUNDAMENTAL OVERTONE** which comes from the way it is designed and operated. What is your fundamental overtone? The Shorter Catechism states that “Man’s chief end is to glorify God and enjoy Him forever” and God says we were “created unto good works...before ordained” for us to do (Eph. 2:10). What better overtone could we have in our life?

Finally, and climactically, I want to consider God’s voice. It is ALL POWERFUL – He spoke and it was so, Gen. 1:3. Think of the power in that voice to create the energy needed to form the earth, the galaxy, the universe! HE SPOKE! Wow! We rightly exclaim “what is man that YOU are mindful of him?” Ps. 8:4.

With such power He had to modulate His voice so that He could speak to Moses and the prophets and to us today. If His voice has such power, it is because of who HE IS: *El Shaddai* – God Almighty; *El Elyon* – God Most High, and therefore we should listen when He speaks. His Word was/is given to us in Jesus, Jn 1:1-3; Heb. 1:2.

His words are not just “noise” as are the words of so many others. His Word is powerful; creative; life-giving; comforting; and brings peace.

May we who have ears to hear listen to HIS voice, and not be hearers only but doers too! James 1:22

“Speak Lord, for thy servant heareth”.