Noise Pollution

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Until recently, Sony Corporation marketed amplifiers and speakers with a "Disturb The Peace" advertising campaign that boasted of "new ways to offend."[1]

Perhaps they got their idea from a Bob Marley song:

"I want to disturb my neighbor
Cause I'm feeling so right
I want to turn up my disco
Blow them to full watts tonight."[2]

In 1960, there were no boom boxes, no boom cars, no leaf blowers, no jet skis, nor car alarms and hardly any snowmobiles.[3] The stereo sound systems we have in our cars today are much louder than the sound system the Beatles used for their concerts in the sixties. All they had back then were 300-Amp speakers.

Movies are recorded louder, and coming attractions, which I try to avoid like the plague, are the loudest. An explosion-rocked scene on today's silver screen is an easy 120 to 130 decibels, compared to the bullet ridden finale of the sixties shoot-em-up, *Bonnie and Clyde*, which wimped out at a mere 80 decibels.[4]

Susan Narod reports, "If we had a camera that photographed the hair cells when a firecracker goes off or when you are sitting next to a rock band, with the volume coming out at 110 decibels with the big quadruple speakers, we would actually see the hair cells as if they were a field of wheat, crushed down as if some big rollers were going over them."[5]

Couple all this with the fact we have many more cars on the roads and airplanes in the sky and you have to agree with Judy Edworthy who reports, "There is no doubt that environmental noise is a significant problem of our time, and can be classed as a pollutant."[6]

Today millions of Americans suffer from noise pollution which can result in hearing loss and a very important point is that hearing loss is irreversible. Once hearing is lost, it's lost forever.[7]

In its 1999 *Guidelines for Community Noise*, the World Health Organization (WHO) declared, "Worldwide, noise-induced hearing impairment is the most prevalent irreversible occupational hazard, and it is estimated that 120 million people worldwide have disabling hearing difficulties."[8]

Wolfgang Babisch observes, "Noise affects everybody in everyday life - at home, at leisure, during sleep, when traveling and at work. Noise is detrimental to health in several respects, for example, hearing impairment, sleep disturbance, cardiovascular effects, psychophysiologic effects, psychiatric symptoms and fetal development. Furthermore, noise has widespread psychosocial effects including noise annoyance, reduced performance and increased aggressive behavior."[8]

Charles Salter, a San Francisco acoustical engineer who's been in the business 38 years, says people fall into three categories regarding noise: 10% are supersensitive; 30% don't notice noise at all and most folks, 60% find that certain noises cause stress while others go in one ear and out the other.[9]

Studies have shown that children's reading performance is negatively affected by noise exposure. The data for these studies were collected in different countries in 1971 and in the 1990s - two decades apart. The evidence suggests that with longer exposure or higher amplitude noise there is a higher likelihood that noise will affect children's reading.[10]

Noise can even be used as a weapon above and beyond Bob Marley's words at the beginning of this column. In November 2005, the Seabourn Spirit cruise ship was attacked by pirates off the coast of Somalia. A sonic weapon that blasts earsplitting noise in a directed beam was used to help ward off the attackers. The sonic device, known as a Long Range Acoustic Device, or LRAD, is a so-called "non-lethal weapon" developed for the military after the 2000 attack on the USS Cole in Yemen as a way the keep operators of small boats from approaching U.S. warships. The military grade of this sonic weapon is capable of causing permanent hearing damage at a distance of 300 meters.[11]

Sound intensity is measured in decibels (dB); the unit A-weighted dB (dBA) is used to indicate how humans hear a given sound. It's important to note that the decibel scale is a logarithmic scale, and that a doubling of loudness is represented by an increase of 10 decibels.[3]

Ron Chepesuik reports, "Zero dBA is considered the point at which a person begins to hear sound. A soft whisper at 3 feet equals 30 dBA, a busy freeway at 50 feet is around 80 dBA and a chain saw can reach 110 dBA or more at operating distance. Brief exposure to sound levels exceeding 120 dBA without hearing protection may even cause physical pain."[7] Table 1 provides a more detailed breakdown on noise from various sources. When looking at the table, realize that The National Institute for Occupational Safety and Health (NIOSH) lists the definition of hazardous noise as sound that exceeds the time-weighted average of 85 dBA, meaning the average noise exposure measured over a typical eight hour work day.

In the US, about 30 million workers are exposed to hazardous sound levels on the job, according to NIOSH. Industries having a high number of workers exposed to loud sounds include construction, agriculture, mining, manufacturing, utilities, transportation and the military.[7]

Anti-noise activists say that Europe, and several countries in Asia, all because of population pressure, are more advanced than the U.S. in terms of combating noise. Ron Chepesiuk reports, "In the European

Table 1
Counting decibels[7]

Device / Situation	dBA
Grand Canyon at night	10
Quiet room	28 to 33
Computer	37 to 45
Normal conversation	40
Dishwasher	54 to 85
Push reel mower	63 to 72
Telephone	66 to 75
Gasoline to powered push lawn mower	87 to 92
Average motorcycle	90
Leaf blower	95 to 105
Chain saw	110
Average snowmobile	120
Average fire crackers	140
Average rock concert	140

Union, countries with cities of at least 250,000 people are creating noise maps of those cities to help leaders determine noise pollution policies. Paris has already prepared its first noise maps. The map data, which must be finished by 2007, will be fed into computer models that will help test the sound impact of street designs or new buildings before construction begins."[7]

Charles Schmidt adds, "In many developed countries, such as some member nations of the European Union, governments have stepped in to protect citizens from this aural assault with regulations that set maximum sound levels for construction equipment, vehicles and airplanes. Switzerland has gone so far as to prohibit aircraft departures between 11:30 PM and 5:00 AM, except in unusual and unforeseen cases. Yet Americans seeking relief from noise pollution are remarkably powerless."[1] "One reason," says Schmidt, "is the disagreement over its inherent health risks. Establishing causal links between sounds and health risks is challenging, if not impossible. Unlike drugs or chemicals, noise pollution leaves no residue in the body. Therefore, it's difficult to distinguish noise impacts from other similar stressors. Humans are clearly irritated by noise, but their reactions to it are tempered by personality and other idiosyncratic factors."[1]

Australia has an interesting problem. Their work rules say an employee can't be exposed to sounds that average more than 85 decibels a day. That's causing major headaches for orchestras. A performance of *Sleeping Beauty* by the Australian Ballet required four separate sections of horns, strings and so on that worked in relays, adding $100,000 to the cost of the performance. Performers say it affected the ballet as well, since dancers respond to changes in the orchestral performance.[12]

Let's start winding this up with an old riddle presented by K.C. Cole that vividly demonstrates just how noise can interfere with thinking, even when that noise is information. Imagine you are a bus driver. At the first stop of the day, nine passengers get on your bus. At the second stop, two people get off. At the third stop, four people get off, but three new people get on. What color are the bus driver's eyes?

Answer - since you are the bus driver, the driver's eyes are the same color of your own. The rest of the information — in this context - is noise.[13]

Cole sums it up, "Noise in other words, is whatever you don't want to be where it is - whether it's the conversation in the background or the weeds in the garden. It's what you need to get rid of to see what we want to see, to learn what we need to learn."[13]

Two last notes:

Here's another plus for red wine. Moderate consumption of red wine or aspirin may delay the onset of age-related deafness and reduce hearing loss caused by loud noise and some antibiotics.[14]

If you think that you will get away from noise when you reach your grave, you may be mistaken. A German media artist who finds the notion of a quiet grave "idiotic" has recently created an exhibit of vocal tombstones, one of which "moans lustfully" when stroked.[2] P&SF

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