

# RIGHT TO QUIET SOCIETY

for Soundscape Awareness and Protection

# NOISE LETTER

359 - 1985 Wallace Street, Vancouver, BC, Canada V6R 4H4 Phone: 604 222 0207  
Website: www.quiet.org E-mail: info@quiet.org Charitable Registration BN: 11915 4680 RR0001

Spring 2017



## Noise hurts!

### Noisy hospitals are putting patients at risk. Here's why.

We get a lot of complaints about how hospitals work, or don't work, at White Coat, Black Art. You might think that the food or the steep parking fees top the list. But you would be wrong. It's noise. You're driven to distraction, and sometimes literal delirium by rising hospital noise. Since 1960, the average daytime noise level in hospitals has gone up 200 percent. But noise isn't just a nuisance that keeps you from sleeping. Studies have shown that when you aren't rested, you're not healing.

Rhonda Wyskiel is the Patient Safety Innovation Coordinator at the Armstrong Institute for Patient Safety and Quality at Johns Hopkins Medicine in Baltimore. She tells Dr. Brian Goldman that it took a stay in the hospital after the birth of one of her children to really make her empathize with patients who complained

about noise. "I was very sick and I was struggling to sleep and I didn't want to take sleeping medication, because I wanted to be there for my child who was in the NICU (Neo-natal Intensive Care Unit)," Wyskiel says.

Her room was right next to a nursing station, where the laughter and loud talking seemed unrelenting. "It was so upsetting during this time, when I was incredibly stressed and trying to heal...and I realized, I was that nurse," she says. There were occasions when working as an ICU nurse, she found it hard to concentrate, including during critical tasks. "The ventilator was going off, their alarms were going off...and I was so concerned I was going to make an error, I literally had to get another nurse to stand with me," she says on this week's program. "Here I was a very senior nurse, and I couldn't even focus."

Those competing alarms add up to something called "alarm fatigue," says Dr. Peter Pronovost, director of the Armstrong Institute for Patient Safety and Quality. He says "without a doubt" patients have been compromised, and even died as a result of the phenomenon. Part of the problem is that hospitals buy monitors and machines that don't talk to each other. "You would think the most dangerous alarm should get our most attention, but that's not the way we designed them," says Pronovost. He calls it an "alarms race" where manufacturers try to make their alarms the most "annoying and attention-getting as possible."

The result? "Our nurses now answer a false alarm every 90 seconds," says Pronovost. "We've seen clinicians either be distracted by an unimportant alarm...and they've missed a real critical issue." Pronovost, known for creating a vital patient safety checklist, is working with submarine and spacecraft engineers and physicists to re-engineer the ICU. "In every other industry the monitors...whether in the cockpit, submarine or nuclear facility, the alarms are central and they're prioritised, based on what the operators or users of that system say is most important."

He says he'd like to "do for the ICU what Steve Jobs did for the iPhone" and create a fully integrated ICU that hospitals could one day buy and install anywhere in the world. "You'd get that same playlist no matter where you are, like an iPhone." It may be a hard sell to cash-strapped hospitals, but Pronovost says it will save money by being more efficient.

In the meantime, many hospitals are implementing more simple solutions. The Ottawa Hospital began calling patients to find out how they felt about their stay. Debra Bournes, the Chief Nursing Executive at the hospital, says the message

continued on page 2...

was loud and clear. "We kept hearing they couldn't sleep...we thought, we have to do something about this," Bournes says.

They brought down the noise by installing something called a SoundEar. It's a device that measures the decibel level in the hospital. It lights up when noise rises, giving staff a visual cue. Bournes says the feedback from patients has been positive, and staff are more aware of the importance of quiet time. "It's not that anyone is trying to make noise, you just don't really know how noisy it is until you're lying in the bed trying to sleep."

<http://www.cbc.ca/radio/whitecoat/noisy-hospitals-are-putting-patients-at-risk-here-s-why-1.3847486>

## Can't sleep? Neither can this doctor. Here's what he did.

A recent survey found that 40 per cent of Canadians have symptoms of insomnia or a sleep disorder. I'm one of them. Growing up, I would be up much of the night worrying about class assignments, exams and friends. By the time I went to medical school, all that sleep deprivation made it easier to fall asleep. Unfortunately I couldn't stay asleep. Ironically, what often kept me awake was the anxiety of knowing the links between chronic insomnia and high blood pressure, diabetes, heart failure, stroke and dementia. The interesting thing is that sleeping pills can amplify these negative health effects.

"There have been two huge studies in the United States involving a million people," says Dr. David Bradley, a respirologist at University Health Network and an expert on obstructive sleep apnea (OSA). As many as four in 10 Canadians have or are at risk of having OSA. Bradley says the study found that "the ones at greatest risk are the ones who complained of insomnia and less than five hours sleep (per night), who also take sleeping pills. In fact, the sleeping pills seem to be a bigger risk than the insomnia itself."

I don't have OSA, but have had insomnia for much of my

life. Though I've gone through periods of relatively undisturbed sleep, recently, something changed. I would wake up in the middle of the night and hear a strange noise in my house - a low-frequency buzz. I couldn't get back to sleep. I called in acoustic engineers Tony Gambino and Nicholas Sylvestre-Williams to help solve the mystery.

Like astute physicians, they took a thorough history of my noise complaint, and checked all possible sources. "Noise is very interesting, the way it travels," says Sylvestre-Williams. "A lot of people think it needs to be close, but we've been on projects where there's been a pump in a whole other building and it's travelling through the water pipes and it affects somebody in another building. That's not uncommon."

Unfortunately, the engineers didn't find the source of my late-night noise. In fact, they said my house was really quiet. Maybe too quiet. And that gave me an idea. I got a white-noise machine. So far, it's drowning out the mysterious noise, and I'm sleeping better than I have in months.

<http://www.cbc.ca/radio/whitecoat/tired-of-waking-up-tired-here-s-help-1.3855792/>

## Infrasound in mating displays: a peacock's tale

### Animal Behaviour

Volume 102, April 2015, Pages 241–250

Angela R. Freeman, James F. Hare

### **Highlights**

- Infrasonic signals were recorded from displaying peacocks.
- Both male and female peafowl responded to infrasonic signals.
- Male-specific responses included vocalizations to infrasonic signals.
- The peacock's train display is a multimodal signal.

Male peafowl display to females with erection and movement of their elaborately ornamented train. We hypothesized that the male's concave train serves as a radiator of acoustic signals, and thus examined both the production and perception of acoustic signals associated with these displays in Indian peafowl, *Pavo cristatus*. We discovered that male train displays produced infra-sonic signals, which were perceived by both male and female peafowl. Both males and females responded to a subset of infra-

sonic signals by increasing the time they spent walking/running and being alert during playbacks relative to baseline controls. Male peafowl also increased rates of vocalization in response to infrasonic signals, but not to audible train-based signals. The apparent intra- and intersexual salience of these signals suggests that they play a potent role in peafowl social signalling. Infrasonic signals are likely adaptive in the peacock's natural habitat, as they would attenuate minimally as they are propagated through dense vegetation that otherwise would attenuate high frequencies in audible signals and obstruct visual signals.

### **Keywords**

- \* communication;
- \* infrasound;
- \* mating display;
- \* *Pavo cristatus*;
- \* sexual selection.

<http://www.sciencedirect.com/science/article/pii/S0003347215000391>

## The Science of Quieter Cities

**Tired of listening to your neighbour's shoes, the garbage truck, and the sound of car traffic? What if you didn't have to?**

By Emily Badger

Cities sound like cars honking and sirens blaring and trains rumbling underfoot. They sound like the couple fighting on the other side of your kitchen wall and the garbage truck backing up out your window. They sound, generally, chaotic and constantly on. And if you live in one long enough, all of this noise starts to blend into a kind of neutral hum, the urban equivalent of crickets chirping. For unaccustomed ears, though, the sound of the city can be a big, if invisible, barrier to actually moving to one.

"The challenge is to prove to people that living close is living well," says Thomas Jones, the dean of Cal Poly's College of Architecture and Environmental Design. "Noise is a huge piece of that. When people talk about cities, they say 'they're dirty, they're ugly, they're noisy.' And many people are choosing single-family homes even now because they've had terrible living experiences in multi-family housing where they could hear everything everybody upstairs and next to them was doing." There would be little point to cities if we were all sitting in our own hermetically sealed boxes.

This leads, Jones laments, to a serious prejudice against city living. And that impression stands at odds with demographic projections that warn more young people want to move into cities, more baby-boomers want to downsize there, more demand for apartments is coming, and more people want to relocate in close proximity to prizes like metro stops. If all of this is accurate, and even more people will soon be living on top of and right next to each other – while sharing sidewalks, roads and public plazas – could we design better places where we could all live together without hearing quite so much of each other? And just what would that sound like?

These aren't questions only for apartment-dwellers. Obnoxious city noise comes from all around us, moving between buildings and through windows and across congested roads. If we don't tame it, Jones worries, people will never willingly rearrange themselves into the denser living patterns environmentalists say we need. "People think, oh we need electricity from solar panels, we need x-y-z system, we need to use less water," Jones says. "But we absolutely have to make living in denser urban environments pleasant to the senses, or we'll lose the environmental battle."

Maybe it's time to start looking at townhouses and bus shelters with the same acoustic care engineers have long given to concert halls and schools. In doing so, it's possible we could make the city sound not just quieter – but, in a very real way, more pleasant. The global engineering firm Arup (they did the structural design for the Sydney Opera House) has built sound labs in Los Angeles, San Francisco, and New York City, where they're doing some

unbelievable things with urban noise. In the past, an acoustic engineer could tell you, "this sound is about as loud as a major highway when you're standing 20 feet away from it." Or: "This room is quiet enough for two people sitting across a table to carry on a conversation."

In the sound lab, though, Arup engineers can demonstrate and manipulate the noise level, source and character of any sound, in any environment. They can record the blare of a passing train – in real life – and play back in the lab what it would sound like from within your apartment, with your windows closed. "It's sort of magical," says Nick Antonio, Arup's Acoustics Group leader in Los Angeles.

Arup doesn't simply want to figure out how to make things quieter. There are plenty of sounds that people like: birds singing, children playing, trees rustling at night. The real challenge is to baffle the noises people don't want to hear while amplifying the ones they do. With this conundrum comes a myriad of others: How do you keep noise out of an apartment while letting fresh air in? How do you adjust for the aural quirks of the human ear at different decibel levels?

At a given sound level, for instance, people generally get more upset about helicopters than fixed-wing aircraft. And we tend to get more upset – at the same decibel level – about fixed-wing aircraft than auto traffic. We like trains, though, and we'd typically prefer the sound of one to the equivalent in passing cars. "So we can't just mechanically look at a number," Antonio says, "and say, 'this is acceptable or this is not.'"

Take those miserable traffic-calming speed bumps. One of the great ironies behind them is that they generate as much noise when vehicles bash into them as they reduce in the sound of speeding cars. And if you're sitting inside your living room near one, you're more likely to be disturbed by the sudden thwack of a scraping muffler than by the whirl of passing cars that fades into your background city soundtrack (this is one of the problems Arup is working on: designing quieter road surfaces, not quieter speed bumps).

"This is difficult to describe because effectively what we're looking at is a sense here, and arguably it's your second most important sense," Antonio says. "And it's your whole environment from that point of view. You are continually swimming through this sea of sound for your entire life. And you have no equivalent to an eyelid in sound terms. You have no earlid." (You have earplugs, you say? Antonio counters that they really produce a slightly different sound, not the absence of it).

Sight, on the other hand, is a linear thing. Look up from your computer screen, and your eyes can take in as much of the environment as your turning head can handle. But sound comes from 360 degrees around us – and it comes from places we cannot see. "Once we're into this mindset,

continued on page 4...

...continued from page 3

we start thinking about the way that an acoustic horizon is different from a visual horizon," Antonio says. "An acoustic horizon in your apartment goes past the visual horizon – the walls, the curtains – because your acoustic horizon stretches past that window to the cars beyond. It might reach to a new couple next door and their newborn baby. It could reach to the guy above you and his heavy-footed shoes. The acoustic horizon presents us with this inherent tension in cities. You probably wouldn't move to one if you didn't want to be connected to other people. There would be little point to cities if we were all sitting in our own hermetically sealed boxes.

But how do we keep that connection without being disturbed by it? "I suspect this is true of most design: space and the use of spaces is effectively evolutionary," Antonio says. "Where people have issues associated with something, somebody will do something about it. Inside buildings themselves, older, pre-war apartments are generally quieter, as are those that have been built in the last decade. The problematic stuff was really constructed in between. The idea that you regulate acoustics only evolved after we realized we'd built a huge number of buildings which basically didn't work from acoustical privacy," Jones says. "There wasn't an advocacy group out there that said 'we're low income, we're renters, and we don't want to live with this stuff.'"

Federal regulation, and then city building codes, didn't start regulating for noise until the 1970s. Today, the Uniform Building Code provides minimum standards for noise levels between units of multi-family dwellings, although they are lower than people who can afford to pay for solitude would generally put up with. America has some of the poorest standards in the world, Antonio says. Scandinavia has some of the best. But some of the difference is cultural: those strict northern European standards tend to relax heading south into the more proudly cacophonous Mediterranean. (Our noisy American cities also have nothing on East Asia, which has millions of scooters all riding around without the benefit of mufflers).

In America, creating quieter places will be a matter of embracing both earlier building techniques and modern technology. Architect Kathy Dorgan lived for years in a townhouse built in 1888 and recalls hearing her next-door neighbours just once, in the midst of some construction. "If we could do it in 1888," she says, "we certainly could do it today." Some of the solution is just good design (and good materials: brownstone is great at quashing sound). Windows shouldn't be aligned directly across from each other. Buildings that abut noisy roads would do better to put closets and bathrooms facing them rather than living spaces. Greenery – a pretty old-school material – also helps absorb sound, whether from plants on your porch or trees lining your street. This is also part of the reason why Central Park in New York City sounds like such a respite.

More recent advancements – new framing techniques, triple-glazing on windows, wall vents that circulate fresh air while muffling sound – also ensure that buildings that will

go up in the coming years will sound nothing like those from the 1960s. "You could be living next to a freeway," says Oakland-based architect Mike Pyatok, "and all you have is a light show." Many of these improvements have been driven by market pressure. As the prime land in cities disappears, denser developments have been going up on less and less desirable land. Formerly industrial neighbourhoods are converting into high-end residential ones, but those sites are still located next to rail lines and highways. Builders there recognize that wealthy residents won't pay for noise. The trick will be extending advancements born from this market pressure to lower-income neighbourhoods and existing retrofits.

Outside of buildings, some of the noisiest hallmarks of cities have steadily been improving. Pyatok recalls living in a Brooklyn apartment half a block from a stretch of the elevated Myrtle Avenue subway line that no longer exists. Anyone who has lived near an elevated train knows the way its regular arrival rearranges every-day life: "If you're watching television," Pyatok laughs, "you learn to read lips. Most of the more horrendous sounds have been done away with when they can be done away with."

Airports are a big exception. But between those big-ticket noise polluters, and the improved party walls between our interior spaces, some of the most intriguing solutions will touch on the interplay of city sound between the outdoors and the inside, when we have our windows wide open. This is when you want to hear the children in a nearby playground, but not the passing truck. "If you're just designing that building, there's almost nothing you can do," Antonio says. "When we have the ability to provide input into the planning stage, and the holistic design, when we're not just literally plunking a building into a plan with no regard to the acoustic environment, then we can actually start looking at reducing noise and providing a much more pleasant sort of space."

This is when engineers can think about masking traffic with water features, filtering it through living green screens or paving sidewalks alongside roads to produce their own soundscapes. The whole idea here is that we don't have to accept cities as noisy places, that apartments can be private and roads can be calmer and whole neighbourhoods can sound, if not like the countryside, then something more humane. "To just accept the status quo is turning our back on innovation and design," Antonio says, "and why we're doing this in the first place."

Cities have soundmarks, like landmarks. In San Francisco, it's the sound of a trolley bell. In New Orleans, it may be the muffled trumpet of a nearby jazz bar. If we could tune up these sounds and tune down the unwanted ones, it's intriguing to think about what the city of the future would sound like. The main wash of noise in cities today comes primarily from road traffic, HVAC units and aircraft. The Federal Aviation Administration has been working on this last one, and HVAC units are getting more sophisticated, too. "The really exciting one to me is what's happening in road traffic," Antonio says. There are more and more hy-

continued on page 5...

## Do certain sounds make you want to punch someone?

Do certain sounds like loud eating, chewing or breathing, nail clipping, pen clicking or even keyboard typing drive you into a rage? You might have misophonia. It's been described as a hidden epidemic. Misophonia is a sound processing disorder characterized by the experience of negative emotions such as anger, anxiety or even rage, in response to everyday sounds generated by other people. Dr. Philip Gander, a Canadian assistant research scientist in the Department of Neurosurgery at the University of Iowa, and his colleagues at Newcastle University in England, used brain imaging to study misophonia. They found an abnormality in the emotional control mechanism, which causes the brain to go into overdrive in misophonia sufferers when they hear trigger sounds. The new research is published in *Cell Reports: The Brain Basis for Misophonia*. Below is one sufferer's description of his experiences with misophonia and some of the sounds that set him off.

My name is Kevin Horton. I'm 45 years old, born and raised in Toronto, and now live in Newmarket Ontario. I first realized that I had trouble with sound when I was 6 years old. Very specific sounds troubled me, and most specifically, it was the sound of people sniffing. I shared a room with an older brother who I felt was a chronic sniffer and it wasn't just when he had a cold. It just seemed to be all the time and it would throw me into fits of rage and he was bigger than I was so there weren't ways of me physically getting him to stop.

Frequently the response from my parents was to just ig-

nore it, don't let it bother you. It's just in your head. So I used other tactics of mimicking his sounds and just sort of banging on walls and just going through fits of rage, and then subsequently having to just get out of his presence whenever I could. It led to us getting separate rooms. So another sound that annoyed me was the sound of my father walking through the house on hardwood floors with shoes that have a hard leather sole, and just that clicking sound through the house would just set me off. So when I say set off, I mean just inciting rage in me and wanting to get out of the presence of that sound.

And as you get older sounds have a snowball effect where the sounds start to attach to each other and become a larger problem. What started as a boy sniffing morphed over years into probably having 12 or 13 trigger sounds. What ends up happening is it leads to anti-social behaviour. So it's trying to avoid dinner time and just removing yourself from situations where you are encountering people who are making sniffing sounds, chewing sounds, especially people who chew with their mouth open. As I got older more trigger sounds that were similar sounding to sniffing and chewing, such as throat clearing, even typing on a keyboard - that sort of repetitive soft sound - it would start to aggravate me and set me off on this rage.

<http://www.cbc.ca/radio/quirks/chewing-triggers-sound-rage-nhl-vs-concussion-science-and-more-1.3988094/do-certain-sounds-make-you-want-to-punch-someone-1.3988467>

---

...continued from page 4

brids on the road every year, and they present an intriguing opportunity for acoustic engineers. Hybrids and electric cars are practically silent. In fact, they're so silent it's becoming a safety problem. Eventually, designers will have to impose some kind of sound on these vehicles, a prospect that delights Antonio and other acoustic engineers starting to debate this question. "What we effectively have at the moment is a blank canvas," he says. Once we blot out your neighbour's high heels and your building's HVAC, once we put triple-glazing on your win-

dows and quieter paving on your street, the sound of the city is largely the sound of cars. And in the future we could make cars sound like anything we want. How about a fleet of vehicles driving around town, singing just like birds?

(HVAC: Heating, Ventilating, and Air Conditioning)

<http://www.citylab.com/cityfixer/2012/03/science-quieter-cities/1577/>

---

### The Cardiovascular Effect of Musical Genres

A Randomized Controlled Study on the Effect of Compositions by W. A. Mozart, J. Strauss, and ABBA  
Hans-Joachim Trappe, Gabriele Voit <<http://www.aerzteblatt.de/int/archive/article/179298>>

**SUMMARY:** Background: The effect of different musical styles on serum cortisol levels, blood pressure, and heart rate is currently unknown. Methods: 60 subjects were randomly assigned to three groups that listened to various compositions by W. A. Mozart, J. Strauss Jr., or ABBA for 25 minutes. Their serum cortisol concentrations, heart rate, and blood pressure were measured before and after the listening session. The same variables were measured in a control group of 60 subjects who did not listen to music but rested in silence. Results: Music by Mozart and Strauss markedly lowered the subjects' blood pressure, while music by ABBA did not. Similar findings were made with respect to heart rate. There were no such changes in the control group. Serum cortisol levels decreased in all groups. The observed effects were not correlated with the style of music individually preferred by the subjects. Conclusion: Music by Mozart and Strauss lowered the subjects' blood pressure and heart rate, while music by ABBA did not.

## The 22<sup>nd</sup> International Noise Awareness Day will be observed on April 26, 2017

On this day we urge everybody to observe one minute of silence at 2:15 p.m. (your local time) and listen, for heightened soundscape awareness! Please contact us early if you wish to distribute leaflets in your area.

## Ranking roster of noise exposure

### **Metropolitan area residents suffer hearing deficits**

On World Hearing Day, combined with the 20<sup>th</sup> Day Against Noise, April 26, 2017, a company in Berlin, Germany, is to release a ranking of the loudest cities. It shows that among those at an advanced age, big-city dwellers in particular show hearing impairment. Specially created apps are meant to help them.

According to one study, a relationship exists between noise exposure in big cities and hearing loss. On the occasion of World Hearing Day, Mimi Hearing Technologies of Berlin published a ranking of 50 large cities worldwide for which data was evaluated by hearing specialists.

Regarding age, Viennese show the least hearing loss, while residents of New Delhi show the greatest hearing loss overall. The ranking also finds Zurich to have the lowest noise exposure levels, and the Chinese city of Guangzhou the highest. Munich scores highest in Germany; the city ranks among the metropolitan areas with the lowest incidence of hearing loss.

The Berlin company offers apps that inform cell phone users about their individual hearing capacity and adjust the volume of the music to the individual's hearing capacity. In

the development and optimisation of the apps the Charité University Hospital Berlin was involved as well. The study involving data from hearing tests of about 200,000 users regarding noise exposure in cities was evaluated and compared, together with investigations by the WHO and the Sintef research organisation in Norway. On average, persons residing in the loudest cities were found to be ten years "older" with respect to their hearing loss compared with those in the quietest cities.

According to the experts, the data indicate that hearing loss is directly or indirectly influenced by noise exposure at the location of residence. Of course, diminished hearing may also be caused by infections, genetic disorders, premature births or medications, said Henrik Mathies, the company manager. However, the result is considered "robust". Manfred Gross of the Charité explained: "While eye sight testing for most people is routine, nobody cares about their hearing." The sooner a hearing loss is discovered, the better the chances are for the prevention of further damage.

<http://www.n-tv.de/wissen/Das-Gehoer-von-Grossstadtmen-schen-leidet-article19729096.html>

## 35<sup>th</sup> anniversary of the Right to Quiet Society

In 1985 I first became aware of the existence of this quiet organisation and joined. The society was founded in 1982 and quietly worked at generating more public awareness about the detrimental effects all noise can have on our health and wellbeing. Considering that there were only very few people doing what little they could in their spare time, the efforts paid off over time.

Initially, the successes were only local. Ever so gradually, with lots of efforts, we managed to get more media attention and reach the public that way. The work was done with typewriters and copies made with carbon paper. Computers with word-processing programmes were a boon, and when we got a connection to the internet and a website established, we could communicate world-wide in an affordable, efficient manner.

Much has happened around this world since then, and in spite of our efforts, the world got ever noisier. There were many technological developments that helped to muffle noisy machinery and motor vehicles. Modern materials afforded us better sound-proofing of dwellings and insulation of noise generators. Unfortunately, simultaneously with this development came the invention and introduction of ever more noise-emitting gadgets, that merely

serve to satisfy whimsical purposes.

Another exponentially growing problem is addiction to a variety of noises, especially loudly amplified "music". I put the term music in quotation marks, because it is a subjective term. The sequence of any sounds could be interpreted as music, depending on the perception of the hearer. On page 11 of our Spring 2005 NOISE-Letter I wrote about this dilemma.

Dealing with these problems is more and more difficult, since that requires expertise that is expensive and beyond our reach. Even without that, more could be done if more people would get actively involved in our work and help to do the necessary work. Research, writing, web-posting, book-keeping, public speaking, organising educational events for schools etc. would all greatly further our cause and help prevent or reduce unhealthy noise.

In retrospect, 35 years seem to have been a short time, though, the next 35 years will prove to be critical for new members to carry on and continue this important work. It is my hope that more people will appreciate the need for a quieter world and join us.

- Hans Schmid