

## #ACOUSTICS

### Healthiest Noise Level For The Office

Open office spaces also come with a common complaint from people who work in them: Noise



Too much or too little noise in the office can harm our well-being, research finds. The ideal amount is about 50 decibels, comparable to moderate rain or birdsong. "Everybody knows that loud noise is stressful, and, in fact, extremely loud noise is harmful to your ear," says study co-author Esther Sternberg, director of the University of Arizona Institute on Place, Wellbeing & Performance. "But what was new about this is that with even low levels of sound—less than 50 decibels—the stress response is higher."

The study appears in the journal Nature Digital Medicine. Sudha Ram, professor of management information systems in the Eller College of Management, is the study's senior author. Karthik Srinivasan, an assistant professor at the University of Kansas, led the research when he was a doctoral student at Eller, and is the paper's lead author. "When we think about well-being, typically we think about emotional or mental well-being," Srinivasan says. "We hardly ever consider the physiological well-being or the actual what's happening in our body, which is also important to understand when we're continuously exposed to environmental factors such as sound."

A study Sternberg led in 2018 showed employees who worked in open office seating at desks that aren't separated by partitions had greater day-time activity levels and lower stress levels in the evening, after work hours, compared to workers in private offices and cubicles.

But open office spaces also come with a common complaint from people who work in them: noise. With this latest study, Sternberg and her co-authors shed more light on employees' physiological reactions to office sound. The new study was part of Sternberg's larger research project, called Wellbuilt for Wellbeing, in partnership with the US General Services Administration, the federal agency that oversees basic operations for all non-military federal government buildings, including building and buying real estate, managing buildings' operating systems, and managing government-wide re-entry into the workplace amid the COVID-19 pandemic.

To measure the impact of sound on office workers, researchers asked 231 of the agency's employees working in four buildings across the US to wear two devices for three days. One device, worn around the neck, measured sound levels in the person's work environment. Another, worn on the chest, measured participants' physiological stress and relaxation levels, using heart rate variability, or the varying lengths of time between each heartbeat. The chest-worn monitors were designed by Aclima, Inc, which also contributed to the study.

Heart rate variability is a direct result of breathing, Sternberg says. As a person inhales, his or her heart rate slightly increases, and it decreases as the person exhales, causing variability between heartbeats. The more variable the space between heartbeats, the healthier the person is.

"One way to think of it is, the least-variable heart rhythm is a straight line," Sternberg says, referring to a flat line on an electrocardiogram—a sign someone has died. "You don't want that—you want a variable heart rate." The researchers measured heart rate variability alongside environmental sound, then used mathematical modeling to determine how changing sound levels affect a person's physiological well-being. Participants also answered questions sent to their smartphones about how they were feeling at random times throughout the day.

The results show that when a worker's environmental sound level was above 50 decibels, each 10-decibel increase was related to a 1.9% decrease in physiological well-being. But when office sound was lower than 50 decibels, each 10-decibel increase related to a 5.4% increase in physiological well-being.

Humans' tendency to get distracted, Sternberg says, is a result of the brain's stress response to potential threats. Our brains are "difference detectors" that take note of sudden changes in sounds so we can decide to fight or flee, she said. That may explain why low, steady sounds help mask distractions in the workplace, she adds.

Acoustical engineers already take great care in choosing or designing furniture, flooring, wall coverings, and other aspects of spaces such as concert halls, recording studios, and museums. If employee health is a priority, Sternberg says, "There's no reason why these simple interventions can't be installed in office spaces to mitigate sound distraction."



Frederick Gustavus Burnaby.

## What's with the Swagger, Sire?

Frederick Gustavus Burnaby was born in 1842, son of a clergyman from a landed family from Leicestershire, from this background it is hardly surprising that he studied at some of the best schools in the country like Harrow and Eton. At the age of 17 he was commissioned in the elite cavalry unit in England, The Royal Horse Guards. Army life gave him the chance to explore his sporting talents, he was a first rate boxer and held his own in fencing, riding and running. Once his friends as a joke took two ponies to his room in Windsor Castle, the joke soon turned on itself, when they could not take the ponies down out of the castle. With potential disciplinary action hanging over them, Burnaby rescued the situation by taking the ponies under his arm, lifting them and physically taking them out of the castle.



Divij Sharma  
Arbit Correspondent

Education begins the gentleman, but reading good company and reflection, must finish him.  
- John Locke (Pun Intended)

Just a few months ago, alumni of Mayo College of Aimer were ushered in to vote for 'Old Boys' general elections for representation in the Board of Governors at school. Plethora of discussion and intrigues took place, camps got made. Battle strategies were laid and executed. In short it was fun to see it played out from silent, discreet hands to more boisterous execution of these desires. It goes without saying; the power to influence for the selected and elected few is as flaccid as the 'twink' in a striptease show. Before you hang me or plan the guillotine, the constitution for the 'Board' makes the aforementioned clear. Moreover, the flaccidity will recoil further with the due proposed changes in the lingua franca, expectedly, by March this year.

I got me thinking, as Shakespeare wrote, "Who, Calls there, Malvolio?" Readers, the ones not initiated in Mr. Samar Bhaduri's class. Here it goes, Malvolio is a fictional character

## #SOME MEN

In William Shakespeare's comedy Twelfth Night, or What You Will. His name means "ill will" in Italian, referencing his disagreeable nature. He is the vain, pompous, authoritarian steward of Olivia's household. In the play, Malvolio is defined as "a kind of Puritan". He despises all manner of fun and games, and wishes his world to be completely free of human sin, yet he behaves very foolishly against his stoic nature when he believes that Olivia loves him.

I spoke to the old, knowledgeable, stoic and the young, crass, epicurean types of my alma mater and asked "Who, Calls there, Malvolio?" What's with the swagger? Some looked at the question quizzically and explained the finer points of the 'Constitution'. The rest looked confident, and explained to me that the elections are a way to identify the "The Jolly good fellow". "The gentleman at Large". This I was convinced was the right reason to hold the elections. After all, the world never changes enough of them and discovering them is a tedious task. Now! One elected from many, As Adam Smith said, "No society can surely be flourishing and happy, of which the far greater part of the members are poor and miserable. It is with the benevolence of the

the most famous Victorian politicians in general elections, a bestselling author, as well as a soldier!

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This blade was found near the spot where Col Fred. Burnaby was killed.



## World Bartender Day



The bartender might be just about everyone's favourite person on a night out! Bartenders are able to keep people well supplied with tasty beverages - most likely those of an alcoholic variety - at any bar or pub they happen to visit. More than just serving drinks, though, bartenders often offer a listening ear, a bit of information, or even some advice. Some people even consider a bartender to be their unofficial therapist! It's time to celebrate those men and women who work behind the bar. It's time for World Bartender Day!



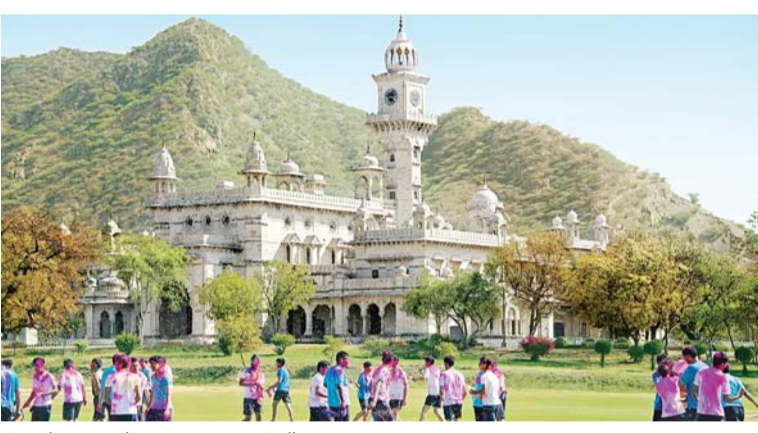
Death of Colonel Burnaby in Sudan while on a rescue mission.

action, but his 'Unit' was stuck in England with ceremonial duties and other boring stuff, luckily being an elite unit. He was entitled for 5 months paid leave every year, this he utilized for his crazy adventures, for example, during his annual leave 1874, he travelled to Spain as a correspondent for "The Times" newspaper to cover the "Carlist" civil war. The very next year he decided to travel to Africa, where he met the Governor of Egypt, General Charles Gordon, with his patronage (the too went to Eaton) Burnaby charted the undiscovered part of Africa, these maps were used by Indian expeditionary forces in World War I and ended up saving the head of the Baha'i Faith from the Ottoman Army, bring laurels to Jodhpur Lancers Aka the today's 61st Cavalry. It is here that Burnaby read an article in the newspaper that fired up the imagination of this 33 year old man.

## The Adventure

The Zarist Russia was planning to start expanding its boundary in Central Asia taking control of the Muslim nations like Uzbekistan and Afghanistan etc. This started the "Great Game"; the Russian empire banned all Europeans from these captured territories. This was like the ultimate challenge that Burnaby could think of but there was a slight problem, his leaves were in the winters and in Central Asia the temperatures could come down to as much as -35 degree Celsius, do think this would down the man who could bend metal bars by his bare hand.

In the winter of 1875 Burnaby took a train straight to St Petersburg, ignorant and naive about going to an adversary's land silently and discreetly. With British sterling in his pocket, he landed in the outer edges of Central Asia, picking up a guide and a servant on the way. He marched toward Khiva. Now imagine a 6 foot something of a man walking towards Khiva in winter with a guide and servant in tow, as expected his fame trav-



Gentleman at large at Mayo College.

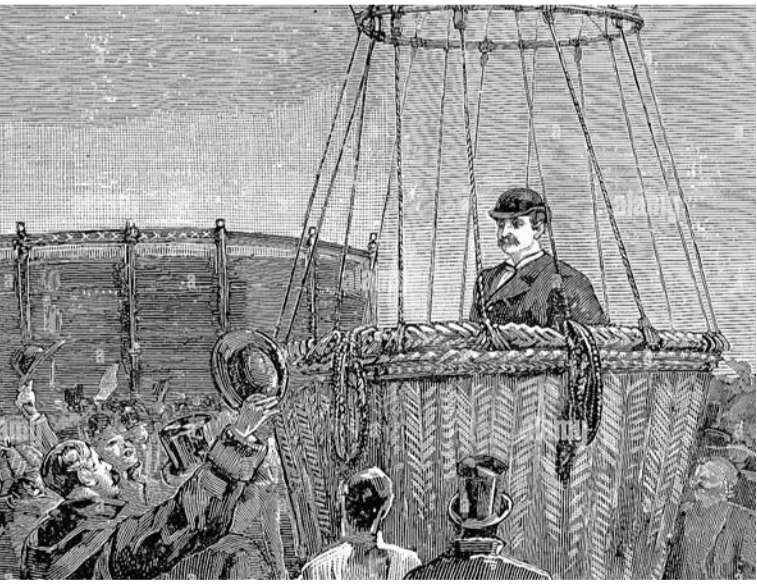
elled far and wide and when he entered Khiva (which was a Russian Protectorate at the time) close to 300 people gathered to see him. He met the Khan of Khiva and spoke to him in Turkish, this impressed the Khan and diplomatic relations got opened between the 2 nations i.e Khiva and Great Britain. His fame now travelled to the commander and chief of the British army Queen Victoria's Cousin, the Duke of Cambridge. Who ordered his return to England, on his return, Burnaby wrote a book called "A Ride to Khiva" that became an instant hit. Here was a real life swashbuckling hero; the Victorian public could not get enough of him. Even Prime minister, Benjamin Disraeli, praised his writing.

The following year, again in the winter with the tensions between the Ottoman Turks and Russia rising as a result of the Bulgaria atrocities, Burnaby again set off on an adventure. This time travelling from Scutari in Constantinople to Erzurum in the Far East of what is now called Turkey. From there he moved up to the Russian borders and observed the troop movements of the Russian forces, informing the Turks through the British foreign office. This 1500 mile round trip on a pony resulted in yet another bestseller "On the Horseback through Asia Minor".

The following winter Burnaby married Lady Elizabeth Hawkins Whitshed who was half his age in 1879. Both Elizabeth and Burnaby hit the party scene like a sledgehammer and made 'Galop' a household name in England (Galop: Originally from France, is simplest of all the couple dances

## ZITS

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Colonel Burnaby ascension to the channel crossing 1880-81 CE.

## FR

Two years after the elections, Burnaby was again in the news. This time for something altogether unrelated, he had taken fancy to "Hot Air Ballooning" and after 12 attempts; he flew from Kent and crossed the English Channel to successfully land in a field in Normandy. Thus, he became the first Englishman to make a solo crossing of the channel in a gas balloon in history. One adventure eluded him all through his career and that was a real military engagement. To gain such an experience Burnaby did what he always did, he took his annual leave in the winter and headed to Egypt to rescue his senior from school, General Charles Gordon from Khartoum.

There in a daring rescue attempt Burnaby was killed in action, along with 99 other British soldiers he was laid to rest in the desert fields of Sudan. When the news of his death reached the whole nation was in mourning. It is said that Queen Victoria fainted when she was told about Burnaby's passing. Poets paid tribute in verse to this all round hero. The most famous being Sir Henry Newbolt:

*The Sand of the Desert is sodden Red,  
Red with the Wreck of the Square which broke,  
The Gatling's Jammed and the Colonel Dead,  
And the Regiment blind with dust and smoke,*

Meanwhile, William McGonagall, who was, at the time, described as the worst poet in Britain made his own contribution.

*Oh! It was an exciting and terrible site,  
To See Colonel Burnaby engaged in a fight  
With sword in hand, fighting with might and main  
Until killed by a spear thrust in the jugular vein*

A 50 ft high obelisk was erected in the honour of Burnaby outside St. Philip's Cathedral.

## Conclusion

It is not easy to be a "The Gentleman at Large" and I hope this is understood by the ones fighting popularity contests, with my daughter now making her way to become proud alumni of my alma mater, I sincerely hope she is greeted by many of the "The Gentleman at Large" with genuine swagger.

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## #OPHIOLGY

### Snakes Can Hear Sound

Because snakes don't have external ears, people typically think they're deaf and can only feel vibrations through the ground and into their bodies.



Contrary to popular belief, snakes can hear and react to airborne sound, according to a new study. The researchers played three different sound frequencies to captive-bred snakes one at a time in a soundproof room and observed their reactions.

"Because snakes don't have external ears, people typically think they're deaf and can only feel vibrations through the ground and into their bodies," says Christina Zdenek from University of Queensland's School of Biological Sciences.

"But our research-the first of its kind using non-anesthetized, freely moving snakes-found they do react to soundwaves traveling through the air, and possibly human voices."

The study involved 19 snakes, representing five genetic families of reptile. "We played one sound which produced ground vibrations, while the other two were airborne only," Zdenek says. "It meant we were able to test both types of hearing-tactile hearing through the snakes' belly scales and airborne through their internal ear."

The reactions strongly depended on the genus of the snakes. "Only the woma python tended to move toward sound, while taipans, brown snakes,



and especially death adders were all more likely to move away from it," Zdenek says. "The types of behavioural reactions also differed, with taipans in particular more likely to exhibit defensive and cautious responses to sound."

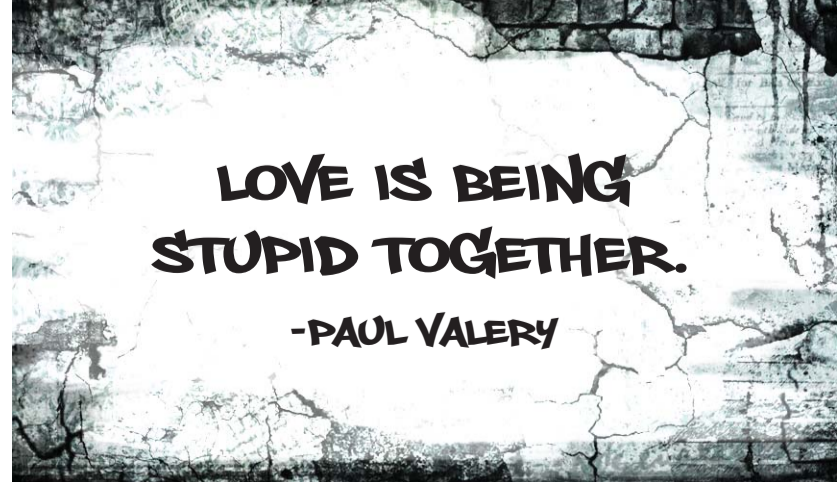
"For example, woma pythons are large nocturnal snakes with fewer predators than smaller species and probably don't need to be as cautious, so they tended to approach sound," Zdenek says. "But taipans may have to worry about raptor predators and they also actively pursue their prey, so their senses seem to be much more sensitive."

The findings challenge the assumption that snakes can't hear sound, such as humans talking or yelling, and could reshape the view on how they react to sound. "We know very little about how most snake species navigate situations and landscapes around the world. But our study shows that sound may be an important part of their sensory repertoire."

"Snakes are very vulnerable, timid creatures that hide most of the time, and we still have so much to learn about them."

The research appears in PLOS ONE. Damlan Candusso, a professor at Queensland University of Technology is a co-author.

## THE WALL



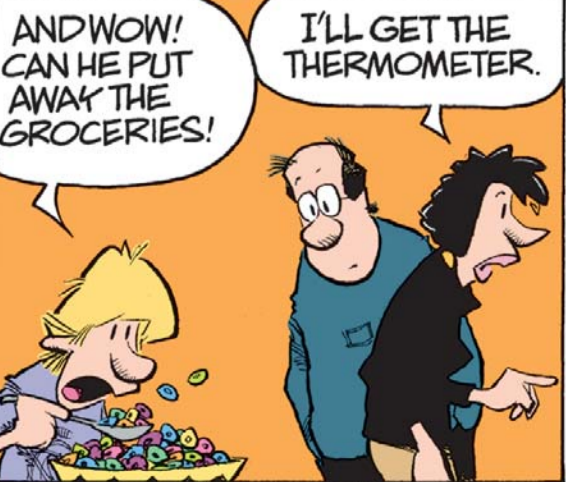
## BABY BLUES



By Rick Kirkman & Jerry Scott



## ZITS



By Jerry Scott & Jim Borgman