

HEALTH & FITNESS

THE SOUND OF SILENCE

Once your hearing's damaged, doctors have long said, YOU'RE PRETTY MUCH SCREWED. But the author was on a mission — and he found that these days, science offers plenty of hope. by RICK BASS

I THINK I KNOW EXACTLY WHEN IT BLEW OUT: AT A concert down in Missoula, Montana. A friend in the music industry had scored front-row tickets for my daughters to hear their latest obsession, and it was almost worth it; when it was over, one of them actually uttered the words, "You're the best dad in the world!"

That part was cool. Less so was the postconcert shrilling that wouldn't go away; it haunted my every waking hour. I made the mistake of going to the internet for my doctoring — tinnitus, the reports said, has no cure, you're fucked — and for several months I trafficked

in increasing despair, unable to concentrate on anything; unable even, it seemed, to breathe.

What's it like? It's like a howl, a drill, a siren with a pitch that penetrates the soft gray matter of your brain and remains inside, so loud that for the first few weeks you're certain that others can hear it, too. For a couple of months it was present nonstop, some days worse than others, but always there: utterly inescapable.

I am far from alone. A shitload of people have tinnitus (the howl), hearing loss (which often follows or accompanies tinnitus), or both. And it's not just Woodstock-going baby boomers, but the iPod gener-

Live like a tribesman.

HEALTH & FITNESS

ation — children and young adults. Sixty-five percent of people under the age of 65 experience some form of hearing loss, including 15 percent of kids between the ages of six and 19. Among 35- to 55-year-olds the percentage climbs to nearly half. The American Tinnitus Association reports that more than 50 million people in the U.S. alone experience some version of my howl. And these numbers are bound to keep growing, mainly because every generation from the baby boomers on down grew up on rock shows, headphones, and loud, amplified music. A number of studies have shown that the now-ubiquitous iPod can deliver as much noise straight into the ear as a full-on concert. Hearing damage is nothing less than a secret epidemic, increasingly isolating the afflicted not just from the natural world but from one another. A study by the Better Hearing Institute reveals that the effects are not “merely” psychological but economic as well; the average household income can drop up to \$23,000 per year as a result of hearing loss.

One of the many disquieting internet tidbits I found told of how some tinnitus sufferers in olden times would pierce their eardrums, preferring to be completely deaf rather than hostage to the maddening wail. One can barely imagine their horror upon discovering that although their hearing was now gone, the tinnitus, the wail, remained.

Science is only beginning to improve on this crude “cure,” but already some progress is being made. A new generation of hearing aids can compensate for hearing loss in specific frequency ranges — and that, researchers are discovering, can help the brain itself adapt to damage in the delicate inner ear. But — and here’s the catch — only if it’s caught early enough. Only if you do something about it. Yet the average person goes seven to 10 years before seeking treatment for hearing problems, according to researchers at Phonak,

one of a handful of companies manufacturing tiny next-generation hearing aids.

And so I did nothing about it, until one day I happened to glance at a streetside window reflection and saw a slump-shouldered, haggard old guy gazing back at me. I barely recognized myself, and I knew then that I had to find a way to fix this.

I MAKE AN APPOINTMENT WITH MY doctor friend Pete, a straight shooter who tells me he too has tinnitus, as does his nurse Jackie — and that, yeah, some days it would damn near drive you crazy. Pete shrugs. “You get used to it, a little,” he says. “I can prescribe some tranquilizers if you can’t sleep.”

Tranquilizers? I’m not ready to be tranquilized; I might as well hit “game over” right now. I go home more desperate than ever, but not willing to give up yet.

I journey over to Glacier Ear, Nose, and Throat clinic, in Kalispell, where I sit in a soundproof room and put on earphones and listen to simple four-letter words, spoken at different frequencies. Although I’m certain I ace the test, I fail pretty miserably: Greed or grief? Goal or gold?

The computer-generated graph exposes my partial left-ear deafness. Dr. Karl Oehrman tells me that’s pretty much standard for a right-handed bird hunter, whose right ear is protected by his scrunched-up shoulder. Still, without ear protection, he says, it would have gotten me sooner or later. I was probably right at the edge for a long time, and the concert was just the last straw.

But it’s not just the muffling of the world that’s so disturbing; in many ways the loss of quietness is worse. I live far back in the mountains, right on the Montana-Canada border, surrounded by wild country and wild creatures that, miraculously, have remained more or less untouched since the last ice age. Entire summer days pass where I hear no sound but the conversations of my family, and the wind

HOW TO SAVE YOUR HEARING

HALF OF MEN AGE 35 TO 55 HAVE SOME KIND OF HEARING LOSS, according to Oregon Health and Science University. OHSU professor William Martin recommends the following preventive steps.

1. KEEP YOUR IPOD VOLUME DOWN You should be able to understand someone speaking to you from an arm’s length away. If you have to pop out one of the earbuds to hear what he’s saying, it’s too loud. (Tip: It’s okay to crank it for your favorite song. Only prolonged exposure causes trouble.)

2. COVER YOUR EARS Sticking your fingers in your ears to muffle loud sounds really does prevent damage.

3. STEP AWAY FROM THE NOISE Doubling the distance between you and loud noise cuts the sound pressure in half.

4. DON’T SKIMP ON HEADPHONES The best ear protection is the one you’re most likely to wear. This is your excuse to splurge on decent noise-canceling earmuffs.

5. DON’T SKIMP ON PLUGS, EITHER Try ER-20s (etymotic.com); they block loud sounds without muffling everything else.

6. BEWARE YARD WORK Wear plugs when you mow the lawn or use power tools.

7. GIVE YOURSELF SOME QUIET TIME Take breaks from loud surroundings to cut the cumulative effect of hearing loss; even just stepping outside of a loud bar makes a difference. —JAMIE BECKMAN



in the marsh, and the calls of birds. What I miss most is not the volume of "true" sound, but this embracing quietness.

My wife and daughters inform me they know when the ringing is really bad because I'm distracted and irritable. So I try to compensate by being ludicrously, falsely cheerful when the howl is at its worst. But I can tell by the way they look at me that that's no better than the edginess.

WHAT I HAVE LOST amazes me; the degree of my squandering is overwhelming. A map of the human ear reveals, if not perfection, then surely a serious attempt at it — all those tiny mysterious parts we memorized in grade school: hammer, stirrup, tympanum, the cochlea — shaped like a snail, with swirling labyrinths and whorls reminiscent of slickrock canyons worn smooth by millennia of running water and desert winds.

Within the cochlea — the fluid-filled chamber in each inner ear that receives acoustic signals and relays them to the brain — lies a forest of upright hair cells. The tips of their stalks, called cilia, wave and sway like eelgrass, constantly seeking out all the sounds in our environment. And I, with wanton disregard for the miracle of my self, have allowed so many of these tiny strands of eelgrass to be slain that all I can hear now is that disconnected wail.

The most interesting explanation I've heard for the cause of the wail is that the dead hair cells are still hungry for sound — that my central nervous system is still firing out commands to listen — but with their tips shorn off or ruined, the hair cells can receive no transmissions, and what the brain "hears" instead is the endless disconnect/reconnect attempts of electricity pulsing out to those severed dead-end circuits, like a computer with a fried modem that keeps trying to connect to the internet.

In the old days it was believed that cell death in the inner ear was generally sound-induced: As the hair cells grew more brittle they became more vulnerable to having their tops sheared off by blasts of sound. But it was also thought that you could lose quite a bit of your eelgrass before it started to be a problem. The theory was that really loud, harsh waves of sound caused tinnitus first, and then, as more cells were shredded, hearing loss.

A new theory of inner-ear cell death is being developed, however, that involves the complex reaction of the hair cells when they're exposed to loud sound. It's possible that the

field of hair cells is simply blown flat, as if before a great wind, and that as a defense mechanism the body shuts down the blood flow to those cells. Cell-destroying free radicals begin to form in such a situation, and for the next two to 10 days, as the blood flow resumes, the free radicals attack and kill the vulnerable cells. (This is essentially the same process that destroys heart tissue in a heart attack.)

The problem, then, is how to repair — or compensate for — the damage? A hearing aid is the obvious solution, so I contact Phonak. Spokeswoman Melissa Barnes tells me I'm fortunate I sought help relatively soon after the concert that triggered my tinnitus. If you wait too long, she says, it's often too late. "Your brain has forgotten how to hear."

Dr. Craig Kasper, co-director of the New York Tinnitus Center, agrees, but says every case is different.

"Everybody experiences tinnitus," he says — all of us have dead cells — but in a healthy hearing system the brain gets the sound it needs and is able to tune out the wail of the dead cells. The thing is, dead nerve cells, whether mown down by the mighty sound system of a country rocker or assailed by the body's own malicious free radicals, don't re-

generate (though there is talk of stem cell research possibly changing this).

Yet Kasper is enthusiastic about rapid advances being made. He talks about various treatments — not cures — such as tinnitus retraining therapy (TRT) and neuromonics, lengthy regimens that involve rerouting sound across that lightning-burnt field of cilia, and trying to find new pathways to replace the old familiar ones my brain once used. He says that listening to surf, and to certain music, can help, as can relaxation techniques.

Sometimes it takes up to 24 months to see improvement with TRT, Kasper warns, but he urges hope. "If I could say one thing — wear ear protection," he says. "People should get their hearing tested on an annual basis." And never give up. "There are always options available. If someone tells you there is nothing that can be done, you have to walk out the door."

That's three things. But I hear him, loud and clear, and I'm strangely optimistic. I've been trying to bear up under it, glorying in the few days when, by whatever miracle, my tinnitus briefly goes away. I marvel at the clarity its absence brings, allowing me to sit and read, or listen to music, especially female singers, whose harmonies seem curative, addressing the higher frequencies that are no longer as available to me. I'm searching for a way to reprogram my brain to take in



Train like a warrior.



sound — the thing Kasper said the brain was still “starving” for — by using whatever remnant cells might be able to cobble a different roadway, rather than persisting in attempting the old burned-out path. In theory, the hearing aid will help transmit sound across those shredded patches and, over time, restimulate my starving brain, so it can hear not only the sounds of our world, but also its silences.

I GO SEE SHERRY CARTER, AN AUDIologist associated with the Glacier clinic, who reminds me of what I already know — that it’s important to not do any further damage — and fits me for a custom-molded pair of earplugs for hunting, which will attenuate loud noise by 36 decibels while still allowing me to hear everything else: the dog panting, the grass rustling, the wind whispering, the cackle of the pheasant as he flushes. I shouldn’t go any crazier than I already am, though some nights I feel pretty borderline.

Also, I’ve got to stop calling the hearing aid, now on the way, a hearing aid. These days they’re referred to as personal communications assistants, because in the near future these pea-size computers will serve as cell phones and e-mailers, map locators, and God knows what all else — world-changing, bionic stuff, but I’d exchange the natural death-wail for anything, no matter how unnatural.

I talk to another hearing expert, Dr. Josef Miller of the University of Michigan, who along with his lead researcher Dr. Colleen Le Prell is pioneering a study aimed at developing a micronutrient potion or pill that can be taken prior to exposure to loud sounds, and even in the days afterward. The nutrients — a mix of magnesium and vitamins A, C, and E — will in theory interfere with the formation of the free radicals that can damage one’s inner-ear hair cells. The experiment has worked on guinea pigs, and a human clinical trial is set to begin this month with some willing volunteers: the Swedish military, whose training includes firing machine guns inside an enclosed concrete bunker. If the micronutrients work on humans, it could rev-

WITH A TINY WIRE STICKING INTO THE EAR CANAL, I CAN HEAR WITH A NEW AND SUDDEN CLARITY THAT IS UNSETTLING AT FIRST.

olutionize hearing protection and reduce sound-induced hearing loss. This is dramatic and fascinating, but when I ask Miller if he has any hopes for curing tinnitus with his morning-after potion, he sighs and says, “Ah, that’s a black box of a mystery.” His and Le Prell’s concoction is only preventive — they hope — not curative.

I should have worn ear protection.

MY PHONAK ARRIVES, AND I drive over to have it fitted and programmed to compress the sounds I can still hear while amplifying frequencies that have been lost. Carter’s thrilled to see this new high-end model, called the Audéo IX, designed to look a little like a miniature Bluetooth headset. The tinnitus has waned that particular day, but once the hearing aid is tucked behind my left ear, with a tiny wire sticking a short distance into the ear canal, I can hear with a new and sudden clarity that is unsettling at first, as it fractures the accreted shell of isolation to which I have become accustomed.

I keep asking Carter to turn it down. She laughs and says that a lot of people are the

opposite, “power hogs” who crave all the decibels they can get. I, however, don’t want to blow out any new developing pathways.

Leaving the clinic I feel intoxicated with the hope of a second chance. I drive west, back toward my distant mountain valley, windows down, reveling in the familiar scents.

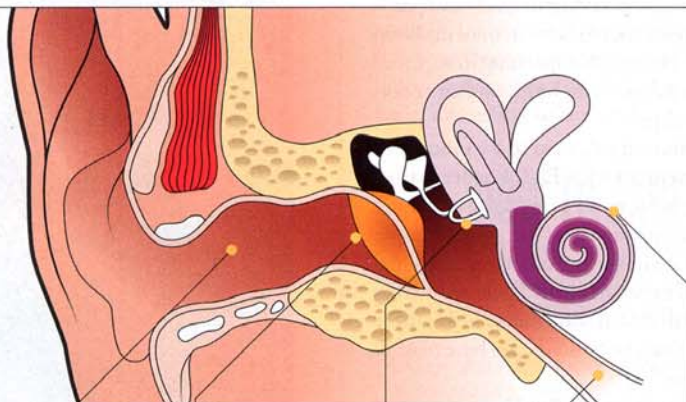
Rounding a bend I am surprised to see just over the ridge in front of me the mother of all mushroom clouds billowing to the upper reaches of the atmosphere, a great thunderhead lined with sunstruck gilding of rose and bronze. The air is dense with the odor of summer sap and lightning-crackle, and the eelgrass of this forest — 45 million trees, easily — is swaying and swirling below me, each feathered and fringed like an undersea frond. Treetops are snapping and swimming through the clouds.

As I drive up the valley in the wake of the storm, the road is blanketed with a carpet of moss and shorn-off green-needed limbs. Some of them are quite large, laying across and blocking the roadway. No one who lives up here travels without a hand-saw, and so I drive over the smaller trees that lattice the road and stop and cut the ones that are too big. Sometimes I’m able to leave the road and drive around a fallen tree, piloting my little car through a meadow, making up a new road as I go, though sometimes I come to a fallen tree too huge to address with my little carpenter’s saw and must backtrack. It takes three hours to get home, but I get there, strangely exhilarated.

I am back in the world, after only five months of being gone. There will be times when the tinnitus returns with a roar — a wave of intense stress, or a too-loud sound, can still set it to singing like a choir of the damned — but not this evening, and not many splendid evenings. 🎧

A GUIDED TOUR OF YOUR EAR

Within the human ear, a few fragile structures ALLOW YOU TO HEAR. by NICOLE CUSICK



Auditory Canal

This tunnel is where sound begins traveling through the ears to the brain. A properly inserted earplug here can reduce noise by approximately 30 dB.

Tympanic Membrane

Otherwise known as the eardrum, this membrane vibrates when struck by sound waves. It can actually rupture when hit by loud noises.

Ossicles

The ossicles are the body’s three smallest bones; they transmit vibrations from the eardrum to the inner ear. One acoustic trauma can fracture these tiny bones.

Eustachian Tube

This tube connects the middle ear to the back of your nose. When your ears “pop,” it’s the tube opening to equalize pressure inside and outside the ear.

Cochlea

This fluid-filled, seashell-spiraled structure is lined with hair cells that trigger nerve impulses as they move. There is no healing these cells once they’ve been damaged.