

THE SOUND OF SNOWFLAKES

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A lone, it has been hours since I heard a human voice. No other sound has rocked my eardrums since morning - no wind, no bird, no squirrel, no jet - just silence. Over the course of a lifetime, serene days of this magnitude can probably be counted on one's fingers. I have only known these special days in winter.

Today, I watch. It took three miles of cross-country skiing to get me to this location. To the south lies an expansive Yellowstone vista of volcanic cliffs probably never touched by human footsteps; to the north frozen waterfalls hang waiting for spring to recommence their cascading journey down the surrounding cliffs; and all around, reverberates the silence or sound of winter. Gray clouds spit minute white snow plates. I listen.

I listen. I listen. Silence! There are ears - my ears - in this forest, but no trees fall to hear. I search, as I have often done, for the sounds of winter. This tranquil day in Yellowstone, another sound teases my ears, a muffled thud of minute proportions, much the same as cotton balls pummeling oak flooring. Thuds resound from my head and clothes. Yet, if I listen, I might not hear them. My eyes verify the origin of the sounds - snowflakes - big fluffy white snowflakes as big as candy sprinkles on a donut.

Each species of snowflake imparts a different soft noise during its frontal attack. Graupel, frozen balls of fused water droplets, sound sharp, hard, and distinct. Fluffy plates sound muffled, like a dropped pillow. Stellar crystals shimmer in your ear.

Snowflakes strike daintily and the brush of an eyelash on a cold winter day can suffocate their audio expression. Yes, eyelashes do make resounding noises when they brush each other or a nearby parka hood. The lesson: to listen to winter, leave your parka hood off.

Have you ever listened to sound in winter? No, have you ever listened to the sounds OF winter? The questions differ only by a preposition; "in" versus "of." The difference though is profound.

Sure in winter, one can hear the occasional chickadee or squirrel proclaiming ownership of its food cache, but these are sounds of other seasons. There are many sounds in winter, but most are sounds shared with other seasons. The sounds of winter are special and speak to us only from the white season. My search for the sounds of winter has been long, expanding to the four winds of the world.

My memory drifts back to a camp in the Dry Valleys of Antarctica, where I watched as the sun swept low around the horizon. It was night, for south of the Antarctic circle the sun does not slumber below the horizon, but merely kisses it on its circular route round the pole. It was quiet - winter quiet. Winter is often immense silence, that almost deafens the listener searching for an audio clue.

Suddenly, tranquility burst with the tinkle of crystal chandeliers shattering. I stood frozen in place, straining to

hear. The chandelier continued to shatter and shatter and shatter. If I listened hard, I scarce could hear, but the tinkling continued. No one else was within 20 miles and most were over 150 miles away, yet, close by, glass was breaking without end.

Puzzled, I ventured near the small pond where we gleaned our fresh water supply and watched. Translucent ice rays shot across small sections of the edge of liquid water. Each new ray froze instantly and another chandelier broke, but so soft that a wisp of wind would have whisked the sound from my ears, never to be heard. Only explorers traversing cold worlds ever hear the sound of ice freezing - a true sound of winter.

The sounds of winter may be hybrid sounds shared with other seasons. Sounds that you can hear in other seasons, but winter imparts a special tone, a special importance. Wind is a sound of all seasons, but a hybrid sound in winter. Winds takes on special significance in the winter, for who can stand unawed at the power of a raging blizzard or the whisper of wind winding its way through winter-bare aspen branches?

The babble of a brook as it wanders among rocks is enhanced when snowbanks guide the flow. Add some ice around the edges of rocks and there is a special snow-framed sound. I cannot describe it, but I know it when I hear it. But this too is a hybrid sound, for brooks babble in all seasons.

Rain, a phenomenon not thought of as a winter sound, creates an audio seasonal hybrid. Twenty years ago, we were camped south of Heart Lake, deep in the interior of Yellowstone National Park. Snow, six feet deep, formed a

foundation for our simple tarps; the night was warm. By morning, I rolled over in my sleeping bag to the sound of sloppy drops hitting nylon and snow. On the snowpack, it was the sickening sound of slush and knowing that we didn't have raincoats. Rain splatters on the ground, but on snow it "splushes," a sound you know when you've heard it.

For three days and two nights, it splushed. We were drenched! The snowpack shrank. We dug a six-foot pit and lit a fire in the bottom. From the pit, we dug individual horizontal shelves into the snowpack for our sleeping bags. The snow would absorb more water than the nylon tarp, keeping us drier. Each morning we wrung out our clothes before putting them on and thanked the sheep who clothed us. Wet wool, a blessing in disguise, dries from the inside out, retaining heat next to the body. The third night it went to -7° . By morning the sound changed, rain-frozen snow under foot and ski.

Perhaps the boldest of hybrid winter sounds is thundersnow, an acoustical event of staggering proportions. First comes the silence of heavy falling snow, perhaps punctuated by wind, but not necessarily. Suddenly, silence is ripped asunder by the boom and roll of thunder; the lightning bolt may not even be visible through the thick snow. Thundersnow is rare, but usually accompanies heavy snowfalls when relatively warm temperatures drop substantially during the storm.

The audio vibrations of winter sounds are isolated in the white season. Isolation brought on by cold, by snow, and by ice. Cold, and frozen water do occur in other seasons, all seasons in the mountains where I live, but their preponder-

ance occurs between winter solstice and spring equinox. Trans-seasonal sharing of cold, snow, and ice means winter shares its sounds with other seasons. To my ear, the purity of winter sound assumes greater profoundness when it occurs between solstice and equinox. Pure winter sounds can occur only under the proper conditions of cold, snow, and ice.

While winter sounds may be hybrid, sharing part of their origin with sounds from other seasons—wind, and babbling brooks. Other winter sounds may be pure, only capable of strumming our ears during the white time of year. Whether hybrid or pure, winter audio is usually a product of frozen water - snow or ice.

Only in the white season can a skier hear the long hiss of a ski breaking new trail or crunching a wind crust. Only in the white season can you hear sastrugi form. Sastrugi is the name for wind-packed snow sculptured into Gothic shapes by a wind cleaver. Often I have lain on alpine tundra, usually after a fall from my skis, and listened to the sand-like scrape of pepper-size snow crystals carving away at the crusted snow surface. It is a muffled rasping sound, punctuated by single flecks of sound.

Like the television weather forecaster, winter sound reports temperature to the veteran observer. When winter days are so cold that nose hairs freeze with each breath, the temperature imparts special tonal qualities to the snowpack. The distinctive squeaky crunch of snow signals approaching footsteps and reveals to the trained ear at least thirty-two degrees of frost, which according to the weather man is 0°. For the wolf, stealth is no longer an option and listeners may hear a raven walking by.

An important subset of the sounds of winter are the sounds of danger. Sounds of nature may be beauty to the ears of the beholder, but be in the wrong place and your impression quickly changes.

Snow carpets on mountain floors often break and slide - an avalanche. The whump of a settling snowpack, as mother nature kicks the wind out of it, immediately elevates the adrenaline level and tells skiers to stay off steep slopes. The running, continuing muffled crack of snow at the headwall of an avalanche questions the judgment of the skier who ventured on to the slope.

The sun was blazing; the winter day hot. We skied in shirt sleeves. The ice of Cottonwood Creek, Grand Teton National Park was level and smooth. We stopped for lunch, spreading out on the frozen stream. Off came our ski boots and out came our lunches. Paradise! GORP washed down by wine from the leather bota.

Then we heard it - a sharp brittle crack, followed by several more. My ears detected water gushing. Upstream, the white snow was turning lead pipe gray. Downstream, blue water. We grabbed boots, skis, packs, cameras, and lunches. Stocking footed, we bolted through knee-deep snow onto shore. Our backward glance saw Cottonwood Creek become a flowing sheet of ice cakes. Safe! Warned by a sound of winter, cracking ice.

Most winter sounds are associated with snow, but not all. Often at night, we hear a splintering, shattering crack. In the morning, a search may reveal a shattered lodgepole pine split from top to bottom. Pine trees tend to freeze and shatter

at -35° , the temperature at which water freezes within its cells.

More subtle, but humanly more important, is the sound of flesh freezing - frostbite. On a quiet night, even with a light breeze, you can hear it. At the instant the tip of your nose freezes, there is a dampened ping. Acting quickly, by placing a warm hand over the spot, will reverse the superficial frost nip. Delay and your body pays for it. Long ago I learned to listen to the winter environment. Lie down with your ear against a hard snowpack and listen. What sounds travel in snow? Might you hear a rodent underneath, the crunch of an approaching coyote, or a deer leg punching through? Are there sounds in the snow you cannot explain?

Snowflakes striking clothes or your head may easily be heard. But what about snowflakes striking the snowpack? Is this the equivalent of the proverbial sound of one hand clapping? No, it is possible to hear snowflakes striking snow, but it takes a keen, dedicated naturalist and the right situation, usually at night. It works best to lie down on the snow with your ear close to the snowpack.

One of the true joys of winter - knowing the sounds of snowflakes - have you heard them?