THE NATURE OF SNOW

An Immersive Experience | Story by Janie Fitzgerald

THE FULL EXPERIENCE / Beyond the Vertical Slice

The Nature of Snow is about how the smallest things in nature are connected to the largest forces on earth.

The beauty and fragility of nature is shown through the wonder of snowflakes and the study of climate science. The interactive piece is joyous and whimsical, factual and scientific, inspired by the photography and life of Wilson A. Bentley and his lifelong search for beauty in nature.

America's first cloud physicist, Bentley was the first person to photograph a snowflake in 1885, the same year the gasoline-powered automobile was invented and the greenhouse effect was first being understood. His study of snowflakes, raindrops, clouds, and atmospheric phenomena was part of the beginning of climate science and what we now understand about what is happening to the planet. Within the project, his discoveries are woven into a larger thread of atmospheric science running from the mid-nineteenth century to the present, asking: how did we get here?

Participants photograph snowflakes through Wilson's camera. A magic lantern projects them enormous into the room. A Weather Machine lets you change temperature, humidity, air pressure, CO2, and particulate matter, showing how each condition shapes the snow crystals.

The experience is photorealistic in its foundations and dreamlike in its atmosphere. Time collapses. A room folds into a starfield. Scale shifts without warning, the way it does in dreams. A transparent room of ice floats in the sky, revealing the land below, Arctic ice fields, coastlines, wind farms, and vast solar arrays, suggesting renewal and restoration.

THE STORY

THE YEAR IS 2058

The story opens in an apartment in the year 2058. Books, antiques, and musical instruments from another era fill the room. The world outside is dangerously hot. Nobody can go outside without a cooling suit to protect them from the heat.

Behind floor to ceiling windows, dead trees stand against a bleached hazy sky. A large wall has screens that run the climate news 24/7. Storms, droughts, wildfires, floods. A breaking news ticker scrolls past: newly released documents show oil companies knew about climate change decades before the public. It has become the only news there is.

Ben Bentley, an eighteen year old musician and an ancestor of Wilson A. Bentley, has always been drawn to the atmosphere, to a natural world he has only seen in photographs. He is fascinated by the way piano notes form cymatic patterns that look remarkably like snowflakes; the same six-sided geometry, the same infinite variation. He has never understood why.

He looks through an old family photo album of snowy Vermont winters from long ago. There is a photograph of Wilson A. Bentley holding his book of snow crystals that he published in 1931.

THE VERMONT LANDSCAPE IN 1885

Ben falls asleep and dreams his way back to 1885 Vermont. Floating up beyond the ceiling in his apartment into the starry night. The stars transform into snowflakes and he floats down in his dream, down into the world where he sees snow for the first time.

An aerial view of a snow scene appears. The snow scene has an old white farmhouse, with animals and trees covered in snow. As he descends, the landscape expands and scales, landing at ground level near a window of the house. Piano music is coming from inside.

WILSON BENTLEY'S WORKROOM

Inside is a chilly old workroom filled with equipment and curiosity. There is an 8x10 camera apparatus with a microscope adapted to it. There are camera accessories, a feather, a metal tray and a pair of mittens. There is a chart with diagrams of piano notes and snowflakes, they look very similar.

Meet Wilson Bentley. He is playing an upright piano. He turns his attention to the camera, adjusting the settings in preparation to take some photographs. He notices you and Ben and says, "there you are. I wondered when you'd come. Come closer, I'd like to show you what I'm working on. I'm making photographs of snowflakes and I've found that no two are alike."

He tells you about how snowflakes form. He says that small changes in temperature, air pressure and humidity affect the shape of the delicate snowflakes. Wilson asks Ben, the way someone asks about a place they'll never visit but care about deeply. *"Tell me, is there still snow in Vermont?"* Ben has no answer. Wilson nods, as if he already knew, and turns back to his work.

SNOWFLAKE PHOTOGRAPHY

Wilson invites you to assist in making photomicrographs and lantern slides, using a feather to carefully position snowflakes under the camera. Once you get it lined up, you hear the shutter click. Youpick up the glass slide and examine it from all angles, seeing

your snowflake pictures up close. You have to work quickly or they melt and you have to start over.

THE MAGIC LANTERN
While making the lantern slides, on a table sits a magic lantern projector. The lantern projects snowflakes onto the wall, enormous and glowing.

Wilson talks about inventions of the year 1885. He tells of the telephone and CO_2 fizzy drinks like Dr. Pepper. He says "Thirty years ago, a scientist named Eunice Foote discovered that CO_2 can actually make the world warmer."

She believed this meant the whole earth could be made warmer by it. No one paid attention. There's a lot of money in burning things. Change the air, you change the snow. Change the snow, you change everything."

He then says *"a new gas powered buggy has just been invented and he's worried the smoke from it might affect the snow and clouds."* He is referring to the 1886 Benz Patent-Motorwagen, the world's first gasoline-powered automobile. A picture of this first automobile appears in the air, like a thought bubble.

When Wilson mentions smoke, the magic lantern suddenly coughs and starts projecting 3D snowflakes (macro) into the room from the mouth of the lantern, creating a field of close up snowflakes that can be touched, they make chime sounds and sparkle. Patches of snow on the ground begin accumulating and then melting.

THE BIG SNOW
The room fills with snowflakes of all shapes and sizes. Snow settles on objects in the space. The snowflakes respond to your hands dancing or melting and disappearing. Wilson takes the magic lantern and waves goodbye disappearing into a heavy snowfall. The snow falls around the viewer and you can see your footsteps left in the snow. As you watch, the ground becomes covered, leaving you in the snow.

THE ICE ROOM
The storm quickly blows away, leaving the viewer standing in front of a small open-air room made completely of ice, large snowflakes drifting through and around the open walls. Touching the snowflakes makes them sparkle and slowly spin and this intereaction transports us into the ice room.

Once standing in the ice room, the room drifts slowly upward, like a hot air balloon. The ice room rises into the sky and we can see the land below opens up in every direction. We are floating above Arctic landscapes, coastlines to wind farms, and vast solar arrays.

THE WEATHER MACHINE
In the middle of this transparent ice room there is a table made of ice, like an ice

sculpture. The Weather Machine is on the table. It looks like a steampunk style machine with dials and levers.

Wilson's voice drifts in,*"Go ahead, you can start where I left off. Nobody else is interested but us, maybe someday in a hundred years they will be."*
"Change the air, you change the snow. "

The interactive levers and dials affect the temperature, humidity and air pressure which change the shape and size of snowflakes. The weather machine also has levers that the viewer can move. CO2 (carbon dioxide) and PM2.5, a soot particle.We see how CO2 and PM 2.5 affects the snowflakes. Snowpack melts into brown and gray. If the levers are moved to reduce the levels of CO2 and PM2.5, the snow becomes restored to a clean natural state. They sparkle and chime.

Above the machine, large snowflakes transform in real time as each value shifts when pulling the levers and dials. There is a chart as a guide for using the weather machine. Example: temperature at 20F and 20% humidity makes snowflakes that look like needles. Around Ben, the words of Ukichiro Nakaya appear: 'Snowflakes are letters sent from heaven.' Ben reads them quietly to himself. The science demonstrates itself.

DATA VISUALIZATION
Climate data is overlaid on the aerial landscapes, revealing the story of a changing planet from above.

Data screens appear in an array that we can browse. They show climate diagrams and charts and visuals including the Albedo effect and the Keeling Curve.

Ben encounters the pioneering climate scientists whose groundbreaking discoveries shaped our understanding of the atmosphere. Each scientist is introduced through photography, period diagrams and documents appearing in the space around the viewer, and text drawn from their published writing, which Ben reads quietly to himself.

Eunice Newton Foote, 1856: her portrait appears alongside a diagram of her experiment, two glass cylinders in sunlight, one filled with CO2, one with ordinary air. Her words: 'An atmosphere of that gas would give to our earth a high temperature.'

Guy Callendar, 1938: his portrait appears alongside a graph showing rising temperatures correlating with rising CO2. His words: 'By fuel combustion, man has added about 150,000 million tons of carbon dioxide to the air during the past half century, and world temperatures have actually increased.'

Ukichiro Nakaya, 1936: his portrait appears with a diagram showing snowflake morphology, how temperature and humidity determine the shape of each crystal. The first scientist to grow artificial snowflakes in a laboratory, proving that snowflake shape is entirely determined by atmospheric conditions.

Charles Keeling, 1958: We see him on a volcano. The Keeling Curve appears, a climbing line of data measured year after year from the summit of Mauna Loa in Hawaii. The reading when Keeling started in 1958: 313 parts per million. The reading today: over 420 parts per million. The line keeps rising.

Ben finally understands. He says, “both snowflakes and sound are shaped by the same forces of physics, temperature, humidity, the atmosphere itself.” The connection between music and atmosphere, between those piano notes and snowflakes, is not a coincidence. It is the geometry of the natural world. And Wilson is the ancestor who shared Ben's obsession, 170 years before him.

Ben is overwhelmed by a sudden information cascade: faces, names, dates, temperature curves, CO2 measurements, satellite images flashing past in a data storm speeding up. The experience shifts from intimate to overwhelming, mirroring how climate science feels: individual human stories of discovery, and then the sheer scale of what was known and not acted on.

RESTORATION
A special data chart pops up with a timeline displaying projections of climate results with CO2 and PM 2.5 levels significnatly reduced. Data screens shows CO2 returning to the important level of 350 ppm (parts per million.)

The screens reflect data for climate being restored to levels from 1885 and show the next hundred years. As restoration or renewal happens, an aerial view of a pristine evening snow scene appears with snow animals and ambient sounds of nature, birds, wind are heard.

The aurora borealis materializes, as the beautiful northern lights become a vivid collision of particles from the sun and the earth’s magnetic field.

WAKE UP
A panoramic scene of the Aurora Borealis over a beautiful winter snow scene. The view descends slowly to the ground. Ben begins to wake up, slowly, still half inside the dream. In that liminal moment, he hears Wilson's voice, quiet and distant: *'Is there still snow?'*

His eyes open. He is in the same room, completely transformed. The windows are open, the air is fresh. Outside, trees are green and alive again. Flowers are blooming. The news reports that the atmosphere is completely restored. Morning light floods the room. Wildflowers pour through the open windows. Whether this restoration is real or part of the dream is left open.