

Tania In A Winter Wonderland



By Kanika G

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Edited by Pell G

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Website:

www.kanikag.com

Fun With Snow

"Mama, look outside. **Mama look! Sonia look!**" The seven year old Tania shouted in excitement, as she looked out of her first floor bedroom window. It was 2:30 pm. She and her family had only just arrived at a cottage in Shimla, that her parents had booked for the winter holidays.

"What's up Tania?" Mama asked, making her way to the window.

"Its snowing Mama." Tania said, unable to tear herself away from the mesmerising sight. It was the first time she had seen the white flakes descend from the sky.

Mama put her arm around Tania and smiled. "It's beautiful isn't it? And everything becomes so quiet when it snows."

Three year old, baby Sonia, was helping Papa unpack in the living room on the ground floor. She came running as fast as her little legs could carry her, as soon as she heard her sister, Tania, call.

"What happened?" Her eyes were wide with excitement, as she entered the bedroom.

"Look Sonia. It's snowing." Tania said, helping Sonia on to the window ledge, so she could see.

"Snow. Snow!" Sonia squealed, trying to reach for it. Fortunately the window had bars on it.

Mama laughed. "Be careful Sonia, and I'll leave the two of you to enjoy the snow, while I go help Papa unpack."

A few minutes later, Mama returned with a tray loaded with two steaming cups of hot chocolate and a plate of *naankhatais*. She found her daughters huddled in a blanket on a large chair by the window, watching the snow. Mama placed the tray on the window ledge and left.

A couple of hours later, after Mama and Papa had unpacked and set up the cottage for their week long stay, they went to check on Sonia and Tania. The

girls had finished their cocoa and biscuits, and had fallen fast asleep, cuddling each other on the chair.

The sun was sinking behind the trees, and pink light bathed the cottage and its surroundings. Mama gently woke the girls up.

"Look out of the window now, girls." She whispered.

Tania and Sonia groggily looked out of the window, but what they saw, made their jaws drop. It had been snowing heavily while they were asleep. Outside the trees were all covered in a blanket of snow, glowing pink in the twilight. Neither of them had ever seen anything so beautiful, and, indeed, as Mama had said, it was very quiet.

They marvelled at it for a few minutes, and then Tania asked. "Mama, Papa, can we go play in the snow?"

"Yes. Of course." Mama replied. "But you need to wear your jackets, caps, scarves, gloves and shoes.

Soon the girls were outside. Tania started making a snowman and Sonia helped her. They used twigs for arms and pebbles for the eyes, smile and buttons. They made him a tin foil hat and used a carrot for the nose.



Just as they finished, Mama and Papa joined them outside.

"I think it's time for a snowball fight." Papa declared. They all started making snowballs and pelting each other, as they ran around the yard. Soon, in spite of the cold, they were sweating and panting.



Mama sat down on the snow to rest. Then she had an idea. "Hey Tania, do you know what snow angels are?"

"Yes Mama. I saw someone make them in a cartoon. Can we make them?"

"Sure, lets do that. Great idea!" Papa joined them.

They lay flat on their backs in the snow and started flapping their arms and legs to push away the snow and make snow angels. Sonia thought it was a hilarious activity, and soon she started rolling around in the soft snow.

After a while, the family trudged back home, but as soon as they stepped in to the house, the power went out. Mama boiled water in a large pot on the stove top, and Papa carried it to the upstairs bathroom, so Tania and Sonia could have a hot bath. Mama and Papa had hot baths too.

Then dressed in their night clothes and warm robes, they returned to the kitchen. Tania helped Mama cut up vegetables to make khichadi, while Papa and Sonia went to the small shed outside to get some firewood. Papa brought back logs for a fire, while Sonia carried a few dried twigs and leaves.

Once the khichadi was set to cook, Mama asked Sonia to fetch a brinjal. Mama made hot brinjal pakodas, while Papa started a fire in the fireplace.

The family enjoyed a tasty meal of hot khichadi and pakodas in firelight. Everything seemed so peaceful until ...

Winter Is Troublesome

The next morning Tania woke up to the sounds of frustration and panic. She had a lovely rest under the warm blankets, that Papa had wrapped her and Sonia up in, so she was most surprised to hear Mama shout "**Oh no! No, no, no, no. Arrgh! Now what?**"

"What happened, Honey?" She heard Papa call out.

"There is no water coming from the tap." Mama complained. Tania had never heard Mama sound so distraught.

Tania ran down to see what was going on. It looked like Papa had just started toasting bread in the fireplace. *Wow! This is awesome*, Tania thought to herself, and went see what was going on in the kitchen.

"Hmm. Do you think a pipe burst last night?" Papa asked turning the tap this way and that. But no water came rushing out.

"That's probably it. The temperature dropped to quite a few degrees below zero last night. We should have left the taps running on a trickle. But what do we do now? How do we have baths, wash utensils and cook?"

"Umm. Mama there is a lot of clean snow lying outside. Can't we just bring it in and melt it in a pot on the gas?"

Mama looked puzzled. "Yes I suppose there is nothing wrong with that. At least we could wash our faces, have our baths and wash a few utensils. Tania, I wouldn't have thought of it, but it is a really good idea."

Papa nodded and smiled at Tania. "I can go to the nearest store and pick up some bottled water for drinking and cooking." He offered. "I'll also drop by on the cottage owners down the street, and see if they can get the pipe fixed soon."

Tania went up to her bedroom to wear warm clothes, so she could go collect snow in buckets for Mama. Sonia had already woken up.

"What are you doing, Tania?" She asked.

Tania explained the situation to Sonia. "I'll come too. I want to collect snow." Sonia jumped out of bed and put on her warm clothes. The sisters took two small buckets and mugs and went to collect snow. It was hard work, but it was fun too.

The family made s grea team. The girls would collect snow in buckets and bring them to Mama. She would empty it in to a large pot and heat the pot as the girls collected another bucket of snow. Mama would put the hot water in to a large bucket and wait for the girls to return with another bucket of snow. When Papa returned with 5 litres of bottled water, he helped Tania and Sonia collect the snow and speeded up the process. So Mama set two large pots on the two gas burners to heat the snow. They all went on, until they had 3 large buckets, 2 small buckets, and 2 large pots, full of hot water.

Once everyone finished their baths with hot water from the melted snow, Mama made oats porridge, and Papa toasted more bread on the fire and spread butter and jam on them. Just then the power returned.

"Typical!" Papa sighed. "But I must say it was fun making toast over a fire, instead of in a toaster for a change."

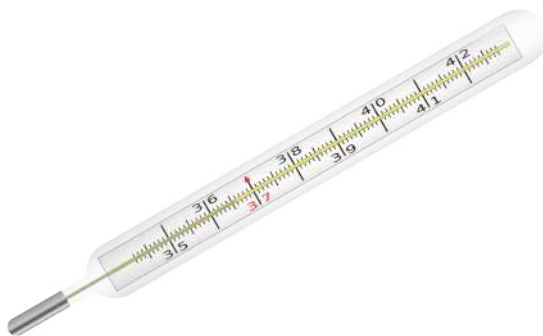
As they ate breakfast, Tania asked. "Why did the pipe burst? You said the cold made the pipe burst. How did it happen?"

"It is because water behaves peculiarly when it is cold." Mama replied. "Did you know, that things expand when they get hot and contract when they cool?" She asked.

"No. What do you mean?" Tania asked.

"If you heat something, the tiny particles in it, get excited and bounce around a lot more energetically, making the thing bigger. So if you heat a metal wire it becomes longer and if you heat a liquid in a container, it rises. For example, in a thermometer, the mercury column goes up with increasing temperature." Papa joined the conversation.

"Oh that's why you look for how far the silver line reaches, when you take my temperature. The silver line is the mercury column, right? The higher my temperature, the longer the mercury column is. Is that right?"



"That is absolutely correct Tania." Papa smiled and ruffled Tania's hair.

"Okay. So why is water peculiar?" Tania asked.

"At most temperatures water behaves normally, meaning the space it occupies increases, when it is heated, and decreases when it is cooled. But something strange happens when water reaches 4 degree Celsius." Mama said.

"Why? What happens then?" Tania was eager to know.

"If you cool a bowl of water at 4 degree Celsius, the space occupied by the water starts increasing slowly, and then it suddenly increases a lot, when it forms ice." Mama explained.

"Oh!" Tania looked puzzled. "Why?"

"Water particles behave like a disorganised crowd huddling together, while ice is like a marching band, where every particle knows its place and doesn't break formation. This tendency of water particles to get organised below 4 degree Celsius, makes it behave peculiarly. When the particles are in formation, there are lots of empty spaces. So, ice occupies a lot more space than water. You'll learn more about it someday but, for now it is interesting to take a look at the effects of this strange behaviour of water." Mama replied.

"Like the pipe bursting you mean? How does this strange behaviour of water cause a pipe to burst?"

"As Mama said, the space occupied by water keeps increasing when it is cooled below 4 degree Celsius, while the particles start getting organised. Ice forms at 0 degree Celsius, when the particles suddenly get in a rigid formation. So ice

occupies a lot more space, than water. In fact, if you start with water at any temperature, the space occupied by the water, is less than the space occupied by the ice formed by cooling that water. That is why ice floats on water. This is called the anomalous behaviour of water. Anomalous means unusual or abnormal." Papa chimed in.

"So Tania, can you figure out what happened in the pipes last night?" Mama asked.

Tania thought for a moment. "Last night, since it was very very cold, the water filled up in the pipe at 4 degree Celsius. Then, when it got even colder, the water started occupying more space, putting pressure on the pipe. Since the taps were closed the increased volume of water could not get out. Oh! I see that's why you said we should have left the taps on a trickle. Okay, so, when the water froze, the ice needed to occupy a lot more space, making the pressure too much for the pipe to cope with, so it burst. Is that right?" Tania asked, her eyes shining .

"Yes. Quite right, Tania." Mama nodded impressed.

"But if the pipe walls were trying to push on the ice and make it smaller, should it not have become water again?" Tania wondered.

"That is very astute Tania. To some extent that would happen, but then if it was too cold, it would still freeze and burst out of the pipe." Mama said thoughtfully. Then she looked at Papa. "You know, there is an experiment we could do, to show Tania, that what she is saying, makes a lot of sense."

"Yes." Papa agreed. I'll go see if I can find some thread." Papa stacked up the breakfast dishes and went to look for thread. Everyone had finished breakfast and Sonia, not too interested in the discussion, had started playing with her blocks.

"And I'll go get an ice cube." Mama put the dishes to soak in the sink, with some water left from the melted snow, and went to the refrigerator.

"What? What are you two talking about?" Tania asked, bewildered.

"Just you see." Papa winked returning with a roll of black thread from the sewing kit.

Water, Ice, And Magic!

Or is it science?

Mama placed the ice-cube on a flat coaster on the table, and Papa placed the thread on top of the ice-cube. He stretched the thread across the top surface of the ice-cube and applied a downward pressure with the thread.

"What are you doing Papa?" Tania asked.

Papa was focussing on the experiment, so Mama answered. "You remember you asked why the ice does not melt back in to water when the pipe pushes on it forcing it to be smaller."

"Yes. And you said it does to some extent."

"Yes and this experiment will show you that. Papa is pushing down on the ice-cube with the thread, forcing that thin strip to be smaller, and so the ice there will melt. Once it melts, the thread will go in. But once the thread goes under, the water above it no longer has any pressure on it and it will refreeze in to ice. This is called regelation."

"Oh so will the thread be caught inside the ice-cube and stick out of the two sides?" Tania asked.

"Yes. That's exactly it." Mama replied.

"So will it look like a necklace made of thread with an ice pendant?" Tania asked.

"Why Tania, you do have a wonderful imagination. I had never thought of it that way, but that is exactly what it will look like." Mama clapped Tania on her back.

As if right on cue, Papa sang out. "Taa-daa!" He was holding up a necklace of black thread with an ice-cube pendant. Even Sonia was excited, and came running to examine it. She begged to be allowed to wear it. Mama and Tania laughed as Papa fit the necklace on Sonia.



"Ouch! Oooch! Cold, cold cold." Sonia danced around, and Papa removed it. Sonia frowned at the ice necklace, and then went back to play with her blocks.

"It's sad though, that water is one of the few substances to behave that way. If it were not for this strange behaviour of water, pipes would not burst in cold places and inconvenience the people living there." Tania lamented.

"True, but this anomalous behaviour of water makes it possible for fishes and other aquatic animals, living in ponds, and lakes to survive the winter in very cold places." Papa pointed out.

"How so?" Tania's frowned trying to figure out the reason.

"You remember, I told you that ice floats on water, because of the anomalous behaviour of water?" Papa asked.

"Yes." Tania replied and waited.

"So when a lake or a pond starts freezing in cold weather, the ice floats on top. Once the lake is covered with floating ice, the ice forms a barrier between the air above it and the water below it. Since the cold air can't come in contact with the water, it cannot cool it much." Papa continued.



"But isn't the ice super cold?" Tania raised her eyebrows.

"Yes the ice is cold, but not as cold as the air above it. So under the layer of ice, the water remains liquid and the fishes and other aquatic life can survive, instead of getting frozen. The ice acts like your sweater. Just like your sweater helps you stay warm, the layer of ice prevents the water below from freezing, strange as that may sound." Mama chimed in.

"Oh that's nice." Tania was relieved. She really did love all animals. "Isn't it amazing how nature works, and how almost everything has an upside and a downside, including the anomalous behaviour of water?"

"Yes nature is quite amazing." Mama agreed.

"And learning it's many secrets one by one, is a very exciting part of growing up." Papa added. "But now I think it's time we went out and enjoyed what nature has to offer in winter."

"Where are we going?" Tania asked

"Just you wait and see". Papa refused to say anything else.

Winter Sports

An hour later, warmly dressed, the family arrived at a large open frozen space. "What is this place?" Tania enquired, watching people slide around on the ice.

"This is an ice skating rink, Tania" Mama replied.

"Oh! I thought those were indoors." Tania was puzzled.

"They, usually, are, but in winter, Shimla has a large outdoor natural ice skating rink. It is the largest one in south Asia! They put water in this flat contained area, and it freezes because of the cold." Papa explained. "Loads of people come here to skate in winter. Come on. Let's try it out."

"Try it out? How? We don't have ice skates." Tania objected.

"We can rent them." Papa said, delighted.

Papa rented ice skates for Mama, Tania and himself, and for Sonia, he brought a large plastic support, that she could hold on to, and push along on the ice, while she walked. Sonia was thrilled.

Mama and Papa had a hard time staying vertical. They kept falling, and that really hurt on the ice, but Tania picked it up pretty quickly. "It's because you know how to roller blade." Papa called out and gave Tania a thumbs up. "It requires the same sense of balance, so just use your roller blading instincts and you'll do great."



Tania enjoyed herself immensely, and at the end of an hour Mama and Papa managed to slide around a little without falling. They were starting to get the idea too. Tania helped them out. She couldn't believe she was teaching her parents how to do something. It was a strange, but pleasing, experience.

Sonia fell a few times too, but it seemed to amuse more than upset her. She was short and her support was quite steady, so she was mostly enjoying herself, and people were kind enough to give her a wide berth.

Tania saw a man spinning on the ice. He had his arms spread out and was spinning slowly. Then he pulled in his arms in, and started spinning faster.

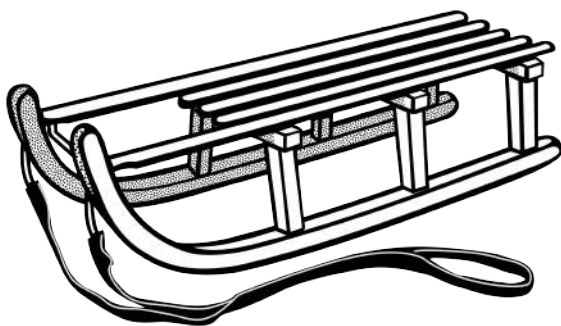


Tania remembered seeing it on TV, but it was so much more amazing seeing a person do that right in front of her. It had something to do with angular momentum in Physics, Mama had said then, but Tania hadn't really understood. Perhaps she would ask Mama again later, but right now, she was having way too much fun sliding around and teaching her parents for a change.

That evening, Mama and Papa were aching all over from their many falls. But, at least, the pipe had been fixed by the time they returned, and with the electricity back too, they all had long hot baths in the tub. Mama and Papa felt much better after that. Tania took charge of dinner, since she had only fallen a couple of times. She made hot vegetable soup, with very little help from Mama. She served it with buttered toasts. Papa grilled some sausages on the fire. It was a great meal.

Over the next few days, the family went for long walks on roads lined with cedar and pine forests on both sides, shopped on the Mall road for pretty wooden bracelets and necklaces and beautiful shawls. They tried skiing and sledding. Tania and Sonia particularly enjoyed tobogganing downhill. They had a marvellous time.

On the way back, the family took the Kalka-Shimla train, which goes through a 102 tunnels and over more than 800 bridges. Chugging through the snow covered land scape was a magical experience. Tania declared, that it was her best holiday ever.



I must agree. Her holidays are always so full of fun and exciting adventures, and yet, somehow, they keep getting better too. I wonder where Mama and Papa will take her next. I hope they invite me to join them next time.



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