

# THE TALE OF JULIE BROWNTAIL

BY BENJAMIN SCOTT

# The Tale of Julie Browntail

*Or, How Bones Become Strong*

Benjamin Scott

Union University Printing

Jackson, Tenn.

Copyright 2022

One fine day when the air was turning colder and the leaves were falling from the trees in the forest, Julie Browntail was a little distracted in Miss Rufa's science class. Normally, she was a very attentive student, but today she was thinking about her grandpa's injury the month before.





Grandpa Browntail had declared that day he wanted a pinecone for supper. He set out for the old familiar pine tree and climbed up it but, as he stretched for the snack, he slipped and tumbled down to the forest floor! When he tried to stand up, he realized he had broken his hip.

The doctor had said he would need several weeks of rest to heal.

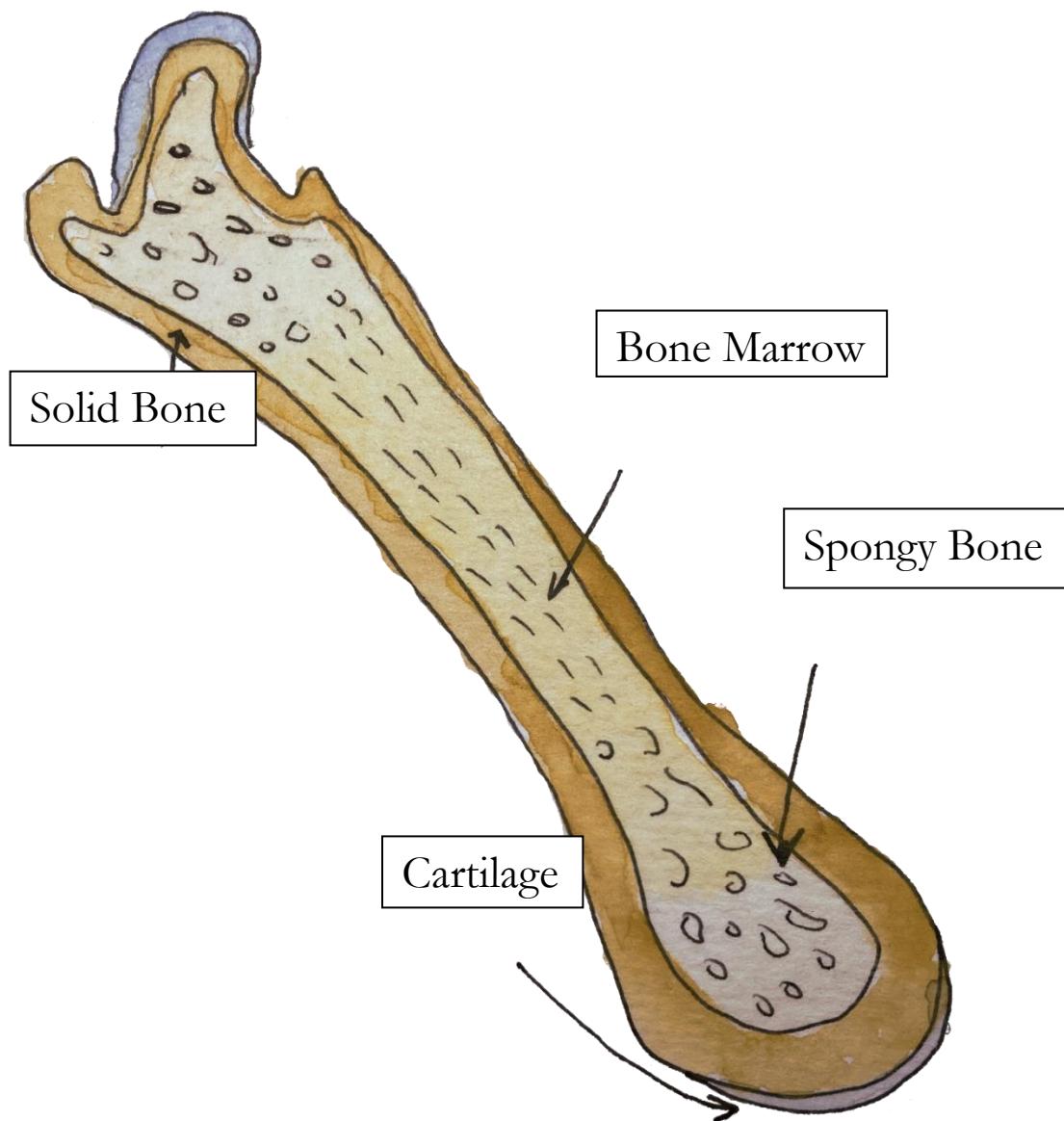
Julie didn't understand why her grandpa had broken his hip when she and her brothers fell out of trees all the time without hurting themselves.





Suddenly Miss Rufa called on her. “Julie, what are you daydreaming about that is more important than squirrel anatomy?” she said. Julie blushed and replied, “I was thinking about when my grandpa broke

his hip falling from a tree. Why do old squirrels break their bones so much more than children do?"

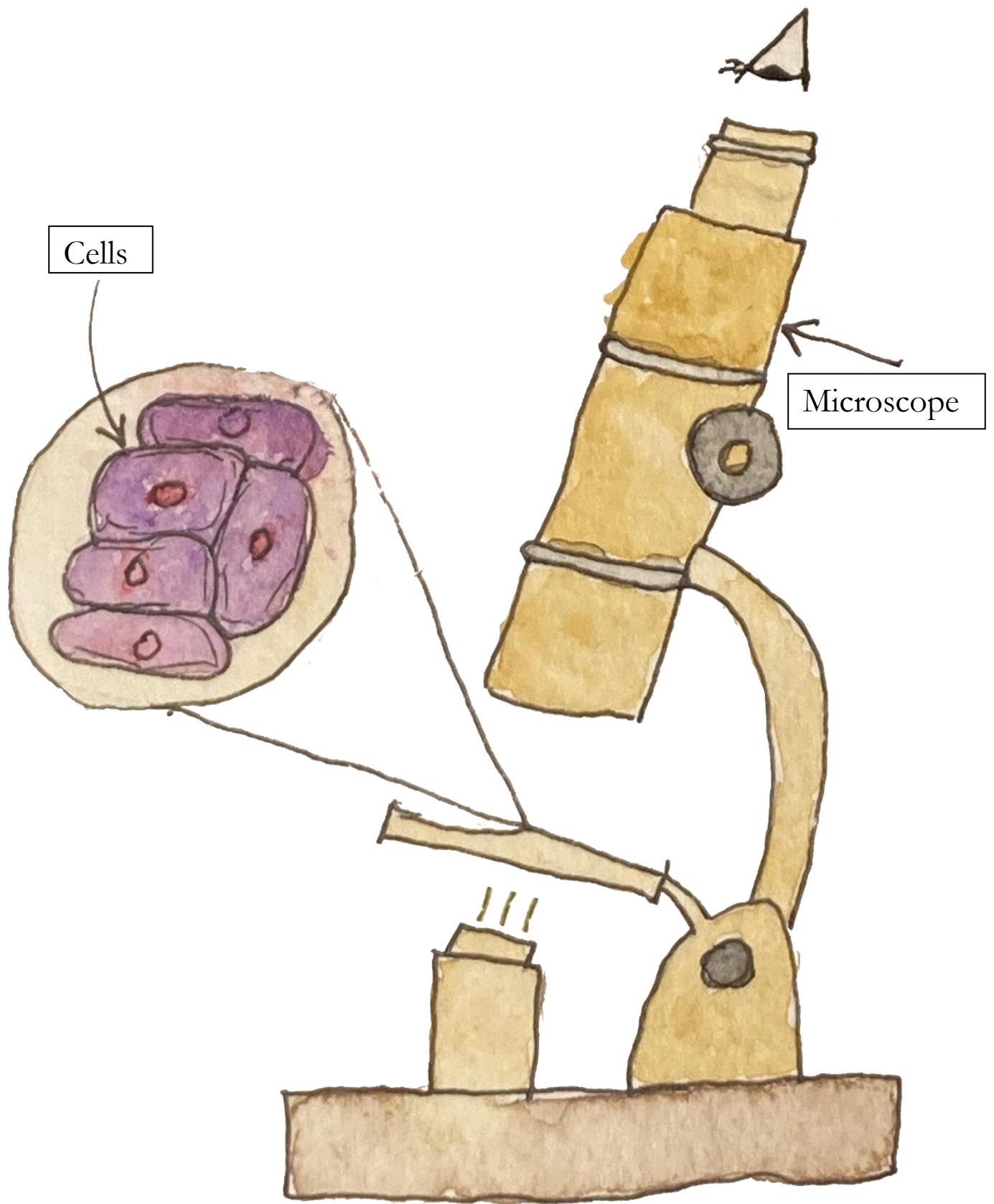


“That is an excellent question, Julie!” Miss Rufa said. She walked to the classroom closet and returned with a model leg bone carefully cut in half. She showed the class that the outer edge of the bone was very solid while the inside looked like a honeycomb. “When squirrels get older the holes in their bones get bigger and their bones become less strong,” she explained.

Then Miss Rufa dismissed the class to recess. Julie stayed behind to ask more about why bones become weak. “But *why* do the holes get bigger and *why* do the bones get less strong?” she asked.

“I am glad you are so interested!” said Miss Rufa. “Let me explain.



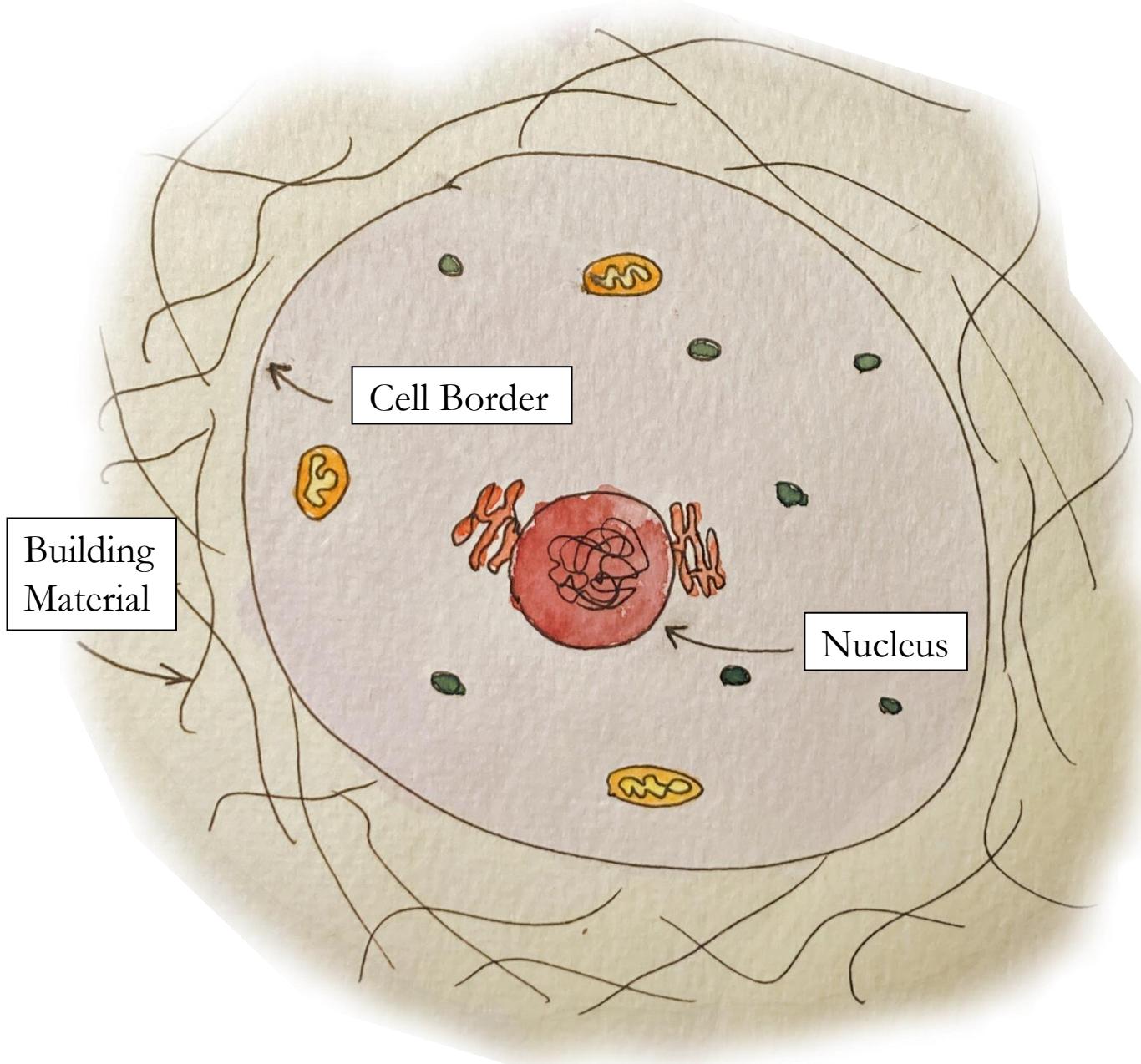


“Do you know what cells are?”

“Yes!” replied Julie. “Cells are the building blocks that make up every animal. You cannot see them without a microscope.”

“Very good!” said Miss Rufa. “There are many different types of cells in your body. Some form your skin; others form your bones or your brain. All of them help you live and grow.

“Though your cells have differences, they also have a lot in common! They have a cell border to protect themselves, a nucleus that contains their genes, and they produce materials for your body to grow,” Miss Rufa explained.



“Wait,” said Julie, “I don’t know what genes are.”

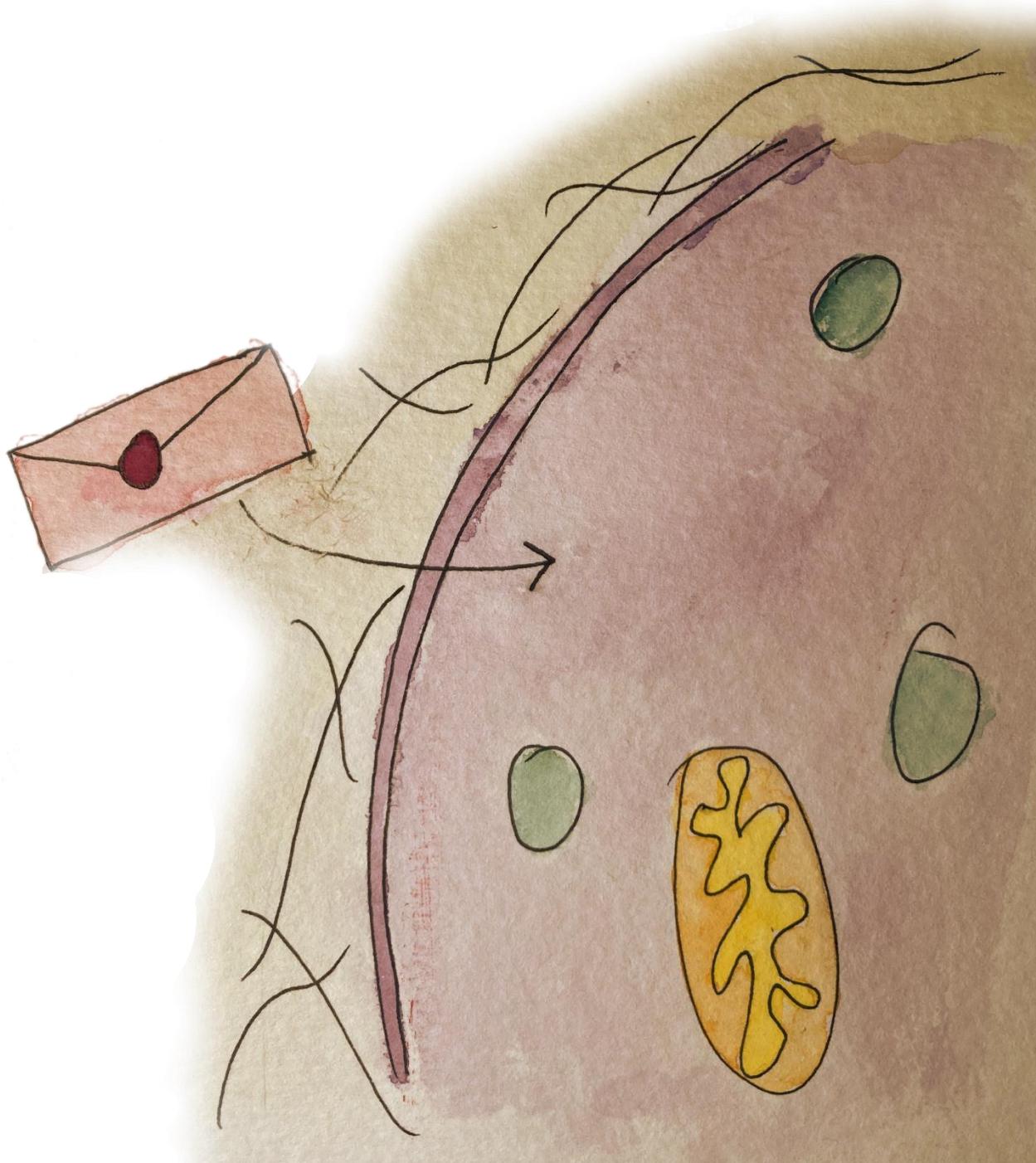
“Oh, yes. Sorry,” Miss Rufa exclaimed. “Genes are bits of information in the cell’s nucleus that tell your cells what to do. Genes control what you look like and what messengers and materials your cells make.



“For example, my fur is red and yours is brown because we have different genes!



“Some of your cells produce a messenger called testosterone, which travels through your blood to every cell in your body to communicate with them. In general, testosterone tells cells to get bigger and stronger.





“Both male and female squirrels make testosterone, though males make more,” Miss Rufa continued. “Young squirrels make a lot, while your grandparents don’t make as much. Testosterone helps us build strong bones and muscles.



“The bone cells work hard like busy beavers to build strong bones. But they cannot work constantly, or your bones would get too big and lumpy. So, messengers like testosterone tell the bone cells when to work. Without testosterone, they don’t build more bone.

“The bone cells respond to the message from testosterone by producing more of the materials they use to build more bone and by growing bigger and living longer.”



“But Miss Rufa,” Julie Browntail interrupted, “What about when squirrels are old?”

“Well,” replied Miss Rufa, “when squirrels are old and their bodies are not making as much testosterone, the bone cells stop working so hard. It’s like they retire!”



“And when the bone cells stop working hard, bones get weaker and thinner and sometimes they break too easily. That is what happened last month when your Grandpa Browntail fell out of the tree. It’s a part of getting old,” Miss Rufa finished.

“And now he has to rest until his broken hip heals,” sighed Julie. “Thanks for telling me about why bones get weaker as squirrels get older.”



“It was my pleasure!” exclaimed Miss Rufa. “But now I think recess is over and it is time to start the lesson again.” She rang the bell and Julie’s classmates scampered back inside from recess.

After school Julie climbed a tall tree and picked a pinecone.

When she got home, she gave the pinecone to her grandpa. Then she snuggled up beside him and told him all about what she had learned in class.



“I love you, Grandpa Browntail!” Julie said. “I love you too, Julie,” he replied.

*The End*

# Acknowledgments

Thank you to my Endocrinology professor, Dr. Bowen, who encouraged me go beyond the requirements of the class.

I would also like to thank my friends Katie Beth Dowling, Collette Truitt, Malachi Gorga, and Lydia McGinnis for their support. And a big thank you to my parents for their excellent suggestions!

