

The Adventures of Antimony



The Adventures of Antimony

The Girl who Lost her Parents,
Ventured to a Distant Land,
Defeated the Evil Fairy Princess,
and Saved her Family.

by Brian Mearns

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Thanks, and I hope you enjoy the story!

-Brian

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*We must go boldly forward,
thoughtfully,
but without trepidation.*

Chapter 1

The Clever Baby with the Metal Voice

HEN Antimony was born, her mother called her “Antimony”, which worked out well as that turned out to be her name. Of course, her mother didn’t know her name was Antimony at the time, she called her that because her eyes were gray and lustrous, the color of tin, and her voice, when she cried, was the sound of two pieces of metal, which shriek when they embrace¹.

Fortunately for her mother and father, and anyone else who happened to be in ear shot, Antimony did not cry too often, and even less so when she was a bit older and learned to express her needs with words instead of cries.

But babies and small children, even those with cries like shrieking metal, are generally rather dull except to their parents and perhaps a few other people who love them. For the

¹ Antimony is the name of a chemical element which looks somewhat like tin. It has atomic number 51 and the chemical symbol *Sb*.

sake of the story, we'll skip ahead to when Antimony is old enough to be interesting to those who have not met her.

* * *

Antimony was a clever girl, and her father told her that often. But he also told her that being clever requires practice, and so she practiced being clever as often as she could. Whenever someone had a stubborn knot to unwork, Antimony was always eager to lend a hand, which was being helpful and was good practice at being clever. Soon she became very good at tying and untying knots and was often sought out by those who knew her to help with a tangle.

Antimony practiced being clever in other ways as well. Her father often posed puzzles for her to solve, and she always solved them, even if she had to work for days to find a solution.

"What would do," he asked one day when they were walking through the market, "if you had a wolf, a sheep, a cabbage, and a boat, and you had to get them all across a river, but there's a catch..."

Antimony waited anxiously for her father to reveal the catch to this particular puzzle.

"And the catch is that you can only fit one of those things in the boat at a time."

Antimony thought about it for a second. "Well I can't leave the wolf alone with the sheep," she thought aloud. "because wolves eat sheep. And I can't leave the sheep alone with the cabbage, because sheep eat cabbage."

Her father smiled proudly at her.

She continued. "So the puzzle is how to get all three across without anything eating anything else."

They continued through the market as Antimony pondered this latest ponderment. As they approached the fruit stand—with the little fat Italian man with the big black mustache and the twinkling eyes who always let Antimony have a strawberry or an apple or some cherries—she threw up her hands triumphantly and shouted "Eureka," which is a word her mother had taught her for when she has a sudden insight.

The sudden gesture took the little Italian man by surprise and he dropped the arm load of apples he was carrying. The tart green fruits skittered across the ground and Antimony and her dad knelt down to help him collect them. Antimony had to crawl under the cart to get an apple that had rolled away.

When the apples were safely back in their crate, Antimony's father looked expectantly at her. "It's so obvious," she declared. He waited patiently for her solution. "Wolves can swim, and cabbage leaves float. So I would put the sheep in the boat, tear up the cabbage and build a little raft out of leaves, and just float it across the river. And the wolf can swim along the side of the boat."

"Ha!" bellowed her father emphatically, clapping her proudly but a little too hard on the back, which he sometimes did when she did something so clever that he forgot how small she was. "What a clever young girl you are," he gloated. "A remarkable girl."

"Am I right? Is that how you would do it?"

He looked down at her warmly, his eyes glowing. “No, that’s not how *I* would do it, because *I* never thought of doing it that way². But that doesn’t mean you’re not right. I suppose some day we should get a boat, a wolf, a sheep, and a cabbage, and test it out.”

Later on, he refined the problem so that the water was moving too swiftly for the wolf to swim, or for the cabbage to float, and Antimony had to work out another way to get the animals and the vegetable across without losing anything, which she did after working on it for a few hours.

* * *

Antimony’s mother also gave her puzzles and helped her practice being clever. Antimony and her mother were often clever together in the kitchen, concocting elaborate recipes and outrageous desserts. Antimony’s mother was a wonderful cook and a brilliant mathematician, and she taught Antimony how to be clever with fractions.

“Numbers are still numbers whether they’re on the top or the bottom of a fraction,” her mother explained one day as she lined up the measuring cups on the counter. She picked up the half cup and the quarter cup. “Four is still twice as many as two,” she said, “but since they’re on the bottom, it means we have to split up a whole into twice as many portions.”

²The solution her father was thinking of is to bring the sheep to the other side and leave it there, then go back and get the cabbage. Swap the cabbage for the sheep on the far bank, and then swap the sheep for the wolf on the near bank. Lastly, leave the wolf and cabbage on the far bank, and come back to fetch the sheep.

“So each portion will be two times smaller!” concluded Antimony excitedly. She and her mother continued to play with fractions all afternoon. First they made a half-batch of cookies, so they had to make all of the portions two times smaller by doubling the numbers on the bottom. Then they made a triple batch of soup and had to make all the portions three times bigger by tripling the numbers on the top. Then they made one-third of a batch of brownies, which was tricky because they didn’t have all the right measuring cups, so they had to approximate. The brownies tasted terrible, but Antimony and her mother had a lot of fun making them.

Antimony and her mother were also very clever at making toys from things they found around the house, which were always Antimony’s favorite toys to play with. Bottle caps, and pieces of paper, and scraps of old fabric, and paper clips, and pieces of broken old toys made great materials for collage. When Antimony was a little older, her mother showed her how to put different pieces together with tape, or glue, or nails, or screws, to come up with something brand new. Old bobbins from the sewing machine were excellent for making cranes and pulleys, and almost anything could be cut and glued or worked in some way to add to the wooden doll house her mother made her in the workshop.

When Antimony was a bit older and a bit brighter, and had better control over her fingers, she started being clever with little mechanical puzzles: nails bent into loops around each other that you had to separate; joined rings that could be unjoined if you worked them just right; puzzle boxes with sliding panels that her mother made for her; and anything

else that she could play with and fidget with and practice being clever with.

One of the things she fidgeted with was an old padlock her father had given her that he lost the key to. It was old and rusty, and probably not very safe for a child to be playing with, but it was damaged enough that she was able to pry the back off with a flat-head screwdriver and look inside to see how it worked. Inside the lock, she could see the tumblers and pins moving up and down, and the little fence which would have to move in order for the lock to open. When Antimony thought that she had a pretty good idea of what was supposed to happen inside the lock, she used an old paper clip and a screw driver to pick all the tumblers and open the lock.

Chapter 2

The Ship with the Golden Flag



OF ALL the ways in which Antimony was clever, one of her favorite ways to be clever was having adventures. She had many of them, sometimes even with her parents. Once on a hike through the woods, the three of them had an adventure in which the Squirrel King's acorns had all been stolen by imps and Antimony and her parents had to find the imps and get back the acorns. Another time, on the beach, Antimony's father helped her build a terrific castle made entirely of sand and they had an adventure of defending the castle from the Seahorse Army which attacked with the rising tide.

Many of these adventure's took place in their imagination, but that was okay, because her father explained that the imagination is a very important place where your brain can works things out that are difficult to understand in the real world.

At the rather young age of ten years old, Antimony began

a rather large adventure which was not in her imagination at all and which, you may have guessed, is the focus of this story.

It began on a sunny Sunday afternoon in autumn, which was Antimony's favorite season because the air was so crisp and clear and the leaves on the trees began to paint themselves with the most beautiful colors they could muster. In solidarity with those leaves, Antimony had adorned herself in the most beautiful yellow dress she had in her closet, and her favorite pair of lovely purple shoes, even though purple wasn't a very autumnal color.

Her dress up was for the sake of a walk she took with her parents along the waterfront, where all the boats come to load and unload freight and cargo and passengers and supplies and all manner of fascinating sea life. This inspired Antimony to have a new adventure in her imagination, one in which the great flopping crates of mackerel and cod and other fish were prisoners of a terrible war between the kingdoms of the land and the kingdoms of the sea. Antimony had been tasked with negotiating a peace between the two mighty forces, a prestigious role to which she was well suited.

Madame Ambassador was quite occupied with hammering out the details of a cease fire with the delegates from the Lobster Republic when she heard a commotion from a short distance down the pier. She looked up to find the pier was quite abandoned, all the fishermen and sailors and other people of the sea having retired to their cabins, or local pubs, or the open water.

The commotion continued from the other end of the pier:

Antimony heard the indignant gravel cries of her mother, and the stern lumber yard consternations of her father. Her head whipped around and her eyes landed on an indistinguishable tussle of shadows occupying a location on the pier where the low autumn sun cast everything in silhouette.

Antimony forgot about her dealings with the lobsters and leapt instantly to her feet, landing with her legs already moving. But her young stems were as yet quite small, and could not carry her half as fast as she wished to be carried. None the less, they did everything they could, and a bit that they shouldn't, as Antimony raced towards the quarrelsome noise.

As she got closer, she began to discern figures amongst the shadows, though it was still quite hard to keep track of them as they tugged and jerked and ripped and struggled. Two of the figures made themselves apparent as Antimony's parents, most often in the center of the mass but occasionally breaking free and reaching what might be called the border of the amorphous blob. Antimony eventually counted five, or possibly six other figures—great bulky figures, in great bulky sailor's sweaters—who were surprisingly, but unmistakably, assaulting Antimony's parents and struggling successfully to drag them away down the pier.

Antimony's legs were quite small and pathetic compared to the hulking limbs of the five or six wicked sailors, but she had the advantage of only having to move her own small body, instead of her own and those of two struggling grown ups. She closed the distance to the melee and had soon caught up to it. Immediately, she began pounding her small fists into the bulk

indiscriminately, hoping not to hit her parents, but focusing primarily on simply delivering all of her energy into the mass in order to split it up.

Only the mass didn't seem to notice, and it wasn't until she began kicking at shins that one of the big sailors reached down without even looking and swatted her away like an irksome gnat. His great ham fist landed like a sledge hammer on Antimony's slight frame and sent her hurling through the air. She landed with an ear splitting crack on the weathered old deck boards, and simply laid there stunned for several seconds.

By the time she was back on her feet, all she could do was stand with her mouth hanging open as the five or six burly sailors carried her still fighting parents up the gangplank and over the side rail of a grand old wooden sailing ship. Antimony cried out as her parents were dropped roughly onto the deck, and gasped as one of the sailors rudely pulled the plank on board.

Antimony raced to the edge of the deck, and briefly considered lunging after her parents, but the gap was formidable and the drop to the water below treacherous. She stopped abruptly at the edge of the pier and had to dig in her heels to keep from flying right off.


Standing alone on the soggy wooden planks, Antimony whipped her head frantically left and right and all over searching for some way to get herself onto the ship, but there were no long planks, no ladders, no ropes with grappling hooks that she could find. She cried out for help, so loudly and so desperately that even her own ears burned with the sound of

metallic abrasion.

Without any permission from Antimony, the ragged cream sails were hauled up the masts, and the rusty, barnacle coated anchor was raised up from the briny depths. Before she could get her head around anything at all, the ship was cast off and making it's way away from the pier, away from Antimony. Through tearful eyes, Antimony stood on the dock and watched the antique vessel sail away with the only life she'd ever known, and the last thing she saw before her eyes were drowned in a salty ocean of tears, was a shimmering gold flag flying boldly from the main mast.

Chapter 3

A Harrowing Voyage across the Sea

 AT THIS point it seems appropriate to take a little break and notice that our story occurred in the past, which you can tell because so many of the action words end in “-ed” or take the kind of forms you use when recounting how you spent your summer vacation, like “did”, “had”, and “was”. This is worth noting because, with high probability, stories that occurred in the past also have endings which occurred in the past, which means we can know what those endings are, as is the case with this story.

So I'll take this opportunity to tell you that this story has a very happy and pleasant ending, at least with regards to Antimony and her parents and all the other characters we will come to care about, and perhaps even a few we shant care about at all.

I don't think sharing this information now takes away from the story, since all good stories have endings which

are happy and pleasant for the heroine. And I hope you'll agree, even though it's very early yet and the plot has only just begun, that this is shaping up to possibly be a rather good story. And at any rate, even if it turns out to not be a very good story, even if it turns out to be a rather poor story (in which case I apologize in advance), you can at least rest assured that it will not be so poor as to have an ending which is unpleasant or unhappy for the heroine or her parents. You can therefore focus your energies on wondering about important things, like how Antimony manages to stay safe and how her parents come to be rescued, instead of if she stays safe, and if they come to be rescued.

With that said, we get back to our story, of which we've only missed a small and insignificant trifle:

... should have billowed steadily in the wind, but instead they whipped about angrily and bound up the mast and slapped and wrenched and tugged at the lines like they wanted to break free. And because of their actions, Antimony began to cry, slumping over the gunwale and sobbing into the choppy sea, so sad she was that her parents had been parent-napped and that she couldn't even muster this little boat to follow the big Ship with the Golden Flag across the sea and save her parents.

The tears streamed down her soft cheeks and dripped over the edge of the boat, adding more salt and more water to the already briny and already wet waters of the little bay, and she thought about other times she had cried.

Like when she was learning to ride a bike and she fell and scraped her knee and cried because it bled so much and that

scared her. Then her father told her that sometimes blood gets spilled and it's nothing to be so worried about, it's just your bodies way of delivering the healing cells where they're needed most. And then he bandaged her knee to help with the healing, kissed her forehead with his rough, dry lips, and asked if she was ready to try her bike again.

But Antimony was afraid to try her bike again, and he told her that it was alright and reasonable to be afraid, but that she shouldn't let that cloud her judgment, and he helped Antimony imagine her life if she did or didn't ever learn to ride her bike and she judged that it sounded better if she did, and so she did, and her life was better for it.

And once in the kitchen, when Antimony devised what she thought would be a very clever recipe for a cake which she wanted to make for her mother's birthday, where instead of using baking powder, she would use paprika so the cake would be all red and beautiful, and instead of eggs and milk, she would use eggs and orange juice because everyone knows that orange juice goes better with eggs than milk does.

Only the oven, or maybe the cake pans, or maybe something else, didn't agree with her and the cake wasn't a cake at all, just a red-orange pile of flat, burnt, and soggy mush. And when the timer dinged and Antimony opened the oven and carefully pulled out the oven rack and saw what had happened, she cried because she had been so excited about her clever recipe, and because she wanted so badly to surprise her mother with a nice birthday cake, and because it had taken so much work and she was very tired and now she had nothing to show for it, and because anyway she didn't even

have a present to give to her mother now.

And when her mother found her standing in the middle of the kitchen staring tragically into the open oven at her disastrous attempt at a birthday cake, the first thing she did was turn off the oven and the second thing she did was scoop her up and hug her and kiss her and coo her and shush her and tell her that it was alright and that it wasn't a waste at all because she had learned some very useful lessons about baking and that she shouldn't be upset at all that her experiment didn't work out because most experiments don't work out and that's how people learn things and that's how progress is made, and then the third thing she did was scold Antimony for using the oven without permission, and almost cry a little because Antimony could have been badly hurt and maybe because she caught a little bit of crying from Antimony.

Staring into her broken reflection, Antimony suddenly stopped crying. Well, mostly.

"Enough, now," she thought. "Look at yourself, sobbing like a child. Nows not the time for being a child, you've got parents to save."

She sat up and wiped her snotty nose and rubbed her leaking eyes and sniffed and snorted and blinked a few times and looked up at the sails, still whipping about like a toddler throwing a tantrum.

"This is not arbitrary," she thought insistently to herself. "This is science." And although she didn't know much about the science of wind or the science of sailing, she knew that science followed logic, and the world followed science, and so

these sails and this boat and her journey across the sea which would be powered by the wind and the sails, must follow logic.

So Antimony watched the sails as they whipped about in the wind, and studied the many ropes and lines and pulleys suspended and hung and dangled from different parts of the boat, and after several minutes of quiet contemplation, she began tugging on some of those ropes and lines and watched to see how the other lines tightened and sagged and shifted and tugged back and how the sails responded to all of this and how the wind effected it all and after some time, she felt like she was starting to get a feel for how this all worked together. Enough, at least, to get the sails mostly billowing in one direction, and get the little boat making some definite progress in a particular direction, which happened to be the direction in which the Ship with the Golden Flag had sailed.

Hello—Narrator here, again. Please excuse the interruption, and I promise this will be the last, but it feels important just now to point out that this is a story, and so it's reasonable that in this story, Antimony should do some rather remarkable things for a girl of her tender years, remarkable even for a girl as bright and as clever as all that. That is, after all, the point of a good story, to remark on remarkable things. It would be a rather dull and rather poor story if nothing at all remarkable happened, so poor in fact that it would probably have an unhappy ending, which we've already established this story does not.

So if you find yourself unable to do some of the remarkable things that Antimony is able to, don't feel badly about it. Some things—like sailing, and picking locks, and baking

cakes, and tricking dragons—are very difficult and complicated things and it may not be reasonable to figure them out on your own. But, as Antimony will soon learn, sometimes the cleverest thing is to learn from someone who already knows things.

Okay, enough of that, you didn't start reading this story to get advice from a lowly narrator. Back to the story now, of which we've hardly missed any at all.

...soon had the sails billowing nice and steady and the little light boat, with its disproportionately large sails, was making swift progress in pursuit of the Ship with the Golden Flag, and at times, when the winds were favorable, even made gains on it so that it mostly grew closer and closer the further they sailed.

* * *

Just when it started to feel like Antimony and her little boat were getting reasonably close to the Ship with the Golden Flag, and like Antimony might after all be able to see her parents again and perhaps, if she was terribly clever and perhaps even a little conniving and a lot brave, rescue them from the five or six wicked sailors, just when Antimony started to feel a bit hopeful—just at that moment the terrible ocean winds began to whip the seas up into something that might reasonably be described as a frenzy.

The little boat began to rock and bob in the waves, and if that wasn't enough, the clouds in the sky grew bigger and darker and ever so menacing, and at last began to leak and drip and drizzle and finally pour outright, so heavy and so

drenching that Antimony could barely see the bow of her own little boat, let alone the Ship with the Golden Flag.

If Antimony actually did know anything at all about sailing, she would have known to trim her sails, bring them down all together, so the wind would have less to grab on to in ravaging her little vessel. Alas, as has been stated, Antimony didn't know anything at all about sailing, and her sails were left up, for as long as the wind would let them, which wasn't long.

Antimony and her little boat were whipped and tossed about the raging seas, and all she knew to do was hold on tight to the boat and cry and cry and cry into the dark night. It was a long and harrowing night for our little adventurer and there were many times when Antimony fully expected to be drowned under the crashing waves, or dashed to pieces against a rocky shore or even the walls or mast of her own little boat. Sadly for Antimony, she had no reason to assume that she would make it through her endeavor intact, and she was forced to spend the night in utter terror. Fortunately for us, we know that Antimony makes it overall safely to the end of the story, and so we can skip over the dire details of that stormy night to the point where she is knocked right out of her boat, very nearly but not quite drowned, and finally washed up onto a sandy and deserted shore.

* * *

As you may know from other stories, when one is nearly drowned and washed ashore onto a sandy beach, one tends to loose consciousness and has to wait for an indeterminable


amount of time before coming to. When Antimony came to, she found herself soaked and alone in an unfamiliar place, covered in wet gritty sand and more than a little bit of seaweed.

Looking around, she saw her little boat had also washed up, just a short distance down the beach, miraculously in one piece, at least mostly.

She looked about some more and found that the beach was rather narrow, just a few yards of open sand, and beyond that, the sand cut off abruptly in a dense, shadowy forest.

Chapter 4

Antimony's First Night in the Forest

NTIMONY knew very well that a forest could be a dangerous place, but the forest at the edge of the beach was rather more flagrant about it than she cared for. The image of a forest she kept in her head hid its many dangers behind the bright colors of poison arrow frogs and the furry majesty of Bengal tigers. The forest before her seemed to display its danger right out in the open, with its deep sinister shadows, its mysterious haunting calls, and its ominous spindly trees.

Antimony supposed there was probably some virtue in being so frank about ones dangerous side, but it didn't make her feel any better about venturing into the wood. She'd have preferred to stay the night on the beach, but it appeared to her that the tide was coming up rather quickly and there may well not be any beach left before much time had passed. Defying the shadows and the spindly trees, ignoring the mysterious calls and keeping her eyes out for imminent threats,

she hiked up her pretty yellow skirt and marched her lovely purple shoes forward across the loose sand of the beach, and into the loose top soil of the forest.

* * *

Inside the forest, it didn't seem so scary. Not quite so scary, anyway. Antimony considered the shore the safest place to be for the moment, but wanted to make sure she was far enough away that she wouldn't wake up to find herself drowned by the rising sea, so she forced herself to go far enough into the woods that she could feel confident about that. Even so, this was a strange land she could tell, and maybe their tides act differently than back home, tides being such tricky things as it is, so she would have to keep her eyes out in case it decided to encroach further than she supposed.

The first thing she decided to do was build a fire, which her father had taught her how to do on their many camping trips. Antimony and her mother and her father used to love to camp, though never in quite such a remote place as this. Still, the lessons she learned there must certainly apply, at least mostly.

Antimony found sound dry twigs, and some rotting crumbling logs, and some leaves, and bark that looked a lot like the birch bark they had back home, only with strange red and gold coloring. She gathered some larger sticks, and then some even larger sticks, and finally some small logs that would keep the fire going longer once it was hot enough to catch them, and she set to work building and starting a fire just like Father had taught her.

The work was good to focus on to keep her mind off her troubles—especially once she was done gathering the wood and no longer had to wander around so much—and in no time at all she had a small fire going, which turned into a bigger fire, and then an even bigger fire, and then a fire which was a bit too large and she had to poke at the logs with a long stick to move them about the right way so that it would settle down. Finally she had an appropriate fire that would burn brightly but not too fast, and that would keep her warm, but not too warm.


The next order of business was shelter, which would be tricky without tools or ropes or anything at all. Daring a little ways away from the fire, she gathered many long branches that she could lean up against a very low branch and construct a type of shelter called a lean-to, because covering herself from above was the most important in case it started to rain or thunder or snow or some other such thing, and because sometimes dangerous things fall out of trees like heavy fruits or hard nuts or poisonous spiders or even droppings from birds and other animals which she didn't want to wake up to find herself covered with. When her lean-to was big enough for her to lay down under, she gathered up lots of large leaves and some mud and used it to cover her lean-to and fill in the worst cracks and openings to keep more things out.

She wished she had a sleeping bag or a mattress or even a cot to sleep on, because creepy dangerous things creep across the ground as much as dirty dangerous things fall from the trees. But she wasn't fortunate enough to have any of those things, and she thought that it would have been clever to

collect some things off of the boat that might prove useful, but she had not been feeling very clever after nearly being drowned by the storm, and now the rising tide had carried her broken little boat far out to sea. So Antimony used a fallen branch to sweep some debris out from under her lean-to, and then found a very large leaf that was just about big enough for her to lay down on if she curled up very tight, and so she did and fell asleep quickly, but not very well, and spent a fitful night dreaming about parent-nappers and terrible ships with golden sails, and creepy things that crept across the ground, and dirty things that fell out of the trees. When she woke in the morning, she was even more tired than when she had fallen asleep.

Chapter 5

Antimony's First Day in the Forest

HE BREAKING light of dawn brought a small but not insubstantial amount of reassurance to our lonely heroine. She had made it through the night, without suffering any rain, or snow, or storm, or droppings from the trees or even, as far as she could tell, any creepy crawly things creeping or crawling over her. But there was still much to be done.

Antimony was eager to find and rescue her parents, but she forced herself to acknowledge that in order to do that, she would need to keep herself safe, and strong, and above all else, alive, or she'd be no good at all as a rescue party.

The first thing was fresh water, she knew that much. Food was important, and she would need it soon enough, but not as soon as she would need fresh water. Fortunately, she had learned some ways to track down fresh water, assuming there was any to be found. For one thing, birds and animals need fresh water, too, so Antimony kept her eyes open for

animals tracks or birds in flight or other signs of animals congregating in one place. Second, water always runs down hill, so Antimony kept to low lying areas where water was most likely to collect. Lastly, lush green plants and swarms of insects usually indicate nearby water, so Antimony kept a look out for those indicators as well.

It took a few hours, in part because Antimony was feeling quite sluggish from lack of food and water, but eventually she found her way to a small pond lined by mossy stones, and fed by a small babbling brook trickling down the rocky face of a mountain. She cupped her hands and drank the cool mountain water, and when she had drunk her fill, she sat down on a sunny rock and even managed to sleep for a short while, waking up feeling slightly refreshed and somewhat ready for adventure.

In her travels looking for water, Antimony had come across a variety of exotic looking plants, but none that looked familiar to her. Her stomach rumbled and roared with hunger, but she knew better than to risk poisoning by eating unfamiliar plants, at least before things got really desperate.

She decided that what she needed was a more strategic position from which to survey the land, perhaps then she could get a better idea of where to look for food. The mountain down which the stream bubbled didn't look too steep or treacherous, and she imagined that a nice high vantage point could only be of benefit, so she gathered up her wits and the hem of her yellow dress, and began hiking up the mountain.


The hike was long but quite dull over all. Antimony was tired and sweaty, and made slow but eventual progress up

the mountain, falling and scraping her knees a few times, but making it to the top more or less unharmed.

At the top of the mountain she could look out and see for a great distance, but what intrigued her most was a dark and foreboding cave, carved into the ancient granite of the mountain.

Chapter 6

Cinnamon, Spice, and Rotting Decay.

HE CAVE was darker than anything Antimony had seen before. Standing outside in the bright afternoon sun, the gaping maw of the mountain top seemed to exhale gloom and despair, which draped around her and chilled her bones. The stalagmites on the ground and stalactites on the ceiling looked like teeth, and she could hear water dripping and gurgling from deep inside. It was menacing and foreboding.

But it was also shelter. It was protection, assuming it was safe inside. And it was in an advantageous location, giving her a grand view over much the island from which she might be able to spot the Ship with the Golden Flag.

Cautiously, carefully, Antimony went inside the cave.

She got as far as the light from outside could reach, and then paused on that shadowy brink.

Actually, it wasn't as bad as all that. The cave was warmer than she imagined it would be, and out of bright

sunlight, her eyes were actually adjusting to the darkness. She remembered something she had read about pirates once and closed one of her eyes, tight to block out all the light. She could have closed both of her eyes, but she didn't want to be completely blind to her surroundings.

After many seconds with her eye closed tight, she opened it back up, and closed the other one. Her eye had adjusted even faster with all the light blocked out, and she could see a little deeper into the cave. When she opened her other eye, she could see still farther.

She ventured a little deeper into the cave. Awful, choking, fetid smells wafted up from the bowels of the mountain. Terrible, vile, pestilent smells like rot and decay, like waste and putrescence, mixed with sulfur, urine, and deep, rank, sweat. Antimony was almost sick several times, but her stomach was empty and couldn't even produce enough bile to wrretch, so instead she heaved and choked and coughed and had to brace herself against the cool moldy walls of the cave.

Then something strange happened. Floating on top of the horrible, putrid odors came the smell of something sweet. Sweet, and fiery. Gently, at first, barely noticeable, then stronger, and stronger, and stronger still, until all she could smell were the sweet smells of her mother's kitchen: Cinnamon and cardamom, nutmeg, ginger, pepper, and curry. The familiar and welcome scents coated the inside of her nose and dripped down to her tongue. She had the wild fantasy of a fantastical kitchen buried deep inside the cave, where three fat chefs in greasy white uniforms were gathered around a wondrous pot of delicious stew, singing silly songs and

concocting wonderful aromas to cover up the other terrible odors. She closed her eyes to see the vision better and drew the sweet and pungent flavors deep into her lungs.

“Aromatic, isn’t it?” boomed a voice from behind her, so deep and rumbling that thunderclouds would shutter in jealous awe. Antimony spun on her heel, and squinted against the blinding light of the outside world.

She tried to make out the form in front of her, but it was silhouetted against the mouth of the cave. She could only see the outline of a great hulking mass, in a shape so confusing, so unknown to her, yet so familiar that she couldn’t make sense of the information her eyes were taking in.

“Cat got your tongue?” thundered the voice. “Or is it just terror?” As the words swept the air between them, the bulk shifted in an instant and the great broad, scaly head of an incredible lizard shot out of the darkness and floated in the space directly in front of Antimony’s own.

Great, round, yellow eyes, as clear and as big as crystal balls, stuck out from under an enormous furrowed brow. Red scales the size of her father’s hand and as thick and heavy as armor, plated the long and narrow face right down to the deeply warped mouth with fangs that looked like carving knives and curled lips drawn back in a hungry sneer.

Antimony wanted to jump backwards, to run and hide in the darkness of the cave, or find the kitchen of the three chef’s and hide in their pantry. But she was paralyzed with fear.

The lips of the dragon’s head uncurled, and the corners of its mouth turned down in a pout. The head drew back

with a sigh that blanketed Antimony in warm, wet, breath which, to her surprise, smelled sweet and spicy like the chef's kitchen, instead of foul and rank like the rest of the cave.

"Well," said the dragon, lumbering forward out of the light. "I usually prefer a little conversation with my meal, some polite chit chat, some small talk. But I suppose a mute will taste as good as a chatterbox." He took another step forward, then squinted and looked studiously at Antimony, keeping his head at a slightly more comfortable distance this time.

"You're much smaller than the other knights who've come to challenge me," he said.

"I'm not a knight," Antimony declared petulantly. "I'm a little girl."

"A little girl?" snorted the dragon. "I should say so. You're so puny and unprotected. Why you're not even armed!" He sniffed the air then, sucking air like a vacuum into a pair of nostrils each big enough to stuff a coconut into. "Even your fear smells different," he stated.

"Well I should think I smell different then some surly old knight trotting all around on the back of a horse in a suit of armor," she replied. "And what about you? What gives you the right to be a nasty old fearsome dragon and smell so delicious like my mother's kitchen?"

"Raww hawww haww haww!" he bellowed with laughter. "You're quite the card, little one. If I wasn't so hungry, I'd seriously consider keeping you around for a while! But alas!" He licked his lips and gnashed his teeth and prepared to snatch up little Antimony's small body in one big bite, pretty yellow dress and lovely purple shoes and all.

"Eeeeeee!" she squealed with her buzz-saw cry. The dragon drew back, squeezing his eyes and shaking his head.

"What sort of awful noise is that!" he demanded.

"Well, I'm sorry sir, it's the only noise I could think to make when I'm about to be eaten."

"Where's the dignity of it?" he asked. "Where's your pride. You're about to have the honor of being eaten by the land's most fearsome dragon. Do you really want your last words to be that terrible noise?"

Antimony thought about that. "I supposed there's not much dignity in it," she agreed. "Have you any suggestions, then?"

The dragon cleared his throat, which sent out great leaping tongues of fire that nearly singed the lace on Antimony's dress. "Well, certainly no time for speeches," he thought aloud, "Oh I don't mean to rush you, but it's been ages since I've enjoyed a nice substantial meal of meat such as yourself. I suppose a short poem might do," he continued. "A limerick, or a sonnet, perhaps. Do you know any?"

Antimony shook her head.

"No, no, I suppose there wouldn't be room for keeping such things in such a small creature." He sat back thoughtfully on his haunches, and Antimony waited patiently. She flinched when he raised his claw to scratch his chin, which made him chuckle.

"You know, there's a lot to be said for silence," he concluded at last. "Silence is golden, as they say."

"Who says that?" Antimony asked, stalling.

"Folk. Folk say that, I suppose. So then, silence?"

Antimony thought as quickly as she could, which was quite quickly thanks to all of her practicing.

“What do you eat otherwise?” she asked.

“What?”

“You said it’s been a long time since you’ve had much meat, but I imagine an incredible beast such as yourself—oh no offense, I hope!” The dragon shook his head. “A great beast like yourself must need a great deal of food to sustain such a physique. So I gather you must eat things other than meat as well?”

“Well of course,” he said. “I’m a modern dragon, I partake of a well rounded diet. Deep in these caves I have quite a stock pile of fruits, vegetables, and grains that I’ve gathered from the forest and surrounding lands. It’s what sustains me, as you say.”

“Well isn’t that lovely!” commented Antimony. “It sounds like you’re quite well off then, no need hassling yourself with food that fights back.”

“Oh but you don’t know the torture of going so long without meat!” he moaned. “Every day, all day, it’s grains, and nuts, and fruits, and roots, and leaves. Have you ever tried to live on just leaves and roots?” he challenged.

Antimony had to confess that she had never tried such a thing, and admitted to herself that it sounded dreadful.

“Then you see my point.” he concluded. “Now then, if you stop all these distractions and just stand still, I promise I’ll kill you as quickly as I can, which I guarantee is as quick as you can imagine.”

“But Mr. Dragon,” Antimony pleaded, backing away from him now. “You don’t want to eat me. I’m such a small thing. Barely more than a chipmunk!”

“Blech! Chipmunks!” He spat a great steaming loupie of spit and phlegm on the ground. “Squirrels, rabbits, gophers, woodchucks, hedgehogs! The only meat I ever eat are measly little woodland critters, and a lot of effort for nothing! All skin and bones!”

“Well the same goes for me!” Antimony exclaimed. “Why look at me!” she said, hiking her skirt to show off her scrawny chicken legs. “I’m not fit for an appetizer! You’d waste more energy chewing through my skin then you’d get out of me. It’s not worth the trouble!”

The dragon glared, inspecting her. “Don’t they feed you where you come from?” he asked.

“I’ve been away a long time,” she explained. “Days and days now with nothing to eat. I’m wasting away.”

“Raaaaahhhhhh!” he roared angrily. “I don’t care!” he snatched. “A little meat is better than no meat!” he stepped closer and bared his teeth.

“But I can get you more meat!” she said, holding her hands up in fear.

The dragon paused. “How?” he asked, dubiously

“I make meat,” Antimony hinted.

“Make meat? What rubbish is this? Meat isn’t made, it’s grown on animals.”

“But I’m an animal!” she insisted. “My body is a meat factory, see. All the food I eat my body turns into meat. Eating me now would be a waste, but if you keep me around

and share your yucky plant food with me, I'll grow big and fat and plump with meat. Then, in a couple of months, we'll agree to some dignified final words, and I'll close me eyes, and you can gobble me right up."

"Hmmm..." considered the dragon. He rocked back onto his hind legs again and thought about her offer. "And you promise you won't try to escape?"

"How could I?" she asked. "I'm so small and weak and you're so fast and powerful."

"And you promise that once it's time, you'll let me gobble you up, and you won't fight or fuss or anything?"

"I promise," she said, crossing her heart. And she didn't even have her fingers crossed or anything.

The dragon thought a little longer and then: "Very well. I'll fatten you up first." He rolled forward onto all fours and walked towards her, then past her.

"Come on," he said. "I better get some food into that meat factory of yours before hunger takes you on it's own." He continued deeper into the cave, but Antimony stood still, watching him.


"What's wrong?" he asked, turning his head back to look at her.

"It's dark in there. I can't see where I'm going."

The dragon whipped his long red lizard tail and stretched it out behind him. "Grab a hold," he said. "I'll lead the way."

Chapter 7

Living with a Dragon

N THOSE early days in this strange place, Antimony cried a lot. She cried because she missed her parents, and she cried because living the lifestyle of a dragon is a great deal of work and she was often tired, and she cried because she was afraid of being eaten by the dragon.

But never let it be said that children are not resilient. Every day Antimony grew stronger with good food and hard work, and every day the pain of her parents being taken waned, even if it did feel as though the sharp sting of her loss was being replaced by a dull aching melancholy deep in her heart.

Even still, living with a dragon isn't the worst thing that can happen to you if you're a little girl on an adventure—right up until the point that he eats you, of course.

But he hadn't eaten her just yet, and in the mean time they did many amusing and interesting things together, like

gather edible plants, and dig up treasures on the beach, and slide down the big rock faces that the little bubbling stream ran down and polished smooth.

The dragon was even kind enough to wash her lovely yellow dress for her, which he did very well, and give her needle and thread to mend it when it needed to be mended, which he couldn't do well at all, but which Antimony could do reasonably well since her mother had taught her how to sew.

Her least favorite thing that they did was to hunt for small animals in the forest. Antimony didn't care for hunting, and she especially didn't care for hunting and killing, and she really especially didn't care to see the dragon killing and eating things because it reminded her of his eventual intentions for her.

"Rah!" laughed the dragon, coughing out black smoke. "What a pathetic little snare that is! What exactly are you trying to catch, a grass hopper?" He rolled back on his tail and laughed a great, big, smoking, belly laugh

"It's a fine snare!" Antimony yelled, embarrassed.

"Look here!" he said, pointing with his gnarly yellow talons. "You haven't even got a trigger mechanism. Why this is nothing but a loop of rope." He rolled back again and laughed some more, smothering Antimony in a thick cloud of smoke.

Antimony pouted and stomped her foot, choking on the smoke.

"Don't you know how to set a snare, child?" he asked, a little warmly, but still chuckling under his great heaving

breath.

"Of course I do! This is just a type of snare you've never seen before!"

"Is that right?" asked the dragon, intrigued now by the unfamiliar design. "How does it work?"

"Well... it's complicated," she bluffed. "You have to know about sophisticated techniques and methods. It's over your head," she concluded dismissively.

"Hrmph," the dragon harrumphed. "Keep your secret then, we'll see in the morning how well it works."

Antimony didn't know how to set a snare, in fact didn't know the first thing about it and barely knew what a snare was. But she wasn't going to admit that to the dragon. She fiddled a little more with it, mostly just moving pieces of rope back and forth so it looked like she was making important adjustments, then headed back to the dragon's cave, her stomach rumbling for meat.

In the morning, her snare was empty as she feared it would be. The dragon had snared three rabbits and a fox, which he hated, but ate anyway, because it was better than fruit and grains.

"Are you sure you know what you're doing?" the dragon asked earnestly.

She didn't respond, but made some more "adjustments" to her snare, trying to figure out exactly how this thing was supposed to trap an animal while acting like she knew all about it.

The next morning, her snare was empty again. The dragon had caught two more rabbits, a squirrel, and a small

porcupine, whose quills he used to pick the stringy squirrel meat from between his gnashing teeth.

“Come on,” said the dragon piteously. “We need to gather some more roots or you’ll starve, and then what will I eat?” They left their snares and headed deeper into the forest.

“Here,” said the dragon when they came to a small clearing. “These polka dotted plants with four leaves and yellow stems, these have roots that are safe to eat.”

“I know!” lied Antimony angrily. She knelt down in the brush, trying not to muss her pretty dress too much, and began pulling up plants to get to the thick fleshy roots that she recognized from the dragon’s dwindling stock pile.

“Rahh!” roared the dragon angrily. “You can’t trick me, plants!” he bellowed. “I know you have bigger roots than this!”

Antimony looked up to see the dragon yelling angrily at a tiny uprooted plant dangling from between two talons. She giggled.

“What are you laughing at!?” he croaked.

“Well you can’t be mad at a baby plant for having a baby root,” she said, laughing.

“A baby plant?”

“Of course!” she replied. “The small plants are just babies, hardly grown at all yet, of course they won’t have big roots. You have to give them more time to grow, and pick them when they’re bigger.”

“Oh,” considered the dragon. “I didn’t know that.” He tossed the baby plant away and bent down to uproot a much

larger plant with a thick woody yellow stem. He held it up triumphantly, letting the large swollen root hang in the air.

“See?” Antimony said.

The dragon nodded. “I see. Thank you,” he said. “Now I know something I didn’t know before.” The two went back to work and in a few hours had a great heap of hearty roots to take back to the cave.

The next morning, the two went back to their snares. The dragon had only caught two squirrels that day, but it was still more to eat than the empty column of air Antimony had snared.

“This is ridiculous,” she thought to herself, loudly over the sound of her aching belly. “I don’t know how to set a snare, and obviously the dragon does. He was grateful when I taught him something he didn’t know, I should be more like that.”

“Dragon?” she called to him. He spat a wad of chewed squirrel fur onto the ground and looked at her, lazy eyed.

“Yes?”

“I don’t know how to set a snare.” she confessed.

The dragon rocked forward and ambled towards her. “I thought as much,” he said.

“Will you teach me?”

He nodded and began instructing her on the finer points of snare setting.

“Understand?” he asked at one point. She nodded slowly, staring at a knot he had just tied. “Really?” he asked. Antimony shook her head. “I didn’t think so.” Patiently, the dragon untied the knot and retied it, more slowly so she

could follow along, and checking in with her at each step to make sure she really grasped it.

“Oh!” Antimony exclaimed excitedly. “Now I get it!”

“You shouldn’t be afraid to admit when you don’t know things,” preached the dragon. “No one will ever teach you anything new if you’re always pretending you know it all.”

From then on, Antimony learned everything she could from the dragon, and even taught him a few things as well. He taught her how to fish, and how to find a safe pass down the mountain, and which plants were edible, and which plants were poisonous.

“What do you know about a ship with a golden flag?” she asked one day as they were resetting their snares. Since he had taught her how to set a snare properly, she was eating much better and gaining a lot of strength. She didn’t like having to eat the little creatures of the woods, but she considered it a matter of survival. “It’s the way of nature,” the dragon had told her. “Everything eats, and everything gets eaten. Except for me of course,” he added.

“A golden flag?”

Antimony nodded.

“Hmmm...” he thought, quickly and mercifully slaughtering the first of the four rabbits he caught, with a quick and smooth flick of his talon. Antimony gulped uncomfortably at the reminder of the fate he planned for her. “It seems I’ve seen a golden flag now and again in the past several years. fairy princess, if I recall correctly. She’s sent many pitiful knights to slay me. None of them could, of course.”

"Of course," agreed Antimony, obligingly. They remained silent for a few moments, each dispatching their prey as kindly as they were able, in the way that had become methodical in the weeks since she had washed up on the shore.

"Do you know where she lives?" Antimony asked.

"Hmmm..." the dragon thought again. "I seem to recall a palace at the center of a vast green garden."

"A green garden?" she asked.

He nodded slowly. "That's right." More silence. "Why do you ask? It's not like you're going anywhere."

Antimony laughed nervously. "Of course not," she said. "Just curious is all."

"Is that how you'll do it to me?" she asked a moment later, changing the subject before he got too suspicious. She was watching him slice through the neck of his fourth and final rabbit of the day.

"Of course not," he replied. "I'm not as cruel as all that. You're self-aware," he explained. "Someday when you're fat enough, I'll kill you in your sleep so you don't feel any pain or fear."

"Don't!" she cried, accidentally allowing her panic to sneak out with her voice. The dragon looked at her and arched an eyebrow the size of an oak tree root. "I mean, don't do it while I'm asleep. It's..." she paused, trying to think of an excuse for not wanting to be blindsided by death. "It's a unique experience, I should think. Being killed by a dragon. Only chance I'll ever get, I'd hate to think I'd sleep through it."

The dragon smiled in his twisted dragon mouth. “You’re a brave one, aren’t you?” Antimony smiled politely but simply turned away from him and they spent the rest of the morning in silence.

That night in the cave, Antimony confessed something to the dragon.

“I’m not brave,” she said.

The dragon turned to face her. His warm breath swirled out of his nostrils and wrapped around her, filling her nose with the scents of hot and exotic spices. “Oh?” he asked.

“I’m scared to be eaten,” she said. “I’m scared to die.”

The dragon smiled sweetly at her. “Being brave doesn’t mean you’re not afraid,” he told her.


“It doesn’t?” she asked.

“No. Being brave means facing what has to be done, despite being afraid.”

Antimony felt a little better about that. She was still scared to be eaten, but at least she didn’t feel like a coward.

Chapter 8

Escape from the Dragon's Lair

ATHER deep in the twisting passageways of the dragon's cave, they lay a large chamber filled with all sorts of treasures, which Antimony discovered once she had worked up enough courage, and gotten enough used to the wretched smells, to venture that far.

A great many gold coins were piled up in mounds and stuffed into trunks and chests and barrels, topped off with strings of pearls and jewels of all kinds. But much more interesting to Antimony were the piles of armor and weapons strewn about the cavern.

"Packaging," commented the dragon when she asked about it. "And garnish."

"What do you mean by that?" she asked densely.

He turned to face her, self conscious as of late about discussing such matters with her. "Knights who come to challenge me," he explained. "They come prepackaged in tin

cans which I find rather distasteful, and often adorned with jewels and trinkets and things, which are quite a nuisance to my digestion."

"I see," Antimony said quietly. After a pause, "but what do you do with all of that treasure?"

"Treasure?" balked the dragon. "It's a rubbish heap, if you ask me." He shifted his weight a bit. "But I will confess, it does provide excellent raw materials for my craft."

"Your craft?" asked Antimony. In all this time she had been living with the dragon, she never knew or even imagined that he had a craft.

"Most certainly," he said haughtily. "I'm not only a fearsome dragon, I'm also a blacksmith, extraordinaire."

"A blacksmith?" bellowed Antimony in disbelief.

"A blacksmith," he confirmed.

"Extraordinaire?" she goaded.

"And what's so unbelievable about that?"

"It's just that you're such a great and hulking beast," she observed frankly. "I should think a blacksmith would require some amount of finesse and delicacy."

"Little morsel," he said, indelicately, "you happen to be in the company of the greatest smith the world has ever possessed. I've forged jewelry and chains for kings and queens for generations. Fine and marvelous threads of gold and silver all properly braided and linked and woven, more subtle than a spider's web and more delicate than a baby's laughter."

"Jewelry, of all things," amazed Antimony, striking on the seed of an idea. "But I don't supposed you could make anything of real substance."

"How's that?" demanded the dragon, testily.

"Delicate chains and fine bracelets are one thing, but sturdy pieces of industrial equipment are something else entirely. I'm talking about real blacksmithing with pounding hammers and ringing anvils. I'm thinking of smiths that make great suits of armor for brave knights, and fearsome strong swords that could strike through a boulder."

"I'm no stranger to the forging of mighty implements, either," he assured her. "Why, I forged my own scales," he continued, tapping his fearsome talon on the broad central scale that covered his chest. The sound rang out through the cave like a gong and deep inside the mountain, Antimony heard rocks break free and crumble to the floor.

"And what's so special about your scales?" she asked.

"I'll have you know that these scales were forged in the volcano heart of this very mountain, with metal taken from meteorites and tempered in the tears of new widows. The only thing in the world strong enough to damage these scales is my own strength."

"Well," poopooed Antimony, "you're hardly a great smith if you can't forge something stronger than a dragon."

"I could if I wanted," claimed the dragon.

"I'd be quite surprised," Antimony replied calmly.

"Well!"

"Don't put yourself out," Antimony continued. "There's no point embarrassing yourself, being a very good black smith is very respectable."

"Raaaahhhhhh!!!!" He roared angrily. "I'll show you! I'll show you that I'm a great black smith!"

"And how exactly do you think you can convince me?" she asked.

The dragon didn't respond, but sat back thinking about that.

Antimony pretended to think about this as well, although she already knew exactly what she had in mind. So instead she simply thought about it again, and thought about it in the context of her entire plan to double check that it would most likely work.

"I've got it," she said at last. "Forge a chain, the strongest you can, and I'll use it to bind you up. If you're really such a great smith, you won't be able to break out and I'll believe you."

The dragon thought about that. His pride was injured and he very much wanted to prove his mettle to Antimony, but he wasn't as dim as all that.

"If I let you bind me up with a chain that even I can't break, what's to stop you from running away?"

"Running away?" cried Antimony, deeply offended. "I gave you my word long ago that I'd let you eat me, didn't I?"

The dragon recollected her promise. "Very well," he said. "If you promise not to run away, then I accept your challenge."

"I promise," Antimony said again, and she still didn't have her fingers crossed.

And so the dragon went to work forging a mighty chain, the likes of which Antimony had never dreamed. Every link was forged from a bar of iron twice as thick as a man's leg, and quadruple-bound to a confusing set of neighboring links. The

chain was massive and imposing, yet beautiful and wistful and awe-inspiring, not unlike the dragon.

When the chain was finished, it was so heavy that Antimony couldn't hope to move it herself, so the dragon had to bind himself up in it, and when he was wrapped up well and tight in it and the chain was passed through hoops that the dragon had forged and mounted to the wall of the cavern, Antimony closed a lock through it, the size of a rhino and twice as strong.

"Well," sighed Antimony, exhausted from the effort. "you are as bound as bound can be. Go ahead now, tear your way out."

The dragon squirmed and strained against the chains, but they held tight.

"You're not even trying," Antimony teased. The dragon strained harder, and then even harder. He thrashed, and gnashed, and tore at the chains, but they wouldn't even sigh or squeal from the pressure.

"Hmmm... I don't know," Antimony challenged. "Seems like a lot of theatrics, to me, but keep trying, with everything you've got!" The dragon wrenched and chewed and gnawed and ripped at the chains, and with all of his effort, he barely noticed Antimony slipping quietly to the mouth of the cave.

"Hey, where are going?" called the dragon once he realized. She winced and turned sheepishly toward him.

"I'm sorry," she said, waving warmly. "I really must be going, though."

"But you promised I could eat you!" roared the dragon, tugging at the chains that held him to the wall.


“Oh, perhaps another time,” she offered, backing slowly out of the cave. The chains rattled and jangled angrily, the bolts winced and whined with strain, but held securely to the wet rock walls of the dank cave.

“But you’re breaking your promise!” the dragon bellowed, accusingly.

Antimony winced again, hurt, but unrelenting. “I know,” she apologized honestly. “And I really do feel badly about it. But my life is really much more important to me than a promise. So I’m sorry. I really did have a grand time, though!” she called from outside of the cave. “No hard feelings!” she waved good bye, then turned and scurried down the mountain path, disappearing into the forest.

Chapter 9

Interlude

HILE the dragon had been busy forging his mighty chain, Antimony had been busy surreptitiously gathering a few items to sneak out of the cave.

The first thing she collected was some food to take with her. She gathered up a few of the hearty edible roots, and wrapped them up in some bright tasting, but not very filling, leaves that they harvested from down by the swamp. She stuck as many as she could into the little pockets of her dress and anywhere else she could manage without looking like she was hiding something.

Next she collected a bit of rope, in case she should need to set some more snares, and some needle and thread because that's almost always useful.

Last of all, she had just one brief opportunity to sneak into the treasure room while the dragon was distracted. For a moment, she considered donning a suit of armor and facing


the dragon head-on, but then she considered that the armor had not been much use to the trained and battle-hardened knight who had worn it last, and it would probably be even less useful to a little girl such as herself.

So instead, she grabbed the only things she could think to grab, which was a handful of gold coins, and a small but ornate dagger with a bejeweled gold handle and a small double-edged blade the color of cobalt. The coins she wedged into her already filled pocket, and the dagger she wrapped up in a scrap of linen and tucked it into the waist band of her underpants where she hoped it would be secure.

She had escaped with all her stolen goods, and the last thing she did before heading down into the forest was to quickly survey the land, which was difficult to do in the twilight hours. But she was at least able to make out a large flat area which she thought might possibly be a large green garden, like the one that the dragon said surrounded the palace of the fairy princess. She did her best to draw a map in her mind of where it was, since she wouldn't be able to see it anymore once she was in the forest, and most importantly, she observed that the sun was setting in the same direction as the garden lay, which would help keep her going in the right direction.

Chapter 10

The Garden of Life

 THE NEXT several days were hard going for Antimony. She did her best to ration the little bit of food she was able to smuggle away from the dragon, but her pockets were so small it didn't last long.

On her first night and all of the next day, she was focused on getting as far away from the dragon as possible, just in case he got loose. Midway through the third day, she felt safe enough to stop and rest, set some snares, and look for more food.

Only her days of traveling had taken her to an unfamiliar part of the forest, and she couldn't find any of the plants that had grown so familiar to her. Worst of all, the next morning she woke to find her snare had gone missing, ripped right out of the tree by an animal which was apparently much larger than those who were foolish enough to live in the vicinity of the dragon's lair.

Out of food and out of rope, Antimony had no other choice but to line herself up with the setting sun and continue in the direction of the green garden.

* * *

Early on the fifth or sixth day away from the dragon, Antimony stumbled upon something rather unexpected. Right there in the middle of her forest was an incredible, tall, evergreen hedgerow, as high as a tree, as thick as wool, and as neat as pressed linen. Antimony looked left and right for a break, but the hedge continued on for as far as she could see. She tried to peep through, but it was so dense and so thick she couldn't even see speckles of light passing through from the other side.

"Well," she thought to herself. "Nothing else to do, I suppose, then tear straight through." She hiked and hugged and gathered up her yellow skirt as much as she could manage to keep it from getting snagged, and without further trepidation, disappeared into the dense yew¹.

* * *

On the other side of the hedgerow, Antimony found herself in a large field of neatly mowed grass, divided up into squares a half foot on a side by a grid of brick lines set into the ground. The grass was dewy and soaked quickly through her shoes and socks and chilled her feet.

"Well, you're not any weed I've ever seen before," came a cheerful voice. Antimony spun around towards the source

¹Yew is a family of small bushy evergreen plants, with the Latin name *Taxaceae*, commonly used for hedges.

of the disturbance. "Oh, heavens!" it continued, "why you're not a plant at all are you?" a young man in mud- and grass-stained overalls waggled a short gardening fork at her. "Why I'd even go as far as to say you're no mere animal, either."

"Well I'm not a mere animal," Antimony pouted, stomping her foot defiantly into the soft sod.

The man in overalls leaned back with a start. "Well of all things, you even talk. Are..." he leaned in closer to inspect her, squinting. "Are you a... a person, then?"

"I most certainly am a person," Antimony declared. "And I'd thank you not to waggle that gardening fork in my face anymore."

"Oh of course!" he apologized, embarrassed by his own rude behavior. "I'm terribly sorry about that. I've been about weeding for so long and haven't seen another person in ages. I guess I must have forgotten what we look like."

"We?" Antimony asked.

"People, that is. Folk."

"Of course."

"Anyway, I really am very sorry about that."

"Well that's alright," Antimony blushed, sorry for making him feel so guilty. She brushed nothing off her skirt, nervously, and flattened down her already flat collar. "Say," she said, now squinting back at him. "You look familiar. Do I know you?"

"Don't think so, miss. I do think I'd remember such a lovely pair of purple shoes as those. Just the color of alpine

aster², I'd say. Lovely, lovely. Just Lovely." He glanced up from her shoes to her face, and smiled warmly. "Anyway, my name's John, miss. Pleasure to make your acquaintance." He held out his grungy, soiled, hand and Antimony shook it politely.

"John, what?" she asked.

"John, the Gardener." he announced, proudly sweeping his hands out to indicate the expanse of unadorned grass.

"Pardon me, Mr. The Gardener," Antimony replied, "but this does not look like much of a garden to me. Why all I see is grass for miles."

"Miles, indeed," he said proudly. "Eleven thousand, twenty-one acres³, more than seventeen square miles, of pristine fescue⁴, and as of a few minutes ago, not a single weed on the whole lot, thank you very much."

"But what on earth do you need so much grass for in a garden? Where are all the other plants? The flowers and the bushes?"

"Oh don't worry, miss, the flowers will come. Now that all the defects are finally out, I'm ready to do some planting. And then you'll see, this is a very special kind of garden."

"Is that why it's broken up into a matrix?"

"Bwah!" John the Gardener blurted out, amused. "A matrix indeed! A very clever girl after all. And for being so

²Alpine aster is a small flowering plant which often has purple flowers. It's scientific name is *Aster alpinus*.

³For those readers interested in such things, 11,021 is the product of 103 and 107, which are two consecutive prime numbers.

⁴Fescue is a genus of grass commonly found on golf courses. It's Latin name is *Fetuca*.

clever, I'd like to invite you to be the first to see my garden in action."

"In action?" Antimony asked dubiously.

"In action," he confirmed. He reached into his dirty front pocket and pulled out five seeds. He held them out for her to see.

The five seeds were plump but elongated, honey brown and white with a strange triangular pattern that looked like scales and reminded her of a type of snail shell her mother had once shown her⁵.

"What type of seeds are those?" she asked curiously.

"A very special type of seed," he replied. "Something of my own devising." He closed his hand around the seeds, picked up his watering can, and stepped a short distance away from Antimony before planting the seeds, one seed in each of five squares in a pattern that Antimony couldn't quite see. He pushed each seed a short distance into the soft soil with his thumb, and when all five were planted, he stood up and double checked his work. He nodded, satisfied, and picked up the watering can.

"Just a little water, now, and we'll see what all this fuss has been about." He tipped the watering can and sprinkled a little drink over each of the squares, then back stepped towards Antimony and nearly tripped over a rake, unwilling to take his eyes off the planted squares.

Antimony was growing impatient waiting to see these strange seeds "in action". John the Gardener had spent so

⁵The seeds resembled the markings on the shell of the *Conus textile* sea snail, commonly called the "cloth of gold cone".

long weeding this field that he forgot what people look like, there was no telling how long he'd be willing to stand here and wait for seeds to germinate!

She was about to excuse herself and take her leave when a squeal of delight escaped John's lips. His eyes were wide as a child's and his hands were clenched up together over his chest with excitement. She looked over to where he had planted the seeds and saw five stubby sprouts poking their way out of the ground.

She had to admit, it was amazing to watch the little plants grow and branch and sprout leaves right before her eyes, like the time-lapse movies her father had shown her. But despite their marvelous speed, the plants themselves were hideous: other than the same honey brown and white scale pattern which covered their stems, there was nothing beautiful, or even attractive about them. Their leaves were an ordinary and unflattering leaf shape, sickly looking with a dull brown color which didn't even benefit from the white accents or the scaly pattern that favored the seeds and stems.

The plants continued to grow, taller, and thicker with leaves, until they were about a foot tall and didn't quite fill each square with their wretched, ugly, bushiness. In rapid succession, buds the color of vomit grew up out of the base of the leaves, then opened and bloomed into flowers the shape of Calla lilies—which happened to be Antimony's least favorite flower⁶—and the color of urine—which happened to

⁶Calla lilies are type of plant with unique, vase-shaped flowers, scientific name *Zantedeschia aethiopica*. They are commonly used in funerals, which could account for Antimony's distaste for them.

be Antimony's least favorite color.

"Shhhh..." John shushed her, sensing her trepidation. "Just wait."

When the flowers were swollen and drooping and looked like they were begging for merciful death, a spray of thick brown dust erupted out of each one, spraying into all of the adjacent squares.

"There go the spores!" announced John, bubbling with joy. He couldn't keep his feet still for all his excitement; he was practically dancing in place on the manicured grass.

As abruptly as the sprouts had erupted out of the soil only several seconds earlier, they now began to wither and die. The leaves and flowers dried out, shriveled up, and fell off, crumbling to dust as they hit the ground. The branches and stems dwindled, too, almost seeming to recede into their parent branches, and then into the ground.

Antimony felt badly for John the Gardener. All that work he did, and his garden only lasted a few seconds. It wasn't until the first generation was nearly gone that Antimony noticed the second generation had already started to grow in nearby squares, and were well on their way to full maturity, with vomit buds forming on the poo-brown leaves. She watched, somewhat startled and very much confused as the second generation flowered, emitted their spores, and then withered and died, only to be replaced by a third generation.

Despite the hideousness of the plants themselves, there was a certain beauty in the rhythm of it all, which Antimony couldn't help but appreciate. As each generation withered and passed on, the next generation was just reaching matur-

ity, ready to take their place.

Only it wasn't exactly the same place. As Antimony watched the generations unfold, she noticed that the whole little garden was shifting away from her. Every few generations they seemed to be a little bit further away, filling out the same pattern, but in different squares.

John the Gardener and Antimony watched for several more minutes as the generations raced by and slowly crept their way towards the horizon.

"What is it?" Antimony asked eventually.

"I call it a garden automaton," John announced proudly. "Each generation follows from the previous generation according to a very specific set of rules."

"Rules? How do plants follow rules?"

"Well," he laughed, "that did take some work I must admit. But the trick is in the spores: every plant grows six flowers and spreads its spores into each of the six neighboring squares. If there are just the right amount of spores in each square, a new plant will grow there. If there are too few or too many, a plant will not grow, the spores will just dissolve into the soil. "From just those simple rules, I can create all kinds of amazing and fantastical patterns that unfold over the generations."⁷

⁷What John the Gardner has described is actually called a *cellular automaton*, which is a type of system that is of great interest to mathematicians and biologists. The most well known cellular automaton is a system called *The Game of Life*, invented by a British mathematician named John Conway. The pattern on the *Conus textile* shell that Antimony remembered is an example of a biological system which operates like a cellular automaton, with each cell in the shell

“What will happen to that pattern?” she asked, gesturing to the little plot which was by now quite a ways off.

“Oh that’s just a very simple pattern, which I call a glider. It will just continue on in that way forever, traveling in a straight line until it reaches the hedge. The spores can’t penetrate the hedge, so the pattern will die there.” He turned to her, excitedly. “Would you like to see another?” She nodded, eagerly.

John the Gardener reached back into his pocket and pulled out the little scaly seeds, along with a little scrap of paper with a grid pattern drawn into it in ink, and a busy pattern in lead which Antimony couldn’t make out. John got to work planting the seeds, consulting his paper as he went, and once or twice shaking his head and digging a seed back out of the ground.

When he was finished he stood up, and surveyed the grass. “I think we’ll need a better vantage point to appreciate this one,” he said. He walked back to Antimony and picked up a step ladder which was lying on the ground. Unfolding it, he set it up at the edge of the pattern he made, took his watering can, and climbed the ladder.

“Come on up if you like,” he offered. Antimony climbed up the ladder and perched carefully on the top step, despite the warnings it displayed to the contrary.

“Care to do the honors?” he asked, holding out the watering can for her.

She nodded eagerly and accepted the watering can.

releasing pigment according to the state of its neighboring cells, just as John described for the flowers.

“Just a sprinkle will do,” he advised. “You may have to reach a bit to get the far side. But you’ll need to get them all, or the pattern will fall apart.”

Antimony did her best to water the entire field where John had planted. Several seconds later, sprouts began shooting out of the earth. John looked rapidly back and forth across the grid, checking for plants, then smiled, satisfied that the planting and watering were correct.

The first generation formed a lovely sun pattern with a squarish center and eight rays that made Antimony not even mind that the plants themselves were so ugly. The second generation was a bit denser, and the pairs of rays in each corner of the sun were replaced by a pattern that looked kind of like a crab’s claw. The third generation was sparse and open, with a cross in the center framed by the corners of a large box. The fourth generation was back to the sun pattern.

“Oh! Beautiful!” Antimony clapped in approval.

“I call that the Pulsar,” John announced. “It will just keep repeating the same three patterns over and over in the same spot forever.⁸”

But just as he spoke the words, one corner of the pattern began to fall apart. First one square failed to bloom, then another, and then the whole pattern dissolved into chaos, and then into nothingness.

“But . . . I don’t understand,” John moaned, climbing down from the ladder. He walked across the field to where the

⁸The Glider and the Pulsar are both well known pattern’s in Conway’s Game of Life.

disease had started in the far left corner, and bent over, inspecting the soil for clues.

“Ah ha!” he proclaimed shortly. Kneeling down, he began digging and rooting through the soil before pulling out a fat and juicy, wriggly, writhing, squirmy, grub. “This little bugger caused the whole thing. You see, these patterns are governed by such simple rules, that if one little piece is out of place, the whole thing melts down. This little guy ate up one of my plants before it had time to grow, which meant it didn’t contribute it’s spores to this other square, which means there weren’t enough for it to grow, and pretty soon we have a run away chain reaction.”

He stood up, gloating over the grub, then let his shoulders slump and looked out over his eleven thousand some-odd acres. “I don’t suppose this little guy is the only one out there. I guess I’ve got another round of cleaning up to do,” he said resolutely.

“Oh, Mr. The Gardener, I do wish I could stay and help you some, but I really have to be on my way. My parents have been parent-napped by the Evil fairy princess, and I have to go and save them.”

“Oh, well I should say!” John exclaimed. “That certainly sounds more important.” He turned to look at her. “But hey, you’re just a little girl, how do you think you’re going to defeat the fairy princess?”

Antimony sighed. “I’m not sure, yet. But I’ve practiced a lot at being very clever and from what I understand, princesses do not put much time into being clever, so I should hope that I can outwit her and save my parents.”

“Well I can’t argue with that,” he agreed. “But you hardly seem dressed correctly for an adventure like that.”

“I supposed not,” she conceded, looking down at what was once her pretty yellow Sunday dress. “But I’m afraid it’s all I’ve got at the moment.”

“Oh, I should think I must have some old clothes that could fit you reasonable well,” John said.

He led her to a small potting shed at the edge of the garden, near the hedge from which she had emerged. After rummaging around a bit, John produced a set of dusty trousers and a hearty work shirt that looked about her size.

“I’m afraid they’re quite caked with mud,” he said apologetically, “but they’re yours if you’d like them.”

“Oh thank you so much, Mr. The Gardener. I’m sorry to say goodbye to this lovely dress, but I think that there is a more appropriate time to look pretty, and now is an appropriate time to look serious and dress for utility.”

“I couldn’t agree more,” he said.

He let her alone in the potting shed to change her clothes, which she did, to find happily that they fit quite well, except for the trousers which were a bit long, and that she took care of quickly with the needle and thread she had taken from the dragon.

Before quitting the garden, Antimony asked John the Gardener how she might get to the palace of the fairy princess, and he told her as best as he could how to get there, which went something like this:

“Go back into the forest, and travel in the direction of the midday sun until you find a creek. Follow it downstream

where it's fed by some other creeks and you'll find it turns from a creek to a stream, and then from a stream to a bigger stream, and from a bigger stream into a river until you finally emerge from the forest. "The river runs straight to the Palace of the fairy princess, and forms a moat about the same. But when you come out of the woods, you'll find your way blocked by a stone wall a thousand feet high, which completely encloses the kingdom of the fairy princess. "The only way through the wall is through the Gate Tower by the River, which is run by a rather wicked Baron and Baroness. If you hope to make it to the Palace, you'll need to convince the Baron and Baroness to let you through. "That will be the first of three obstacles you'll need to face if you're going to confront the fairy princess. Inside the wall you'll find the Outer Kingdom, and inside there you'll find another wall, guarded by a Duke in his castle. I'm afraid I can't offer you much guidance there, only to keep your wits about you. "If you make it past Duke, you'll be in the Inner Kingdom, and the only thing left to do is get into the palace of the fairy princess herself, though I'm afraid you're likely to find it quite heavily guarded. "I do wish I could be of better assistance to you," he concluded. "But I certainly wish you the absolute best of luck!"


Antimony thanked John very much for his help and said goodbye.

"Wait!" he said, fishing into his pocket a third time. "A simple gift," he offered, holding out a handful of seeds. "Just a token of my appreciation for spending a little time with me."

Antimony accepted the seeds gratefully, and John said goodbye, then offered her some water which she happily accepted as well, and he wished her good luck again and farewell as she crawled back through the hedgerow, an effort made considerably easier by her new clothes.

Chapter 11

The Gate Tower of the Baron and Baroness, by the River

NTIMONY did just as John had told her, following the direction of the midday sun¹ until she found a creek, and then a stream and a larger stream and at last a river which led her out of the forest to an enormous stone wall that stretched at least as high as John had said.

Built into the wall, just to the side of the river, was a great round tower, and built into the tower was a large pair of arched wooden doors, exactly like you see in the fairy tales, and labeled simply “The Baron, and the Baroness.”

The tower and the great wooden doors were certainly imposing, but Antimony had already braved many nights alone in the forest, and had lived alone with a fearsome

¹Unless you're on the equator, the sun is never directly over head as many people think. In the northern hemisphere, the midday sun is approximately south; in the southern hemisphere it is approximately north.

dragon who was rather set on eating her, and in comparison to that, the fire-warmed tower run by a couple of ornery old gentry didn't seem like such a big deal.

And so she hiked up a little worn dirt path which lead to the doors, and knocked politely but firmly on the great oak beams.

A moment later, the doors opened for her, without ceremony. She peered cautiously inside, expecting some fearsome guard to be waiting for her, but all she saw were two rather silly looking old people mounted atop twin thrones on the far side of a lavish marble floor.

"Come in, come in, come in," beckoned the Baron impatiently from his throne. "We haven't got all day to just wait around for the likes of you."

Antimony stepped across the threshold into the great tower hall, nervously at first, then checking herself and continuing with bold bravado, even if it was rather forced and a little fake. She positioned herself in front of the twin thrones of the Baron and Baroness.

"What is your name, thing?" demanded the Baron.

"Antimony," Antimony responded.

"Antimony!?" he echoed.

"Antimony," she confirmed.

"Isn't that some kind of metal?" asked the Baron.

Antimony nodded. "It is a kind of metal," she acknowledged. "But it is also my name."

The Baroness spoke up: "Baron, I believe you're right, it is a kind of metal, but I think it's also this little thing's name."

"That's what I just said!" insisted Antimony, stamping her small foot on the lustrous white tile of the marble floor.

"You know," continued the Baron. "I'm quite certain that it is a type of metal. Oh, but it's certainly no name for a little girl such as yourself. Hence forth, you shall be called Aluminium," he decreed. "Guards! Please take Aluminium to the dungeon."

Three guards stepped forward to apprehend Antimony—one from in front of the elevated dual thrones of the Baron and Baroness, and one each from the walls on either side of Antimony. The guard from beneath the thrones reached out to take her arm, which she snatched away from his grasp.

"No!" she cried out. Her metallic screech tore through the air over their heads and raced up into the tower, wrenching its way out through the arrow slits that lined the walkway just below the ceiling. The guards stopped in their tracks.

"What did you say?" demanded the Baron.

"I said, 'No!'," Antimony repeated.

"No, what?"

"No, don't put me in the dungeon."

"Don't put you in the dungeon?" he echoed.

"That's right," she said defiantly.

"I don't think you have a choice in the matter," said the Baron, uncertainly. He turned to the Baroness. "Does she have a choice in the matter?" he asked earnestly.

The Baroness shook her head. "I really don't know," she confessed.

The Baron turned back to Antimony. "I really don't think you have a choice." he paused for a moment. "But why not,

let's give it a whirl. Go ahead, try it again, choose whether or not you'd like to be taken to the dungeon."

"No," replied Antimony politely but firmly. "I choose not to be taken to the dungeon."

The Baron sat back in his throne and pondered for a moment. His pondering turned into puzzling, and then slipped briefly back into pondering before transitioning to concluding. "No, I'm afraid it didn't work. Very nice try, though," he commended. "Guards, take Aluminium to the dungeon." The guards advanced on her again.

"Wait!" she demanded, holding up her hand commandingly.

"What now?" whined the Baron who was starting to feel cranky and whose stomach was starting to rumble with hunger.

"You have to tell me what I've done wrong."

"Wrong?"

"What I've done to warrant my being put in the dungeon."

The Baron sat back again and rubbed his chin. "I see... well I don't see the harm in that, anyway." He sat up straight as a bolt and pointed accusingly at her shoes. "Little girls are not permitted to wear purple shoes on Thursday mornings," he stated authoritatively.

"Purple shoes!?" The words echoed out of Antimony, dripping with disbelief and indignation.

"That's right," the Baron said smugly. "And the penalty is to spend the rest of your life in the dungeon."

"But that's absurd!" Antimony insisted. "You can't make up dumb rules like that. Rules have to have a good reason, or

it's not just. Is there a good reason I shouldn't wear purple shoes on Thursday mornings or be thrown in the dungeon for the rest of my life?"

The Baron sat back again, uncertainty once again drawing down the corners of his plump lips. "Well, I suppose there must have been at some point," he guessed. "Can't think of it at the moment..." he began to puzzle again, his lips puckered pensively and his eyes lost focus as they stared off into the distance.

Antimony was preparing to make an exit when the Baron's face changed abruptly. His eyes turned cold and sharp and they snapped back into focus, and his frown shifted into a scowl.

"Enough of this menace!" he proclaimed. "I'm the Baron, and I make the rules. And I say it's off to the dungeon with you. Guards!"

The guards stepped forward again, forming a line of three on the tiles in front of Antimony. Antimony surmised that if she stayed where she was, or if she stepped left or right, she would be in a tile directly adjacent to one of the guards, and she would surely be seized. But she also surmised that she had one liberty free and clear behind her, so she stepped cautiously back to the next tile. The guards on the left and right followed, taking up their positions just in front of her flanks. The guard who was now two tiles in front of her was about to step forward as well, but Antimony raised her hand.

"I wouldn't do that," she said to him. The guard stopped and looked at her curiously.

"Why not?" he demanded.

“Because right now you each have four liberties,” she explained, pointing out the four empty tiles that surrounded each guard. “See? If you move forward, you’ll be surrounded on three sides, which makes you easier to attack. Plus you’ll be taking away one liberty from each of your mates.” The guards on the left and right began to flutter nervously at the prospect of losing a liberty. “I suggest you maintain your four liberties until you’re absolutely certain you can capture me.”

The guard looked at the tiles of the floor, then at Antimony. He didn’t respond, but he shifted his weight resolutely, indicating his intention to hold his position for the moment. The three guards now formed a kiddy corner in front of Antimony, which she believed she could work with.

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# # # # #
# # G # #
# G # G #
# # A # #
# # # # #

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“Very good,” Antimony said. She stepped back again to the next tile, and the three guards followed. She stepped back again, and again the guards followed her. She had one more tile behind her, but then she knew that behind that tile was a pillar that she would have to go around. She took another step, her back to the ornately carved marble base of the ornately carved marble column which stretched up to the decidedly plain wooden walkway just below the ceiling.

The guards were smirking, sensing that Antimony had backed herself into a corner, so to speak.

“Wait,” she said again, before they could move. “I think I was wrong about that,” she said, studying the floor tiles. She turned to the guard on her right. “If you take a step back to join your mate,” she said, helpfully, “together the two of you will have six liberties.” The guard looked intrigued, and studied the floor to see if she was right. She pointed to the tiles. “See?”

The guard nodded, slowly, uncertainly at first, then rapidly and with conviction as he pieced together the configuration. He stepped back and joined his mate two tiles in front of Antimony, leaving a passage open to her right.

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# # # # #
# # G G #
# G # # #
# # A # #
# # P # #

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“What about me?” demanded the guard to her left. “Now they have six liberties where I only have four! Surely if anyone is to be attacked it will be me!” The Baron and Baroness watched anxiously from the edge of their thrones, enthralled to see how this would turn out.

“You’re quite right,” Antimony responded. “Clever man you are. You step back as well, and together, the three of you will have eight liberties! Surely three grown men as yourselves with eight liberties free can defeat one little girl.” The guard stepped back proudly to join his mates.

```

# # # # #
# G G G #
# # # # #
# # A # #
# # P # #

```

Antimony stepped to her right. One at a time, the guards followed her lead, shuffling to the next tile.

Antimony stepped back, placing the pillar to her left. She could see the exit behind her and to the left. The guards stepped forward in unison.

```

# # # # #
# G G G #
# # # # #
# P A # #
# # # # #
--X-----

```

She stepped back again and the guards followed.

“Hey!” cried the guard on the end, who was left standing facing the pillar. “What am I supposed to do now?”

```

# # # # #
# G G G #
# P # # #
# # A # #
--X-----

```

“Well I can’t do everything for you,” Antimony scolded. “How will you ever learn anything?” She stepped to her left.

The two free guards stepped forward after her, while the blocked guard looked about nervously, and stepped doubtfully to his right.

```

# # # # #
G # # # #
# P G G #
# A # # #
--X-----

```

Antimony took one final step backwards, through the exit.

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# # # # #
G # # # #
# P G G #
# # # # #
--X-----
A

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The guards were about to take another step when she interrupted them.

“Hold on a second! What do you think you’re doing?” she asked, sharply. “You don’t get to move again.”

“Why not?” demanded the guard who had previously been in front of her.

“Because the game’s over. I already won.” she announced.

“You won?” the three guards asked in shocked unison.

“That’s right, I reached the end of the game board first,” she explained confidently, shuffling her feet on the dusty path outside the tower for emphasis. “And everybody knows that whoever reaches the end of the game board first wins.”

“But...”

“Now, now, don’t be sore losers. You played a great game, you should be proud of yourselves. I just happened to come out on top this time, but that doesn’t diminish your accomplishments.”

“Quite right!” called the Baroness warmly from her throne. “Excellent match gentlemen, you should be proud!”

“Proud, indeed!” declared the Baron, clapping his hands graciously.

“Now,” continued Antimony from beyond the stone walls. “Be good sports and congratulate me.”

“Oh yes, of course. Congratulations, Miss Alumi... Miss Antimony,” oozed one of the guards.


“Yes, capital performance,” said another.

“A very worthy opponent, indeed,” called the last from further back.

“Until next time, Gentlemen. Your highnesses,” she curtsied goodbye to the Baron and Baroness and walked unmolested away from the tower.

Chapter 12

Antimony Thinks her way Around the Wall

NTIMONY was pleased to have escaped from the tower without landing in the Dungeon, but as it happened, she had escaped the same way she came in, which left her still on the outside of the wall. She needed to find a way to get past the Baron and Baroness.

Or maybe she didn't. Antimony decided to try some of what her father called "lateral thinking," which meant she had to consider some options which didn't seem like options. She began by clearing out all the clutter regarding the Baron and Baroness, and getting permission, and all that, and focused just on what she wanted to achieve: to find herself on the other side of this wall.

There are lots of ways to get to the other side of a wall, she reasoned. One could go over a wall, though that was very difficult when the wall was a thousand feet high and one was just a small girl.

One could go around a wall, only that didn't work if the wall went all the way around the place you were trying to get to, as this wall did.

Or one could go under a wall, by digging a tunnel beneath it. Antimony had read lots of stories where people dug tunnels to get into or out of somewhere they either wanted or didn't want to be. Antimony looked about for some digging implements but all she found were her own hands which she reckoned would be rather poor at digging under a wall. She was also taken to understand that walls as large as this tend to go way down into the ground as well, so she may have to dig very far to get under it. It wasn't completely out of the question, but she didn't consider it a very good option, so she would save it for if she couldn't come up with something better.

If there's a passageway through the wall, of course one could use that, but the passageway in this case was through the Gate Tower of the Baron and Baroness, and she didn't think going back there was a terribly bright idea.

Antimony was discouraged that her best idea was digging under the wall, and it didn't seem like a very good idea at all, so she tried to clear her head again, and approach the problem from another angle.

What else makes it from this side of the wall to the other side of the wall? She asked herself. Birds, they can go over a wall, even one as high as this. Vermin, maybe, they're much better diggers. Loud sounds, hot, and cold, they can all pass straight through the wall, but that doesn't help a little girl. She looked around for more clues.

Her eyes landed on the gently bubbling river. “Eureka!” she thought to herself. John said that the river starts on this side of the wall, and continues on the other side of the wall, all the way to the palace of the fairy princess, which is exactly what she wanted to do.

She followed the river to where it met the wall and saw that, hidden behind some shrubs, a very small archway was built into the wall, under which the river flowed unobstructed from one side of the wall to the other.

“That hole is too small for a boat full of marauders, or a dragon,” she reasoned. “But it’s not too small for one little girl.” Antimony had found her solution, and she wouldn’t even have to dig.

* * *

Antimony felt shy about undressing out in the open, but the prospect of continuing her adventure in soggy clothes was very unappealing. And most of all, she had to make sure her seeds didn’t get wet, or they would sprout immediately, and that seemed like a very poor thing indeed.

She couldn’t be sure what she would find on the other side of the wall, but she couldn’t hear any noise coming from back there and she hoped that it would be quiet and unpopulated and include a sunny private spot where she could dry off.


So Antimony undressed beneath the great stone wall and bundled up her clothes as small and as tight as she could, with the seeds tucked safely in the center of the bundle, and John’s shirt, which she considered the least important article, wrapped snugly around the outside.

Walking to the edge of the river, she sat down on the bank and let her legs dangle into the cold water. She shivered as the water flowed gently over her feet. “Well,” she said aloud, “it’s now or never, I suppose.”

She let herself slip gently into the river and floated on her back so she could keep her bundle lifted high up out of the water. The current was gentle but steady and it carried her towards the small opening in the wall through which it flowed; she only had to pull her bundle in a little ways to fit under it, and then she was beyond the wall, floating down the river in the kingdom of the fairy princess.

Chapter 13

The Honey Lady in the Warm Cottage by the Wall

“H, MY!” offered a gentle voice so warm and honey-sweet that Antimony felt like she was melting.

Embarrassed, she tried to sink deeper into the water, but found that the deeper she sank, the harder it was to keep both her head and her bundle above water. She looked around for the source of the voice, hoping not to find herself in the middle of a crowded market place or something like that.

There was no market, but there was a little cottage a short distance from the river, huddled under the great behemoth wall like an old woman huddled in the corner of a grand manor.

Closer than the cottage, Antimony spotted a young woman kneeling with a washboard at the water’s edge, who she supposed was the source of the melting voice.

“Pardon me, ma’am,” Antimony said, humbly. “I only wanted to keep my clothes dry.”

“Well,” giggled the pretty lady, “at least your skin is waterproof.” She helped Antimony out of the river and wrapped her up in a rough but warm woolen blanket which was drying on a nearby clothesline, then invited her inside to warm up by the fire.

Antimony learned that the lady with the honey voice was the washer woman for the Baron and Baroness and their guards. It wasn’t a very joyful way to spend a life, she told her, but it was less unpleasant than how most people in the kingdom lived.

And at any rate, she had her own cottage, even if it was choked off from the forest by the great stone wall, and her own stone hearth, even if she did have to beg the Baron and Baroness for enough wood to keep it warm, and she had enough time in the evenings to bake breads and cakes, (which Antimony was very glad to hear as she hadn’t eaten in quite some time), even if the guards did come every night and demand half of everything she made.

“But I shouldn’t complain,” the honey lady said as Antimony helped her roll out dough for biscuits. “There are many others in the kingdom who are far worse off than I am.”

“Well,” Antimony suggested, “It’s good to appreciate what you have, but I don’t suppose their misfortune makes your hardships any easier.”

The honey lady smiled warmly at Antimony. “You’re a very wise girl,” she observed.

Antimony was pleased with that and continued rolling out

the dough, which required her to put most of her little body into the effort as the dough was a mountain, bigger than any dough mountain she'd seen before.

"Why do you make so much bread?" Antimony asked, wiping sweat from her forehead. She looked around. "Do you have a family to feed?"

The honey lady laughed softly and the air filled with the twinkling of fairy bells. "In a manner of speaking," she replied. "In the morning, before the washing," she continued, "I take everything that's left after the guards take their share, and after I set aside just a little something to feed myself, and bring it into town to feed the poor people there."

Antimony stopped rolling out the dough, and turned to the honey lady. "You do all this work for other people?"

The lady nodded.

"Why?"

"Because they don't have any food themselves."

"Do they pay you?"

Her laugh twinkled again. "No," she said, "they've no money to pay with."

"Do they trade for it, then?"

"No, they've nothing to trade."

"Do you owe them a favor?"

"I owe them only decency."

Antimony paused her questions and contemplated that word, which she was familiar with, but may not have understood quite as well as she had previously thought.

"It hardly seems fair," she said at last. "That you should do all this work, and they should reap all the benefits."

“Fairness is overrated, if you ask me,” the honey lady responded, her tone just slightly curt, more like buckwheat honey just now than clover honey or wildflower honey. “Fairness means everyone gets what they deserve, but I’m more concerned that everyone gets what they need.”

Antimony thought about that a bit more, than tried one more time. “Still, as a matter of principle...” she began.

The honey lady cut her off, “Principles don’t fill hungry bellies,” she insisted, her voice turning crystallized and jagged, as honey is wont to do when it’s stored too long.

Antimony remained silent now, and went back to work sheepishly, rolling out the dough to fill the hungry bellies.

“I’m sorry,” cooed the honey lady a short time later, her voice soft and sweet and flowing again. “I don’t mean to snap,” she said, “I only want you to see that somethings are more important than principles, and deserving. If you don’t learn that, you may turn out just like the Baron and Baroness, or that terrible fairy princess.” Her tongue grew sharp for just a moment, but her voice reminded smooth and gentle.

Antimony perked up at the mention of the fairy princess, who she had to remember still had her parents somewhere.

“What happened to make the princess so terrible?” she asked.

The honey lady sighed sweet marmalade over the dusty floured table where they worked. “Oh many things contributed,” she said, “but mostly just bad parents.”

“Bad parents?” Antimony echoed with shock. “I didn’t know there was such a thing.”

“Oh, I’m afraid so,” the lady replied. “Not that they meant to be, certainly. They always wanted what was best for their little girl,” she explained. “All parents do. Only, they were terribly near sighted.”

“Near sighted?”

The lady nodded. Antimony thought about her father and his reading glasses.

“And that makes you a bad parent?” she asked. Her voice was dry with earnest concern.

The honey lady looked at her for a moment, then smiled warmly and laughed her pretty laugh. “Oh not literally near sighted sweet girl. I only mean that they didn’t consider the future, they never imagined the consequences of what they did.”

Antimony felt better, and relaxed a bit. “My mother says everything we do has consequences,” she said. “And that we must act deliberately and thoughtfully so that the consequences will be mostly positive.”

The honey lady smiled again. “Your mother sounds like a very wise woman.” Antimony nodded in agreement.

“How do you know so much about the fairy princess and her parents?” Antimony asked after a brief silence.

She sighed again. “Because I was her teacher,” she said.

Antimony looked up at her, surprised. “You were the royal teacher?” she asked.

“Oh, no,” she chuckled. “You see the princess wasn’t always a princess. Her parent’s were not the King or the Queen. You see, we have a somewhat less predictable system of governance than a monarchy like you’re thinking. In this

kingdom, we have a Gentrarchy, where power is wielded by the land owners. The more land one has, the more power one has. The princess rose to her position gradually, and through a great many nefarious actions, and unsavory dealings.”

“Oh,” Antimony offered.

“I did my best to teach that little girl good values,” the lady continued woefully. “But there’s only so much a teacher can do when she’s undermined at every step by the parents.”

The honey lady looked up and saw Antimony’s sad eyes looking up at her from across the table.


“Oh, never mind all that,” the lady said. “Past histories and sour milk. We are where we are, now, and all we can do is try to make it better going forward.”

Antimony and the honey lady baked long into the night, in silence for a while, and then with some light conversation, and then joking, and laughing, and even singing: some songs that Antimony didn’t know and had to learn, and some songs that the honey lady didn’t know and had to learn, and some songs that neither of them knew and had to make up along the way.

Antimony didn’t remember falling asleep, but she remembered waking up briefly, wrapped up warm and snug in a small bed, the honey lady sitting on the edge, rubbing her back gently in the soft glow of lamp light. She awoke just long enough to enjoy how wonderfully pleasant it was, and how incredibly safe she felt, before drifting off into a deep, dreamless sleep.

Chapter 14

The Outer Kingdom

NTIMONY awoke in the comfort of a soft, warm bed. It was the first time that had happened in quite some time, and it took her a moment to figure out that it was not *her* bed, that her trials and adventures since that tragic day on the pier had *not* been a dream.

The honey lady was already awake, packing loaves and loaves of the bread they had baked the previous night into sacks and net bags for delivery to the poor people of the Outer Kingdom.

“Oh good,” she said, as Antimony propped herself up on an elbow. “I was hoping you’d wake before I go, I’d hate for you to wake up to an empty cottage.”

“Are you going to deliver to the poor people now?” Antimony asked.

The honey lady nodded. “Would you like to come with me?”

Antimony thought that she would like that very much, if for no other reason than to stay in the company of the honey lady, with her sweet kindness and soothing voice. And on top of that, she thought it would be a good idea to see some of the kingdom and maybe meet some of the people. If she was ever going to find a way past the Duke to the Inner Kingdom, she would need to learn her way around.

So Antimony and the honey lady set off with their sacks of bread, and as the honey lady led Antimony through town, she introduced her to some of the people—like the fat little German man with the beard and the rosy cheeks who owned the vegetable cart and gave Antimony a crisp and sweet orange carrot to eat—and pointed out some important places—like the flour mill, and the butcher, and, most importantly, the Duke’s castle and the wall that barred the way to the Inner Kingdom.

“But why does the fairy princess build so many walls?” Antimony asked as they walked past the formidable stone edifice.

“Remember how I told you that power comes from owning land here?” the honey lady replied. “Well the Inner Kingdom is all of the fairy princess’s land, she uses the walls to protect it.”

“Why does she need to protect it?”

“The princess made a great many enemies during her rise to power. Many people would like to see her land and power taken away.”

Antimony was silently contemplative for a few moments as they delivered the final few loaves of bread. Then: “What

did her parents do that made her that way? You said they did not consider the consequences of their actions: I can see the consequences, but what were the actions?"

The honey lady smiled sweetly down at Antimony. "You see, little darling, all parents want their children to be happy, all the time. Only, the world isn't happy all the time. Sometimes bad things happen. Sometimes boring things happen. Sometimes, you don't get to do what you want, and sometimes you get to do what you want, but you have to be patient for it. "Sometimes, parents have the ability to shield their children from such unhappiness. Sometimes parents can hide the unhappy things from their children, and give them everything they ask for without waiting, and never make them do anything that isn't pleasant."

"Well that sounds pretty nice, to me," Antimony countered.

"Yes, sweetie, it does sound nice. Only it isn't. Because when a child is never told no, they never learn to handle disappointment, and they come to believe that it is right and natural that they should get whatever they want."

"And I suppose sometimes what they want comes at the expense of others." Antimony concluded.

The honey lady smiled again. "A truly clever girl," she remarked, which made Antimony ooze with warm pride.

They continued on for a short while, then the honey lady spoke again. "Why are you interested in the fairy princess, anyway?" she asked.

"Well," Antimony sighed, "I believe she's taken my parents."

“Oh my!”

“It was such a lovely sunny Sunday afternoon,” Antimony continued. “We were walking on the pier, which is one of Father’s favorite places to walk because he likes to look at all the boats and he points them out to me and sometime we talk to the sailors and fishermen. “Only on that day, there were some very wicked sailors that appeared and they took my parents aboard their ship and sailed away from the pier, in their great wooden sail boat with the golden flag.”

“The flag of the fairy princess,” the honey lady observed.

“That’s what the dragon told me!” Antimony said, excitedly.

“The dragon? Oh my! It sounds like you’ve had quite an adventure!”

Antimony nodded. “Yes, I have!” And she told the honey lady all about her adventures in this foreign land, starting with her treacherous voyage across the stormy sea, then her fearsome night alone in the forest, and followed by the even more fearsome dragon in his lair. Then Antimony told the honey lady about how she outsmarted the dragon, and trekked until she found the garden of John the Gardener, and then confronted the Baron and the Baroness and their three guards, who she bested in their marble-floor game. And last of all she told the honey lady about how she floated under the wall down the river and met the kindly washer woman who was really a teacher and a baker, even though the honey lady already knew that part.

“Oh dear,” The honey lady replied. “You poor young thing, you’ve been through so much. A girl of your tender


age shouldn't be left all alone. I'm not sure how much I can do to help you find your parents, but as long as you're here, you'll stay with me in my little cottage. That is, if you'd like to."

"I think I should like that very much!" Antimony gushed.

And so she did, staying with the sweet honey lady and in her little warm cottage, helping every night with the baking, and every morning with the delivering, and every afternoon with the laundry, and it turned out to be a rather lovely way to live, after all, and the honey lady thought so, too.

Chapter 15

The Labyrinth

HE LONGER Antimony stayed with the honey lady, the more she grew to love her. And the more she grew to love her, the easier it became to live with the heartache of missing her real parents, locked away somewhere by that wicked fairy princess.

But Antimony never forgot why she was there, and every day she learned everything she could about the fairy princess in her palace, and the Duke in his castle, and the wall keeping her away.

One day, she learned that the Duke loved riddles and teasers, which was fortunate because Antimony had spent a lot of time practicing riddles and teasers.

Another day, she learned that there was only one way into the Inner Kingdom, and that was through an underground labyrinth buried beneath his castle. This was also fortunate for Antimony, because one of her favorite types of puzzles were mazes, and she knew just how to get through them

every time.

On a third day, she learned that there were two different entrances to the labyrinth, guarded by two brothers: one was the real entrance, and one was a trick entrance which would lead to a maze with no exit, from which there was no escape. Unfortunately, nobody could tell Antimony which entrance was which.

Until one day, at last, she came upon just exactly the clue she needed.

"I have it on good authority," whispered the fat German man with the beard and the vegetable cart, "that one of the brothers will always lie, and one will always tell the truth. Only. . ." He bent in closer and lowered his voice: "Nobody knows which is which."

But Antimony realized that she didn't need to know which guard was which, she only needed to know which entrance was real, and which was fake.

"Oh thank you, thank you sir, you've been most helpful!" Antimony exclaimed, shaking his hand gratefully in both of hers. "I know just how to proceed now."

Antimony felt renewed by her breakthrough, and was eager to continue on her way to her parents. But as desperately as she wanted to rescue them, her heart ached at leaving the sweet honey lady.

"Oh I wish I didn't have to leave you!" Antimony cried.

The honey lady scooped Antimony up and held her tight, tears pooling in the corners of her eyes. "I know my sweet girl," she cooed. "I wish that, too." She squeezed her tighter and the two cried onto each other's shoulders.

“Are you scared?” asked the honey lady.

Antimony nodded. “Yes I am. But now I must be brave, and being brave means doing what must be done despite being afraid.”

The honey lady held Antimony at arm’s length and looked into her eye’s adoringly. “You really are a very wise girl,” she said warmly. “I will miss you dearly.”

They embraced once more and then, with tearful eyes, Antimony turned and slipped out of the little cottage by the wall.

* * *

Antimony made her way to stone wall that surrounded the Inner Kingdom, and followed it until she found two brothers guarding two doors. She reviewed her logic carefully in her head, and then approached the guards. Turning to the one on the left, she said: “If I asked your brother which door he’s guarding, would he say the true door, or the trick door?”

The guard paused, and Antimony thought she caught a small grin flash on his lips, but when she looked again it was gone.

“My brother would say he guards the true door,” he responded.

Antimony worked it through again quickly in her head, double checking herself. “Very well,” she said. She walked past the guard, opened the door on the left, and entered the labyrinth¹. The guard closed and locked the door behind her.

¹ Antimony asked Guard A which door Guard B would say he guards. Guard A replied that Guard B would say he guards the true door. If

She found herself in a hallway, dimly lit by torches. She knew she had to pick a direction to travel in, and since she was in a hallway, she chose the only direction she could, marching boldly forward.

The hallway was long and she passed several passageways which offered to lead her off in other directions, but she ignored them. After a little while, she found herself at a wall at the end of the hallway, with another hallway forming a capital T intersection. She stopped for a moment to collect herself.

“Right turns are plus one,” she said quietly. “Left turns are minus one, and I just need to keep track of which way is which,” which she did by imagining herself as the hour hand on a clock, and right now, she was facing twelve o’clock.

She turned to the left, placing her right hand on the wall. “Minus-one” she counted aloud. “nine o’clock.”

Antimony continued down the new hallway until she came to a passage and the wall she was following turned away to the right. She could continue straight as well, but she knew that was not the way to get out of the labyrinth. She turned the corner and said “Plus one brings me back to zero, and

Guard A was the liar, then he would tell Antimony the opposite of what Guard B would really say, so in this case, Guard B would really say that he was guarding the fake door. And since Guard A is the liar, Guard B is the truth-teller, so he really would be guarding the fake door. On the other hand, if Guard A was the truth-teller, then he would honestly tell her that Guard B would say he’s guarding the true door. But since Guard B is a liar, that would be false. So either way, Guard B must be guarding the fake door, and Guard A (the one Antimony asked) is guarding the true door. In general, Guard B is guarding the opposite of what Guard A says he would claim. For a more detailed explanation, see Appendix B.

back to twelve o'clock." She took her hand off the wall and walked straight down the passageway until she came across another wall.

"Minus-one, nine o'clock," she said again, once again turning left and following the wall with her right hand.

This time, the wall turned left, so she counted again, "Minus-two, six o'clock", and continued to trace the wall with her right hand. Another left turn: "Minus-three, three o'clock," she said. Another left turn and she was facing twelve o'clock again, but her count was minus-four, which meant she must now be following the little cross piece of some shape that looks like a capital G, or else an even more dizzying spiral. But she put that out of her mind and focused on counting.

Soon enough, the wall turned off to the right, and she followed it, once again counting "Minus-three, three o'clock." Another right turn "Minus-two, six o'clock", and then another, and another, and she was back to "Zero, twelve o'clock." She took her hand off the wall and walked straight, ignoring all passageways.

After a few minutes, she finally came to a point where the hall turned right and she couldn't go straight anymore. She guessed she had already been walking for at least an hour, and every bone in her body was screaming to follow the hallway to the right, but she knew better than to listen to bones.

Again she put her right hand on the wall and turned left, almost immediately reaching the corner and turning left again. Heading back the way she came, she counted "Minus-two, six o'clock".

Antimony continued in this way just like her mother had taught her. Whenever she had a count of zero and was facing twelve o'clock, she just kept going straight until she couldn't go any further. Then she would put her right hand on the wall and follow it where ever it went, counting minus one for every left turn, and plus one for every right turn, and keeping track of which way she was facing until she was back out zero and twelve.

Antimony continued for hours through the labyrinth, growing more and more weary all the time, but staying vigilant so as not to loose track of her counts. If she did that, she'd have to start all over from where she was and all of her efforts so far would be a waste. It was hard to tell, but there were several times that it seemed she past the same spot. It was easy to get discouraged when that happened, but she knew it was a possibility, so she just kept going.

After several hours, Antimony was so tired and so bored that she barely noticed the change in the texture of the wall. In fact, she didn't notice it when it changed, only when it changed back.

Cautiously, being careful not to change directions, she backed up, keeping her hand on the wall, until it changed again. Wood! The stone wall had turned into wood, which could mean only one thing!

She felt around in the darkness, and found exciting things like cross bars and hinges, and then at last the most exciting thing of all, the handle! She jerked on it recklessly until a latch inside the wall released and the door swung open, bathing her in the crimson rays of the evening sun.


She took just one step out of the labyrinth and sank to her knees in exhaustion. But she had barely hit the ground when two rough hands seized her under each arm and lifted her kicking and screaming off the ground.

“Let go of me!” she demanded. “What’s the meaning of this? Let go of me, you brutes!”

Two men in painted armor and carrying wooden spears festooned with ribbons and pennants, were carrying her like a common pick pocket through the bustling market place of the Inner Kingdom, ignoring her taunts and struggling to ignore her assaults.

Chapter 16

Inside the Duke's Castle

NTIMONY found herself in a large court, as grand and polished as that of the Baron and Baroness, but even larger. She stood alone, an island in a sea of tile, with a coast composed of stately courtiers in rich flowing robes and coarse white wigs.

Before her sat the Duke, a weaselly looking man decked head to toe in a purple short coat and purple breeches, lounging impishly in his golden thrown.

“You must be pretty proud of yourself, young one,” he crowed. “Not many people have made it through my labyrinth, and certainly none half so young. Haven’t you anything to say for yourself?”

“It was a very challenging labyrinth,” Antimony offered.

“Challenging! Why I designed it myself, it’s the most perplexing maze the world has ever seen! Tell me” he sneered, leaning closer. “How did you find your way through?”

“Oh, I had a strategy,” she replied, humbly. “Just a simple

algorithm, and a lot of careful counting.”

“A strategy!?” he cried, mockingly. “An algorithm!? Well, isn’t that something special! Very well then, if you’re so very special and clever, how would you like to try on some of my brain teasers?”

Antimony felt uneasy about the Duke. He gave the impression of being rather unhinged. But peppered conspicuously among the the courtiers were the Duke’s guards, and she suspected that the Duke would not allow them to allow her to leave just now. She could think of no better option than to play along with his games.

“Very well,” she said. “If it will please you.”

“Very good!” he replied, clapping his hands excitedly. “First, a riddle: what animal goes first on four legs, and then on two legs, and then on three legs?¹ ”

Antimony could not keep the sly grin from creeping across her face as she responded coolly, “That’s an old one, Your Grace. The answer is a man: he crawls on all fours as a baby, walks on two legs when he’s grown, and hobbles with a cane as an old man.”

“Hrmph” pouted the Duke. “You’re right, that is an old one. Very well then: there is one thing that you will always find at the end of anything and everything. What is it?”

“The letter ‘g’, of course,²” Antimony replied.

¹This is known as the Riddle of the Sphinx. According to a Greek myth, a sphinx (a mythical creature with the body of a lion and the head of a woman) guarded the entrance to the city of Thebes and strangled any travelers who could not answer this riddle.

²The words “anything” and “everything” both end in the letter “g”.

The Duke's cheeks began to turn red. "What makes a man bald?" he demanded.

"A lack of hair, naturally."

"What has a foot on each end, and one in the middle?"

"A yard.³"

"How many squares are there on a checkerboard?"

Antimony was about to say sixty-four, but she caught herself, and closed her mouth pensively. She thought for several moments before finally replying "Two hundred and four⁴."

"Rah!" the Duke roared angrily. "Very well, so you're good with riddles. How about puzzles?" He gestured to his attendants, who scurried behind the thick purple curtains

³A yard is a unit of measure which is equal to three feet.

⁴The trick is that squares are not just the individual tiles, you can also group tiles together to form larger squares, and these larger squares can overlap, so the question is to figure out how many of them there are. Start with the largest square, which is just the checker board itself. A checker board is eight tiles across by eight tiles down, so it's an 8x8 square, and there is only one of those. Now consider making 7x7 squares on the checker board: You can fit one of these squares in the top left corner (for instance), and then shift over by one column and fit another. This puts you at the right edge, so you can't go over any further, so you have a row of two 7x7 squares. But you can also shift this whole row down by one row of tiles to get two more 7x7 squares. Now you're at the bottom edge, so you can't go any further, and you have a total of four 7x7 squares. For 6x6, if you start in the upper left corner, you can shift over two more times before reaching the right edge, and you can also shift down twice before reaching the bottom edge, so you can fit three rows of three, or nine 6x6 squares in total. Similarly, you can fit four rows of four squares that are 5x5, and so on. Going all the way down to eight rows of eight squares each, that are each one tile by one tile, you have a total number of squares given by $1 + 2*2 + 3*3 + 4*4 + 5*5 + 6*6 + 7*7 + 8*8 = 204$. This would be a little tricky to do in your head, but with a little practice, it is certainly possible.

behind his throne, and emerged a moment later with a large balance and six small bags, all of which were placed in front of Antimony.

"Five of these bags weigh the same," the Duke said. "The other is slightly different: it may be lighter, it may be heavier. You may use the scale three times, but no more. Find which one is different, and tell me whether it is heavier or lighter!"

Antimony looked at the scale and the six bags. Her initial instinct was to place three bags on one side of the scale, and three on the other, but she quickly realized this wouldn't tell her anything⁵. Instead, she put just two of the bags on the left side, two of the bags on the right side, and left the other two bags off the scale. The left side of the scale went down, and Antimony paused to consider what this meant. After a moment, she took the two bags off of the left side and replaced them with the two bags she had not yet placed on the balance. Once again, the left side went down. Lastly, she removed the bags from the left side, and moved one of the bags from the right side to the left. This time, the right side went down.

"This bag is lighter than the others," she announced, pointing to the bag on the left⁶.

⁵With three bags on each side of the scale, one side would go up and the other side would go down, but since she didn't know if the odd bag was heavy or light, this wouldn't provide any clues about which side it was on.

⁶On the first use of the scales, Antimony determined that the odd bag was one of the four bags on the scales, otherwise two bags and two bags would have balanced. But since she didn't know if the odd bag was heavier or lighter, she didn't know which side it was on. On the second use of the scales, she compared one of the original pairs of bags

“Bring out the next puzzle!” commanded the Duke. His attendant disappeared again behind the curtain to fetch the next puzzle.

The Duke continued to test Antimony, becoming more and more frustrated with every puzzle that she solved.

“Enough!” he screamed at last. “Has it ever occurred to you, little girl, that you may be too smart for your own good?”

Antimony only stood silently before him.

“Take her away to the Dungeon!” he commanded.

“Pardon me, Your Grace,” Antimony demurred. “But I have an offer for you, before your guards take me to the dungeon. If you’re interested.”

The Duke raised his hand to the guards and they stopped in their tracks. “I’m listening,” he replied.

“Now I’m an honest girl by nature,” Antimony began, “though I must admit I have been known to lie from time to time. However, your teasers have left me tired and confused, that I can barely tell truth from fiction. So I propose a deal, which I think you’ll find to your liking.” She waited for the Duke to respond, but he only looked at her intently. She

to the pair which she knew were both standard bags, since they had not been on the scale when it was imbalanced. The scale was once again imbalanced which means the odd bag must be one of the two which had been on the scales both the first and the second time, which means one of the two on the right hand side. Further more, since the side with the odd bag went up, the odd bag must be lighter. For the third use, she just needed to figure out which of the two bags was odd, which she knew would be the lighter one. This puzzle can also be down with twelve bags instead of six, and you can still determine which is odd and whether it is heavier or lighter in just three steps. However, the problem is much harder with twelve bags.

went on, "I will make a single statement to you. If it is true, you will get this dagger which I've stolen from the dragon's lair." She produced the jeweled dagger and displayed it for all the court to see. The Duke was intrigued, though also a bit miffed that his guards had not confiscated her weapon. "But if it is false, you will not get the dagger," she concluded.

"Hmmm..." pondered the Duke, rubbing his chin. "But you could simply lie and then I get nothing. Hardly seems worth my time."

"Very well," Antimony responded. With just a little reluctance, she said: "Then if my statement is false, you will not get the dagger, but I will give you my lovely purple shoes."

"Oh!" delighted the Duke, who had secretly coveted her purple shoes since the guards dragged her into the court.

"Is it a deal?" asked Antimony impatiently.

The Duke agreed, and waited anxiously for her statement.

Antimony paused long enough to think it through carefully and then pronounced, "You will not get the dagger, and you will not free me."

This took the Duke by surprise and he didn't know how to react. He sat puzzling for some time, then his face sank in anger. Then it erupted in laughter, then sank again. Then a wry smile crept over his face.

"I admit," he said at last through clenched teeth. "You have bested me, small one. Guards, she is free to go. Release her shackles⁷." Confused, the guards looked about at each

⁷Consider what actions the Duke might take. He could take her dagger, which would make her statement false (because she stated that he would not get the dagger). However, according to the rules, if her

other, then shrugged, and obeyed the Duke's commands.


"I will take your lovely purple shoes, though," he reminded her. Antimony kept her word and slipped out of her lovely purple shoes, pausing just a moment before handing them over to the guard and saying goodbye to the last item she had from home.

Barefooted but glowing with pride, Antimony walked across the cool marble tiles to the fanciful wooden doors at the end of the Duke's court, and slipped back out into the open space of the Inner Kingdom, unobstructed.

statement is false then he doesn't get her dagger, so this would be a contradiction. He could choose not to take her dagger but throw her in the dungeon, but then her statement would be true, and according to the rules, a true statement means he gets the dagger, so this is another contradiction. The only other option is to not take her dagger, and to let her go: this makes her statement false (because she stated that he would not let her go) and he's obeying the rules for a false statement by not taking her dagger.

Chapter 17

At Large in the Inner Kingdom

 RELEASED into the Inner Kingdom, Antimony was eager to find the palace of the fairy princess and rescue her parents. And it didn't take her long to find the palace. In fact, it would have been rather difficult for her to have missed the sky-scraping towers and glimmering white walls situated in the center of a grand and sweeping garden that put even John the Gardener's fields to shame.

The problem, as it turned out, was not finding the palace, but getting inside. Stationed outside the palace gates was a small army of rather brutish looking guards. Each man towered head, shoulders, and chest above Antimony, with backs as broad as a barn. They all carried long spears, with jagged and rusted blades longer than her leg and spattered with blood; a far cry from the pompous and ornate staves the Duke's guards had carried.

They didn't look, didn't even glance at her when she

approached the gate, simply stood at rigid attention staring straight ahead and holding their wicked weapons at the ready.

Antimony didn't dare ask to be permitted, didn't even dare to open her mouth. After standing before the dreadful guards for a few short moments, she lost her nerve altogether and slunk away.

She wandered away from the palace to the little town that surrounded the Duke's castle. Walking through the busy market place, it occurred to Antimony that it may take some time for her to figure a way into the palace and come up with a rescue plan, just as it had taken some time to figure out how to get past the Duke's labyrinth. Only then, she had the company of the sweet and caring honey lady, and now, she was alone in the world.

* * *

Antimony spent some time exploring, and eventually found a small stable at the end of the town which seemed to be abandoned. There was enough hay to makeup a little bed for herself and the roof did a reasonable job of keeping the weather outside.

Food was the hard part, and of course the most important one. Back in the cottage, her and the honey lady baked up piles and piles of bread; much of it went to the guards of the Baron and Baroness, most of the rest they distributed to the poor people of the village. But there was always enough for the two of them to eat, spread with a bit of jam, nibbled down in front of the cozy fire. Antimony missed the honey

lady and the warm little cottage desperately, almost as much as she missed her real parents.

But now was not the time for despair, Antimony knew she needed food, and wishing to be back in the cottage would not get her any. For the first few days, she was able to get by with the few coins she had stolen from the dragon's lair. But gold coins didn't buy nearly as much food as she would have hoped, and by her third day in town, she was out of money.

After that, she spent her time lurking in the dark shadows of the market place. She would wait until an unsuspecting shop keeper or vendor turned his back, then snatch a little trifle for her aching belly. She felt badly about stealing from the merchants, but she didn't have a choice if she was going to avoid dying of hunger.

During her days in the market, she noticed some rather peculiar business going on. Young boys, about her age, were constantly zipping back and forth in conspicuous monotone uniforms; some in red, some in green, and some dressed head to toe in blue. And each boy carried a satchel full of wax tablets, sometimes bare and sometimes covered with charcoal markings. In the mornings, they would deliver their tablets to the merchants, and in the evenings, they would pick them back up, covered with dark smudges and marks. "Ledger Bearers" is what the people of the town called them, and Antimony knew enough to know that ledgers had something to do with bookkeeping for businesses.

The Ledger Bearers infested the market, most prominently in the mornings and evenings when they made their deliveries and pick ups. They were generally regarded as a minor

nuisance, but overall were ignored as part of the environment, excepting the occasional collision with a cart or argument over a smudged ledger. But what Antimony noticed most of all, and coveted above all else, were the handsome and colorful leather shoes they wore, which only reminded Antimony of how badly her own bare feet were aching since she had turned over her pretty purple shoes to the Duke.

* * *

One morning while stalking through the market and dodging the ledger bearers in the red, green, and blue uniforms, Antimony happened upon a rather boisterous scene between two men at a lentil stand.

Getting closer, she could hear two men arguing: one the owner of the stand, and the other a tax collector. A girl slightly older than Antimony, whom she had seen before in the market, happened to be standing by, watching the fight.

“What’s going on?” Antimony asked.

“The tax collector has come collecting, but they can’t work out how to measure what’s owed,” she said.

“Why not?” asked Antimony.

“The vendor owes four pounds of lentils for tax, but only has sacks that hold five pounds or three pounds. The tax collector said he’ll pour some out from a five pound sack, but the vendor doesn’t trust him to pour out a full pound.”

“Hmmm...” observed Antimony. She considered the poor men’s dilemma and rubbed her chin considering how such a thing could work.

"Excuse me," she interjected politely, stepping forward to the arguing men.

"What is it, little girl?" asked the tax collector curtly.

"Well I believe I can settle this for you," she offered.

"Bwah!" scoffed the vendor. "A silly little fool, run along and let grown ups do grown up work."

But the tax collector, who after all was in the regrettable service of the fairy princess—who had connived her way into the ultimate position of power—was not so quick to dismiss her. "What did you have in mind?" he asked.

"Well," Antimony began, taking a deep, thoughtful breath, and stepping a little closer. "If you fill the five pound sack, and then empty it into a three pound sack, you'll have two pounds left over. Then you can empty the three pound sack back into your barrel, and transfer the two pounds of lentils into the three pound sack. "Then," she continued, "you can fill the five pound sack again, and use it to top off the three pound sack. Since the three pound sack will already have two pounds in it, it will only take one pound to top off, leaving four pounds of lentils in the five pound sack."

The two men stared at her, the tax collector with a small and pleasant smile crossing his lips, the vendor with his mouth hanging open in disbelief.

"Did you follow that?" she asked trying to sound polite and ending up sounding just a little bit patronizing.

"A very bright girl," observed the tax collector. "What do you say Cornelius?" he asked the vendor. "Does it sound fair?"

The vendor agreed and went to work pouring and repouring and topping off bags of lentils as per Antimony's instructions, all under the watchful eye of the tax collector.

The measuring done, the tax collector marked something off in his own ledger, and the vendor did the same. The two men shook hands, and the crowd began to disperse.

Before Antimony could slip away, the tax collector touched her on the shoulder, which, although gentle, took her by surprise and she jumped with a start.

"Oh, I'm sorry, miss," he said kindly. "I didn't mean to startle you."

"What do you want?" she asked just a little frightened. "I haven't got any taxes due, I should think," she added smartly.

The tax man chuckled good naturedly and shook his head nicely. "No, I should think not," he assured her. "I was just curious what a bright girl such as yourself was doing wandering about in the market place." He paused and looked down at her dirty and calloused feet. "Barefoot," he added.

"Kindly mind to your own business about who's doing what in the market place," she snapped rudely. The tax collector seemed kind enough, but he worked for the wicked fairy princess, after all, who had stolen away her parents and caused her to go on this dreadful and tiring adventure, and for that he must not be trusted.

"Oh, my dear girl, I certainly don't mean to pry into your business. I only meant to know if you're free and interested in a small job. Something to occupy your time, and maybe even provide a few coins to buy yourself some new shoes. Or

some food," he added, eyeing the little morsel of bread she had earlier snuck into the pocket of her trousers.

This sounded intriguing. In addition to having some money so she could stop stealing from the merchants, a job in the market place might be just the kind of thing she needed to find her way around and get to know some people and learn enough to figure out how to free her parents from the princess.

Antimony asked, only a little less rudely, what sort of job, and he told her that he needed a new ledger bearer and that a bright and clever girl such as herself could do very well for such a job.

"It's just a small job," he said. "Hardly takes half the day, and you'll have the whole rest of your day free to kick around barefoot or contemplate measuring lentils or do whatever it is that bright young girls do to pass their time."

Antimony thought about the nice and neat red, green, and blue uniforms of the ledger carriers, and especially about their handsome looking shoes with the thick leather soles. Antimony agreed to the job, and even went with the tax collector to his office just outside the market where he provided her with a gently used but still very nice red uniform, complete with nicely broken in red leather shoes.

"Come back here first thing in the morning," he told her at last. "Before the market opens. I'll give you blank ledgers and tell you where to deliver them. At the end of the day, you'll go back out and collect the filled in ledgers, and bring them back here to me."

Antimony thanked him, somewhat reluctantly, for the clothes and the shoes and the job, and took her exit from

the tax office.

Antimony did just what she had been directed to do, showing up promptly in the morning at the tax office, even before the tax collector himself. She delivered the blank ledgers where he told her, and at the end of the day, she picked up full ledgers from the vendors, and delivered them back to the tax office.

“Very good,” he said, checking over the ledgers quickly to make sure she hadn’t forgotten any. “Not such a bad job, was it?” he asked.

Antimony shook her head in agreement.

“Well then,” he continued. “Come back in the morning if you like, I’ll give you some new blank ledgers and you can do the whole thing again.” He reached into a small felt purse he kept on the desk and drew out two small coins and offered them to Antimony as wages. She thanked him, not at all reluctantly, and he dismissed her.

Antimony continued on in this way for several days, glad to have shoes on her feet and a few coins in her pocket so she didn’t have to swipe food from the kind vendors when they were distracted. She was good at her job, and every day the tax collector thanked her for her good work, and even some of the vendors thanked her, even though she was working for the tax collector.

But something about the work bothered her, and she wasn’t quite sure what it was, until one morning it dawned on her as she waited patiently in the tax office for her next set of blank ledgers to deliver.

“Why does it matter who I deliver the ledgers to if they’re

blank?” she blurted out. The tax collector started at her question and nearly dropped the pile of tablets he was carrying.

“It’s just logistics,” he said coolly. “Can’t have different bearers bringing ledgers to the same person now, could we? Then someone wouldn’t get one.”

Antimony thought about that as the tax collector pulled a stack of fresh new ledgers from the wall where they were neatly organized into tall and narrow pigeon holes, each labeled with the name of a vendor or shopkeeper.

“But why do the blank tablets need to be organized?” she asked. “Why not just stack them up once they’re cleaned?”

The tax collector was getting frazzled now, and visibly trying to keep his calm. “It’s just the way I like to do it,” he said. “I like everything to be organized so I don’t lose track of what’s what.”

“Oh, I see. I’m the same way,” she lied. She could tell he was getting aggravated, and even a little hot under the collar, so she let it drop, although she still thought it was strange.

Antimony continued delivering and picking up and swapping the ledgers for several days, and didn’t ask any more questions except for innocent ones related to her work like “Where’s Mr. So-and-So’s shop?” or “What’s this name say? I can’t make it out,” and things like that.

But she still felt something was fishy about these funny wax tablets and in particular the supposedly blank ones which she spent a lot of time inspecting for markings or patterns or tiny writing or anything else that would make it signifi-

cant which one went to whom, but they all looked the same: perfectly blank, perfectly smooth.

She briefly considered mixing them up one day, and trying to learn more by seeing what happened. But she worried that what would happen was that she would get fired from her job and lose her nice uniform and her sturdy shoes and her pocket change and any chance she might have of figuring out the mystery of the ledgers. In the end, she decided to be very careful not to mix up the ledgers, although she congratulated herself on coming up with a clever experiment, even if it wasn't practical.

It was two weeks that she had been working for the tax collector when she finally got a clue. She was carrying her stack of completed ledgers through the market when the axle of a vegetable cart gave out and spilled its good right in front of her. She tripped and skidded on busted squash guts and tried to keep her balance, and she mostly did, but one of the ledgers fell to the ground and the wax cracked.

"Oh no!" she moaned quietly. "What am I going to do now?"

She decided to use a few of her coins to buy a candle and some charcoal from a vendor of general wares, and she took the ledgers back to her stable and tried to figure out how best to repair the ledger.

Just as she was about to drip some candle wax into the crack, she noticed something strange about the tablet. She knew that inside the tablet was a wood panel, that's what gave them a bit of strength and durability. But she never imagined that there would be more writing on the wooden

panel!

“This must be it!” she thought to herself. “This is the secret of the ledgers, and this is why it matters who I deliver them to even if they’re blank. It’s because they’re not blank, there’s writing on the inside, too!”

Antimony’s curiosity was overpowering, which she reasoned was not reckless anyway because she was still looking for clues about how to rescue her parents, so she couldn’t pass up a clue as obviously significant as hidden messages.

Using the charcoal she bought and the paper that the shopkeeper had nicely used to wrap up the candles, she copied down every mark she could find on the wax surface of the tablet, before scraping all of it away with her dragon dagger, and carefully collecting all of the scraps so she could melt it back on later.

Sure enough, the thin layer of wax covered up a wooden panel covered with more writing. Only she couldn’t make any sense of the writing, it was just gibberish. Not even gibberish because gibberish can be pronounced, this was more like gobbelty-gook; just a collection of letters written out in any old order and way.

“But that’s silly,” she thought. “Why go through the hassle of hiding gobbelty-gook under a wax ledger?” So Antimony reasoned that it must be a secret code, which was lovely news because she used to do secret code puzzles with her father back home¹.

¹Scrambling up messages with ciphers, so that they can’t be read, is called *cryptography*. Hiding messages altogether, like the messages under the wax ledgers, is a related field called *steganography*.

“A cipher is like a game,” he had explained to her. “And there’s rules for what you’re allowed to do. The words and letters to be encoded are like the game board, and certain patterns tend to appear depending on what the rules are.”

So Antimony began looking for patterns in the gobbeltygook, just like he had taught her to do. She spent a lot of time looking for patterns, and it was hard not to think that it was all just a lot of nonsense, because she couldn’t come up with any kind of patterns that seemed helpful.

Finally she spotted something that might be a pattern. Three letters in particular, R, F, and C, showed up very frequently together in that order, often at the beginning of a word and sometimes in the middle of a word, and almost never at the end of a word, but most of all as a word all on their own. She looked for more patterns related to this and quickly noticed that the second and third letter, F and C, showed up a lot without an R before them: sometimes at the beginning or in the middle of a word, and several times all alone.

This felt like a very important clue, and she guessed (and hoped) that this was a simple kind of cipher where a particular coded letter always stands for the same decoded letter, which would mean that R-F-C in the code would always stand for the same three letter segment in the secret message.

Antimony considered common three letter words, of which she could imagine many, such as “our”, or “are”, or “bar”, or “dog”. Then she remembered the second part of the pattern she had found, that the last two letters sometime appeared as a word on their own, and she couldn’t think of any words

at all that were spelled “ur” or “re” or “ar” or “og”, so none of those words were right.

“What could the word be?” she asked herself. “Oh!” she thought. “I mean, Eureka! The word could be the word ‘the’. T-H-E certainly appears at the beginning of lots of words, like ‘they’ and ‘these’ and ‘theory’. And H-E is a word to, it’s the word ‘he’, which is common enough.”

So Antimony made a hypothesis that the code letters R-F-C stood for the plain letters T-H-E, and worked the rest from there. First she thought of what rules could turn a T into an R, and realized that R is two letters before T. Then she thought about turning an H into a F, and it turned out that F is two letters before H as well. And sure enough, she quickly confirmed that C is two letters before E, and so the cipher seemed to be to replace each letter with the one that’s two letters before it.

Antimony got to work decoding the entire cipher with her guess, copying each letter onto her paper as she decoded it. After just a few words, she was pretty sure she was right, because all of the words decoded to words she recognized, and even stringing them together looked like it could certainly be the start of a sentence. That would be very unlikely if she had guessed the wrong cipher.

After several minutes, Antimony had decoded the entire secret message hidden beneath the wax surface of the ledger and, although she could read it fine, she couldn’t make any sense of it, at least not in the context of a hidden and coded message. It read something like this:

The flower in the field may wither or grow with the season and clime. When rain falls gently and sun shines warmly, the leaves grow plump and the stem stands strong, with bright colors blushing in the vital petals. And when the sky is dry and hazy, the land is parched, and the wind blows arid across the plain, the leaves get limp and wrinkled, the stem bends and leans, and the petals fall pale to the harsh earth. The flower left to his own devices may prosper or may fail as is the wont of history. But in the shadow of the castle wall, he is not afforded that freedom. The flower by the wall is sheltered as much from the blustering wind as from the helpful breeze, as much from the scorching summer heat as from the warm and nourishing spring sun.


And so on in that vein for several more paragraphs.

For the life of her, Antimony could not understand why the tax collector would be sending secret messages about flowers, but the fact that it mentioned a castle interested her. Perhaps if there were secret messages on all the other tablets, and she could decode them as well, she could learn more.

But it would have to wait, because Antimony needed to get the ledger put back together and returned to the tax man in his office. She carefully lit the candle and melted the wax she had saved back onto the wooden tablet. When it had cooled and hardened, she used her charcoal to copy the original numbers and marks back onto the ledger, and she had to admit it looked quite good.

Chapter 18

Antimony and the Green Uniform Ledgers

NTIMONY continued delivering the ledgers every day in her red uniform, and every day before she turned the ledgers in to the tax collector, she scraped off the wax and decoded the hidden messages underneath, then re-waxed the tablets and recreated the ledgers before turning them in.

The messages all decoded in the same way, and the decoded messages were all remarkably mundane, talking about flowers, or mice, or sparrows, and various other such things that Antimony couldn't manage to find interesting. But most of the messages also made some passing reference to a castle, or a wall, or a ruler, or something that kept her interest piqued to decode the messages again the next day.

But even with these hints and references, after a few weeks, Antimony began to feel discouraged.

Then something changed that renewed her interest again; she had done such a good job delivering the ledgers in her

red uniform, that the tax collector promoted her to the green uniform, and started giving her a different set of vendors to deliver to.

Antimony didn't waste any time with the new ledgers: as soon as she picked up the first set in her green uniform, she took them straight back to her little stable, scraped away the wax, and began decoding the hidden messages.

Only, something was wrong. The messages didn't decode correctly, the gobbety-gook just turned into more gobbety-gook. "It must use a different cipher," Antimony thought. She began looking for patterns again, like she had done with the very first message. She looked and looked and looked and thought she had found some at first, but they never panned out. She looked for patterns all day until she was simply out of time. Without any success, she came to a point where she couldn't wait any longer; she had no choice but to start re-coating the tablets and filling in the ledgers to bring back to the tax collector.

Antimony tried again the next day, without any better luck: a cipher that turned one chunk of gibberish into a word turned another into worse gibberish. By the end of the day she hadn't made any progress and was starting to feel discouraged. She re-coated the tablets, copied the ledgers back over and turned them in to the tax man.

But Antimony wouldn't let this little set back get her down. That night as she sat in the dim and dancing candle light of her little stable, she took a mental step back and thought about the problem in a broader context. The first cipher was extremely simple, and had been easy to crack.

And the tax man had trusted her with those tablets right away, even though she wasn't supposed to know the messages were there. She had to work for him for a little while before he had trusted her with these new ledgers, so maybe the messages hidden on these ledgers were more important, which meant it probably used a harder cipher.

So Antimony thought about some of the other cipher games she used to play with her father. The easiest ones were the ones where each letter was just shifted a certain distance up or down the alphabet, like the one she had cracked when she wore the red uniform¹. These ciphers are a type her father called “monoalphabetic ciphers”, because each letter of cipher text always corresponds to one specific letter of plain text.

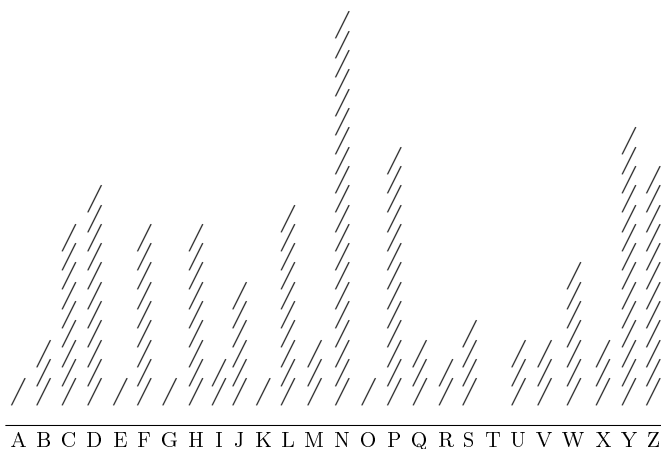
Another type of monoalphabetic cipher didn't just shift the alphabet, it scrambled it up completely. These were harder because finding the correct substitution for one letter didn't automatically give you the substitutions for the other letters.

But that didn't mean there were no patterns. Antimony knew from her games that certain letters tended to be used more often than others. For instance, she knew the letter E was used more often than any other letter. And so it stood to reason that if each letter of code always stood for the same letter of plain text, then whichever letter showed up most often in the code probably stood for an E.

So Antimony got to work counting up all the different

¹A cipher where each letter is shifted a certain distance through the alphabet is sometimes called a “Caesar cipher” after Julius Caesar who reportedly used it for military messages.

letters on the tablet. Then, just to be certain, she counted up all the coded letters on all the other tablets she had that day, so that she would have a good sample to work from. When she was done, she had a set of tallies that looked like this:



The letter that appeared the most was N, and by a good margin, so she made a hypothesis that an N in the code most likely represented an E in the plain text message.

Antimony also knew that the next most common letter after E is T, and she saw from her tallies that the next most common code letter was Y and so she reasoned that Y probably stood for T.

In a similar manner, she was able to guess that P stood for A and that Z probably stood for O, but beyond that it started to get a little tricky because many of the remaining letters

were almost equally common, so for instance an H might be more common than R in one message, but less common in another, and she couldn't be sure which kind of message she had.

So Antimony started with her four guesses and tried to see if she could use them to make words out of the coded message. At one point she found a three letter code word "LNY", which she knew (or at least guessed) stood for "_ET". She looked up L in her tallies and saw that it was used quite frequently, so it probably stood for one of I, N, S, H, or R, since those were the most commonly used letters after E, T, A, and O. Of those, only N and S turned the code word "LNY" into a word that she recognized.

She continued looking over the tablet, and found a code word that began with "LY...", which, according to her assumptions, stood for either "NT..." or "ST...", and she didn't know of any words that started with N-T, so it must be that L stands for S.

In a similar way, Antimony was able to discover the rest of the code and decipher the hidden message, which got easier the further she went since more and more letters revealed themselves and it became easier to guess the unknown letters in each word.


When she had finished decoding the message, Antimony was disappointed to find that it was no more helpful than the other hidden messages, although at least it talked about real world things instead of just hypothetical flowers and walls and mice. At least, it seemed to:

No vendor is fully independent: the craftsman buys lumber from the lumberjack, the lumberjack buys his tools from the blacksmith, the blacksmith buys ore from the miner. The craftsman earns his living by selling his crafts, less the cost of the lumber. If he is clever and finds a way to use lumber more efficiently, he can earn a better living, but the lumberjack will sell less wood and will suffer in kind. In turn, if the lumberjack sells less wood, he will chop less wood and won't wear through his tools as quickly, so the blacksmith will suffer, as will the miner. And yet who can blame the craftsman for learning to be more efficient? Why should every person not try to find ways to waste less? Whoever succeeds in doing so should be celebrated for it, and all of society should benefit, not suffer.

It seemed reasonable enough, but it didn't help Antimony at all to find a way into the palace. Just to be sure, she decoded the other ledgers, but they were all similarly irrelevant to her goal of rescuing her parents, although they did have some thought provoking ideas which she promised herself she would think more about.

Chapter 19

Antimony and the Litter

NTIMONY was delivering her ledgers in her green uniform one day—complete with their interesting but ultimately unhelpful hidden messages—when she noticed that the market place was looking quite shabby. Oh, the market place always looks a bit ramshackled with all the carts and people and horses and donkeys and goats kicking up the loose soil and whatnot. But lately, she just realized, it was becoming more and more littered with little bits of trash everywhere. She mentioned as much to the curmudgeonly old lady who owned the fish cart, as she delivered the day's ledger.

“It's the princess's soldiers,” the old lady replied with a spitting croak. “Ruffians, the whole lot of 'em. No respect for our town, they just think the whole market place is their own personal garbage heap.”

“That's terrible!” Antimony said earnestly. “Somebody should do something!”

"Who can do anything?" replied the old woman. "The soldiers are backed by the princess; they do what they want, and it's the dungeon for anyone who challenges them. And if the dungeon's too good for you, well..." she ran her finger coarsely across her wrinkled neck. Antimony shuddered in spite of herself.

"Well all the same, if this keeps up, this place is going to become unlivable!" Antimony looked out over the square and shook her head disapprovingly. Then she watched, appalled, as some townspeople walked by a dropped more of their own trash on the ground. "Hey!" she cried after them.

"You see?" she demanded of the old woman. "Now others are doing it, too!"

The woman shrugged. "Sure they are. Once a place is already a garbage heap, why wouldn't you add more garbage?"

"Well this has to stop." She walked over to the garbage that had just been dropped and picked it up. Then she stooped over and picked up another piece, and another.

"What're you doing?" asked the old lady, incredulously.

"Well somebody's got to pick up this mess. It may as well be me."

"But it's not your mess, why should you clean it up?"

Antimony shrugged and picked up another piece of trash. "Because if I don't, and nobody else does, then it's just going to stay a mess."

"Still, as a matter of principle..." began the old woman.

"Principles don't clean up the town." Antimony snapped, remembering her sweet honey lady. The old lady let her mouth close and simply watched Antimony quietly for a few

minutes. Then, slowly, she hobbled out from behind her little cart, and bent over to pick up a piece of trash. Then another, and another.

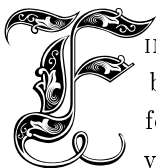
Soon enough, they had a good sized area around the old lady's fish cart cleared of trash. Some of the nearby vendors saw what they were doing and watched, curious. Then some of them joined in, and then others. In no time at all, Antimony and the towns people had cleaned up all the trash and litter they could find in the market place, and some even took it upon themselves to clean up and fix some messes that had been around for years.

The square looked so nice that some of the vendors were inspired to put out some little carpets or flags or banners around their shops and stalls to spruce it up even more, and by the time the clock began to chime noon, the town was looking downright festive, and cleaner than it had looked in many years.

"Oh dear," Antimony said. "It's already noon and I haven't even delivered all of my ledgers yet." She brushed the soil off of her green uniform and gathered up her ledgers and raced off to deliver them, although most of them she just had to leave in the shops and stalls since so many of the vendors were out in the square picking up trash or repairing broken windows or hanging garlands.

Chapter 20

The Blue Uniform

 FINALLY, the tax man promoted Antimony to the blue uniform. She had been working very hard for him in the green uniform and he very much valued her as an employee. Still, it took him a very long time to trust her enough to give her this new set of ledgers, which meant they must be very important.

Antimony spent all week trying to work out the cipher without anything to show for it, but she didn't get discouraged. "These must be very important messages," she thought, "so of course the cipher would be very hard to crack."

She began to wonder if this new cipher wasn't monoalphabetic like the others, perhaps it was polyalphabetic, which means the same code letter could stand for multiple plain letters. Her father had once told her about a cipher called a Vigenere cipher¹, which was sort of like several shifting ci-

¹The Vigenere cipher uses a secret word or phrase called a *key*. The key is lined up with the message, and repeated as many times as it takes to cover the entire message. Then each letter in the key indicates how

phers all put together so that each letter would use a different shift depending on where it was in the message. Antimony knew that breaking such a cipher was possible, but would be a lot harder than the earlier ciphers and unfortunately, she couldn't remember how her father had explained to do it.

So if Antimony was going to crack these secret messages, she was going to have to figure out how to do it on her own. And so she thought about it. She thought about it all day without even touching any of the ledgers (except of course to deliver them). She thought about it all the next day, too, and for the rest of the week.

Then she had to stop thinking about it, because she had thought about it too much and it was getting all jumbled around in her head. So, reluctantly, she took a break from thinking about the cipher and just let it sit in the back of her head while she went about her daily business.

Every couple of days, she would come back to it, with fresh eyes and think a little more about it. She was delighted to find that some of her ideas had become more clear while she wasn't even thinking about them, which is the funny thing about thinking and not thinking.

Eventually, Antimony was able to come up with an idea that she might actually be able to start working with. She

much to shift the corresponding message letter. For instance, a letter A in the key means the corresponding message letter will be shifted by one, where as a letter B in the key indicates a shift of two. For a time, the Vigenere cipher was considered unbreakable. It is now known to be relatively trivial to break and is classified as a "classic cipher", as are the other two cipher's Antimony has encountered. Modern cryptography uses much stronger ciphers that typically rely on advanced mathematics, and are usually implemented on computers.

reasoned that since the same pattern of shifts was used over and over to encipher the message, then there should still be recurring patterns in the coded message. For instance, the word "the" wouldn't be coded the same way every time it occurred, but every so often, it would line up in the same way within the pattern of shifts, and so it would end up coded the same.

So she started looking for patterns that repeated. Small patterns of two or three letters were pretty easy to find, but those weren't very helpful because they might not actually be the same word. Longer patterns of four or five or six letters were good because it was very unlikely that such a long pattern would show up if they didn't represent the same word.

After searching through all of the days ledgers, she was able to find a few long patterns that occurred multiple times in the same message. One of the patterns was six letters long, and it appeared three times on one tablet, with forty-eight letters from the first to the second occurrence, and seventy-two letters from the second to the third.

Another pattern was only five letters long, but it showed up four times in one message, separated by twenty-four, forty-eight, sixty, and forty-eight letters. Antimony had an idea that the distances between these occurrences was important, but she couldn't work out exactly how, so she would need to think more about it. She re-waxed and rewrote all the ledgers and headed off to deliver them to the tax man.

* * *

It was a gloomy and overcast day in the market—very good for deep thinking—and Antimony had just finished delivering the last of the ledgers to the vendors. She was walking through the square and kept looking up at the big face of the public clock, though she wasn't really sure why. Just as the clock began to chime, it struck her like a thunderbolt, and she could barely keep herself for yelling out "Eureka!"

The clock had twelve numbers on it, so every twelve hours, it repeated itself. And twice twelve is twenty-four, so every twenty-four hours it would repeat itself as well, having gone around exactly twice. It would likewise repeat itself after thirty-six hours, and forty-eight hours, and sixty-hours, and so on, just like the patterns she had found in the code. She also realized that if a clock had twenty-four numbers on it, it would also repeat itself every twenty-four, and forty-eight, and seventy-two hours, just like her patterns, but it would *not* repeat after sixty hours, which her patterns did. Therefore, she reasoned, the pattern must not be any longer than twelve.

Of course, it could be smaller than twelve. It could be that the pattern was only six long, for instance, because then it would go around twice as often, but it would still have a chance to repeat after twelve letters, and twenty four letter, and thirty-six letters, and so on. But it couldn't be five, for instance, because then it wouldn't repeat after twenty four letters².

²Antimony has discovered the concept of the *greatest common denominator*, which is the biggest whole number that can be used to evenly divide each of a set of numbers. Specifically, she found that twelve is the greatest common denominator of twenty-four, forty-eight, sixty, and seventy-two.

She raced back to her little stable and worked out that if the pattern had one, two, three, four, six, or twelve parts, then it would have a chance to repeat every twelve letters³like she saw. However, a pattern which was one, two, three, four, or six parts long could look just like a pattern that was twelve parts long, if you just repeated it a few times. Therefore, Antimony could assume for the moment the worst case, that the pattern had twelve parts, and work it from there. If at any point she was able to find that it had fewer, then it would just be that much easier.

Figuring out how many parts the pattern had was just the beginning of cracking the cipher. Having a pattern with twelve parts meant she had twelve different monoalphabetic ciphers to break, only each cipher was only applied to every twelfth letter, which meant there were no words she could use to guess the cipher, and it would take her twelve times as long to collect useful letter counts.

“So I guess I better start right away.” Antimony said to herself. And so she began tallying up the letters on all the day’s tablets, keeping a different set of tallies for each of the twelve repeating positions.

By the time she got through the last of the tablets, she only had a handful of tallies for each letter, which was too small of a sample to be reliable. She would need to wait until tomorrow when she could add tallies for the next set of

³One, two, three, four, six, and twelve are all the common denominators for her pattern of twenty-four, forty-eight, sixty, and seventy-two. Of course, only one of these can be the *greatest* common denominator.

messages.

* * *

It took all week for her to gather enough tallies that she could be confident they were representative of the messages, and from there she was finally able to crack each cipher the way she had done before.

The messages on these tablets were striking for how frank they were, especially in comparison to the earlier ones. The first message she decoded began like this:


The princess is choking progress and innovation. Her tyranny suppresses creativity, and rewards cowardice and lackeyism. Leading by example, her own ascent to power has set the stage for corruption, bribery, and greed. Her reign casts a dark malaise across the entire kingdom.

The other tablets she decoded that day contained similarly viperous messages, which electrified Antimony. She was excited and frightened to find that there were others in the town who shared her extreme dislike of the fairy princess. It seemed hers was not the only life which had been turned wrong side up by the wicked fay.

Only her excitement would not last long. Soon, her eagerness would lead to recklessness, and that recklessness would lead her into trouble.

Chapter 21

Behind the Old Lady's Fish Cart

NTIMONY devoured the secret messages greedily, hungry for their defamatory prose. She learned that the princess used her soldiers to intimidate and extort the people of the kingdom. Like the honey lady had said, the princess was unaccustomed to being told “no”, and so she expected that everyone would do what she commanded. And if they refused, her soldiers would throw them in the dungeon, or force them to work as laborers on one of her great tracts of land.

But most importantly, she learned that the fairy princess hated her parents and had banished them from the kingdom. Now she circled the globe searching for replacement parents and taking them away from their own families. It was good news, to Antimony, because it meant that her parents most likely had not been harmed by the princess.

The more she learned about the princess, the more she ached to find and rescue her parents, to take them away from

the wretched brat. Eagerly she would race back to her stable every day with the ledgers, scrape them clean and decrypt the messages as fast as she could, hoping to find some helpful clue about how she could actually do it.

And sometimes her eagerness was so great that it would boil up inside of her and she would get all steamy and bubbly, practically to the point of losing control of her own body.

That was how it came to be that one of the tablets she delivered was compromised. She was in such a rush to decrypt it that she smudged some of the charcoal on the wooden tablet, and had to rewrite it herself. Rattled a bit by her carelessness, she took her time and copied it over carefully, matching the original handwriting to a tee.

Pleased with her work, she caught her breath and forced herself to slow down, to avoid making any more mistakes. She melted her wax shavings, re-coated all the tablets, and headed out to finish her day's tasks.

* * *

The next day she was delivering a blank ledger to the old woman who sold fish. Dried strips of stinking gray meat were hanging as usual from the frame of her little cart, with whole trout, pike, and bass laid out on the counter on beds of fresh green lettuce. Everything was as it should be, only the old lady was nowhere in sight.

"Hello, ma'am?" called Antimony. "I've your day's ledger. From the tax collector."

A rattling old voice came from behind a curtain of worsted wool, hung in the back of the cart to create a little private

area.

“Through here, deary,” the old crone said. “I’m only taking a little break from the beating sun.”

Antimony ducked back behind the cart and dipped past the tired curtain. It was dim and shadowy inside the little room, and Antimony’s eyes tried to adjust to the darkness, just as they had when she first ventured into the dragon’s lair so long ago.

Only her eyes were slow to adjust after being out in the bright sunlight, and she didn’t have a chance to look around before the old woman hooked her bony hands around Antimony’s shoulder and spun her around. Something cold and flat pressed angrily against her throat as a match was struck behind the old woman.

In the darkness, the match floated a short distance through the air and then settled into a little copper cage, where its flame spread to an oily wick, filling the little tent with a greasy, smoky perfume which would have been a pleasant alternative to the stench of fish, if Antimony had had the presence of mind to notice it.

A second hand adjusted the little dial on the lamp until the tent was cast in a low warm light. Antimony could now clearly see the haggard face of the old fish monger glaring into her own, and although she couldn’t see the blade, she could see the old woman’s arm outstretched towards her neck and made a reasonable guess about what she felt there.

For a moment, she considered whether or not she could overpower the frail woman, and whether or not she could do it fast enough to avoid being sliced open like one of the fish

on the counter out front.

Then she remembered the other figure in the room, the one who had struck the match and lit the lamp. The one who stood silently behind the angry old woman.

"You thought you were very clever, didn't you?" croaked the old woman. "A remarkable bright girl, indeed, to figure out our little secret."

Antimony tried to talk, but the pressure of the knife made it hard to concentrate on forming words. She murmured a few incoherent sounds.

"What's that, spy? I can't make out your devil words?" the old lady laughed.

Antimony swallowed, hard, and the sharp edge of the knife dug into her neck painfully. She tried again, "I'm not a spy," she gasped. "I only want to save my parents." She was scared, and as the words came out, her emotions began to pile up in the back of her throat. Everything she had been through since the morning on the pier seemed to catch up with her all at once. Her body seemed all at once to grow heavy on her small and tired legs, and the force of will that had mostly kept her from crying all this time suddenly shattered. Her eyes began to rain uncontrollably, until they were so full that she could barely see the old woman. She sobbed to herself, and every sob caused the knife to dig into her skin, but she couldn't control it.

"Enough, now," said the shadowy figure behind the old woman. He put his hand on her shoulder and pulled her easily back, away from Antimony, releasing her neck from the knife's pressure.

Antimony wiped her eyes as the man stepped forward, and for just a second before they filled up again, she could make out the stern but kind face of the tax collector.

* * *

“Antimony,” said the tax collector. “Try to calm down, we won’t hurt you.” Antimony sniffed and sobbed and tried to gain control of herself, and mostly she did, but still she was occasionally gripped by spasms of despair that shook and rattled her little crying body.

When she was a little bit under control, the tax collector continued, “Antimony, now we’re not going to hurt you, and I don’t want to scare you, but this is a very serious matter. We know you’ve discovered our hidden messages.”

“Spy!” crowed the old woman accusingly.

“I’m not a spy! And I don’t know anything about any secret messages,” Antimony lied.

“Easy,” said the tax collector. “Antimony, we know you do, because one of the message was copied incorrectly. And you’re the only one who has access to them”

“Incorrectly!” Antimony blurted out defensively. Her eyes went wide with terror when she realized what she said, and wished with all her might that the words would just fall out of the air before they reached anyone’s ears.

“So you did copy them!” gloated the old woman.

“The truth, Antimony. This is very important.”

He didn’t have to tell Antimony how important this way, he wasn’t the one bleeding from the neck. But that was an old trick that grownups sometimes use on children, to tell them

something is very important so that they will cooperate. Only Antimony was wise enough to know that what was important to him and what was important to herself weren't necessarily the same thing.

"I'm not a spy," she insisted.

"But you have been reading our messages," repeated the tax collector, raising a hand to silence the old woman before she could speak.

Antimony remained silent.

"It doesn't matter if you admit it or not, we know the truth," he continued. "The question now is what to do with you. I'm sure you can appreciate how sensitive this information is. We can't very well just release you to go back and report everything to the princess." He rubbed his chin pensively.

"But I'm not working for the princess!" cried Antimony desperately. "I told you, I'm not a spy, I just want to rescue my parents! She's taken them and I'm just trying to figure out how to get into the palace so I can rescue them. And when I found your hidden messages by accident I was just so curious, and the first one was so easy to decipher, and then the second was a little bit harder but it was just so interesting and I didn't understand why you were hiding these messages and then when I was finally able to break the third cipher and I learned how terribly wicked the princess is, even more than I thought, and I learned that there were so many others who disliked her as well, and I just... I just..." she had to stop to catch her breath, and because her train of thought had run out of track. She stood in the dark and oily little room,

shaking with fear and desperation in the flickering lamp light.

"There, there," said the old woman, with surprising softness. She stepped forward and put her bony hand back on Antimony's shoulder, but gently now, and with kindness. She looked long and deep into Antimony's eyes, which were still wet with tears barely held back. Then she turned back to the tax collector and said simply "I believe her."

He nodded slowly. "So do I."

The old woman slipped out of the little tent, then returned a moment later with a ladle full of water and held it to Antimony.

"Take a sip, deary, try to calm yourself." Antimony took a sip. The cool refreshing water washing over her sticky lips and down her hoarse throat was soothing. She took another sip, then wiped her eyes on the blue sleeve of her uniform.

The three remained silent in the tent for several moments. At last, Antimony said, "How did you know?"

"Because you're too smart for your own good," croaked the old woman gently. "You see, I always put little mistakes in my messages. Just simple little spelling errors that you wouldn't even notice."

"So small," continued the tax collector, "that when you were copying it over, you didn't even see it, and you wrote down the correct spelling instead."

Antimony felt angry with herself for having missed something so simple and so important. But she was impressed with the old woman for setting such a clever trap.

"I'm sorry I read your secret messages," she said genuinely.

"Never mind that now," said the tax collector. "It seems as though we have much to discuss. Come to the public house this evening, one hour after the end of business. Ask the landlord for a bowl of root stock, and a private table."

"Root stock?" Antimony replied.


"It's a type of soup," said the old woman.

"We'll meet you there," added the tax collector. With that, he ducked out of the little tent.

The old woman nodded to Antimony, and Antimony followed after him, back out into the bright sun.

Chapter 22

The Council of Ledger Bearers

NTIMONY had just enough time to clean the little bit of blood off her neck before she had to finish delivering the ledgers for the day. She wouldn't have time to decrypt them as she normally did, but she figured that wasn't really necessary at this point.

The old woman's knife had only nicked the skin on her neck, it hadn't done any real damage. She cleaned it gently with a wet rag, the way her father had cleaned her skinned knees when she had fallen off her bicycle. That seemed like a very long time ago now, back in the safety and comfort of her home. No one had ever held a knife to her throat then. No, back then she couldn't ever even imagine that such a thing would happen.

Her loneliness, which had become so persistently dull over the course of her trials, began to ache sharply again. But now, after all this time with the ledgers and their secret messages, she finally felt like she was making progress again, and it

renewed her spirit. She swallowed her sorrow down hard, and allowed herself to hope that the tax collector and the fish monger would be able to help her get into the palace.

She dried her neck gently, then packed the remaining ledgers into her satchel and went off to deliver them to the other vendors.

* * *

She delivered the filled in ledgers as usual to the tax collector at the end of the day, and he didn't say anything about their encounter behind the fish cart earlier, or about their future encounter at the public house that evening. He accepted the ledgers with a few words of thanks, as he always did, paid her as he always did, and then returned to his work, as he always did. Antimony turned and left his office, as she always did.

An hour later she stood nervously outside the heavy wooden door of the public house. Blurry light from candles and lamps danced across the fogged glass windows. She had been past the public house many times, but had never gone inside. Usually the warm glow emanating from within was wholesome and welcoming. But tonight, under the purple haze of dusk and the deep penetrating shadow of the palace, the flickering forms and the shapes to which they alluded felt menacing and uncertain.

She thought back to the shadows of the forest, on the first night she had arrived in this place from across the sea. Back then, she had to work just to stay alive, and it was the rising tide of the ocean that pushed her into the woods.

The danger now was much less imminent, and in a scared and shallow corner of her mind, she always had the sense that should could just give up, surrender to the obstacles that challenged her and settle in to her new life here in this place. She thought about the honey lady, and about John the Gardener, and even about the dragon who had, in a his own way, taken care of her.

“It would be so easy,” she couldn’t help thinking. “I could stop all of this, right now, by just giving up. It’s not like I haven’t tried. No body could say I haven’t tried. And I’ve been through so much, certainly more than any little girl is obligated to go through.”

But in a much brighter and much more heartfelt part of her mind, she thought about her parents, trapped by the fairy princess, alone in the palace, and not even knowing what had become of her.

Standing there before the menacing shadows of the unknown, she once again sensed a tide rising up, driving her to go inside. Only this wasn’t an ocean’s tide, coming to swallow her up. This tide was much more urgent, and it came from inside of her.

Boldly, she pushed opened the old oak door, and disappeared into the shadows within.

* * *

“Root stock?” asked the landlord incredulously.

“Root stock.” Antimony confirmed. “It’s a type of soup.”

“I know what it is,” he replied assuringly.

“And I’d like a private table, please.”

He raised one eyebrow and echoed her again.

"Yes, please."

He looked at her for a long time. "What's your name?" he finally asked.

"I'm Antimony," she replied confidently.

He looked at her some more. "Very well," he said at last.

The man stepped out from behind the battered wooden bar. He had a barrel chest and shoulders as broad as a pack horse. When he stood in front of Antimony, his towering frame rose up like a tree, and his head was so high it nearly disappeared in the shadows of the rafters.

"Follow me," he said, leading the way to the back of the tavern.

He pulled back a heavy velvet curtain for her, and she slipped through the narrow doorway it had obscured. He ducked to get through the frame, then led her along a narrow hallway.

At the end of the hall, he stopped and knocked twice on a door. Antimony could hear a heavy bolt being moved from the inside, then the door opened just wide enough for a petite figure and some smoky lamp light to get through.

The woman in the doorway was young and pretty, with sharp features, red flowing hair, and eyes the color of amber. As the perfumed air inside her room escaped through the doorway, Antimony caught hints of cinnamon and cloves, and half expected the young woman to start breathing fire.

She wore a shimmering and ornate dress just a shade deeper than her hair, embellished not ostentatiously with lace and ribbons and beads. It was fit snugly to her body in all

the right places, and billowed and flowed in all the right other places and the whole effect was to give the small figure a bold and regal air.

Antimony couldn't help but contrast the lovely woman with her own dreary appearance. Her hair was shabby and tangled from sleeping in hay (and because of a general lack of attention), her clothes were good and useful, but boring and downright unattractive. Even the sturdy ledger bearer shoes that she had so longed for when she was barefoot, now felt ugly and utilitarian. Now she longed for her pretty yellow dress and her lovely purple shoes, or her white dress with the orange flowers on it, or the fancy black and red velvet skirt she wore for special occasions, or any of the other lovely things from her closet at home. Self-consciously, she reached up and tried to tame her hair with her fingers, only to find them caught in a tangle of course knots.

"What do you want?" the dragon lady said to the landlord.

"She's here," the landlord said. He turned without even looking at Antimony, and walked back towards the front of the house. The woman watched him go, and waited till the curtain was closed, then looked down at Antimony.

"So you're the one causing all this fuss," she said. Her voice was sharp and biting, but not unkind, a fitting match for her pleasantly angular face. "I suppose you'd like some root stock, then?" she asked.

Antimony nodded, trying hard to be bold.

The dragon lady smiled and opened her door enough for Antimony to slip in under her outstretched arm.

The room was small and ordinary with a plank floor and wood paneled walls. The only furniture was a desk, a bookshelf, and a little table and chair. The desk was covered with yellowed papers, and the shelves were mostly empty, except for a few leather bound books.

"It's just his office," she explained as Antimony looked around. "All the other rooms are taken, so if you want a private table, it'll have to be that one," she gestured to the little table against the far wall. A little black cauldron steamed on one side, with a wooden bowl and a spoon on the other.

"Have a seat,"

Antimony sat down, and the lady spooned some ruddy brown broth from the cauldron into the bowl. The smells of sweet spices wafted up from the bowl and tickled Antimony's nose.

Antimony sat staring at the bowl for several minutes, confused about what exactly was supposed to be happening. Had she made another mistake? Had they understood what she was there for? Was it a trick?

The lady simply watched her in silence, leaning back against the landlord's little desk. Antimony picked up the spoon, then hesitated.

"The others will be here soon," the lady said at last. Antimony looked at her. "But you may as well eat while you're waiting." She smiled in a queer sort of way which Antimony guessed was meant to be sweet.

Antimony raised the spoon to her lips, and slurped the piping broth into her mouth. It was sweet and savory, and

rich with earthy spice. It tasted like carrots, and potatoes, and radishes, and all the things that grow in the ground, mixed together with the most alluring blend of spices Antimony could imagine. She slurped down several more spoonfuls.

“Old family recipe,” the lady said offhandedly.

As Antimony was finishing her soup, she heard another knock, only this time it didn’t come from the door, it came from the wall right next to her. It took her by such surprise she nearly knocked over her bowl.

The dragon lady stood up and walked to the wall, knocked back, then turned to Antimony.

“Move,” she commanded sternly. Antimony jumped to her feet, almost involuntarily. “Move the cauldron to the desk,”

Antimony tried to pick it up but it scalded her hands. She let out a shriek of pain and dropped the cauldron back onto the table. The steaming broth sloshed back and forth inside the pot.

“Never mind,” the lady grabbed the heavy iron cauldron in one hand and carried it casually across the room to the desk, then came back and pulled the little table away from the wall.

She squatted down on the floor where the table had been and placed her finger on a little knot in one of the wooden planks. She pressed on it and it slide into the plank. As it did, Antimony heard several latches going into action somewhere inside the wall.

Now the dragon lady stood up and pushed on the corner of the wall. As she released it, it sprang forward just far

enough for her to slip her fingers in and pull it open. A small door had been hidden cleverly in the wall, hinged where two slats of the wood paneled walls met so it couldn't be seen.

"This way," said said.

She slipped through the door, and waited for Antimony to follow her.

* * *

The secret doorway lead to a dark and narrow walkway hidden in the walls between two sides of the house. Once the dragon lady closed the door, it was all but pitch black inside, with only very occasional and very small flickers of light coming in through cracks in the walls.

The dragon lady took Antimony strongly but warmly by the hand and led her a short way through the darkness. After a moment they stopped, not abruptly, and the dragon lady seemed to be manipulating something in the darkness. Then a rush of cool damp air breezed across her skin as another small door swung open, but unfortunately didn't provide any light.

"Step down," warned the lady, directing Antimony down a steep flight of stairs. She pulled the door closed behind them, and followed Antimony down the steps, catching up with her at the bottom. More manipulating and another door swung open, this time allowing some dim light to penetrate the darkness.

The dragon lady stepped through the door, and Antimony

followed.

* * *

Antimony found herself in a large, dimly lit room with dirt floors and walls, and a low ceiling supported by a few heavy wooden posts and spanned by some impressively large beams. The room was filled with several tables of various shapes and sizes, around which a few dozen people gathered and talked quietly in small and large groups, seated on an eclectic variety of chairs. Assorted carpets and fabrics had been laid down under some of the tables, and a stone fireplace was built into one of the walls, over which hung a large, black, steaming cauldron, from which rose the sweet and pungent aromas of the root stock.

“What is this place?” Antimony asked, bewildered.

At the sound of her voice, all conversations in the room came to an abrupt halt, and every eye turned to the newcomers. Then a familiar face emerged from the crowd.

“Welcome, Antimony,” said the tax collector, stepping forward, “to the Council of Ledger Bearers.”

Antimony peered into the room and began to recognize the faces of many of the vendors she had delivered ledgers to, while wearing the red, green, or blue uniform. As she scanned through the faces, each one met her glance, and smiled warmly. She turned back to the tax collector.

“But what is it?”

He gestured for her to sit down at a table, and he followed her there. Some of the others, including the dragon lady and

the fish monger, joined them at the table. The rest returned to their own conversations.

"It's a meeting place," the tax collector said, sitting down in a blue upholstered reading chair. "Something of a forum, really. A place where people can come and discuss things they can't discuss in public."

"Like a secret club?" asked Antimony. The others at the table laughed lightly, good-naturedly.

"Something like that," he replied.

"Secret being the operative word," interjected the old fish monger.

"You see Antimony," the tax collector continued, "as you've gathered by now, there are those of us within the kingdom who don't care very much for the way the princess is running things, and we have other ideas of how things could be run."

"But why do you need a secret club for that?" Antimony asked. "Why can't you just confront the princess and tell her your ideas?"

The dragon lady responded: "I'm afraid the princess isn't very keen on people challenging her authority. She likes things the way she likes them and isn't interested if other people are unhappy with it."

"Still," tried Antimony, "I don't see why you need to keep your ideas secret. Even if she isn't interested, I'm sure other people would be."

"Well that's exactly the problem," said the tax collector. "The more people are interested, the more of a threat it is to the princess."

"And when the princess feels threatened," hinted the fish monger. Then she once again sliced her finger coarsely across her neck. Antimony swallowed, recalling the unpleasant events involving her own neck from earlier that day.

"So you see," explained the dragon lady, "we take a great risk by sharing our ideas, but they're ideas that are worth sharing. That's why we use the coded ledgers, and this secret meeting hall."

She stopped, and leaned in closer to Antimony, meeting her eyes with a concerned gaze. "The others told me about your parents. I can't tell you how sorry I am." She placed her warm hands on Antimony's and held them earnestly. "I only wish there was something we could do to help you." she said softly, sadly. The others around the table nodded in somber agreement.

"But there must be someway into the palace!" Antimony pleaded.

The dragon lady shook her head. "I'm afraid not," she said. "The princess has it locked down tight as can be."

"Not even I can get inside the palace," said the tax collector. "The soldiers collect the taxes and records at the gate."

"And the soldiers hand them off to other soldiers further in," said the dragon lady. "And those soldiers hand them off to guards at the palace gates."

"The only way anyone ever gets in to the palace," cackled the fish monger, "is to be dragged by the guards on their way to the dungeon." She laughed a dark and coughing laugh to herself, and the dragon lady nodded somberly.

Antimony thought quietly about that for a moment. “Well then” she said at last. “if that’s what it takes, then that’s what it takes.” Everyone around the table looked at her dubiously.

“I have an plan,” she announced. “I’ll need all the messages from all of the ledgers, especially the blue ones. I need all the ideas you’ve got, every notion, every dissenting remark. Anything that will make the princess feel threatened.”

Antimony explained her plan to the others and, although they were reluctant, they agreed that it was her best shot of getting into the palace. They set to work recalling and uncovering every revolutionary message they could, putting some ideas on paper for the first time, even coming up with brand new ideas to threaten the princess’s reign. It was a lively and thrilling night in the meeting hall under the public house, not least of all for Antimony herself who was filling herself up with some of the most exciting and interesting ideas she’d ever come across, even pitching in some thoughts of her own.

* * *

Dawn was already breaking overhead, though the lighting in their underground hall hadn’t changed.

“I think we’ve done all we can,” conceded the tax collector at last. “I’m not sure any one of us has the strength left to continue, and we have a full day’s work ahead of us yet.”

“Agreed,” said Antimony, looking around satisfied at the stacks and stacks of notes they had compiled. “I want to thank you all for your help. Your courageous spirits and


brave ideas have emboldened me. I feel now like the rescue of my parents is nearly within reach.”

“But Antimony,” said the old fish monger apprehensively. “Once you’re inside the palace, how are you going to actually rescue your parents?”

Antimony felt her spirit drop a little at the question. “I have to admit, I haven’t thought very much about that.” The mood grew noticeably melancholy in the room. Antimony tried to perk herself and the others back up. “Never mind that!” she said boldly. “Nothing was ever accomplished by standing still, the only option is to move boldly forward, thoughtfully, but without trepidation.” Her vim and vigor rallied the other members of the council a bit, and a din of excited conversation rose up once more through the hall. Still, in the back of her mind, the old lady’s question nagged at her.

Chapter 23

Antimony on a Soapbox

NTIMONY'S plan for getting into the palace was rather simple: cause enough of a disturbance that the princess would be forced to deal with her. To that end, she began to surreptitiously distribute the council's ideas all through out the town.

She worked mostly at night, in the shadows and back alleys of the market place. Copies of the writings were left in shops and carts and vendor stalls, pasted on walls, slipped under doors, even tucked into the bridles and saddles of horses and donkeys. Before long, the whole town was abuzz with discussions of the council's subversive ideas, whispered at first behind closed doors, then discussed more and more openly as the buzz continued to grow.

The palace was buzzing as well, though more with agitation than excitement. Soldiers were placed on high alert for whoever was responsible for this mess, and Antimony knew that she would not be able to stay in the shadows for long.

On the fifth day, the market was crowded and bustling as always, only now there was an additional layer of conversation and discussion beneath the usual business. Antimony could feel the energy of the town welling up like the tide within her, filling her to the brim with eager anticipation. Now was the time, she decided, now was the time for action.

Antimony made her way nervously to the center of the town square, noticing deliberately the significant and irritated presence of the princess's soldiers, around whom bubbles of quiet murmuring formed spontaneously within the fervent discourse.

In the center of the square, Antimony climbed up onto the little stone wall that surrounded the town well. Earlier that morning she had officially resigned from her post as a ledger bearer for the tax collector, and turned in her dull but useful blue uniform. She stood now in the center of the town—elevated just slightly above the crowd—barefoot again, and in the worn and soiled work clothes that John had given her so long ago.

Nobody paid her any attention, until she began to speak. “The princess is a tyrant,” she announced nervously. She meant for the words to be bold and forceful, but her fear choked them off, and they eked out as little more than a whisper. A few of the nearby townspeople glanced up at her curiously, but continued on their way.

“I must go boldly forward,” she thought to herself. “Without trepidation.”

She cleared her throat, and tried again: “The princess is a tyrant!” she proclaimed loud and clear. Now all those within

ear shot turned to look at her. Their eyes lay on her with curious anticipation, which helped to drum up her courage. She continued the speech she had rehearsed all week, based on excerpts from some of the most courageous ideas the council had come up with.

“The princess is a tyrant, and no rightful ruler of this kingdom. She comes to her power through trickery, deceit, and underhanded dealings.”

The crowd was starting to gather around her now, and a new bubble of quiet began to take shape, with little Antimony at its center on top of the well.

“The princess only cares about what she wants, not about the needs of the people. She forces the entire kingdom to work to satisfy her wants, but who is there to worry about yours? Governance is a position of responsibility, not privilege. If we grant that a governor should wield great power, it is only that they may apply this power to the benefit of their citizens.”

Antimony paused to let that sink in, and to catch her breath, which was short and shallow with nervous excitement. The crowd continued to grow around her, and a hush had fallen over the entire square. The clusters of soldiers that dotted the perimeter stood out even more than usual as the towns people gathered together around the well. Antimony could see that the soldiers were beginning to take notice; they shifted their weight nervously and muttered to each other, pointing occasionally at the crowd, or at Antimony herself.

She went on: “The laws of a nation are not forged for the benefit of one, or a few, they are forged for the benefit of all. The laws of a nation are not natural laws which define

and restrict us, they are rules which are crafted by men and women in an effort to realize the means by which the kingdom can benefit the most, by which the most good can come to the most people.”

Out of the corner of her eye, Antimony could see that soldiers were leaving their positions, making their way in her direction.

“When those laws no longer serve such purpose, when time or society changes in such a way that those laws no longer represent what is best for the people. . . .”

The guards had reached the edge of the crowd and were quickly carving out pathways through it as they shoved and tossed people aside to make their way.

“... when those laws are used to take advantage and abuse the people they were meant to protect. . . .”

The guards closed in on all sides, Antimony could hear the commotion of their coming, the jangling of their belts and armored plates as they forced their way closer.

“... then those laws should and must be nullified and torn down, and it is the right and the duty of every good person not to obey such perversions of the public trust. . . .” A hand clamped down roughly on her shoulder, then another hand on her other shoulder. The grubby and unshaven face of the captain of the soldiers emerged from the crowd and in a step he was on top of the wall beside her.

“Quite enough of that, you tiny brat.” he said coarsely. He gestured for the other soldiers, the ones who had grabbed her from behind, to take her away, and they were just about to do so when yet another hand came to rest on her shoulder.

This third hand was smaller, and gentler, and rested warmly on her collar. Antimony turned sharply to see the glowing amber eyes of the dragon lady.


"She's with me," the woman announced.

The soldiers' grip on her shoulders loosened ever so slightly, but did not let go, and the captain even seemed to take a small step back when she appeared on the wall.

"Well enough," he said with a sneer. He stepped forward again and grabbed the dragon lady by the arm. "Then you can both go!" he jumped down from the wall, pulling the dragon lady almost to her knees behind him. But she recovered quickly, and gracefully, and marched proudly behind him as the other soldiers carried Antimony down from the wall and away to the palace.

Chapter 24

The Court of the Fairy Princess

O ANTIMONY'S great surprise, she found herself, alongside the dragon lady, not in the palace dungeons, but in a grand hall ornately adorned with gold and ivory, marble and gem stones of all kinds.

They had been handed off, as the dragon lady had described, from one set of soldiers to another as they were brought further and further into the palatial grounds, until at last they were presented at the palace gates to a pair of richly dressed royal guards.

The two guards had looked briefly at Antimony, then curiously at the dragon lady, and at last at each other. They said nothing, but at last they had signaled for the gates to be drawn open, and escorted the two prisoners here, to the grand court of the fairy princess.

They were shackled and ordered to wait in the center of the court, on a decadently tiled floor more lavish than that of

the silly Baron and Baroness, and even more than that of the tricky old Duke. Plopped in the center of a polished marble tile, big enough to fit a small bed and still have room for a pair of nightstands, Antimony couldn't help but marvel at the flickering rainbow light that refracted through diamond prisms embedded generously in the floor.

The dragon lady, for her part, stood proudly motionless in the court, chin elevated just slightly, and staring straight ahead.

All around them, courtiers in deliciously gaudy costumes eyed the two strangers—the small scrubby one with soiled clothing and bare-feet, and the slightly taller, elegantly attired one with the crisp clean features and the flowing red hair—and murmured to one another behind ostrich feather fans and ostentatiously bejeweled hands.

They were left to wait in the court for what felt like a considerable fraction of eternity. Antimony tried to use the time to devise a plan, but was largely distracted by the busy goings-on of the court. Even with all the lords and ladies focused on the two of them, there were still many other figures milling about the court, darting in and out of small undistinguished doors, or behind enormous curtains and draperies.

At long last, a herald emerged from behind the large gilded curtain which covered the entire back wall of the court. An impressive figure in gold threaded black velvet, he waited demanding for the attention of the court. When he was suitably satisfied that all eyes were on him, he raised a long golden horn to his lips, and blew a triumphant and imposing

fanfare through the hall.

His task completed, he lowered the horn, basked just briefly in the glory of the courtly attention, and then slipped back behind the curtain. A moment later, the curtain was drawn back from both sides, quickly and abruptly. Behind the curtain was a throne of solid gold, larger than the little cottage of the honey lady by the great outer wall, and studded with enough gems and jewels to sink a great ship.

Seated on the throne, though Antimony could barely make her out at first, was the small figure of the fairy princess. She was no taller than Antimony herself, perhaps even a bit smaller, and her frail arms hung limply folded in her petite lap. But her presence was palpable, and impressive. As soon as the curtains began to draw back, the proud and noble courtiers sank humbly to their knees, and lay prostrate on the majestic floors.

Antimony wasn't sure whether or not to mimic them, but the dragon lady seemed quite intent on standing erect, so Antimony did the same.

The princess sat quietly in her throne for several more moments, dramatically feigning boredom and disinterest. When at least she spoke, neither the words, nor the raspy and haggard voice which came out could possibly have surprised Antimony more.

"Nice to see you again, Mother." she croaked. Antimony was dumbfounded. There was no mistaking what she said, and no mistaking that the words were directed poignantly at the dragon lady.

"I wish I could say the same, Erica." the dragon lady

responded.

“Erica?” Antimony repeated to herself.

“You might choose to watch your tongue,” the princess Erica snipped. “You should be grateful I’m giving you this opportunity for an audience. I warned you if you ever showed your face in this kingdom again, it’d be straight to the gallows for you. And now, to be conspiring with this disdainful little radical... against your own daughter. It breaks my heart.”

The dragon lady only shook her head sadly. “I regret so much, Erica. I wanted nothing more than to make you happy.”

“Well you should be quite pleased then, Mother. I can have anything I want. I’m wealthy beyond imagination. Whatever I ask for, I get.”

A hushed silence fell over the court, then Antimony spoke up. “But, are you happy?” she asked meekly.

The princess glared at her. “What sort of question is that?” she demanded. “I just told you I have everything I want. And more! Why shouldn’t I be happy.”

“I just thought perhaps...”

“Never mind what you thought! I shouldn’t even be letting you speak, you’ve already caused enough trouble. The two of you should be off to the gallows together, right away.” And yet she didn’t move, didn’t gesture or signal to have them taken away. Another silence hung in the courtroom.

The princess shifted uncomfortably in her large throne. She leaned forward, then sat back. Then leaned forward again. “Who are you, anyway? What business do you have in this kingdom, and to cause such a disturbance?”

"To be honest, your highness," Antimony replied. "I'm here for just one thing. I'd like to have my parents back."

"Your parents?" the princess laughed. "Oh, I see. And which parents might those be?"

Antimony described her parents as she recalled them.

"Oh, of course. Those two. A couple of rotters if you ask me, no good at all."

"I beg your pardon!" cried Antimony. "They are not rotters, they are wonderful parents!"

"Wonderful, indeed! They wouldn't give in to anything I wanted! Kept telling me I had plenty enough already! To think of it!"

"Well, haven't you?"

The princess shot a piercing look at Antimony. "If I wanted parents to tell me 'no', I would have kept her around," she said, gesturing to the dragon lady. "And the old man, too, after they went sour on me."

"Then why do you want parents at all?"

"Because I have everything I want," the princess lamented. "I've all the gold and jewels of the earth, hundreds of thousands of acres of the best land in the kingdom, every dress and pretty thing I can imagine, every toy, every trinket, every trifle, every bit of entertainment I could ever desire. The only thing, the one thing in the entire world, that I haven't got, is a decent set of parents."

The dragon lady's face sunk at this, the hard angular edges softening like wilted lilies. Antimony's heart ached for her grief. She reached into her pocket and pawed the seeds from John, thinking quickly.

“Well then... No,” she said, truncating her thought with a dismissive shake of her head.

The fairy princess looked intrigued. “What is it?” she asked.

“Never mind,” Antimony replied. “I had a thought, but I’m sure you wouldn’t be interested.”

The fairy princess did not like the idea that Antimony should be so certain about what she would or would not be interested in, and demanded to know her thought.

“Well,” Antimony began, “I just thought perhaps we could have a little bet, a kind of deal. But I don’t suppose you’re really a betting type,” she finished, conclusively.

“And what makes you think that?” the princess demanded.

“Well it’s nothing to be upset about, I just imagine you must be the cautious type to have gained such a high position. It’s a very positive trait, it certainly doesn’t make you a coward or anything.”

“You’d be wise to watch your tongue, little one!” bellowed the princess. “I am the ruler of this kingdom, after all. Now tell me exactly what kind of deal you had in mind.”

Antimony sighed falsely. “If you insist, Your Highness.” She straightened her back and offered her idea: “You, your highness, have all this land: hundreds of thousands of acres, by your own account. I propose a trade.” She pulled the handful of seeds out of her pocket and displayed them to the court. “I have ten seeds here. You give me the day to plant on your land, and at the end of the day, however much land I can cover will be mine. All the rest remains yours. And

in exchange, myself and my parents will remain as rightful possessions of the kingdom.”

The princess scoffed. “A single day? Ha! It takes an army of laborers an entire season to plant my land.”

“Then you haven’t much to loose,” suggested Antimony.

“True enough. But even the loss of a few acres is still a loss.”

“But you’ll keep my parents.”

“I already have your parents.”

“Yes, but I intend to rescue them, to take them away from this place so you won’t have them anymore.”

“Puh, you’re going to rescue them? You’re just a little tragedy,” the princess replied with a wave of her hand.

“Perhaps, but I tracked you here across the sea from a great distance. I defeated a dragon, in his own lair, won out over your Baron and Baroness at the Gate Tower by the River, and even outwitted that trickster Duke. And now here I am in your palace, standing before you, having turned your entire town on its head.”

“You have been quite a handful,” replied the princess pensively. “Still, I have you in shackles now, I could end this all with one quick hanging.”

Antimony sighed. “I guess it’s true what they say about you.”

“What do they say about me?” demanded the princess.

“Only that you’re afraid of a fair challenge. That all you have you got through cowardly acts. That you never earned anything for yourself, that you don’t deserve any of the great wealth and power you’ve amassed.”

"They say that about me!?" shrieked the princess.

"It'd be simple enough to prove them wrong by accepting my little wager. All I ask is a day's worth of planted land."

The princess inspected the small intruder and considered her offer. "Very well," she conceded at last. "But, I am the princess, after all, so I make the rules. Instead of taking the day to plant, I will give you. . ." she rubbed her chin pensively. "Oh, I'm feeling generous today. . . one hour!" she bellowed, cruelly.

Antimony swallowed hard, trying to do a rapid estimation in her head but having a hard time focusing. "Very well," she agreed.

The princess signaled to an unseen agent hidden around the perimeter of the court. A curtain next to her throne lifted, revealing an enormous hour glass on a frame of beautifully carved cherry wood. "Your time begins. . ." she reached with her small claw and pulled a golden chain, causing the hour glass to flip over and begin trickling away the time in a steady stream of sand grains. "Now!"

Antimony remained before her, lifting her shackled hands.

"You haven't unbound me," she pointed out.

"That was never part of the deal!" cackled the princess.

Antimony kicked herself for having overlooked such a small but important detail. She quickly considered her options and decided that it would be a waste of time to try to pick the locks open; she spun clumsily around to face the exit and shuffled foolishly towards the garden, taking the time to go over her plan again and again in her head, checking and double checking her assumptions and calculations.

She did her best to keep track of time in her head as she shuffled as far as she could out into the royal gardens, which wasn't very far. After what she thought was about a half hour, she stopped, fell to her knees, and silently hoped that the royal gardens were pest-free.

* * *

"Your time is up!" bellowed a voice from high above. Antimony looked up, squinting against the afternoon sun to see the fairy princess watching her from a balcony. Antimony had finished planting her seeds and managed to collect enough water from the royal fountains in leaves from the royal cabbage patch to water them. The first generation of plants was just coming up as the sand in the clock ran out.

Antimony sighed, hoping her efforts and her plan would be enough, and made her way back towards the palace, shuffling beneath the cackling taunts of the fairy princess.

"What a pathetic and hideous garden," she chortled. "All scraggly and sad. Plants the color of bile!" she croaked. "Who ever heard of such a thing!"

Back inside the palace, Antimony stood patiently before the princess on her throne, trying to hide her nerves.

"Alright," said the princess through curled lips. "You've had your little fun defacing my gardens with your hideous plants. Now, show me you're worth having around, or I'll lock you up in the dungeon. Entertain me with a story!"

So Antimony told her the story of her adventures since arriving on the beach so long ago, just as I have told them to you, although leaving out some details, like the nature of the

seeds from John the Gardener. Antimony bided her time by elaborating on details which I have not elaborated on, even adding fibs here and there which I have added neither here nor there. She spun her tale throughout the day, like a weaver spins her yarn, continuing for hours as the sun continued its slow march across the sky, and even after it had tucked in beneath the horizon for the night and the only mechanism left for telling the time was the grand old whirring, whizzing clock at the end of the great hall as it ticked, tocked, and chimed away the hours.

"Enough!" bellowed the princess, during a particularly tedious part of Antimony's story. "I'm bored with your dribble. . ."

"But you haven't heard the best part yet!" urged Antimony, trying to buy herself a few more seconds. But it didn't matter anymore; the clock ticked again and the bells in cupola began to ring out the midnight hour, stirring those in the court who had dozed off during Antimony's long litany.

"Guards!" continued the princess. "Take her to the dungeon!"

Guards began to close in on Antimony, but she stood her ground, looked directly into the eyes of the nearest guard, and raised her hand to him. "Halt!" she commanded, her voice as hard and sharp with authority as a general's sword. The guard halted in his tracks, as did all the others.

"What now?" whined the princess.

Antimony ignored her, and addressed the gaggle of aids and book keepers who loitered around the princess's throne. "Check the garden," she ordered. One of the bookkeepers

jumped obediently to his feet and scurried off to the tower to survey the royal gardens.

“What’s the meaning of this? The bet is over, you have your pathetic little garden, and now you must surrender yourself to the kingdom!”

“True enough,” Antimony replied calmly. “But who controls the kingdom?”

The princess grew weary of Antimony’s games. “She who controls the most land!” she snapped.

“And we agreed that I had till the end of the day to claim what land I could,” Antimony reminded her.

“Puh!” laughed the princess. “You’re forgetting that I only gave you one hour!”

“Wrong!” cried Antimony, her voice like a chainsaw. “You gave me just one hour to plant,” she emphasized. “That’s true enough. But my original terms were for the bet to be settled at the end of the day. Terms which you failed to negotiate.”

“What!” exclaimed the princess in disbelief.

Just then, the bookkeeper scurried back into the court and stood quietly bubbling in the middle of the floor, a thousand eyes burning anxiously in his direction.

“It’s Antimony,” he said at last, quietly, but joyously. “It’s Antimony!” he repeated, loud enough to echo from the rafters.

“At day’s end,” he continued officially, “Antimony’s garden covers more than half of the royal land, Antimony holds a majority share, Antimony is ruler of the kingdom!”

A cheer erupted from the court, while the fairy princess sat silently shocked in Antimony’s new throne.

“Guards! Take the princess to the dungeon!” Antimony commanded, still in her own shackles and chains.

Without being asked, a nearby guard approached to unshackle and unbind her, and the dragon lady as well, while the rest converged on the princess to take her away.

When Antimony was free of her restraints, the guard knelt humbly before her and bowed his head. “Your Highness,” he offered.

Antimony smiled warmly. “Thank you, Sir,” she replied, with a lovely and profound curtsy. “You can call me Antimony,” she added, placing her small hand on his armored shoulder, inviting him to stand.

As the princess was taken away, Antimony’s parents were retrieved from the dungeon, unshackled, and brought to Antimony in her court. As soon as she saw them, she leapt down from her throne and into her father’s waiting arms. They kissed her and hugged her and petted her head and cried and carried on and told her how much they loved her and missed her and how brave she was, and how clever she was, and how wonderful it was to be a family again.

“We never stopped being a family,” Antimony corrected sweetly. “We were just separated for a bit.”

Her father grinned and hugged her tight. “What a clever girl,” he said. “What a remarkable girl.”


“But even when we were separated,” Antimony continued, “it was like you were there with me because of all the clever things you taught me.” She went on to relate the whole story of her adventure, again, but this time not leaving out any of the details, and not adding any fibs. Well, hardly any.

“And in the Gate Tower by the River,” she said, turning to her mother, “I remembered what you taught me in our games, to always play thoughtfully and act deliberately. Anytime I was in a bind, I could hear it just like you used to tell me, like you were there whispering it in my ear. “And when I had to get past the great wall,” she continued, now facing her father, “I did just like you taught me: I unlatched my mind and thought around the problem.”

Her parents hugged her again, and then once more after that, and then a few more times, and they spent the whole night hugging and kissing each other and being grateful to be unseparated again.

Chapter 25

Antimony: Ruler of the Kingdom

S RULER of the Kingdom, Antimony had a lot of responsibilities to see to, many of which the fairy princess had disregarded which explained the sorry state of things. Her parents and the nice people of the court helped her as much as possible, but as ruler, there were some things only she could do.

“I don’t think I care too much for ruling a kingdom,” she confessed one day from her throne.

“I must admit,” agreed her mother, “it would be nice to see home again.”

“And take a nice walk through the market,” added her father.

And so they agreed that this strange land was not the place for them in the long run and it would be best to turn over the kingdom to a kind and capable person so they could return home.

“I know just the person,” Antimony declared excitedly.

“But first, there are a few changes I’d like to make around here.”

Her first order of business was to send for the Baron and Baroness and their three guards at the Gate Tower by the River. She explained to the Baron that arbitrary rules, like no purple shoes on Thursdays, are inappropriate for governing people, but they are exactly the kind of thing that makes a game interesting. The Baron and Baroness seemed to understand that, and so she appointed them Gaming Commissioners for the Kingdom.

“Of course,” she continued, turning to the three guards. “Gaming commissioners won’t have much to do if there are no games to be played, and games aren’t much fun without teams.” And so she announced the establishment of the three Royal Teams, the Red team, the Green team, and the Blue team, who would compete, for fun, in all of the royal games, and she appointed each of the guards as captain to one of the teams, which pleased them very much.

Her second order of business was to make amends with the dragon, who she hoped was okay bound up in his lair.

“I’m sorry I broke my promise,” she said to him when she arrived at the mouth of his cave. “But I hope you understand that some things are even more important than promises.”

“I do,” he grunted sorrowfully. “I’ve had a lot of time to think locked up in this lair, and I understand why you did what you did. It was your best option.” He exhaled like a great burden had been lifted off of him, the warm fiery air swirled around Antimony and poked up into her nose, carrying the sweet smells of curry and cinnamon and pepper.

“I’m sorry I tried to eat you,” he added.

Antimony forgave him and offered him a deal, which neither of them would break. “I’ll free you if you promise not to eat any more people,” she said.

The dragon sighed, reluctantly. “I’m just so very tired of fruits and grains,” he said.

Antimony, who despite her misgivings was becoming a rather excellent ruler and a skilled diplomat, came up with a solution they both agreed to. The people of the kingdom would provide more agreeable meats for the dragon—turkey and ham and beef and pheasant and wild boar—and in exchange the dragon would use his skills to fulfill all of the blacksmithing needs of the people and the kingdom. He even used his talons to carve out a little wooden sign to hang above his cave: “Arthur K. Dragon - Blacksmith (extraordinaire)”.

With that issue resolved, Antimony turned her attention to the Duke, who’s labyrinth separated the inner and outer kingdom. “You’re obviously very good with puzzles,” she said to him. “But there’s no reason for your puzzles to bring unhappiness and harm to people. Puzzles should be for fun and whimsy.” The Duke was reluctant at first, but since Antimony was ruler of the kingdom, he didn’t have much choice. He agreed to spruce up the labyrinth and turn it into something of an amusement park. Under Antimony’s guidance, he added some windows and lights so it wasn’t so dreary, installed some additional exits for those who didn’t feel like playing anymore, and even set up snack bars inside. In the meantime, Antimony had many grand arches carved out of the inner and outer walls, so everyone was free to

come and go as they pleased, and the labyrinth was optional for those who wanted to try their hand at it.

And when the Duke saw how much fun people had trying to solve his tricky labyrinth, he was delighted! He even turned the great hall of his castle into a museum of puzzles, where people from near and far could come and try their hand at his favorite riddles and brain teasers.

The last change Antimony made was to summon the tax collector, and the fish monger, and all the others from the Council of the Ledger Bearers.

“Your ideas are so courageous and so insightful,” she told them. “And I don’t think you should ever stop having such grand ideas. It’s important for any kingdom to have brave thinkers to challenge the way things are, and think about the way things ought to be. But you mustn’t keep these ideas secret, they have to be shared and discussed and ripened by public discourse.” To this end, Antimony called for the construction of a great public meeting hall, above ground this time, where people could go and speak freely and voice their ideas and opinions and challenge one another politely and openly. She dubbed this hall “The Hall of Opposition” and placed it at a small distance from the palace itself, so the free thinkers there would not feel the shadow of government weighing on their freedom of expression.

“I’m charging you,” she said to the council members, “with the very important task of safe guarding this hall and the openness it represents. Whoever might come to power in future generations, this hall will be a bastion of free thought and progress. This hall and its patrons must act to check and

balance the powers of the governor, whoever that might be.”

The council members understood and agreed, and accepted this charge gravely. They immediately went to work preparing for the new hall and coming up with clever ways to foster and safeguard free thinking in the hall, and throughout the kingdom.

* * *

Everyone was very pleased with the lovely changes Antimony had made to the kingdom, but she and her parents grew more and more weary every day. They were delighted to be united once more, but this place was still strange to them, and it wasn't their home.

“It's time to send for the new ruler,” she decreed at last. A team of the kingdom's swiftest couriers were quickly dispatched to the little cottage by the great wall, to invite the sweet honey lady for an audience with the new ruler of the kingdom.

The honey lady was surprised and then delighted to find Antimony seated in the princess's throne inside the palace. She was nearly bursting with joy to see her dear little friend again, but she bore in mind the particular circumstances of this unexpected meeting, and humbly prostrated herself on the floor.

Or at any rate she tried to. Before she could even make it to the floor, Antimony had leapt down from her silly throne, sprinted across the obscene floors, and hurled herself at the honey lady, who just barely succeeded in catching her with a great and passionate hug. The two were overjoyed to see

each other again, they had missed each other almost as much as Antimony and her parents had missed one another.

Antimony was delighted to introduce the honey lady to her parents, and they were all three delighted to meet one another. The honey lady was eager to hear all about Antimony's subsequent adventures after leaving the little cottage and disappearing into the labyrinth, and Antimony was eager to tell her all about it.

"It sounds like you've had some marvelous adventures," the honey lady said at last. "And the whole kingdom is talking about all the wonderful changes the new ruler is making. To think all this time it was you they were talking about! Oh, I should have guessed that such a remarkable girl might do such things!"

"I'm glad that people are happy with the changes I've made," Antimony replied. "Only I'm afraid I'm not particularly cut out for this sort of work. I am just a little girl, after all."

"A remarkable little girl," suggested the honey lady.

"But a little girl, none the less, and little girls don't belong in big silly thrones, or grand lavish palaces. Little girls belong at home with their parents, taking walks through the market, and maybe even along the pier again, someday."

"Well that's hard to argue with," said the honey lady.

"Which is why," Antimony continued. "I'd like to turn over the kingdom to you. For you to run and manage and rule over in your kind ways."

"Me!? But I'm no ruler."

“Oh but you are! Or at least you could be. You’re perfect for the job,” Antimony said. “Because you’re so kind and sweet and bright and you always want what’s best for people.”

“Oh, but there’s just so much to keep track of, I couldn’t possibly manage all of this!”

“You don’t have to do it alone,” Antimony said. “In fact, I know just the person to help you, a kind young man who is very good at keeping track of lots of things and sorting out complicated plans.” With the honey lady’s blessing, she sent more couriers off to fetch John the Gardener, and ask him to pay a visit to the palace¹.

With a bit more coaxing, the honey lady eventually agreed to take over for Antimony, although she was still nervous to take up so much responsibility, and she was sad to think that Antimony would be leaving again so soon.

* * *

The royal courtiers were all set to throw a lavish coronation ceremony for the honey lady, but she insisted on a simple and quaint affair. There was some official paper work that Antimony and the honey lady needed to sign, and with a few simple strokes of the pen, the deal was done. The new governess did allow the herald to blow a simple celebratory fanfare on his horn to mark the occasion.

¹John the Gardener turned out to be an excellent choice for this role; he was even able to figure out ways to represent and process data using his plants, turning a large chunk of the royal gardens into a giant computing device to assist the honey lady with her governing.

The dragon lady, who had been keeping largely to herself ever since she had helped remove her daughter from the throne, approached the honey lady humbly in the grand hall.

"Congratulations, Your Highness," she said softly with a polite curtsy. "I... I'd like to apologize for my daughter. And for myself. Oh, you were a wonderful teacher for her, she could have been so much better thanks to your help, if only her father and I hadn't been so short sighted."

The honey lady smiled sweetly. "I understand you only wanted what was best for her. I know it's hard sometimes," she said, smiling down at little Antimony, "to do things that you know must be done, even though it will make them unhappy in the short term." She looked back up at the dragon lady, and met her eyes warmly. "I'm sorry for how things turned out," she said.

The dragon lady smiled, and shrugged lightly. She looked around at the great hall bustling with workers planning and implementing Antimony's many great ideas for the kingdom. "It seems it has had a happy ending over all."

"But not for you and Erica," the honey lady replied.

"Oh I wish there was something I could do for you," Antimony said earnestly. "You were so kind and brave to help me, and none of this would have happened without your help. I feel as though I've been able to help everybody but you. I wish there was something I could do."

Just as the dragon lady was about to speak, the doors of the palace swung open, and in came the team of couriers, with John the Gardener at the lead. Antimony and the others turned to see him, and when the dragon lady saw him, she

froze in disbelief.

“Could it be?” she said quietly. “Am I imagining it?” She stood paralyzed with doubt until John saw her across the crowded hall. A small smile slipped across his lips, then grew larger, and larger still until it ringed his face from ear to ear. He dropped his few bags, which he had insisted on carrying for himself, and dashed across the gold and diamond floors.

Reaching the dragon lady in no time, he swept her up in his arms and twirled her about in the air, then brought her back down to her feet and kissed her and hugged her and loved her so deeply it brought tears to Antimony’s eyes.

“My darling!” cried the dragon lady. “I thought I’d never see you again! When Erica cast you out of the kingdom, I thought you were gone forever.”

“Oh my sweetness,” he replied gushingly. “I’ve never been far, I’ve always kept close, just outside the kingdom walls. Only I heard that you too had been banished!”

“Oh, it’s true,” she said with wet eyes. “I saw what you saw, what we were doing to our daughter by never saying ‘no’ and always giving her whatever she wanted. Only I wasn’t as wise as you, I didn’t see it soon enough.”

“We are both to blame for the problems she has caused,” John said sadly.

“Yes,” agreed the dragon lady. “Which is why when she banished me, I found a way to sneak back in. I’ve been hiding here in town, trying all these years to come up with a way to fix this mess.”

“As have I!” said John. “Outside the walls, I’ve been working all this time to find a way to reclaim the source of her

authority.” Then he turned with a smile to little Antimony and said, “Only I see someone has beat me to it! I saw my plants, or should I say *your* plants on my way in. That’s an impressive space-filler pattern² you came up with.”

Antimony smiled graciously.

“Well it seems things have worked out rather well after all,” the dragon lady said to Antimony. “Thank you for everything you’ve done. I can’t tell you how grateful we are.”

“Well I’m still sorry about the princess. I mean, Erica.”

“Oh don’t give up on her just yet,” said the honey lady. “No child is ever too far lost to be beyond hope. I think she needs a nice long timeout in the dungeon to think about things, but perhaps we can get through to her yet.”

With that, the dragon lady and John went off to be alone together and catch up on all the lost years, and they even went down to the dungeon to visit their daughter, who was already almost starting to feel just a little bit bad about the way she had acted.

* * *

The next day, Antimony and her parents prepared to say their goodbyes and set sail for home. Antimony celebrated the occasion by dressing up in a brand new pretty yellow dress, which the dragon lady had crafted for her, and a new pair of lovely purple shoes, which were a goodbye gift from the Duke.

²In a two-dimensional cellular automaton, like the Game of Life, a *space-filler* is a pattern that grows and grows in order to fill up as much of the game board as possible, which of course is just what Antimony wanted in order to claim a majority of the garden.

Before leaving, Antimony made a point of saying goodbye to everyone she had met during her adventures, and thanked each one for their help along the way, even the dragon in his lair (who was doing a very nice business with the people of the kingdom and was much happier to be eating meat again and not even having to spend his whole day finding food).

When all the goodbyes and thank-yous were done, the honey lady, the dragon lady, John the Gardener, the tax collector, and even the old fish monger accompanied Antimony and her parents to the royal dock, where the ship with the gold flag waited to bring them home.

“Thank you,” said the honey lady one last time as she hugged Antimony good bye. “For everything.”

When they were finished with their hug, Antimony’s father reached over the railing and lifted Antimony up onto the ship. The ropes were cast off, the sails were set (in a much more effective way than Antimony had done in her little boat), and the ship headed off across the sea.

Antimony stayed at the railing waving good bye as the kingdom shrank into the distance. When the last spire of the palace at long last slipped beneath the horizon, Antimony blew one last kiss to her friends, then turned to her parents and said, “Let’s go home.”

— The End —

Appendices

Appendix A

A Game to Play: The Pattern on John's Seed

Appendix A-1

How to Play the Game

The *Conus textile* is a species of sea snail with a very distinct and very interesting pattern on its shell. It's the same pattern that Antimony recognized on the seeds and stems in John's garden.

The pattern is very interesting to mathematicians and biologists, because it closely resembles a well known cellular automaton known as *Rule 30*, which produces a rich and complex pattern over time as a result of a few very simple rules, just like the designs in John's garden.





See if you can generate a Rule 30 pattern like the *Conus textile* shell, or John's seeds. The rules are easy: start with a row of squares like the one shown below. In a cellular automaton, each of these squares is called a *cell*.

Fill in some of the squares with your favorite color, but be sure to leave some squares empty. The pattern you create by coloring in the first row is called the *seed*, because the rest of the pattern will *grow* out of it.

Now draw another row of squares directly beneath the



first. This represents the second *generation* of the cells. In order to color in the cells in this second row, you need to follow a simple set of rules: you can only color in a square if the three squares that surround it in the previous row match certain patterns. In other words, whether or not each square gets filled in depends on whether or not the squares above it, above it to the left, and above it to the right are filled in.

The following table shows the patterns that these three squares need to have in order to color in the center square below them; if they don't have one of these four patterns, then the square has to stay empty.

pattern 1:	
pattern 2:	
pattern 3:	
pattern 4:	

For the cells on each end of the row, assume that missing squares in the previous row are not colored in.

Once you've colored in the appropriate squares in the second row, add a third row and do it again, this time using the squares in the second row to decide whether or not to color in each square in the third row. Then you can add a fourth and a fifth row, and keep going for as long as you want.

First generation:	
Second generation:	
Third generation:	
Fourth generation:	

The figure above shows a few rows as an example. See if you can understand why each row is colored the way it is, then go ahead and make your own pattern!

Appendix A-2

More Ways to Play

Instead of leaving the “empty” squares blank, you can fill them in with a different color, but they still need to be treated as empty when deciding how to color each new row.

Try colors that look good together, or colors that look bad together. Try colors that are very different, or colors that are very similar. Look around your house, or your school, or at nature to find some different color schemes to try, or just use your imagination!

* * *

You don’t have to just use paper and crayons to make the patterns, you can use anything that can be arranged in a grid to represent the filled in cells. Try checkers, or buttons, or small rocks, or even big rocks.

* * *









Since you’re always following the same set of rules to fill in your squares, the pattern you create completely depends on the way you fill in the first row (your *seed*). If you’re satisfied

(or unsatisfied) with what you've created, start over but fill in your first row differently, and see how the pattern changes. Try different repeating patterns in your first row, and see if the resulting pattern also repeats.

* * *

Of course, you don't have to always follow the same set of rules. Rule 30 is just one specific set of rules; see if you can come up with some rules of your own. Instead of just the four cases used for Rule 30, add some additional cases for which you can color in a cell in the next generation, or remove some cases, or both!

There are a total of eight different patterns that the three cells can have: choose any set from among these and see what kind of patterns you can produce with them.

Pattern 1:	
Pattern 2:	
Pattern 3:	
Pattern 4:	
Pattern 5:	
Pattern 6:	
Pattern 7:	
Pattern 8:	

Can you come up with any other ways to change the game?

* * *

Here's a little bit more of an advanced game: instead of using just two states for each cell (empty or filled), try three

or even more. You can use a different color to represent each of the different states within a cell, but you'll need to come up with some rules that tell you which of the three states to put it in based on the cells above it.

For example, you might use red, green, and blue (like the ledger bearers) to represent each of three states, and say that a cell will be colored red if the three cells above it are either red, red, blue, or green, red, green. You can add additional rules to decide when a cell should be colored green, and when it should be colored blue.

* * *

The pattern on the shell of the *Conus textile* snail doesn't follow the rules exactly, there's some *randomness* built in. That means that every once in a while, a cell that is supposed to be one color according to the rules ends up a different color. You can try this with your design and see how it effects the patterns.

Appendix A-3

More Details

About the Conus Textile, Rule 30, and other Cellular Automata

Rule 30 is one example of a *cellular automaton*. It is called an *automaton* because it proceeds on its own according to a set of rules, without anyone having to make decisions about how to proceed. It is called *cellular* because each little unit that makes it up is called a *cell*.

Rule 30 is known as a *one-dimensional* cellular automaton because the cells in each generation stretch out in a line, and a line has only one dimension (for instance, it has length, but no depth or width).

When you play the “game” described above, you generate a two dimensional pattern which spreads out in two dimensions: it has both length and width. That’s because with each generation, you *move* the line down to the next row so that you can see the pattern unfold over multiple generations. The cellular automaton itself is just the current row of cells,

which is only one dimensional.

The pattern on the shell of the *Conus textile* works the same way, spreading out over time so you can see the history of all the previous generations. In fact, only a narrow band of cells on the leading edge of the shell can actually produce the pigments which give the pattern its colors. These biological cells behave very much like the cells of the Rule 30 automaton: each cells decides whether or not to release some pigment based on whether or not the cells around it have done so¹. Once the pigment is released (or not), the shell continues to grow forward and the pigmentation cells move along to the next generation.

Other systems actually are *two-dimensional* cellular automaton, in which the cells of each single generation spread out in two dimensions. Examples include John's Garden of Life, in the story, and John Conway's Game of Life, after which the garden was modeled.

Two dimensional cellular automaton work very similar to one-dimensional cellular automaton, except that each cell has more neighbors. For instance, Conway's Game of Life and many others use a rectangular grid, so each cell has eight neighbors (up, down, left, right, and the four corners). In order to see a two-dimensional cellular automaton develop over the generations, you need a new grid for each new generation, which is why it's tricky to do by hand. Computers often render a two-dimensional automaton by erasing the grid

¹As mentioned previously, sometimes these cells don't behave exactly according to Rule 30, they "goof up" sometimes, which is why the shells don't look exactly like the patterns you produce with Rule 30.

and drawing the new generation right in the same place. This allows you to watch the pattern change over time, but you can only see one generation at a time.

If you'd like to try out Conway's Game of Life, there are many websites and computer programs available. You can also try out small patterns by hand, just like Rule 30. The rules for the Game of Life are simple:

- A cell that is currently filled will remain filled in the next generation if and only if it has exactly two or three filled neighbors. If it has less than two or more than three filled neighbors, it will be unfilled in the next generation.
- A cell that is *not* currently filled will become filled in the next generation if and only if it has exactly three filled neighbors.

Of course, you can also make up your own set of rules and other variants (such as more than two states) and see what other patterns and behaviors you can produce. You are also not limited to a rectangular grid: some two-dimensional cellular automaton use triangular or hexagonal grids, or even irregular grids.

* * *

One of the reasons that cellular automaton in general, and Rule 30 in particular, are so interesting to mathematicians, biologists, and other scientists, is because they can produce

very complex and provably *chaotic*² patterns from a very small and simple set of rules. Some people believe that this is analogous to how complex structures and behaviors arise in nature—perhaps even including things like the galactic structure and human intelligence.

In addition to complex *chaotic* behavior, many cellular automaton are studied for their applications to complex *non-chaotic* behavior. For instance, Conway's Game of Life has been shown to be *Turing Complete*, which means that it is computationally equivalent to a modern computer. Seed patterns can be setup which act like logic gates—similar to the electronic circuits used inside computer processors—and these gates can be combined to produce arbitrarily complex logic circuits, including those which mimic the behavior of a computer processor.

Cellular automaton are also used for more specialized applications, since so many natural phenomena have been shown to closely resemble the behavior of simple automaton. Certain behaviors in the leaves of plants, the motion of gastropods across a surface, even the flow of automobile traffic have all been modeled using cellular automaton.

²Mathematicians have a rigorous set of criteria which are used to classify a system as *chaotic*. Among these criteria is the idea of being sensitive to the initial condition, meaning that a small change in the seed pattern will rapidly lead to a large change in the subsequent patterns.

Appendix B

The Labyrinth Guards

To understand how Antimony figured out which door was the correct door into the Duke's labyrinth, it helps to break the problem up into smaller pieces. Antimony asked a tricky question requesting information about one guard from the other guard. Let's start by considering what a guard might say about his own door.

To make things a little simpler, we use letters to represent different *propositions*. For instance, we'll use the letter T to represent the proposition that Guard A always tells the truth. If Guard A *does* always tell the truth, then this is a *true proposition*, and we say that T is true. On the other hand, if Guard A *does not* always tell the truth (in other words, if he is the liar), then this is a *false proposition*, and we say the T is false.

Similarly, we can let the letter D represent the proposition that Guard A guards the correct door. If Guard A *does* guard the correct door, then D is true, but if Guard A guards the trick door, then D is false.

So let's consider what would happen if we asked Guard A which door he guards. We will use the letter C to represent the proposition that Guard A *claims* to guard the correct door.

We can see that the value of proposition C (what Guard A will claim about his own door) depends on whether or not he tells the truth (which is proposition T), and whether or not he actually guards the correct door (which is proposition D).

If Guard A always tells the truth (meaning proposition T is true), then what he claims about the door (proposition C)

will match the reality of which door he guards (proposition D). So if T is true, then C is equal to D.

On the other hand, if Guard A always lies (meaning T is false), then what he claims about the door (proposition C) will be the *opposite* of reality (proposition D). Therefore if T is false, then C is the opposite of D.

We can summarize this in a *truth table*:

T	D	C
false	false	true
false	true	false
true	false	false
true	true	true

In this table, the first two columns show all the possible cases as different combinations of T and D, with each case in a different row. The third column shows whether proposition C will be true or false in each case.

For example, the first row illustrates the case that Guard A lies (T is false), *and* Guard A does not guard the correct door (D is false). In such a case, Guard A will lie by claiming that he guards the correct door (C will be true), when in fact he does not.

Now remember that what Antimony really wants to know is which door is which, in other words, she wants to know whether proposition D is true or false. Unfortunately, the question that we considered—asking Guard A which door he guards—does not help us figure this out. You can see in the

table that no matter what the guard answers, proposition D may be true or false.

So now let's consider the question that Antimony asked. Instead of asking Guard A which door he guarded (proposition C), she asked Guard B what Guard A would say *if she had* asked Guard A which door he guarded. In other words, she asked Guard B to tell her whether proposition C was true or false.

We will use the letter R to represent the proposition that Guard B claims that C is true (in other words, that Guard B says that Guard A would say that he guards the correct door). But remember that Guard B may lie, or may tell the truth. If Guard B tells the truth, then he will tell the truth about the value of C, and so R and C will be the same. However, if Guard B lies, he will give a false value of C, and so R and C will be opposite.

We know that one guard always lies, and the other always tells the truth. That means that if Guard A is telling the truth (proposition T is true), then Guard B is lying and R is the opposite of C. But if Guard A is lying (T is false), then Guard B is telling the truth, and R will be the same as C. To help keep track of things, we will introduce one more proposition: proposition S, which is that Guard B tells the truth. However, we know that S is always the opposite of T.

Putting it all together, we have the following truth table:

T	D	C	S	R
false	false	true	true	true
false	true	false	true	false
true	false	false	false	true
true	true	true	false	false

So we see that T, D, and C are the same as before, and S is always the opposite of T, as we know it must be. The final column gives us the value of proposition R in each case, which is what Guard B will say about what Guard A *would have* said about his own door. Remember that when Guard B tells the truth (meaning S is true, as in the first two rows), then R is correct and is equal to C. But when Guard B lies (S is false, as in the last two rows), then R is a lie and so it has the opposite value of C.

Remember that proposition D is what Antimony really cares about (whether or not Guard A guards the correct door), and R is the answer she gets from Guard B. You can see in the second truth table that D and R are always opposite each other: when R is true, D is false; and when R is false, D is true. So to figure out the correct door, Antimony just needs to do the opposite of what Guard B reports: if he reports that Guard A would claim to guard the correct door, then it means that Guard B actually guards the correct door. But if Guard B reports that Guard A would claim to guard the trick door, then it means that Guard A really guards the correct door.

Appendix C

Cryptography Games

Appendix C-1

Shift Ciphers

Try your hand at some shift ciphers, like the one Antimony found while she was wearing the red ledger bearer uniform.

The first cipher is the same one Antimony found in the red ledgers: to decrypt the message, replace each code-letter in the message below with the letter which is two ahead of it in the alphabet. For Y and Z, you have to *roll over* back to the beginning of the alphabet. To help you on this first one, the table below shows how to decrypt each letter.

Coded Message:

WMS ZPSIC RFC AMBC!

Substitution Table (-2)			
Code-Letter	Plain-Letter	Code-Letter	Plain-Letter
A	C	N	P
B	D	O	Q
C	E	P	R
D	F	Q	S
E	G	R	T
F	H	S	U
G	I	T	V
H	J	U	W
I	K	V	X
J	L	W	Y
K	M	X	Z
L	N	Y	A
M	O	Z	B

* * *

This next cipher works the same way, except instead of decrypting by going two letters forward, go one letter back. See if you can write out the substitution table yourself, or try it without using a table:

Coded Message:

ZPV'SF HFUUJOH HPPE BU UIJT!

* * *

This is a tricky one, because we aren't going to tell you how to do the substitution, but you can try to figure it out for yourself. This is very tricky, so be patient and don't get

frustrated. Remember, when Antimony was having trouble with the blue cipher, she found it helpful to stop working on it for a little while and let it percolate in the back of her mind while she did other things.

This cipher works the same way as the last two, so you just need to figure out how many letters to go, and in which direction. Look for patterns in the message, like repeating letters, and letters that show up a lot. Also keep your eye on short words (because there aren't very many plain-text words that it could be), and look for patterns within words: for instance, it is common to see GH together in a word, and they are only one apart in the alphabet.

Here's a hint: this is a message that the tax collector sent to the Dragon Lady.

Coded Message:

QIIX EX XLI TYFPMG LSYWI XSRMKLX.

Appendix C-2

Keyword Ciphers

The cipher that Antimony found while wearing the green uniform is also a *monoalphabetic substitution cipher*, but it is a bit harder to crack than the shift ciphers because each letter has its own substitution rule, instead of one rule for all of the letter.

Often, the substitution rules for these ciphers are created using a *keyword*: the encrypted alphabet is ordered by taking letters out of the keyword in the order they appear, ignoring duplicates. Then, any letters from the ordinary alphabet which haven't been used yet are added in their normal order to the end.

To give you an idea, this first cipher uses the keyword “ANTIMONY”, and the substitution table is given below.

Coded Message:

TPXKRJYPAKBX CQ OSH!

Substitution Table (keyword="ANTIMONY")			
Code-Letter	Plain-Letter	Code-Letter	Plain-Letter
A	A	H	N
N	B	J	O
T	C	K	P
I	D	L	Q
M	E	P	R
O	F	Q	S
Y	G	R	T
B	H	S	U
C	I	U	V
D	J	V	W
E	K	W	X
F	L	X	Y
G	M	Z	Z

* * *

Try another one; see if you can create the substitution table yourself. The keyword is "HONEYLADY":

Coded Message:

XKT OQKFY IX NKEY!

* * *

If you're ready for a real challenge, you can try to crack this next message without knowing the keyword. You'll have to study the message very carefully and pick up whatever clues you can find. You may have to make some guesses and then follow them through to see if they work out correctly.

As you go along, fill in your substitution table, but be ready to change it if you made a mistake. Sometimes you can narrow down a substitution to just a few possibilities: make a note of that in your table, because when you come across it somewhere else, you may find that only some of them make sense. Also, keep an eye on the beginning of the substitution table, where the keyword is. Sometimes, but not always, the keyword is a real word that you might recognize and be able to fill in the rest of the table directly.

This message is quite a bit longer than the other ones, but that will make it easier, because it will give you more clues. A good way to start it to try to guess some *cribs* in the message: these are parts of the message that you can guess without having to decrypt. For instance, if you know the message was sent to Antimony, you might look for encrypted words that are eight letters long, and guess that they might stand for her name, ANTIMONY. If you're correct, then the encrypted word shows you how to encrypt the letters A, N, T, I, M, O, and Y: you can try out these same substitutions elsewhere in the message and see if they make sense. You can also look for cribs by guessing the ends of words or sentences that are partially decrypted, or by inspecting the structure of the message. For instance, questions often begin with words like WHAT or WHY or WHO. Just like before, look for short words because they are easier to guess.

There are also some useful hints you can learn from the last two ciphers. If you look at the substitution tables, you can see that a lot of the sequence from the original alphabet is preserved in the encrypted alphabet. For instance, in

the first cipher you can see that B, C, D, E, F, and G are all in a sequence, and so are the letters they correspond to. This tends to happen because the keyword picks letters out here and there from the alphabet, and leaves the rest in order. This is helpful because once you figure out one of the substitutions, you can guess that, *perhaps*, the next substitution follows in sequence. But remember, that's only a guess, so you have to be prepared that it could be wrong.

More general sequences also tend to be preserved. For instance, letters that appear later in the normal alphabet tend to be later in the encrypted alphabet as well. For instance, unless that keyword contains a Z, then Z will be the last letter in the encrypted alphabet, which means it will also correspond to a plaintext Z. Again, it isn't always the case, but it's a good place to start if you can't find any other clues.

The coded message below was sent from Antimony to one of her friends in the kingdom. See if you can find any patterns or guess any cribs and break the code!

Coded message:

SABL GL. SLBCIH,

Y RIJA VIO BLA QAFF, Y'G SIYHC WYHA. Y'G MI
RBJJV NI UA UBZE QYNR GV JBLAHNM, BFNRIOCR
Y GYMM VIO BFF PALV GOZR! RIQ YM VIOL
MGYNRYHC CIYHC? Y RIJA VIO'LA CANNYHC
AHIOCR NI ABN. JFABMA MAHS GV QBLGAMN
LACBLSM NI BFF IW GV WLYAHSM YH NRA
EYHCSIG, BHS Y RIJA NI MAA VIO BFF BCBYH
MIGASBV.

MYHZALAFV VIOLM,
BHNYGIHV