The Story Ends
NAKED COMBS, EMPTY SPACES

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Queens, Drone Layers, Winter

Early June

We are the hive at the north end of the hedgerow. We are waiting for a queen to emerge that was produced under unexpected conditions. Sister groups initially started many queen cells, but then they started to remove them for reasons we do not all understand. Now we have just six as we approach the time they will emerge. One candidate queen is ready but has been kept in confinement in her cell because she was too old when she was selected to become a queen. She does not produce the right odor. That leaves us with five cells of right aged candidates that will compete to become our queen and resume the growth of our colony.

The fruit bloom is over, and we are now visiting the delicate white flowers of the black locust tree. We collect the nectar as rapidly as we are able, but the weather is unsettled. There are storms with great electrical energy passing through that send us flying rapidly back to our home when they approach. Some foragers are lost because they miscalculate the distance back to the colony and the time it will take them to return. When the storm reached them they were still working the intoxicating flowers.

As the storm passes we work to process the nectar with its ideal sugar composition and light color. But as we work the air temperature outside the hive becomes much colder, and when the light appears the next day foragers report that it is too cold to go out, the sky is filled with clouds and the human is seen breathing clouds of moisture.

But later in the day the human appears with her smoke maker and opens our nest. The blast of cold air is a shock to our warm brood area, and as she searches each frame she mutters that there *must* be eggs in the hive from the queen *she* introduced. But the bee the human gave us was not recognized as a suitable queen and was not allowed to live. The nearly mature queen cells are the method we use to replace the missing queen. We must have her laying as soon as possible so we make enough bees to fill the naked, empty combs that sit on top of our nest. If we fail, if we are unsuccessful, we will not survive the Winter.

When the beekeeper reassembles the colony we are unable to find the queen cells. Foragers return to the hive and report that the cells are smashed against a rock and the bees inside are dead. Without their special odor throughout, a great unrest begins within as we seek our queen. Then, a faint scent spreads throughout and there is one bee-that-could-be-queen that has survived. This was the one that was kept in her cell as a confinement. She was able to escape during the confusion of the human's intrusion. One group of sisters had selected her for queen production, but she was several days past egg hatching when they selected her, and she is small and not what the older bees want in a queen. Several worker bees chase after her, but she moves quickly on the comb and they do not capture her. The human did not see her as a queen because she is short and she hid when the human moved the frame into her view. The queen-to-be produces some of the odor and taste of the queen, but in smaller amounts. It is not the odor and taste of a good queen-to-be.

Over a Week Later

We are approaching the long day, the day of the greatest amount of sunlight for the season. The queen-to-bee will soon be old enough to leave the hive and go where the drones go and, hopefully, return with her body filled with the seed from the many drones she has met there. She has made her orientation flights and finds the hive entrance without difficulty.

Finally, on a bright but cloudy afternoon the queen-to-be leaves the hive to find drones. The sun falls lower into the sky as nurse bees wait for her return, but at the end of the day she is nowhere within the hive. The nurse bees search for her with growing attentiveness, but there is no queen. Many drones disappear every day, for that is normal for drones, since it is their job to move to other hives and we welcome drones from other hives into our nest for this is the way it has always been during the mating season of the hives.

The next day there is still no queen-to-be. Some of the drones

Many colonies loose queens during the year for a variety of reasons. As in this story, a failure of a queen to return from a mating flight is a possible occurrence. The initial problem here was that the beekeeper cut out the cells from the colony that was undergoing emergency queen replacement. I am always amazed by the number of beekeepers who routinely cut out all queen cells in a colony without thinking that these cells may be needed to produce a new queen! It is important to remember that not all queen cells are swarm cells, and if you do not know the status of the queen in a colony, it is better to leave the queen cells untouched and let the bees sort matters out. Research shows that some cells that appear to be swarm cells (as determined by humans by position on the frame and time of year), end up being supersedure queens, and no swarm issues. When in doubt, leave the cells in the hive. Or have a clear follow-up plan.

Another frequent reason queens are lost is during and after a physical move of a colony for pollination or honey production. Another reason, implied in the story, may be the production of a queen from a too-old larva that has difficulty mating.

Initially the human in this story misread the strength of the colony because it was so weak over the Winter and did not have adequate stores. It could not start buildup until natural food was available. Then it takes time, and is slower than a colony with great reserves of over-wintered food. While the beekeeper added a frame of honey to the hive in the later Winter, it was not where the bees could use it and the bees nearly starved. Indeed, the colony had barely escaped starvation several times in the past few months. Once the queen was able to work with the bees to build the hive's strength and resources, the human re-

DRONE

reported that birds chased them on the way to and from the mating place; others reported dragonflies. Scout bees visit other hives along the hedgerow but none had a returning queen-to-be come during the past day. Our queen-to-be is gone.

Summer Solstice

We have eggs in the cells, but these are eggs from worker bees, not from a queen. We are feeding these drones. Soon drones will be emerging. They are not able to help the colony. They are specialized only to mate. They cannot raise brood, build wax, or forage and they are worthless at colony defense because they lack the weapon.

Our colony has been without a queen for a month now and the last of her brood emerged a week ago. It was then that the worker bees started to lay eggs. But their bodies are short so the eggs are not in the center of the cells, but on the edges and sides of the cell bottoms. Without the special queen odor our nurse bees prepare few cells for egg laying, and the workers deposit multiple eggs at the bottom of each cell.

The human threw her hive tool in anger when she saw the multiple eggs in the bottom of the cells. She walked away and left us for days. Our population fell rapidly. Many days later she opened the hive and carried us on frames into the brush some distance from the hive and shook us off the frames there. In the center of the brood nest she placed a frame of young bees and eggs, taken from the colony on the south side of the hedgerow. Oh, we are attracted to that frame. It carries traces of a queen's odor, and eggs and brood – the scents we have not experienced for many weeks.

Almost immediately a few of our youngest nurses begin to feed the newly arrived brood. They empty stored pollen from cells and quickly digest it to create the food these baby bees need. Others start building queen cells, right over these tiny larvae and even some eggs, much like we did before.

Mid July

We are filled with renewed energy. Most of us are rested and ready to help rebuild the colony. One of the queen cells produced from the added comb has yielded a vigorous new queen and she was able to avoid the dragonflies and birds and returned to the colony fully mated. For a whole day attendant bees stroked her body and removed long thin filaments of unneeded drone seed she expelled from her body, and in a few days she began to lay eggs. Almost immediately the colony has several combs filled with developing young ones.

But the nectar has slowed. The weather has been hot, very hot, and our foragers spend much of their energy flying to a distant pond to gather the stagnant water to help cool the hive.

The new queen sometimes puts two eggs in some of the cells since we just cannot keep up with her tremendous egg producing capacity. The combs above are still naked, empty of the surplus we need to provide us with Winter reserves. Returning scout bees report on fires in the foraging area as a whole Winter's worth of nectar burns in the dry heat. We continue to search for food, finding a little in gardens of the humans. There is corn, and the cucumbers, squash and gourd flowers to visit. A few mint flowers are found along the

moved her and a new queen was introduced. Perhaps the replacement queen was released too quickly, or perhaps she was never a good queen – the result of substandard queen rearing conditions and thus inadequate pheromone production.

There is a great deal of misinformation about workers that become laying workers. Since they are unmated, their eggs will all produce drones – there must be some selective advantage for colonies that pass on genes this way as the colony itself dies, for the genes live on. There are many laying workers in a hive. They appear after the brood has been absent for a week or so, or about four weeks after the queen is removed/killed.

It is the presence of worker brood that inhibits the development of worker ovaries, not just the presence of the queen. When both are gone it is nearly impossible to requeen a colony with laying workers. In the story the human took bees into the woods and brushed them off, but the laying workers are able to fly and this is not a valid way to solve the problem.

One method I have used to establish a queen in a strong colony with laying workers is to add a frame or more of brood. This will inhibit egg laying by the workers. Several days later you can then try to add a queen.

In the long run, it is often easier to use the newspaper method or to shake bees from a colony with laying workers in front of a hive with a laying queen, nucleus or full sized hive. The queen pheromone and brood will inhibit the egg laying, and the bees will not be lost. Equipment may be positioned as needed by this and other hives.

Finally, there are *very* few times when a beekeeper should divide a brood nest with a frame of foundation; perhaps, during the flow, and in a very strong colony.

LAYERS

ditches. We stay alive, but we are not growing.

Early September

The human has opened our hive again and combs are thrown about. We are in dismay over her ability to disrupt the order of our colony. When we return to her version of order we find a frame of foundation separating the combs holding the young ones, and there is a cage holding a strange queen sitting on the bottomboard of the colony. We find the odor of our queen, the one just reared a few weeks ago, spread on the cage of this foreign queen.

While some of the nurse bees feed the foreign queen through the screen of the cage, some of the guard bees are alert to her strange odor, and continuously attempt to sting her through the screen of the cage. Others remove the sweet material at one end of the cage, and in less than a day we have freed that foreign queen and the defensive bees are able to sting her.

So for the third time this season we are queenless. Nurse bees again begin the process of producing candidate queens, and by late September a lone queen attempts to mate. The weather has cooled. There is frost on the ground, and the Fall winds blow cold and strong. Our virgin queen starts to fly out every afternoon, but quickly returns. Finally, on one fine October afternoon, she reaches the place where drones go but there are no drones there. She flies to another along the flyways but cannot find a mate. She continues this several times as the declining weather allows, but no drones. Our colony has not had drones for many weeks because of the poor forage. Apparently many of the colonies in the area have experienced the same decline in conditions and have produced drones no more and the old ones have died.

November

The limited amount of brood from the last queen has emerged. There are not enough of us to survive the Winter, but we continue to move limited food to the brood area, hampered by a frame of foundation that we have chewed to use the wax. The unmated queen has laid a few eggs, but they are not fertilized and now we have drones when it is too late for her mating!

The human has given up. She carried our remaining numbers to the colony at the south end of the hedgerow and placed a newspaper between the boxes containing our combs. Our bees slowly mingle as they chew holes in the paper and become part of the hive at the south end of the hedgerow.

Once we were the hive at the north end of the hedgerow, a rapidly growing colony with a good queen. The human has added two queens and we killed both of them. We have raised three queens and the human has killed two of them and one could not find drones to mate. This is the end. The combs are empty. BC

Dr. Larry Connor has moved to Kalamazoo Michigan to be closer to the center of his business travel, his 92-year old mother, his family and his best friend. He has completed writing his next book, Bee Sex, and is in the production phase of the book prior to publication. Dr. Connor offers a free Internet newsletter called ebeebooks. You may subscribe by sending a message to ebeebooks@aol.com and type subscribe in the subject field.