

Beekeeping Basics

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Part 1:

Introduction to Honey Bees and Beekeeping

The honey bee has fascinated mankind since prehistory, when ancient people learned to rob wild bees' nests for their honey. Over many thousands of years of observation and experimentation, people have developed techniques to manage colonies of bees for increased production of honey and beeswax and other products, and for the pollination of our agricultural crops.

The honey bee, *Apis mellifera*, is just one of around 20,000 different species of bees found all over the world – anywhere flowers grow. There are more types of bees than there are birds and mammals put together! That's just the bees! That does not include the millions other types of insect species that have been named or have yet to be discovered.

The vast majority of bee species are solitary. Each of these female bees will live for just one season, alone, visiting and pollinating many flowers, and producing a few offspring before she dies. Her young will usually overwinter in a dormant stage, and then appear when the weather warms next year to start again. Relatively few types of bees live in social groups.

Bumble bees colonies only persist for a single season, and will die out in winter. Only newly-produced bumble bee queens survive, by hibernating through winter, and must start a new colony by themselves in the spring. They in turn produce new queens in the fall before they too die off.

Of all the insects known, only the honey bee remains active all year. They live together in large colonies, able to defend themselves if necessary, and are able to gather and store up surplus food – honey – that they can feed on in the winter when there are no flowers available. They will use the stored sugar energy in this honey to generate heat, and that helps them survive harsh cold conditions.

There are several species of honey bees found in Asia, but only one species, the western honey bee, or *Apis mellifera*, is native to Africa and Europe. It has also been introduced into North and South America, Australia, and even into Asia, where it has become the most popular honey bee because it produces much more honey than other native species there.

At some point in our prehistoric past, someone had the wild idea to put their hand into a nest of stinging bees, and to taste the sticky golden liquid they found dripping out of it. And what a treat it must have been! For centuries ever since, people have sought out wild bee colonies and robbed them of their honey and beeswax. Throughout most of history, honey was the only sweetener people had, and beeswax was a valuable substance for making candles, waterproofing materials, and was used in many industrial processes and crafts. And of course bees have always been important for pollinating plants, and improving the yields of many fruits, vegetables, seeds and nuts that we enjoy as part of our diet.

Still today, there are many places in the world where people cannot walk into a supermarket and purchase a bear-shaped jug of pure liquid honey right off the shelf. So many people still hunt wild bee nests to rob their

honey. The extreme trouble and risk that people are willing to go to for this delicious treat is an indicator of how valuable honey really is for those without access to plentiful refined sugar.

The ancient Egyptians were probably among the first cultures to try and domesticate the honey bee. There are many scenes of daily life carved into the walls of the remaining temples and tombs of ancient Egypt, and they often depict symbols of honey bees and beekeeping. They probably noticed that the honey bee swarms would sometimes naturally move into empty baskets or pieces of pottery that were left outside, and they would build their wax honey combs inside, storing up delicious honey. This led to the creation of hollow cylindrical hives made of terracotta or hollow logs. The Egyptians learned that smoke could be used to drive out the bees, and they could cut out the combs to harvest the honey. Similar hives are still used today all over Africa and the Middle East.

All over the ancient world, people have tried keeping honey bees in various ways. The bees were valued for the honey and wax that they produced, and were also important cultural symbols for many ancient peoples, so we see their images on coins and jewelry and in other artwork. While their biology may have been poorly understood, and some of the things they believed and practiced may seem laughable or backward today, people still managed to keep these insects around throughout history.

Aristotle wrote a treatise on honey bee diseases. It was once believed that swarms of bees spontaneously generated from the carcass of dead cattle. And until fairly recently, many beekeepers practiced “tanging” which was the clanging of metal objects together to cause a flying swarm of bees to settle somewhere to be caught. This doesn’t actually work – bee swarms will settle fairly soon after they emerge from a hive anyway. But banging your kitchenware together certainly allowed a beekeeper to claim dibs on a swarm when they saw it.

In some parts of Europe, honey bees were kept in sections of hollow log hives, sometimes intricately carved. And sometimes bee colonies were maintained right in the trees. When a bee tree was discovered, honey hunters might choose to carefully chop open the trunk and remove only a portion of the honey combs, and then close up the tree again with a plank of wood, so they could return the next year and easily do it again, preserving the bees inside.

The straw “skep” became the quintessential type of bee hive across much of Europe. We’re probably all familiar with this old fashioned style of bee hive from pictures on honey bottles or illustrations in books. They were certainly more portable than wooden logs or terracotta pots, and basket-making was a common skill. People may have found by accident that overturned baskets made an excellent shelter for honey bees. Skep makers would often weave sticks into the skep, which provided additional support for the honey combs. The bees simply built parallel wax combs from the top, hanging down into the cavity around these sticks, and filled the combs with honey.

Honey bees were highly prized because they gave people two very important things: honey that was used as a sweetener and as a medicine, and beeswax, for candles and many other uses. Bees (and other stinging insects) have also been used in war. Bee hives could be kept on top of castle walls, to allow the bees to forage in the surrounding countryside. But in case of trouble, the hives of bees could also be effectively dropped onto a besieging army trying to scale the walls. Sometimes hollow spaces were purposely left in the castle walls during construction, with external openings, so that wild bee colonies would naturally nest inside. If the walls were being battered or scaled, the bees would become agitated and defend themselves – and the castle. There is also historical evidence that bee hives and hornets’ nests were sometimes hurled into fortifications to drive out those who were sheltering inside.

Our honey bees were not native to the new world. The European colonists brought many plants and animals with them as they immigrated. They brought cows and horse, chickens, pigs, many fruits and vegetables, and they brought the European honey bee. This honey bees did very well over here. The east coast had vast old-growth forests with plenty of large hollow trees and wildflowers, and while there were many native bee

species, most were solitary and likely posed little competition for the comparatively large honey bee colonies. Thus the European honey bee, “western” honey bee, has since become largely naturalized in America. They have been continuously transported west as well as to South America, but they have readily spread into the wild on their own. Early settlers in New England often commented on the abundance of honey that could be taken from these “wild” colonies, so there was often little need to keep bees in hives. Technically we cannot say that these are “wild” honey bee colonies, since they are not a native species. Rather, they are “feral” colonies since they have escaped domestication and gone back into the wild.

The old timers would locate a bee tree by first finding bees to follow. This was often done in the late summer, when hives would be full of honey, and bees would often be foraging for water to cool their hives. Bees foraging for nectar or pollen might proceed randomly from flower to flower for quite a while before heading home. But water foraging bees fill up on water at a creek, and then fly in a straight line back to their hive (this is the origin of the phrase “to make a bee line”). A skilled observer could plot the direction that these bees were flying to figure out the direction back to the hive. Some people would capture a number of bees in a jar or a box, and proceed along the bee line, letting out another bee to follow when they lost track of the last one. Sometimes bees would be dusted with flour, to make them easier to see in the dark woods. If a honey hunter was successful in tracking the bee back to its nest, the tree was usually marked with an axe, so they could return later, with tools and buckets and others to help. The tree would often be chopped down, and the nest completely robbed of honey and destroyed. If the bees survived, they might have found another tree, but may not have been able to build up sufficient stored honey to survive the coming winter. A landowner rarely minded the honey hunting. Hollow rotting trees were essentially worthless for timber, and once the tree was felled, and the bees removed, it was easier to chop up for firewood. And they were often given a share of the honey as well. As destructive as it was, there always seemed to be plenty more bees in the wild, so little thought was given to their fate.

The early American colonists did not have vast fields of grain, so they did not have lots of extra straw for basket making. But they did have an abundance of wood, which was less common in Europe where much of the original forests had been cleared away over the centuries for farming and for timber. So Americans began keeping bees in hollow log hive – often called “bee gums” because gum trees were often hollow, or in box hives- simple hollow wooden boxes, in which bees built combs similar to skeps. But in all of these primitive types of hives, harvesting the honey was very destructive – and often fatal – for the bees.

There had to be a better way!

In our next lesson we'll take a look at the modern bee hive and its components, and we'll see how the structure and function of these types of hives fits with the biology and behaviors of the honey bees that live in them.