

The Secret Workings of the Bee-Hive

Though we're often inclined to believe that bees are some sort of pollen-collecting automatons, bee society is more complex than you may imagine. Think of them as a honey-producing civilization—one that we cannot live without. In this article, you'll learn how bees select a location for a hive, then how they create it, and what the bees' roles are in bee society.

How bees select their hive location

The search for a new home begins [when a hive becomes overcrowded](#). At that moment, the colony divides. A queen, drones, and half the workers give their goodbye dance (there is no goodbye dance, we call this artistic license), and set off in search of a new home and new resources.

Fortunately, unlike a migrating barbarian tribe, the bees come in peace. They fly to a nearby branch and make camp—a temporary camp. In fact, if you've ever seen a group of bees clinging to something like a tree branch, you've seen a bee migration in person.

As the bulk of the new colony is busy scaring you, a few scouts break off in search of permanent residence. When a suitable home is discovered, the scouts return and unveil their findings to the rest of the colony with a "waggle dance"—something we'll talk about a little later. If the dance is heeded, the colony lifts off and begins the journey to their new home.

The creation of the hive

Scouts seem partial to selecting trees cavities, or caves, or even rock cavities for their nesting location—though it's not unheard of to see hanging combs.

The preferred [nest height is approximately five metres](#) with the entry hole opening at approximately 12.5cm²; the entrance position is on either the top or bottom, or both, and the entrance direction usually faces toward the equator—likely to prevent northerly winds, and snow from entering the hive during the winter (though we are not certain).

But how do the bees create their hives? Well, it starts on the outside of the tree where rough tree bark is smoothed and peeled away—perhaps to ensure there aren't any snags when entering or exiting. Following that process, the bees collect propolis (bee glue) from the surrounding flora and use it as a sealant for the inside of the hive.

Building Honeycombs

The beeswax used to create the bewildering hexagonal combs is secreted by female worker bees after they've ingested enough nectar. The honeycomb then—like the honey itself—is essentially bee vomit (sorry).

The organization of the hive doesn't end with the creation of the comb though, as hives are more than just storage for honey. In fact, only the top half of the combs are used for honey. At the bottom, the bee larvae—known as the "brood"—are nursed, and pollen reserves are often found in the middle, dividing the brood from the honey.

Now that you know how organized the inner features of the hive is, let's move on to how bee society itself is organized.

The roles of the society

As you've surely seen, both natural and manufactured beehives are busy places. Hives have been known to hold more than 60,000 bees, with a hive housing [over 100,000 being found once before](#). So obviously there are jobs to be done or why else would they need such massive populations?

Much like humans, the roles and responsibilities of each bee changes with age. The female worker bee, for example, takes on a swath of duties throughout her life. The change in role is so structured that a detailed timeline can be constructed to outline the job that each bee must complete during their approximate 40-day life cycle.

On day one the young female bee is expected to clean her own cell, as well as adjacent cells; these young bees are also tasked with ensuring the warmth of the brood. From the third to the fifth day, she's responsible for feeding the oldest larvae—she'll then transition to feeding younger larvae from day six to eleven.

As the bees close in on middle age, the number of roles increases. Between days twelve and seventeen, they begin building combs, producing wax, and generally maintaining the infrastructure within the hive.

It's only upon reaching middle age that female workers get to experience life outside the hive. From day eighteen to twenty-one, they're ordered to guard the entry of the hive and ensure that predators like wasps don't gain easy access to the spoils within.

Finally, after completing their mandatory military service, they're given the ultimate objective: collecting resources.

But how do they assign roles? Is it instinct? How can a civilization so large and complex function without a language?

How they communicate

By dancing. Humans have been doing it for millennia—for entertainment or otherwise—but for bees, dancing is more than a recreational or spiritual activity.

If you know one thing about bees other than “They're more scared of you than you are of it,” you likely know about their “waggle dance.” And while criticisms have been thrown against the notion of a dancing language and how well bees truly understand it, the act itself is still fascinating. Let's take a look at the two forms of dance in the bee society:

The Waggle Dance

The supposed purpose of the waggle dance is to either encourage other bees to forage or direct fellow scavengers toward hot spots.

The waggle dance is the more precise of the two dances, and while looking rather silly, it contains information like the distance and direction to a hotspot.

The distance from the hive is pertinent information for other foragers to know because a bee can only travel six and a half kilometres from the hive before needing to “refuel.” If you've ever seen a grounded bee before, this is likely the cause, and if you're so inclined, a little bit of sugar water, or simply plucking a flower and bringing it to the grounded bee can save its—now precious—life. But I digress.

The distance from the foraging location to the hive is relayed by the amount of “circuits” the bee dances. For example, if the bee does five circuits, it may indicate a source 1000 metres away.

The direction of the source is explained by the direction the bee faces during the wagging portion of the dance. A bee that dances at a 60-degree angle to the left indicates that the food source is 60-degrees left of the Sun.

The Round Dance

The round dance is performed when a food source is within 100 metres of the hive. This dance, unlike the waggle dance, is imprecise and serves only to illicit a general response from the hive. Usually, after performing the round dance in various locations around the hive, other foragers take flight en masse and search the immediate vicinity for food sources.

So, while there may not be any words, nor any direct communication between individual bees, the dancing language still serves a fundamental role within bee society: that of the collective; that all bees work together as one.

And for 14 million years these little pollinators have adapted and evolved into critical players in our ecosystems. We owe a lot to them, so thank you for taking the time to learn more about them. We hope you enjoyed.