

## **“The Bee Dance—Not Exactly the ‘Electric Slide!’”**

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Have you ever wondered where the honey on your toast comes from? If you answered, “the store,” you’re incorrect. The honey you and millions of others enjoy is made by the *Apis mellifera* (honey bee).

Believe it or not, scientists think that the complexity of the honey bee’s language is second only to ours! [1] The *Apis mellifera* communicates by dancing. It uses this dance to start the honey-making process. Pretty amazing, huh? “Oh, sure,” you may be sarcastically thinking, “the honey bee does the Electric Slide...ha, ha, ha.” Well, I’ve got to admit the dance I’m thinking of has nothing in common with the Electric Slide, but it is the honey bee’s very own, amazingly unique, form of communication.

Aristotle described a certain bee behavior in his *Historia Animalium* in 330 B.C. He had noticed that forager bees (foragers are always female) laden with nectar perform two certain dances on their return to the hive. The forager dances upon the comb in a kind of circular pattern, occasionally crossing it with a zig-zag or a waggle, across the center. This behavior was thought to attract the attention of other bees. In 1947 Karl Von Frisch recognized the fact that the runs and turns of the dance could relate to the location of the food source from the hive. He also put forth the theory that the bees use the sun’s position to help guide forager bees to the nectar. He also found proof that the more vigorous the display is, the more quality the food has. In 1973 Von Frisch was awarded the Nobel Prize in Physiology of Medicine for his awe-inspiring discoveries.[2]

The honey bee performs three dances, composed of a series of patterns and waggles: the Round dance, the Waggle dance, and the Crescent dance. Different types of bees—German, Italian, and Western, among others—use different dances for when the nectar is closer or farther away from the hive. (Italian honey bees are favored by beekeepers in the U.S.) For instance, the Italian honey bee (*Apis mellifera ligustica*) performs the Round dance in cases of the nectar being zero through 20 feet from the hive. The tempo of the dance also portrays the quality and quantity of the source. The Crescent dance is an intermediate between the Round dance and the Waggle dance, and is used for approximately 25 to 75 feet from the hive. The Waggle dance is the most complex, and is used for when the nectar is at least 115 feet from the hive. In the Waggle dance also, the speed conveys the quality and quantity of the nectar. The forager bee pretends that the top of the honeycomb is the “sun.” The straight portion of the dance in relation to the angle of the “sun” shows the angle that the real nectar is to the angle of the real sun. For example, if the honey bee dances the straight portion thirty degrees to the right of the “sun,” the nectar is at a thirty-degree angle to the right of the real sun. Thus the dance attendees will know how to find the food. [3]

The distance is also shown by the speed of the dance. For instance, if the nectar is further away, the dance is slower. If it is closer, the dance is faster. For example, if the bee dances 11 cycles in 30 seconds, it means the nectar is 2000 feet away from the hive. And if she dances 15 cycles in 30 seconds, it means the nectar is approximately 1000 feet away. That’s a fast dance! [4]

The bees following a dance are known as “dance attendees.” The dance attendees will touch the dancing bee with their antennae. The bee performing the dance will also stop from time to time and give the dance attendees a taste of the nectar that she is bringing back. This probably gives them information on the taste and smell of the nectar they are attempting to pinpoint. [5]

Amazingly bees communicate longer distances for the same flower on a day of harsh wind than for a day of calm. By doing this, they show the dance attendees the amount of energy it will take to get to the flower. [6]

Honey bees have lived for millions of years, and humans have only been harvesting honey from them for thousands of years. Obviously, the bee dance has been going on much longer than the Electric Slide! The oldest record of humans using honey for their own benefit is a 9,000-year old cave painting in Spain which portrays a figure apparently sneaking honey from a hive on a cliff. Even today people still take honey from bees, when they can find it, in various parts of the world. [7]

Different kinds of honey can be made from different kinds of flowers. Honey made from clover is one of the most popular in the U.S. We tend to take honey for granted, but it takes 154 trips from the hive to make one teaspoon of honey! A forager bee only makes one twelfth of a teaspoon in her entire lifetime. The entire hive carefully guards the honey—every hexagon of comb of the hive is turned slightly upward so none of the honey spills out. [8]

Because of the Bee Dance the *Apis mellifera* is successful in making honey. So successful, in fact, that six hundred thousand tons of honey are sold annually world wide, with plenty left over for the bees! [9] So let’s hear a round of applause for our little friends, who communicate through circles, wiggles, and waggles (and do the “Bee Electric Slide”) in order to create one of the world’s favorite sweeteners—honey.

### End Notes

[1] Friend, Tim (2005) “Animal Talk”, Pg. 8, Simon and Schuster.

[2] Internet Source: [Wikipedia.org/wiki/Bee\\_learning\\_and\\_communication](http://Wikipedia.org/wiki/Bee_learning_and_communication) (Oct. 31, 2008).

[3] University of Minnesota, Internet Site: [www.tc.umn.edu/](http://www.tc.umn.edu/), Search, “dance of bees” [PDF] Kids, Dance Web.

[4] University of Minnesota, Internet Site: [www.tc.umn.edu/](http://www.tc.umn.edu/), Search, “dance of bees” [PDF] Kids, Dance Web.

[5] Setiai (July 3, 2002) “Honey Bee Dance Language” Internet Site: [www.setiai.com/achives/000065.html](http://www.setiai.com/achives/000065.html).

[6] University of Minnesota, Internet Site: [www.tc.umn.edu/](http://www.tc.umn.edu/), Search, “dance of bees” [PDF] Kids, Dance Web.

[7] Mound, Laurence “Insect”. (2004) Eyewitness Books, Dorling Kindersley.

[8] Field Guide to Agriculture in the Classroom. Internet Site: [www.Agclassroom.org/UT](http://www.Agclassroom.org/UT), Click “search resources,” then search for “Field Guide.” Click, “Free Downloads,” and then click “Bees” link.

[9] Ericson, Eric, Jr.—Carlson, Stanley—Garment, Martin (1986) “A Scanning Electron Microscope Atlas of the Honey Bee” Iowa University Press Internet Site: <http://gears.tucson.ars.ag.gov/beebook/sec1/sec1.html>.

### Additional Resources

Gibbons, Gail (1997) "The Honey Makers" Morrow Junior Books, New York.

O'Toole, Christopher, and Raw, Anthony (2004) "Bees of the World", New York.

Facklam, Margery (1992) "Bees Dance and Whales Sing: The Mysteries of Animal Communication", Sierra Club Books for Children, San Francisco.