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https://www.100test.com/kao_ti2020/643/2021_2022__E9_9B_85_E6_80_9D_E5_90_AC_E5_c5_643970.htm Section 4 A paper published in Nature on May 12th (1) provides new data that resolves a long-standing scientific controversy. In the 1960s, Nobel Prize winning zoologist, Karl von Frisch, proposed that honeybees use dance (the “ wobble dance ”) as a coded message to guide other bees to new food sources. However, some scientists did not accept von Frisch ’ s theory. Using harmonic radar, scientists, funded in part by the UK ’ s Biotechnology and Biological Sciences Research Council have now tracked the flight of bees that had attended a “ wobble dance ” and found that they flew straight to the vicinity of the feeding site, as predicted by von Frisch. The tracks allowed the scientists to determine how accurately bees translate the dance code into successful navigation, and showed that they correct for wind drift even when en route to destinations they have never visited before. If a honeybee worker discovers a good feeding site it is believed that she informs her nest mates through a dance that describes the distance and direction of the feeding site. This ‘ dance language ’ was first described by Karl von Frisch in the 1960s but his experiments also showed that bees that had attended the dance (recruits) took far longer to get to food than would be expected. This time delay caused other scientists to argue that the recruits did not read the abstract code in the dance at all, but found the food source simply by tracking down the smell that they had picked up from the

dancing bee. Another suggestion was that recruits simply followed the dancer when she flew back to the food, and then other bees joined in. The controversy has persisted because prior to the advent of harmonic radar, no one could show exactly where the recruits flew when they left their hives. The scientists watched the waggle dance occurring in a glass observation hive and identified recruits. They captured these recruits as they left the hive, attached a radar transponder to them and then tracked their flight paths using harmonic radar. Most recruited bees undertook a flight path that took them straight to the vicinity of the feeding site where they all spent a lot of time in searching flights, trying to locate its exact position. This searching behaviour accounts for the time lag that caused the original controversy.来源：考试大的美女编辑们

In another set of experiments, bee recruits leaving the hive were taken to release sites up to 250m away. These bees flew, not to the feeding site, but in the direction that would have taken them to the feeding site had they not been displaced from the hive. This result adds weight to von Frisch ' s original theory and allows alternative hypotheses about bee behaviour to be firmly discounted. Entomologists have long known that bees use polarized sunlight to navigate. Two Swiss scientists now say that a bees navigational "map" lies embedded in special photoreceptors in its eyes. According to Samuel Rossel and Rudiger Wehner of the University of Zurich, "... the array of receptors [in the bees eyes] forms a template which the bee uses to scan and match the polarization patterns in the sky." In the 1940s, Nobel laureate Karl von Frisch showed that bees have a simple yet

elegant way of communicating the location of distant sources of food. When a foraging bee returns to the hive, she performs a "waggle dance" consisting of a short run ending in a loop that returns her to the beginning point of her run. The direction of her run indicates the direction of the food source with respect to the sun. A sister bee observing this performance somehow remembers the size of the angle between the sun and the food indicated by the dancing bee. She flies out of the hive, makes a quick calculation of the position of the sun, and zips away at the same angle. Bees have compound eyes made of almost 6,000 tiny lenses covering the openings of equally tiny tubes. Each tube contains eight light receptors that look like toothbrushes with the bristles facing each other at the lens end of the tube. The "handle" is the nerve going to the brain. The tubes located at the top of the bees eye contain "toothbrushes" that specialize in detecting polarized ultraviolet light. Beginning at the back of the bees compound eye and continuing around to the front, these specialized photoreceptors in each tube are arranged in a pattern that matches the direction of polarized sunlight. Polarization results when the atmosphere scatters incoming sunlight and restricts the light's electrical field to a certain direction. When polarized sunlight enters a bees eye, it stimulates the bristles, which in turn stimulate the photoreceptor "handles" that send a message to the bees brain. Polarized sunlight with an electrical field direction that matches the direction of the bristles stimulates the bees eye more than any other type of light. In a complicated series of experiments described in the Sept. 11 NATURE, Rossel and Wehner showed that

a bee flies in a circle until the special receptors in her eye detect the maximum stimulation from polarized light. The map in her eye tells her that, in this position, she is facing directly away from the sun. Remembering the orientation of her sister bees waggle dance back at the hive, the bee veers off at the same angle to make a beeline for lunch. 相关推荐：影响雅思听力的7个因素及其相应对策 雅思听力秘笈：内功修行 题海战术 100Test 下载频道开通，各类考试题目直接下载。详细请访问 www.100test.com