

a "dance language" which is described as follows:

The language of bees (Dance language). Communication among organisms is an important phenomenon which helps individuals to come close for mating and often for parental care of the off-



A. Waggle's dance

B. Round dance

Fig. 3. Diagram showing different types of honey bee dance

spring. In social populations, different ways of communications like release of different chemicals, production of sound and touch etc. are seen to help in maintaining cohesion among the society members. The bee's dance is one of them where foragers show a definite dance pattern to locate food and water sources. The language of bees have been studied by Karl Von Frisch (1944) for which he was awarded the Nobel prize in 1973. They show "Waggle dance" (Fig. 3 A) and "Round dance" (Fig. 3 B) to communicate about the location of food and water sources to other individual bees. In a Waggle dance, figure of eight is traced against the vertical surface of the comb. In manoeuvring the central portion, the dancer flies straight and buzzes noisily shaking its abdomen violently. Other members of the society surround this dancer. According to Karl Von Frisch, the straight portion of the dance is "The Waggle Run" which signifies the dis-

ance and the direction of the food source. Generally Waggle runs are performed vertical to the honey comb in the hive and points upwards if it is in the direction of the food. He further observed that the dances result 80 degrees to the left of the vertical and the food source is horizontally 80 degrees left to the sun's azimuth. The number of waggles increases with the increase in the food distance where each waggle is about 250 fts near the hive and it goes on declining if the food source goes on increasing in kilometers. In waggle dance a circle with a diameter more than three times as that of the bee, a straight run while wagging the abdomen violently about 15 per second from side to side and another tracing circle in direction opposite to that of the first.

In the "Round dance" a nearby food source is indicated by a simple circular dance. The forager repeats clockwise and anti-clockwise circle for a number of times throughout the day but when the food sources are quite a distance, the round dances are converted into waggle dances which gives information about the distance and direction of food or water source which is inversely related to the distance covered by the flies in search of food.

Dr. Manning (1972) explained that "The more 8's the dancer completes per unit time, closer is the food source". He further adds that "the dancer may also convey distance by the number of waggles she makes on the straight path of her run, by the length of time, she spends on each run or by the duration of the buzzing that accompanies it. We are not sure which of these codes - sound or tempo - the other bees respond to; quite possibly they respond to all of them". The forager bee flights depends on the position of the sun and the waggle dance denotes the same angle vertical as the food is located. A forager takes about 1.25 seconds to complete a figure of eight, if the food is about 100 meters away from the hive. A. Wenner of U.S.A. believed that foraging bees bring back the odours of food source with them while returning back to the hive and the other bees are stimulated by dances to search for flowers having similar odours. Gould (1976) conducted an experiment on bees and reported that bee dances communicate both distance and direction of food source and the sister bees use such information to locate the food source.