Illumining the Mystery of the Honeybees

By Johannes Wirz

The bright flame of a candle reveals the magic of alchemy at its best. The burning wick makes the solid mass of beeswax melt and stream upwards. The gas is readily ignited. The flame draws a stream of oxygenated air from below to nourish the flame and produce the mood of calm that we so treasure. We can easily discover the interplay of the four elements here: earth (in the wick and solid beeswax); fluid (in the melted beeswax); air (in the gaseous vapor of the wax and the oxygen that nourish the flame); and the gentle warmth of the fire itself.

But where does the *light* of the candle come from? This question is accentuated by the fact that the hot flame of a welding torch does not produce light at all. What makes the difference? If a piece of metal or glass is pulled through the ignited welding torch, it remains unaffected. If the same procedure is executed with a burning candle, a black line reveals the path of the movement. Take a piece of white paper, pull it through the flame and convince yourself.

Black carbon is steadily released by the wick and the burning gases. It is the black sooty particles that are diffused by the stream of air and eventually glow brightly in the heat of the flame. Candlelight does not arise without darkness!

Now let us see how the bees produce wax. It may well be that the interplay of light and darkness also has something to do with the life in and outside the hive. A honeybee takes twenty-one days to develop from the egg to the adult- in the total absence of light in the hive. After hatching, she follows a precise biography, which can be accelerated or even

reversed in cases of emergency, revealing the enormous plasticity and inherent intelligence of the colony. The young worker bee starts by cleaning the cells of the comb. Later she develops the glands to produce royal jelly, the magic substance that nourishes the brood. Soon after, she turns into a comb-builder by secreting tiny translucent scales of wax from the paired glands on the ventral side of the abdomen, bringing them to her mouthparts, adding enzymes and sticking them to the growing snow white comb. In the darkness of the hive “light” is born, although the bees involved in comb construction have never seen the sun! It is only after this that a bee becomes acquainted with the life outside the hive. This happens first through the nectar and pollen that are quickly handed over by her elder sisters, and later she guards the hive at the entrance hole. Only after that does she become a forager bee, collecting pollen and nectar with amazing diligence. It is said that at the very end of her life she carries water into the colony. Evolutionary biologists assume that this must be so because collecting water is the most dangerous task and is therefore only accomplished by animals shortly before their death. But if one considers water to be the most essential element of life, it can also be the metaphor for the intimate connection between life and death.

In her cradle the honeybee has been nourished by pollen and nectar, the substances that represent the ultimate and most delicate transformation of light into matter during the growth process of the plants. Forager bees collect these precious goods in the bright sunlight, sometimes far away from home. Sunlight turns into refined plant substance, feeds the brood, turns into beeswax, and is freed again in the flame of a burning candle on dark winter evenings. We participate in a cycle of materialization, transformation and de-materialization. The grand circle of alchemy from mind to matter and back to mind is accomplished in the form of light to matter in pollen, nectar and beeswax, and back to light again in the burning candle.

This imagination harbors the whole wisdom of the hive and allows us to understand why bees have such an important role in the mythology of different cultures. The story of light and darkness is also the story of breathing on many different levels. The life of a single bee starts in the dark; it is followed by the rhythm between inside and outside during the stage of foraging, and it is completed by a natural death in summer, outside and under the full light of the sun, after foraging for some eight to eighteen of its thirty to forty days of life. In a reversed way this is also true for the swarm. Here, the birth of a new colony takes place in the bright noon of a summer day and continues in a new nest site, which provides the right volume, shelter, and darkness.

Finally, the whole life of a colony from spring to winter recounts the tale of breath. It is wide and big in the warm season, small and discrete in the winter cluster. Ephemeral “objects” like bees, wax and honey, even the new swarm, hail the mystery of breathing, without which no life is possible. In the plants, this breathing process is transformed into growth and decay. Pollination encompasses both: the beginning of maturation and death of the mother plant, as well as the birth of the daughter plants in the developing seed.

Modern bee-keeping techniques and agricultural technologies threaten this magic cycle. The former oppress fundamental behaviors of the colonies. Swarm prevention, foundations or combs made out of plastic, which replaces the beeswax, and artificial queen breeding seemingly belong to the mandatory tools to maximize yields. The suppression of the innate behavior of the colony, the real “bee-being,” is similar to the amputation of an organ. In addition, honey has deteriorated by being loaded with too many pesticides. This counteracts its healing power, for both bees and man. And often pollen from genetically modified plants that have not been approved for human consumption contaminates the harvest, as has already occurred in Germany. As a consequence, it had

to be disposed of as hazardous waste. What will future generations say when they find out how man has transformed a kind of sacred substance into a poison?

Maximization of yield neglects the whole for the sake of profit. Orchards with billions of trees as in California feed about a million colonies or so for a lousy two to three weeks and turn land into a desert, or worse, a deadly sea, flooded by pesticides, herbicides and fungicides. Corn belts have become clean and sterile like the hallways in a hospital to prevent the arrival of weedy plants –no flowers, no bees.

To avoid the bees' extinction is a far from a simple task. It will require a revolution, a transformation as dramatic as the alchemy involved in the burning candle. Farming must turn away from excessive technology and become an art again. The chemical arsenal in the barn will need to be replaced by ingenious skills: crop rotation, mixed crop farming, the cultivation of predators against insect pests, and the composting of manure, which heals and improves the soil. The dynamic drama of life needs to be played in a theater well founded on a stage prepared by earthworms and company, with beautiful flower scenery and myriads of actors: cows, butterflies, bugs, and bees. Our own aspirations and striving can create such a setting; consumers will savor the beauty and diversity of the play as flavorful and healthy food; and future generations will admire the wisdom and inspiration of their ancestors.