

Golden threads and the Golden Fleece

Imagine! It is early spring time. During recent days, the sun has gained in strength, the snow is melting away and the first willow trees have opened their buds. On his afternoon walk, the attentive Rambler hears a gentle humming sound. Above his head, hundreds of honeybees are collecting the first pollen of the year, diligently. In the hive the precious goods are welcome. Since late January, the queen has been laying eggs, and the whole colony has taken great care in raising the brood, warming and feeding it. Pollen is urgently needed.

Some seven months later – the first clear and frosty October nights announce the approaching winter. Leaf Mustard sown for green manure has resisted the cold, and colors the shortening days with its remaining yellow hue. The cold has devastated most of the insect life. Migrating butterflies like the monarch have headed south long ago, others like the small tortoiseshell have found their places under stacks of wood, in quiet barns or pavement cracks, to sleep their long winter sleep, and yet others like the marbled white have secured the existence of their descendants by depositing eggs, larvae or pupae for hibernation.

Magic! In this seasonal grave of pollinating insects the honeybees are still around. By hundreds and thousands they take advantage of the remaining sunny afternoons before the long weeks of winter to come, and collect the last drops of nectar, as well as the last grains of pollen. They replenish the stockpiles for their future sisters: the brood to be reared after the winter break.

Both situations display the specifics of the honeybee. Irrespective of the season, they are present in great numbers ready to pollinate the flowers yearning for maturing seeds and ripening fruits. With an unsurpassed fidelity and precision, they ensure that the styles of one flower species are pollinated with only the correct grains of pollen. What is so clearly visible at the beginning and at the end of the flowering season, holds true throughout the year. Honeybees take in the abundance of the flora around their hives by thousands, and transform it into the cornucopia of life in relation to both plants and hives.

If we think of the honeybees as the orchestra in the symphony of the pollinators, then solitary bees and butterflies represent the soloists in different ways. Solitary bees have a short and exclusive performance on the stage of flowers: some three to six short weeks. It is an enigma how they always manage to appear just at the right moment, when “their” flowers start to bloom. And they will pass away as soon as their only source of pollen has withered. Unlike the honeybees, which build a whole camp for their progeny, solitary bees prepare rooms with single cradles in the hollow stems of plants, or narrow tunnels, built in sand or clay, each one furnished with the exactly sufficient amount of pollen to secure the development of the larva hatching from the egg to the pupal stage. For many months the siblings remain enclosed, either awake or dormant, who can tell? The next year – and this is magic again – they manage to leave their nursery in the opposite order of egg deposition. The bee from the last laid egg leaves the pupa and the shelter first, the one from the first egg politely waits and emerges last. How this is possible, still remains their secret.

Of course the solitary bees from spring are not kindred with those in summer, and those of the summer will never meet with those of early fall, and not a single solitary bee has ever seen her mother. By contrast, honeybees from one colony know their mother and spend most of their time in the circle of their sisters. However, they share with the solitary bee the unique faculty of pollination fidelity.

Along with many other insects, including butterflies, beetles and flies, honeybees have in common the capacity to visit different flowers. But what a difference! Butterflies, and flies even more so, like to swap from one plant species to another, often guided rather by colors than by the species specific odor or taste. Shorter or longer visits to flowers are

interrupted by phases of egg deposition. Though mist and wind may carry them long distances away, they do not long for a home, or to put it another way, "home" is where they are. Honeybees return home every day, with the same fidelity as that with which they secure the right pollen on the right style. At the same time they share the butterflies' plasticity of flower choice, but of course with an important exception. For a given period of time they stick to one species. No wonder that the pollen deposited in an artistic way on the hindlegs is stored with the same fidelity in the combs; you will never find a mixture of colors – fancifully, cells of different colors are arranged as on palette – yellow, red, black-blue, orange or pink.

The same holds true for honey. Some beekeepers take advantage of this fact and collect honey from orchards, acacia, oil seed rape, chestnut trees, or sunflowers, following the blooming with their colonies. Whereas those who cannot or do not want to move the bees, unwittingly collect a blend, because in the course of honey extraction the nicely separated honeys mix.

Spinning threads in the Landscape

Some big numbers to think about! One kilogram of honey requires some two million visits to flowers. If all these flowers were just 10 cm apart from each other, the distance covered for a jar of honey would account for some 200 kilometers. Of course, this calculation can be extended. Assume that one colony must collect some 120 kilograms of honey for survival over the year, the distance reads about 24,000 kilometers. Less conservative estimates would increase the distance accordingly. Since in the United States of America there are some 2.5 million colonies, the distance covered is likely to exceed 50 billion kilometers! Given the average distance of the Sun from the Earth to be 150 million kilometers, these calculations give an impression of the paramount performance of the honeybees, year on year. Behind these numbers there is more to be unraveled: the mystery of the encounter between flowers and pollinators is a story of mutual benefit.

Let us begin a series of observations in the apiary on a sunny summer day, standing behind a hive. Bees leave and arrive continuously. Others, distinguishable by the bright color on the dorsal side of the thorax, are dancing rhythmically with vertical movements, heads facing the hive and the entrance hole. Closer inspection shows that the pale color of these bees is the effect of many tiny bristles – these are young bees in transformation for becoming foragers, who first must learn to identify the site and the hive.

The leaving and arriving bees exhibit different modes of flight. Bees take off with an incredible energy and speed. Almost all the time one can observe that they depart into a number of different, but discrete directions. There must be more than one location of a good nectar source. Or to put it another way, colonies like to forage on a diversity of plant species. We know that collecting bees recruit sisters by the waggle dance, an enticing movement that indicates the direction, the distance and the quality of the nectar source. Returning bees are slower, their flight sometimes looks insecure, and often they have difficulty in landing properly on the entrance board. Whoever has carried a big backpack on top of a mountain will understand why. Either their stomachs are filled with nectar or their hindlegs are heavily loaded with pollen. Their direction home is less co-ordinated, and their return paths show a continuum of different angles.

Most of the time, we do not know where they are returning from or heading to, with two exceptions: in the case of honey robbery in the same apiary, or in summer, when there is a solitary linden tree in full blossom, in a landscape deprived of flowers. In this situation, you can follow the bees as they fly to the tree, and you may smell the typical odor of nectar and pollen, wafting through the entrance hole from the inside of the hive.

After this first impression, we walk into our garden. Poppies are flowering and raspberries have opened their blossoms. With the two plant species different modes of foraging behavior can be observed. There is no doubt that two types of flower visits by the bees

can be identified. In the poppies they seem to take a hasty bath in the receptacle, eager to switch to the next flower, which sure enough will be poppy again. They are collecting pollen, the color of which is almost black, and they do not appear disturbed by the presence of other bees and insects. In the small and colorless flowers of the raspberries the scenario is different. Bees sit on the convex flower, head down, and the attentive observer may see that they hunt for nectar, with the proboscis stretched out. The duration of a visit to one blossom is long, and the frequency of switching to the next flower is low. Here, the foraging bee is aggressive towards uninvited guests; she wants to be alone. The two activities are a reminder of the rhythms of the quick beat and the slow drum. In both cases the path of a single bee from flower to flower is a kind of random flight, the best option for guaranteeing that all flowers are visited by different pollinators. In addition, every visit is governed by a kind of delicate analysis: the availability and quality of pollen and nectar is quickly checked – in the case of poor quantity or quality the flower is swiftly abandoned and the next one is tried. If we were to trace the journeys of these foraging bees, we would realize that every single animal is spinning a continuous thread from the hive to the flowers and back to the hive. Continuity and randomness, necessity and chance, are the features which secure the thorough and complete success of pollination – but also a rich and tasty feed for all the present and future sisters in the hive.

The Golden Fleece

In the light of the early morning sun, little imagination is needed to see flying bees as golden sparks, and it is not very difficult to imagine that with a capable eye one would see that the forager bees lay golden threads over the flower meadow or the fruit tree in bloom. And it might take some concentration to reintegrate all these threads into a single picture. All the bees weave a fabric in a joint and concerted action: this is the imagination of the Golden Fleece! They “wrap” trees, shrubs, meadows and landscapes. The size of the stitches varies in relation to the abundance of the flowers. They are narrow in blooming fruit trees, and wide on sparsely distributed flowers in a meadow. This is comparable to the objects of the wrapping artists Christo and Jeanne Claude, pictures of which, such as the covered Reichstag in Berlin, have made their way around the world!

Beside the honeybees, which in a certain way create the basic Golden Fleece, all the other pollinators, fewer in number and in a shorter time, also add their threads. Butterflies, beetles, solitary bees and flies spin shorter or longer fibers, distinguishable in the weaving dynamics, different in “color”. The common blue butterfly adds a thread in narrow stitches, carefully woven between the blossoms of his nectar plant, the lotus. His piece of art does not exceed a few square meters, the area sufficient to sustain an entire, small population. The majestic swallowtail, in contrast, adds mesh of gigantic size. After a short visit to a flower, and it is not very fastidious, it may fly for some one hundred meters or more before it comes to rest again. The six-spot burnet makes tiny delicate stitches in the fleece, sitting for hours or sometimes even days on the very same flower of a field scabiosa.

Unlike the wrapped trees of Christo and Claude, the imagination of the Golden Fleece depends of our inner strength, our alertness and our aspirations. The Golden Fleece is an inner experience, ephemeral and only present as long as you create it yourself – vanished and lost if you lack the power or the time to create it. At the same time, it is a safe and lively experience, whenever you can confidently recall it to mind, throughout the whole year, from spring, summer and fall, to winter. Every time you create the Fleece, you realise an indisputable truth – the spiritual reality of the action of the honeybees and their friends!

The Ensoulment of Landscape

What substance is the golden fabric made of? Or to put in another way: what kind of essence is woven from flower to flower by all these pollinators? It is soul substance, or as we might say in agreement with the words of Rudolf Steiner, astral substance – meaning

both originating from the stars, and manifesting itself through the animal's wisdom. What insects pour all over the Earth is from a certain perspective the most fundamental contribution to the evolution of our planet, of all plants, and of Man himself. In older times – when people were still familiar with the “scala naturae” - this was an open secret. In this view, rocks, water, air and warmth, i.e. the four elements of ancient Greece, provided the earthly ground for all the other beings. Plants were considered to be the purest and most immediate manifestation of the living, preparing the basis of all the different sentient beings, the animals, which brought forward the quality of soul in the most fundamental and irreducible shape. What is the task of Man in this picture? According to many philosophers of nature he is able and obliged to bring the consciousness of Nature into being, i.e. to see, feel and think of her beauty, and to praise her through ideas and laws in science, through monuments, sculptures and paintings in the arts, as much through agriculture as through the raising of cathedrals, and last but not least, through imaginations in religion and spiritual science.

The Golden Fleece is the result of landscape ensoulment by pollinating insects. Its singularity is easily revealed: pollination, beside the harvest of propolis, an invaluable substance for the health of honeybees (see the chapter of David Heaf) is the only process whereby animals take something away from plants without destroying them – think of grazing cows in contrast to foraging honeybees – on the contrary, it is for their benefit! It is the source of the plenitude of life. What allows the most beautiful imagination to be created is a source of unexpected relations and unbelievable diversity. Flowers and plants are separate from each other – it is their nature, as well as their limitation. Without pollinators most of the vegetative life forms would be condemned to perish. Most annual flowering plants survive by pollination, exclusively. Therefore, the Golden Fleece must be woven, year by year, without interruption – it is in a certain way as dependent on the activity of the honeybees and their friends, as is the imagination on the inner activity of Man!

The wonder of the co-evolution of flowering plants and pollinators is the scientific expression of this fact. The interdependence goes further. A plethora of birds relies on seeds and insects, and in consequence, birds of prey cannot exist without them. Thus, we would lose not only magic for our eyes, but also for our ears – the world would become a sad place. The lesson is an easy one to learn: the ecology, beauty, and diversity of nature lives and evolves on the basis of giving and taking.

This thought is heightened by another, seemingly disturbing truth. Pollination induces processes of maturation and decay. The mother plants must pass away to secure the future of their daughters. The German poet and thinker Johann Wolfgang Goethe has written with serene confidence: “Nature: Life is her most exquisite invention; and death is her expert contrivance to get plenty of life” (Natur: Leben ist ihre schönste Erfindung, und der Tod ist ihr Kunstgriff, viel Leben zu haben). If this is correct, then there is more than truth, there is – since death is kind of an art – beauty. Consider plastic surgery for flowering plants; it would be an irritating world of becoming - nothing except evergreen flowering plants. We would lack fruit, berries, and vegetables - for food, as well as for beauty. We would lack the golden grass, the golden fields of barleycorn, wheat, rye or oat – the most impressive and touching accounts of maturation and decay, albeit independent of pollinating insects.

Coming back to the honeybees; They help to close the circle of everlasting life. Without their Golden Fleece there is no end and no new beginning. If this is true, the great holes in the fabric, caused by the unexpected death, of bee colonies, sometimes inevitable, but more often provoked by man, must be mended as rapidly as possible. Again – for the sake of food, and for the sake of the Golden Fleece.

I am grateful to Patricia and David Heaf for their invaluable help in clarifying and editing.
Johannes Wirz, January 2011