

Program 25 - BEAUTY AND THE INSECTS - March 24, 1941
(Nature's Purpose in Providing Flower Fragrance and Color)

SOMETHING TO DO AND TALK ABOUT FIRST

This lesson is intended to show the ingenuity of nature. Call attention to the many different shapes of flowers. How many can the pupils describe? Do they know many flowers that get their names from their shapes? There is as much variety in fragrance and color, as in shape. Why did nature design all this glory? Color, fragrance, and shape call insects to plants. Without the help of these insects plants could not perpetuate their kind. Have pupils examine a snapdragon blossom and note what takes place when a bee lights on the petal that forms a lip. Do this with other flowers. Point out the parts of the flower.

DO YOU KNOW THESE WORDS?

pistil stamen pollination pollen corolla ovule

LISTEN FOR THESE IDEAS

1. Flowers have developed beauty and fragrance to attract insects which perform the marriage ceremony of the flowers, taking nectar and pollen, usually, as their fee.
2. What must take place in the flower in order to create seeds that will germinate and grow?
3. What part do insects take in this necessary procedure?
4. What brings the insects to the flower?
5. Does nectar have any other purpose than that of paying the insects for services rendered?
6. Can insects detect color?
7. How do humming birds and moths carry on pollination? What kind of flowers do they visit mostly? At what time of day do they work?
8. What are some of the contrivances flowers have for getting the insect work properly done?

SOMETHING TO DO AND TALK ABOUT LATER

1. If you want humming birds and sphynx moths in your garden, what flower will you plant?
2. Do you think the Pitcher Plant a bit cruel to insects? What is the sun dew? Venus fly trap?
3. Why do some plants have hairy stems?
4. How is pollination carried out in some plants like the elms, maples, and pines, etc., which have no color or fragrance?

Wisconsin School of the Air
Afield With Ranger Mac
March 24, 1941

BEAUTY AND THE INSECT

Hello Boys and Girls:

There isn't a Trailhitter listening in today who has not seen some time in his life a bee working in a flower. No doubt many of you thought the bee was treating the flower rather roughly; you objected to this insect invading this little temple of beauty, and you called it an invader, a wrecker, a rough fellow, a burly trespasser, a thief or an intruder (or names that mean the same thing). Maybe you thought he had no business there and roughly scared him away. I have seen children pick up sticks and drive bees out of flowers, and thought the insects had no business there tramping around in these jewels of nature. But if you have followed the trail with Ranger Mac for any distance, you have discovered that what is taking place is just what should take place, in fact must take place, if we are to have these flowers at all. Plants do not blossom and send out their fragrance for us, though some of us are vain enough to think so. The color and fragrance are lures, baits, welcoming signs to attract and invite the winged creatures we used to think were trespassers. People who run restaurants put signs along the highways telling the passers-by that here is a place to get a good meal. Likewise, many of the flowers that we like so well, flaunt their colors and send out their fragrance as a sign, an advertisement, to the passing winged insect that here is a floral tea room where the insect may get a good meal of nectar and pollen.

Now, the very natural question is, "Why do some flowers put out these signs to invite the insects?" The answer is simple but very important. The owner of the restaurant puts out his sign so he may exchange his food for money and with this money the owner buys the things he needs to live. The plants hang out bright flags - the flowers - for the very same reason to invite the passing insect to help himself to what the flower has to offer - nectar and maybe pollen.

But in doing so the insect pays the flower for what he gets. For that insect may be carrying just what the flower needs in order to do just what the flower needs in order to do just what the flower was created to do - and that is to have seeds. Here is the most important thing for us to learn on our trip afield today - that, just as many of our insects depend upon flowers for their food, so the flowers depend upon insects to serve them - and that service is carrying pollen from one flower to another of its kind. Without this service most of our flowers (notice that I say most, because some flowers do not depend upon insects to perform this service) most of our flowers would disappear from the face of the earth. Let me give you a good example. When the sheep growers of New Zealand began to raise red clover, they had a beautiful crop the first year, but in a few years had no clover at all. The crop did not seed because there were no bumblebees in New Zealand to carry the pollen from one blossom to another. So they had to start all over again, but this time when they imported seed they imported bumblebees as well. They imported only ninety-five bumblebees but in nine years time this island produced one million dollars worth of clover seed. The peculiar thing about this is, that while New Zealand had insects of its own, none of them could carry on the work which the clover blossoms needed. Red clover must rely upon bumblebees entirely because that is the only bee with a tongue long enough to reach the nectar wells of the deep-throated flowers.

When the spring brings back blue days and fair and the flowers bloom again, Ranger Mac wants you to examine the flowers to see the pollen. You will find it to be a very fine dust, each grain of which is so small you can hardly see it with the naked eye. This pollen is manufactured in the male part of the flower called the anthers. Bees and other insects in visiting flowers for nectar, brush against the anthers and some of the pollen clings to their bodies. As they go from flower to flower, their legs and bodies rub against the pistil, which is the mother part of the flower. When a number of insects visit a

flower in the course of a day's time, one is quite sure to leave on the end of the pistil, called the stigma, just the right kind of a pollen grain to grow there. When that takes place, the pollen grain sprouts and grows right down the pistil and enters the chamber at the base of the pistil where the undeveloped seeds are located. This is a very simple story of the process that is necessary in order to develop seeds that will grow. It is called fertilization. When you examine pollen you will find that it is yellow on many flowers, but the pollen from many tree blossoms is greyish, from others a lovely reddish shade, and that from still others is almost black. You look for this pollen the next time you see a flower. Without insects to carry this pollen there would be very few food plants in this world. Imagine what life would be like if we had no apples, oranges, plums, pears, cherries, strawberries, raspberries - no orange marmalade and no raspberry jam. What would summer picnics be without sliced watermelon! Think of meals without vegetables. We could have corn because corn belongs to the grass family, and grasses depend on the wind and not on insects to spread the pollen grains. We could have spinach, too, because spinach is both wind and insect pollinated. No tea, no coffee, no cocoa, no vinegar, no olive oil, and your father would have no tobacco for his pipe, if it weren't for the pollinating work of insects. Nor would we have linen, for the flax plant depends on insects, so does the cotton plant, and it would be hard to imagine getting along without cotton and all the things that are made from cotton and the seed of the cotton plant.

Not all plants must rely on insects for pollination. All members of the grass family, like wheat, oats, barley, corn, and sorghum depend on the wind to carry their pollen from flower to flower. So do the conifers, like the pines, spruces, firs, cedars and tamaracks. So do many of the broadleafed trees like elms, oaks, and maples. Many of these come into bloom before the insects are abroad, and so nature has made provision for the wind to take care of pollination.

These early blossoming trees have no petals, have no flaunting colors, for why should they try to invite the insect that will not come? Why try to catch the eye of the blind wind? But some trees like the citrus trees - the oranges, lemons and grapefruit; and many of our own broadleaf trees like the basswood and black locust have either color or fragrance or both to invite the insect, and some of our finest honey comes from these trees. Some flowers bloom only at night so that they may receive the service of insects like the moths which fly at night. This is true of the moonflower. Some flowers depend on water currents to render this service like the bull-rushes and the pickerel weed. And, of course, you know that hummingbirds spread pollen because you have seen them sipping from petunias, delphiniums, trumpet-creepers, and other deep-throated blossoms. But they pay for their nectar too. When they dip their long bills deep into the heart of the flower to obtain the nectar, pollen from the anthers sticks to the feathers of the forehead and chin. This pollen is gathered by the next flower visited. Some flowers, like the bottle gentian, remain closed so that no insects may enter. These flowers fertilize their seed with their own pollen. On the other hand, there are certain flowers that wither up and die if a grain of their own pollen is placed on the sticky stigma. This is called self-pollination. Crawling insects are apt to do this. So some flowers like the verbenas, thistles, black-eyed Susans and many others have hairs or bristles on the stems and leaves to discourage these unwelcomed prowlers. The fringed gentian has fringes on the edges of its petals to keep ants from climbing into the flower. Flowers do not want insects to rob their precious supply of nectar unless those insects will transport the pollen which they need. Some flowers protect themselves from unwelcome visitors by hanging their heads. The columbines, the Virginia bluebells, the fawnlily and the huckleberries are good examples of this.

So a flower is a clever device to attract insects and to get insects

to work for it. It doesn't destroy any of the beauty and your admiration for a flower to think of it in that way, does it? The fact is, it should only increase your admiration for it and your interest in it. There is no place in all the outdoors where nature shows greater cleverness than in the way flowers attract insects and get insects to do the work that flowers must have done. Take the moccasin flower for instance. I do not mean the yellow lady slipper which has an opening in the top for the insect to enter, but the pink slipper in which the two edges fit together making a slit at the top. There is only one kind of insect that can work on this flower and that is the common bumblebee. Drawn by the fragrance and the gorgeous color this burly insect buzzes about looking for an opening. Round and round he goes then finally stumbles against the central slit in the lovely pink shoe. He pushes against it and it opens a little, then he forces his burly form inside. He does not seem to know that the fissure will close after him, but little does he care for all he is thinking of is the sweet meal he hopes to have.

When he has sipped all the delicious nectar, he is ready to leave his banquet hall. He looks about for an exit, and he notices two spots of light at the place where the flower is attached to the stem. So he pushes his way toward them, and as he does so he blunders against the stigma, so placed that he must touch it. The very fine curving hairs on the stigma comb from his back any pollen that may have been placed there by another flower. Then as he passes on toward the light and freedom an anther blocks his way. So he pushes past this anther and as he does so, the anther places a load of pollen on his back. Thus he has paid for the sweets here and has pollen on his back to pay for the next sweet meal he will get at the next Moccasin Blossom Inn. So you can see the fine partnership that nature has made between the bumblebee and the moccasin flower.

And so if it were not for these relationships between plants and insects, the garden and the country side would not be filled with beautiful flowers.

We enjoy their color, their fragrance, the many forms and shapes, but these attractions are primarily for the use of insects.

And after the insects have done their work, and the seeds begin to form, Ranger Mac has an idea that the seed absorb the nectar that is left, packs it away in the seed case as sugar to be used as food by the young plant that is getting a start in life.

Good bye, and remember that this is the week that the robins and meadowlarks return to southern Wisconsin, and if you want an early bouquet, go out to the marsh and gather the stems of the pussy willow, the stems with round fat buds on them, put them in water, and soon they will be blossoming for you and on these blossoms you will find this golden dust, which is far more precious than gold - pollen.

Good luck and

May the Great Spirit

Put Sunshine into your Heart

Today, and forevermore,

HEAP MUCH!