

Wisconsin School of the Air
Afield with Ranger Mac
December 4, 1939

Wonders of the Insect World

April 19, 1942

Hello Boys and Girls:

This is your day -
So up and away!

3 copies

Have you ever wished that you could suddenly change yourself into a miniature person, a very tiny person, say about $\frac{1}{4}$ inch high; so small you could crawl in to an angleworm's burrow; so small that a ^{hummingbird's} ~~butterfly's~~ egg would look as big as the dome of the capitol, or a patch of asparagus as tremendous and awe inspiring as a forest of gigantic sequoias? To be that small would permit one to walk among the clods of soil, the blades of grass, and enter the world of tiny people who are fighting out their destinies beneath our very feet - the world of insects. One might discover then whether ants say soothing words to each other as they feed each other with concentrated sweetness. They do it in so gentle a way that it looks as though they might. One might discover whether the caterpillar yells with pain when the black wasp thrusts its ugly needle-like instrument into the caterpillar's body to lay an egg there, and whether the caterpillar complains of being sick when the egg hatches and the grub starts to eat away at its vitals. One might learn whether ants hurl angry words at each other as they wage war, and whether there is any noise of battle as they hurl themselves at each other, in mouth to mouth conflict. One might discover whether the bee, after striking a well of nectar, says in bee-language "tastes good" or the ant thanks the plant louse for the honey dew that it takes. One could then mingle with the swarming life with its terror and brutality, and its examples of industry, organization and efficiency. One might discover the mysterious behavior of gnats, grubs, cocoons and mosquitoes. Here we would find bridgebuilders, herders, warriors, road builders, construction engineers, upholsterers, carpenters, weavers, surgeons, maids of honor, queens that are as absolute rules as found anywhere, nursemaids, workers and drones; safety and sanitary engineers, in fact many of the same things that we see in human life we would find among the swarming life of the insect world.

with a trace

Under the eaves of my home this fall I detected a daub of mud. Upon examination I found it to contain cells, all empty. It was the home of the mud-dauber, a mason wasp. If you look closely about your homes in protected places you may find similar constructions. If you do, remove it carefully and bring it to school for all to examine. The maker of this home is a black nervous, fidgety wasp with a long thin waist line. It is from this wasp and others that behave as it does, that our surgeons learned how to make the human body insensible to pain while they perform operations. Let's see what happens. In the early summer this black wasp visits the edges of pools and mud puddles where she finds mud which she mixes with saliva, secreted from her mouth to make a cement. This cement she plasters on the under side of some roof or eaves, or some protected place, going back and forth until she has made a firm foundation. Having done this she then makes a tube about an inch long. All this, you understand, she does with her jaws as a trowel. When the tube is completed, she starts off in search for spiders. When she finds one, she swoops down hawk-like upon the unfortunate. There is a struggle, a short one, the wasp's sting finds its mark, plunges home and in an instant the spider is limp. But the peculiar thing is the spider is not dead just helpless, paralyzed. So she carries it to her cement tube, and thrusts it within. She then brings more spiders until the tube is almost full. Then she lays an egg within the tube, makes more cement and closes the door of the tube. Then she makes another tube along side the first one; fills it with spiders, lays an egg and closes the door with cement. This she repeats until she has constructed about half dozen of the tubes and her life's work is done. She has laid eggs so that she will have children to keep up the race and she has provided food for them during their helpless growing period of life. It takes about two weeks for the eggs to hatch. During the hot summer months the meat she has provided would spoil unless it were kept fresh. Here the wasp proves herself a master surgeon. She understood spiders and their anatomy long before man understood himself. She knows just where to sting the spider. So she sends her dart into the nerve center of her victim and spills her poison. The spider lives on; paralyzed, motionless, helpless but alive. So when

the egg hatches, the little fat grub has fresh meat to eat. This seems a rather cruel method, but it's the way this wasp and many others carry on their fight to live. From them the man - surgeon has learned how to inject a serum into the nerve centers of the human body and perform operations while the patient is conscious of what is going on, and even answers questions. *see attached here -*

According to some authorities there are some 6,000,000 to 10,000,000 kinds of insects roaming over this world. All of them have their own ways and devices for getting food and protecting themselves. Otherwise they would have disappeared from the earth long ago. Of these ^{3rd} 470,000 have been described and named. It is roughly estimated that about 1% of the insects are destructive, that is they are arrayed against our health and prosperity. That is not a very large percent of the great numbers, but just the same, it is such a vast and rapidly multiplying horde that if not opposed they would overrun the earth and wipe out all vegetable and animal life, including mankind. For insects, like all other creatures of this earth, from sponges to man, must have food. The more food there is, generally the more rapidly the creatures multiply. This is true of insects. So when man began to cultivate crops in the fields, he spread out a table for the insects to feed at; and as a consequence they have multiplied enormously. In that way our modern methods of agriculture have given rise to serious insect pests. The boll weevil which we described last week is one of them. Since we have started to grow large fields of peas for commercial canning, a kind of louse, called the pea louse, has been very bothersome. Take any crop you will, from cotton in the south to apples in the north the same thing is true - increase the amount of food for the insects and the insects increase to a degree that they give the growers trouble.

But nature knows what she is about. She has created a large number of different kinds of insects that feed upon these plant-eaters and thus keep down their numbers. These insects are called parasites, or parasitic insects. One of these friendly insects is the ladybird. Everybody likes the ladybird and will allow it to crawl over the hand without feeling at all squirmish. Maybe it is because of that nursery rhyme:

~~What do you think about when the word insect is mentioned?~~

try to think of a place on this earth where you cannot find some kind of an insect. You get out of bed in the morning, and there, if proper precautions ^{have not been} ~~are not~~ taken, you might find an insect - the bed bug. You take a bath and find your body covered with little eruptions, some caused by the mosquito, or maybe by the mite that burrows into human skin. It lays an egg which causes an ulcer the adult escapes. You comb your hair and there, alas, you might find a flea or the cocoons of fleas. You walk downstairs on a carpet with a bare spot made so by the clothes moth. The things you eat for breakfast - each has an insect - One or more - that would live in it except for the precautions your mother takes to prevent it. You grab your books and out runs a silver fish, an insect that lives on paper. You open the door and you find a deep groove in it made by an insect that live in the wood. ate of it, when the wood was a part of a tree. In the open you see a wasp basking in the sunshine - an insect, and over the ponds and filmy creatures in swarms making pretty figures in the air and sunshine. In the road is a rabbit crushed by an automobile and you find it is full of yellowish -white legless worms - the larvae of the ~~potter~~ blowfly. At every turn during the warm days, you find some kind of an insect.

Ladybird, ladybird, fly away home!
Your house is on fire, your children are burning.

Of course, you know what the ladybird looks like. It looks like a pill cut in half, with legs attached to the flat side. Sometimes the top is black with red or yellow spots, sometimes red with black spots; but the top is always shiny. Let's see what happens to make the ladybird such a friend to man. In the spring, after hibernating as an adult all winter, the mother beetle lays her eggs here and there on plants. As soon as a larva hatches, it starts looking for plant lice and scale insects, that suck the plant juices, and the green fly grubs that eat the leaves. One larva will devour as many as thirty to forty in a day's time. It is the ladybird that protects the orange groves of California by devouring an insect, a sucking insect, with a hard shell back, called the San Jose scale. Like the toad, the ladybird is a fine creature to have around our gardens and shrubbery. So you see, the ladybird is a cannibal, but in its cannibalism it proves to be a friend to man.

If you keep your eyes open when out-of-doors in summer you are sure to see a rather small, slender, glistening black four winged fly that looks something like a wasp, running rapidly over the leaves of shrubs and trees. This is the ichneumon fly, one of the commonest of our friendly insects. This is the story. The mother fly in her hunting finds a caterpillar. She pierces the skin of the caterpillar with a sharp egg depositor, called ovipositor, which is located at the end of her abdomen. Some boys think that is her stinging instrument. When she pierces the skin of the caterpillar, she deposits an egg in the body of the caterpillar. The caterpillar continues to feed upon the leaves. Soon the egg hatches into a footless maggot that feeds upon the body juices of the caterpillar. This parasite maggot continues to grow until finally it kills the caterpillar. It then changes into the pupa stage and finally comes out an ichneumon fly like the one that laid the egg at the beginning. There are many kinds of ichneumon flies. Some of them lay their eggs on the body of the caterpillar, and when the larvae hatch they suck the body juices thru the skin and thus kill the caterpillar. One kind has this egg-placer, the ovipositor, very well developed. There are some very harmful insects that work within the plant itself, like the horn-

tail saw-fly that feeds in the solid wood of pine trees. Nature has provided an enemy for these insects also to prevent their over-populating the earth. This enemy, and our friend, is the ichneumon fly with the long hair-like ovipositor. This delicate instrument is thrust through the bark and wood exactly to the spot where the grub is feeding on the wood inside the tree, and an egg is deposited that hatches and feeds upon and finally kills the grub that is destroying the tree. How so fine an instrument can be used to pierce thick wood is a marvel. How she knows just where to lay the egg is equally marvelous.

Some of the beneficial insects lay their eggs in the eggs of harmful insects. The yellow and white garden butterflies whose children, that is larva, feed upon cabbage, have an enemy that lays its egg in the egg of this destroyer of our gardens. What a help and friend that parasite is!

There is a parasite for the eggs of many of our common butterflies. One time while on a hike we chanced to detect a mourning clock butterfly in the act of laying a cluster of eggs around a twig of a poplar tree. No sooner had she finished her task that we noticed a small four winged fly running over the eggs. In a few seconds it stopped upon one of the eggs, straightened up its body and thrust its pointed ovipositor thru the shell of the egg, and no doubt deposited an egg inside the shell of the butterfly egg. This it continued to do until it had deposited fourteen eggs. I do not know the name of that tiny friend, but we do know that it is helping to keep the balance of butterflies. But what I should like to know is how did our little friend find those eggs almost as soon as they were laid. Was her sense of smell so keen that she could detect freshly laid butterfly eggs from afar, or was she riding around on the butterfly in order to be on hand at the proper time?

From as far back as recorded history, insects have been used for food. Probably the most commonly used insect is the locust. The Arabs and other races ground locusts in stone motars to make a flour. When moistened with water it was worked into a dough and baked for cakes. In South Africa the large grasshopper is fried and the thick leaping legs are regarded as a great delicacy. Caterpillars of several kinds are eaten by the natives of Africa and by the Chinese. Some of the Chinese enjoy as a

delicacy the chrysalis of the silk worm after the silk has been unwound from the cocoon. Other people eat ants of various kinds, boiled or raw, or parch in iron pots over a gentle fire in much the same way as coffee is roasted. The dragon fly is eaten by natives in the Malay Archipelago. Their bodies are fried in oil along with onions and shrimps. It is great, I understand. In many places throughout the world the larvae of bees and wasps are eaten, and in many of the market places throughout the world insects are sold for food. With the improved facilities of transportation and the spread of civilization, pork and other meats have rapidly taken the place of insects in these far off countries, but when I think about it and look at some of the food we eat, oysters for instance, maybe insects seem about as reasonable an article of diet. What do you think?

Now is the time to find cocoons or chrysalis - now, before the leaves develop on the shrubbery. Have you tried to find any this spring? Why not spend your recess during it? Why not look closely on your way home from school, or after you have eaten your lunch this noon? If you find a pupa of an insect, take it to your teacher. ~~Write~~ When you write me the exact hour that you found the ~~cccc~~ pupa, and have your teacher sign the letter or card, or telegram, and Langer ac will send a book on insects to the one who found the first pupa. In case of a tie, which is possible, or times that are very close, Langer ac will send a book to each.

And that is all for to-day.