

CHRISTIAN LIBERTY NATURE READER

Book Three

Third Edition



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JULIA MCNAIR WRIGHT

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Preface

We are honored to bring you this classic reader. This particular book is designed to not only improve a student's reading skills and comprehension, but to also increase the student's understanding of and interest in God's wonderful creation.

The ability to read is the foundation for all subsequent education. The child whose reading skills are deficient may grow up to become one who is frustrated and loses hope, but learning to read well encourages the freedom to learn and the hope to succeed.

Phonics-based reading is a teaching method of vital importance, which is coupled with the quality of the reading material. So many of what pass for "modern" readers in education today are nothing more than a means to promote "social adjustment"; that is, conformity to the standard and values of secular society in order to be accepted.

The Bible, however, commands us to do "all to the glory of God" (1 Corinthians 10:31). Reading for God's glory demands reading material that draws attention to Him and His truth, which reflects His majesty and meets biblical standards. This means that we should measure whatever we read against the standard of Philippians 4:8. Ask these simple questions: Is it true? Is it

noble? Is it right? Is it pure? Is it lovely? Is it admirable?
Is it excellent? Is it praiseworthy?

As we look at the American readers of days gone by, we find that the biblical standard was followed. Such readers featured the finest British and American authors, who emphasized the glory of God, obedience to His Word, appreciation for His creation, and respect for one's country.

The *Christian Liberty Nature Reader* series follows the pattern of the past. Believing that the student can gain an enhanced appreciation for God by studying His creation (Psalm 19:1; Romans 1:20), this reader seeks to present the majestic splendor of His handiwork.

It is our prayer that this series will give to the student the joy that is to be associated with “good reading,” and that the knowledge imparted will help “make wise the simple” (Psalm 19:7).

*The Staff of Christian Liberty Press
Arlington Heights, Illinois*

Unit One

All About Ants

A Look at an Ant

You have been told that an insect is a living creature with a body made in rings and divided into three parts. Most insects have six legs, four wings, and two feelers. There is a great order of insects that we shall call the hook-wing insects—that is, the order **Hymenoptera** (hī•mə•nŏp'•tĕr•ə). The wasp, bee, sawfly, and ant belong to this order. They are outstanding insects. They can do many strange and curious things. You will know insects of this great family by their wings. The larger front wings fold back over the smaller rear wings when at rest. In flight, the upper front wings hook firmly to the lower rear ones.

If you look carefully at some kinds of insects, you will soon think that what I have told you is not quite true. Why will you think that? You will say to me, “The fly has only two wings, not four; and the ant has no wings at all.” Ah, but wait until you study about ants and flies, and see what you will think then.

The body of an insect is divided into three parts. The first part is its head, which contains the mouth, eyes, and feelers. The mouth of all the hook-wing insects has two jaws for cutting or for carrying things. The mouth is nearly as wide as the head. Above the mouth are two big eyes, one on each side of the head. On the top of the head between the two big eyes, there are some little eyes. You see, insects are as well supplied with eyes as crabs are with legs. The back part, or **abdomen** (ăb'•dă•mən), of the body of many insects is fastened to the middle part, or **thorax** (thôr'•ăks), by a small joint. God created insects in this way because they need to bend, or even double up, to do some of their work.

The hook-wing order is divided into two great kinds. The insects of one kind carry a little “saw.” The insects of the other kind carry a “sword.” The “sword” is a stinger that is used to fight battles or to kill things for food. The “saw” is a blade that is used to cut holes in plants to make nice, soft nests or houses for the eggs. Among the “saw” carriers is the fine, long fly, called a sawfly. Bees, ants, wasps, and others carry the stinger. If you find one of these insects, you will see all the parts of which I have told you.

Let us first
take a look
at an ant.

The head of

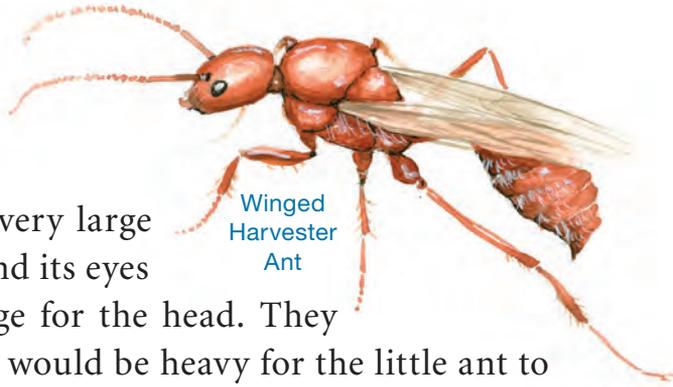
an ant seems very large
for its body, and its eyes

seem very large for the head. They

look as if they would be heavy for the little ant to carry. Most ants have very good eyes and can see above ground and underground; but there is one kind of ant that is blind. The jaws of an ant have tiny “teeth” that are often quite worn down in an old worker. Its jaws are well made for digging.

Next to the ant’s head is its middle part, or thorax. On the bottom part of the thorax are attached six jointed legs. Its feet, which are also jointed, have small hairs that help the ant run up and down a piece of glass or hang upside down on a wall. Its feet are also made for digging. On the top part of the thorax are attached four wings—two large and two small. The upper two wings are larger than the lower ones. But you may argue, “My ant has no wings!” Well, let me tell you a secret. The wings of your ant have been cut off or unhooked, as you shall learn shortly.

Next to the ant’s thorax is the end part, or abdomen. The abdomen of an ant’s body is made



Winged
Harvester
Ant

of six rings. On the tip, or pointed end, of this back part is the stinger.

There are many families of ants. Each family has its own name and its own ways. All ants are clever, so people have often called them “the wise insects.” Would you like to learn about their homes, offspring, and way of life? Before you begin, go to your backyard or a nearby field and find an anthill. Remember to take some sugar or bits of cake to feed the ants. Sit by the anthill for an hour or so. Be careful not to disturb the hill or alarm the ants. Find out all that you can about them. Facts that you learn by **observation** (ǒb•sər•vā’•shən) will be remembered more than those learned any other way.

Review

1. The hook-wing insects belong to what order?
2. Most insects have how many legs? How many wings? How many feelers?
3. Name the three parts of the ant’s body.
4. The hook-wing order is divided into which two kinds?
5. The abdomen of an ant’s body has _____ rings.

The Life of an Ant

In anthills, we find three kinds of ants—queen ants, drone ants, and worker ants. The drone ants have no stinger and do no work, but they have wings. Their bodies are longer and slimmer than the bodies of the queens. The queen ants have stingers, and their bodies are round. Queens and newborn ants that do not go out into the sunshine have a light color. The workers are smaller and darker than the queens and drones, and they do not have any wings. Workers are of two sizes, large and small. They are the builders, nurses, soldiers, and servants of the others.

In an anthill, there may be many queens at one time. A queen ant is not like a queen bee, who allows no other queen to live near her. Queen ants work hard. They are both mothers and queens. Sometimes, they will even act as soldiers. I think that “mother ant” is a better name than “queen ant,” because the word “queen” may make you think that this ant rules the rest. This is not so. Ants have no leader and no ruler. God created each ant to act as it should without being told. The main work of the queen ant is to lay eggs. In a short time, out of each egg comes a lively, hungry, little baby ant. It is called a *larva*.



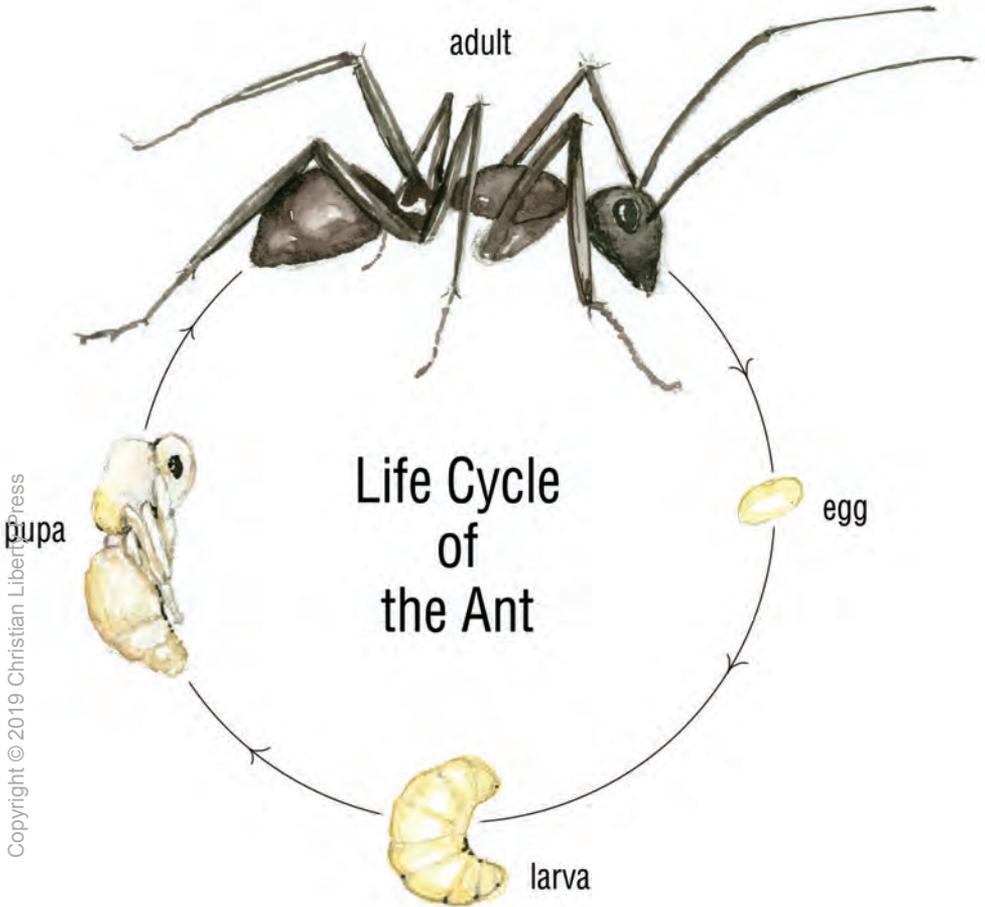
Queen Harvester
Ant and Larva

A larva is like a small, white “worm.” This little creature needs to be washed, fed, kept warm and dry, and taken into the air and sunshine. It must be cared for, very much as the baby in your home is cared for. The nurse workers are very kind to the young larvae. How do they wash these little things? They lick them all over, as the mother cat licks her kittens. They use such care that they keep them nearly as white as snow. The nurse workers feed the baby ants four or five times each day. They prepare the food to make it soft and fit for the little ants. The nurses also stroke and smooth the larvae. It seems as if they pat and pet them. When the weather is cold, they keep the larvae indoors. When it is warm and dry, they hurry to carry them up to the top of the hill. They place them there to bask in the sun. If any rain comes, or the hill is broken, the nurses run to carry the babies to a safe place.

When the larva is full grown, it spins around itself a little fine net, which wraps it all up. When people see these white bundles in the anthills, they call them “ant eggs.” They are not eggs but cases, or **cocoons**, of the **pupal stage**. In them, the ants are getting ready to come out, with legs and wings, as full-grown ants. The pupal cases come in several sizes. The largest ones are for the queens and drones. The next size holds large workers; the smallest cases hold the smallest workers. In the hills, there are often very tiny ants called **dwarf ants**. When you study more about ants in other books, you can learn about these dwarfs.

After the ants have been in the little cases for some time, they are ready to come out. The nurse ants help them to get free. Many hundreds come out of the cases. They crowd the old home so full that they can scarcely find room to move about. Then they see the light shine in at the little gates on the top of the hill. They feel the warmth of the sun and crawl up and out. They push upon each other. The hill is not wide and high enough for so many uncles, cousins, sisters, and brothers. They act like great crowds in the streets at a big parade, each one struggling for his own place.

Young ants, like young people, wish to set up new homes for themselves. They spread their fine



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wings and off they fly! Since there is no room in the old hill, they will build a new one. They swarm in the same way that the bees do. As they rise high from the earth, they drift off on the wind. Many of them tire out and die, and others are blown into the water and are drowned. A few live and settle on places fit for a new anthill.

It is the mother or queen ant who chooses the new home. When she has found the right place, what do you think she does? She takes off her wings, as she does not care to fly anymore. The queen does not tear off her wings. She unhooks them and lets them fall away, and she does not seem to miss them.

Review

1. Name the three types of ants in an anthill.
2. How are queen ants different from the queen bee in her hive?
3. How do nurse workers care for the ant larvae?
4. When the ant larvae are full grown, they spin _____ , in which they change into adult ants.

The Ant's Home

Ants live in nests made in the earth. We call them anthills because, above the ground, they are shaped like hills. It is the queen ants who begin to build the anthills. Like mother wasps, mother ants work on their nests until enough ants grow up to do all the work. After that, like queen bees, they do no work; but the worker ants will not allow them to go from home.

When the mother, or queen, ant finds a place for her new home, what does she do first? Mrs. Ant takes off her wings because they would be in her way while she works. She presses the edge of a wing upon the ground, pushing it up and loosening the hook, just as you may unhook a dress. Then she begins to dig. At first, Mrs. Ant acts much like a dog does when it digs after a chipmunk or a rabbit. She lays her big head close to the ground and, with her front feet, she digs up the soil and tosses it back between her hind legs.

Mrs. Ant digs as her cousin, Mrs. Wasp, digs. She keeps waving her little feelers, as if to find out the kind of soil. Soon she has a hole deep enough to cover her body. It is too deep for her to throw out the dirt with her feet. Now she uses her feet and her



Starting an Anthill

jaws to dig, as well. Where the soil is sandy, Mrs. Ant takes it out grain by grain. At first, she must back out of her hole. Soon her hallway is so wide that she can turn about after she has backed a few steps.

As she continues to make the hall, Mrs. Ant bites off bits of dirt with her jaws and rolls them up with her feet. Then she uses the back part of her body to press and push the earth into firm balls. These balls are carried out and laid by the door. Slowly, layer by layer, these balls form the anthill. When the hall is two or three inches long, she makes a room for her babies. Soon Mrs. Ant has many helpers. Then they make more halls and more rooms for eggs, larvae, pupae, and food.

To make a room, the ants often have to stand on their back legs and bite the earth off, as they reach up their heads. Sometimes, they lie on their sides

to clean off or smooth the side wall. They have even been seen lying on their backs, as men do when they work on their cars. An anthill is made of many little rooms—some are connected to other rooms and some are not. There are bedrooms, nurseries, pantries, and dining rooms. Many of the rooms are shaped like a horseshoe, but some are round. The ants press and knead the floors and walls to make them hard and smooth. Sometimes, they line the walls with a sticky soil, like paste, to keep the earth from falling in. Some ants seem to make a kind of glue, or **varnish**, with which they line their walls.

We can learn a lot about how to live together from the ants. Ants are very kind to each other in their work. If they push or step on each other in haste, they never fight about it. They also know how to work and how to rest. After a little hard work, they stop, clean their bodies, take some food, and sleep. As Proverbs 6:6–8 says, “Go to the ant, you sluggard! Consider her ways and be wise, which, having no captain, overseer or ruler, provides her supplies in the summer, and gathers her food in the harvest.” All of us would do well to heed this command lest poverty come upon us like a bandit or shortage like an armed man (Proverbs 6:11).

Now I will tell you about a very unusual anthill. It was made by big black ants in a little valley between

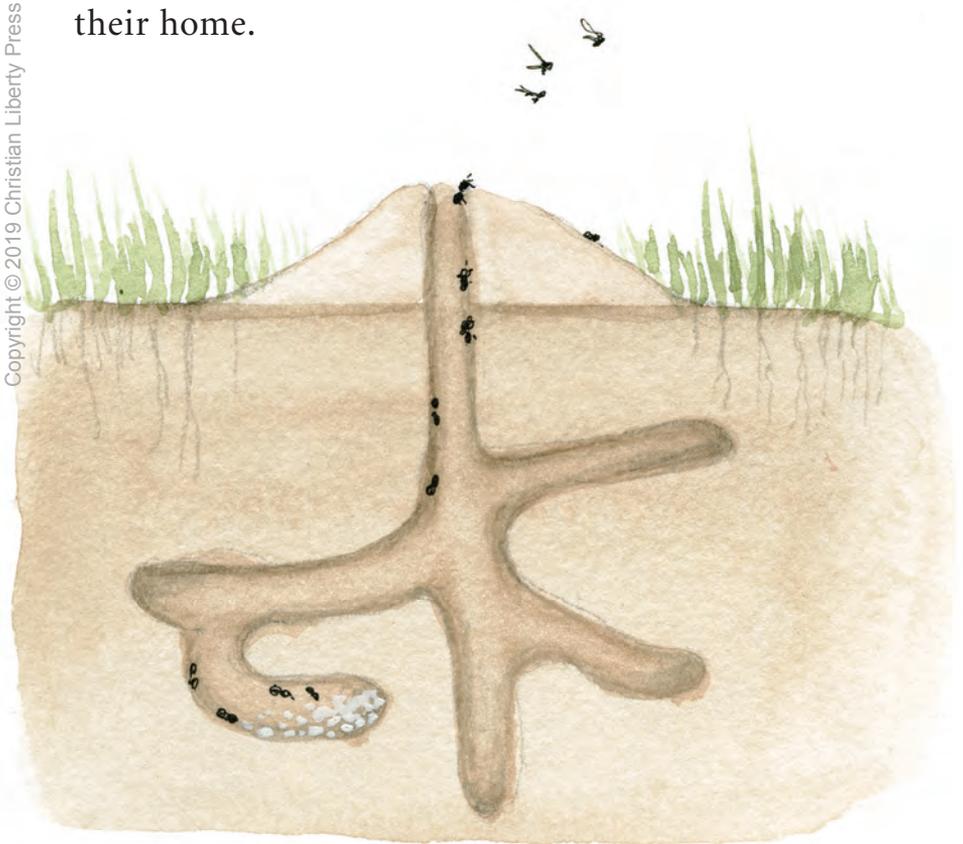
two hills of sand. A very large sheet of thick paper had blown into this valley. The paper had been around a piece of ham and was very greasy. It had lain on the ground crumpled up in sun, snow, and rain for a year. By that time, it was hard and stiff, and weeds had grown up about it. One day, as I was going by, I saw ants running in and out of the folds of the paper. I took a stick and turned the top fold open like a lid. It was full of ants and of white pupa cases, cocoons. The ants, I think, liked the folds of the paper for halls, and the larger wrinkles for rooms. They had found out how to have a house without much work in making it. When I opened this paper hill, they ran in swarms to pick up the white bundles. Poor things! They did not know where to go for safety. So I laid the lid of their house back in its place, and soon they were quiet again.

Review

1. How does the queen ant begin to build her nest or anthill?
2. How do the queen ant and her helpers make more halls and more rooms?
3. Some ants seem to make a kind of glue, or _____, with which they line their walls.
4. Proverbs 6:6–8 commands us to do what?

The Ants at Home

We have taken a look at the ants and have seen how their hill is made. Now let us see how they live in their hill home. When we go to visit the ants, we shall find some of them running all about the hill and in the halls. These are the worker ants. Others seem to stand on the hill like soldiers, watching for any danger that may come near. If you look closely, maybe you will see them defend their home.



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When the drones and the queens are young, the worker ants let them go out and fly. When they go out, the drones seldom come back because they become lost or die. Some of the young queens, however, come back—except for those who go off to make new hills. When the young queens settle down to their work of laying eggs, the worker ants do not let them leave the hill anymore. How do they keep the queens in, though? If the queens have not taken off their pretty wings, the workers will take them off and throw them away! If the queens try to walk off, the worker ants will pick them up in their jaws and carry them back.

The ants are very kind to their queens. They feed them and pet them, so they become very lazy. They do not even care to lay their eggs in a nice, clean place; they drop their eggs anywhere. The worker ants quickly pick up the eggs and place them in a cell. When there are too many young queens in one hill, they do not have a war, as the bees do. The workers settle the trouble by taking off the wings of some of the young queens and turning them into worker ants. This is done before the queens begin to lay eggs.

How does the weather affect the ants? In cold, wet weather the ants stay at home. If it starts to rain when they are out, the ants hurry back. Early in

the day and late in the afternoon, they all seem to be very busy. In the hot hours of the day, especially during summer, they stay in the hill and rest. In the spring, however, I have seen very large swarms of ants busily working about their hill when the weather was warm and dry. In very hot lands, the ants build hills that stay cool even when the hot sun shines down on them. Some of these hills are taller than you. They also work hard all winter to store up food, as you will learn shortly. In cooler lands, however, the ants are “asleep,” or **torpid**, during the winter. In autumn, the young swarms of ants usually go out to start new **colonies**.

What do ants like to eat? Best of all, ants like sugar and **nectar**. They get nectar from flowers, and in other ways of which I will soon tell you. Some like seeds that have a sweet taste. For this reason, they eat some kinds of grass seeds, oats, apple seeds, and such things.

Ants take their food by licking it. Their little, rough tongues wear away bits of seed; they also suck up the oil and juice of seeds. They seem to press the food with their jaws. It has been found out that they know how to moisten their food and make it soft. If you give them dry sugar or cake, they turn it into a kind of paste or “honey.” Then it is easier for them to suck or drink it up.



Ant Farm in a Jar

If you put a nest of ants with plenty of earth into a large glass jar and put some food nearby for the ants to eat, they may settle down in the jar and make a home. If you cover the outside of the jar with thick, dark paper, the ants may build close to the glass. Then, when you take off the paper, you will be able to see the halls and storerooms. You might put such a jar in a safe place outdoors. Then you would be able to study the ants, as they roam around nearby or do their work inside the

jar. In this way, you can learn a lot about ants as you watch them live and work.

Review

1. How do the worker ants keep the queens from leaving?
2. How does the weather affect the ants?
3. In autumn, the young swarms of ants usually go out to start new _____ .
4. What do ants like to eat?

The Ants on a Trip

The round hole in the anthill is called a “gate.” The ants can close it with a bit of stone. Often there are two, three, or even more, gates for one anthill. Once I saw a hill with six large gates.

One day I saw a line of ants moving all one way by my garden path. They were black ants. They went two by two, or one and two, close to each other. Every one had in its jaws a white bundle. I

found that they all came from an anthill. They came up out of the gate very fast, one by one, each with its bundle.

About two or three inches from this line of ants, I saw another line. This line went to the hill, not from it.

They went in good order. They had no bundles when they went into the hill; when they came out, each had a bundle and joined the other line of ants.

I went along with the stream of ants that had the white bundles. I found that they went to a new hill, about thirty feet from the old hill. There they laid down their bundles and went back to

the old hill to bring more. The bundles lay heaped in a ring all about the gate of the new city. Out of this gate ran other ants in haste. They caught up the bundles, one by one, and carried them in. In about half an hour, they were nearly all taken in, and the ants brought no more. The moving was over.

With a long blade of grass, I gently took up a few bundles. I hid them behind a stone, some six inches off. When all the rest of the bundles left at the hill were carried in, the ants went down the gates. But in a minute out came three or four ants. They ran about wildly and searched the ground. They went in circles and looked over the ground with much care. The circles grew wider. At last one came up behind the stone and found the bundles. The ant picked up one bundle and ran. Then this ant met the other ants and, I think, told them the news. For at once the other ants ran up to the stone, and each took up a bundle. Then they all ran into the hill. Can ants count? It looked as if they knew how many bundles they had. It also looked as if they knew that two ants must go for two bundles.

A man who took bundles from a march, in the same way I did, thinks that the ants smell the

hidden bundles. He says they will not search for the bundles if you hide them in the earth.

Review

1. The round hole in the anthill is called a _____ .
2. Where was the stream of ants that had the white bundles going?

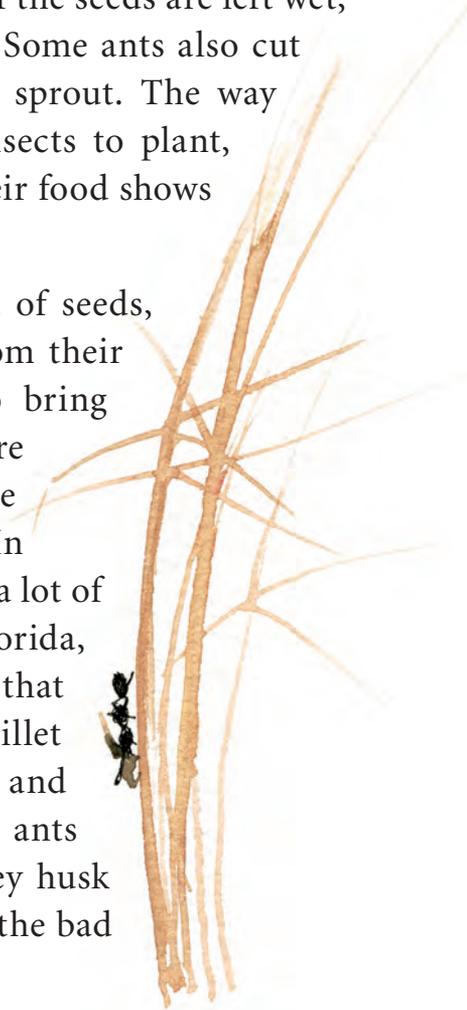
The Farmer Ants

You may have heard about the spider that makes a den in the ground. It puts a trapdoor on its den and plants ferns on the door to hide it. The spider becomes a gardener in this way, and all its plants grow well. There is an ant that also becomes a gardener, or farmer. This ant lives on its “farm” in warm places around the world. In the United States, they are found in Texas, Florida, and in one or two other warm states. These farmer ants raise grain to eat. The grain is a kind of grass with a large seed. Some people call it “ant rice.”

The farmer ants do not live in a small hill that is as big as your hand, but in a large hill that is sometimes flat and sometimes high. It is often as wide as a big room that is in the shape of a circle. In this circle, all the weeds and all kinds of grass are cut down, except for the one kind of grass that the ants like. The earth inside the circle is kept clean and smooth. Only the seeds of the “ant rice” are left to grow. When the “ant rice” is ripe, the ants pick up the seeds as they fall to the ground and take them into the hill to special storerooms. After all the seeds have fallen, the ants cut down the old stems and take them away. The circle is then clean for the next crop.

It is most likely that, as the farmer ants let this “ant rice” grow on their hill, it sows itself by its fallen seed. Still, the ants are real farmers, as they keep their land clean, tend and gather the crop, and store it up. The ants watch the stored seeds and, after it rains, carry them out to dry in the sun. They may know that, if the seeds are left wet, they will sprout and grow. Some ants also cut the seeds so they will not sprout. The way God created these little insects to plant, raise, harvest, and store their food shows how wise He is.

If the farmer ants run out of seeds, they will go a long way from their hill to find new seeds to bring home. They like to go where horses have eaten, for there they find scattered oats. In some places, they carry off a lot of grain from the fields. In Florida, there is one kind of ant that climbs the stalk of the millet plant, cuts off the seeds, and carries them home. When ants take seeds to their hill, they husk and clean them and throw the bad seeds away.



These ants like to eat the seeds that they gather. They also feed them to their young. How do the ants eat the hard grain? Their tongues are like files, or something like that of the little shellfish called the “drill.” The ants can rasp, file, and press the grain, so they can lick up the oil and juice of the seeds. One kind of ant in Florida rolls up the dust, or pollen, of pine cones into little balls and stores them up to eat. Another kind of ant in New Jersey cuts new, little pine trees into tiny pieces, just as these **saplings** break through the ground, and carries them to the nest to eat.

Did you ever see the ants that like sunflower seeds to eat? They are large ants, and when they have climbed onto the disk of a sunflower plant, they pull out the ripe seeds and carry them away. It is said that these ants plant the sunflower seeds in a ring around their hill. Since they have not been seen to plant the seeds, we may not be quite sure that they do so. Perhaps they build where they see young sunflower plants growing. Yet it is possible that ants plant seeds of some kind. You see, there are still many things left for you to discover in God’s creation. It will be well for us to keep our eyes open.

Review

1. What do farmer ants raise to eat?
2. After it rains, what do the farmer ants do with the stored grain?
3. If the farmer ants run out of seeds, where do they go to find more seeds?
4. How do these ants eat the hard grain?
5. How do ants that like to eat sunflower seeds harvest them?

Ants and Their Trades

Since you know that bees, ants, and wasps all belong to the same great order, called Hymenoptera, you will not wonder that many of their ways are alike. You may have read how, in the spring, Mrs. Social Wasp builds her home and raises a **brood** of babies. These, as soon as they are full-grown, begin to build more rooms and nurse the new babies that come along. Mrs. Ant does as Mrs. Wasp does. Mrs. Ant begins a new hill, and as her children grow, they help her build. She does not often begin her hill in the spring, though. Mrs. Ant chooses the early fall to build her hill. As the eggs change into worker ants, Mrs. Ant gets plenty of help in her work.

You have seen bees swarm and hang in a bunch on the branch of a tree. Ants also cling together and form balls, but they do this for warmth or safety. It is called “snuggling.” In some lands, in times of flood, ants form balls as large as your soccer ball. In this way, they can float on the water so they will not drown.

As Mrs. Wasp makes paper, Mrs. Ant can also make a thin paper for her nest. It is poor paper, however, compared to the paper Mrs. Wasp makes. Mrs. Wasp is the best of the paper-makers.

Likewise, as Mrs. Bee cuts leaves to line her nest, Mrs. Ant sometimes does the same thing. With the cut leaves she lines her neat, little nest.

The brown **mason ant** makes its nest of little balls of mud, laid up like bricks in a wall. Then there is a **carpenter ant**, just as there is a carpenter bee. These carpenters cut their way into trees and logs. They hollow out the inside of a dead tree, or rotten beam, until it is ready to fall to pieces. They can do much harm to wooden homes or buildings.

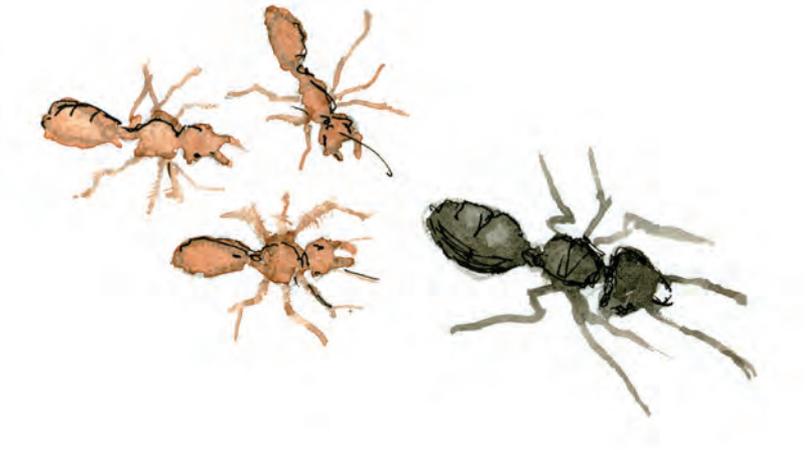
Although spiders are not insects, some have ways that are similar to the ways of certain ants. As the spider makes a fine spun ball in which to put her babies, there is an ant that makes a woolly nest. Probably, you have also read of the **tower spider** that builds a neat tower of sticks, straw, and grass over its nest. There is an ant that thatches its hill in much the same way.

Besides their other skills, the ants know the art of warfare. Ants are usually mild and kind to each other while at work, but soldier ants are brave and are ready to do battle. When it comes to war, it is interesting to see how much ants are like humans. The ants make war to get slaves, or servants. They also make war to get “cows,” as you will learn shortly. They seem to have some other reasons for war, as well. When the ant army marches, it keeps

in line and in order. It seems to have captains to rule and lead it. Scouts go before the army to seek out the way. The anthill also has some soldiers that act like sentries, to see that no danger comes near. When a worker ant gets into trouble, it will run to a soldier for help.

The soldier ants have very large heads, as if they wear big hats. Some of them have smooth heads, and others have hairy heads. They eat a lot and love to sleep. These soldier ants do not do much work, except when they awaken for battle. In an anthill, the soldiers are larger and often more in number than the other ants. In a battle, two soldier ants will often cling to each other by their jaws, until both die. The usual way in which an ant soldier kills a foe is by cutting off the head. Sometimes, the battle ends without any killing. At other times, the ants are very fierce, and large numbers are cut to pieces.

When strange ants get into a hill, sometimes they are driven out; sometimes they are killed; sometimes they are treated kindly. One time, I put a black ant into the gate of a city of brown ants. You should have seen how they drove it out! The black ant ran as if it were wild with fear. Three or four brown ants chased it to the edge of their hill.



Though some strange ants are cast out so fiercely, there are two or three kinds of beetles that go into anthills and live with the ants. The ants do not harm them in any way. You shall hear about that when we have some stories about beetles.

Review

1. To what order do the bees, ants, and wasps belong?
2. What is it called when ants form balls for warmth or safety?
3. How are carpenter ants harmful?
4. List some reasons ants go to war.
5. How do ants go into battle?

Words You Should Know

A

- abdomen**—the body part behind the thorax in an arthropod; the part of the body between the chest and the legs of mammals and humans
- acid**—a chemical substance that has a sour, or stinging taste
- adult stage**—the fourth stage in complete metamorphosis; the third stage in incomplete metamorphosis
- alulae**—false winglets; small, irregular wings; tufts of short, stiff flight feathers
- amber**—a dark yellowish to brownish orange resin
- antennae**—a pair of feelers on the head of insects and other creatures; used to smell, taste, and sense heat, sound, and motion
- aphids**—very small, soft-bodied insects that suck the juices of plants and produce honeydew

B

- barnacle**—a marine crustacean with feathery appendages for gathering food; has free-swimming larvae but is permanently attached to a hard surface as an adult