

## WHERE YOUR FARM CAME FROM

Did you ever pick up a handful of soil, crumble it, and wonder where it came from? Most Trailhitters are living on foreign soil, brought down from Canada 50,000 or more years ago by huge masses of slowly moving ice, called glaciers.

### We Get Ready

Wisconsin has a great variety of soils, much scenic beauty, and different types of farming. In the eastern part, especially, we find odd-shaped hills, mounds and sinkholes, sandy soils alongside rich loam, and beds of muck that grow good celery. We find gravel pits for road material and rounded boulders scattered over the land.



Glacial ice grinds the rocks.

What happened?—50 to 100 thousand years ago vast accumulations of snow centered in the Arctic regions. The snow fused into ice, and the pressure became so great that the ice spread out over vast areas of North America.

Pull down a map of the United States. Draw a line from New York City west to the headwaters of the Ohio River; thence down the Ohio to the Mississippi; then northwest taking in the northeast one-third of Kansas, eastern half of Nebraska, eastern two-thirds of South Dakota, all of North Dakota, then west to the Pacific. Except in isolated areas, like southwestern Wisconsin (called driftless areas) the farms north of this line were influenced by the glaciers.

### We Hit the Trail

What is supposed to have caused these vast accumulations of ice? Are there glaciers today? Where? What Wisconsin boy became an authority on glaciers?

What caused moraines? Where is the Kettle Moraine country in Wisconsin? What is the State Conservation Department doing there?

How do you account for the many lakes in the northern part of Wisconsin and Minnesota? What caused the central part of our state, from Wisconsin Dells to Stevens Point to be so sandy? How do you account for the rich, deep soil of Iowa and Illinois?

### Farther Afield

How do you suppose the land became covered with vegetation after being stripped by the glaciers?

Visit a glacial pit. Is Wisconsin fortunate in having them for road building material? Notice how boulders were milled into rock, and rocks into fine particles. Some of the larger boulders may show grooves made by the ice.

## POLLUTION IS AN UGLY WORD

Water is so common that we seldom think of it as a priceless resource; at least, not "until the well goes dry"—or we see the sign: "Unsafe for swimming, by order of the Board of Health"—or the fishing in erstwhile good streams has disappeared—or scum and refuse line the banks and stench arises from streams where we once loved to ramble. This is the misuse of water that we are going to talk about today—*pollution*. Wherever people live and industries are carried on, there is waste. The easiest way to dispose of waste is by dumping it into streams and lakes. We talk about this today.

### We Get Ready

What is the meaning of these words: pollution, oxidize, refuse, sewage, industrial waste, by-product, purify, filter, septic?

You have heard, time and again, about the misuse of the forests, soil, and wildlife. Is the misuse of water a new idea to you? Trailhitters should understand that misuse of water does not mean unnecessary use of water but the destroying of the purity of the water. This is pollution. Do you know of any creamery that dumps the waste into a stream? Is that a misuse of water?

Our state has two important rivers with industries lining the banks, the Wisconsin and the Fox. What are the principal industries? What is done with the waste of these industries?

Have your Radio Secretary write a letter similar to this one, addressed to the State Sanitary Engineer, State Board of Health, State Office Building, Madison, Wisconsin:

Dear Sir:

We are studying water conservation in our class, giving particular attention to the misuse of water by pollution. Would you be kind enough to send us a brief of the most important law or laws regulating the dumping of sewage and industrial wastes into our streams and lakes? Our class and teacher would appreciate your doing this for us.

### We Hit the Trail

Ranger Mac will discuss four ways in which water resources are being misused: (1) the dumping of raw sewage from homes and cities into streams and lakes; (2) dumping of wastes of industries of all kinds—paper mills, packing houses, creameries, etc. (3) unwise farm practices; (4) drainage of marshes and damming of streams that destroy scenic beauty.

### Farther Afield

In what ways does pollution of water destroy fish life and spoil recreation places?

## THE GIFTS OF TREES

I can understand why the Druids of old worshipped trees as an expression of their God. With all the science we know today, we still stand in wonderment of how water from the soil, air, and the energy of the sun can make so glorious a creation as a tree. The products of trees contribute in a thousand ways to our daily lives; and living trees at all seasons, especially at Christmastime, to our spiritual lives.



### We Get Ready

There are two broad classes of trees—the conifer and the broadleaf. Name five trees in each class.

Do you know: Which conifer is not an evergreen? Which conifer has five needles in a cluster? Which conifer has its cones growing upward instead of hanging downward? Which conifer has pointed needles arranged singly around a rough stem? Which one has flat needles arranged in two ranks along a smooth stem? Which conifers grow in swamps? Which one makes the best Christmas tree?

At Christmastime we celebrate the coming of One who talked of wildflowers, crops, and weather; who spoke in parables of grass and sparrows, the grinding of corn, the tending of vineyards, and of the importance of childhood. He spoke in the language of the earth. Do you think the wonder of the earth is a part of religion? Who were the Druids?

### We Hit the Trail

Ranger Mac will tell when the tree was first used at Christmastime and how the custom has spread through the Christian world, even to Japan. Do you think that Christmas trees make some contribution to the peace of the world?

There is much plant lore that has come to us from the pagan days. Listen for the story of the mistletoe and holly and others.

### Farther Afield

No time of the year is a woodland more interesting than in the heart of winter. Take a hike into a woodland. Bark patterns and tree structure can be studied best then. Identify the trees for sale at grocery stores and marts. How can you grow your own Christmas trees?

*May all of you have a Merry Christmas.*

## BIRDS OF THE SNOW

The wise man takes the seasons as they come. Each season has its destined purpose and its beauty. Many forms of wildlife are hibernating. Chipmunks and woodchucks are sleeping in their underground chambers; the queen bumblebees have found refuge under logs and tufts of grass; turtles have escaped the sharp knife of winter by burrowing into the mud of ponds and creeks; most of the birds are vacationing in the lands of warm sun. But the cheerful voice of the chickadee is telling us that there is feathered life abroad. It is inviting us to explore, so let's be up and away!

### We Get Ready

When this outline was being prepared, the goldfinches were at work in the white birch, tearing the catkins apart and eating the seeds. Are they birds of the snow?

Make a list of birds which you know are winter residents. Where do these birds come from? Last winter the evening grosbecks were plentiful in many parts of the state. Where did they come from? What do they eat? What is the importance of cover to bird life? What shrubs make good cover?

Why is the winter a good time for the beginner to start studying birds? Think: Why do birds like to face the cold winds while feeding? Does this give any suggestion on where to place a feeding station? What is meant by warm-blooded creatures? How is the temperature kept up?

### We Hit the Trail

Get on your coat and muffler for we are going to a nearby thicket. What birds are we quite sure to find there? Where is one quite sure to find the blue jay? We will notice that winter birds usually go in flocks.

Where do insect-eating birds, like the chickadee and brown creepers, find food enough to keep life in their small bodies? Note what is said about the plumage of birds in winter, the change in color and how it makes good protection.

### Farther Afield

Construct a feeding station at your school. In the LOG BOOK keep a record of the birds that visit the station. How can the discarded Christmas Tree be a help in attracting birds? Learn to know these winter birds: hairy and downy woodpeckers, goldfinch, tree sparrow, nuthatch, brown creeper, blue jay, junco, golden-crowned kinglet, crow, horned lark, screech owl, red poll, evening grosbeak, cardinal, starling, and snow bunting.

## FURY IN FUR

This is a story of the weasel tribe. It includes animals that furnish the most valuable furs and some that are the most bloodthirsty. In these days when so much is prepared for our use—corn flakes from a package, shoes from a store, writing tablets from a stationer, clothes from a haberdasher, penicillin from a drug store, fur garments from a furrier—there is so little need to think about the source of these things that our touch with nature is lost. For instance, we forget that the costly garment was, a little while ago, living animals pursuing their own way of life in some quiet woodland.

### We Get Ready

Underline the proper word or phrase in each of the following statements:

1. Royal robes were made of muskrat, ermine, leopard, beaver.
2. Musk is the horn of a musk ox, decayed vegetation in a swamp, a call to urge dog teams on, a stench from the glands of certain animals.
3. Which one of these four members of the weasel tribe, once plentiful in our state, has disappeared? ermine, otter, badger, marten
4. The state of Michigan bears the nickname of badger, otter, wolverine, weasel.

### We Hit the Trail

Why does Ranger Mac call the mink a "fury in fur"? Why can we rightly call the mink the most bloodthirsty of our animals? Does the mink confine his hunting to the land? Note his method of catching fish. Despite his ferocious nature, the mink is the only member of the weasel tribe grown in captivity.

What is a ferret? Do you think it is good sportsmanship to hunt with a ferret? If so, why is there a law prohibiting it?

Which member of the family is the best swimmer? How is it equipped for living in the water? Don't you think the parents have a fine way of playing with their children?

What is musk? Where are the musk glands located? What is the purpose of musk to the animal? What commercial use is made of it? Which member of the tribe is most offensive when on the defensive?

### Farther Afield

After listening to the broadcast, what trait is common to most members of the tribe? After which member of the tribe does Wisconsin get its nickname? The hair of which one furnishes material for brushes? What will you put in your LOG BOOK covering today's broadcast?

## THE LAMPREY INVASION

This broadcast is given at the request of a Trailhitter who discovered a lamprey while fishing in the waters around Phillips, Wisconsin. It is a sea creature, slimy and unattractive and vicious. It is causing us deep concern because it is a killer.

### We Get Ready

First a little study of geography. How do the Great Lakes drain into the ocean? How do ships get from Lake Ontario to Lake Erie? Do you think a swimming creature could make the same trip? How would such a creature get from Lake Erie to Lake Michigan?

Read about the lamprey in your school encyclopedia; and learn the meaning of the words *parasite*, *spawn*. Write to the State Conservation Department for information about the importance of commercial fishing in Lake Michigan.

Has any Trailhitter had any experience with blood suckers? Have him tell about it.

### We Hit the Trail

Last September Congress appropriated money to study the life history of the lamprey and find means of controlling it. What does this indicate about the seriousness of the invasion of the creatures? How does it affect our lives?

What is the life history of the lamprey? How is it equipped to carry on the business of living? Do we have any native lampreys in our streams? How do they compare in size and destructiveness with the sea cousin?

Listen while Ranger Mac compares the life history of the eel with that of the lamprey. Note that the eel is a true fish while the lamprey is not.

What is being done now to prevent the lamprey from multiplying? Why are so many of the lakes in New York state infested with this creature?

What have we learned from blood-sucking creatures that is valuable in medicine today? Since ancient times the flesh of the lamprey has been used for human food. What two kings are supposed to have died from eating too much of the rich meat of the lamprey?

### Farther Afield

What cities in Wisconsin have considerable commercial fishing? How are they affected by this invasion of the lamprey? How is commercial fishing carried on?

### HEADLINES IN THE SNOW

Delicate patterns in the snow, mud, and dust may be signatures of unseen creatures, many of which work only at night. Tracks tell us what animals are about; oftimes they tell stories of gripping dramas of life and death, dramas that have been going on since the beginning of time. Early man learned to read the writings of creatures because his life depended on it. We do it because it is interesting.

#### We Get Ready

Why is snow-time a good time to make an inventory of the kinds and number of animals living near us?

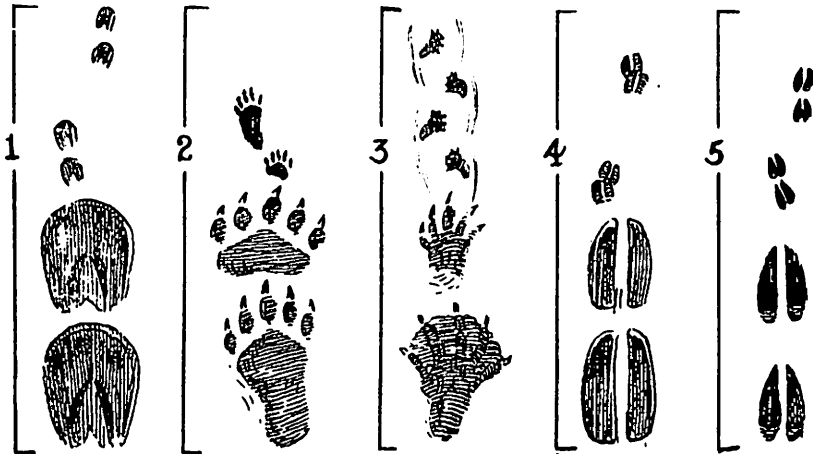
Become familiar with the meaning of such words as: stalking, cloven, plantigrade, digitigrade.

Study the tracks shown here. Try to identify them all. After you have finished, there will be two of the following names left over.

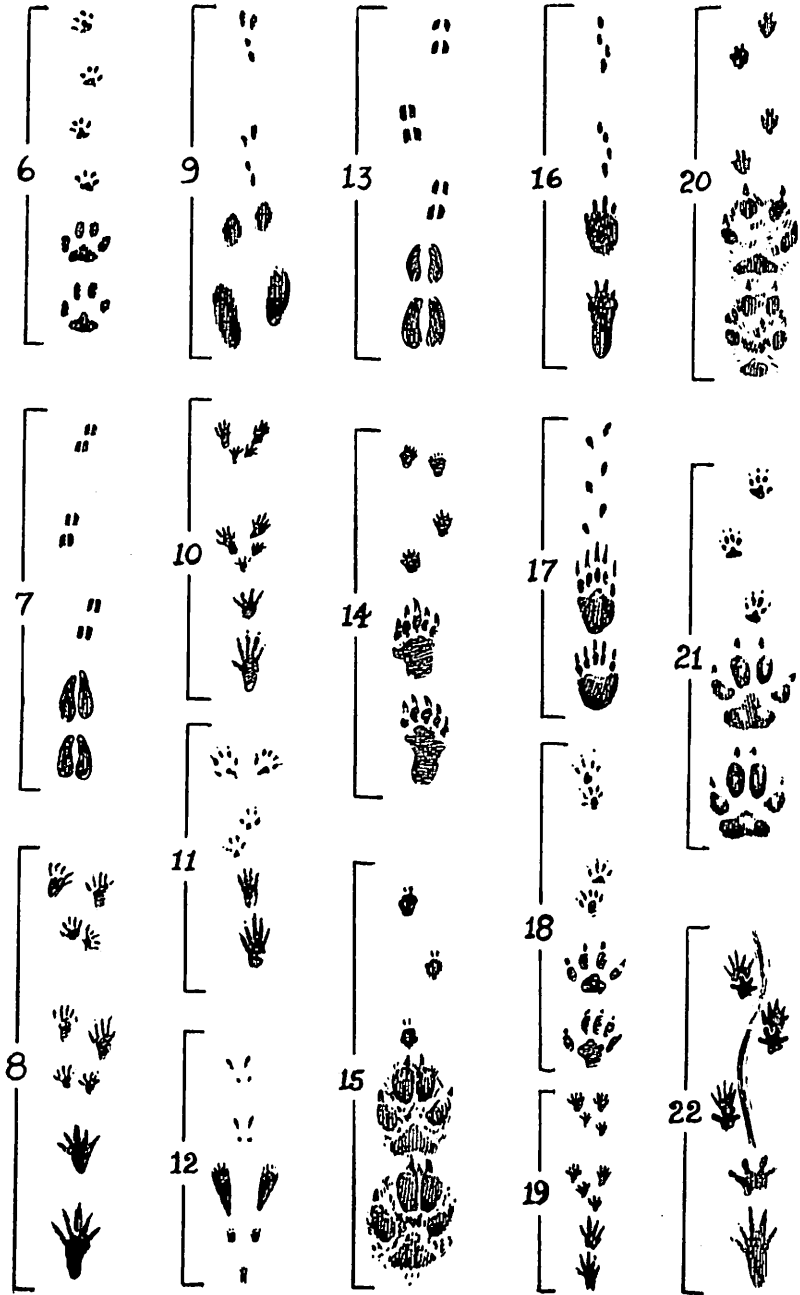
#### We Hit the Trail

Ranger Mac will help you to identify the tracks illustrated below and tell some stories about them.

- |        |          |        |         |         |           |
|--------|----------|--------|---------|---------|-----------|
| badger | chipmunk | fox    | mink    | raccoon | skunk     |
| bear   | cow      | frog   | mouse   | rabbit  | squirrel  |
| beaver | deer     | horse  | muskrat | rat     | wolf      |
| cat    | dog      | marten | pig     | sheep   | woodchuck |



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## ANIMAL SOUNDS

The sounds that animals make seem to harmonize with their surroundings. The sunlit field of waving grass is just the place for the lilting song of the bob-o-link; the solitude of a lonely lake is the place for the loon's weird call. As to time, what song could be better for the twilight hour than that of a vesper sparrow or of a thrush?

*We Get Ready*

It is next to impossible to describe sounds with written words, but let's see how well you can identify the sound with the creature that makes it. Place the letter in the parenthesis to indicate the association.

- |                 |                 |                    |                  |
|-----------------|-----------------|--------------------|------------------|
| ( ) coyote      | a. jug-o-rum    | ( ) red squirrel   | k. thumps        |
| ( ) killdeer    | b. wails        | ( ) prairiechicken | l. katy-didn't   |
| ( ) cricket     | c. drums        | ( ) beaver         | m. silent noises |
| ( ) frog        | d. whistles     | ( ) loon           | n. winnows       |
| ( ) fox         | e. splash       | ( ) katy-did       | o. wild laughter |
| ( ) bat         | f. shrill snort | ( ) deer           | p. howls         |
| ( ) mice        | g. kill-dee     | ( ) woodcock       | q. chir-r-r      |
| ( ) screech owl | h. chirps       | ( ) ruffed grouse  | r. barks-yelps   |
| ( ) rabbit      | i. chatters     | ( ) woodchuck      | s. booms         |
| ( ) wolf        | j. squeaks      | ( ) chipmunk       | t. yap,yap,yap   |

*We Hit the Trail*

What is meant by the hearing range? What is the hearing range of the human ear? Are there many sounds we do not hear? What is a silent whistle? What enables the bat to dodge obstacles unflinchingly? Why are so few ruffed grouse victims of owls?

Which of the above noises can be called warning signals? Which mating calls? Which animals make a call that is passed along in grapevine fashion until their kind for miles around get the same call? What is the purpose of this method? Do dogs still do it?

What birds, named above, carry on their mating songs by means of noises made by wings? How does the ruffed grouse send out its call? How did the movie camera help make this discovery? Do you think that we have made much more than a good start in knowing all that can be known about the outdoors?

Why do birds sing? What birds are vocal only in the night?

*Farther Afield*

If you wish to see and hear your woodland friends, learn the gentle art of keeping quiet in the woods.

*Correct Answers:* b 'p 's 'u 'f 'j 'o 'a 's 't 'd 'q 'q 'l 'u 't 'p 'q 's 'u

## HEATLESS LIGHT; WETLESS WATER

Ninety per cent of the energy in an electric light bulb is given off in the form of heat, but there is an insect magician that has invented a baffling trick—light without heat. Another insect can do something that lies outside the ability of man—walk on water. We are going to talk about these insects on this trip afield.

*We Get Ready*

Every boy and girl who is at all observant has seen a spiderlike bug gliding over the surface of the water, dancing on the surface like a human being skating on ice. In certain countries of the world they are called Jesus-bugs. They make little dimples on the surface where their feet rest.

Do this: Take a dry needle, and by means of a hair pin place it gently on the surface of water in a saucer or pan. Although eight times heavier than the same amount of water, the needle will float. Is there a film over the surface of the water? We will talk about that in our broadcast.

About the first of July the velvety darkness is bespangled with flashes of light over meadows, dew-damped lawns, and in the shrubbery and trees. Over some meadows that creates a scene of weird beauty. It is done by fire beetles. How and why do they do it? Read what you can find in your encyclopedia about "fire flies."

*We Hit the Trail*

Note what Ranger Mac has to say about surface tension and the film that covers the surface of bodies of water. What is meant by "wetless water"? How is the water strider equipped to walk on this film? What water bug walks on the underside of the film? Is this film of any use to mosquito wigglers?

It is winter. Where is the water strider now? What does it feed on? What feeds on it? What happens when the water strider dives? Why doesn't it get wet?

Why is the light of the firefly one of nature's great miracles? Has man been able to achieve heatless light? Men who study the chemistry of living things have discovered what makes this light. Note what is said about this. In what part of the body is the light produced? What is said about fireflies in other parts of the world?

*Farther Afield*

What makes raindrops round? What other water insect uses the surface skin of water to travel on? Write a composition for your LOG BOOK on some phase of this broadcast that interests you most.

### MORE THAN A GOOD BAIT

The earthworm is formed just right for putting easily and quickly on a hook. Then there is enough wiggle to entice fish. By all odds, it is the best all-round bait. President Coolidge caught his trout with them. So do the natives when they want fish to eat. But the earthworm is more than good bait. It is Nature's supreme soil builder. That's one of the things that takes us afield today; another is how they are grown commercially and how boys can grow them at home.

#### *We Get Ready*

Let's study the earthworm. To do this bring enough to school so that each Trailhitter will have one. (Girls, too!) Place the earthworm on a piece of paper and examine it. Which is the head and which the tail? Count the segments. Do all have the same number? Feel the bristles, called setae, by which crawling is done. Notice the whitish ring near the end of a mature specimen. (lacking in the immature) This girdle contains the eggs.

Earthworms spend the winter below the frost line, curled up in mucus. How then can they be secured at this time of the year? Ask the man who fishes regularly through the ice. He knows how to keep them in his basement. Or dig beneath a rotting manure pile. These worms do not have to dig deeply into the soil to get away from the frosts. They can be purchased from any biological supply house at any time of the year, but that is foolish.

#### *We Hit the Trail*

Blind, deaf, voiceless, the earthworm feels, tunnels, and eats. It eats the earth itself. Herein lies its value as a soil builder. How does the creature work and why is it such a perfect companion to plant life? Was the old lady who drove the robins from her garden because they took the worms as foolish as she seemed?

Where would you look for worms? Why are they found in damp places, under leaves and ground cover? Would you expect to find them in deserts? Why does the earthworm work in the night? What evidence of their working can be found near their burrows? Did you know you can buy these castings at stores where plants are sold?

In good soil, how many earthworms may there be to an acre? How many tons of digested earth are left on the surface in a year's time?

#### *Farther Afield*

Summarize this trip afield by relating how earthworms are such good soil builders. There are now over twenty large commercial earthworm farms. What is done with their product? The largest earthworms are found in Australia—four to six feet long. They are the principal food of the platypus. Museums having this animal must grow earthworms to feed it.

### NATURE'S SANITARY CORPS

The greatest of all struggles among all living things is to get enough food. Among the creatures of the wild there are two classes as far as securing of food is concerned—predators and scavengers. The predators prey on the living, as hawks on mice; the scavengers eat animals after they are killed or die, as opossums on birds. If it were not for these scavengers, the outdoors would be unsightly and odorous with the decomposing bodies of birds, fish, animals, and other creatures that are killed or die daily. The work of these scavengers is not pleasing, but it is important.

#### *We Get Ready*

Look up the meaning of these words: predators, scavengers, carrion, sanitary, corps, buzzard, by-products, canine.

Why do hunters hang their deer high above the ground on a limb of a tree? Why is it that the creatures of the woodlands and streams that die daily are seldom found? Why are the antlers of the deer that are shed each January seldom found in the woods? Do scavengers do an efficient job of keeping the countryside clean and sweet-smelling?

Think: Can you mention a scavenger among the birds, animals, fish, amphibians, insects, microscopic creatures?

#### *We Hit the Trail*

Each spring after the winter has left its dead, the gulls come up our streams from the Great Lakes. What are they doing?

Many deer are shot in the woods that are not carried out. What happens to their bodies?

Catfish and bullheads scour the bottom of lakes and streams, their young following after them. What are they doing?

Did your dog ever come home smelling terrible of decaying flesh? What is said about members of the canine family perfuming themselves in decomposed flesh? Why do dogs eat bones? Must all our forest friends have minerals in their diet? Where do they get them?

What is said about the opossum, coyote, turtle, crayfish, crow, heron, buzzard, ants, blow flies, molds, and bacteria? Is there anything wasted in nature?

#### *Farther Afield*

Make a list of the scavengers of woodlands, fields, and streams. Write a story for THE LOG BOOK about how the scavengers keep our countryside clean and sweet smelling.

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## FADING TRAILS

This is a story of what has happened to some forms of wildlife. It is not a very happy story. Yet there will be some heartening things about it. One is the awakening in our minds of a need for cooperating with nature to preserve what is left.

### We Get Ready

What is meant by the caption of this broadcast, *FADING TRAILS*? It means that some forms of wildlife found by the early settlers in America have disappeared, and others are getting scarce and seem to be threatened with the same fate.

It means that in spite of the hardships and dangers that the early settlers endured, they were richer than we are in nature's gifts. We are not going to talk about the losses in soils and forests, and purity of water, though these losses may have influenced the disappearance of wildlife, but about the passenger pigeon, the prairie chicken, the heath hen, bison, and some of the other creatures which we must go to the museums and zoos to see if we are to see them at all.

We are going to talk about the market hunters who were greedy for profits; about the rapid increase in population and the use of the land that crowded out wildlife; about inventions that changed the natural order of things.

We want our young people to know that while we can never restore the wildlife of America to its former abundance, we can by right practices do much to increase the wildlife that remains.

### We Hit the Trail

The story of the passenger pigeon is tragic. They filled the skies of Wisconsin during their migrations and broke down the branches of trees with their weight during the nesting periods. They were decoyed, trapped, shot, clubbed, suffocated with sulphur fumes. What was done with these slaughtered birds? There are men still living who can tell about the last migrations of these birds. It was as short a time ago as that.

Listen to stories about the American bison, wolf, prairie chicken, and other tragedies in American wildlife.

### Farther Afield

Not only wildlife but our natural areas are now being buried by the onrush of civilization and growth of population. There is a bill in Congress now that will lead to the preservation of samples of early types of prairie, desert, forest, and marsh. There is an arboretum in Madison and a museum virgin forest in Shawano devoted to preserving samples of natural areas that are on the fading trail.

## A GREAT LILLIPIUTIAN SOCIETY

In considering the ways of ants one must be prepared for most anything. We dislike the creatures in our gardens, lawns, and sugar bowls; but our dislike for them is softened by a respect for their clever and admirable ways of meeting the business of living. There are about 8000 named ants in the world. An ant hill may have a population of 100,000. Supposedly, there are more ants than any other land creatures.

### We Get Ready

What is meant by the world *lilliputian*? Bees and ants have a similar mode of life. How does each spend the winter? What do bees live on in the winter? Do ants have the same foresight?

What is meant by a "highly developed community life"? Ants, like bees, are socialists—each individual exists for the good of the whole. Can you guess how they know each other as members of the same colony?

### We Hit the Trail

First will be given a description of the anatomy of an ant. This will help us to understand how an ant lives and works. What are the antennae? How important are they? Next the jaws: How are they equipped? How powerful are they? Were you ever bitten by an ant? What is formic acid? The family name for ants is Formicidae.

Note the life history of the ant. It is like that of most insects. As in any household, there is work to do. The workers are females that lay no eggs. The queen does that. The drones are males; they have wings. The household has nurseries, kindergartens, store chambers, cemeteries, and garbage dumps; likewise workers for each.

Just as the queen bee takes a marriage flight, so does the queen ant. How are new colonies of ants established? Something will be said about ants in other parts of the world. What are some of the unusual things they do? What is the ant-aphid partnership of our ants? In what ways are ants beneficial? What ways destructive?

### Farther Afield

Put a notice to an ant hill on your schedule before school closes. Disturb the nest and visit the deep concern for the pupal bags. They are small as pin points, clustered together.

You can build an ants' nest for observation in your schoolroom. Write Ranger Mac for instructions on its construction and care. Make a record in THE LOG BOOK of the most interesting features of this trip afield.