The Young Naturalist

VOL. 12 — NO. 4
APRIL, 1970

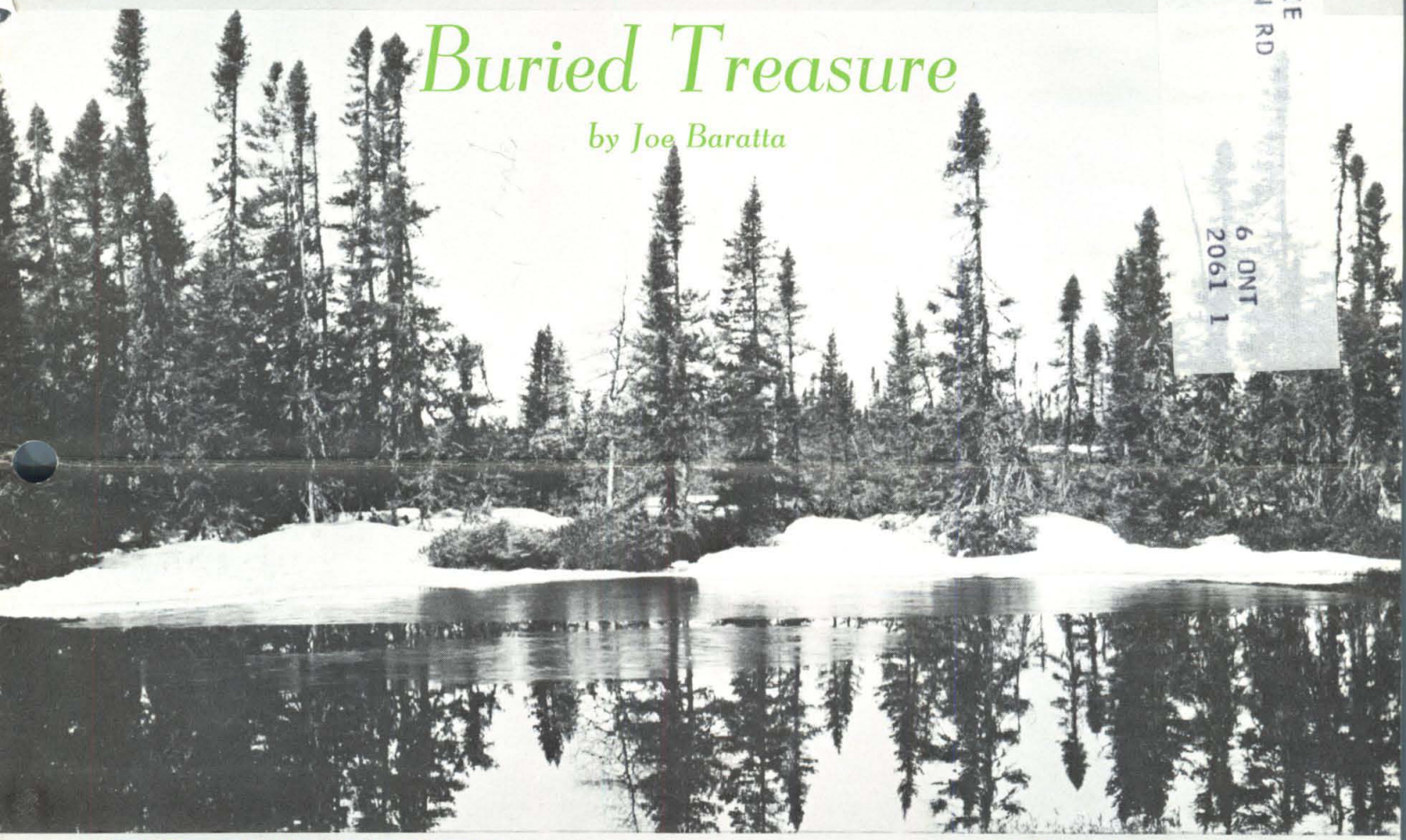
PUBLISHED BY THE FEDERATION OF ONTARIO NATURALISTS

YOUNG NATURALISTS
F. O. N.

SECOND CLASS
REGISTRATION N

Buried Treasure

by Joe Baratta



Black Spruce in the Muskeg Country — *Ont. Dept. of Lands and Forests*

What is black, mucky, spongy,
swallows-up its prey, is relatively
unexplored, is native to Canada,
and is quite mysterious in nature?
Black Gold or "Muskeg"

It is found located in regions. where the water level in the soil is high due to poor drainage and evaporation. The region is usually a depression in the earth's surface, caused by glaciation and in areas of below normal temperatures. It is only in Canada that this type of soil, usually known as "bogland" or "peatland", is called muskeg, a Chippewan Indian word meaning "grassy bog."

Continued next page

A Thick, Black Porous Mud

One must be careful though, not to confuse muskeg with swamps. In a swamp or marsh the water level is very high, and the winds are able to create waves that enable oxygen to enter the water. This helps to almost completely decompose the rotting vegetation. But if the water level remains constant or stagnant, there is not enough oxygen present for the agents to decay, rot, and decompose the plant matter. Instead, it slowly turns into peat, a thick black porous mud which makes up most of the area referred to as "muskeg". This process is continually repeated when more dead plants fall into the muskeg, and are swallowed up and transformed into peat. This peat, in time, is buried under layers of sediment and is eventually compressed into a low-grade type of coal called lignite. It can also be changed to bituminous or anthracite coal, depending on the amount of extra deposits of vegetation and pressure applied over the years.

This could be one of the reasons why a muskeg fire is so difficult to put out. Because it is a form of coal, the fire burns both downward and laterally, and has the characteristics of a coal fire in that it smolders. To add to the fireman's problem, the sponge-like mud composition of the muskeg absorbs and holds the water, therefore, very little water reaches the burning peat. To try to overcome this problem, the firemen use a nozzle with a smaller opening in an attempt to increase the pressure and hopefully force the water through the mud and down into the peat.

How Old Is Canada's Muskeg?

Muskeg is not a constant thing. It could be 100,000 years old or it could be forming right now. But it is an accepted fact that most of the muskeg in Canada originated about 10,000 years ago with the melting of the glaciers. As they retreated northward, the glaciers pock-marked the land and within about 100 years the first layers of muskeg had been formed. Muskeg is also a problem in that its thickness has been found to vary from a few inches to 100 feet in depth.

All Muskeg Is Not the Same

The type of muskeg will also vary from one locale to another. It may be a thinly covered area having a high moisture content, thus giving it a pudding-like consistency which would not support the weight of a man; on the other hand, if the muskeg is in an area of trees and shrubs, the root system would be interwoven through the underlying mud giving the muskeg a firm subterranean base. In northern areas the muskeg freezes in winter and enables man to travel over it with little risk. The only concern is that if a quick or unexpected thaw occurred, everything or anything would get bogged down in the slime.

Muskeg at the mouth of the Tha-Anne River — Northwest Territories *Ont. Dept. of Lands and Forests*

A Natural Fertilizer

Muskeg besides being a hindrance to Canada's economy is also an asset. It is a natural fertilizer and if adequately drained can be turned into rich farmland. An example of this is the region of the Holland Marshes — northwest of Toronto — where once useless muskeg has been turned into an eight million dollar a year enterprise.

Also in recent years sphagnum moss, which has a high moisture content, has been combined with peat moss, to be used as a soil conditioner. This industry has developed into a fifteen million dollar a year business.

The real treasure though is below the sphagnum moss and deep in the peat moss. From this type of soil raw materials have been taken out from which such things as coke, cellulose, gasoline, dyes and resins have been produced.

In addition to these uses, muskeg also affords man the opportunity to study his past. By examining the various layers, scientists can find signs and clues that will help open the door to our past. This knowledge in turn will help man better explain the present and more accurately predicate the future. An example of this is the disappearance of the black spruce tree. By studying the composition of the vegetation in the muskeg scientists may be able to determine what changes have occurred to alter the growth pattern of these trees. The black spruce now takes 175 years to mature as compared to 100 years previously.

Muskeg therefore is something that man must learn to live with for although it is considered by many people to be a vast wasteland covering a large portion of our country, it is too valuable to be ignored or forgotten.

The End

LIFE IN THE FOREST

By Gord McKenzie

All the living things mentioned here — the trillium, the violet, the rabbit, the beech tree and the owl live together in what we call a forest community. All the members of the community gain their energy from the sun, either directly, as in the case of the plants, or indirectly, in the case of the animals.

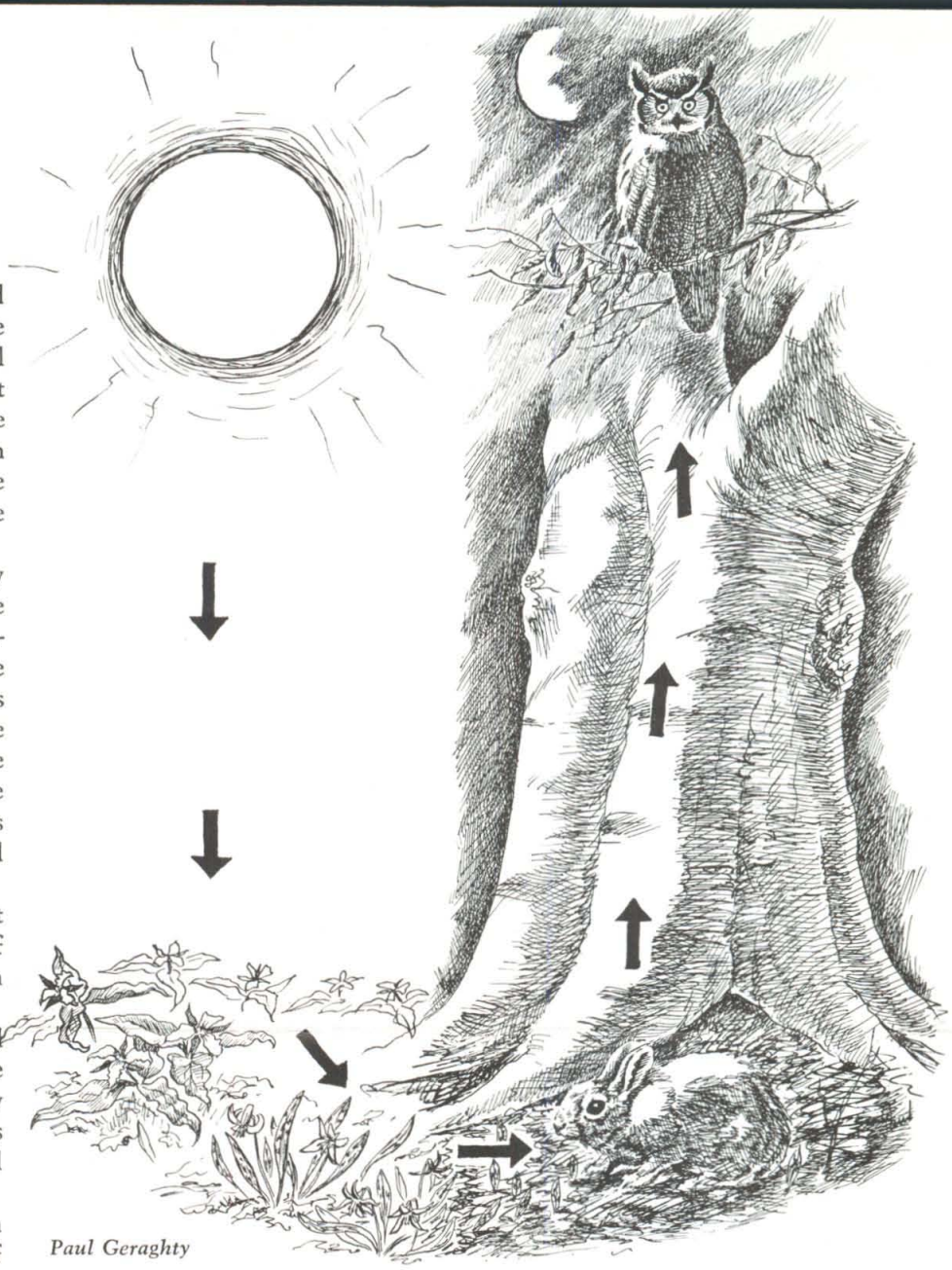
The owl, high on his perch, may see the rabbit far below him, because even though it is dark, the soft moonlight is bright enough for him to see nearly everything which moves around him. If he does detect the rabbit, he will swoop down from the treetop in a long, open-winged glide and the soft downy feathers on his under wings will muffle the sound of air moving past them.

The rabbit, who is far more alert than he looks, has a good chance of avoiding the owl but sometimes in this serious game, the owl wins.

We call this series of events a food chain in action. The chain's links are sunlight, plants, rabbit and finally owl. In this chain the sun's energy is used and passed along to the animal at the top.

The owl seems to be a villain in this story, but this is not really so. If too many rabbits were trying to live in this part of the forest, there wouldn't be enough food to keep them all healthy. Also, the owl is likely to catch the weaker rabbits more easily. So, by simply doing what is natural for him to do, he is unknowingly helping the remaining rabbits. The owl is a "natural selector". This leads us to decide that nature has a Balance and if we think about it for awhile, the owl doesn't seem so evil after all.

When we study these things we are investigating the ecology of the forest — or, in smaller words, we are finding out about how plants and animals live together. In this continuing story, all living things have important parts to play.



Paul Geraghty

The links of the food chain are sunlight, plants, rabbits, and owls.

The soft blue moonlight spreads over the forest. The leaves on the trees stir a little in a very gentle breeze. In a nearby farm house an old grandfather clock chimes twice. Down on the forest floor among the trillium plants and dog-toothed violets a cotton-tail rabbit is enjoying his regular nightly outing, all the while nibbling on dewy, tender plants. He is a harmless little fellow, but like all animals, must eat in order to have the energy to move around and grow and stay healthy.

The plants which he eats contain materials which his digestive system can turn into sugar. These materials were formed in the leaves of the plants during the day, because leaves can harness the sun's energy and hold it trapped in the materials which the leaves produce.

Very close to the rabbit a huge silvery-barked beech tree, whose trunk is like an elephant's leg, towers up from the forest floor. It is sixty or seventy feet tall — three or four times as high as most houses. Its crown is the favourite lookout position for a sober looking mature Horned Owl. Like the rabbit, the owl also must eat in order to stay alive. However, in some important ways his system cannot run on green food and therefore he depends on flesh. He is specially equipped to catch his food, just as the rabbit is specially equipped for browsing.

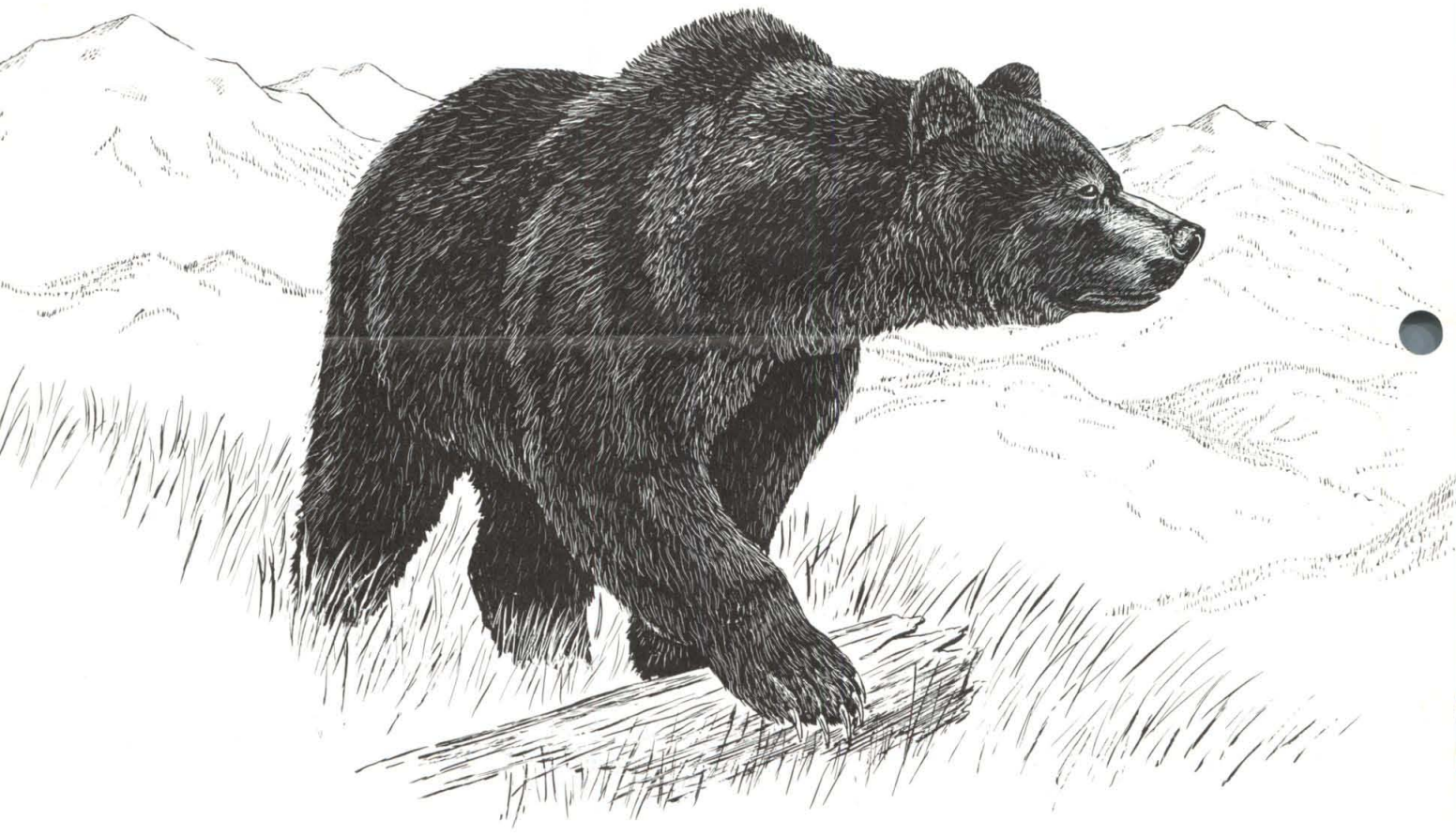
The End

Predators of Canada — The Bears

Written and illustrated by Don Foxall

THE BEARS (ursidae)

All members of this family are heavy in form and big. They are called CARNIVOROUS animals, which means that they are meat-eaters. They all have short tails, heavy legs, and tend to walk on the soles of their feet, rather than on their toes.



GRIZZLY BEAR (ursus horribilis)

The grizzly is the largest carnivore in the world attaining a weight of up to sixteen hundred pounds. Its enormous size is rivalled only by the extra large polar bears which also may weigh up to sixteen hundred pounds. Despite its great bulk the grizzly is extremely agile and can move with surprising speed. Its swiftness and agility is demonstrated by the way it catches quickly swimming salmon. While the salmon are moving up the river to spawn, the grizzly has life fairly easy, but most of the time its life is one long hungry search for enough food to satisfy its huge appetite. The grizzly's claws are longer and straighter than the black bear and, although it cannot climb trees as well, it is better adapted to digging up rodents and roots which form a large part of its diet.

POLAR BEAR (thalarctos maritimus)

Polar bears are well adapted to their cold, arctic wilderness existence. More streamlined than their inland cousins. they spend much of their time swimming in the frigid arctic waters, either fishing or travelling from one ice floe to another. These tireless swimmers are often spotted miles from shore. Dense underfur and long, thick, outer hair protect them from the cold in or out of the water. Large feet covered with thick hair give them the footing necessary to move swiftly over slippery ice surfaces. The white or yellowish white fur serves as effective camouflage enabling it to stalk seals on the open ice. Polar bear cubs are born in a den which the female digs in a snowbank early in the arctic winter. As the female dozes through the winter her cubs snuggle close for warmth and protection until they emerge in early spring.

BLACK BEAR (ursus americanus)

Black bears are the most widely distributed of the North American bears, occurring from coast to coast. In spite of their name the black bears' coat may vary from white through blond, cinnamon, brown, bluish to coal black which is the most common colour. The claws of the black bear are strong, heavy, and sharply curved, well suited for climbing trees and tearing apart rotten logs and stumps to get at insects and rodents. Bears in true wilderness areas usually avoid contact with man, but in protected park areas they can become very bold and will scrounge food around tourist areas. Although these "tame" bears seem clownish and appealing they can also be unpredictable and dangerous when hungry or aroused. Tourists would do themselves and the bears a big favour by obeying signs which read "Do Not Feed The Bears".

YOU AND THE WEATHER

By Bob Trueman

Our health, energy and comfort are affected more by the weather than by any other element on our earth. Not only does it affect how we feel, how we dress, what type of diseases we are most likely to catch, but it also affects our body so that a large number of changes take place within ourselves without us really being aware.

Temperature

Of all the climatic elements which affect the human body, the most important one is temperature. We certainly have to dress differently depending on the range of temperature, and we probably feel different too. What is actually happening to our body when we experience great differences in temperature? At low temperatures the following things happen: the blood thickens, the skin blood vessels get narrower, our body shivers, there is a decrease in the flow of blood near the skin, the number of white blood cells increase, the liver enlarges, the appetite and oxygen consumption both increase in an attempt to provide more body heat. At high temperatures we find an increased blood supply, sweating, an inclination to decrease the body's activity, decreased oxygen consumption and a listless appetite. During the hot periods the body is attempting to cool itself by allowing evaporation of the heated body liquids to escape into the air. The cooling process is controlled by the humidity of the surrounding air. The higher the humidity level, the slower the rate of cooling and then you hear people complain, "It's not the heat; it's the humidity." This statement is only partly true since our feeling of being hot depends upon both the temperature and the humidity.

Dress Wisely

Dressing properly for the temperature changes, of course, is important.

This boy is wearing clothing that insulates him from the cold.

Clothing protects against the cold by trapping still air within its open spaces and the layer next to the skin. These layers of "dead air" are good insulators and knitted or loosely woven woolens are better than cotton with a hard weave. As well, several thin layers of clothing are better than one thick one. In warm weather, clothing should be loose, lightweight, and light-coloured and should be porous to allow for air movement next to the skin.

The Wind

The wind greatly affects how we feel, too, particularly during the winter months. In talking about how the body cools itself you remember that it depends on evaporation and the wind speeds up this process. The colder the air and the higher the wind speeds, the greater is the loss of body heat. The wind chill produced by a 45 mile per hour wind at 20 degrees F. is about the same as that of wind moving at 5 miles per hour with a temperature of −20 degrees F. In order to be effective against wind chill, clothing must be reasonably impervous to the passage of air but yet will allow moisture to escape from the body.

Changes in Weather

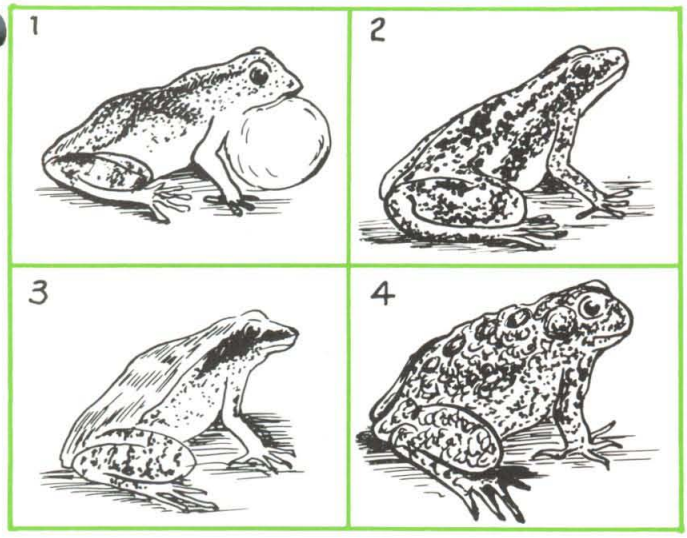
Weather changes have been known to produce a number of illnesses and diseases upon the body. Extremes in temperature can produce heat strokes, heat exhaustion, cramps, and frostbite. Muscular aches and illnesses connected with breathing are influenced by the amount of humidity. Very dry air causes chapped hands and slows down the healing of sores and wounds. Many diseases follow a distinct seasonal pattern. Chilling, for example, lowers the body's resistance to most illnesses and during the winter months we are more susceptible to colds, influenza, pneumonia, ear aches, and sore throats. Cases of measles are more numerous in the spring. Fresh air, sunshine, mild temperatures and moderate humidity seem to be the best climate for warding off diseases.

The Human Body

The human body is capable of withstanding remarkable changes in the weather but it operates best under conditions of proper diet, clothing and housing, and by the control of physical activity. As scientists and doctors learn more about the human body we will come to an even greater realization of how much we really are affected by our ever-changing weather.

The End

APRIL: focus on EMERGING POND LIFE



Many water-loving creatures are to be found soon after the ice goes out of the ponds and marshy areas. As these creatures feel the warming rays of the sun on the surface of the water, life begins at an ever quickening pace. In ponds and swampy places the chorus of frogs and toads fill the air with spring music. This month we would like to introduce you to some of the more common creatures that you are likely to meet when visiting a pond. Keep your eyes open — how many will you be able to spot?

(1) *Spring Peeper* — small size, dark multiplication marks on its back, general colour varies from light to dark brown — underparts white washed with yellow.
Song: shrill peeping, high pitched clear chorus.

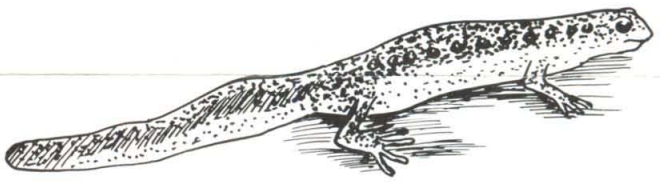
(2) *Swamp Chorus Frog* — normally three dark stripes on a pale gray, or dark brown down the back, variable colour, always a line along upper lip, under parts white.
Song: a rasping trill emitted in chorus. Generally first frog song of spring.

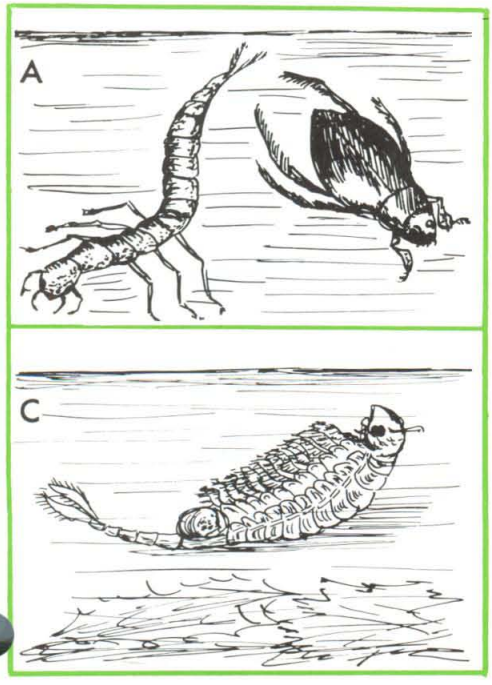
(3) *Wood Frog* — upper parts vary from light fawn colour to dark brown. Prominent dark brown or blackish cheek patch, below it is a light line that extends along upper jaw to shoulder, underparts white.
Song: chorus of explosive chucks or clucks.

(4) *American Toad* — has a thick set, chunky body, short legged and broad toed — skin conspicuously warted, colour of ground overall.
Song: a long, high-pitched, steady sweet trill.

EGGS OF FROGS AND TOADS — Most frogs lay their eggs in clusters, surrounded by a gelatinous substance. Toads lay their eggs in a long string encased in a cord of jelly about the diameter of a pencil.

SPOTTED NEWT — Upper surfaces of their bodies are olive green, but may vary from yellowish brown to dark greenish brown — rows of scarlet dots each side of back. Underparts lemon yellow covered with black dots. "Red newt" different colour phases of the same animal, Carnivorous, eating snails, crustaceans.



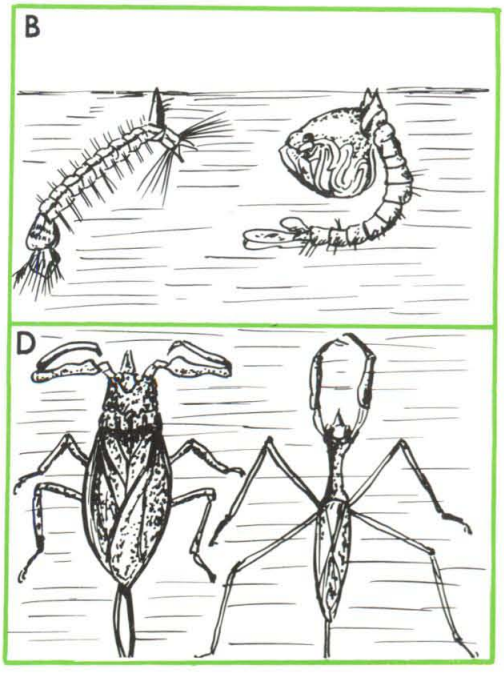


A. *DIVING BEETLE* — Adults hang head downward from the surface of quiet waters. Larvae are "water tigers" — feed on dragon-fly larvae. Both breathe the air obtained through spiracles at the rear end of the body, which is thrust above the surface of the pond.

B. *FAIRY SHRIMP* — Constantly swims on its back with its eleven pairs of "gill feet" waving above its body. Body semi-transparent. Females more abundant. Have a very interesting life history. Look for them as soon as ice goes out in small pools.

C. *MOSQUITO LARVA AND PUPA* — Eggs laid by female on surface of pond. It is only the females that bite and suck blood — males live on fruit and plant juices. Larvae known as "wrigglers". Pupa lie parallel to surface film. Both larva and pupa breathe through air tubes projected above pond surface.

D. *WATER SCORPIONS* — Have two long tail filaments which form a breathing tube, can rest on bottom or on submerged support with its tube thrust up through the surface film for air. Feeds on mayfly nymphs, snails and crustaceans.



EDITOR'S NOTE: This continuing series is designed to provide information and activity ideas for teachers who want to encourage their pupils to become actively involved in nature study as an exciting feature of their outdoor education program. Text and sketches by Bill Girling.

Woodlore

by John Macfie

BANNOCK: You can make bread like the old time woodsman made.

The prospectors and trappers of earlier days made their bread in a frying pan, and the Indians of far northern Ontario still do. Called bannock in English and "puh-kway'-zik-un' in Cree and Ojibwa, it resembles a huge baking powder biscuit more closely than a loaf of bread. Thanks to modern tea biscuit mixes, you can make a campfire bannock more easily than the old-timers made it, and it will probably be a better bannock too.

The Ingredients:

Where bread employs yeast as a rising agent, bannock uses baking powder. When this chemical is moistened and heated it forms a gas which separates the flour particles, rendering it digestible. When I travelled with northern Indians 15 to 20 years ago they mixed bread flour, baking powder, lard, salt and water to make our bannock. It was quite good while warm, but tended to be hard and tasteless cold. Sometimes I got them to add sugar, powdered milk and raisins, which made it more palatable, and even delicious at times. I have heard that biscuit mixes are now to be found on trading post shelves, but I expect the staff of life in Indian trapping camps will continue to come from 50 pounds bags of flour for a few years to come.

The Cooking Fire:

Bannock-making begins with the cooking fire. Use dry hardwood sticks, and when a good bed of coals begins to form make a dough according to the tea biscuit recipe on your box of mix. It contains all the necessary ingredients but milk, and powdered milk will do for that. Lightly grease a frying pan and gently press the dough into it about one-half or three-quarters of an inch thick.

Baking the Bannock:

But you don't fry a bannock. The frying pan is simply a convenient container for the dough while it *bakes* from the *top*. Prop the pan at a high angle facing the slightly flaming bed of coals; say about eight inches away. Rotate the pan 180° after a few minutes to permit even cooking. When deep brown spots appear on the surface turn the bannock over and do the other side. A couple more turns will likely be needed before the bannock rises to a thickness of 1½ inches, and is cooked through.

I knew an Ojibwa canoeman who could have a bannock of sorts ready for eating in slightly less than half an hour after we beached our canoe. You had better allow yourself at least an hour from the time you touch a match to your fire.

THE YOUNG NATURALIST is published ten times a year by the Federation of Ontario Naturalists. Reprinting of text is not permitted without written permission of *The Young Naturalist*. Editor: Barry Griffiths; Assistant Editor, Gerald McKeating; 1262 Don Mills Road, Don Mills, Ont.

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