The

Young Naturalist

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Gordon MacKenzie

Part I

OIL IN SOUTHWESTERN ONTARIO

Imperial Oil Limited

Wooden machinery like the kind shown here, was used to drill the first commercial oil well in North America. The site is near Petrolia on Highway 21.

When you think of oil, places such as Texas, California, and western Canada come to mind, but did you know that the first oil to be discovered and produced was in Ontario? The date was 1858, one year earlier than Colonel Drake's well at Titusville, Pennsylvania, usually considered to be the world's first commercial well, drilled expressly for the recovery of oil. The site of the first well in Ontario is believed to be Lot 16, Concession 2 of Enniskillen Township, east of Sarnia.

You can find this site on Highway 21, just south of Oil Springs, because it is now occupied by a museum in which are depicted the historical aspects of the petroleum industry in Ontario. The full importance of this industry to the growth of Ontario can be best understood when, in the *Canada Year Book* for 1868, you read: "Petroleum may be considered the most important product of the Dominion."

Early descriptions of the oil-producing area, around which the towns of Oil Springs and Petrolia grew up, refer to the 'gum-beds' as being the source of the crude oil. These oil-bearing materials were actually the soft clays associated with the glacial deposits of the area, into which oil had seeped from the underlying bed-

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Mosses Grow from Spores

Most people refer to the green mantle that co[illegible] logs and stumps simply as "moss", as though it were a single kind of plant. Actually, there are in Ontario several hundred species of mosses, varying in size and colour as well as in other ways. The next time you are in the woods, try to find five or six different mosses and then compare them. Even if you get them from under the snow, they will emerge fresh and green, and will stay that way if you keep them moist in a saucer at home.

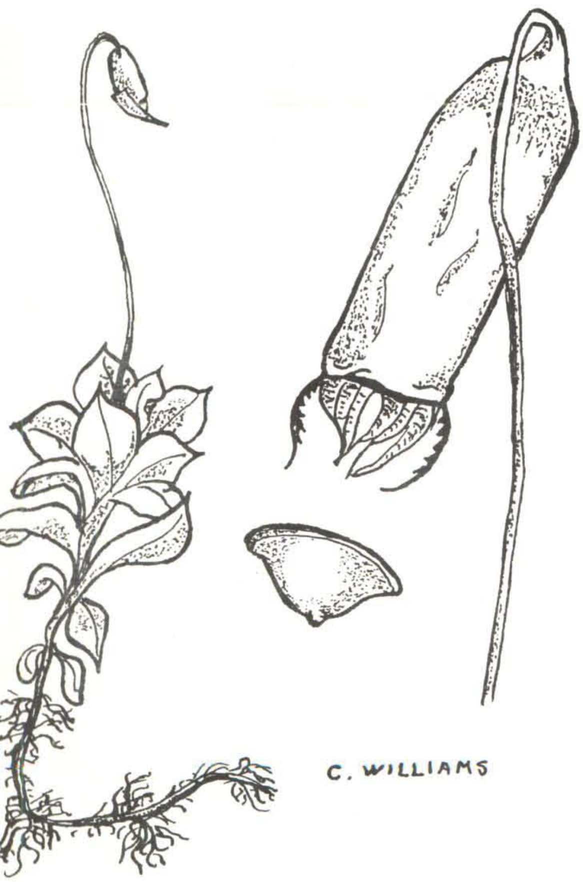
The accompanying sketch shows the parts of a single moss plant. There is a short upright stem, with simple green leaves around the upper part, and a mass of root-like threads at the bottom. In the species shown, the spore-producing capsule and its stalk grow from the top of the stem in autumn. In other species, the capsule appears in spring or early summer. The capsule is drawn enlarged to show the lid and the teeth at the mouth that control the escape of the spores. Blown like dust by the wind, these spores serve to produce new plants, as seeds do in the case of flowering plants.

The drawing illustrates one of the two forms of growth in the mosses. In this form, the stems are upright and the individual plants are easily separated from the mass of leaves. In the other form, the stems are horizontal and branch to form a mat from which it is difficult to separate a single plant.

Like the flowering plants, mosses make their own food. Thus the mosses found on trees are growing only on the dead bark and are not stealing the sap of the tree. Because their requirements are so simple, mosses are pioneer plants capable of growing on such materials as bare rock. They help to prepare a soil cover in which higher plants may grow. Look for round black cushions of moss on rocks, then wet them to see the leaves expand and turn green. Growing where they do, these mosses get water only from rain or dew, and are able to endure long periods of drought. Cold does not seem to bother mosses, and even the very delicate-looking kinds survive our winters unharmed.

Where are mosses found? The answer is that they are found almost everywhere: on soil, bark, rotten wood, and rock. They are also found in springs and streams, and even in the cracks of city sidewalks. Wooded swamps, old woods, and limestone cliffs are good places to look for mosses. The largest expanses of moss in Ontario are in the muskeg of the north, where there are thousands of square miles of sphagnum or bog moss.

H. WILLIAMS



The parts of a single moss plant are shown in this sketch, including the spore capsule.

Things to Do

Adult collectors of rock and mineral specimens are sometimes referred to as "rock hounds". The name "pebble pups" seems appropriate for the younger collectors of mineral specimens.

Some Hints for Pebble Pups

1. Be particularly careful when you are in collecting areas — of other people as well as of yourself! Before you climb up on a rock dump or a cliff side, make sure there is nobody working or walking below you. You can easily dislodge loose rocks which may fall down the slope and possibly injure persons at the bottom.

2. Be "selective" in your choice of rock and mineral specimens. A small collection of well-chosen specimens in good condition is more meaningful than a large collection of weathered and cracked material.

3. Be neat, orderly and considerate when out collecting. Do not throw garbage around; do not damage other people's property; do be sure to obtain permission from private owners before you enter and collect upon their property.

4. Be sure to wrap and label your specimens carefully, indicating type of material or, if it is yet to be identified, specific location, date, and other information. Take with you a roll of adhesive tape and a marking pencil so that you can label each specimen in the "field" during your "expedition". A collection has no meaning if you do not know what you have or from where the specimens came.

5. Be sure to leave something for someone else, either for future examination by professionals or for other collectors.

G. RUTH MARSHALL

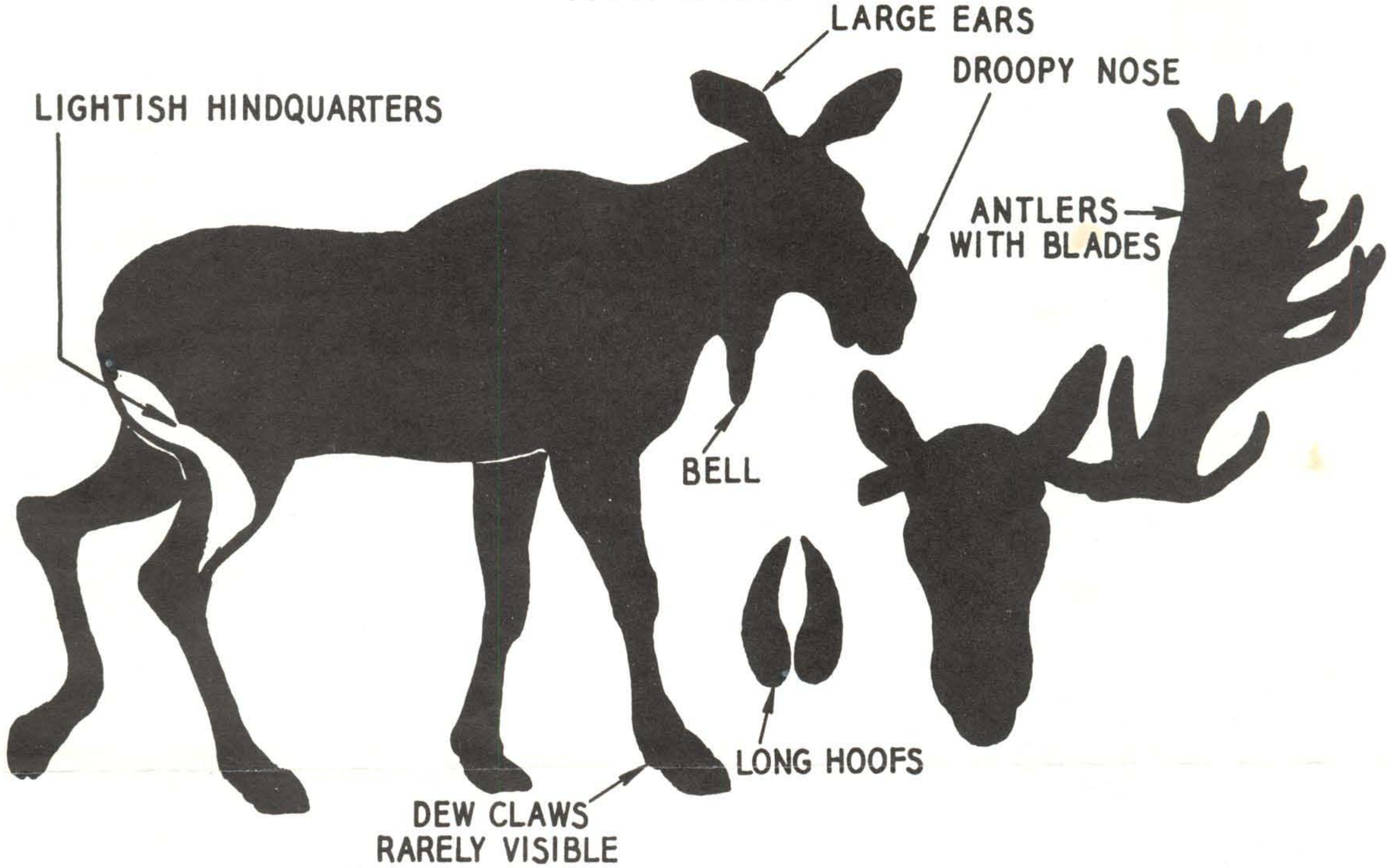
SWEET SUDS

It has been found that bacteria attack detergent suds when they have been sweetened by a compound made from sugar cane and oil. This discovery provides a possible method of removing the detergent polution of water supplies in many countries of the world.

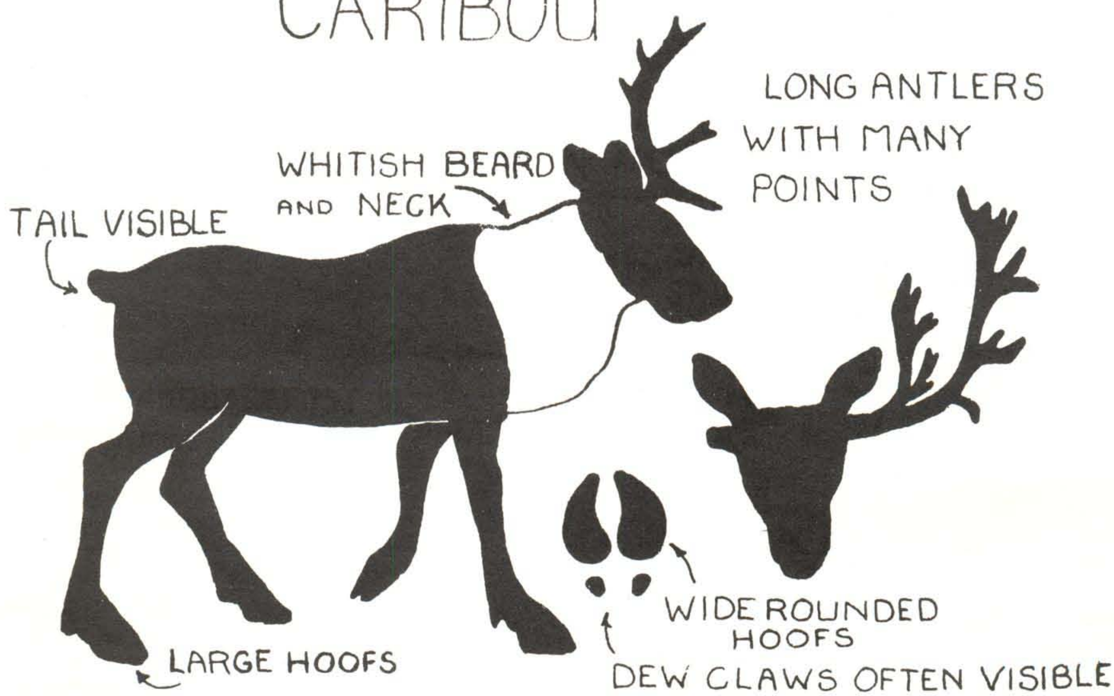
Gordon MacKenzie

DIFFERENCES BETWEEN MOOSE AND CARIBOU

MOOSE



CARIBOU



ONTARIO DEPARTMENT OF LANDS AND FORESTS

The Changing Forest

When fire sweeps across a forest area, the trees are destroyed and the animals are killed or driven out. The soil itself may be burned so badly that certain plants will no longer be able to grow there. Soon, however, the seeds of trees and other plants blow in from nearby areas and a new forest begins to grow.

The first forest to appear on a burned area consists mainly of Trembling Aspen and White Birch. That is because these trees grow more rapidly than most others, and they are able to grow even where fire has destroyed the humus in the soil.

But young Aspen and White Birch seedlings require sunlight for their growth. They cannot grow in the shade of their parents. Thus when the parent trees die, there are no young ones to take their place. White pine seedlings being able to withstand shade, can grow up under the Aspen and White Birch, and so it is pine that may form the next forest. In many parts of the north country, the second stage forest is Balsam and spruce instead of pine.

When pine, or Balsam and spruce, become fully grown trees, they have the same problem as Aspen and White Birch. Their young seedlings cannot grow in the shade of the parent trees. Thus when the forest of large pine, or balsam and spruce, begins to die, it is replaced by a third kind of forest, the hardwood forest. This is made up mostly of Sugar Maple and Beech. These trees are able to grow up in the shade of pine, or Balsam and spruce. Their seedlings can also grow in the shade of the parent maple and Beech trees, and this kind of forest may last a long time.

Sooner or later, however, something happens to make the forest change once again. This time it is the appearance of Hemlock trees in the hardwood forest. The shade of Hemlock trees is so intense that no other trees except White Cedar can grow up underneath them. And so the final forest is Hemlock, with an understory of White Cedar. The Hemlock forest is called the *climax* forest, because it will last until another fire occurs to destroy it, or until someone cuts it down, for no other kinds of tree can grow underneath to replace it.

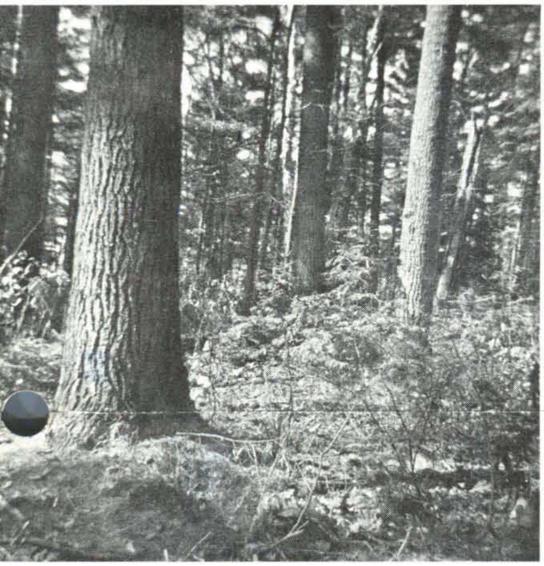
Sometimes one or more of these stages of forest succession are left out, depending upon such things as how badly the fire destroyed the original forest, and how far away are the trees that must provide seeds for the new forest.

Do you know where there is a forest of Sugar Maple and Beech, with some Hemlock in it? The next time you go there, look underneath the Hemlock trees. You will notice that there are almost no young maple trees growing underneath the large Hemlocks.

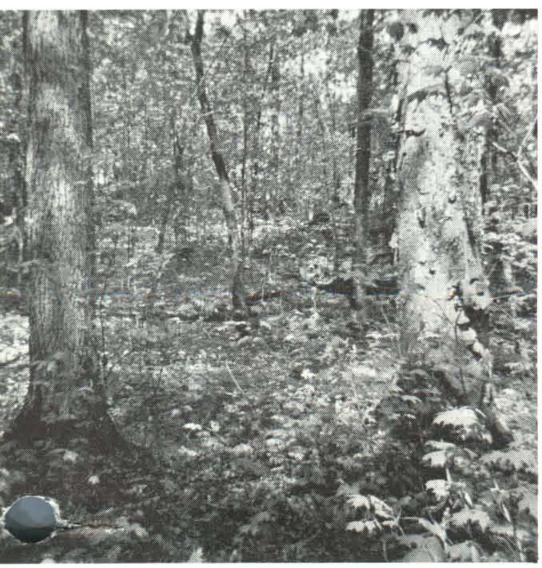
N. D. MARTIN

(The photographs appearing with this article were taken by the author.)

HE FIRST FOREST to appear on a burned rea is Trembling Aspen and White Birch.



HE SECOND FOREST may be formed large- from White Pine, or Balsam and Spruce.

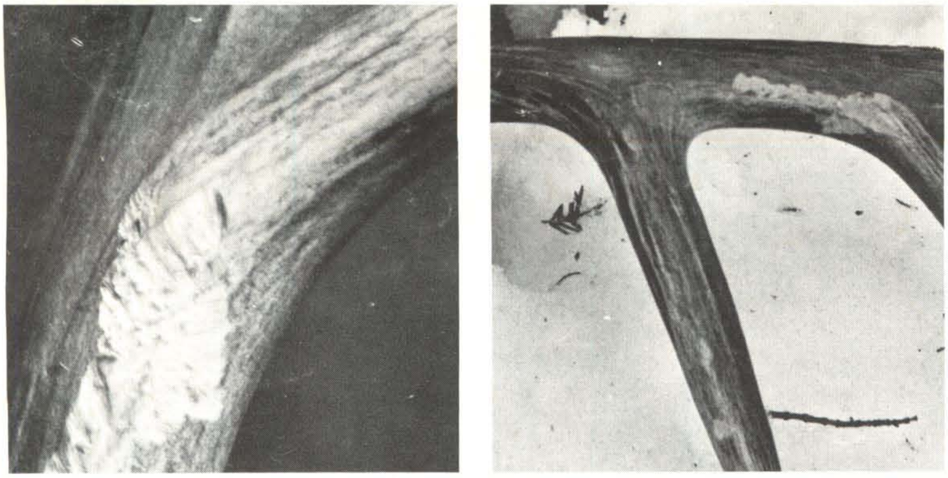


HE THIRD FOREST (hardwood) is composed ainly of Sugar Maple and Beech trees.

THE CLIMAX FOREST is formed of Hemlock. Notice the heavy shade.

Moths Trick Bats

It is well-known that bats find insects by squeaking ultra-sonic chirps that bounce back from their prey. Now it has been discovered that certain moths can give out similar sounds that confuse the bats, and thus permit the insects to escape.



Ontario Department of Lands and Forests

Few things in nature appear to be wasted. These discarded antlers of the male deer serve as food for mice and other rodents during the winter.

Discarded Antlers: Food for Rodents

The male deer grows a brand-new set of antlers every year. In the spring, blood vessels in a pair of circular platforms on top of the skull begin to deposit a bony secretion which by midsummer rises to assume the form of branching antlers. While growing they are encased in soft hairy skin known as 'velvet', through which run the nourishing blood vessels. When full grown, the blood supply is cut off and the deer removes the loose skin by rubbing it against trees.

The buck uses his sharp antlers in his fights with other bucks for possession of females in the breeding season. Then, only a few months after he began to grow them, they become a useless burden and are discarded. For defense against predators the deer depends on his feet, both as a means of escape and as weapons. In late December or January they loosen at the base, and the deer knocks or pries them off on a tree trunk.

This may seem wasteful, but if we examine nature closely enough we see that nothing is wasted. A shed antler presents a bonanza of vital, hard-to-find nutrients for a mouse lucky enough to have one fall in its home territory. Within hours tiny tooth marks will show on the bony antler and, with additional help perhaps from porcupines or rabbits, it will soon be gnawed completely away.

While the deer wore it, the antler was a briefly useful summer adornment. But to many mice it represents the difference between healthy survival and possible death through malnutrition in the harsh winter season.

John Macfie

Water in Rock

Research men at the Boeing Aircraft company in Seattle, Washington, are "squeezing" water from ordinary rocks. Some scientists think that the moon's crust is composed of basaltic rock. Rock of this kind is being used in experiments to extract water from it.

Heat is first used to evaporate any surface water from the crushed rock. More heat is then applied, and the components of the rock begin to break down. Water trapped in the crystalline structure of the rock is released and collected by a chemical process.

OIL—from page 1

rock. Wells were drilled using machinery hung from wooden tripods and wooden derricks. With this primitive equipment drillers managed to reach depths of nearly 150 feet. Production from the wells was variable. The discovery well produced sixty barrels (2100 gallons) per day.

The occurrence of oil in glacial deposits is a geological oddity. The reason for the occurrence is that the bedrock below the glacial deposits was oil-bearing. Oil had seeped from the bedrock into the overlying soft sands and clays, and had also formed seeps. It was these seeps, and the outcrop of the 'gum-beds', that first attracted people to drill in the area.

There was another reason. It was of no use to produce oil if it could not be sold, and at the time of the discovery of oil in southwestern Ontario there were no automobiles, no aeroplanes, indeed no diesel or internal combustion engines that make use of petroleum products. What then was the economic motive?

It was kerosene, because this was the best product that was available for artificial light. It had been produced and manufactured first from the pitch from Trinidad in the 1840's. With the discovery of petroleum in southwestern Ontario our forefathers, for the first time, had materials from which they could extract kerosene to provide safe artificial light.

From these early beginnings, and in a little over one hundred years, petroleum has become the most important product not of Canada, but of the world. Ontario continues to contribute its share from newer, deeper fields, but some of the very old wells are still producing a few gallons per day.

The origin and occurrence of oil in the deeper fields will be discussed in the next issue.

Walter M. Tovell

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