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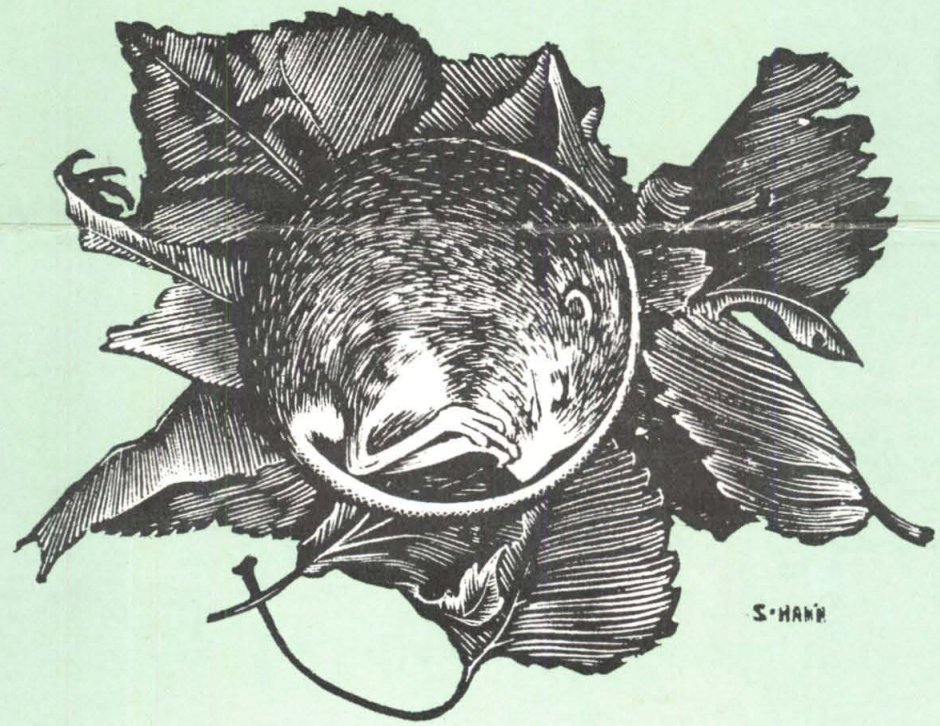
The Long Winter Sleep

by A. A. Outram



Jumping Mouse

Many animals hibernate, although not the majority. Among those that do are certain kinds of frogs, reptiles, insects, etc. This article deals with one kind of animal, the mammals, and those of Ontario only.

We think of the raccoon, skunk, and black bear as winter sleepers and rightly so. Our Black Bear dens up for the winter after having eaten a great deal and becoming very fat. Strange to say, it does not lose much weight until after it awakens in the spring. It is during the winter that the mother Black Bear gives birth to one, two, or three babies. Although the bear's breathing slows down to a rate of four or five times a minute, it does not hibernate, as its temperature does not drop low and it is easily aroused. The Polar Bear is found in our Province, particularly near the end of James Bay and Hudson Bay. The females den up, at least each second winter, when they give birth to young, but they are not hibernaters.

The Raccoon and Skunk are merely winter sleepers and may awaken and wander on one or more occa-

Continued next page

sions during mild spells.

In the case of hibernation, the heart beat slows to four or five a minute and the temperature of the sleeper may drop almost to the freezing point. It will be very slow to awaken if disturbed. In Ontario we have the following hibernating mammals: Bats, Chipmunks, Jumping Mice, Woodchuck and Franklin Ground Squirrel.

Of the eight species of Bat native to our Province, about half migrate and the others hibernate in caves, mine shafts, buildings, etc. Some species go to sleep earlier in the fall than others. If the temperature surrounding them were to drop to the freezing point they would perish, but some seem to have the ability to awaken in time to seek a new and warmer location.

There are two species of Chipmunk in Ontario, the Eastern and the Least or Western. They hibernate, although at times they may arouse and emerge in mid winter.

We have two species of Jumping Mouse, the Meadow and the Woodland. Both may be found in the Toronto Region as well as much further north. The Meadow Jumping Mouse has been found right up to Hudson Bay. These creatures have very long tails and hind legs. They are seldom seen but are quite common. Meadow Mice are really long sleepers. They may retire as early as September and stay in hibernation until April or later.

Chipmunks *M. Moore*

Raccoon *N. Lightfoot*

The Woodchuck also goes to bed early, sometimes in late September. It may take as long as a few days or a month to become really torpid, but in spite of that may awaken and wander in the winter, and go to sleep again. In March (not February 2nd) hibernation is over. Scientists are studying Woodchucks in laboratories to find out about the mechanism of their sleep. Through their research, man may some day be able to enter a form of "hibernation" enabling him to go on very long space journeys.

To complete our Ontario list we must include Franklin Ground Squirrel, a western mammal that is found near our Manitoba and Minnesota borders. It was not on the Ontario list until 1925 and so is a recent immigrant. It is about the size of our Gray Squirrel and has much the same period of hibernation as the Woodchuck.

If you are fortunate enough to take Latin you will find that our word "hibernation" comes from a verb "hiberno" which means "to remain in winter quarters."

The End

Black Bear *N. Lightfoot*

A ROCKET-PROPELLED BOAT

By W. C. MAY

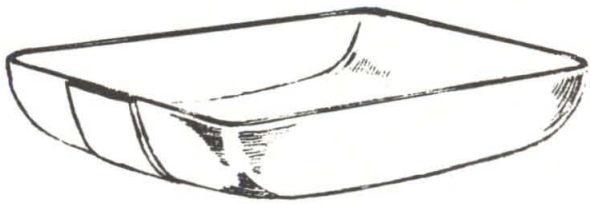
One of the most amazing things about the "Man on the Moon" space program is the tremendous amount of energy that is needed to get the rocket ship off the ground. What happens, in fact, is that a huge amount of gas is forced out through the back opening of the rocket. This is an example of Sir Isaac Newton's law which he invented over two hundred years ago. It states that for every action there is an equal and opposite reaction. (The direction of the rocket will *always* be opposite to the flow of hot gases coming out of the rocket's engine).

This month I am going to show you how to harness the energy of steam to prove that Newton was right.

You Will Need:

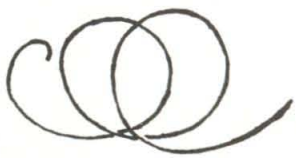
1. A small tin can. (A foot powder can is best because of its tight-fitting cap).

2. The lid of a large soap dish.



3. A short candle. (About 1" or less)

4. A few feet of No. 20 bell wire.



5. A large, strong, sewing needle.

6. A cork.

Put your rocket-propelled boat together this way.

A Stand the can on its top. Push the needle through the cork lengthwise and, holding the cork in your hand, place the point of the needle near the rim of the bottom of the can. Strike the needle with a hammer to make a small hole.

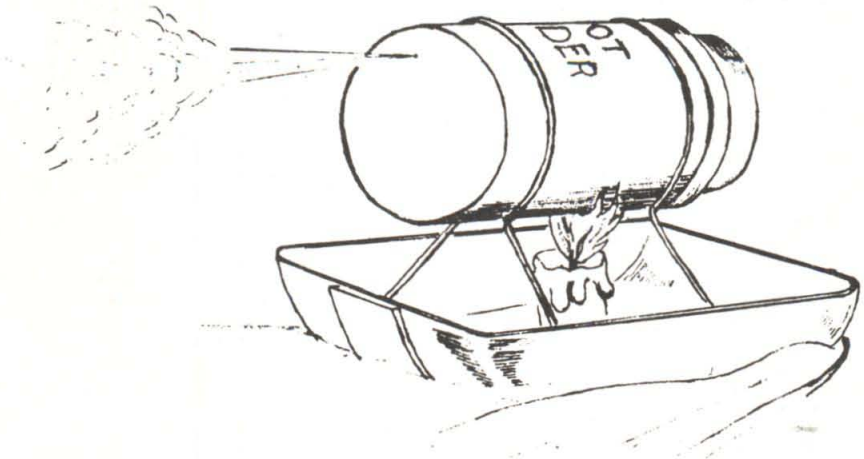
B With the wire fix the can to the lid of the soap dish as shown in the diagram. (Make sure the can is high enough above the dish so that the candle and its flame will fit under the can).

C Fill the can half full of water.

D Place the candle on the lid of the soap dish under the can and light it.

E Float the rocket-propelled boat you have just made in the bathtub.

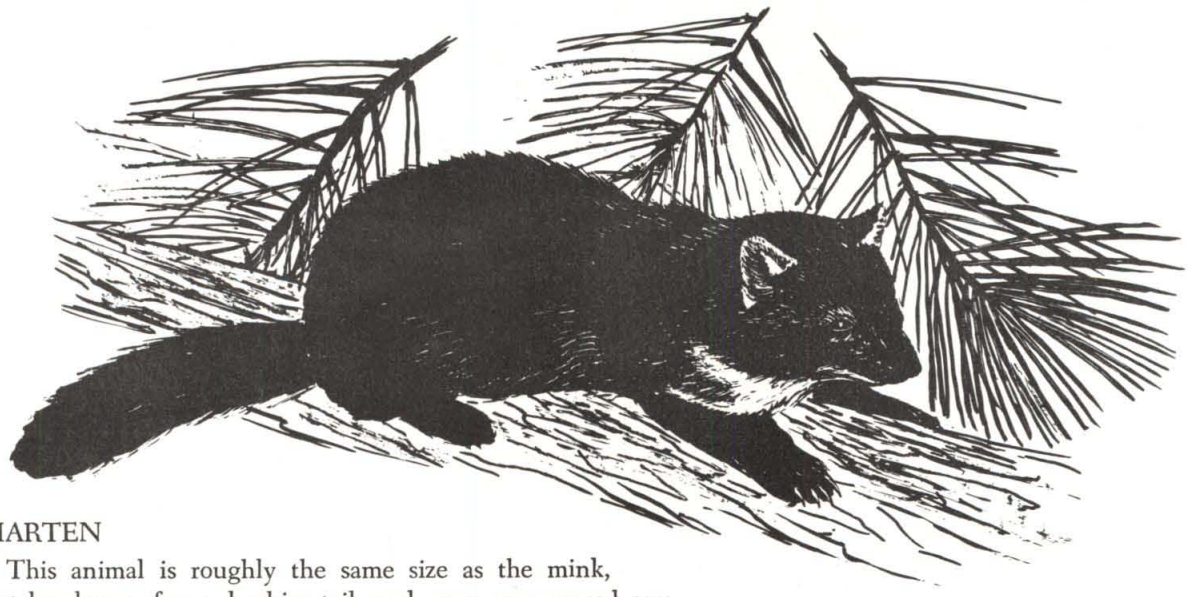
When the water in the can boils, steam will shoot out of the hole. Your rocket-propelled boat is in action.



Predators of Canada — The Musk Carriers

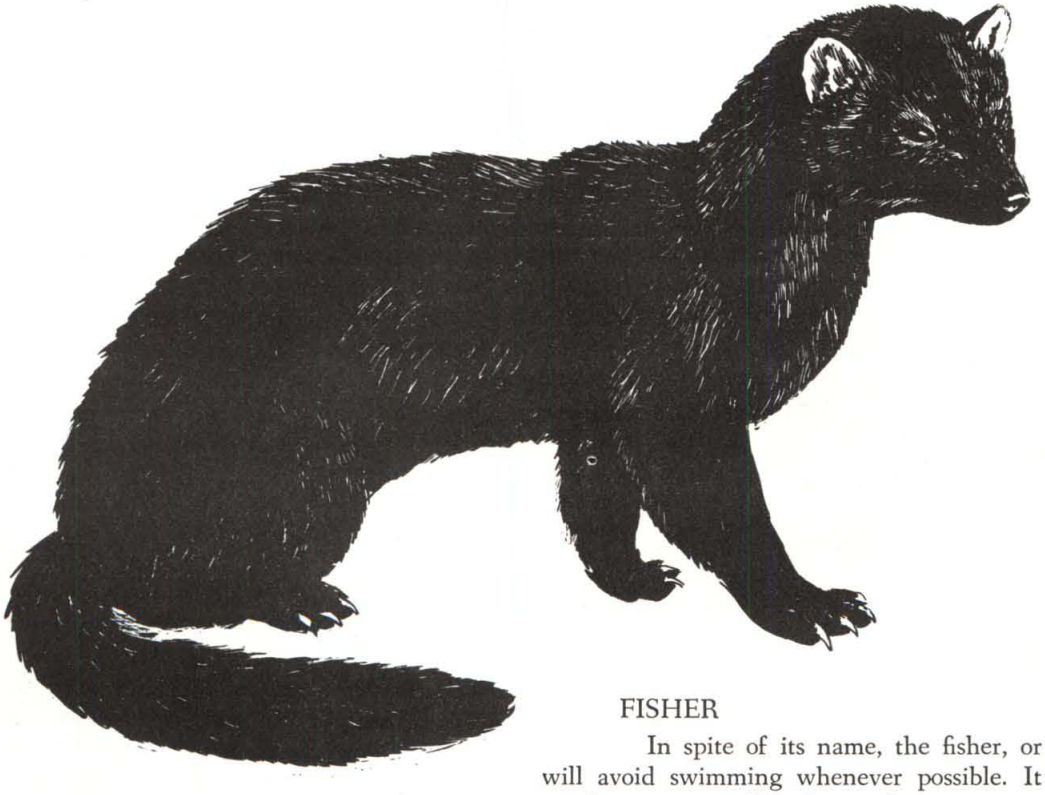
Written and illustrated by Don Foxall

This month we have the less common members of the weasel family. These species normally inhabit remote wilderness areas and, with the exception of the otter, do not adapt too well to a life that is close to civilization.



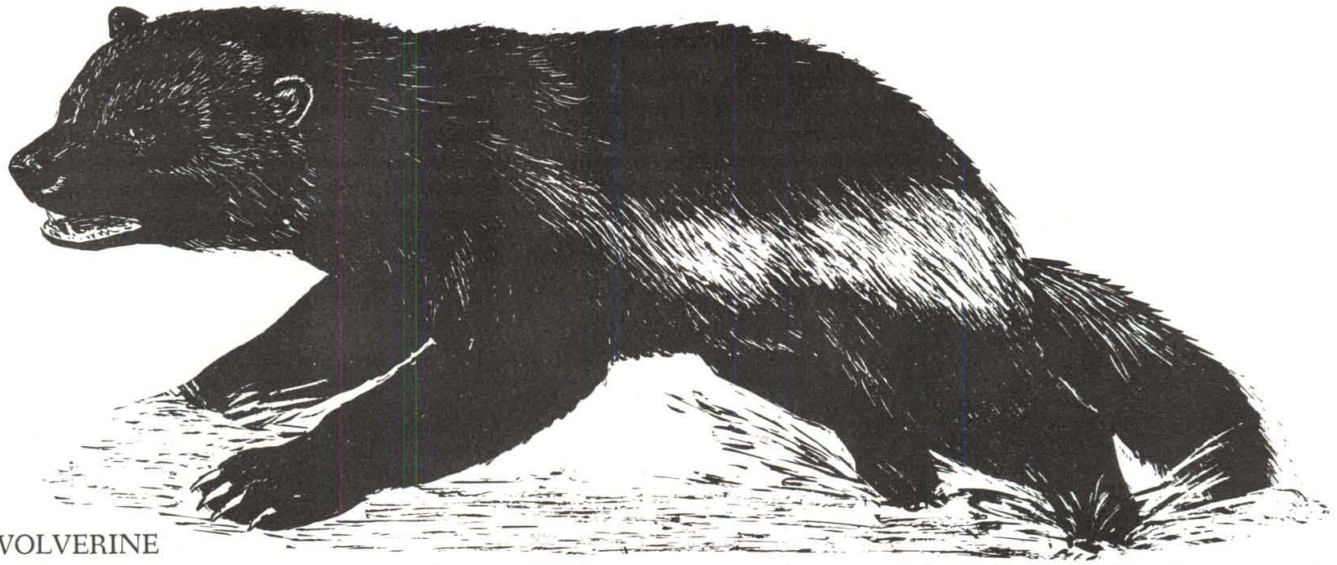
MARTEN

This animal is roughly the same size as the mink, but has longer fur, a bushier tail, and more pronounced ears. Second only to the fisher in the treetops, the marten can outrace and outmanoeuvre even the nimble red squirrel. Besides squirrels, they also prey on rabbits, birds, small rodents, and insects. Heavy trapping has eliminated the marten from many areas, but lower fur prices in recent years have eased the pressure, and the marten population seems to be making a comeback.



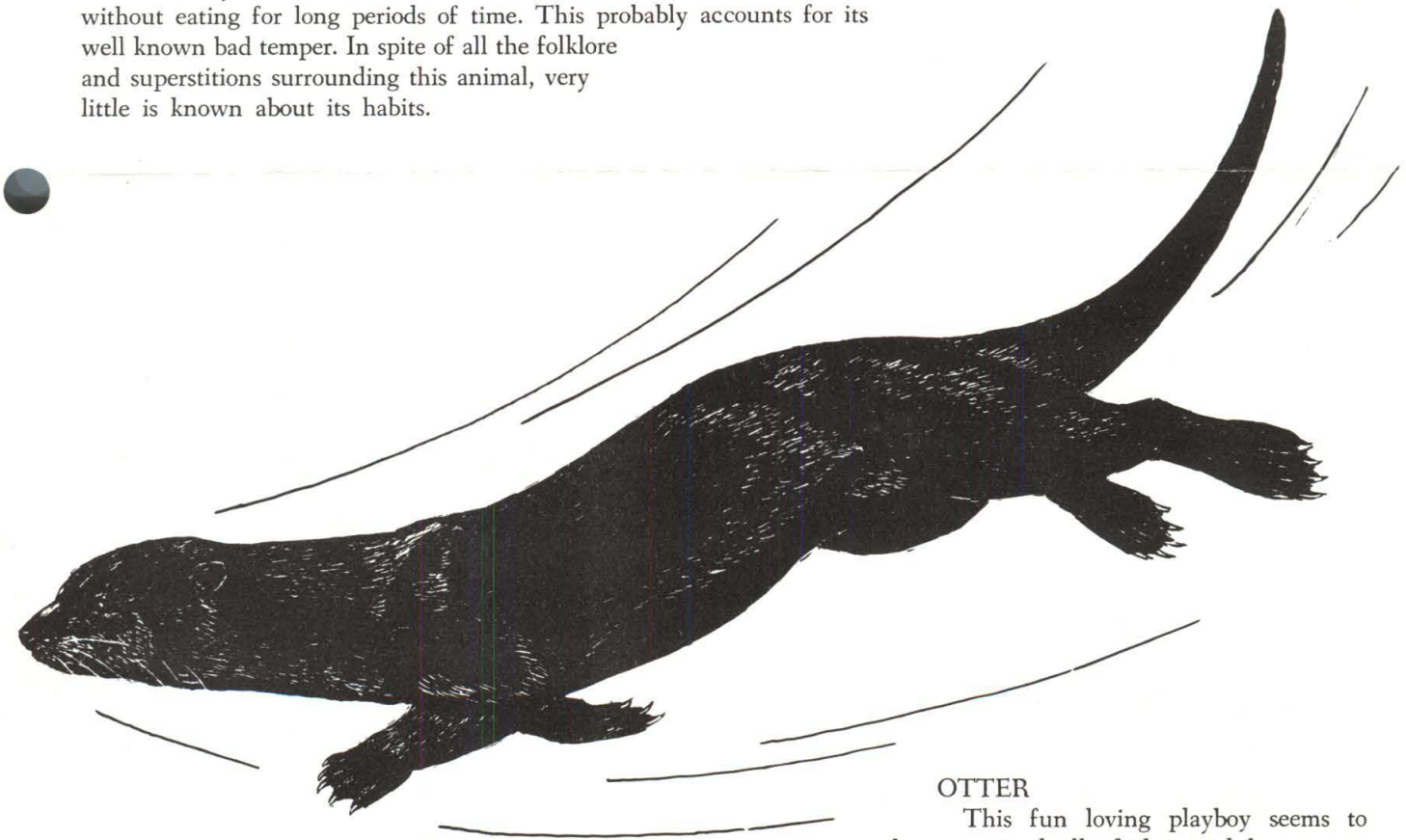
FISHER

In spite of its name, the fisher, or pekan as it is also called, will avoid swimming whenever possible. It is extremely agile in the treetops and is quite capable of overtaking even its smaller cousin, the marten. Fishers hunt mainly at night and will travel over very large distances in their search for food. They are one of the few predators capable of killing porcupines without suffering any ill effects from the quills.



WOLVERINE

There have been many tales that tell about the almost supernatural powers of the wolverine, and its destruction of trap lines. This large, powerful member of the weasel family lacks the speed to catch the more fleet-footed animals, so it must rely on carrion and slow moving prey such as the porcupine for the bulk of its diet. It is often forced to go without eating for long periods of time. This probably accounts for its well known bad temper. In spite of all the folklore and superstitions surrounding this animal, very little is known about its habits.

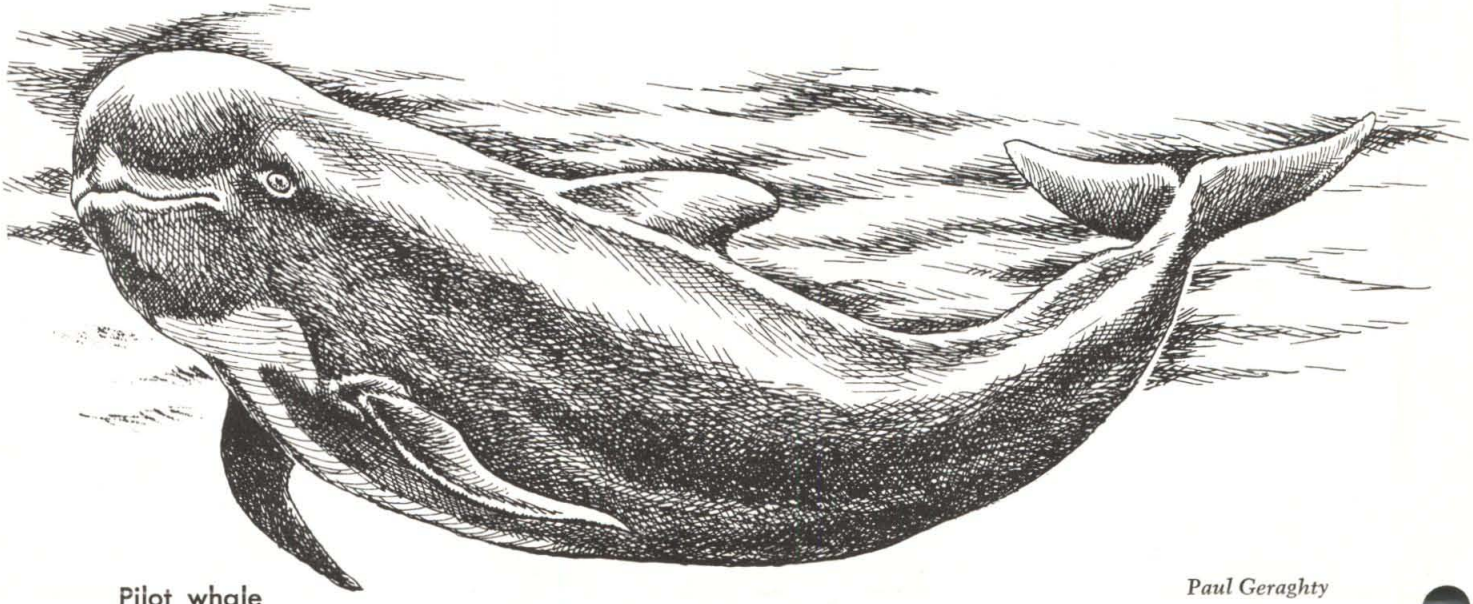


OTTER

This fun loving playboy seems to have acquired all of the good humour so clearly absent in his relatives. Otters are sociable animals that love to toboggan down muddy or snow covered slopes, play tag and other games in the water and generally have a pretty good time. The otter has adapted so well to the water that it can catch fish very easily. Unfortunately the high prices paid for otter pelts has caused heavy trapping pressure on this interesting and most desirable animal.

STRANGE CATCHES—"PILOT WHALE SKULLS"

Esther I. Lord & R. A. Chandler
Fisheries Research Board of Canada
St. Andrews, New Brunswick



Pilot whale

Paul Geraghty

Whale skulls taken by scallopers on Georges Bank are among the interesting articles that have come our way during the past few years.

The first one was taken in 1964 by M.V. *Diplomat II* on the northern edge of Georges Bank It is 25 inches long, 18 inches wide and almost complete except for the teeth. It is probably not ancient. Three more whale skulls have been found and are all similar to the first one.

Mr. Edward D. Mitchell, a sea mammal palaeontologist with the Fisheries Research Board, has told us that the first two skulls belonged to adult Atlantic pilot whales. Mr. Phillip M. Youngman, Curator of Mammals at the National Museum of Natural Sciences identified the last two as belonging to the same species.

These pilot whales travel in herds and feed almost entirely on squid. The largest male usually acts as the leader. He is the "pilot" which probably accounts for this common name for the species. They are sometimes called pothead whales or blackfish, even though they are mammals — not fish. They are small- to-medium-sized toothed whales belonging to the porpoise and dolphin family.

Pilot whales have been hunted along the Atlantic coast for many years; our best known fishery is near Dildo in Trinity Bay, Newfoundland. The whales are captured by herding them towards shore where they become stranded in shallow water and are then slaughtered in great numbers. There is a ready market for both the oil and meat, and yields can be high because large males are 20 to 25 feet long and weigh up to 3 tons. Females are a bit smaller — they grow to about 17 feet.

Recently whales have been hunted off southern Nova Scotia, the main catch being finbacks with some minkes and bottlenoses.

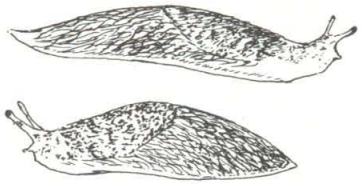
Growth layers in their teeth show that pilot whales may live to an age of 50 years. Our specimens could not be aged because there were no teeth left in any of the skulls.

These pilot whale skulls may not have such an ancient tale to unfold as the walrus tusk and the concretions previously described in our notes on "Strange Catches", but they do add sound information on the distribution of this subspecies. It cruises far and wide in the North Atlantic and these finds have provided clues for establishing its southern most range which so far has been poorly defined.

JANUARY: focus on WINTER ACTIVITIES

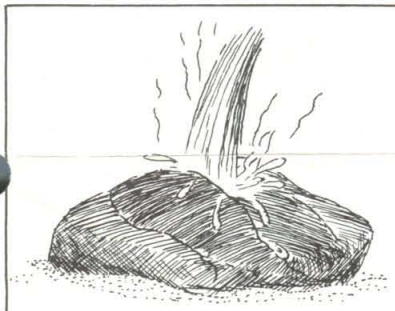
Animal Tracks

Observe footprints of birds and animals in the snow. Carefully sketch any footprints you find. Compare your sketches with a footprint chart.



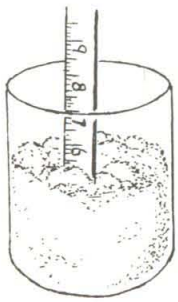
A Snail Test

Look on the undersides of boards or logs until you find a group of snails wintering inactively. Set up a number of jars containing water of different temperatures. Drop two snails in each jar and observe which temperatures make them the most active.



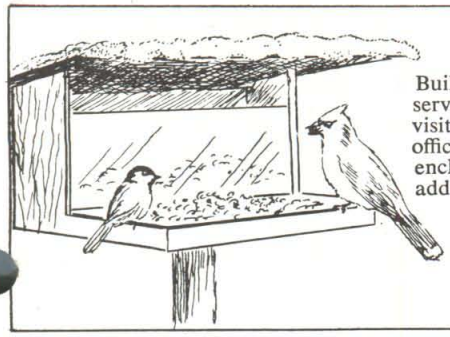
Cracking Rocks

Look for a rock with some cracks in it. Make sure that it is a cold day with the temperature below freezing. Boil water and pour it over the rock. What happens? Pour the boiling water over a rock that does not have any cracks. What happens?



The Amount of Water in Snow

How much snow does it take to make an inch of water? Use a container that has a ruler standing inside it. Did you use loose or packed snow? Estimate how much water there will be in snowbanks.



Bird Feeder

Build a bird feeder and observe the birds that come to visit it. Write to the F.O.N. office for free plans . . . enclose a stamped, self-addressed envelope.

Winter in Canada is the time of year when nature seems to be marking time and waiting for the warm sun of spring to arrive. The trees are bare and drab, the earth is frozen hard and covered with a thick blanket of snow, the animals so familiar in the summer have disappeared but are not forgotten.
Look a little more closely at the winter signs and you will find that you have discovered a storehouse of fascinating natural treasures that will keep you and your pupils intrigued for the balance of the winter.
Observe! Gather information! Set up experiments and test your ideas! Above all, get outside and take your children with you.

ACTIVITY PROJECTS

ACTIVITY PROJECT #1
Measure the depth of footprints made on packed snow. Is there any relationship between the weight of the pupil or animal and the depth of the footprints?

ACTIVITY PROJECT #2
Dig through a snow bank and thus make a cross-section. Record the thickness in inches of the faint colour changes. Record the results on squared paper. Take temperature readings at regular intervals.

ACTIVITY PROJECT #3
With a lens examine fresh snowflakes on cold, black construction paper, or aluminum pie plates painted black. Sketch some of them. Take outside temperatures each time. Does the temperature affect the general structure of the flakes?

ACTIVITY PROJECT #4
Measure the length of icicles from top to tip. Make a graph. Sketch interesting formations.

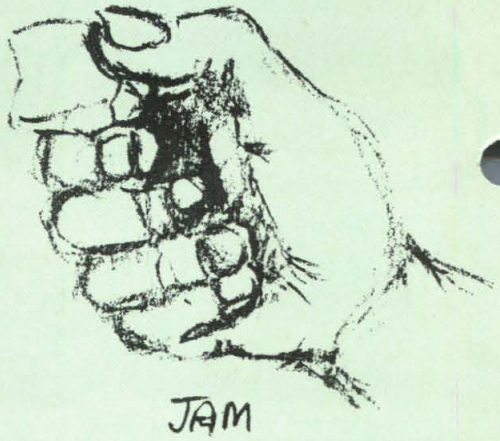
ACTIVITY PROJECT #5
Mark off several square foot areas across a blanket of snow. Dust a different colour of tempera paint on each one. Does the colour affect how the snow melts? Does the temperature of the snow vary according to colour?

ACTIVITY PROJECT #6
In late winter, walk through a woodlot noting the buds on the trees. Which trees show signs of beginning growth?

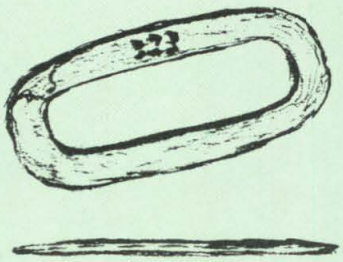
EDITOR'S NOTE: This continuing series is designed to provide information and activity ideas for teachers who want to encourage their pupils to become actively involved in nature study as an exciting feature of their outdoor education program. Text by Barry Griffiths, sketches by Don Foxall.

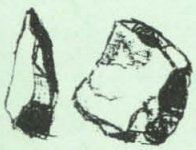
Woodlore

by John Macfie



FLINT & STEEL





Perhaps you have been led to wonder, as you struggled to get a campfire burning after an all day rain, how the old time fur-traders and voyageurs managed this nightly chore in the days before matches. Prior to 1850, when matches began to be generally available, every woodsman carried a fire bag containing flint, steel, and tinder. Equipped with these items and a measure of patience, he was able to light his pipe and kindle his campfire.

The flint and steel created heat by percussion rather than the older, more cumbersome friction method, of which the bow drill is one example. Some primitive peoples had discovered that by striking a lump of iron pyrite, a mineral composed of iron and sulphur, with a flake of flint, a hard silica rock, produced a shower of red hot iron particles. Steel, when it was invented, proved to be better than pyrites, and the flint and steel rapidly became the common means of making fire (and later of igniting gunpowder, as in the flintlock gun) throughout the civilized world. As a matter of fact the principle is still widely used in cigarette lighters.

The flint and steel shown here are of the sort used by the voyageurs of the North West Company days. I sketched them from a set recovered by a skin diver from a rapids on the French River which drains Lake Nipissing into Georgian Bay, a segment of the voyageur highway to western Canada. They had lain there, part of the contents of a bale of trade goods lost when a canoe upset, for perhaps 200 years.

Actually, the flint would be meant for selling to an Indian as a gunflint, but whole or broken gunflints were also used as strike-a-lights. Its shape identifies it as being of French manufacture (English flints were square), probably struck from a flint nodule mined from chalk beds south of Paris. The steel appears to carry a manufacturer's mark, but it has not yet been traced. The fire maker inserted the four fingers of one hand through the steel and struck the thin edge with the flint held in the other, directing the spark shower down onto a piece of tinder, often a dry bit of bracket fungus from the trunk of a dead birch tree. He then blew a spark to a glow and got a flame going by applying a bit of finely shredded cedar bark or similarly combustible material to it.

So, can I make fire with the flint and steel lost by the unfortunate voyageurs? No, all the fire I can generate is an occasional feeble spark. It seems that flint loses its sparking properties some time after being struck from the moist nodule of which it was a part. I suspect, too, that the steel gave up some of its hardness to the swift flowing French.

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