

The Young Naturalist

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THE MIXED-UP MOUNTAINS

By Yorke Edwards



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2061 1

This Hoary Marmot lives above Peyto Lake, Alberta.

N. Lightfoot

The most mixed-up part of Canada is the western mountains. The warmest part of Canada is there and perhaps the coldest, the wettest part and the driest, the highest and the lowest where mountain valleys plunge far under the sea. Naturalists find the mountains one of the most exciting parts of Canada. Many kinds of habitats are there, and this results in many plants and animals. More kinds of living things dwell in these mountains than in all the rest of Canada put together, because six life zones are there. For this reason it is easy to have unusual adventures.

It is possible in the morning to

begin walking in desert, deep in a valley among cactus, sagebrush, and Brewer's sparrows, and after hiking up steep slopes to arrive before sundown at an arctic place with arctic flowers, nesting water pipits, and patches of snow defying the sun, even in August. This walk to the Arctic was first through grasslands, then through well spaced ponderosa pines and Douglas firs, then through dense spruce and alpine fir, and finally beyond timberline into alpine meadows gay with flowers.

The life in our mountains has unusual variety. Some of the lowest valleys are fjords and straits flooded

by the sea. Packs of killer whales cruise these valleys, and rocky shores contain the dens of octopuses. Some forests near the sea are the wettest in Canada. They once grew huge trees. Some Douglas firs there have lived for 1,300 years and others grew upward over 300 feet to become the tallest trees in Canada. Also on this warm coast are black widow spiders, licorice ferns growing high in trees, cougars, and Canada's only broad-leaved evergreen tree, the arbutus. Dry valleys inland have badgers, bunchgrass, black-billed magpies, ponderosa pines, and a real boa con-

Continued next page

stricter called the rubber boa. Middle slopes have spruce forests with the gray jays and ravens found in most spruce forests, but there are mountain things too, like thickets of white rhododendron, and purple acres of the orchid called calypso. Just above the trees are meadows that must be the most scenic wild flower gardens in the world. Higher yet the rocks have white-tailed ptarmigan, a grouse that turns white for winter, and

mountain goats which are always white, except when mud baths soil their coats. Some high places have glaciers, habitats made of snow and ice. Red snow is found there, caused by minute algae living in the snow, while rivulets on the ice are the homes of ice worms, transparent little nematodes that feed on dust.

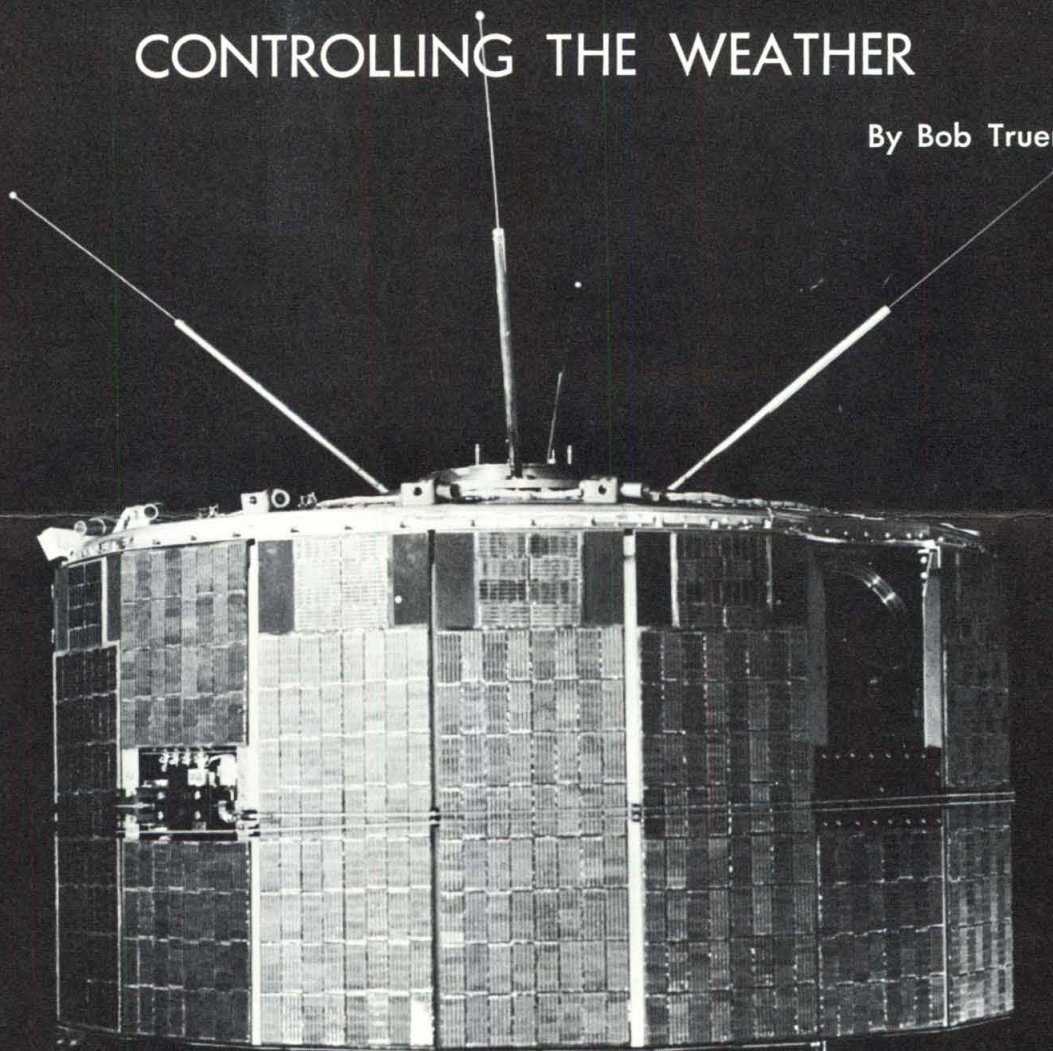
Geologists call this mountain region the Cordillera. Not all of it has mountains. There are plateaus too,

like in central British Columbia. Canadians should be careful not to call this region the Rocky Mountains. The Rockies are found only near the border between Alberta and British Columbia. There are many other groups of mountains that are just as important. So when someone says that Vancouver is in the Rocky Mountains, he is showing how little he knows about Canada.

The End

CONTROLLING THE WEATHER

By Bob Trueman



This weather satellite is in a 460-mile-high orbit, and circles the earth every 100 minutes. N.A.S.A.

The beep, beep, beep of a weather satellite circling our earth and sending back electronic photographs of the world's everchanging cloud patterns, the sweeping antenna of a weather radar receiving the returning radio signals, the high flying radiosonde instrument carried aloft by its hydrogen balloon are all part of modern day attempts to gather complete information about our

weather. In the hands of the meteorologist, this information is transformed into more accurate short and long range weather forecasts and predictions. As well, research meteorologists have used these and other instruments extensively in their investigations of precipitation, tornadoes, hurricanes, and thunderstorms.

THE RAINMAKERS

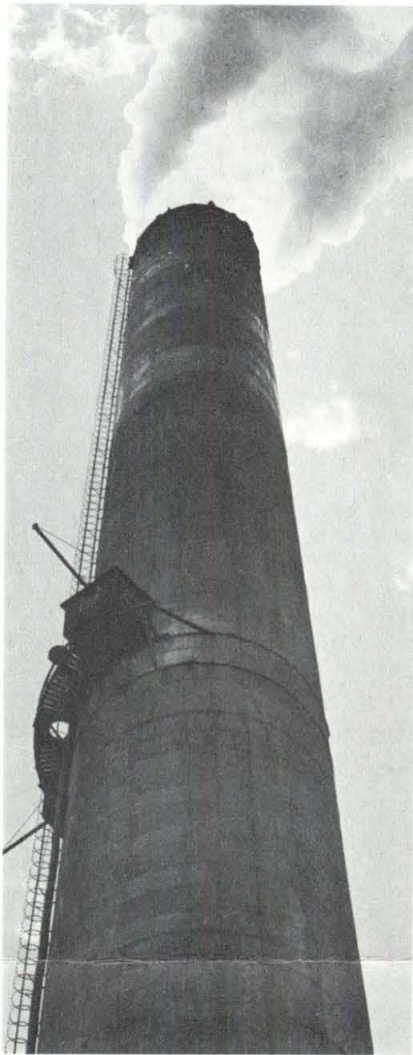
But it is one thing to be able to predict more accurately what is going to happen; it is another thing to do something about it. You have probably heard people say, "Everyone talks about the weather but nobody ever does anything about it." This is no longer true. Perhaps, though, it never really has been true. Certainly the Indians of North America used to perform their rain dances and there are many stories in the Bible of man's early attempts to control the weather. During prolonged drought periods, "rain-makers" were almost certain to appear who promised, for a certain amount of money, to make it rain. Large fires, chemicals, and even cannon fire were tried without great success and, if by chance rain happened to follow them, there is no scientific evidence to prove they caused it.

CLOUD SEEDING

Today, however, meteorologists and scientists around the world are tackling the problems of weather control with increasing interest. Probably the best known of these attempts has been with cloud seeding to produce rain. Back in November, 1946, Vincent Schaefer sprinkled six pounds of powdered dry ice from an airplane into a cloud and snow subsequently fell although none reached the ground. This was man's first attempt at scientific rain making and came about after the discovery that dry ice pellets cause the tiny cloud water droplets to freeze and to serve as nuclei for snow crystals which become heavy enough to fall to the ground. Rain is produced in much the same way but it depends on higher air temperatures. As well as dry ice, silver iodide crystals have also been used to start rainfalls but both methods are expensive, dangerous, and although they have been valuable in helping scientists understand the nature and causes of precipitation, they have not, unfortunately, been much help to farmers in drought-stricken regions.

FROST THREATENS THE FARMER'S CROPS

To the farmer who depends so much on weather conditions for the success of his crop production, frost



N.F.B.

Air pollution has affected the climate and weather in recent years.

presents a real threat. Several methods are open to the farmer to prevent the layer of cold nighttime air, which may move over his fields, from possibly destroying his whole year's crops. He may use huge fans to stir up the air or he may heat the air with oil burning heaters called smudge pots. The dense cloud of smoke which is produced spreads out over the area and helps reduce some of the heat lost by radiation. Helicopters and airplanes have been used in emergencies to act as giant fans, although this is very expensive. In the orchards and vineyards of Europe, protection against low temperatures has been achieved by the use of fine water sprays.

AIR POLLUTION

Although not intending to, man

has greatly affected the climate and weather in recent years. Reduced visibility, less sunshine, smog, increased amounts of sulphur dioxide and carbon dioxide in the atmosphere, strange smells and a burning feeling in the eyes are not due to weather and climate but are often the effects of air pollution. Under extreme conditions of pollution accompanying a fog, death can even result. In December, 1930, thirty-six persons died in the Meuse Valley, Belgium; at Donora, Pennsylvania, twenty-one persons died in October, 1948; and in December, 1952, nearly 4000 deaths were recorded in Greater London, all of them attributed to air pollution.

THE INDOOR WEATHER

Perhaps we have been most successful in our attempts to control the weather indoors. We now know how to get, inside our buildings, any kind of weather we want. With modern air conditioning and heating, we can have the temperature we want. We have equipment to put moisture into the air and equipment to take the moisture out. We can take all the dust, soot and pollen out of the air by means of filters and washers. We can stir up gentle or strong breezes with electric fans. We can even give ourselves a Florida tan, if we wish, with sun lamps and heat lamps.

WHAT OF THE FUTURE?

As our understanding of the weather increases, scientists hope to be able to prevent destructive hurricanes from moving inland by controlling the movement of its "eye," perhaps with nuclear explosives. We may be able to prevent heavy snowfalls in cities by forcing clouds to drop their snow before they reach big cities and prevent hail from ruining crops by forcing the rain to fall before it is blown upwards to form hail. Hot, dry deserts could become fruitful orchards, and forest fires could be put out quickly if we could produce a rain cloud over the burning area once scientists discover how to seed clouds more effectively. Whatever the future holds, man's control of the weather is bound to bring about a safer and more abundant world for all.

The End

MOURNING CLOAK
(*Nymphalis antiopa*)

VICEROY
(*Limenitis archippus*)

Some Familiar Canadian Butterflies

BLACK SWALLOWTAIL
(*Papilio polyxenes asterias*)

by Darryl Stewart

Although not comparable with the more exotic species of the tropics, Canada can still boast of a goodly number of attractive butterflies that are worthy of more than passing interest. It is most encouraging to note that many of our more splendid species like the Tiger Swallowtail, Great Spangled Fritillary, Mourning Cloak and Milbert's Tortoiseshell, are all fairly common and widespread throughout much of the country.

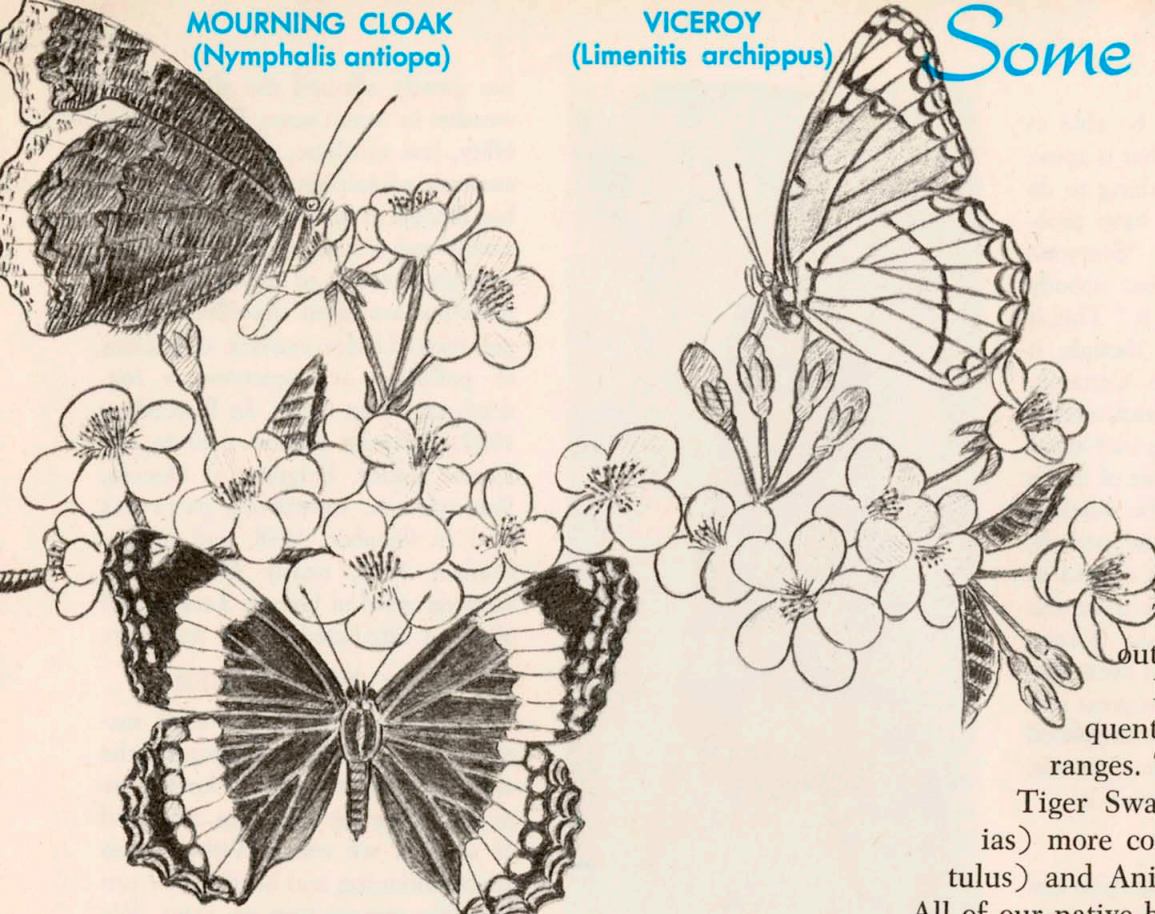
In the distribution of butterflies in North America, there is frequently a faunal change occurring on each side of the Rocky Mountain ranges. These are for the most part closely related counterparts. The Canadian Tiger Swallowtail (*P. glaucus canadensis*) and Black Swallowtail (*P. polyxenes asterias*) more common in the East, are replaced respectively by the Western Swallowtail (*P. rutulus*) and Anise Swallowtail (*P. zelicaon*) in British Columbia.

All of our native butterflies except for the Monarch hibernate throughout the winter in their various stages, most often as crystalids, but many also hibernate in the egg, caterpillar and adult butterfly stage. Those species that hibernate as adult butterflies (generally referred to as imagos) which are limited to the family "Nymphalidae", are generally the first to be seen in the spring. The Mourning Cloak, the most common of this group, is invariably the first to make its reappearance. Sometimes an unusually warm spell of weather in late winter will entice them out of their sleeping quarters. Then one can observe the unusual sight of butterflies flying over snow.

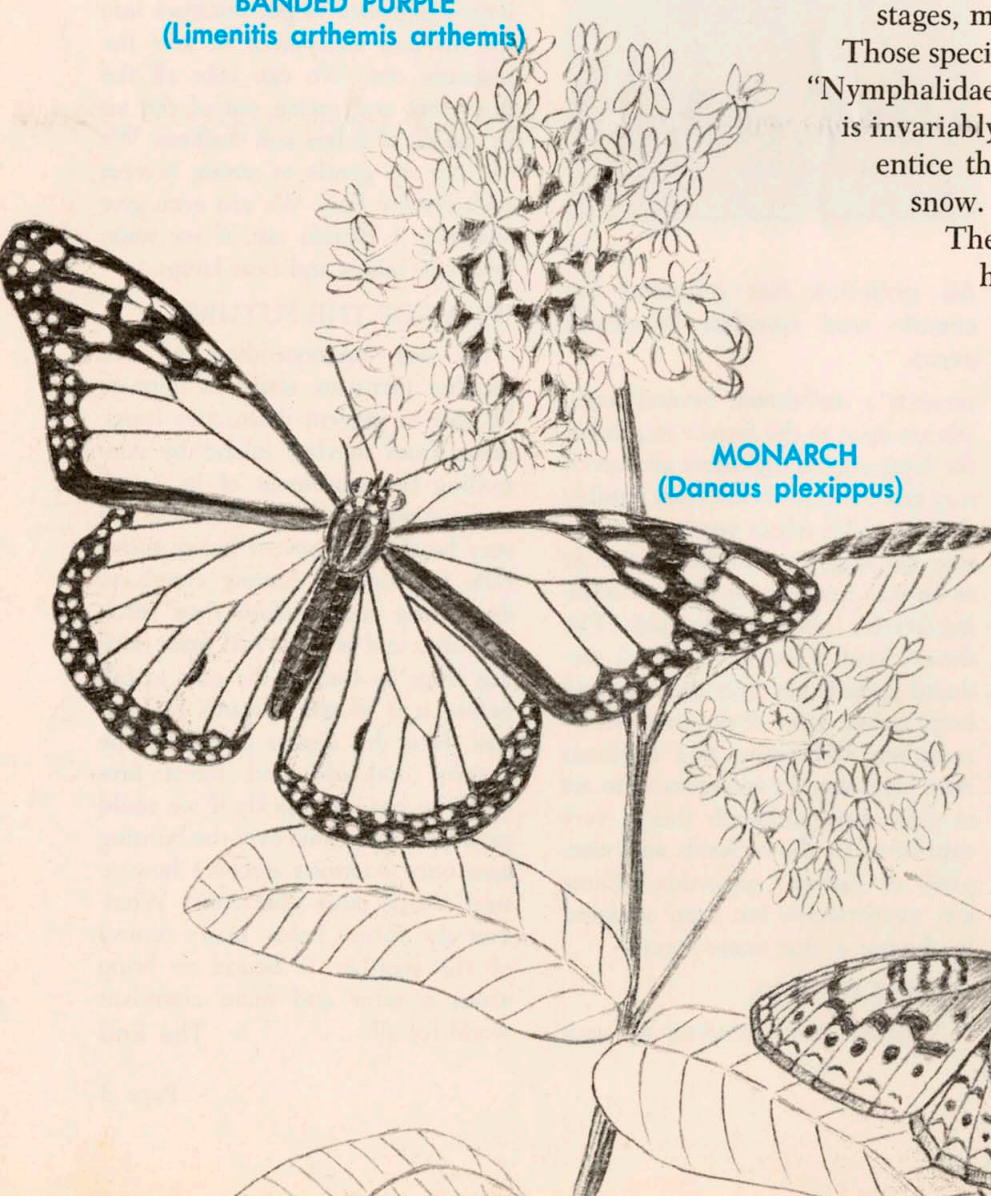
The average life span of the adult butterfly is very short, about two to three weeks. Those that hibernate in this stage of course live considerably longer, often nine to ten months.

The female butterfly may lay up to 200 to 500 eggs at a time but only a very small proportion of these ever reach maturity. Butterflies have many predators that yearly take heavy toll of their numbers. These include birds, lizards, mice, beetles and spiders.

However the greatest source of peril is incurred by parasitic flies and wasps that lay their eggs (ovaposit) into the caterpillar or the egg of the butterfly, and eat away the inside of their host eventually killing it in the process.

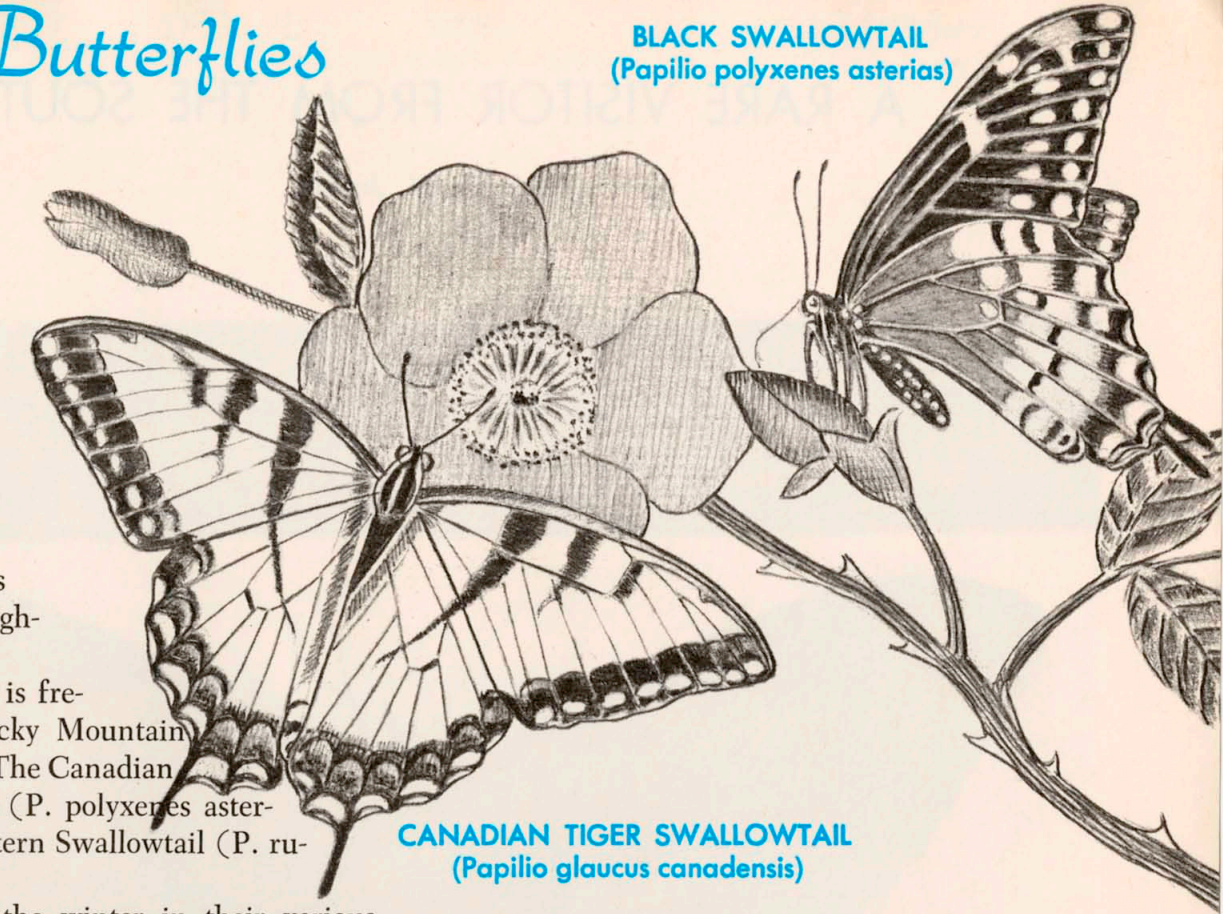


BANDED PURPLE
(*Limenitis arthemis arthemis*)

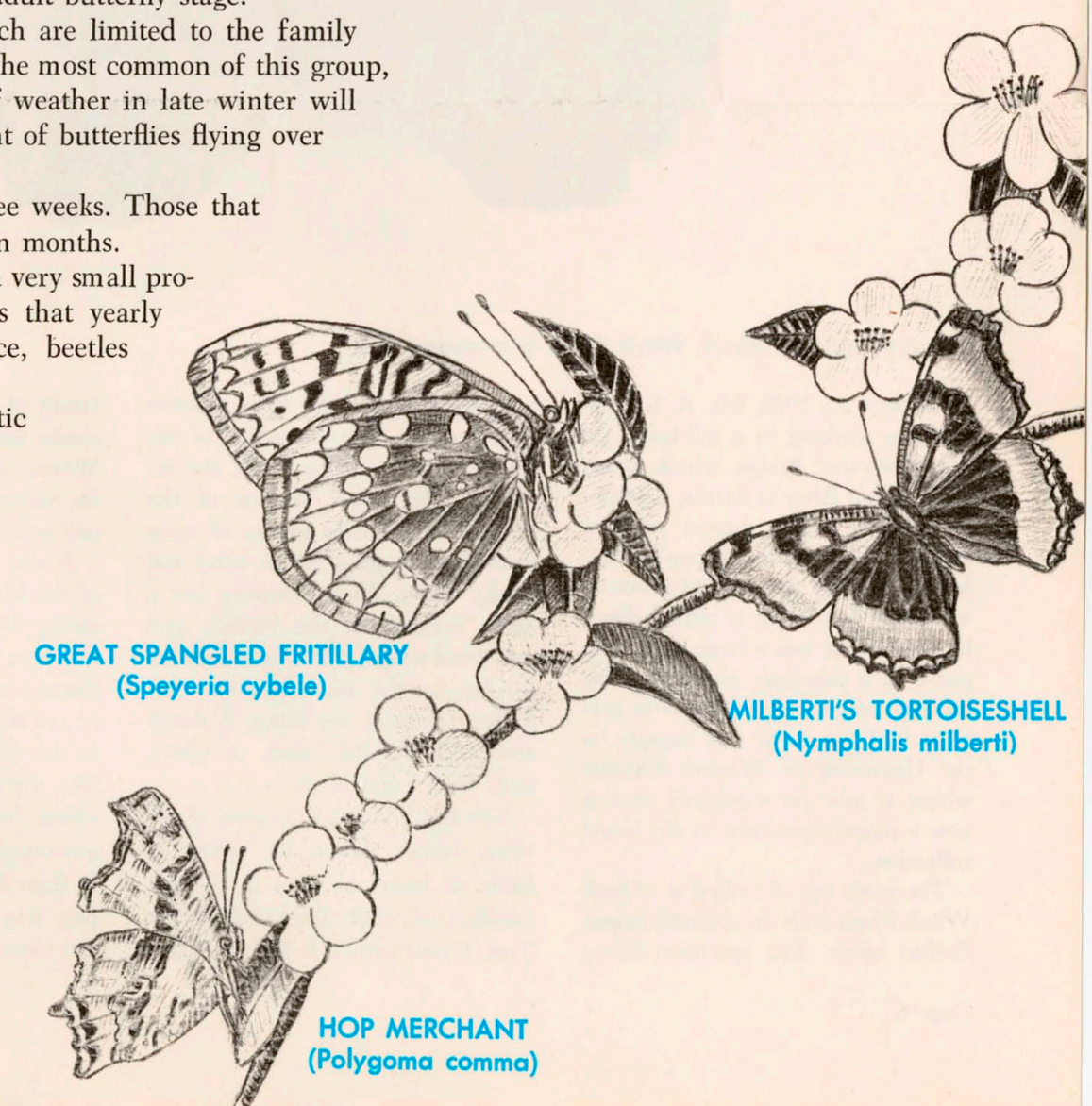


MONARCH
(*Danaus plexippus*)

ATLANTIS FRITILLARY
(*Speyeria atlantis*)



CANADIAN TIGER SWALLOWTAIL
(*Papilio glaucus canadensis*)



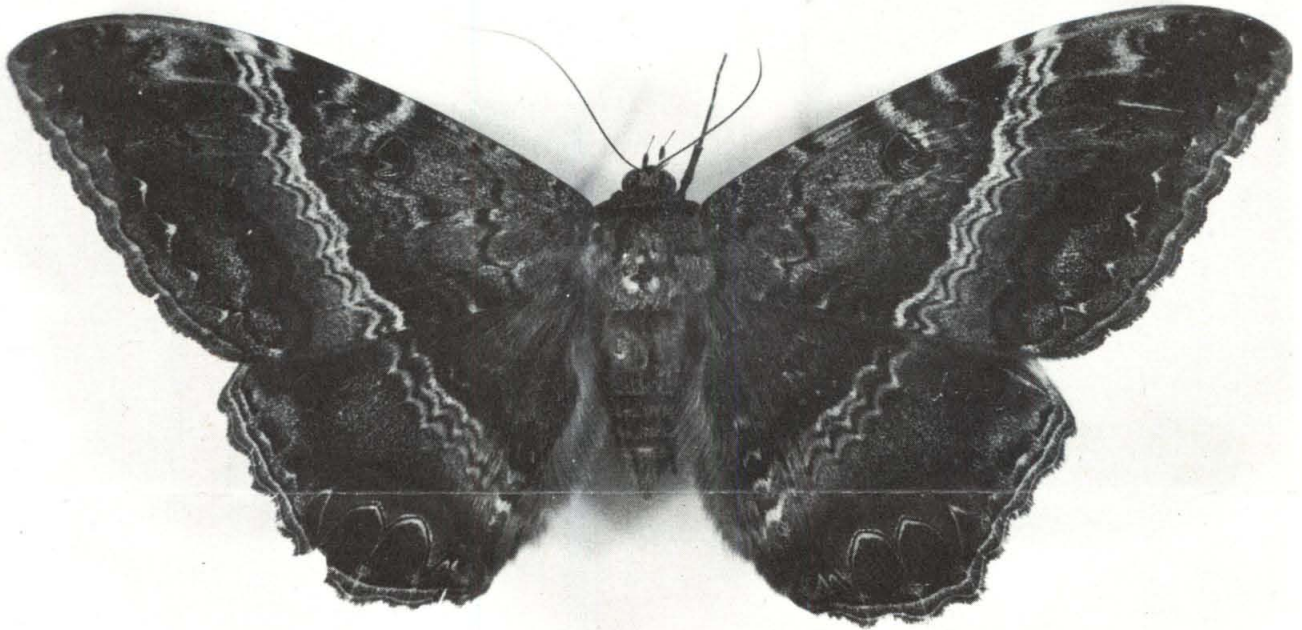
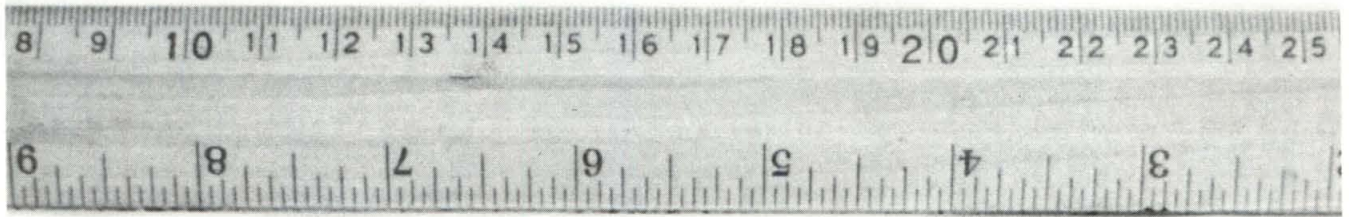
GREAT SPANGLED FRITILLARY
(*Speyeria cybele*)

MILBERT'S TORTOISESHELL
(*Nymphalis milberti*)

HOP MERCHANT
(*Polygona comma*)

A RARE VISITOR FROM THE SOUTH

By W. W. Judd



(Actual size) The Black Witch Moth is a strong flier.

On July 20, 1968, Mr. R. C. Hillary was working in a toll-booth on the Bluewater Bridge which spans the St. Clair River at Sarnia, Ontario. At mid-day a large brown creature flew into the booth and flapped about. Mr. Hillary at first thought that it was a bat but when it settled down he saw that it was a large moth. He put it in a container in the freezing compartment of a refrigerator to preserve it. Later on it was brought to the University of Western Ontario where it was photographed and is now a pinned specimen in the insect collection.

The moth was identified as a Black Witch Moth with the scientific name *Erebus odora*. The specimen has a

wing span of six and three-quarters inches, much larger than that of our largest native Ontario moth, the ce-cropia. The upper surface of the wings has an ornate pattern of wavy lines of white, gray, brown, black and smoky violet. Each forewing has a dark "eyespot" at the middle, and each hind wing a pair of angular dark patches at the hind borders. The lower surface of the wings is decorated with parallel bands of white, gray, brown and black.

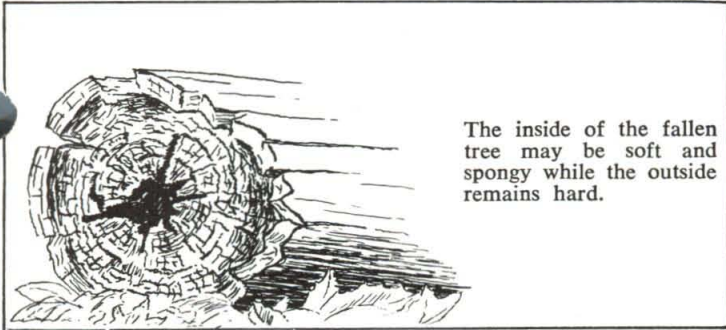
The Black Witch is a native of the West Indies where its caterpillar feeds on leaves of trees in the pea family, particularly the Pudding Pipe Tree, *Cassia fistula*. It is in the large

family of "cutworm moths" which includes important ones like the Army Worm and Corn Ear-Worm, but it far exceeds in size any of our native moths in this group.

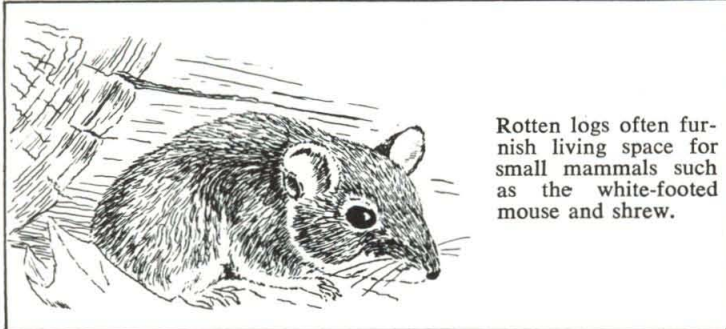
It also lives in the southern states of the United States. The moth is a strong flier and after emerging from the pupa in summer it can fly a long distance northward in North America or can alight on ships well out at sea in the Atlantic Ocean. Rarely it gets into southern Ontario as an exotic visitor from the south. Perhaps the one caught by Mr. Hillary had flown in from Michigan or had hitch-hiked part way on a ship sailing through the Great Lakes.

The End

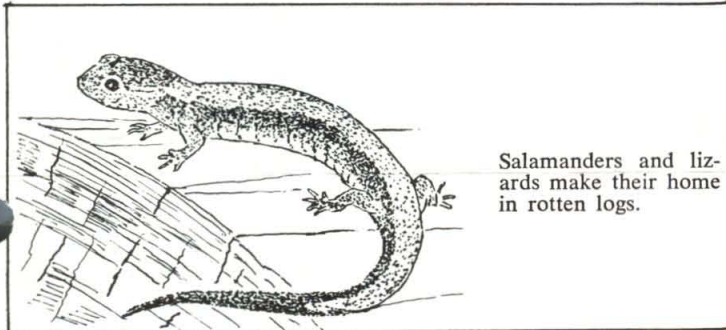
MAY: focus on a ROTTEN LOG



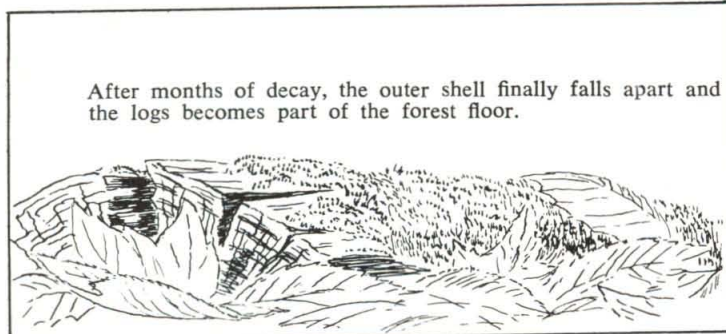
The inside of the fallen tree may be soft and spongy while the outside remains hard.



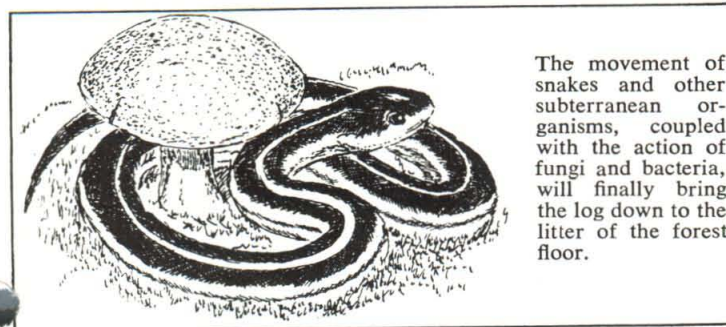
Rotten logs often furnish living space for small mammals such as the white-footed mouse and shrew.



Salamanders and lizards make their home in rotten logs.



After months of decay, the outer shell finally falls apart and the logs becomes part of the forest floor.



The movement of snakes and other subterranean organisms, coupled with the action of fungi and bacteria, will finally bring the log down to the litter of the forest floor.

Plant and animal life can be studied very easily in the limited environment of a rotten log. One of the good features of such a study is the availability of rotten logs. These logs may be found deep in the woods or at the edge of the road.

While a tree is still alive and standing insects and other invertebrates inhabit the outer wood and bark. Eventually the tree is weakened to such a point that it falls. By this time the bark is usually off and the wood will be eaten further by boring animals. The effects of fungi will also probably be showing.

This new group of plants and animals change the wood entirely until a new community is established in the fallen tree.

In the accompanying diagrams we show some of the features of the new community that locates in the rotten log.

The next time you go on a hike, stop and take a second look at that rotten log. You will not be disappointed.

ACTIVITY PROJECTS

PROJECT #1 DATA SHEET STUDY OF A ROTTEN LOG

1. Is the bark still on the log? _____
2. Can a nail be pushed by hand into the wood? _____
3. Are borings apparent in the wood or on the surface? _____
4. Estimate how long it has been dead. _____
5. How many invertebrates have you seen. _____
6. Did you see any salamanders or lizards? _____
7. Are any mammal runways apparent? _____
8. Is the wood moist or dry in this specimen? _____

PROJECT #2

Locate several rotten logs of the same species, but in various stages of decay if possible.

STAGE 1 — The standing dead tree.

STAGE 2 — The newly fallen tree.

STAGE 3 — The log rotting inside but hard on the outside.

STAGE 4 — The completely rotten log.

What changes take place in the living inhabitants of the tree during the four stages?

CORRECTION. In last month's Activities the description should have read. A. Diving Beetle B. Mosquito Larva and Pupa C. Fairy Shrimp D. Water Scorpions.

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

WHAT'S BITING YOU?

(Part 1)

Now that it is known that the cheap and extremely effective pesticides like DDT, which promised to make wide-spread area control of annoying insects possible, kill more than flies, it looks like combatting biting bugs will remain a purely personal battle for some time to come. If knowing your enemy doesn't help defeat him, it at least lends a little interest to the encounter.

There are five sorts of biting insects that may trouble the Ontario outdoorsman, depending on where and when he travels. The rule of thumb that they get worse the farther north one goes remains valid all the way to the top of the Province, in my experience. You can learn about them in detail from books, but I will give you some of my observations, which are based on a long, reluctant association with them. Surprisingly, all species have good points as well as bad, relatively speaking. I will begin with the two kinds that are most notorious in the more northerly latitudes.. A later issue will deal with the other three.

Black fly The curse of the north, where it occurs in incredible numbers and lasts all summer. It subsides after mid-June in the more southerly

bush country. The black fly breeds in running water, hence canoeists encounter them at their thickest. It flies soundlessly and attacks with a bite you may not feel, leaving an open wound which can develop complications in certain people. But these unfortunates seems to develop immunity after a few days. Other insects don't crawl under clothing or into ears to bite, but the black fly does. Its redeeming features are that it won't bite inside a tent, and it disappears miraculously at sundown.

WHAT CAN YOU DO?

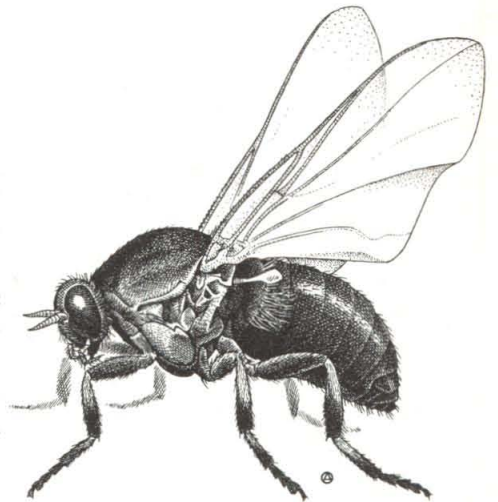
To combat the black fly wear light coloured clothing (new blue denims are a real black fly magnet), long sleeves and snug collar, and stuff your trouser cuffs into boot tops or tie them around your ankles. Those who are prone to infection or allergic reaction (the black fly leaves a chemical in its bite which causes the latter) need a head net and perhaps even gloves. Spray cap, clothing, and packsack with a fly killer containing pyrethrum, and make frequent applications of fly repellent to exposed areas of skin.

Horse fly The droning, inch-long "bulldog" of the northern regions.



Fly killer may be sprayed on clothes but use only repellent on skin.

The only place I found them a real nuisance was in the Hudson Bay Lowland. They appear only on hot days, and even then they may subside noticeably when the sun disappears behind a cumulus cloud. Easily swatted and not often very numerous, they take a real bite out of you if given the chance. They are too big to be bothered by repellent, but are not active at night.



A. Odum

The black fly occurs in the north in incredible numbers.

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