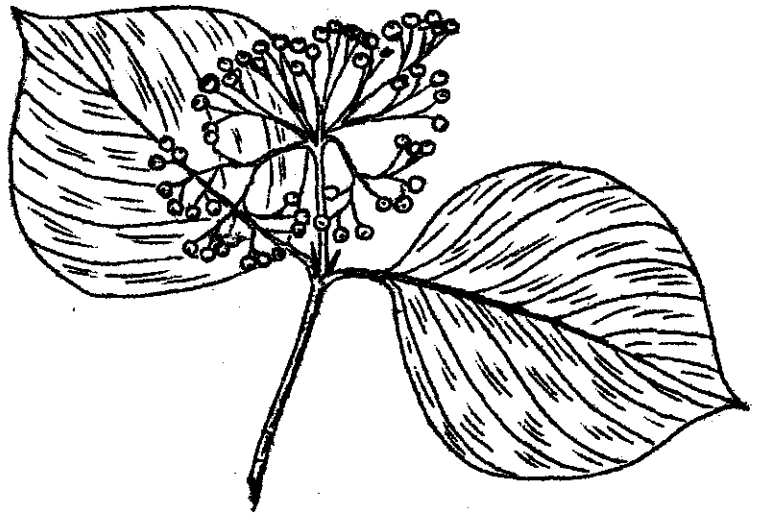


Blomidon
Naturalists
Society
Newsletter



Volume 6, No. 3,4

September, December, 1979

The BNS Newsletter is published on the equinoxes and solstices.

Editors: Jean Timpa and Roy Bishop

Art/Production: Roy Bishop

NEW EXECUTIVE FOR BNS

At the meeting of Dec. 3, several members expressed their concern that the BNS should continue. On Jan. 11, eight of these members met and arrived at a slate of nominees for the Executive for the coming year. These are:

President: Peter Austin-Smith, Wolfville, 542-2109

Vice-Pres: Sherman Williams, Avonport, 542-5104

Sec.-Treas: Roy Bishop, Avonport, 542-3992

Editors: Jean Timpa, Wolfville, 542-5678

Roy Bishop, Avonport 542-3992

Program

Committee: Alf Gerritse, Canning (Chairman) 582-3206

Jim Wolford, Wolfville, 542-5278

+(The President)

Youth Committee: Peter Armstrong, Wolfville
(plus?)

Further nominations may be made at the March 17th meeting and elections will be held at that time.

Upcoming Meetings (put these on your calendar!)

February 20 (Wed.) Don Dodds: "AFRICAN MAMMALS"

March 17 (Mon.) Ross Anderson: "BIRD BANDING ON BRIER ISLAND"

April 21 (Mon.) Jim Wolford: "SPRINGTIME AMPHIBIAN ACTIVITY"

All meetings will be held at 8 p.m. in Room 241 of the Beveridge Arts Centre, Acadia. (Room 244 on March 17)

1979-80 DUES

This Newsletter is two issues in one because there was not enough money to produce the September issue. Dues for this year have been set at \$4.00, and should be sent to the proposed Secretary-Treasurer, Roy Bishop, Avonport, N. S. BOP 1B0. Only those who have paid will be kept on the mailing list for future meetings and Newsletters.

Visits to Offshore Islands

Cyril Coldwell
Gaspereau, N.S.

During the Summer, members of the Acadia Biology Department made a number of visits to some of the islands along the Nova Scotia coastline, mainly for the purpose of banding and observing breeding bird populations.

On June 30, a trip was made to Boot Island, Kings County to band Black-back Gulls in the large colony located there. 167 fledglings were tagged and released on this date. Gull populations seem to be maintaining past levels so there are probably 1,000 pairs of both Black-back and Herring Gulls residing here with the Black-backs accounting for two-thirds of the total count. Other species found breeding here are as follows: 26 Great Blue Heron; possibly 100 Double-crested Cormorants; several Ringneck Pheasants; 1 Long-eared Owl; 1 Raven; 6 to 8 Crow nests.

April 27 found the crew encamped on Bon Portage Island, Shelburne County, equipped with mist nets and banding gear to do species check on this outpost. Although it was a bit early for Leach's Petrels, 14 were banded and released. Among the more common passerines banded was a Fox Sparrow; the bird we believe is breeding here although at present no nest has been found.

July 6 found us back on Bon Portage again for three days. This time we banded 746 Petrels during three nights of netting. Two of these birds were carrying bands placed on them two years previous by scientists working on Kent Island off the coast of Maine. Breeding pairs on Bon Portage are estimated in the thousands. Two Fox Sparrows were caught, one a newly fledged bird which further indicates this species is nesting here. When a nest is found it will be a first record for Nova Scotia.

There appears to be only one Osprey nest on the Island and at this time contained two small young. Gulls nest all over the open bog and grassy areas with the Herring Gulls being the large majority. Two more trips were made to Bon Portage, one early October - one early November. The highlight of the first trip was the abundance of Yellow-billed Cuckoo's a relatively rare bird in Nova Scotia. 14 were banded with many more sightings. Petrel numbers were down with about a dozen banded. Other species of special mention were 16 Sharp-shinned Hawks, 2 Merlin, 2 Long-eared Owls, 1 White-eyed Vireo, 1 House Wren, 1 Towhee, 1 Connecticut Warbler, 1 Brown Thrasher, and 1 Phoebe, plus many other passerines too numerous to mention.

By early November many species had passed through, but 16 Saw-Whet Owls were captured and banded along with 3 Long-eared Owls. The Petrels had mostly left although several were caught.

A number of trips were made to Brier Island, Digby County, to assist Ross Anderson in his banding operations there. This Fall he was able to band over 4000 passerines, over about a 5 week period. Although I do not have his species count, some of the more interesting ones were: 76 Sharp-shinned Hawks; 5 Merlin; 2 Sparrow Hawks; 1 Golden-winged Warbler; 1 Blue-winged Warbler; 2 Yellow-billed Cuckoos.

Another bird of interest to Nova Scotians is an adult Golden Eagle which was picked up in Cumberland County on the roadside in a starved and/or weakened condition and taken to Shubenacadie Wildlife Park for a week where it began to recover. At present it is at my place in Gaspereau where it will be released soon.

From Oscar Morehouse, Wolfville

About mid-November on a clear day and very high, Oscar spotted a flock of 15-20 Snow Geese. Three trailed behind which he was able to observe easily. Snow Geese are not often seen in or over Nova Scotia.

A Catbird hung around with the robins until approximately Nov.25, when all the birds disappeared. This is very late for a Catbird to hang around.

On December 2, Oscar sighted a Yellow-breasted Chat in the Ravine behind the hospital and has seen it three times since. In several years past a Chat has appeared this time of year in the Ravine area.

On December 4 Oscar noticed the Crows and Bluejays were making more of a raucous than usual. A walk into the Ravine revealed a Barred Owl.

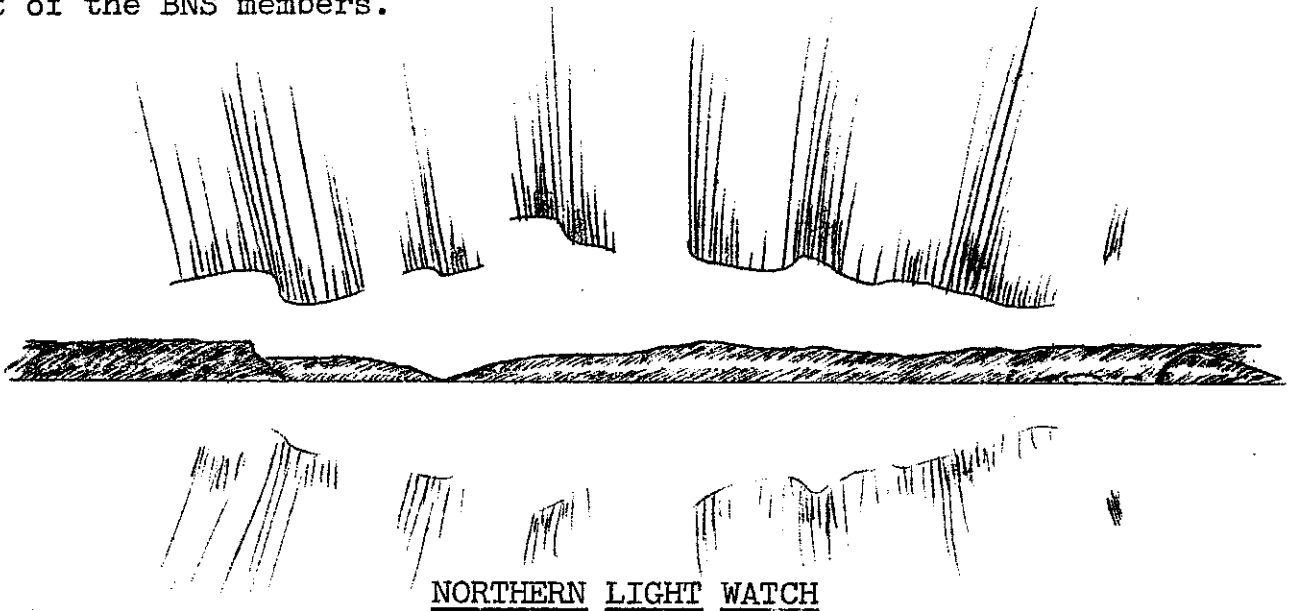
At his feeders or nearby, Oscar has seen many White-Throated Sparrows, one Song Sparrow, Chickadees, a few Juncos, one or two Goldfinch, many Evening Grosbeak, Downey Woodpeckers, three or four Purple Finch, and quite a few Pine Grosbeak, which usually migrate, are still hanging around.

From Cyril Coldwell, Gaspereau

The Golden Eagle was released successfully November 29 at Shubenacadie where there are quite a few Bald Eagles. First it was taken to the veterinarian for complete x-rays to determine if its downfall to ground level had been caused by gunshot wounds or broken bones. No evidence was found of either, so its unhealthy condition is still a mystery, but perhaps due to slight poisoning.

Five Bald Eagles have already arrived at the feeding station which Cyril maintains in the Gaspereau Valley. Usually they have not availed themselves of these free lunches until January or February.

Anyone having any odds and ends of interesting sightings please call 542-5678 before our next Newsletter, and we will share them with the rest of the BNS members.



NORTHERN LIGHT WATCH

Again, Roy Bishop (542-3992) or Jean Timpa (542-5678) will be glad to call you anytime of night if you want to see Northern Lights. Shall we put you on our list? This is the 11th year of a cycle of sunspot activity and presumably the most spectacular. So, if your phone rings in the middle of the night (only if you request us to do so!) don't jump too far. Aunt Kate hasn't died yet and left you a million!

TORPIDITY IN HUMMING BIRDS?

Robie Tufts
Wolfville, N. S.
Sept. 15, '79

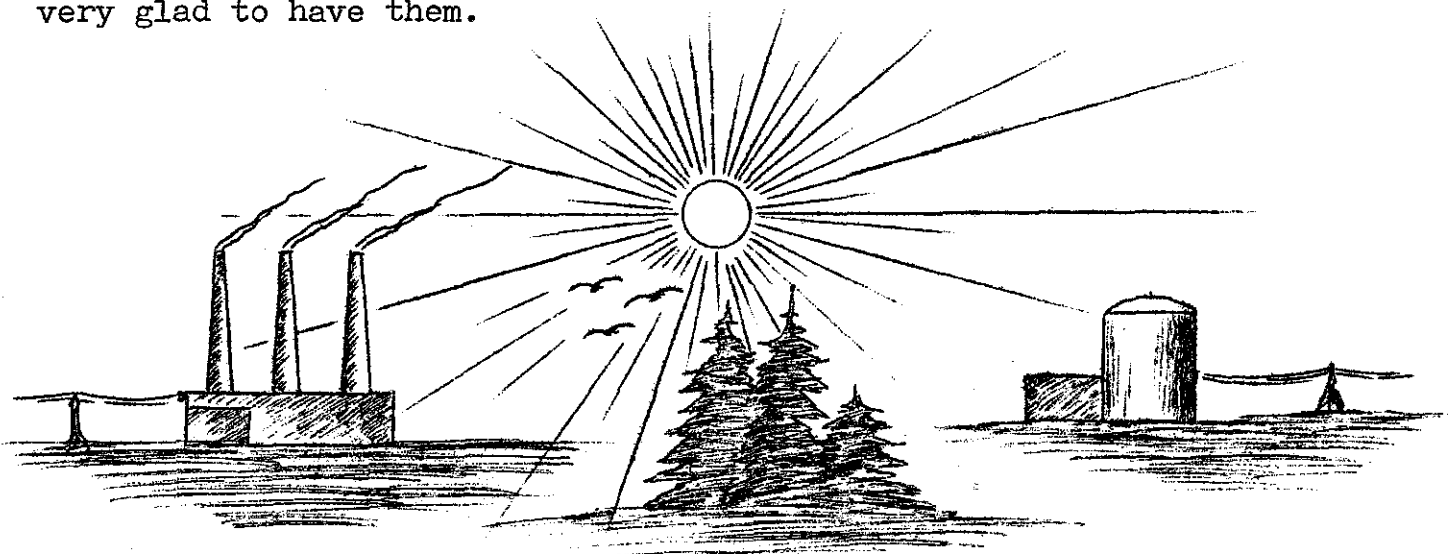
During evening twilight on a rainy day in May many years ago, a neighbour phoned to tell of a Ruby-throated Hummingbird that seemed to be in serious trouble. On arrival I found it perched on a dead twig of an ornamental shrub near his verandah. He said it had been there for 20 minutes or longer and had permitted him to stroke it. On examination it proved to be a male and was drenched "to the hide", as a result of exposure to the heavy downpour.

Equipped with a small box copiously lined with cotton wool, I attempted to remove it by hand but its grasp to the twig was so tight that I was eventually forced to break off the twig with the bird still attached. It was finally wrapped in well-warmed wool with plenty of breathing space and left in the box overnight. Next morning I was pleased to note what appeared to be complete recovery, for when I opened the box outside it buzzed off quite normally and when last seen was busily engaged probing the blossoms of a cherry tree close by. I naturally assumed that my application of warm wool had saved the bird's life, and for the time being the incident was all but forgotten.

Several years later I chanced to read in ornithological literature two separate accounts which told of hummingbirds becoming torpid at the approach of night-fall and remain in a state of suspended animation til morning. I can recall that one of the writers was the President of the Kingston (Jamaica) Bird Society. I have forgotten the other's identity. However, the reasons both writers gave by way of explaining why these birds so react were substantially the same. They told us that a Humming Bird's metabolism (food intake transformed into energy) is exceptionally rapid. This would be due to the spectacular and unique manner of flight of Humming Birds which is highly energy-consuming. Unable to feed at night (the normal period of fasting), Nature has remedied the situation by putting Hummingbirds into an abnormally sound slumber or state of torpidity.

Based on the foregoing evidence it has long been my belief or understanding that it was common knowledge throughout the realm of ornithology that Hummingbirds become torpid as darkness approaches. But recently I had an opportunity to discuss the subject with Canada's leading ornithologist, Dr. W. Earl Godfrey, who, I was surprised to find, holds a decidedly divergent opinion on the subject. Our discussion ended by his admission that some Hummingbirds may become torpid. To me this thesis is not satisfactory; they either do or they don't, and I am pursuing the subject further in an effort to determine the facts.

If any of my readers has any comments to offer, or any relative information to add to this topic of torpidity in Hummingbirds, I'd be very glad to have them.



WHENCE ENERGY

Roy Bishop
Avonport, N. S.

Energy has joined religion and politics as a common topic of conversation. Indeed, aspects of the so-called energy crisis are often pursued with almost religious fervor, while politics are at least as much a factor in the energy picture as technology. However, it is not the purpose of this article to delve into these topics, nor into the relative merits and hazards of the various sources of commercial energy. I wish instead to describe energy in a broader context, broader in the dimensions of space and time. Such a description involves astronomy, and is of value for the insight and framework it provides.

To begin, the matter of energy conservation must be understood. When all forms of energy are accounted for, the total amount of energy is found to be constant. Energy can be neither created nor destroyed.

The popular concern for "energy conservation" is really a concern for conservation not of energy, but of readily available, economic sources of energy. We should be concerned about conserving oil; however, Nature ensures that the energy which temporarily resides in oil is always conserved. Last Winter's furnace oil is gone, but the energy it contained still exists, long since lost through roofs and windows, now partly as radiation a light-year or more from Earth streaming through interstellar space.

Whence energy? Where does it come from? The obvious answers are: from oil, from rivers, and so on. However, let us take a broader view.

We are part of a blue and white planet; a small, spherical turquoise set in the black velvet of space. The various sorts of energy available to us were either present at Earth's formation some five billion years ago, or have been received from space since that time. Of these two categories let us consider the latter one first.

Several types of energy reach Earth from space: meteors streak down through the atmosphere; cosmic rays bring packets of energy that have travelled far through the Universe; and starlight fills the night. It is starlight that dominates. Specifically, it is the light of the nearest star that brings the largest contribution of energy across space to Earth. Indeed, because of its closeness, our Sun so overwhelms the other stars that we rarely regard it as merely the brightest star in the night sky. The naturalist Henry David Thoreau was sensitive to this point when he concluded Walden with the words: "The sun is but a morning star."

The energy reaching us as sunlight can, in turn, be categorized according to how soon it is used by man. Three categories are appropriate: immediate, short delay, long delay.

In the first category, that of immediate use, the most important one is the warmth we receive from the Sun. In tropical regions this provides nearly all the heat needed by man. Even in Canada, over ninety percent of our heat is direct solar heat. e.g. Thanks to sunlight, the average outdoor temperature here is about 275 C° above the absolute zero of interstellar space. Furnaces provide only another 20°.

Photoelectric devices, such as silicon solar cells, are also in the immediate category. Another involves the wind, a product of the atmospheric heat engine driven by sunlight. Windmills and sailboats are powered by sunlight via the intermediate action of the atmosphere.

The second category involves use after a short delay. Delays of the order of weeks are involved when sunlight drives the atmosphere to place water on hills from whence it can drive hydroelectric turbines to run motors, lights and heat our homes. Prior to the coming of commercial electric power, falling water was used directly to drive devices such as millstones and saws.

Delays of months are involved when, through photosynthesis, plants eat sunlight to produce food for the animals on Earth. Associated with this are plant and animal wastes which may be used to produce fuels such as alcohol and methane. Delays of years are involved when plants store the energy of sunlight in wood, which can subsequently be burnt in a stove or steam engine.

The third category involves a delay that is long by human standards although still a small fraction of the age of Earth; of the order of 100 million years. Again, photosynthesis is the agent that has stored the energy of sunlight; but the plants lived back in the carboniferous period. The energy they captured is now contained in fossil fuels: oil, gas, and coal. Although coal contains the bulk of the energy stored in fossil fuels, oil dominates transportation, and the fossil fuels, together account for most of man's active conversion of energy.

All other forms of energy available to us today did not come in from space, but have been present here ever since Earth formed nearly five billion years ago. One of these involves nuclear power. Uranium is the basis of a nuclear reactor and, like all the other chemical elements on Earth, was part of our planet when it formed. Another is geothermal heat,

which is used for man's benefit in limited areas such as Iceland and parts of the western United States. Its energy, also present when Earth formed, was contained in potassium, uranium, and thorium, and is being released as heat in the radioactive decay of these elements in Earth's crust.

A potentially very important, abundant source of energy for man is deuterium, an isotope of hydrogen. It too has been here since Earth began. Although hydrogen bombs have demonstrated only too well that deuterium may be used with high efficiency, man has not yet been able to construct a viable, controlled, hydrogen fusion reactor. Yet it is likely that some time in the next century, fusion reactors together with sunlight will be the main sources of energy for man. Since the stars also obtain the bulk of their energy from hydrogen fusion, civilization's energy sources will then be based almost entirely on fusion.

The one remaining form of energy available to us and present when Earth began, is tidal power. This is of particular interest to the Maritimes since the highest tides on our planet occur in the upper end of the Bay of Fundy. The energy which is twice daily pumped into the tides is associated with Earth's rotation on its axis: the Moon and Sun raise humps of water beneath which Earth rotates. The churning tides transform the flywheel energy of our spinning planet to heat radiation which eventually streams out of the solar system at the speed of light. Harnessing the tides will merely complicate this transformation a little, the net result remaining the same. Slowly but inexorably the days are lengthening as tidal friction extracts Earth's rotational energy.

In summary, our blue planet receives energy on a beam of starlight, the various manifestations of which are solar heat, photoelectric power, wind, hydroelectric power and water wheels, food, alcohol, methane, wood and fossil fuels. Aside from this energy income, Earth possesses energy capital that accompanied her birth: uranium, thorium, potassium, deuterium and her own pirouette.

The question, Whence Energy? may be pursued still further back in time, back before the birth of our planet and its star. The answers are no less interesting than the foregoing account, but the details are more exotic, further from ordinary experience.

For instance, where did uranium come from? The answer concerns large stars that lit the night sky long before there were men to admire it, before even our solar system came into existence. As these stars reached the end of their life cycles, they underwent colossal explosions as supernovae. In this process some of the energy involved in the gravitational collapse of these stars was used to synthesize heavy elements out of lighter ones. Among these were uranium and thorium. Potassium formed under somewhat similar conditions. Later generations of stars, including our Sun and its planets, incorporate this recycled star debris.

Where did Earth obtain its spin? Again the origin was gravitational collapse, only a much milder collapse than that in supernovae. Like a figure skater pulling her arms in to spin faster, the cloud of debris from which Earth formed spun faster and faster as it collapsed down to form our small planet.

In both of these descriptions of gravitational collapse, the question: Whence energy? has once again really only been shifted back a step. The question now becomes: What sort of energy set the matter of stars and planets apart so that it could fall together? The answer involves the immense explosion from which the Universe originated. It was apparently this "Big Bang" that lifted the particles of the Universe apart so that they could later fall together to form galaxies, stars, planets, and men. Then: What sort of energy caused the Big Bang? Here physics and astronomy do not yet have an answer. We meet a blank. In fact, unlike the previous questions, this question seems to be of an entirely different sort. It is not clear that there ever can be an answer to it, even in principle.

The remaining form of energy, starlight, originates - as mentioned earlier - from hydrogen fusion, the joining of hydrogen nuclei to form helium. Pursuing this back in time, back before the birth of our Sun,

the question becomes: Where did hydrogen come from? Here, as in the case of the Big Bang, we arrive at a blank. Hydrogen is the simplest and most abundant element in the Universe. It seems to be primordial, having been present in the early stages of the Big Bang. We do not know the "how" of its origins, or, indeed, even if it had an origin.

Thus when we inquire into the origins of the energy in the glow of a light bulb or in the warmth of our own bodies, we seem to be able to trace the thread back to the origins of the Universe itself. From that point we stare into a void, and are left alone with but a profound sense of the mystery of it all.

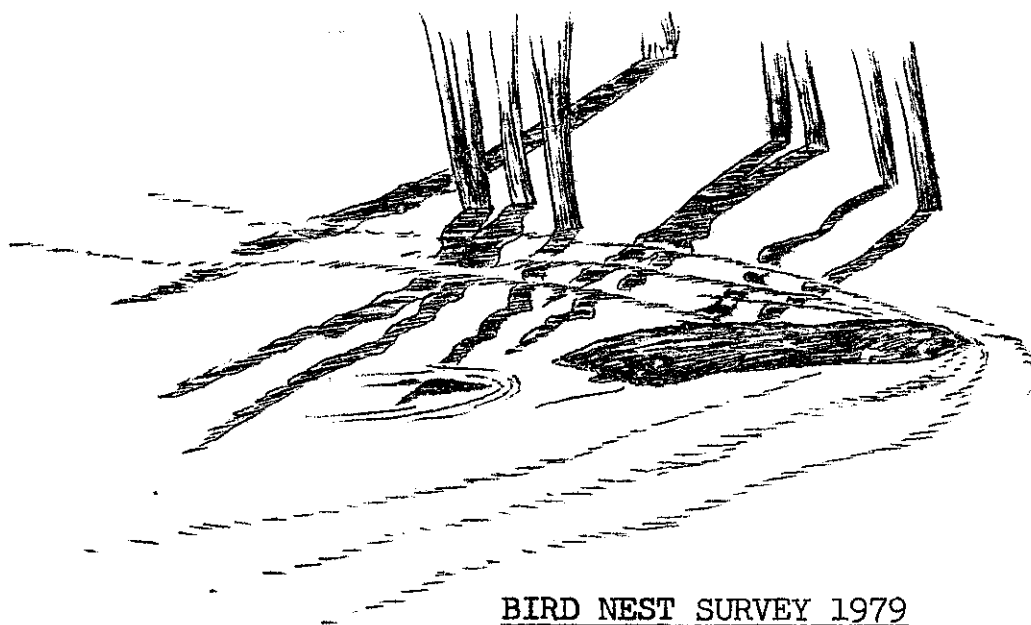
A POOR DAY FOR FISHING --- BUT!

E. L. Eaton
Upper Canard
Kings Co., N. S.

It was a poor day for fishing. The stream was still high from the heavy rain a couple of days before, although the water had lost the murky hue resulting from the run-off from a carelessly worked field up stream. Hiding somewhere not far away a frog was sounding out his throaty love song, while farther away the shrill treble of a toad added his amorous message. Out of sight, up stream, an earlier freshet had wrecked a boundary fence and one large pole had lodged diagonally across the stream, offering a band of shade where just possibly a wise old trout might have sought shelter from the direct sunlight. Wading cautiously out to the near end of the pole and casting with care, neither fly nor worm aroused the slightest response. Any fish that might have been around was too well satisfied with the extra food washed down by the rain to have any interest in my meagre offerings, however enticingly presented.

Suddenly my attention was taken by a gentle splashing down stream, distinctly clearer as the cause of it approached. In a matter of minutes a full grown muskrat swam into view. Breasting the current and completely oblivious of my presence, she was obviously searching for something in the shallow water near the edge of the stream. Head and fore quarters would disappear below the water with only a rump in sight and the muscular paddle-like tail giving an intermittent push to change position. Then, head up, she would move a few inches up stream and repeat the performance. Finally, patience rewarded, she reappeared with the entire crown of a big water grass plant in her mouth, nipped off neatly at the root, the leaves trailing limply as she headed briskly for a favourable landing spot on the fence pole at my feet, where I then noticed evidence of previous visits. Holding the stout, tender, white portion firmly with her front feet, sharp teeth quickly removed the green leaves, one by one, dropping them in the water to float gently down stream. Still not satisfied, she proceeded to wash it thoroughly in the running water. Cleaned finally to her exacting taste, she sat up on her haunches and proceeded to nibble daintily at this and that protruding bit, with every evidence of keen enjoyment. When the last scrap was devoured, she plunged into the water, swimming rapidly up stream for perhaps fifty or so feet. Then a pause, a turn half way around first to the right, then to the left, evidently to be sure no enemy was following, then straight for the bank, where I could now discern the top of the entrance to a burrow, just below the water line. With a last glance both ways, and a farewell flip of the powerful tail, she dipped beneath the surface, entered the burrow, not to be seen or heard again. No doubt a young family, safely hidden in a nest above the water level, lined with the dry remnants of similar meals, awaited the attentions that only a well fed mother could supply.

That adventure was many years ago, but one day recently, along the same stream and near the same spot, I spied another muskrat searching for food in the same way. How many generations of these friendly creatures have come and gone in the intervening years? A great-great-great-great grand daughter? Perhaps.



BIRD NEST SURVEY 1979

Bernard Forsythe
Wolfville, N. S.

September marked the end of another successful nesting season. My total for this year was 176 nests representing 52 different species of birds. Several were new for my list, meaning that I have now recorded the nests of 86 species of birds in this area.

The continued observation of a nest often turns up surprises. The Long-eared Owl nest that I found on May 2 was checked again on May 27 and was empty. Nearby was a crow's nest that had crow eggs in it the first week of May. When I climbed to it on May 27 out flew the Long-eared Owl and the nest held 5 owl eggs. By July 15, 4 young owls had fledged from this second nest. It would be interesting to know if the crows had lost their eggs before the owls moved in or if the owls were able to oust the crows. Another unusual occurrence happened in a Redwinged Blackbird nest. On June 6 it held 5 pin-feathered young. On June 21 there was one dead Redwing young under the nest, which was tipped on its side with a strange egg in it. The egg and nest had droppings on them indicating the other young Redwings had fledged. The strange egg proved to be that of a Sora, and was partly incubated probably from the warmth of the young. This was the first time I had heard of Soras "dumping" eggs.

A crow's nest was found 55 ft. up at the top of a large spruce tree on May 2 and held 2 eggs. Because the nest was so high I wanted a calm day to revisit it. The opportunity came on June 3. I was just about to look over the edge of the nest when something jumped out of it onto a branch next to me. I was face to face to face with a raccoon and it was hard to tell which one of us was more surprised. After a long moment the raccoon jumped into space, flailing its legs and tail to stay right side up and landed with a thud on the ground. The nest was empty and by the time I reached the ground the raccoon was gone.

As usual Cowbirds caused the failure of many nests of our songbirds. They even go into mature woods in their search for nests. The 2 Solitary Vireo nests I had in Hemlock woods at Newtonville were both lost to Cowbirds. However, a young Cowbird was a help to me on one occasion. Its food begging calls led me to my first Yellow-rumped Warbler nest. On July 8 the nest contained 1 Cowbird young plus 2 Warbler young. This time all the young fledged.

Following is a list of the nests found and their outcome.
S = successful; F = Failed.

No. Found	Species	S or F	No. Found	Species	S or F
1	Goshawk	S	1	Sharp-shinned Hawk	S
1	Broad-winged Hawk	S	1	Ring-necked Pheasant	S
1	Sora	F	1	Killdeer	S
2	Great Black-backed Gull	2S	3	Barred Owl	2S;1F
2	Long-eared Owl	1S;1F	1	Chimney Swift	S
1	Ruby-throated Hummingbird	S	1	Belted Kingfisher	S
6	Common Flicker	3S;1F;2?	1	Pileated Woodpecker	S
1	Hairy Woodpecker	?	3	Eastern Kingbird	2S;1F

No.	Species	S or F	No.	Species	S or F
5	Alder Flycatcher	3S;2F	4	Tree Swallow	3S;1F
7	Bank Swallow	4S;3F	5	Barn Swallow	2S;3F
1	Cliff Swallow	S	4	Blue Jay	2S;2F
6	Common Raven	3S;2F;1?	16	Common Crow	8S;8F
3	Black-capped Chickadee	3S	2	Boreal Chickadee	1S;1F
2	Brown Creeper	1S;1F	6	Gray Catbird	4S;2F
17	American Robin	9S;8F	1	Hermit Thrush	F
2	Swainson's Thrush	2F	4	Veery	2S;2F
1	Ruby-crowned Kinglet	S	3	Cedar Waxwing	1S;2F
7	Starling	6S;1F	2	Solitary Vireo	2F
1	Red-eyed Vireo	F	1	Northern Parula Warbler	S
4	Yellow Warbler	2S;1F;1?	1	Yellow-rumped Warbler	S
3	Chestnut-sided Warbler	1S;2F	1	Ovenbird	S
7	American Redstart	2S;5F	6	Red-winged Blackbird	5S;1?
12	Brown-headed Cowbird	6S;6F	2	Rose-breasted Grosbeak	2S
1	Purple Finch	F	2	American Goldfinch	1S;1F
1	Chipping Sparrow	S	4	White-throated Sparrow	3S;1?
2	Dark-eyed Junco	1S;1F	3	Song Sparrow	1S;2F

Editor's Note: The Mourning Dove nest which Mrs. Walter Urban of Avonport found (a first for Nova Scotia) fledged two young. The parents re-nested and on September 24, two more eggs were found. On Sept. 29, though, it was discovered that the eggs had been destroyed.

October 15, 1979

Dear Mrs. Timpa:

I thought you might be interested in this write-up which appeared in our church newsletter in July. We were grateful to Sherman Williams for the excellent leadership and fascinating knowledge which he contributed to the Cape Split walk, and we feel that you are performing a most valuable public service in sharing your interest and expertise in this way. With very best wishes for your continued success -

Yours sincerely,
Heather M. Watts

Extract from Newsletter of July 1979
The Universalist Unitarian Church (Halifax, N.S.)

The day of the Nature Hike to Cape Split was such a day as poets sing of - the sunny air was fragrant with Spring. Avonport naturalist, Sherman Williams, our scientific leader for the walk, assembled us at Scott's Bay for a most interesting explanation of the geology of the area, illustrated with maps and rock samples. He explained the part played by continental drift and volcanic action in producing the dramatic cliffs of basalt over sandstone, and the amethyst and jasper which make the Cape Split beaches a rockhound's Mecca. Sherman generously shared also his knowledge of the plant and animal life of the area. We learned how to distinguish the several different kinds of ferns growing there, and he patiently identified the many common wildflowers we novices asked about. When we emerged from the shelter of the woods to the top of the enormous cliffs at the Cape, a stiff, cold gale made us wonder how the hundreds of gulls (especially the tiny fluffy chicks) managed to hold onto the bare rock of the great offshore cliff they appeared to have made their home.

The return path lay partly along the cliff top where we enjoyed breath-taking views of rock and ocean, and Sherman explained the Krummholz Effect resulting in the strangely beautiful shapes the trees has assumed in their age-long struggles with the gales of all seasons.

It was a tired, happy and satisfied group who thankfully accepted the hospitality of Betty and James Potts, relaxing under their trees while enjoying good conversation and the refreshments so thoughtfully provided.

Thank you! It was a day to remember!

SMALL FISHES

John S. Eskine
(From the Journal
of Education, Nov. '57)

(continued from 6,2, BNS Newsletter)

Brier Island

The last of the North Mountain as it dips into the sea is Brier Island. Dr. Roland, author of the Flora of Nova Scotia, visited the island three times with half a dozen co-operating collectors and did an exhaustive study of the flowering plants. The Museum had had some of this material in exchange, so that I was less anxious about the plant-collecting than to find how other aspects of its living things fitted into our general picture. In the field of reptiles, amphibians and freshwater fish I expected to find nothing, for that would best have fitted what we know of its geological history.

Westport, a fishing village, lined the strait where the ferry came in, and one of the two roads stretched up the eastern shore towards the North Light. The alder and spruce scrub beside the way opened at times to the weedy yards of fallen houses or to sheep-clipped headlands where only a waste of raspberries or a clump of chives, blooming in balls of mauve showed where people once had lived. Nova Scotia was built in the days when wind and water, animals and man, were the only sources of power, and human labour was needed in crude and cheap abundance. Today in the countryside the population is everywhere in retreat, for cheaper power and machinery reduces the demand for men in farming and fishing. This is not wholly a matter for regret, since the old life was very hard and poor, and it is in the nature of man to be forever on the move, but tumbled walls and overgrown gardens are sadder to me than a graveyard. Death may be neutral, but a retreat is always a defeat.

In an old well where the green-scummed water rose to within half a yard of the surface of the ground, I thought I saw a flicker of quick motion. "Spotted salamander egg," Francis announced. He scooped a jelly-like mass into a jar and began to dismantle the loose rim of the well. "The true herpetologist," he quoted, "leaves not a stone unturned." We found no life there, but in a gravel pit the puddles were black with tiny toad tadpoles. The day was windy and bleak and overcast, late June but not yet summer, and by a fallen house every board seemed to cover a shiny redbacked salamander or a coil of snake-garter or red-bellied-sheltering from the cold.

The weather was not kind to us either this time or when we visited the island again in late August. In June we shivered to sleep, breathing into our sleeping-bags as though it were mid-Winter; in August of a dry summer we sloshed about flooded bogs in grey squalls of rain.

But there was beauty on the Island too. On the rocky barrens in the west the heathy shrubs were still in flower, pink lambkill and mauve rhodora, and the wide bog was starred with pink *Arethusa* and the mahogany flowers of pitcher-plants. Near Whipple Light, the western-most point of Nova Scotia, the sheep-mown grass was varied by banks of iris, the tiny blue flag of cliffs and the taller common iris which here had also a lovely violet form which I have never seen elsewhere. By the great pond, separated from Pond Cove by a wide barrier beach of pebbles, there were clumps of European iris gleaming golden in the apologetic morning sun, and in the shallows the floating red-top grass shook with the scurrying of schools of minnows which the seine brought up by the dozen, mummichogs and sticklebacks and an occasional brown eel from the muddy bottom.

Eels

Eels were a great problem to us. At first we captured only little ones and then usually by treading them in the mud. The larger were fast as snakes on the land and too slippery to hold even with a foot. "The next time we get one", said Francis disgustedly, "throw it up on the land." I tossed one up, and in a flash it had dived into the grass and we saw it no more. So I thought out a new technique. Eels were quiet enough in the seine and became active only when touched or frightened. First we must roll the eel in the seine so that she could not escape; then, when the jar was quite ready to receive her, her head should be unwrapped over it, whereupon she would ooze in. It was on Brier Island that we tried out the system upon a two-foot eel, not a very large one but the largest we had caught. I wrapped the eel, Francis brought the bottle, I unwrapped the

eel's head, and she oozed rapidly into the jar according to plan. But - the eel's nose touched bottom and, realizing that something was wrong, she began to backtrack. An eel moves like a snake by twisting against resistance and having very little friction at the point of contact, the snake by means of shiny scales, the eel by a thick coating of mucus. Our eel would not turn in the bottle, and I, squeezing hard on the seine, could as easily have crumpled a slippery stick of wood. Then I recalled the way in which Jamaican cartmen had encouraged stubborn oxen to arise and work. Francis unwrapped the eel's tail and lighted a match under it. For several seconds there was no response, possibly the mucus needed warming, possibly matches were merely outside the range of the eel's experience; and then suddenly she got the idea and shot into the jar and the top was screwed down.

Eels are among the wonders and delights in the world of fish. Sometimes, though rarely, I have happened upon the spring run of the elvers in the Gaspereau River, when at the White Rock dam the wet rocks and the concrete of the spillway are inches in grey-and-white wormlike miniature eels that are trying to wriggle up the damp face. In France these would be barreled as a delicacy or carried off to be farmed for market, but here we now ignore such sources of food. Probably most of these thousands on the spillway die unsuccessful, which seems rather terrible to us. We shoot our children at the future as with a fine rifle, aiming years ahead and trying to place each shot where it will have the greatest chance of success; but the lower forms of life fire blindly a great charge of dust-shot, hoping that two in a million may reach their mark. A pair of eels launches hundreds of thousands of eggs in the depths of the Sargasso Sea, thousands of miles away. These hatch into transparent leaf-shaped larvae that drift for months in the gigantic eddy of the Gulf Stream and soak up food through their skins. They lengthen into worm-like form and begin to swim against the current and then turn aside towards the fresher water, and ascend the streams. Of a million, some hundreds may enter the river mouth, and there these minute creatures divide according to their sex, the males halting in the estuary, the females pushing on upstream. Most of the latter will die at the spillway, but a few will find their way up cracks in the concrete or through the fish-ladder and will go on, swimming blindly upstream until there is no more stream. Even then they will move on, slipping over the dew-wet grass or sliding up the film of water on rain-pipes to the gutter under the roof. Hardly a pond without its eels; and I have found them coiled, half a dozen together, in a pool in a gypsum sinkhole, passing a foodless summer which can be but an interlude in the great timelessness of their lives.

It is said that the serpent form is an advantage only to those that live underground. Certainly eels can travel under the mud, depend greatly upon smell in finding their food, and are happiest in the dark. I have rarely seen an eel by day, but after dark they are there in their dozens, lying alert on the muddy bottom or wavering yard-long in the current by the overflow. These are the great females who will one day feel the call and will slide downstream to the sea, linger awhile at the river mouth while they change from brown to grey-black and white, and then as silver eels will cross the thousands of miles of ocean in order to plunge into the depths beyond Bermuda to spawn once and die.

Other Brier Island Plants and Fish

But now on Brier Island we turned inland to fresher waters where in the evening spring-peepers and toads were still singing. The toads were an excitement when first we found them preoccupied with their egg-laying in the freshwater ponds, big blackish creatures as clumsy in water as on land, depending for their protection upon the poisonous secretion of their skin. In Jamaica the toad was so poisonous that dogs were sometimes killed when they picked them up on their mouths, while the mongoose had learned to eat toads by turning them upside down and opening them from the belly. These blackish toads of Brier Island were very difficult to see when they were clinging to blackened sticks in peat-brown water, but after a few hours in a collecting bag they changed back to the normal brown.

In these same pools were brown newts and mummichogs, and it came to be our consistent experience of mummichogs that they invaded fresh water only when their near relatives, the killifish, were absent. The members of one's own species are one's best friends and most serious competitors; the members of nearly related species are the next most serious competitors and are not friends at all. Stickleback may be found in almost any water in Nova Scotia, but it is unusual to find more than one species in any lake.

Of course, we did not find everything that existed on Brier Island. Local gossip, there as everywhere in Nova Scotia, told of large black snakes and of frogs imported by a visiting American, but we found no traces of either. (We never do.) The rare plants of the island were of the mixed northern and southern species typical of the southwestern bogs, which suggested that the island had not been submerged since the ice-age. The absence of freshwater fish was what we should have expected. But the presence of two species of snakes and five amphibians on Brier Island and two more on Long Island across the passage remains to be explained. Probably we must invoke the accidental transportation of all these species on driftwood, as one must for their presence on Prince Edward Island, but this seems a true Noah's ark of accidents, as improbable as the existence of all these species in Nova Scotia during the boreal period following the ice-age.

(to be continued)

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Our thanks to all those who have made this issue of our Newsletter possible, be it authors, artists, stamp-lickers or typist. Thank you, too, Oscar Morehouse, for a lovely slide presentation of Newfoundland and salmon fishing. And last but not least, a very special thanks to Larry Bogan for his long leadership as President.

And another news item: Wallace Turner reports that he and Mrs. Turner saw a black bear as it crossed Route 103 near St. Margaret's Bay last July 10th (about 10 a.m.). It appeared to be a young bear, a little more than half grown. According to Mr. Turner, the bear crossed the highway about 25 yards ahead of their car. It seemed to be in no hurry to cross, but also seemed to know where it was going.

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