

# THE HALIFAX FIELD NATURALIST



No. 91  
June to August 1998



Dame's Rocket

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Return address: HFN, c/o NS Museum of Natural History, 1747 Summer Street, Halifax, NS, B3H 3A6

# HFN

is incorporated under the Nova Scotia Societies Act. It is a member organisation of the Federation of Nova Scotia Naturalists and of the Canadian Nature Federation. It is registered for federal income tax purposes. Official receipts will be issued for individual and corporate gifts. HFN is a member of the Federation of Nova Scotia Naturalists — the provincial umbrella association for Nova Scotia Naturalist groups.

**Objectives** are to encourage a greater appreciation and understanding of Nova Scotia's natural history, both within the membership of HFN and in the public at large. To represent the interests of naturalists by encouraging the conservation of Nova Scotia's natural resources.

**Meetings** are held, except for July and August, on the first Thursday of every month at 8:00 pm in the auditorium of the Nova Scotia Museum of Natural History, 1747 Summer Street, Halifax. Meetings are open to the public.

**Field Trips** are held at least once a month, and it is appreciated if those travelling in someone else's car share the cost of the gas. All participants in HFN activities are responsible for their own safety. Everyone, member or not, is welcome to take part in field trips.

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**Membership** is open to anyone interested in the natural history of Nova Scotia. Memberships are available at any meeting of the society, or by writing to: Membership Secretary, Halifax Field Naturalists, c/o NS Museum of Natural History. New memberships starting from September 1 will be valid until the end of the following membership year. The regular membership year is from January 1 to December 31. Members receive the HFN Newsletter and notices of all meetings, field trips, and special programmes. The fees are as follows:

Individual	\$13.00 per year
Family	\$19.00 per year
Supporting	\$25.00 per year
FNSN (opt.)	\$5.00 per year

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# HFN NEWS AND ANNOUNCEMENTS

## EDITORIAL tadpole

This has been a good-news bad-news spring!

The first good news is that the weather has warmed steadily since late winter, so migrants of all sorts had easy travelling. This may presage a dry summer, but we can hope the wet winter has filled the wells and reservoirs.

The bad news is, that we are faced with crises in fish stocks including Atlantic salmon, in forestry, and from chemicals in the environment, as well as seeing our wildlife and open spaces threatened.

More good news: the problems are being tackled, by more people than ever. Many have found new hobbies in conservation and reclamation, and have become even more aware of our diversity of animals and plants.

Best of all, amateur naturalists are coming into their own again. HFN has heard talks by Paul Brunelle and Stewart Tingley on dragonflies and damselflies, and from Linda and Peter Payzant on butterflies. Manuals on dragonflies, and possibly on lichens and fungi, will soon appear.

Roland's Flora of Nova Scotia will be launched on 17 June, at the Museum of Natural History.

We leave most of our advocacy work to the Federation of Nova Scotia Naturalists, whose activities were reviewed at the Annual General Meeting in Antigonish on 5—7 June. We enjoyed seeing their new Fairmount Ridge Trail, and the restored Briery Brook, where salmon can now spawn in riffles in the middle of town. A report on the meeting will appear in the Federation's Newsletter.

HFN will have no indoor meetings in July or August. See you all in September.

— Ursula Grigg

## ASTRONOMY TIPS

On page 10, David Lane of SMU's Observatory shares his trick for remembering the correct order of the planets. Here's another: "Mankind's Verdant Earth Must Journey (as a) Star Unites Nine Planets". This one has a feature that allows no mix-up between Mercury and Mars; 'mankind' has the same number of letters as Mercury; 'must' has the same number as Mars. Also, the Sun *is* a star!

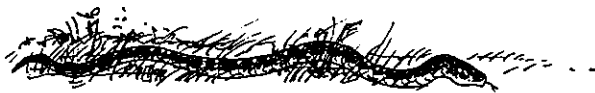
## LEATHERBACK TURTLES IN ATLANTIC CANADA

Leatherback Turtles are seen regularly in our coastal waters in late summer and fall. Most of us know of them only from strandings, but fishermen see them offshore, grazing on jellyfish at the convergence of the warm Gulf Stream and the cold Labrador Current.

They differ from other sea turtles by their enormous size and their leathery carapaces, and are less well known, especially during the stages between hatchling and adult. This survey is an attempt to fill in the gaps.

Leatherbacks are endangered. They become entangled in fishing gear and drown; they mistake plastic for jellyfish, and die because they cannot digest it. Their breeding beaches are becoming tourist resorts; erosion and poaching also play a part.

Any turtles seen should be photographed if possible — full body, and top and sides of head — and reported to The Leatherback Turtle Working Group at 1-888-729-4667. More information can be obtained from the Museum of Natural History.



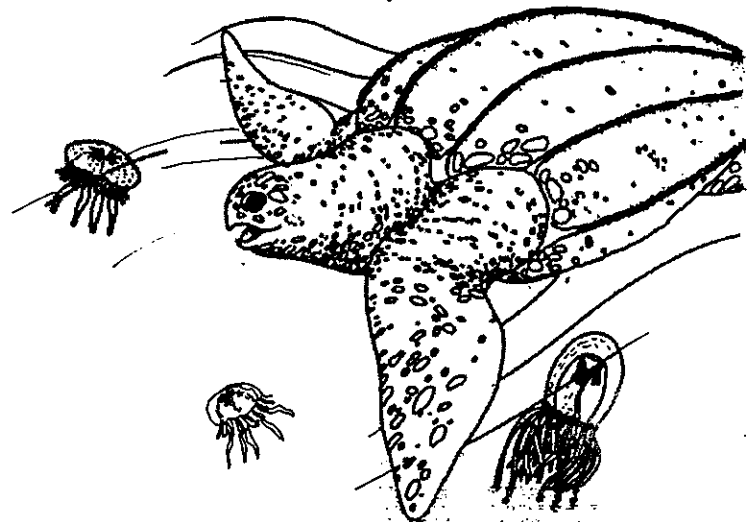
## THE HERP ATLAS

This is an effort to map the occurrences of amphibians and reptiles (which together are sometimes called herptiles) on grid maps in the same way as the breeding bird survey was compiled. There are old records of these animals with which a current survey can be compared, to see how our fauna is doing. Amphibia particularly are declining worldwide, and odd colour varieties and deformations are commoner than they used to be.

For instructions and cards contact Tom Herman, Fred Scott, or Philip Taylor at Acadia Biology Department, Acadia University, Wolfville, NS, B0P 1X0.

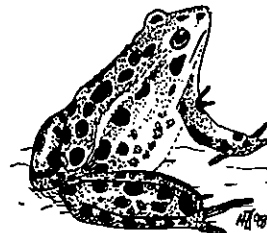
e-mail: philip.taylor@acadiau.ca, fwscott@ns.sympatico.ca, or tom.herman@acadiau.ca. Phone: (902) 585-1469 (Tom Herman), (902) 585-1720 (Fred Scott), (902) 585-1287 (Phil Taylor).

For information on Nova Scotia herps: <http://www.ednet.ns.ca/educ/museum/mnh/nature/index.htm>



## NEW AND RETURNING MEMBERS

Louise Gass  
Margaret A. Clark  
Douglas MacLeod  
Terry Paquet  
Carol Pizio



# HFN TALKS

## BUTTERFLIES

2 APRIL

Linda and Peter Payzant have been enjoying butterflies for years, and have looked for them in many countries. They watch them through field glasses, and seldom need to catch them. Sometimes Peter walks casually up to a resting insect and lays his small net gently down on it; after examining the insect, he lets it go. He leaves the athletic leaps and enormous nets of the Mad Entomologist to those who want to stop dragonflies at 15' above ground!



It seems amazing that butterflies can hold territories and migrate long distances, often going only part-way before laying eggs and dying. The next generation completes the journey; how does the hatchling know whether to go south or north? Monarch butterflies are the classic migrators.

Butterflies belong to the Insect Order Lepidoptera. They develop by complete metamorphosis, with three distinct stages: they hatch as caterpillars, which may be colourful and beautiful in their own right, and after several moults become pupae, cryptically coloured and sheltered in holes or among vegetation. The pupa is a resting stage in which larval parts are completely reformed to produce the adult insect or imago. The adult emerges through a slit in the back of the pupal skin over the thorax; it is the reproductive phase.

Peter and Linda showed slides of the commonest species around here, telling us when and where we might find them, from the sprightly Spring Azures to the Admirals and the Monarch. They also told us which food plants some of the caterpillars use, and where they form their pupae.

There is a Peterson Field Guide to the Eastern Butterflies, by Paul A. Opler (1992), and a Nova Scotia checklist published by HFN and the Museum.

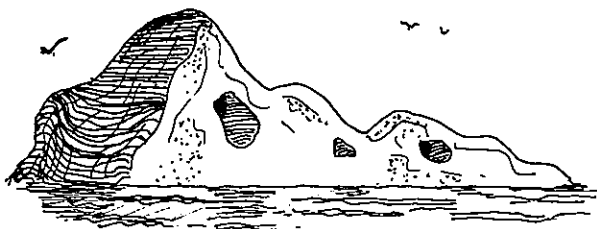
— Ursula Grigg

## ANTARCTICA

7 MAY

When birder Margaret Clark and photographer Margaret Slatkin retired, they joined forces and travelled footloose in a recreational vehicle to look for birds and take photographs. Now they winter in Arizona, and go on nature tours to more remote areas still. Recently they visited Antarctica on the ferry *Lavonia*, built in Estonia for the Russians, and made redundant by the end of the Cold War. They brought back memories and slides of penguins, icebergs, seals, and some forgotten debris of human occupation and cold war history.

For once, there were plenty of pictures of icebergs, those photogenic and infinitely variable floating ice islands!



The Antarctic fauna is fairly approachable; nevertheless, these naturalists have an unusually quiet and respectful attitude towards them. Margaret Clark chatted with a penguin, and an elephant seal came to pose for Margaret Slatkin. The scenery lay open to our view and understanding — lonely and barren, with almost no vegetation. The old whaling stations and even modern installations looked only temporary.

There were delightful studies of King Penguin chicks, as big and important-looking as adults but still in brown down. There were Adelie Penguins tobogganing into the sea. We saw Albatrosses, Kelp Gulls, and the ubiquitous Snowy Sheathbills. This was a wonderful evening of exotic natural history.

— Ursula Grigg

## DRAGONS AND DAMSELS — MASTERS OF THE AIR 4 JUNE

This was the night of the high-flyers, the speedy ones — and also some lazy ones. Five years ago, Stewart Tingley was seduced from his life-long study of birds by the revelation that dragonflies (the insect Order Odonata) could be identified with field glasses. Next, he photographed any he could approach, as he learned to identify them. Now he is going through his photographs identifying the subjects, and finding he has some rarities. Some of these very fine slides illustrated his talk.

Stewart showed us slides of the Dragonfly Society of the Americas hunting for Paul Brunelle's new-to-science species, familiarly named the Broad-tailed Shadow Dragon. Yes, they are a naturalist's delight; they have common names, an informal checklist, and will soon have an identification manual for the Maritimes.

Odonates have their times and seasons, and some of them migrate as the butterflies do. Paul's new one is crepuscular, most are daylight fliers. All are avid hunters, from hatching to death, and a study of their prey would be an excellent introduction to Nova Scotia insects.

They really are beauties; most of the dragons (with wings held out sideways when at rest) and the damsels (which hold their wings tented over their backs at rest) are brilliant, and are easy to find around lakes and streams. They can be seen flying in pairs, too, sometimes with the male grasping the female's collar, and holding her while she drops eggs on the water surface or inserts them into a grass or reed stem.

The larvae are aquatic and dull, going through a series of moults in a metamorphosis which is gradual compared with that of butterflies. One day the larva climbs out of the water up a plant stem, splits its skin down the back and emerges as an adult. It flies as soon as possible, sheltering in trees while it finishes drying and hardening. After that it takes to the air to hunt for prey and a mate. Discarded larval skins can be used to identify the species. The editor has copies of the check and literature lists.

— Ursula Grigg

# SPECIAL REPORTS

## PARKS VISION

On a late-April weekend, some 45 people donated a day and a half to talking about the future of natural spaces within the Halifax Regional Municipality. Some 20 years ago, a parks plan was drawn up for the Halifax and vicinity urban area. The objective of this year's conference was to do a reality check, see where we stand, and develop a fresh vision for the next 20 years. The first day was devoted to understanding the current situation, with views from the three levels of government (an inventory), from NGOs (some ongoing and existing programs), and from users (looking at the value of parks).

Glyn Bissix of Acadia University's Outdoor Recreation program gave the keynote talk, warming us up to thinking about what citizens need and want with regard to nature in the city. Brian Kinsman, a parks planner with the Department of Natural Resources, then led us through a description of the 12 natural landscapes within HRM. To finish off the introduction, Colin Stewart discussed the history of parks in our area from 1749 to the present.

The meeting was just the right size, in that there was a good mix of knowledge and interests, and there was plenty of interaction. On the first panel, Mart Johanson of Parks Canada concentrated on the Halifax Defence Complex and its five major sites. Dale Smith of NS Parks and Recreation outlined the provincial parks, trails, and protected areas within HRM. The picture is considerably different now from what it was in the 70s: 3,135 ha now in 20 parks, (340 then in 12 parks); 7,645 ha in reserves now (1080 then); 28,000 ha preserved in wilderness areas (0 then); 135 km of abandoned rail trail (0 in the 70s). Carol Macomber then gave an outline of HRM's Open Space Plan, which is currently in development.

In the second panel, we heard from Dusan Soudek about McNabs Island. Then Walter Regan filled us in on the successes of the Sackville Rivers Association and made a special plea for protection of the Second Lake area.

Diana Dalton, chairperson of the Point Pleasant Park Advisory Committee, gave us an update on the various problems facing the park. Audrey Manzer described the story of the Dartmouth Lakes Advisory Board and how it has become a respected and integral part of planning in Dartmouth.

For the third panel, we heard first from Wendy Scott, owner of Scott Walking Tours, about the rapidly increasing potential for nature tourism and its demands for plenty of natural space to be left in place. John Charles of the Recreation and Leisure Services Division of HRM described the "benefits of Outdoor Education" and the importance of "experiential education" for instilling an understanding of nature in young people. Paul Euloth brought us up to date on the work of the Ecology Action Centre's Wilderness Committee, which has put a great deal of effort into identifying lands in HRM that should be preserved. Greg Brown of the Halifax Regional Development Association, which has a mandate for community economic development in HRM, told us about an encouraging change of emphasis over the last few years: Wilderness areas are now considered to have

value; quality of life is an important criterion in site selection for development; and HRDA now represents a real variety of interests, no longer only business.

The second day was workshop time. We identified issues that affect and are affected by green spaces in the city. We developed a vision for the future of HRM, and discussed how to move towards that vision. Our primary vision is a continuous network of healthy open green and blue places, both large and small, with human settlement in between.

On the whole, this conference was pretty upbeat. Yes, we've lost some opportunities, but the climate has never been better for making real progress in creating a truly livable city. From a practical point of view, it seems to make sense to use the HRM Open Spaces Plan as the foundation. The discussion is continuing, via the Internet, and proceedings and ongoing developments will be posted to the Web under the aegis of CPAWS. See <http://chebucto.ns.ca/Environment/CPAWS/PV98/index.html>

— Doug Linzey



## TOXIC CHEMICALS IN THE MUNICIPALITY

There were two meetings in Halifax this spring, to discuss the use of toxic chemicals in urban areas, and what can be done about it. The meetings had several sponsors, including the local chapter of RATE (Real Alternatives to Toxins in the Environment), the Sierra Club of Canada, and the Dalhousie Environmental Law Students' Society.

The Raging Grannies opened both meetings in aprons and outrageous hats, proclaiming their preference for dandelions and bird song over the silence of the perfect lawn.

### 23 APRIL On the Cosmetic Use of Garden Chemicals

There was an audience of about 200, including representatives of the chemical companies and the Press.

Dr. Roy Fox, Director of the Environmental Health Clinic in Fall River, discussed the health implications of pet and human contact with garden pesticides. Dr. Fox began with the statement that pesticides were made to kill, and we should expect them to affect us, even at low levels of chronic exposure, since most organisms share similar metabolic pathways.

Most pesticides are inhaled. Hormonal and nervous systems are the most usual targets, and reproduction and the growth of children may be affected. Men produce abnormal sperm, and their children, especially their sons, may have developmental abnormalities, including abnormal genitalia. Cancer and immune diseases, such as asthma, are frequent results of exposure. Moreover, some people are much more susceptible than others, depending on how their bodies break down synthetic chemicals. All this also applies to pets and wildlife.



Data on pesticides are not always accurate; Breakdown times are often longer than claimed, and the products are not harmless. Herbicide residues carried indoors on feet or paws have been identified in carpets a year after they were sprayed outside. Babies and pets spend a lot of time on carpets!

As for proof of causation, statistical evidence can be obtained by comparing health records of people exposed to toxic chemicals at work with those of the general population. Golf greens have the heaviest burden of lawn chemicals, and women professional golfers have a higher incidence of breast cancer than the general public. Similarly, greens keepers have a high rate of prostate cancer, and farmers also have more health problems than the norm, including cancers. Children whose parents or next door neighbours spray, have a risk of childhood leukemia increased by more than six times.

There are also risks from the so-called inert ingredients which bulk up the spray, and little study has been made of possible synergism between pesticides and their carriers and surfactants, or with medications taken by those exposed to sprays.

Dr. Fox does not have a high opinion of government regulators or the laws they administer.

Dr. David Patriquin, Dalhousie University, a specialist in natural horticulture, told the meeting that nitrogenous fertiliser was first sold after the war to reduce the piles of it collected for manufacture of explosives. Fertiliser became popular, but its use destabilised the typical grass-and-clover turf and killed earthworms, resulting in compacted soil, reduced soil fertility, thatch, and invasion by weeds and chinch bugs. Herbicides were introduced to get rid of the weeds, and the clover died, while soil quality continued to go down. The fashion in grasses changed, with introduction of some which do not thrive in Nova Scotia.

The remedy is to stop using cosmetic chemicals, to aerate and weed manually, over-seed with a tough grass mix with 10% of white clover added (and some yarrow, optional), and top-dress lightly twice a year with compost or crushed leaves. Keep mown at a height of 3" and leave the mowings. As the worms return they will aerate and dethatch. This is safe, inexpensive, and neat (the audience could be heard exchanging dandelion recipes).

We were reminded that the first golf courses were fine natural turfs of grass and clover, maintained and fertilised by sheep.

Howard Epstein, now an MLA, was the third speaker; he described the Municipal bylaw proposed recently, which he thinks is the only realistic legal protection for anyone wanting to avoid contact. It would allow any householder with environmental sensitivity or who wants to avoid contact with toxic chemicals to inform the Municipality; neighbours would then be enjoined not to spray. Although this would result in patchy protection, the patches would soon overlap. Howard Epstein said he was pleasantly surprised by the number of councillors who support the bylaw. He reminded us that an uncut front lawn was recently protected under the freedom of expression provisions of the Canadian Charter of Rights.

The Municipality has to have Provincial permission to regulate pesticide use, and a bill is before the Legislature now and has passed first reading. It is important for us to support these measures, at both levels.

Blue's



## 28 APRIL 'Pesticides, Their Uses and Abuses.'

There was an audience of about 100, including two monks from Nova Nada, and the chemical company representatives.

The speaker was Elizabeth May, well known to us from past budworm battles, and now Director of the Sierra Club (Canada). She has written several books, the latest being On the Cutting Edge, about logging practices. She said that there is a shift in attitudes in forestry; the CEO of MacMillan Bloedel told shareholders that it was time to find alternatives to clear-cutting with enormous feller-bunchers. He was promptly criticised by the BC Minister of Forests.

Elizabeth May calls feller-bunchers "forest vegematics which each displace a bunch o' fellas" (20 men). Nova Nada's problems with Irving were mentioned, with other problems posed by current forestry practices.

Elizabeth May gave a great deal of information about pesticides, amid lively discussion. She believes Canadian regulations are inadequate, outdated, patchy and ineffective; those in the USA are better. It is impossible in Canada to deregulate a pesticide which has gained acceptance, even if it is now known to be unsafe, or if it became licenced through testing by private laboratories which were providing biased results. The chemical companies are taking full advantage of this laxity and their business practices were criticised.

In the United States, Pesticides are being retested, and many are being delisted.

Pesticide formulae also contain so-called inert ingredients, which in Canada do not have to be listed (they are considered trade secrets). The Sierra Club recently obtained a copy of the approximately 4,000 compounds in use, and found that many are not inert, some are banned as main ingredients, and some are known carcinogens. The agents which caused Reye's Syndrome in New Brunswick were surfactants (wetting agents). The effects of chemicals on endocrine systems are not considered in testing, nor are their synergistic possibilities.

Even the bacterial spray Bt is now unsafe; its former carrier of water and fishmeal has been replaced by chemical carriers and surfactants. This is why its use has been banned in BC, but it is to be used soon against Tussock Moth caterpillars in Nova Scotia. One of its effects is likely to be the death of the mycorrhizal networks in the soil which keep trees healthy. It will also kill songbirds, and wipe out other moths and butterflies.

Elizabeth May supports our right to know what is in these brews, to refuse to have them used near us, and to support the search for safer methods. She asked if we knew that 2,4,D is sprayed on our school yards, in spite of its being a carcinogen; permission for this comes from Ottawa — we should complain to Minister Alan Rock. All speakers criticised Federal and Provincial authorities; Health Ministries were particularly condemned.

Asked her opinion of bio-engineered foods, Elizabeth May described them as uncontrolled experiments at our expense, and said the Sierra Club is mobilising to oppose them.

If we want to avoid this situation and the incidental health costs, we can contact our legislators; RATE has literature, and suggestions on doing this. Contact RATE at (902) 479-1440.

— Ursula Grigg

# SPECIAL ARTICLES

## MORE CHALLENGES TO NOVA SCOTIAN FORESTS

In the the Fall /96 edition of The Halifax Field Naturalist, issue No. 84, the article "Endangered Species and Forestry" pointed out the relationship between declining bark beetle populations, the traditional practice of removing forest 'deadwood', and subsequent compromised forest health. It also referred to Acadia graduate Daniel Kehler's work "Beetles and Forestry: The 99% That Aren't Pests" which related particularly to HFN's 1990 Point Pleasant Park Bark Beetle Survey and the declining vigour of its forest cover.

If you are fortunate enough to have a small private plane and a pilot's license, or lucky enough to fly commercially over our province when the visibility is clear, you will see by many new bare areas we are rapidly losing our forests for the fifth time. Nova Scotia has been clearcut four times in the past since colonization (in particular for the famous past glories of its shipbuilding industry)

Besides commercial clear-cut areas, small and large private woodlot and land owners are being encouraged to use the old practice of pre-commercial thinning (PCT), and are subsidized for doing so, depending upon the percentage of trees taken out, and the size of their holdings. In the Spring 97 issue of Atlantic Forestry Review, the piece "Old Practice May Solve Expected Wood Shortage" by David Sutherland outlines the method. PCT can reduce the rotation age of a stand by at least 10 years, thereby helping to ensure a steady flow of wood to pulp and saw mills and to keep those mills running continually. "This will be good news to the pulp and stud mills whose future depends on a continuous supply of smaller trees which can be chipped or sawn into 2X4s and smaller dimension lumber." The spacing of this pre-clearing practice was originally 6 feet for spruce and fir; then 7 feet; now 8-foot spacing is being considered. The taking out of 'undesirable competition' of non-commercial crop trees, shrubs, and undergrowth lets the targeted trees grow faster and thicker for earlier harvesting.

But Dr. Suzanne Simard, a Provincial Ministry of Forests biologist in B.C., noticed that uncontrolled forest competition couldn't explain the different rates of tree growth. She conducted extensive research on the various species of underground tree-root fungi that help supply a forest's plants with essential soil nutrients. (In exchange, the fungi receive carbon from the forest's photosynthesis in the form of sugars.) This symbiosis has been known for a long time; but what Simard and her colleagues found, in addition to this, was that the fungi not only connect each tree and plant to the earth, but to each other. When necessary, trees can transfer nutrients back and forth through their underground root-fungi connections; seedlings shaded by the canopy are nurtured by their elders, and even by different species than themselves. A particular example cited: fast-growing Paper Birch can be connected to young Douglas Fir by as many as 10 distinct fungi. By the mapping of various radioactive carbon isotopes given to different

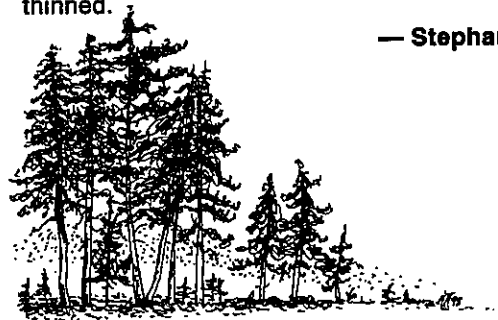


species of trees, it was shown that the Birches were supplying food to the young Firs through these root-fungi.

Subsidized PCT and 'conifer-release' spraying programmes to reduce competition of undesirable trees are doing more long term damage by removing this cooperative, underground ecology. Similarly, constantly spraying for Spruce budworm, and removing the deadwood/slash that bark beetles turn into fertiliser, will in the end create spray-resistant insect larvae and reduce the vigour of the forest soil. The balance of the more visible wildlife populations will also be affected, helping to hasten the demise of some of our endangered species as their irreplaceable habitat is destroyed.

David Sutherland reports, "Private lands in the province are being intensively searched for areas that will qualify for pre-commercial thinning. With the advent of a provincial GIS (Geographic Information System) areas can often be identified for closer inspection." In 1991, 783 hectares of small private lots and 1,469 of Crown land were pre-commercially thinned; in 1995 — 1,396 ha of private land and 705 of Crown land was thinned.

— Stephanie Robertson



## SACRED WORTH

**"What an Artist Sees, What a Biologist Sees."**  
May 13, sponsored by the Nova Scotia Nature Trust

Alice Reed, who painted landscapes of the 31 Crown sites proposed for protection under the Nova Scotia Protected Areas Strategy, spoke of her experiences while completing the series. She shared the presentation with Oliver Maass, land planner with the Province, who helped her visit many of the sites by hiking trails and canoes, and an occasional helicopter flight, in all seasons.

Alice Reed made studies in pencil and small watercolours while on site. When she painted the landscapes, she also used her own and Oliver's slides. Many of the slides illustrated this talk, and her albums of studies were available for us to see afterwards. The exhibition was also opened for the occasion.

Oliver spoke about the potential of the candidate sites for tourism and recreation, mentioning the geology and topography of each, and the type of vegetation. He commented on the likelihood of meeting bear and moose on some of the trails. Alice did see a moose near Pollett Cove, and envied the ease with which its long legs cleared the scrubby vegetation humans had to struggle through!

— Ursula Grigg



# FIELD TRIPS

## BISSETT ROAD PARKLANDS

**DATE:** 18 April, 1998

**PLACE:** The old Bissett Farm

**WEATHER:** foggy, with showers

**INTERPRETER:** Elizabeth Corser

**PARTICIPANTS:** 26



Despite the fog and the occasional rain shower, 26 people showed up at the old Bissett farm to tour part of its 600 acres. Elizabeth Corser's commitment to this property was apparent as she guided us throughout the day.

Elizabeth explained that this land that encircles Cole Harbour is not yet designated as a park but that they have high expectations for the near future. Halifax County owned and farmed this land, which was originally acquired by Mr. Bissett in a 1781 grant. In the 1980s, with the help of Ira Settle, the Province of Nova Scotia bought it from the County for \$1 and joined it to the land around Rainbow Haven, which the Province already owned.

As we strolled through vast open fields, examined wooded areas and stood on the hillsides admiring the scenic water, it was evident why Elizabeth had become attached to this place. It would make a marvellous park.

First known as Poors Farm, then the County Home, the buildings were constructed in 1880 near the end of the Old Bissett Road, which of course went back into what is now woods. There was not one big building but rather a series of small ones. The Home burned down in 1929 with, it is believed, no loss of life. There are no distinct foundations left where the houses stood, but there are piles of rock that were probably part of them. A cement foundation nearby, approximately 15' by 25', is thought to have been part of the cook's house, which was said to have been close to the Home. Near it is a spring-fed cistern which was their source of water. The walls of carefully piled square rocks can still be seen under the water. There are several old apple trees growing majestically in this area; these also are believed to date from the time the Home was here.

Time did not permit research on exactly how many people resided in the Home during this early period, however Elizabeth says the information is available because the Home was required to make reports on how many persons of each category were housed. That is, they would report so many insane, so many incapable of looking after themselves, how many children, how many could work the farm, and so on.

At that time this was a working farm where everyone who could work was expected to do so. This was how they fed and financed themselves. We viewed a cemetery which held about 18 large white wooden crosses. Elizabeth said the crosses were erected to replace small white wooden ones that were falling apart. There was no indication on the original crosses as to who was buried there or when. Elizabeth said the deceased were probably residents of the Home whom no outsider would have cared about anyway.

This area includes Cole Harbour Salt Marsh.

A company once decided to dike the land at the mouth of the harbour in order to drain it. The dikes were underwater at high tide. The company thought it could do here what had been done by diking the mud flats in the Annapolis Valley, but this way of reclaiming land is a very slow process with only a small area being reclaimed each year. It took the company a long time to discover that the land when drained did not contain good soil.

There was once a 75-foot wharf jutting out from shore near the old Home; unfortunately, there are no pictures of this wharf and no signs of it remain. During our walk we were delighted to see many Downy Woodpeckers, American Robins, and Gulls near the shore. We saw a Grey Seal and several Common Loons in the water.

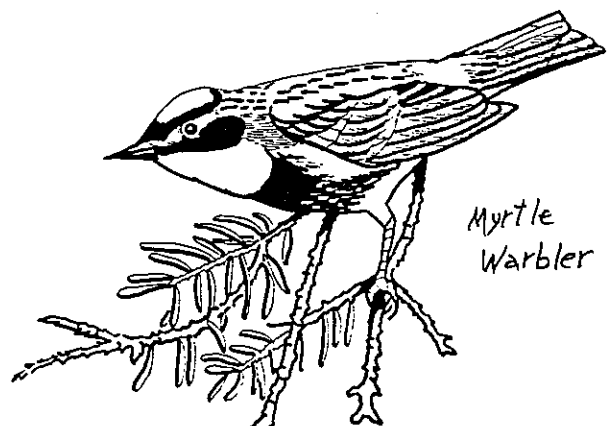
At lunch time we drove back to the Cole Harbour Heritage Farm Museum's 'Rose and Kettle' tearoom. There, Elizabeth served us tea and coffee while we ate our lunch, after which we patted and talked to the cow, who was ready to give birth, and to the rams and other sheep that live year round in this Museum. Hilary, one of the black sheep, was especially noisy on this occasion.

Next, we drove to the salt marsh next to Rainbow Haven camp. We enjoyed the pounding surf where at least one live crab was returned to the water. Our stroll along the beach and boardwalk was enlivened by a Myrtle Warbler, Hairy Woodpeckers, Tree Swallows, Eider Ducks, and several Grackles. Elizabeth told us a story about one of the G-7 Ministers, from Japan, who spent several hours birding there in 1996. It is known to be an excellent fall and winter birding area.

— Elizabeth Keizer

### Wild Creatures Seen

Grey Seal	<i>Halichoerus grypus</i>
Common Loon	<i>Gavia immer</i>
Eider Duck	<i>Somateria mollissima</i>
Osprey	<i>Pandion haliaetus</i>
Gulls	<i>Laridae</i>
Downy Woodpecker	<i>Picoides pubescens</i>
Hairy Woodpecker	<i>P. villosus</i>
Tree Swallow	<i>Tachycineta bicolor</i>
American Robin	<i>Turdus migratorius</i>
Myrtle (Yellow-rumped) Warbler	<i>Dendroica coronata</i>
Savannah Sparrow	<i>Passerculus sandwichensis</i>



Myrtle  
Warbler



# TOUR OF THE PUBLIC GARDENS GREENHOUSES

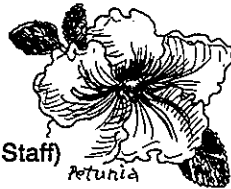
**DATE:** 28 March, 1998

**PLACE:** City Greenhouses

**WEATHER:** Cold and drizzling

**INTERPRETER:** Sheldon Harper (City Staff)

**PARTICIPANTS:** Many!



Most days I walk three kilometres briskly to and from work. That is, I walk briskly except for the several acres that are a complete contrast to the rest of the area over which I travel. I stroll over this area, basking in the peaceful hush, which is almost always present. It is restful and placid. People are not hurrying, they are strolling or lounging, enjoying. This peace may be achieved by the abundant array of stately trees and flowering bushes, the green grass, the flowers, the waterfowl, and the birds. This wonderful haven is achieved by the gardeners that plant and groom the large variety of exotically beautiful plants that grace our Public Gardens each summer.

Despite a cold drizzling morning, many of us gathered at the greenhouses on Bell Road for our chance to see the inside story of all this living splendour. A very knowledgeable Sheldon Harper conducted the tour. He explained that they have at least five full-time staff members working from October to May in the greenhouses. Four of them work in the gardens all summer, while one or two will stay in the greenhouses or work in other areas. The City started out with two greenhouses and now has six at this Bell Road location. They also do all the hanging baskets for City streets, and the public areas and parks in Halifax, Bedford, and Sheet Harbour.

All plants are started from seed, which is why staff are required to be Plant Science Technicians. This requires them to have a diploma and horticulture certificate, and about two years of experience. They also need an education in greenhouse management to enable them to keep the houses at the required temperatures, no matter how hot or cold it is outside. Sheldon wanted us to know that in winter they remove ice and snow from Municipal-owned sidewalks and parking lots.

We went through one greenhouse of sweet-smelling white Easter Lilies to get to the Tropical House. Stepping into this is like taking a leap into a science fiction movie. You are instantly surrounded by giant Sunny Ears Cactus, whose jointed pads are covered in two inch spines; Golden Barrel Cactus; Evergreen Azaleas; and Century Plants. There are also plants that look like giant corn (*Dracaena*). There is a Bird of Paradise, a huge-leaved Tree Philodendron, and Yucca plants which belong to the lily family. Of interest was the Monkey Puzzle Tree, which grows spines pointing both ways; this prevents monkeys from climbing it, because the spines dig in. There is even a Pomegranate Tree with a fruit almost ready for eating.

In the rest of the houses they had about 300 Poinsettia growing. If you want to know how to bring the plant back to full bloom for the second time, ask Sheldon; he has all the secrets! There were also about 200 hanging baskets getting ready to grace our streets for the summer. Some baskets are lined with coconut fibre and the seedlings are pushed into holes made in

the side of the basket. However, Sheldon said they preferred to work with plastic, which they introduced this year; it is easier to work with and holds moisture better after the finished basket is hung. We also examined their composting display set up by Parks and National Services for the Halifax Regional Municipality.

The greenhouses contain large rolling beds to hold the new plants, with an aisle on one long side and a space at one end. As each bed is rolled aside, the space reforms to provide a narrow path between it and the next, so that all plants in the beds can be reached in turn. In this way almost 100% of the area in each house can be planted. Sheldon said a Dosatron fertiliser system automatically delivers fertiliser into the watering system once every two weeks. They use Triple 20 chemical fertiliser mixed with organic seaweed extract.

We examined *Alternanthera*, a yellow and red plant used for the lettering on the Crest Bed (commemorating the 125th Anniversary of the RCMP this year), Dusty Miller, Hibiscus, Columbine, and Hens and Chickens. They have large Century Plants that are at least 35 years old; these are set out in the gardens each summer. Sage is used among other plants in order to repel bugs. One area had over 10,000 scarlet and salmon-coloured geraniums, started from seeds in Mid-February and blooming in April. Other houses had White Snowflakes, Pacifica Blush Periwinkles, Pink Morn Petunias, Calibracoa, Birds of Paradise, and Cannas. Canna bulbs should have their ends dipped in sulphur before planting to inhibit disease.

One greenhouse also had a transverse slice from a White Elm that was 155 years old. This elm had been cut down in the gardens because it was damaged. Sheldon reported that 17 trees were cut down this year because of Black Pine disease coming up from the USA. Many will be replaced. Interested persons can pay \$250 to have a tree planted in the gardens with a plaque, or can provide a bench.

At the end of the tour, Sheldon offered to take us round the Public Gardens when they reach their full summer glory. Watch for this in the Summer Programmel

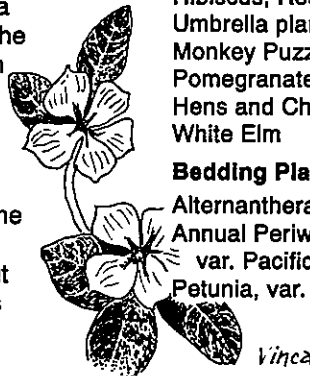
— Elizabeth Keizer

## Some of the Plants We Saw

Yucca	<i>Yucca aloifolia</i>
Corn Plant	<i>Dracaena deramensis</i> Warneckii
Bird of Paradise	<i>Strelitzia reginae</i>
Tree Philodendron	<i>Philodendron selloum</i>
Century Plant	<i>Agave americana</i>
Sunny Ears Cactus	<i>Opuntia</i>
Hibiscus, Rose of China	<i>Hibiscus rosa-sinensis</i>
Umbrella plant	<i>Schefflera</i> sp.
Monkey Puzzle Tree	<i>Araucaria araucana</i>
Pomegranate	<i>Punica granata</i>
Hens and Chickens	<i>Sempervivum</i> sp.
White Elm	<i>Ulmus americana</i>

## Bedding Plants

<i>Alternanthera</i>	<i>Catharanthus roseus</i>
Annual Periwinkle ( <i>Vinca</i> )	
var. Pacifica Blush	
Petunia, var. Celebrity Pink Morn	



# BE AN ASTRONOMER!

**DATE:** 20 April 1998

**PLACE:** Burke-Gaffney Observatory, SMU

**WEATHER:** Overcast; subminimal

**PARTICIPANTS:** 8

**INTERPRETER:** David Lane, SMU Astronomy Dept.

Unfortunately, the weather did not permit use of the telescope, but David's wonderful slides and fascinating information made this a worthwhile trip.

## SETTING THE SCENE

It will take 30 trips to set up the proposed international space station; the launches will fly over Nova Scotia, with the burning rocket fuel trails visible.

The twelve constellations the sun passes through every year are called the zodiac signs. Leo and Virgo dominate the spring sky; Bootes (also called the Herdsman), Gemini and Orion are setting. Constellations Crater and Corvus can be seen in the south on moonless nights in the country. On the Thursday following, 23 April, the crescent moon approached the group consisting of Venus and Jupiter, just above the eastern horizon.

## THE MOON

It takes twenty-seven and one third days for the moon to go round the earth. Some societies still follow a lunar year. A first quarter moon is one quarter of the distance along its orbit round the earth. The best viewing is when the terminator line is showing, as there is less sun being reflected than when the moon is full.

The moon's surface is concrete hard and covered with one inch of lunar dust, in which the astronauts' footprints were left. Mare, Latin for sea or water, is the term given to the large craters on the moon's surface.

## THE SUN

The sun filter on a telescope blocks out all but .001% of the visible light. The temperature of the sun's surface is 6,000° Celsius; sunspots reach 5,000° Celsius.

One small sunspot was pointed out to us as approximately the same size as the earth. Solar activity will begin to increase again as we come to the beginning of another 11-year cycle. Northern Lights increase with sunspot activity; the increase 11 years ago caused a power failure in Quebec and was seen in Nova Scotia.

The magnetic north pole is presently just west of Resolute, North West Territories.

## THE PLANETS

### Mercury

Mercury is small, and has craters and no atmosphere.

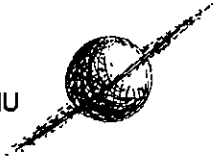
### Venus

Venus has a thick atmosphere, consisting of 90% carbon dioxide; atmospheric pressure on the surface corresponds to that at 1,000 feet *under* Earth's surface. Its surface temperature is 500° Celsius.

### Earth

Earth is three-quarters covered by liquid water; the pull of gravity prevents it from leaking off into space.

Young craters on Earth, about 100,000 years old, can easily be seen in satellite photographs. There are two craters south of Middleton which are side-by-side because the object causing them broke in two just before impact. Their floors are now covered by water, but at one time a farmer found them ideal for grazing and keeping his cattle, which could not climb the steep sides.



## Mars

It would cost 100 trillion dollars to travel to Mars, and three years to go there and come back. That's a year to a year-and-a-half to get there; and then one has to wait until the earth comes out from behind the sun before returning!

Mars has 1% the atmosphere Earth has; this information was obtained by measuring atmospheric pressure at the surface, and was confirmed during the recent Viking landing. Winter temperature is way below -100° Celsius; when it is below -80° Celsius (in summer) carbon dioxide in the atmosphere freezes and falls down to the surface. We know frozen carbon dioxide as dry ice.

## Jupiter

Jupiter is almost all gas with a very small core. Its large mass and size affect all the other planets and can affect astronauts and spacecraft nearby. The oval shape near its equator is actually a storm which has been occurring for several hundred years at least back to when telescopes were invented.

Jupiter has 16 moons of which the four largest are Io, Europa, Ganymede, and Callisto. Io has volcanic eruptions caused by Jupiter squeezing, heating, and bending it.

## Saturn

The jewel of the solar system! Saturn is made up of ringlets of countless fragments of ice and rock. It is a big ball of gas all the way through except for a small core about the size of Earth. Saturn has an atmosphere; like the Sun's, it is composed of hydrogen. One of Saturn's moons, Titan, has a surface temperature of -200° Celsius, an atmosphere like Earth's, and is the largest moon in the solar system.

## Uranus

David Lane did not tell us much about this planet.

## Neptune

Neptune is three or four times the size of Earth, and it has an atmosphere. A storm was seen on its surface in 1989, but has now disappeared. Neptune has a moon called Triton.

## Pluto

This planet is very small and very far away. It is the only one unvisited, but a probe is expected to head there within five years, taking about 7 years to arrive.

(Tip: For night viewing, use binoculars 10x50 or 7x50)

## THE UNIVERSE

The sun is only one of millions or billions of young suns within untold numbers of galaxies each consisting of many solar systems; therefore the occurrence of intelligent life forms existing outside our own Milky Way cannot be discounted.

## THE OBSERVATORY

The telescope has a 16" reflective mirror, and weighs 1,000 lb. It is tilted according to Earth's axis and can move up and down for North and South, and left and right for East and West. It has a camera attachment, and a small spotting telescope attached to the outside of the casing.

One computer controls the telescope as it follows, very slowly, the movement of stars and planets in the heavens, and another computer controls the electronic camera.

The top half of the observatory also moves with the telescope as it follows the stars and planets through the narrow slit. This opening is made narrow to block any back light from reaching the telescope.

Here's a way to remember the order of the planets — "My Very Educated Mother Just Showed Us Nine Planets."

—Terri Gagnac

# ALMANAC

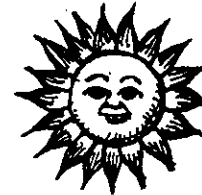
This almanac is for the dates of events which are not found in our programme: for field trips or lectures which members might like to attend, or natural happenings to watch for, such as eclipses, comets, average migration dates, expected blooming seasons etc. Please suggest other suitable items.

It has been a radiant summer — a series of windless, sun-filled days in which rains fall softly at dusk or just before glistening dawns. A generous season of plentiful catches, bountiful gardens, bushes heavy with berries and goats' milk of a creaminess that must be commented upon with each sip. A summer so splendid it will be remembered as the golden mean by which all summers to come must be measured.

— Bernice Morgan: Random Passage (1992)

## NATURAL EVENTS

June-early July	Snapping, Wood, and Painted Turtles lay eggs.
10 June	Full moon — this is the 'Strawberry Moon'.
21 June	Summer Solstice at 11:03 ADT: Summer begins.
late June-July	Eastern Garter Snakes born alive.
July & August	Young Spring Peepers migrate from ponds to woodlands
9 July	Full moon - this is the 'Buck Moon'.
18 July-12 Sept.	Flight period of the Red Admiral butterfly.
28 July-4 Oct.	Flight period of the Monarch butterfly.
31 July-10 Oct.	Flight period of the Mourning Cloak butterfly.
August- Sept.	Tadpoles of American Toads metamorphose, and the toads leave ponds looking for terrestrial homes.
5-12 August	Hottest days of Summer (average daily maximum is 22.5° C.).
7 August	Full moon — this is the 'Corn Moon'.
12 Aug.-5 Sept.	Flight period of the Viceroy butterfly.
13 August	Temperatures start decreasing.
late Aug.-Sept.	Snapping, Wood, and Painted Turtles' eggs hatch.
6 Sept.	Full moon — this is the 'Harvest Moon'.
23 Sept.	Autumnal Equinox at 1:37 a.m. ADT: Fall begins.
30 Sept.	First frost in Halifax (i.e. 1:10 chance that a frost will occur before this). 210 days of frost follow.



— Sources: Atmospheric Environment Service, Climate Normals 1951-80 Halifax (Shearwater A) N.S.; Blomidon Naturalists Society, A Natural History Of King's County, 1992; Colombo's Canadian Global Almanac, 1997 & 1998; Gibson's Summer Nature Notes for Nova Scotians, 1982; Peter Payzant's compilation of butterfly data, and the personal observations of the compiler.

## SUNRISE AND SUNSET ON LATE SPRING AND SUMMER SATURDAYS

6 June	5:30	20:56	4 July	5:34	21:03
13 June	5:28	21:01	11 July	5:40	21:00
20 June	5:29	21:03	18 July	5:46	20:55
27 June	5:31	21:04	25 July	5:53	20:48
1 Aug.	6:00	20:40	5 Sept.	6:41	19:44
8 Aug.	6:08	20:31	12 Sept.	6:49	19:31
15 Aug.	6:17	20:20	19 Sept.	6:58	19:18
22 Aug.	6:25	20:09	26 Sept.	7:06	19:05
29 Aug.	6:33	19:57			



— courtesy of David Lane, Burke-Gaffney Observatory, Saint Mary's University

## ORGANISATIONAL EVENTS

**BLOMIDON NATURALISTS SOCIETY** — Indoor meetings take place on the third Monday of the month at Room 241 in the Beveridge Arts Centre, Acadia University, 7:30 p.m. Field trips usually depart from the Robie Tufts Nature Centre, Front St., Wolfville. For more information, <<http://www.go.ednet.ns.ca/~bns/home.htm>>.

11 July "Gaspereau River Flower Walk" with leader Ruth Newell. Meet at 9:00 a.m.

25 July "Shorebirds of the Minas Basin" with leader Judy Tufts. Meet at 12:30 p.m.

**BURKE-GAFFNEY OBSERVATORY** — Public shows at the Burke-Gaffney Observatory at Saint Mary's University are held every Saturday from June through September; tours begin at 7:00 p.m. For more information phone 496-8257.

**DARTMOUTH VOLKSMARCH CLUB** — Meets for organised walks, at least 10k, every Sunday at 10:00 a.m. Pick up their schedule at the Trail Shop on Quinpool Road, or phone 435-5252 for information.

**FRIENDS OF MCNABS ISLAND** — for more information call Dusan Soudek at 422-1045, or Mike Tilley at 465-4563; or <<http://chebucto.ns.ca/Environment/FOMIS/>>.

**20 June** Paddle and Clean-Up.

**HALIFAX OUTDOOR CLUB** — Weekly outings meet at Bagel Works on Quinpool Road, for carpooling. For details and more information, call the Hotline, 492-5450.

**NOVA SCOTIA BIRD SOCIETY** — Indoor meetings take place on the fourth Thursday of the month, September to April, at the Nova Scotia Museum of Natural History, 8:00 p.m. For more information phone 852-2428 (recording), or Joan Czapalay at 455-9892; or <<http://chebucto.ns.ca/Recreation/NS-BirdSoc/nsbsmain.html>>.

**11 July** "Port Greville Beginners Field Day", with leader Joan Czapalay, 348-2803.

**19 July** "Wallace Bay", with leader Jim Taylor, 434-8516.

**19 July** "Crescent Beach", with leader Lisë Cohrs, 477-6036.

**26 July** "Mahone Bay", with leader Clarence Stevens, 835-0098.



**NOVA SCOTIA MUSEUM OF NATURAL HISTORY** — For more information about programmes phone 424-6099, or 424-7353; or <<http://www.ednet.ns.ca/educ/museum/mnh/>>.

**22 April-21 June** "Sacred Worth - Protecting Nova Scotia's Natural Areas" — Paintings by Alice Reed. A Project of the Nova Scotia Nature Trust.

**3 July-1 Nov.** "So Much to Sea". A new exhibit for the International Year of the Oceans.

**11 July** "Dawn Chorus at the Uniacke Estate" with leaders Andrew Hebda, Alex Wilson, and Azor Vienneau. **REGISTER starting June 22 at 424-3563.**

**29 July** "Botanical Ramble through the Public Gardens" with leader Alex Wilson. **REGISTER starting July 6 at 424-3563.**

**1 Aug.** "Stream Saunter" at Salt Springs Provincial Park, Pictou County with leader Andrew Hebda.

**4 Aug.** "Peggys Cove Rock Walk".

**21 & 22 Aug.** "Night Crawl Expedition and Night Critter ID Workshop" with leader Andrew Hebda. **REGISTER starting July 31 at 424-3563.**

**29 Aug.** "Shore Bird Migration Field Trip" at Conrads Beach with members of the Nova Scotia Bird Society.

**NOVA SCOTIA WILD FLORA SOCIETY** — Meets fourth Monday of the month, September to May, at the Nova Scotia Museum of Natural History, 7:30 p.m. For more information phone Heather Drope at 423-7032.

**22 June** "Native Plant Medicinal Garden" with leader Deannie Sullivan-Fraser.

**4 July** Two trips to Taylor Head: "Plant Identification" with leader Heather Drope, followed by "Identification and Folklore of Edible Seashore Plants" with leader Janet McGinity.

#### **HELEN CREIGHTON FOLKLORE SOCIETY**

**19 July** "Micmac Plant Lore", with Laurie Lacey who will lead an interpretive walk at Uniacke Estate Museum Park. For more information, call 866-0032.

**ORCHID SOCIETY OF NOVA SCOTIA** — Meets second Sunday of the month, September to June, at the Nova Scotia Museum of Natural History, 7:30 p.m. Orchids are usually on display before the meeting. For more information phone Jean Hartley, 443-3080; or <<http://www.chebucto.ns.ca/Recreation/OrchidSNS/orchid.html>>.

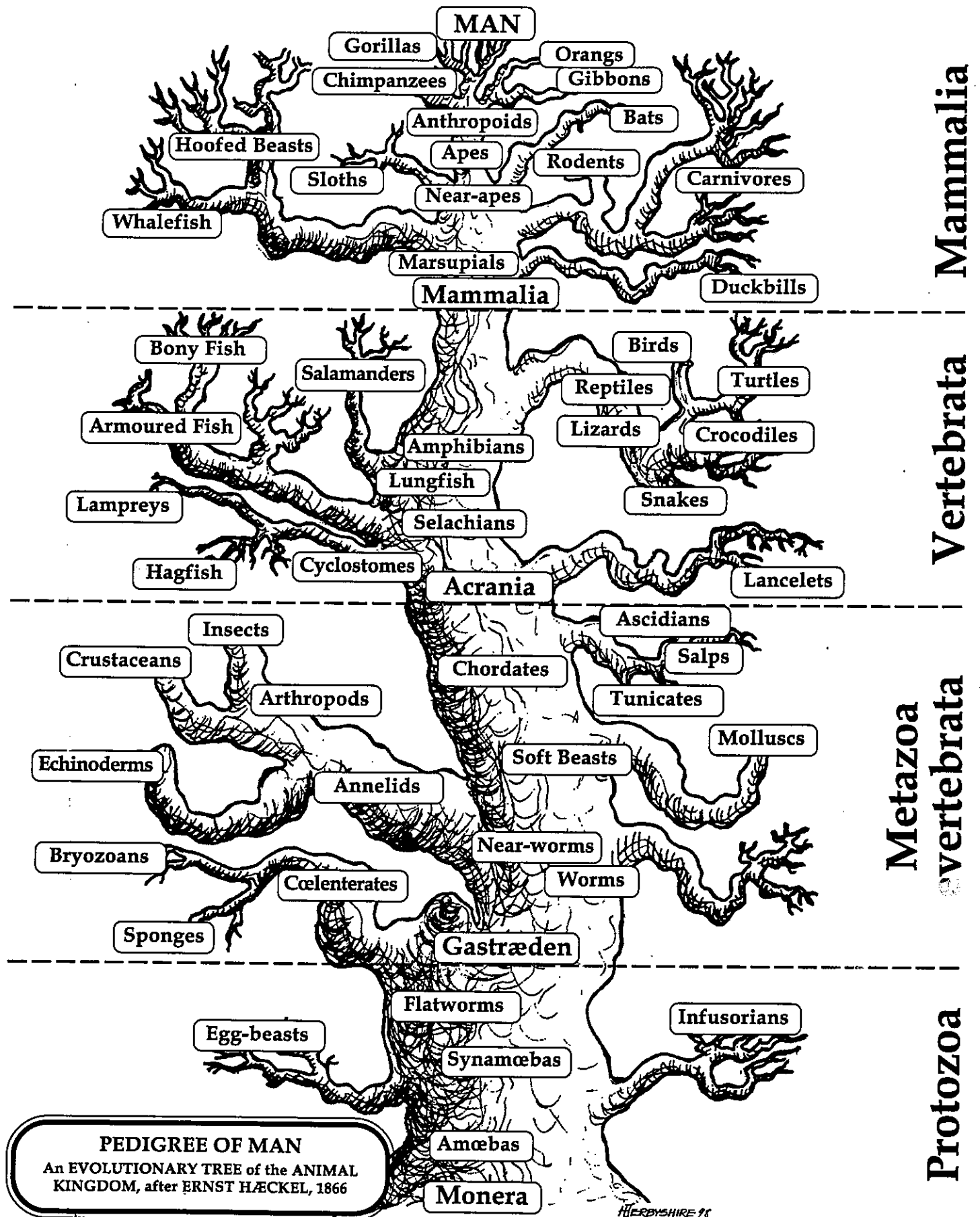
**PHOTOGRAPHIC GUILD OF NOVA SCOTIA** — Meets second Monday of the month, as well as the first and third Sundays of the month, at the Nova Scotia Museum of Natural History, 7:30 p.m. Special Seminars and Shows are held at Saint Mary's University, Theatre A, Burke Education Centre. For more information phone Gilbert van Ryckevorsel at 463-2695, or <<http://chebucto.ns.ca/Recreation/PGNS/PGNS.html>>

**26 Sept.(?)** "Fall Show", Burke Education Centre at 8:00 p.m.

**ROYAL ASTRONOMICAL SOCIETY OF CANADA (Halifax Chapter)** — Meets third Friday of each month (except July and August) at the Nova Scotia Museum of Natural History, 8:00 p.m. For more information, <<http://halifax.rasc.ca>>. Public shows are presented at 7:00 p.m. on the second and fourth Thursdays at the Planetarium in the Sir James Dunn Building, Dalhousie University. There are no shows in July and August. For more information phone the Nova Scotia Museum of Natural History, 424-6099, or 424-7353.

— compiled by Patricia L. Chalmers

# NATURAL HISTORY

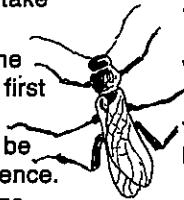


## THE KINGDOMS OF LIFE



The story of evolution continues to evolve, and systematists are adjusting their classifications along with notions of relationships. It won't make much difference to lovers of well-known groups — orchids for example, or birds; but for taxonomists, medical specialists, and naturalists who look at everything, the change is enormous. There are now five Kingdoms of Life instead of two (Animals and Plants; or perhaps three if you take Fungi out of Plants).

The element of time has always been implicit in the sciences of geology and biology, but was disguised first by attempts to correlate events with the literal interpretation of the bible. Nowadays time tends to be overlooked because of the emphasis on applied science. Even in the Creation Story there is a sense of change, Creation didn't happen in the blink of an eye.



Bishop James Ussher, in the 1500s, was curious about the age of the earth, and used the chronology of the Bible to determine the year of Creation. He made it 4004 BC, considerably earlier than was then supposed. Peer review promptly revised this to 23 October, 4004 BC, at 9:00 a.m! Ussher's approach, even though he was using biblical sources, was a step on the way to the scientific method.

A hierarchy of organisms is presented in the Creation story; this was amplified in later times, but with an element of status added. Plants were ranked below animals, and Man, a recent creation and a special edition, stood at the top of the tree. In fact living things were and still are often presented as a tree, with Man (no women or children) at the top, Apes just below, and Lower Organisms towards the bottom, where there are some so insignificant they are only there for completeness.



We were lucky to have Charles Darwin, with his lifelong curiosity in the natural world, enough money to keep him out of employment, and the chance to sail as naturalist on the Beagle in 1831. The Beagle's Captain, another inquisitive man who later contributed to the infant science of meteorology, was a good colleague for most of the long voyage. Darwin took for shipboard reading geologist Charles Lyell's Principles of Geology, about the theory of Uniformitarianism. This sounds like a new religion, but Lyell's work actually moved geology further away from Biblical sources.

Lyell believed that the old rocks of earth had been formed in the same ways and as slowly as present ones were seen to do; if his proofs were accepted, the earth must be very much older than either geologists or clerics had supposed. When Darwin realised that the slow processes of evolution must have needed millennia for their accomplishment, Lyell's work showed that the time was available.

Darwin returned to a long life of scholarship and formulated The Origin of Species (1859) from his own observations and the conjectures of many other savants, including his grandfather Erasmus. The idea was far from new.

Several scientists then produced evolutionary trees; the best known was 'Pedigree of Man', by Ernst Haeckel, a version of which is on page 13.

Darwin later published The Descent of Man and Selection in Relation to Sex (1871). He was less sexist than most men of his time, but it was customary to base all theories on the male of any species.

The Descent of Woman, by Elaine Morgan, appeared in 1972 when Desmond Morris, Robert Ardrey, and Lionel Tiger were writing popular macho theories of human behaviour. While the study of humanity had become the subject of mild ribaldry, the first publications on the Five Kingdoms of Life were appearing (1969, 1970) and once again were built on a body of previous work.

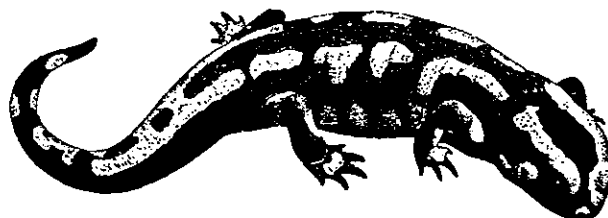
A modern chart of the animal kingdom, with a nod to the plants and some unclassifiable oddments at the bottom, hangs in the Paleontology Lab at Saint Mary's. It is no longer a tree, but Haeckel would recognise it. A fan of evolutionary lines is drawn from the sea floor to the surface and the land dwellers; a time scale is incorporated, and a few strategic fossils are depicted (in ghostly grey). Man is still top and centre, clean and well-barbered, striding along unembarrassed by his nudity (but there is no Woman in sight). He is indifferent to the Flea, Scorpion and Tick in front of him; worse, a Leopard is keeping pace with him, on a parallel path to his left. The Leopard looks sad however, and gazes out of the chart — not hungry, lonely for a Leopardess perhaps? The obvious anomalies have been resolved; the Duck-billed Platypus has been dragged by its hairs into the Mammalia in spite of its egg-laying habit. But the small oddments still lie along the foot of the chart.

Taxonomists and curious naturalists found the old Tree of Life increasingly inadequate; there were just too many exceptions. Meanwhile, during the 1930s there had been a shift from systematics and the study of whole organisms to cell biology, biochemistry, and the plotting of genetic maps. This revolution nearly swamped the science of biology. In fact, the Halifax Field Naturalists club was formed partly to keep whole living things in view.

After more than fifty years the science of cells has come back to its source, providing new understanding of the relationships between organisms, and sometimes new ways of dealing with them, especially in medicine. All species are now accepted as equals, for every thing maintaining a niche in the world is obviously successful. Much of the new knowledge concerns the unconsidered trifles at the feet of the old Trees, many of which are unicellular.

The Five Kingdoms edition of the Tree of Life is much less artistic than older ones, but elegance will come; meanwhile taxonomists are happy — and naturalists should be too. (...to be continued.)

— Ursula Grigg



# HALIFAX TIDE TABLE



## July-juillet

## August-août

## September-septembre

Day	Time	Feet	Metres	jour	heure	pieds	metres	Day	Time	Feet	Metres	jour	heure	pieds	metres	Day	Time	Feet	Metres	jour	heure	pieds	metres		
<b>1</b>	0055	4.9	1.5	<b>16</b>	0030	5.2	1.6	<b>1</b>	0155	4.6	1.4	<b>16</b>	0220	4.9	1.5	<b>1</b>	0315	4.3	1.3	<b>16</b>	0450	4.9	1.5		
	0740	1.3	0.4		0730	0.7	0.2		0815	2.0	0.6		0920	1.3	0.4		0930	2.0	0.6		1115	1.6	0.5		
WE	1320	5.2	1.6	TH	1310	5.6	1.7	SA	1410	4.9	1.5	SU	1450	5.2	1.6	TU	1525	4.9	1.5	WE	1655	5.2	1.6		
ME	2020	1.6	0.5	JE	2015	1.3	0.4	SA	2105	1.3	0.4	DI	2205	1.0	0.3	MA	2215	1.3	0.4	ME	2340	0.7	0.2		
<b>2</b>	0145	4.6	1.4	<b>17</b>	0130	5.2	1.6	<b>2</b>	0255	4.3	1.3	<b>17</b>	0340	4.9	1.5	<b>2</b>	0420	4.6	1.4	<b>17</b>	0545	5.2	1.6		
	0820	1.6	0.5		0825	1.0	0.3		0905	2.0	0.6		1025	1.3	0.4		1025	2.0	0.6		1205	1.3	0.4		
TH	1410	5.2	1.6	FR	1405	5.6	1.7	SU	1510	4.9	1.5	MO	1600	5.2	1.6	WE	1625	5.2	1.6	TH	1750	5.6	1.7		
JE	2105	1.6	0.5	VE	2115	1.0	0.3	DI	2200	1.3	0.4	LU	2305	0.7	0.2	ME	2310	1.0	0.3	JE					
<b>3</b>	0245	4.6	1.4	<b>18</b>	0235	4.9	1.5	<b>3</b>	0400	4.3	1.3	<b>18</b>	0455	4.9	1.5	<b>3</b>	0520	4.9	1.5	<b>18</b>	0030	0.7	0.2		
	0900	1.6	0.5		0930	1.0	0.3		1000	2.0	0.6		1125	1.3	0.4		1125	1.6	0.5		0630	5.6	1.7		
FR	1505	4.9	1.5	SA	1510	5.6	1.7	MO	1610	4.9	1.5	TU	1705	5.6	1.7	TH	1725	5.6	1.7	FR	1255	1.3	0.4		
VE	2150	1.3	0.4	SA	2220	1.0	0.3	LU	2255	1.3	0.4	MA			JE			VE	1835	5.6	1.7	VE	1835	5.6	1.7
<b>4</b>	0345	4.6	1.4	<b>19</b>	0350	4.9	1.5	<b>4</b>	0500	4.6	1.4	<b>19</b>	0000	0.7	0.2	<b>4</b>	0000	0.7	0.2	<b>19</b>	0115	0.7	0.2		
	0950	2.0	0.6		1030	1.3	0.4		1100	2.0	0.6		0600	5.2	1.6		0610	5.2	1.6		0710	5.9	1.8		
SA	1600	5.2	1.6	SU	1620	5.6	1.7	TU	1705	5.2	1.6	WE	1220	1.3	0.4	FR	1215	1.3	0.4	SA	1340	1.3	0.4		
SA	2245	1.3	0.4	DI	2320	0.7	0.2	MA	2345	1.0	0.3	ME	1805	5.6	1.7	VE	1815	5.9	1.8	SA	1920	5.9	1.8		
<b>5</b>	0445	4.6	1.4	<b>20</b>	0505	4.9	1.5	<b>5</b>	0550	4.9	1.5	<b>20</b>	0055	0.3	0.1	<b>5</b>	0050	0.3	0.1	<b>20</b>	0155	0.7	0.2		
	1040	2.0	0.6		1135	1.3	0.4		1155	1.6	0.5		0650	5.6	1.7		0655	5.6	1.7		0745	5.9	1.8		
SU	1655	5.2	1.6	MO	1720	5.9	1.8	WE	1755	5.6	1.7	TH	1315	1.3	0.4	SA	1305	1.0	0.3	SU	1415	1.0	0.3		
DI	2335	1.0	0.3	LU				ME			JE	1855	5.9	1.8	SA	1900	6.2	1.9	SA	2000	5.9	1.8			
<b>6</b>	0540	4.6	1.4	<b>21</b>	0020	0.3	0.1	<b>6</b>	0035	0.7	0.2	<b>21</b>	0140	0.3	0.1	<b>6</b>	0135	0.3	0.1	<b>21</b>	0225	0.7	0.2		
	1135	1.6	0.5		0605	5.2	1.6		0640	4.9	1.5		0730	5.6	1.7		0740	6.2	1.9		0820	5.9	1.8		
MO	1740	5.2	1.6	TU	1235	1.0	0.3	TH	1245	1.3	0.4	FR	1400	1.0	0.3	SU	1355	1.0	0.3	MO	1450	1.0	0.3		
LU				MA	1815	5.9	1.8	JE	1840	5.6	1.7	VE	1940	5.9	1.8	DI	1950	6.2	1.9	LU	2040	5.9	1.8		
<b>7</b>	0020	1.0	0.3	<b>22</b>	0110	0.3	0.1	<b>7</b>	0120	0.3	0.1	<b>22</b>	0220	0.3	0.1	<b>7</b>	0220	0.0	0.0	<b>22</b>	0255	1.0	0.3		
	0625	4.9	1.5		0700	5.6	1.7		0725	5.2	1.6		0815	5.9	1.8		0825	6.2	1.9		0855	5.9	1.8		
TU	1225	1.6	0.5	WE	1325	1.0	0.3	FR	1330	1.3	0.4	SA	1440	1.0	0.3	MO	1445	0.7	0.2	TU	1520	1.0	0.3		
MA	1825	5.6	1.7	ME	1905	5.9	1.8	VE	1925	5.9	1.8	SA	2020	5.9	1.8	LU	2040	6.2	1.9	MA	2115	5.6	1.7		
<b>8</b>	0105	0.7	0.2	<b>23</b>	0155	0.0	0.0	<b>8</b>	0205	0.3	0.1	<b>23</b>	0300	0.3	0.1	<b>8</b>	0310	0.0	0.0	<b>23</b>	0325	1.0	0.3		
	0705	4.9	1.5		0750	5.6	1.7		0805	5.6	1.7		0850	5.9	1.8		0910	6.6	2.0		0930	5.9	1.8		
WE	1310	1.3	0.4	TH	1415	1.0	0.3	SA	1415	1.0	0.3	SU	1515	1.0	0.3	TU	1540	0.7	0.2	WE	1550	1.0	0.3		
ME	1910	5.6	1.7	JE	1955	6.2	1.9	SA	2015	6.2	1.9	DI	2105	5.9	1.8	MA	2125	6.2	1.9	ME	2155	5.6	1.7		
<b>9</b>	0145	0.7	0.2	<b>24</b>	0240	0.0	0.0	<b>9</b>	0245	0.0	0.0	<b>24</b>	0330	0.7	0.2	<b>9</b>	0400	0.0	0.0	<b>24</b>	0355	1.3	0.4		
	0750	5.2	1.6		0835	5.9	1.8		0850	5.9	1.8		0930	5.9	1.8		0955	6.6	2.0		1005	5.9	1.8		
TH	1355	1.3	0.4	FR	1500	1.0	0.3	SU	1505	1.0	0.3	MO	1555	1.3	0.4	WE	1635	0.7	0.2	TH	1620	1.0	0.3		
JE	1950	5.9	1.8	VE	2045	5.9	1.8	DI	2100	6.2	1.9	LU	2145	5.6	1.7	ME	2215	6.2	1.9	JE	2230	5.2	1.6		
<b>10</b>	0225	0.3	0.1	<b>25</b>	0325	0.3	0.1	<b>10</b>	0330	0.0	0.0	<b>25</b>	0405	1.0	0.3	<b>10</b>	0455	0.3	0.1	<b>25</b>	0425	1.6	0.5		
	0830	5.6	1.7		0920	5.9	1.8		0935	6.2	1.9		1005	5.9	1.8		1045	6.2	1.9		1040	5.6	1.7		
FR	1435	1.3	0.4	SA	1545	1.0	0.3	MO	1555	1.0	0.3	TU	1630	1.3	0.4	TH	1735	0.7	0.2	FR	1700	1.3	0.4		
VE	2035	5.9	1.8	SA	2125	5.9	1.8	LU	2145	6.2	1.9	MA	2225	5.6	1.7	JE	2305	5.9	1.8	VE	2310	4.9	1.5		
<b>11</b>	0310	0.3	0.1	<b>26</b>	0405	0.3	0.1	<b>11</b>	0420	0.3	0.1	<b>26</b>	0435	1.0	0.3	<b>11</b>	0555	0.7	0.2	<b>26</b>	0505	1.6	0.5		
	0915	5.6	1.7		1000	5.9	1.8		1020	6.2	1.9		1040	5.6	1.7		1130	6.2	1.9		1115	5.2	1.6		
SA	1520	1.3	0.4	SU	1630	1.3	0.4	TU	1655	1.0	0.3	WE	1705	1.3	0.4	FR	1840	0.7	0.2	SA	1750	1.3	0.4		
SA	2120	5.9	1.8	DI	2210	5.6	1.7	MA	2230	5.9	1.8	ME	2300	5.2	1.6	MA	2125	6.2	1.9	SA	2350	4.9	1.5		
<b>12</b>	0355	0.3	0.1	<b>27</b>	0445	0.7	0.2	<b>12</b>	0515	0.3	0.1	<b>27</b>	0510	1.3	0.4	<b>12</b>	0000	5.6	1.7	<b>27</b>	0550	2.0	0.6		
	0955	5.9	1.8		1040	5.6	1.7		1105	6.2	1.9		1120	5.6	1.7		0700	1.0	0.3		1155	5.2	1.6		
SU	1610	1.3	0.4	MO	1715	1.3	0.4	WE	1755	1.0	0.3	TH	1750	1.3	0.4	SA	1225	5.9	1.8	SU	1845	1.6	0.5		
DI	2205	5.9	1.8	LU	2250	5.6	1.7	ME	2320	5.6	1.7	JE	2340	4.9	1.5	SA	1945	1.0	0.3	DI					
<b>13</b>	0440	0.3	0.1	<b>28</b>	0525	1.0	0.3	<b>13</b>	0615	0.7	0.2	<b>28</b>	0550	1.6	0.5	<b>13</b>	0100	5.2	1.6	<b>28</b>	0030	4.6	1.4		
	1040	5.9	1.8		1115	5.6	1.7		1155	5.9	1.8		1155	5.2	1.6		0805	1.3	0.4		0655	2.3	0.7		
MO	1710	1.3	0.4	TU	1800	1.3	0.4	TH	1900	1.0	0.3	FR	1835	1.3	0.4	SU	1320	5.6	1.7	MO	1240	4.9	1.5		
LU	2250	5.9	1.8	MA	2335	5.2	1.6	JE			VE			DI	2045	1.0	0.3	DI	2045	1.0	0.3	LU	1945	1.6	0.5
<b>14</b>	0535	0.3	0.1	<b>29</b>	0605	1.3	0.4	<b>14</b>	0015	5.2	1.6	<b>29</b>	0025	4.6	1.4	<b>14</b>	0210	4.9	1.5	<b>29</b>	0125	4.6	1.4		
	1125	5.9	1.8		1155	5.6	1.7		0715	1.0	0.3		0635	2.0	0.6		0910	1.6	0.5		0800	2.3	0.7		
TU	1810	1.3	0.4	WE	1845	1.																			

## **! NEXT DEADLINE !**

**21 AUGUST FOR SEPTEMBER ISSUE**

contributions to the Editor, HFN  
c/o NS Museum of Natural History  
Please phone 455-8160 to alert the editor

## **NATURE NOTES**

Nature notes for this quarter have shown the peaceful progress of a spring blessedly two weeks early. By 7 May:

— The Payzants had a Hermit Thrush singing, and the trees around them were in leaf.

— Red Trillium, Bloodroot and American Toads and Garter Snakes were seen in the Gaspereau Valley by Lesley Butters.

— Shirley McIntyre also reported Bloodroot and Trillium in bloom.

— There was a Northern Cardinal migration in the last fortnight; some were reported singing in the district — one in Conrose Field (Pat Chalmers).

— A starling was reported chasing a Blue Jay on several consecutive evenings; it was suggested that the jay was threatening the starling's nest. Clarence Stevens remarked that offering a broken chicken egg with its shell to a predatory jay will stop the jay from taking eggs from other birds. This doesn't work for crows or grackles.

— Tree Swallows were back, and humming birds due.

— Ospreys were building a nest on a light stand on the Wanderer's Grounds and catching goldfish in the Public Gardens. Andrew Hebda (Museum Curator) predicted the birds would abandon it when night sports began on the grounds beneath them.

P.S. Dandelions are now an endangered species in England!

