THE HALIFAX FIELD NATURAL



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



is incorporated under the Nova Scotia Societies Act and holds Registered Charity status with Revenue Canada. Tax-creditable receipts will be issued for individual and corporate gifts. It is an affiliate of the Canadian Nature Federation and an organisational member of the Federation of Nova Scotia Naturalists, the provincial umbrella association for naturalist groups in Nova Scotia.

- 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 7:30 p.m. 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.
 - HFN POST Halifax Field Naturalists
 - c/o Nova Scotia Museum of Natural History, 1747 Summer St., Halifax, Nova Scotia, B3H 3A6 EMAIL hfnexec@chebucto.ns.ca
 - WEBSITE http://chebucto.ns.ca/Recreation/FieldNaturalists/fieldnat.html
- FNSN POST Federation of Nova Scotia Naturalists c/o Nova Scotia Museum of Natural History, 1747 Summer St., Halifax, Nova Scotia, B3H 3A6 EMAIL nstn0308@fox.nstn.ca (Doug Linzey, FNSN Newsletter Editor)
- **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 1 September will be valid until the end of the following membership year. The regular membership year is from 1 January to 31 December. Members receive the HFN Newsletter and notices of all meetings, field trips, and special programmes. The fees are as follows:

Individuai	\$15.00 per year
Family	\$20.00 per year
Supporting	\$25.00 per year
FNSN (opt.)	\$ 5.00 per year

EXECUTIVE	President	Ursula Grigg	455-8160
1999-2000	Vice-President	Bernice Moores	422-5292
	Treasurer	Tony MacKay	462-1179
	Secretary	Linda Pavzant	861-1607
	Past President	Peter Payzant	422-6326

DIRECTORS Harry Beach, Bob MacDonald, Linda MacKay, Shirley McIntyre, Bernice Moores, Marie Moverley, Stephanie Robertson, Colin Stewart

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	Refreshments	Regina Maass	
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GRAPHICS All uncredited illustrations by H. Derbyshire or from copyright-free sources. Halifax Tide Tables courtesy Canadian Hydrographic Service, Fisheries and Oceans Canada. This issue (No. 94): p. 3-5—James F. Donly, Ident. N.S. Plants in Winter. p. 8, Pheasant, Duck, Mergansers & p. 10—Twila Robar DeCoste, Merritt Gibson's Nature Notes for Nova Scotians series; Loon Scene, Joan Dunning, The Loon. Voice of The Wilderness, Yankee Books. p. 11, Star, Squid, Cuttle—Milla, Animal Life Encyclopedia, Vol.3, Dr. h.c. B. Grzimek; octopus, Jean Day Sallinger, Sea Creatures Do Amazing Things, Arthur Myers. p. 14 & 15—Margulis, Origin of Eukaryotic Cells, 1970. p. 16—Hackmatack & parts, the Petersons; celestial—the Granger Collection, Discover magazine.

HFN NEWS AND ANNOUNCEMENTS

EDITORIAL CONTRACTOR CONTRA TOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR C

Once again we have a perfect spring, with warmth increasing with the light. It remains to be seen how shrubs and perennials have survived it, after a winter with little deep cold and a lot of rain in place of snow. Rhododendrons, which need to be well soaked in winter, and sugar maples, which turn water into sap, have benefitted. A bumper crop of maple syrup is reported.

As gardeners increasingly plant native species or their cultivars, we all come to appreciate the effects of the seasons on our wild flora.

After a winter of stimulating talks and trips, HFN members are ready for a summer out of doors; of course this includes urban natural history, even tree wasps emerging again through the bathroom wall! It also includes visits to other people's wild places; the FNSN meeting at Chéticamp on the last weekend in May will be a dilly.

FNSN was set up by naturalists in our province to be our watch-dog and intervenor in the task of protecting wild spaces for recreation and study, and our access to it. Its board has had a difficult year, so let's enjoy their gala weekend, and find out how we can support them while doing so.

And let's not forget that amateurs have contributed most of what we know about biodiversity!

Thanks to the many members, especially the Programme Committee, who contributed to the Newsletter this year.

Now let's move out of doors!

— Ursula Grigg

NEWSLETTER



The Halifax Field Naturalist continues to become easier and more enjoyable to produce, thanks to increased familiarity and practice with scanners, digital cameras, optical character recognition, and software.

Also, the new, greatly decreased cost of printing lessens pressures on HFNs budget.

A special thank you to Patricia Chalmers for always supplying our wonderful Almanac pages in plenty of time for deadlines. And thank yous are due to all the field trip writers and other contributors as well; without them there would be nothing to report!

---- Stephanie Robertson

PROGRAMME VOLUNTEERS 🖑

The programme Committee needs a couple of lively volunteers to help Marie Moverley. This job does not involve a lot of meetings, but is a chance to meet interesting people and, if you wish, to influence the direction of your club!

FNSN ANNUAL CONFERENCE 🐗

The 1999 Annual General Meeting is to be held on the 28-30 May, 1999 in Chéticamp, hosted by Les Amis de Plein Air with the Cape Breton Highlands National Park.

The previous FNSN AGM conference that was held there was wonderful!

There will be an owl watch, nature hikes, and a whale cruise with David Lawley; Pixie Williams and Charlie Dan Roach will be two of the trip leaders. A programme summary and registration form are included with this Newsletter; more details, with suggestions for lodging, can be obtained from Les Amis du Plein Air, AGM Committee, P.O. Box 472, Chéticamp, Inv. Co., N.S., BOE 1H0

SURVEYS INVITING INPUT

We are asked to help with several surveys this summer: **Plant Watch** continues to collect dates of blooming for a dozen common plants. Contact Liette Vasseur at Saint Mary's University; e-mail lvasseur@shark.stmarys.ca; FAX 420-5261.

The **Herp Atlas** is continuing to collect distribution and life history records of amphibians and reptiles. Records of Blandings Turtle and Loggerhead Turtles are particularly welcome. More information can be obtained from John Gilhen at the Museum of Natural History, 424-7370.

Joseph Nocera, contact for the **Northeast Loon Study** Group, is asking for access to any collection containing local loons, to "snip off 4 inconspicuous feathers" for analysis for pollutants, mainly mercury. The group is trying to trace the history of mercury pollution in these birds. Joseph J. Nocera, Atlantic Coop. Wildlife Ecology Research Network, Acadia University, Wolfville, NS, BOP 1X0. e-mail: 023758n@acadiau.ca,

or <http://dragon.acadiau.ca/~acwern/j.nocera/JNOCERA.HTM>

CONSERVATION PLANNING JOB

Maritimes provincial nature federations and the Canadian Nature Federation invite applications for the job of Community Conservation Planner to develop strategies for Important Bird Areas in our region. It's a one-year job, with extension possible, and applications close on 6 April. Among other requirements, it needs experience, and ability to use both English and French.

For full particulars, contact Dr. Martin Willison, <martin.willison@dal.ca>, or Ursula Grigg <ursula.grigg@stmarys.ca>.



NEW AND RETURNING MEMBERS

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Harry Beach Glenda Bollivar Anne Bourdon Janet Dalton Joy Emmanuel Phyllis Hall Barbara Hinds Dennis Hippern Iris Leblanc Nelson Poirier Johanne Rondeau-Wall Jack Wall Catherine Young

SPECIAL REPORTS

98/99 ANNUAL REPORTS

FROM THE PRESIDENT



Your Board of Directors held only four meetings last year, one of them lasting just twenty minutes. This was in keeping with our decision to reduce our activities to a low level, in order to retain members on the board.

We continued support for the Piping Plover project by sharing the cost of some signage with the Canadian Wildlife Service, and by supporting an application by the project for funding from the James L. Baillie memorial fund. In the housekeeping department, we advanced the monthly meeting time to 7:30 p.m., and raised the membership fees slightly.

As you are all aware, our friend and longtime member Mary Primrose passed away last year, and we participated in the planting of a tree here at the museum in her memory. A number of her slides were donated to us from her estate.

We sponsored another child to attend Sunship Earth camp, and we received her letter of thanks.

Ten members of our society attended a fund-raising dinner for the Nova Scotia Nature Trust, at which David Suzuki was the guest speaker. This was of course paid for out of our own pockets, but it did enable us to have a table dedicated to the Halifax Field Naturalists, with a sign to that effect.

I would like to thank all the members of the Board for their faithful activities during the past year. In particular, I would like to mention two retiring board members: Doug Linzey and Debra Burleson. Both Doug and Debra have been associated with the HFN for many years and we will miss the benefit of their advice at board meetings.

Of course, the major benefits which we all derive from belonging to the HFN are the newsletter and programmes. First of all, I would like to thank, on your behalf, the enthusiastic and reliable people who get the newsletter out each quarter without fail. Ursula Grigg is the editor, and she works closely with Stephanie Robertson who looks after production and also provides the illustrations. Patricia Chalmers contributes the Almanac section. The last stage, mailing, is handled by Shirley MacIntyre, who also has handled the membership records with great accuracy for yet another year. All of these people have agreed to stay on for another term, and we owe them a very large vote of thanks for a job well done.

The programmes, both here in the Museum and in the field, were planned by Bernice Moores, Carol Klar, and Elizabeth Keizer. Here again, the work they do is largely invisible because everything runs so smoothly. These three have provided us with consistently interesting speakers and field trips, and from all of us who have benefited from your hard work and organisation, all I can say is 'thank you'. The programme committee will undergo some changes this year, as Marie Moverley gradually assumes responsibility, and I would like to welcome Marie to this challenging and essential position. Every meeting ends with refreshments, ably carried out once again by Regina Maass. Thank you, Regina, for supplying us with tea, juice, and cookies so faithfully every night — it's the ideal end to our meetings.

This is the end of my term as President of the Halifax Field Naturalists, and I would like to say that it has been a most enjoyable and fulfilling experience. Working with the board has been great fun, and I learned a lot from these people. I can recommend the experience to anyone who would like to contribute to the well-being of the society, and perhaps to learn a little as well.

Ursula Grigg has graciously agreed to serve as President for the coming year, at the same time staying on as newsletter editor. I can only say that we are grateful to you, Ursula, for taking both of these tasks on at the same time, and I know that the new Board will be working with you to share the load as much as possible.

Finally, I would like to thank Tony MacKay, not only for an outstanding job as treasurer, but for agreeing to chair this meeting in my absence.

--- Respectfully submitted, Peter Payzant, President

MEMBERSHIP

Membership remained steady for 1998, with a total of one hundred and forty-six paid members, twenty-six of whom were new. Ninety-seven people had 'Individual' memberships; thirty-three were 'Family' memberships; and sixteen were 'Supporting' members.

Fifty-three memberships paid the affiliated Federation of Nova Scotia Naturalists fee.

– respectfully submitted, Shirley McIntyre, Membership

CONSERVATION

1998 saw some significant advances in projects we have worked on, and sometimes on things we did nothing on. On 3 December both the Wilderness Areas Protection Act, which protects the 31 sites we sought to protect, and the Endangered Species Act, were passed in the Nova Scotia Legislature. (We are still seeking a federal Endangered Species Act.)

McNabs Island Provincial Park was greatly advanced by the transfer of most of Parks Canada's lands to the province. Parks Canada kept the area around Fort McNab National Historic Site, but transferred the rest of the south end of the island, all of Lawlor Island plus Fort lves to the province. This leaves the lighthouse, Fort Hugonin, and about seven acres of private land outside of park control. We will continue to work on improving the quality of McNabs as a park.

The transfer of the lands at Second Lake in Sackville from housing to parks moves us a large step closer to a provincial park there. Despite long-standing, strong public support, this now appears caught up in the Integrated Resource Management process. We will continue to support proceeding with a park.

Cole Harbour marsh became a wildlife management

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area when it was donated to the province early in the year. Near the end of the year Cole Harbour Provincial Park was created by combining Lawrenceton, Conrad's Island, and Rainbow Haven parks with land around Cole Harbour and some new acquisitions near Lawrenceton. There is a public meeting on a plan for this new park on 12 April at Cole Harbour Place.

Several HFN members took part in a regional parks conference posted by CPAWS last spring. The group urged the decision-makers to support both more parks and better care of parks around Metro. Regrettably, our involvement with Point Pleasant Park has not prevented the park from looking increasingly like a select cut logging operation. We will keep on working on this issue.

- Colin Stewart



PROGRAMME

Carol Klar, Elizabeth Keizer, and Bernice Moores arranged 25 field trips as well as the evening presentations for the year just ended. It is our impression that all events were well attended.

Several of the events suggested by members have taken place while others are recorded for scheduling at a future time. We urge members to continue to make their suggestions known to this committee.

Each of us has enjoyed being part of the programme committee and sincerely thank all those who have helped in so many ways. Special thanks to Stephanie Robertson who always makes the programme 'look so good'.

> - Respectfully submitted, Elizabeth Keizer Carol Klar Bernice Moores

> > Treasurer

FROM THE TREASURER

Halifax Field Naturalists Balance Sheet As At December31, 1998

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Assets	1998	1997	
Cash	\$5,088	\$3,503	
Accounts Receivable and Accrued Income	\$132	\$377	
Inventories (Schedule 1)	\$1,254	\$1,732	
Investments (Schedule2)	\$9,908	\$10,352	
Fixed Assets	\$0	\$0	
	\$16,38 1	\$15,964	
Liabilities and Surplus			
Accounts Payable General FNSN Surplus Restricted Unrestricted	\$50 \$300 \$9,695 \$6,337 \$16,032	\$181 \$0 \$10,264 \$5,519 \$15,783	
	\$16,381	\$15,964	
	— Res	pectfully submitte Tony MacK	ed, ay,

HFN TALKS

NORTH ATLANTIC FISHWATCHING



Dr. Chris Harvey-Clark brought slides of undersea explorations both off Nova Scotia and a few from the Caribbean. The first impression was the grey colour of the local water, with a large number of particles in it, contrasted with the sparkling blue Caribbean. The next surprise was the beauty and brilliance of some of the underwater rockeries, especially the gardens of expanded anemones. Fish shots included the endearingly ugly wolf fish and the sting ray, both elegant in the water but flat and menacing on the lab bench!

Chris and his colleagues have a thoroughly enjoyable hobby, and we were privileged to share it for one dry, warm, evening.



PALEO DISCOVERY **4 FEB.** Heiner Josenhans told us about a 10 cm. long stone knife found in Juan Perez Sound on the last working day of a 1998 summer cruise. The site is near the Queen Charlotte Islands off British Columbia, on an old drowned shoreline some 53 metres below present sea level. Archaeologist Daryl Fedje, from Victoria, had been looking for signs of settlement there. Heiner Josenhans had been mapping old shorelines, now submerged, off British Columbia, for the Geological Survey of Canada. Both were interested in dating the changes in sea levels. The ship was the research vessel Victor, equipped with side-scan sonar and seismic profiling eqipment; she subsequently worked on recovery of parts of Swissair Flight 111 in St. Margaret's Bay.

The present Gwali Haanas people were asked what their ancestors looked for in a site for settlement. The answer was — access to marine foods; fresh water; shelter from bad weather; and two routes out in case of enemy attack. The site selected for exploration would have been perfect when the area was above water at the end of the last ice age. The knife has been dated to about 10,200 years ago, some 2,000 years after humans are known to have reached North America. Its location fits with the finding of parts of a human skeleton more than 9,000 years old. This individual, found in a cave on Prince of Wales Island off Alaska by American archaeologist Peter Heaton in 1996, had apparently lived largely on seafood. This supports a recent theory that the Americas were populated by clans who spread from north to south along the western margin of the continents rather than inland down a central plain; the new route would have kept them to the west of the glaciers which covered the north and east at that time.

Heiner Josenhans and Daryl Fedje expect to go back this summer to look for more.

AGM/MEMBERS' SLIDES 4 MAR.

After the Annual General Meeting, three very different sets of slides were shown.

Linda and Peter Payzant offered some of their slides of owls, made over many years. Owl photography is difficult, often producing pictures of foliage which require eyes of faith to translate into birds. Here the birds were beautifully clear and showed the great diversity of owls, from tiny handfulls bunched on perches glaring fiercely at the camera, to long thin owls with disdainful expressions, and cool monsters like Great Horned and Great Grey Owls.

Teunis Obdam and his wife went to New Mexico and looked at Saguerro Cactuses. We saw pictures of these magnificent plants from chubby seedlings through growth to tall centenarians; through flowering and fruiting; and to final death and woody skeletons.

Patricia Chalmers went to Machias Seal Island and walked among nesting seabirds, including puffins. Access to the island across rocks slippery with seaweed is difficult; the party had to walk the plank acrtoss a gulley at one point. Luckily the tide had risen when they left, so it was easy to board.

Thanks to these members for a most entertaining and varied evening. \sim



SPECIAL ARTICLES

KILLING THE GOOSE...

Small farmers keep their fields small, preserve the hedges and ditches inhabited by wildlife, and use a minimum of agricultural chemicals. As naturalists as well as customers, we should be aware of changes in the way they are treated, and should let our MLAs know our opinions.

There is a proposal to change the criteria on which Nova Scotian small farms are assessed for taxes. At present, taxes are paid on agricultural occupancy when the farm sells only its own produce; if the farm buys raw materials, commercial rates apply. The change suggested is to place any farm which packages its produce, however simply, in the business category; a request for this change is before the Nova Scotia Utilities and Review Board now.

This would shut down some small operations selling at the roadside and in Farmers' Markets, including at least three stall-holders in the Brewery Market in Halifax. Not everyone wants to rival McCain's, a modest livelihood will suffice! One farm fighting the change has had to lay off its two employees already.

Information from Maxine Bruce, Golden Goat Producers, in the Brewery Market, Halifax. Phone 1-902-582-7050; RR5 Canning, N.S. B0P 1H0.



MAI (NOT?)

There is still a list serve devoted to 'MAI-not'. This international list originating from Ottawa's community net is similar to our Chebucto Community Net, and was influential in helping to defeat or derail the MAI by working synergistically with other anti-MAI internet groups, citizens, and non-profit groups around the world. In the process it became, and remains, a space for sharing information, resources, and ideas on all manner of issues related to economic globalisation, and for ideas and dialgoue devoted to alternatives. A positive sign of hope for a more humane Liberal government in Ottawa with a greater sensitivity to past traditions and the social condition!

Long-time Liberal party policy advisor, Tom Kent, who has played a key role shaping Liberal party policies in the past, has just released a blueprint, "Social Policy 2000 - An Agenda", published by the well-respected Caledon Institute of Social Policy. This kind of agenda seems in keeping with the words of Finance Minister Paul Martin at last summer's Couchiching Institute of Public Affairs Conference 1998, in his key note address, "Rethinking Canada for the 21st Century":

"Let me repeat something I said in the last budget: globalisation is a fact. It is a reality. But it is not a faith. It is not a religion. And we commit a very serious mistake if we ever come to believe that there is no role or no responsibility on the part of the national government to provide opportunity and security at home."

For the Hon. Paul Martin's full speech see mai-not posting by jeaton August 7, 1998 at:

http://news.flora.org/flora.mai-not/6246 and http://www.southam.com/ottawacitizen/newsnow/cpfs/national/99010>

For MAI-not (un)subscription information, posting guidelines, and links to other MAI sites, please see http://mai.flora.org/>.



COFFEE CHOICE HELPS BIRDS

Let me confess that I start every day of my life the same way, by turning on my caffeine delivery system and filling my bird feeder. An ideal breakfast for me is coffee with a chaser of chickadees.

It is this dual allegiance to birds and java that brings me to the double trailer located behind an abandoned mansion that looks for all the world like an illegal Caffeine House. While my colleagues are hustling for tickets to the Keystone Cops Impeachment, I have dropped out and dropped in to the Smithsonian Migratory Bird Centre to be among my own kind: those folk who have a connection between birds and coffee.

Here, some scientists are figuring out a way to have coffee without sacrificing the Baltimore Orioles, Rubythroated Hummingbirds, Barn Swallows, and Catbirds. They are behind a movement to get us to drink shadegrown coffee. The whole thing began in 1990, explains Russ Greenberg, the lanky and bearded ornithologist who runs this centre. Congress anted up some money to find out about a decline in the birds that migrate to Central America, Mexico, and the Caribbean.

It turned out that since their old habitat, the forests, were disappearing, coffee plantations were the most hospitable homes for the I50-odd species that migrate. It wasn't the coffee plants that kept the birds alive. They get lift-off unaided by drugs. It's the shade trees that hover over the coffee beans.

But in the effort to get more bean for the buck (or the acre), the big coffee farmers have been moving to sungrown coffee plants — what Greenberg and his ilk like to call 'technified' coffee. As the shade trees are cut down, the migratory bird population is put in greater jeopardy.

"We didn't just want to say, 'the migratorybirds are declining, the sky is falling,' we wanted to think of something people can do that will have positive results," says Greenberg. "We thought that people might buy coffee in a way that would help the birds."

With this in mind, the Smithsonian folks patented the logo for 'Bird Friendly' coffee, held symposiums for the specialty coffee market, have come up with criteria for accrediting shade-grown coffee, and are now on the cusp of new agreements with coffee companies for their environmental seal of approval.

Shade-grown coffee is still in its consciousness-raising infancy, found mainly in organic or gourmet markets. But it may not be long before shade-grown coffee is offered right between the cappuccino and the macchiato.

There is a nice symmetry to all this; North Americans protecting the birds that migrate south, by drinking the coffee that migrates north. Coffee is our top import, right after that other well-known fuel, oil. The U.S. consumes a third of all the world's coffee.

But Greenberg, who reluctantly admits to a threecups-or-more daily habit, also describes the push for shade-grown coffee as a 'Trojan horse'. He says it forces us to think about what goes into the cup — the land use, the farmers, the environment, "how the world is used for us". By and large, the shade plantations still belong to the small farmers who could end up with a premium price for being good stewards.

In the coffee-craze era, coffee is ideal for green marketing because, as the ornithologist says, "coffee makes more of a statement about you than the banana you eat". Nobody wants a double tall skim latte over the dead body of a hummingbird. The model in the green marketing world would be as successful as dolphin-free tuna. I may be a touch reluctant to add politicatly correct coffee to my grocery list. By the time you finish studying the fat grams, the additives, the employment practices and the government policies of everything you ingest, there's hardly time to watch the impeachment trial.

Come to think of it, that's the good news. As they say, think global, drink local.



— Ellen Goodman ©Boston Globe Newspaper Co.

FIELD TRIPS

ROCKS AND LANDFORMS

DATE: Saturday, 5 December, 1998 PLACE: Point Pleasant Park WEATHER: Cloudless, with a chilly wind INTERPRETER: Dr. Howard Donahue PARTICIPANTS: 22

Dr. Howard Donahue, geologist with the Department of Natural Resources, arrived at Point Pleasant Park a little breathless having just changed hats after playing the role of Santa Claus! He found a much relieved tour guide organiser (myself) and 21 eagerly waiting participants. The winter day was exceptional, with not a cloud in the sky although a cold wind was blowing.

Dr. Donahue's opening comments with his flip chart on display indicated we would embark on a journey back in time — 450 million years, approximately --- to discover why the sea is where it is, where the rocks came from, as well as how the beaches were formed and how the landscape areas around our favourite Point Pleasant Park had their beginnings. Our trip today would commence on Black Rock Beach and end on Chain Rock Beach at the point.

We proceeded to Black Rock Beach, where Dr. Donahue asked us what we observed about the sand. There are ruffles in the sand, one observer suggested. Yes, and how so? asked Howard. Was it caused by water or wind? Since it was unlikely the water rose this far up on the beach we deduced it was caused by wind. What size of particles are easily blown about by wind to generate these ripple marks? As we looked more closely at the sand we discovered the fine sand had blown away while the heavier, coarser material was left behind. The greater the energy of wind or water the heavier the particles that are moved about.

This is basic geology, Howard tells us. How long does it take to make sand, someone queried? The answer: there are varying factors - first what's in the rock, and then the force of the wind and water at a specific location. It may take 25 years for one mm of sand to form from granite. We moved closer to the water's edge and discovered a marked increase in pebbles in the sand. These grey pebbles had been slate, which is the base rock of the beach here at Black Rock. There are no ripple marks here, for the energy of the waves is not enough for any movement of the pebbles. The fine sand underneath the pebbles is being 'winnowed out' however.

Before we moved on, Howard pointed out this beach is topped up yearly with sand trucked in by the city. He said the water here is safe to swim in, and only on a very hot day would there be enough of an increase in the bacteria in the water to make it unsafe.

Our group moved from the beach to Black Rock itself, where our attention was called to the 'ripple marks' in the rock. These wavy marks consist of rows of light lines — sandstone — alternating with dark lines of mud compacted into slate, a process beginning some 450 million years ago. The dynamic energy on the bottom of

the ocean produced by the movement of tides and currents began the formation of shale over millions of years ago. These ripple marks are created on the bottom of the ocean. Rather than Black Rock being a beach deposit, the asymmetry of the lines indicate movement of a current here. With no fossils embedded in the rock, the indications are that no life and no oxygen existed here at the time it was being formed. Approximately 200 years exist between the development of a layer of sand and a layer of mud, the weathering or darkening of the rock being evident above the present water line. All this started off Africa some 450 million vears ago, 2000 meters below sea level.

Then our attention was drawn to the jagged, raised marks on the surface of the opposite side of the rock; these, called chatter marks, were so unlike the smooth surface we had just been observing. The marks were the result of glacial ice movement over the slate during the ice age. The effects of glacial ice movement can be found as far out as Sable Island, where the glacially formed continental shelf slopes into deep ocean.

We left Black Rock and headed south towards Point Pleasant Battery, where Howard spoke about the significance of the Batteries in the Park as well as the fortifications at McNabs, Georges Island, York Redoubt, and the Citadel. Although many of these structures were built in the 1700s, they continued as important defences throughout the early 1800s to keep American marauders out of Halifax. By 1860 the introduction of powerful rifled guns made much of PPP defences obsolete. By the early 20th century Fort Ogilvie and Cambridge Battery in the Park were converted to modern breech loading guns, and the Martello Tower was converted into a central magazine.

Harbour Seal

We continued to Chain Rock Beach at the park's southern محمي point, a natural beach of pebbles and cobbles with sand - - underneath. While we were standing

there we spotted Harbour Seals, Phoca vitulina, splashing about by the Point Pleasant buoy and the Hen and Chicken rocks, and to everyone's delight a mature Bald Eagle, Haliæetus leucocephalus, soared high above and flew off into the distance.

Chain Rock Beach is a high energy beach created by storm waves and ocean swells. Underneath the beach lies bedrock which extends downward far into the earth. Howard took us back 400 million years ago to describe how the rocks, slate, and granite got here. Heat in the core of the earth breaks up rock, splits the earth's crust and forms a deep basin which fills with water. Thus the oceans were formed and the land mass separated into two, North America and Africa. The collision of two land masses formed high mountains with a base 40 to 50 kilometres deep. The base got very hot, rock melted and the liquid moved up as it was lighter (like the heating which causes a hot air balloon to rise). The existing rock was altered by heat and pressure into slate, and large amounts of granite were injected into the rock mass. The granite formed over 370 million years ago and moved upward because it was less dense, moving as isolated blobs that coalesced and came up to the surface. The heat from the granite cooked the slate and allowed new crystals of andalusite to grow in the rock. Weathering of these small crystals by sea, rain, and ice left countless pits on the rock surface.

Less than 20,000 years ago, glaciers scratched and polished the surface of the bedrock, where it cropped out all over southern Nova Scotia. When glaciers moved across Halifax to the Continental Shelf they dropped boulders. The massive, cold glaciers carved out the landscape by their weight, changing their own structure in the process. Weak spots formed cracks and fractures that developed into lakes while strong spots became hills. Where the glacier gouged out cracks and fractures one sees, for example, the deep North West Arm and the Harbour, while the hills on either side are the result of glaciers dumping tons of rock there. The hills or drumlins of Georges and McNabs Islands were formed by glaciers dropping rocks as they passed over.

Then Howard recreated for us how our surroundings would have appeared some 8,000 years ago, when this area reached an equilibrium. The North West Arm was a long gorge with a depth of 100 feet down to bedrock. The harbour was another gorge or river, 300 feet deep. The Atlantic Ocean began 20 kilometres away from where we were standing. On the tall hills and drumlins surrounding the rivers the first growth of trees was beginning. Our imaginations tried to take it all in, this very different world from the one we now see. As Howard suggested, we would never view our setting in quite the same way, but rather from a historical and geological stance. A chilled but happy group made its way back through the park to the cars, warmed by the adventure and excitement of our geological journey back in time.



DATE: Sunday, 17 January, 1999 PLACE: Point Pleasant Park WEATHER: Sunny and warm INTERPRETER: Etta Parker PARTICIPANTS: about 25



We appreciated the effort exerted by Etta Parker and her assistant, in making our orienteering meet at Point Pleasant Park so enjoyable. After the original date had to be cancelled because of bad weather, we were rewarded with one of those bright, sunny, warm winter days on the afternoon of January 17, 1999. Although the first cancellation meant that Etta had to redo the whole 40-marker course, she and her assistant did it with good grace.

The object in orienteering is to visit as many of the sites laid out on a trail as possible in the least amount of time; this is done using a map with the sites marked, and a compass.

Etta gave us up to 1 1/2 hours to visit all 40 sites. Additional time taken was penalised at 1 point per minute deducted from the score obtained from reaching



each marker. Sites near the start and finish area have low scores, while those further away or more difficult to find are scored higher. There is usually a different symbol or word on each site marker; this must be recorded on one's control sheet in order to obtain the marks for that site.

We think it would be a good idea for participants to refresh their knowledge of map reading before venturing into the forest. The ability to read the contour lines, which are the light brown lines overprinted on the map, can be important. They indicate the elevation above sea level of land features, so one can determine if the path goes up a mountain or over a cliff. The closed or 'vee' end of a contour line drawn on water always points upstream. This rule applies to all types of waterways, including creeks, streams, and rivers; therefore, the closed ends of the 'u-shaped' contour lines shown on land point downhill.

Maps printed in colour, with a 1:50,000 scale, are best for orienteering. If you cannot find them locally, you may write to: Canada Map Office, Dept. of Energy, Mines and Resources, 615 Booth St., Ottawa, Ontario K1A 0E9. It is suggested that you ask them first for the free "Index to Topographic Maps", which lists which are available and what they cost.

Years ago, in addition to using a compass for orienteering, one used a protractor to compute direction and distance while orienting the map to north. Now, we use the Silva compass pioneered in Sweden; this permits computation of true directions from a map which is not necessarily adjusted to the north. There is nothing to remember and nothing to write down; the direction you wish to travel is set on the compass with the turn of a dial. However, this still requires some practice; some people have been known to read the compass backwards!

The two biggest errors that people make when learning to use this compasss are the 180 degree error, when you go north when you want to go south, and the 100 degree error in which you go 240 degrees instead of 140 or 340. To avoid these errors it is a good habit to approximate the direction of travel before you read the compass, then do the compass reading to check on your estimate. If you find that there is a large discrepancy between the two, you can check your findings before starting off in the wrong direction.

Congratulations to all participants for their fine showing in this event. Linda and Peter Payzant came in first place with a total score of 1195 in a time of 1 hour, 26 minutes. Second place was shared by Lise Fillmore and Regina Maass with a score of 1180 in a time of 1 hour, 45 minutes. Ian, Denise, and Marion Blair also shared the 1 hour, 45 minute time with a score of 1170 for third place. Other people wishing to know their scores may contact me at the next meeting.

- Elizabeth Keizer

ANNUAL SEWER STROLL

DATE: Saturday, 23 January, 1999 PLACE: Various locations around Halifax Harbour WEATHER: Partly cloudy, snow showers later INTERPRETERS: Peter and Linda Payzant PARTICIPANTS: 19

Ring-necked Pheasant

We began our annual sewer stroll at the Dartmouth side of the mouth of Halifax Harbour, gazing past Devils Island towards our final destination on the Halifax side. Hartlen Point has a kind of bleak wildness about it, since it is so exposed to the Atlantic winds. Our first birds were a pair of Ringnecked Pheasants, which are regulars in the deep grasses here. In the water, we saw a good collection of seabirds for starters, including Common Loon, Redbreasted and Common Mergansers, and Black Guillemot.

En route to the obligatory stop at Tim Hortons, we passed a largish flock of Lesser Scaup in Eastern Passage which many had remarked on their way to the meeting point.

At the sewer outfall at the foot of Old Ferry Road, the beautiful little Black-headed Gulls made their first appearance, and we enjoyed puzzling over a strange hybrid Tufted Duck x Scaup. With the extension of the Canal Street sewer outfall several hundred meters out into Dartmouth Cove, Canal Street has become less interesting, so we skipped that traditional stop and headed straight for Sullivan's Pond. Here we saw the usual hordes of Black Ducks and Mallards, and as usual there were also some delightful surprises, including a very convincing male Tufted Duck, an Coot, and some American Widgeon.

American Black Duck

After a brief stop at Tufts Cove (with a ^K Gadwall!) we drove to the Sackville River outfall, losing only one of our party in the process. As expected, we 'ticked' a couple of Mute Swans and a wonderful male Hooded Merganser, which has been quite reliable of late. For contrast, we also got good looks at a Bufflehead, which superficially resembles the Hooded Merganser.

With the weather threatening, we decided to make a quick stop at the Mill Cove sewage treatment plant and then get on to Chebucto Head, where there had been considerable activity in recent weeks. Mill Cove was almost devoid of birds, so we got in the cars and began the long drive out to the end of the harbour on the Halifax side. Alas, the hoped-for

Whales, Gannets, and Auks had moved out, so Chebucto Head was somewhat of a disappointment. It was also darn cold and windy!

__Red-breasted Mergansers

We headed back into town, with stops at Purcell's Cove (White-winged and Surf Scoter, Red-necked Grebe) and Tribune Head, the very queen of sewer outfalls. Here those remaining (hardy souls) were treated to hundreds of Black and White-winged Scoters, a few Black Guillemots, hundreds more Common Eiders and a few Oldsguaw.

Our final stop was at the Northwest Arm Memorial Tower, hoping for something new in the Arm. The best we could turn up here were some more Common Loons and a few more Black Guillemots. However, looking back on the trip, it was a very enjoyable day with a good selection of birds, and I think that we'll do it again next year!

- Peter Payzant



Sewer Stroll Species

Common Loon Red-necked Grebe Cormorant sp. Mute Śwan American Black Duck Mallard Gadwall American Wigeon **Greater Scaup** Lesser Scaup **Tufted Duck** Tufted Duck 'hybrid' Common Eider Oldsquaw Black Scoter White-winged Scoter Surf Scoter Bufflehead Common Goldeneye Barrow's Goldeneye Hooded Merganser Common Merganser Red-breasted Merganser American Coot Common Black-headed Gull Ring-billed Gull Herring Guli Iceland Gull Great Black-Backed Gull Black Guillemot Bald Eagle **Ring-necked Pheasant** Rock Dove Mourning Dove Blue Jay American Crow Common Raven Black-capped Chickadee European Starling House Sparrow

Gavia immer Podiceps grisegena Phalacrocorax sp. Cygnus olor Anas rubripes Anas platyrhynchos Anas strepera Anas americana Aythya marila Aythya affinis Aythya fuligula Avthva 'X' Somateria molissima Clangula hyemalis Melanitta nigra Melanitta deglandi Melanitta perspicillata Bucephala albeola Bucephala clangula Bucephala islandica Lophodytes cucullatus Mergus merganser Mergus serrator Fulica americana Larus ridibundus Larus delawarensis Larus argentatus Larus glaucoides Larus marinus Cepphus arvlle Haliaeetus leucocephalus Phasianus colchicus Columba livia Zenaida macroura Cyanocitta cristata Corvus brachyrhynchos Corvus corax Parus atricapillus Sturnus vulgaris Passer domesticus

DAL'S MCCULLOCH MUSEUM

DATE: Sunday, 14 February, 1999 PLACE: Dalhousie Biology Department INTERPRETER: James B. Wood, Sr. graduate student PARTICIPANTS: 15

This delightful afternoon started with a lively quiz and slide show presented by Dalhousie graduate students James Wood and Alison King. The quiz determined that most people ignore the 95% of the animal kingdom that are not vertebrates. The subject of the slide show was invertebrates, particularly marine invertebrates. The slide show started with worms — creatures that we don't often associate with words like 'beautiful' and 'delicate'. The marine worms included the beautiful Christmas Tree Worm and the Fire Worm, which is strikingly

Worm and the Fire Worm, which is strikingly white and red, and has dangerous bristles.

Orange Tube, Emerald Green, and other coloured Corals continued the parade. Then there were Brittle Starfish and Basket Starfish, a Longspined Sea Urchin, and a Hawaiian Pencil Urchin, an Arrow Crab, and delicate Anemone Shrimp. James, a

iles. Ophiophalis acuteatu C

photographer of some renown, had taken all of the slides and showed us one of a live Queen Conch with its eye stalks extended — an unusual sight.



James works on Cephalopods — molluscs with sucker-laden tentacles around their mouths; they include Octopus, Cuttlefish, Squid, and the Paper Nautilus. Cephalopods are noted for their ability to travel by jet propulsion, using a siphon to eject water from the mantle cavity; the direction of the jet steers the mollusc. There is an ink sac in the

> cavity too, and ink may be ejected by the siphon to obscure the creature's escape from danger. All
> Cephalopods are predaceous, catching prey with their tentacles, and then tearing it up with strong beaks in muscular mouths. They

are noted for having vision that is almost as good as ours, and complex nervous systems, and Octopuses can be taught simple tricks.

These awesome beasts can change the colour and the texture of their skins to blend with their surroundings — or — to stand out and intimidate. James finds them wonderful, admitting he may be biased... he has an Octopus and some Cuttlefish in hidden tanks in the Life Sciences Building.

Octopuses, which have eight tentacles, are relatively short-lived: six months for the Pigmy Octopus from Florida, to three years for the Giant Octopuses; longer for the cold water species. *Bathypolypus arcticus*, the Octopus James showed us, was found in very deep water in the Bay of Fundy off Brier Island, and may live as long as five years. Their long life span is partly due to the cold water they live in, at -4° C. The Octopus featured in our field trip was also featured in the Discovery Channel special "The Ultimate Guide to the Octopus" which aired last fall. She has been brooding eggs (infertile, unfortunately) for over a year and is near the end of her life. She has lost about half of her weight since being caught, and is now about the size of a little white mouse.

For many of us this afternoon provided our introduction to Cuttlefish, Alison's area of study. The species of Cuttlefish at Dal are found only in the Mediterranean Sea. Their defensive tactics were demonstrated, including not only changing colours, but also texture. The ink, known as sepla after the generic name of the mollusc (or perhaps it was the other way round), used to be used as a pigment for writers and artists. Cuttlefish swim horizontally above the sea bottom, their long bodies defined by large, flat internal calcareous shells, which are sometimes sold in pet stores for cage birds to peck. Except for the fin which ripples all round the body, Cuttles rather resemble narrow Turtles. Of course instead of front legs, ten greyish-white tentacles extend in front, surrounding the mouth. The two 'extra' tentacles are very long and slender, and in the male are modified to clasp the female during mating. Otherwise they are used for snatching prey and are coiled up behind the

prey and are colled up benin beautiful goat-like eyes when not in use. Alison S showed us eggs, a baby Cuttle, and some adults. Although they are usually shy, these were used to people and some of us even got to feed them.

Common Octopus

After a short self-guided tour of the McCulloch Museum we were taken in small groups to the very secret tanks holding Cuttlefish and the Octopus. Seeing the live creatures after viewing the slides, and being treated to a wealth of information, brought a field naturalist's dream afternoon to a perfect close. Cheers to James and Alison.



For more information on cephalopods see: <http:// is.dal.ca/~ceph/TCP/index.html>. Some of James' images are on-line at: <http://is.dal.ca/~ceph/ imagelab.html>.

- Bernice Moores

TRACKS AND TREES IN WINTER

DATE: Sunday, 21 February, 1999 PLACE: Island Lake, Hants County WEATHER: Cloudy, windy, and cold INTERPRETERS: Mike Crowell, Fulton Lavender, Mike MacDonald PARTICIPANTS: 11

Biologist Mike Crowell was knowledgably assisted by two of Nova Scotia's premier naturalists, Mike MacDonald and Fulton Lavender for this 7km round-trip to Island Lake near Mount Uniacke. Weather conditions were not ideal but tolerable (overcast and somewhat windy, temperature around-5°). Tracking conditions on this field trip were good as a result of a light snowfall which had occurred in the early morning hours. However, relatively few tracks were seen due to the fact that the snow had ended only a few hours before the field trip began (providing insufficient time to accumulate).

Mammals, Identified By Tracks

Varying Hare Red Squirrel Red-backed Vole Short-tailed Weasel Covote Lepus americanus Tamiasciuris hudsonicus Clethrionomys gapperi Mustela erminea (), Canis latrans



Most Abundant White-winged Crossbills Pine Siskins Black-capped Chickadees Northern Juncos Golden-crowned Kinglets

Others

Red Crossbill American Goldfinch Boreal Chickadee Common Raven American Crow Red-breasted Nuthatch Loxia curvirostra Carduelis tristus Parus Hudsonicus Corvus corax C. brachyrhyncos Sitta canadensis

Loxia leucoptera

Parus atricapillus

Carduelis pinus

Junco hyemalis

Regulus satrapa

The most interesting discovery during the trip was a Red Crossbill nest in a White Pine near Island Lake. Red Crossbills are uncommon in Nova Scotia, so the discovery of this nest was of some interest.

Approximately 80 species of vascular plants were identified during the trip. The life history attributes and winter identification characteristics were discussed for a variety of species found along the route.

Flowering Plants

Red Spruce Black Spruce White Spruce White Pine **Balsam Fir** Eastern Hemlock Canada Yew **Red Maple** Striped Maple White Birch Grev Birch Yellow Birch Red Oak English Oak Pin Cherry Meadowsweet Steeple Bush



Picea rubens P. mariana P. glauca Pinus stroba Abies balsamea Tsuga canadensis Taxus canadensis Acer rubrum A. pensylvanicum Betula papyrifera B. populifolia B. alleghaniensis Quercus rubra Q. robur Prunus pensylvanica Spiraea alba S. tomentosa

Bush Honeysuckle Lambkill Bog Lambkill Labrador Tea Rhodora Low-bush Blueberry Canada Blueberry Huckleberry Witherod Winterberry Speckled Alder Willows Sweet Gale Sweet Fern Blackberry Wild Raspberry Checkerberry Bunchberry Goldthread **Poverty Grass** Bulrush Broad-leaved Cattail Sedges Burr Reed Canada Goldenrod Rough Goldenrod Calico Aster Pearly Everlasting Ferns Spinulose Wood Fern Resurrection Fern Lichens Caribou Lichen Pink Earth Lichen Old-man's Beard

Diervilla Ionicera Kalmia angustifolia Kalmia polifolia Ledum groenlandicum Rhododendrom canadense Vaccinium angustifolium V. myrtilloides Gavlussacia baccata Vibernum nudum llex verticillata Alnus incana Salix spp. Myrica gale Comptionia peregrina Rubus allegheniensis R. idaeus Gaultheria procumbens Cornus canadensis Coptis trifolia ?Danthonia spicata Scirpus spp. Typha latifolia Cyperaciae spp. Sparganium sp. Solidago canadensis S. puberula Aster lateriflorus Anaphalis margaritacea Dryopteris carthusiana

ryopteris carthusiana ? ? Usnea spp. —Mike Crowell

HAIRY, SCARY... SPIDERS!

DATE: Sunday, 7 March, 1999 PLACE: Nova Scotia Museum of Natural History WEATHER: Awful PARTICIPANTS: 20

This was an 'indoor' field trip, a Sunday afternoon slide show to introduced field-naturalists to the biology of spiders, and this venue was welcome, considering the weather! For those who were forced by the sleet to miss this presentation — a brief summary follows.



Spiders are Arachnids, included in the Arthropods (with Crabs, Lobsters, Krill, and other Crustaceans), with four pairs of walking legs and a two-segmented body. A close-up look at these hairy creatures reveals that most of their hairs are sense organs. Spiders carry tactile hairs and chemosensitive hairs on their exoskeletons to feel, hear, smell, and taste their environment. Even if hairs are probably the major sensory organs for all spiders, some of them have very accurate vision too. Jumping Spiders with their two huge frontal eyes and six much smaller eyes (by the way, most spiders have eight eyes) demonstrate accurate visual recognition of their prey, mates, or enemies. They, and many other hunting spiders, like Wolf Spiders or the big Tarantulas, don't





Wolf Spiders or the big Tarantulas, don't build webs to trap their prey. Like the Jumping Spiders, they sneak around and look for prey, or they use a 'sit-and-wait' strategy. Detected prey is captured by assault, without using silk traps. Hunting spiders use their silk only to build hides, or construct egg sacs to raise their offspring.

In contrast to hunting spiders, web spiders build silk webs to trap their prey. The common and well-known orb-webs of Cross and Garden Spiders are only one type of web. Others, like cob-webs or sheath-webs, are more 3-dimensional and sometimes look chaotic! These webs are built much closer to the ground. In the early morning, dewdrops make these webs easy to spot, and their number is often surprisingly high. All types are deadly traps for insects and other Arthropods, the usual spider diet.

All spiders are predators, and all spiders are venomous. They inject venom with their chelicera (poison claws) into their victims to kill and digest them. But most spiders are not harmful to humans. Even if they are able to penetrate human skin with their chelicerae, the effect of the venom is like a bee or wasp sting.

However, there a couple of uncommon species here in North America which are potentially harmful for people, and very rarely, fatal.

— Ulli Höeger

M-M-MAPLE SUGAR!

DATE: Saturday, 20 March, 1999 PLACE: Maple Ridge Farm, Truro WEATHER: A beautiful, sunny, spring day! PARTICIPANTS: 20

Many of the 20 people that attended the maple syrup tour at Maple Ridge Farm located near New Central Annan were delighted to find there a double attraction. Not only was the maple syrup operation of great interest, we were delighted to hear of the interesting life that Mr. Cook has led. Perhaps I should say Dr. Cook, since he is a retired surgeon who grew up near Shubenacadie. He was a fighter pilot during World War II, and I'm sure that if time had permitted there would have been many interesting stories to tell.

Dr. Cook purchased his 300-acre maple-bush over 20 years ago, not knowing what type of wood the acreage held at the time. He was delighted when he discovered it was a sugar bush because he had tapped trees as a child.

In mid-February the Cooks plough out their road and prepare to start setting the taps. The sap from 10,000 to 15,000 taps is collected by means of plastic tubes that empty by gravity into storage tanks. They only tap trees that are at least ten inches in diameter, using a two and one-half inch tap. Occasionally, a bear or a squirrel will bite through some of the tubing! Last winter an ice storm buried the sugar bush under two inches of ice. causing considerable damage. These setbacks make extra work for the small staff.

The best weather for collecting sap is when the nights have low temperatures of -8° to -10° and the days are warm at +5° to +10°. Low atmospheric pressure also affects the flow of the sap. Dr. Cook said that 66% sugar content is the standard; however, they take their syrup to 66.5% which makes a thicker, more syrupy product. Three people operate the equipment, which has the high capacity of processing 8000 gallons in eight hours. The ratio of syrup to water is 40:1. That is, for every forty gallons of sap, they get one gallon of syrup.

The sap runs from the trees through the gravity-feed lines into tanks. From here there it goes to a huge stainless steel cooker to begin the boil that extracts the water. Two large burners take about 20 minutes to heat pans that are six feet wide by ten feet long. There is no worry about burning the syrup at this stage because it still contains so much water. Each pan is filled to a depth of about two inches in order to provide faster evaporation. They have no problem with foam, the removal of which can cost a lot of time, because they add an anti-foaming agent; this agent leaves only a minor amount of harmless residue in the finished product. From the pans, the syrup automatically passes through successive pieces of stainless steel equipment where more water is removed. The pans contain channels that allow hot gases from the burners to pass through flues that are surrounded with fluid. As the syrup becomes closer to the finished product it has to be watched for scorching.

Water extracted from the sap is very flat and not pleasant to drink.. It is only useful for washing out the equipment and the sand filters because it has the ability to kill bacteria. This eliminates the need to sterilise the equipment with chlorine solutions, which leave an aftertaste. As the syrup continues to boil, a residue called sugar sand accumulates in the bottom of the pan and this is discarded. Any sand remaining in the syrup is then filtered out with cloth and paper filters.

Eventually, after all the boiling and filtering, a clear product is run into barrels which are sealed and stored until the syrup is required for sale. As needed, it is reheated and bottled.

Dr. Cook personally makes the very time-consuming fancy products such as maple butter and candy in his home kitchen. Maple syrup is indeed a sweet treat!

Many thanks for an informative, interesting demonstration, and a wonderful field trip!

-Elizabeth Keizer



NATURAL HISTORY

THE KINGDOMS OF LIFE

(cont'd from No. 91, Summer '98)

By the 1960s, the standard classification represented by Haeckel's Tree of Life was being dismembered. That old Tree had baggage: its arrangement implied that all life came from one source; that animals were derived from plants, and fungi also belonged with plants; and that there was an untidy mass of minute unicells, with incredible life histories, at its roots.

In the 1960s, in the tradition of Charles Darwin, who drew on all the knowledge of his time as well as making intuitive leaps, Lynne Margulis combined all available sources and proposed that the traditional two kingdoms, Plants and Animals, become five. These would be Monera, Protoctista, Fungi, Plants, and Animals; this followed the suggestion of R.H. Whittaker, but went much further. (One of the charms of the scientific literature here is evidence that the authors were talking to each other behind the scenes).

Technology had improved in several fields; electron microscopy gave more information on cellular anatomy. Micro-methods in biochemistry traced the chemical pathways of energy production and so on, and showed that they were similar in most eukaryotes, but very varied in prokaryotes. Geological explorations produced more fossils and dated them, and geochemistry even traced the evolution of earth's atmosphere and showed how much of the planet's present structure is owed to living organisms.

Division of organisms into Prokaryota (Bacteria and Blue-green Algae) and Eukaryota (the rest) was already accepted. Prokaryote cells have no cell walls, nuclei, or organelles (the latter are bodies such as plastids, mitochondria, and nuclei). The prokaryote's cell boundary is a simple protein. Cell walls of cellulose or chitin, and nuclei and other organelles are found in eukaryote cells.

Prokaryote cells are small, single, and presumably the oldest organisms on earth; they are still found everywhere in wet places. They may form masses but individual cells are not connected. They contain DNA, but their reproduction involves simply parting it between daughter cells, not necessarily

equally. Eukarvote cells are larger, and may form connected balls

or filaments, tissues, or large organisms. They have a regulated division of DNA during fission and have sexual reproduction; that is, the offspring contains DNA equally from two parents. "Let us suppose," said Lynne Margulis, "that the chemical processes which became life occurred many times, in different ways. Various organisms grew and reproduced using different chemical reactions, anaerobically, in an environment with no oxygen. Photosynthesis occurred in some by several first paths, but none produced oxygen. What if the big change came with the new form of photosynthesis which produced oxygen? This change led to the Blue-Green algae." Then the earth's atmosphere gradually became charged with oxygen, which is fairly poisonous; some of the anaerobic cells died out but others throve. All this occurred in the three billion years before the Palaeozoic Era.

By the beginning of the Palaeozoic, the atmosphere contained oxygen and there was a great diversity of single-

celled prokaryotes and eukaryotes, and some many-celled eukaryotes. Some prokaryotes remained anaerobic, but

eukaryotes required oxygen. Apparently the new atmosphere was congenial. Lynne Margulis believed that eukaryotic cells had become more complex by the process of combination between different kinds of organisms; she identified various prokaryote families which could have contributed symbionts. This process of symbiosis would account for the possession of and cilia (projections with a characeristic structure), packets of photosynthetic pigments mitochondria, and a membrane-bound (plastids),

Symbiosis must have occurred at different complexity; it is still happening today. Algae with fungi to form lichens, and some corals photosynthetic algae in their skins. Tree roots combine with fungal hyphae, and beans host nitrogen-fixing bacteria inside their roots. Symbioses are usually concerned with nutrition, may involve protection: sea slugs incorporate stinging cells from the ceolenterates they eat into prominent parts of their own bodies.

The next stage of the story depends on reproductive strategies. Eukaryotes developed different patterns of transference of DNA to their offspring. Most eukarvote species have an alternation of generations between asexual division - the cells simply duplicate their DNA and half goes to each daughter cell - and sexual reproduction, in which half of the DNA goes to each daughter cell to be matched with half from another organism. The way this is done separates off the three most advanced Kingdoms -Fungi, Animals, and Plants. With fungi, animals, and plants, we are back on familiar ground. Fungi never have cilia or flagellae, have a rather lazy mating system, and absorb nourishment through the integument. Animals ingest their food, do have cilia or flagellae, and have an elegant transfer of DNA, with chromosomes, spindles, and their own food by

centrioles. Plants typically form their own food by photosynthesis, have an orderly but less striking method of transferring DNA in have at least some cells with cilia or flagellae.

This still leaves a large for further classification. Protoctista, and diatoms, dulse, They have f have varied patterns her own local by hur less striking method chromosomes, and cilia or flagellae. Kingdom of eukaryotes They are named include amoebas and and the kelps, among others.

have **G** flagellae at some stages, and varied patterns of nutrition and reproduction.

Taxonomists like the Five Kingdoms because so much is explained, and exceptions are relatively few. The increase in Kingdoms and Phyla emphasises the antiquity of many well-known groups, and makes it easier to see them in perspective. After all, life has been around for 3.5 billion years and for at least the first billion, earth was the territory of the bacteria. Animals seem to have arisen between seven and eight million years ago, and plants later still!

Both bacteria and protoctists invite further investigation and speculation. Will the next top dogs of evolution be

intelligent apes or super-ants; will they be something different, derived from a forest pool, or

the ruminating stomach of a deer? Ernst Haeckel would have approved of the Five Kingdoms, and so would Charles Darwin.



— Ursula Grigg



BILLIONS OF YEARS AGO

LARCH CASEBEARER IN NEW BRUNSWICK

In a recent letter to NatureNB, Brian Dalzell wrote that Tamaracks on Grand Manan are turning brown and dying off due to an infestation by the Larch Casebearer (Coleophora laricella), a small moth.

Tamarack is the North American species of Larix, the only local conifer to shed its leaves annually. Tamarack is *Larix laricina*; the European species, *L. decidua*, is known as Larch, and is grown here as an ornamental. Probably we in Nova Scotia should also be watching for this destructive insect.

Fred Schueller, from the Eastern Ontario Biodiversity Museum, gave NatureNB an undated article titled "Tamarack - Sure Looks Brown!", by Bob Heyd, Michigan Dept. of Nat. Res. Part of it follows:

"Tamarack needles are browning in the Eastern Upper Peninsula from Shingleton to the Mackinac Bridge, and as far south as Indian River in Northern Lower Michigan. The culprit is a tiny moth called the Larch Casebearer (Coleophora laricella). This is an introduced species from Europe, first recorded in Massachusetts in 1886. It now occurs throughout most of the range of Tamarack in North America. The Larch Casebearer is a serious defoliator of Tamarack of all ages. It derives its name from the case it constructs. The case is formed by part of a minedout Larch needle, which the tiny larvae line with silk. This case enlarged as the is provides larvae grow. - It camouflage, making the larvae verv difficult to see. When the larvae finish A inside the needle case. feeding in June, they pupate Moths emerge in June or early July. They are silvery gray and have a wingspan of 8 mm. Eggs are then deposited in

needles.

When they hatch, the tiny larvae feed within the needle for a couple of months before overwintering within its case firmly attached to a branch. Most larvae attach near the base of a bud. They begin feeding again in May as soon as new needles appear. The most evident damage occurs in the spring when foliage shrivels and dies. Damaged needles look as though they have been bleached or scorched. If defoliation occurs for two or more consecutive years, the tree may be killed.

The good news is that a number of parasites have been imported from Europe to combat the casebearer. These parasites have been widely established and are believed to be the reason that outbreak severity has diminished throughout North America."



- Ursula Grigg

1999 CELESTIAL FIREWORKS

As if to compensate for relatively uneventful skies in 1998, the heavens are cooking up an extraordinary year perhaps to celebrate the millennium's end. It's been decades since the planets put on the kind of show they will present during the next 12 months. Even meteor showers and eclipses will abound. On all fronts, 1999 promises to be an amazing time for anyone interested in the night sky.

Fortunately, the spectacles won't crowd themselves into

one season. Instead they're spread leisurely throughout the year. Mercury, for instance, is at its most obvious — as a bright 'star' low in evening twilight — during the first week of March. Mars is closer to Earth and more brilliant than it's been all decade — a rosy beacon in the midnight sky — in April and May. And Venus is best, dazzling and unmistakable, at dusk from May through July. (On July 15, Venus and the crescent moon present an eye-catching conjunction in the western twilight.) Then, during the summer, these three closest-to-Earth planets fade, as if to surrender centre stage to other warm weather events.

The date most deserving of the spotlight is August 11, which features a remarkable double whammy: the century's final total solar eclipse; and in the evening, the Perseid meteor shower, unfolding under ideal moonless skies. This last totality of the millennium may be the year's most significant event. Because of its relatively convenient path across densely populated England, France, Germany, and Eastern Europe, it is expected to be viewed by more people than any other solar eclipse until the lengthy Chinese totality in July of 2009. Most of the others, during the next two decades, will occur over oceans and polar regions.

With the arrival of autumn, the planets return. Jupiter's brightest, nearest, highest, and closest approach to Earth of the decade occurs on October 6, while Saturn reaches its brightest, highest visit of the decade just weeks later, on November 6. To heap the plate still more, November delivers another twin feast: for the first time in decades, Mercury will cross the face of the sun, as seen from most of the United States. Two days later, on November 17, the long-awaited Leonid meteors arrive. Every 33 years, these ultra-fast shooting stars put on an amazing display, 100 meteors per second. The storm is due again this year. Count on the entire world gazing skyward that night. But it's no sure thing; sometimes — in 1899 and 1933, for example — the Armageddon-like display fizzles into a normal shower.

Even if no storm develops, the fireworks aren't finished yet. On December I3, the rich Geminid meteors are due under ideal skies, brightened only by a thin, early-setting crescent moon. These dense, rocky meteors have been the most dependable one-a-minute show for the last quarter century.

And it's still not over. On December 22, people looking for end-of-the-millennium portents will surely note that the winter solstice falls — by chance — on the same date as the full moon, as well as the moon's closest approach to Earth of the entire year. This huge full moon will be potent, causing enormous tides.

For a final touch, throw in a rapidly rising sunspot cycle, which means 1999 will almost surely bring a harvest of auroral displays. Then add in a partial eclipse of the moon on July 28, visible in most of the United States, plus several unusually tight and easily observed planetary conjunctions. See why sky observers are cheering? We survived the drought of 1998, and now the coming year will bring a flood of worthwhile sky pageants for the world's nightwatchers.

> --- Bob Berman Jan. 99 Discover Magazine



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.

Make me over, mother April, When the sap begins to stir! When thy flowery hand delivers All the mountain-prisoned rivers, And thy great heart beats and quivers To revive the days that were, Make me over, mother April, When the sap begins to stir!

- Bliss Carman, the first verse of "Spring Song"

NATURAL EVENTS

mid-March 20 March 23 March 31 March	Mating season for Snow Fleas: a sure sign that winter is nearly over! Vernal Equinox at 9:46 p.m. AST: Spring begins in the Northern hemisphere. Daily average temperature above 0°. Full Moon — the "Pine Moon".
late Marearl. May	Look for the Day-flying Moth, Archieras infans, also called the Infant; one of first Moths to hatch in spring.
1 April	Jupiter in conjunction with the Sun.
4 April	Daylight Savings Time begins at 2:00 a.m.: turn clocks ahead one hour.
11 April-3 June	Flight period of Mourning Cloak Butterfly.
16 April	Daily minimum temperature at Shearwater is above 0°.
22 April	Earth Day.
22 April-19 July	Flight period of Spring Azure Butterfly.
30 April	Full Moon — the "Flower Moon".
15/16 May	Perigean spring tides: the second-highest tides of the year.
late May	Hummingbird Moth emerges to feed on Lilacs.
24 May-15 July	Flight period of Canadian Tiger Swallowtail.
28 May	Date of last spring frost in Halifax (1:10 chance that a frost will occur after this); 155 frost-free days follow.
30 May	Full Moon — the "Strawberry Moon".
2 June-September	Flight period of Mustard White Butterfly.
21 June	Summer Solstice at 4:49 p.m. ADT: Summer begins in the Northern Hemisphere.

— Sources: Atmospheric Environment Service, Climate Normals 1951-80 Halifax (Shearwater A) N.S.; Colombo's Canadian Global Almanac, 1997 &1999; Royal Astronomical Society of Canada's Observer's Handbook 1999; Peter Payzant's compilation of butterfly data; Jim Edsail & Tony Thomas (both on NatureNB); and — the personal observations of the compiler.

SUNRISE AND SUNSET ON SPRING AND EARLY SUMMER SATURD



— courtesy of David Lane

5:52

6:40

6:27

6:16

5:30

5:29

5:28

5:30

16....

19:53

20:01

20:10

20:56

21:00

21:03

21:04

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.

- 15 March "The Poetic Greek Islands", with speaker Jim Wolford.
- 19 April "The Shrubs of Nova Scotia", with speaker Raymond Fielding.
- 23 April "Spring Sky", with leaders Sherman Williams and Larry Bogan. Meet at 8:30 p.m.
- 25 April "Spring Birds", with leader Jim Wolford. Meet at 10:00 a.m.

Burke-Gaffney Observatory — Public shows at the Burke-Gaffney Observatory at Saint Mary's University are held on the first and third Saturday of each month; 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 more information.

Friends of McNabs Island — for more information call Dusan Soudek, 422-1045 or Mike Tilley, 465-4563, or; ">http://chebucto.ns.ca/Environment/FOMIS/>.

Halifax Outdoor Club — Weekly outings meet at Bagel Works on Quinpool Road, for carpooling. For more details, call the Hotline at 492-5450.

Nova Scotla Bird Society — Indoor meetings take place on the fourth Thursday of the month, October to April, at the Nova Scotla Museum of Natural History, 8:00 p.m. For more information phone 852-2428 (recording), or Fulton Lavender, 455-4966, or; http://chebucto.ns.ca/Recreation/NS-BirdSoc>.

- 25 March "Birds of Texas", with speakers Joan Waldron and Blake Maybank.
- 27 March "Baccaro and Blanche Peninsula", with leader Donna Ensor, 875-4269.
- 10 April "Martinique Beach", with leader lan McLaren, 429-7024.
- 22 Aprll "Is This the Garden of Eden?", with speaker Richard Knapton.
- 24 April "The Hawk, Cape Sable Island", with leader Johnny Nickerson, 745-2958.
- 25 April "Wolfville Area", with leader Jim Wolford, 542-7650.
 - 2 May "Amherst Point Bird Sanctuary", with leader Alan Smith, 506-536-0164 (h) or 506-364-5038
- 19 May "Halifax County Early Morning Warbler Walk", with leader Fred Dobson, 852-3042.
- 21-24 May "Bon Portage Island", with leader Claire Diggins, 825-6152.
 - 22 May "Hants County Day", with leader Peter LeBlanc, 864-6551.
 - 23 May "Hopewell, Pictou County, for Hawks and Warblers", with leader Harry Brennan, 923-2780.
 - 29 May "Hawk Picnic Day, Cape Sable Island", with Lillian Scott Perry, 637-2844.

Nova Scotia Nature Trust - Call 425-5263 for more information.

- 17 April AGM, followed by a "Photographic Journey of our Natural Areas", with Oliver Maass. NSMNH, 7:30 p.m.
- 24 April "Cole Harbour Easement Celebration and Birding Excursion", with leader lan McLaren.
- 15 May "Blomidon Nature Walk".
- 30 May "Meander River Easement Celebration and Nature Hike", with leader Jim Wolford.

Maritime Museum of the Atlantic — For more information about programmes phone 424-7490 or; ">http://www.ednet.ns.ca/educ/museum/mma/>.

- 23 March "Island Outposts", with speaker Scott Cunningham.
- 30 March "Sambro: North America's Oldest Working Lighthouse", with speaker Kathy Brown.

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/.

13 Mar24 May	"Fossii Art", an exhibit from Germany.
31 March	"Through the Eyes of Geologists", a Fossil Gallery Tour.
7 April	"Bugs that Bite", with speaker Edith Angelopolis.
14 April	"CBC Land & Sea", with host Peter Verner.
15-30 April	"Annual Salamander Meander", with leader John Gilhen. Pre-register 424-3563 starting March 27.
17 April	"Getting Ready For the Birds", with members of the Nova Scotia Bird Society.
21 April	"Hit the Cape Breton Trails", with author Michael Haynes.
28-30 May	"Nova Scotla Wildlife Carvers and Artists Association Tenth Anniversary Competition and Show". The
-	NSCCD has designated 1999 as the year of 'Wildlife in Wood'. This year's theme is the Harlequin Duck.

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, 423-7032.

22 March "Ecology and Conservation of the Wild Leek", with speaker Liette Vasseur.

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.

10 & 11 April Orchid Show and Sale, Nova Scotia Museum of Natural History.

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. Shows are held at Saint Mary's University, Theatre A, Burke Education Centre. For more information phone Kenneth Moore, 826-1121 or; http://chebucto.ns.ca/Recreation/PGNS/PGNS.html.

- 4 April "NS Bird Society Competition" and "Trails of Nova Scotia", a seminar with Michael Haynes.
 - 24 April "Spring Show", Burke Education Centre, Saint Mary's University, 8:00 p.m.

Royal Astronomical Society of Canada (Halifax Chapter) — Meets third Friday of each month at the Nova Scotia Museum of Natural History, 8:00 p.m. For more information; http://halifax.rasc.ca. Public shows at the Planetarium in the Sir James Dunn Building, Dalhousie University, have been discontinued.

HALIFAX TIDE TABLE

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NATURE NOTES

February

The Payzants saw very many crossbills presumably in response to a good crop of spruce seeds. Each crossbill species has its bill crossed either to the right or to the left; they are never ambidextrous! They also saw a Pileated Woodpecker.

Lesley Butters had a wonderful day around Wolfville. She saw a Snowy Owl by the Gaspereau River, some eagles feeding on a deer carcase, and a small brown spider. She went skating and heard birds chatting all around. The rising moon was red; it was actually a rare blue moon, the second full moon in February. She saw a parade of planets and heard a pack of Coyotes barking.

Linda saw 40 Bald Eagles and 24 Rough-legged Hawks.

Elizabeth Keizer went to Duncans Cove and saw a Red-breasted Merganser, Goldeneye, grebes, and ten Fin Whales. On ice at Ketch Harbour were two young seals; one was a pup, the other a bit older.

Regina Maass saw four Common Loons, one Red-throated Loon, and two Dovekies on the Northwest Arm; she commented on the lack of ice this winter. She had Robins in her garden; Windflowers were out, Skunk Cabbage poking up, and there may have been a Catbird in the bushes.

Joan Czapalay saw a Red-headed Woodpecker wintering at Hantsport and a pair of Northern Mockingbirds at Grand Pré.

March

Many people saw Venus and Mars on the western horizon and Mercury briefly. Tony MacKay saw them in the Domincan Republic! Shirley McIntyre mentioned Sherman Williams' astronomy notes posted on NatureNS.

Snowdrops and Crocuses were already out.

Pat Chalmers saw 19 Harlequin Ducks at Indian Point near Prospect; five drakes and 12 ducks. Ursula Grigg had a kind of cranefly in the house (her first insect of 1999).

A junco was building a nest in a Beaufort Avenue garden; crows were flying in with twigs.

! NEXT DEADLINE ! 21 MAY FOR JUNE ISSUE

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