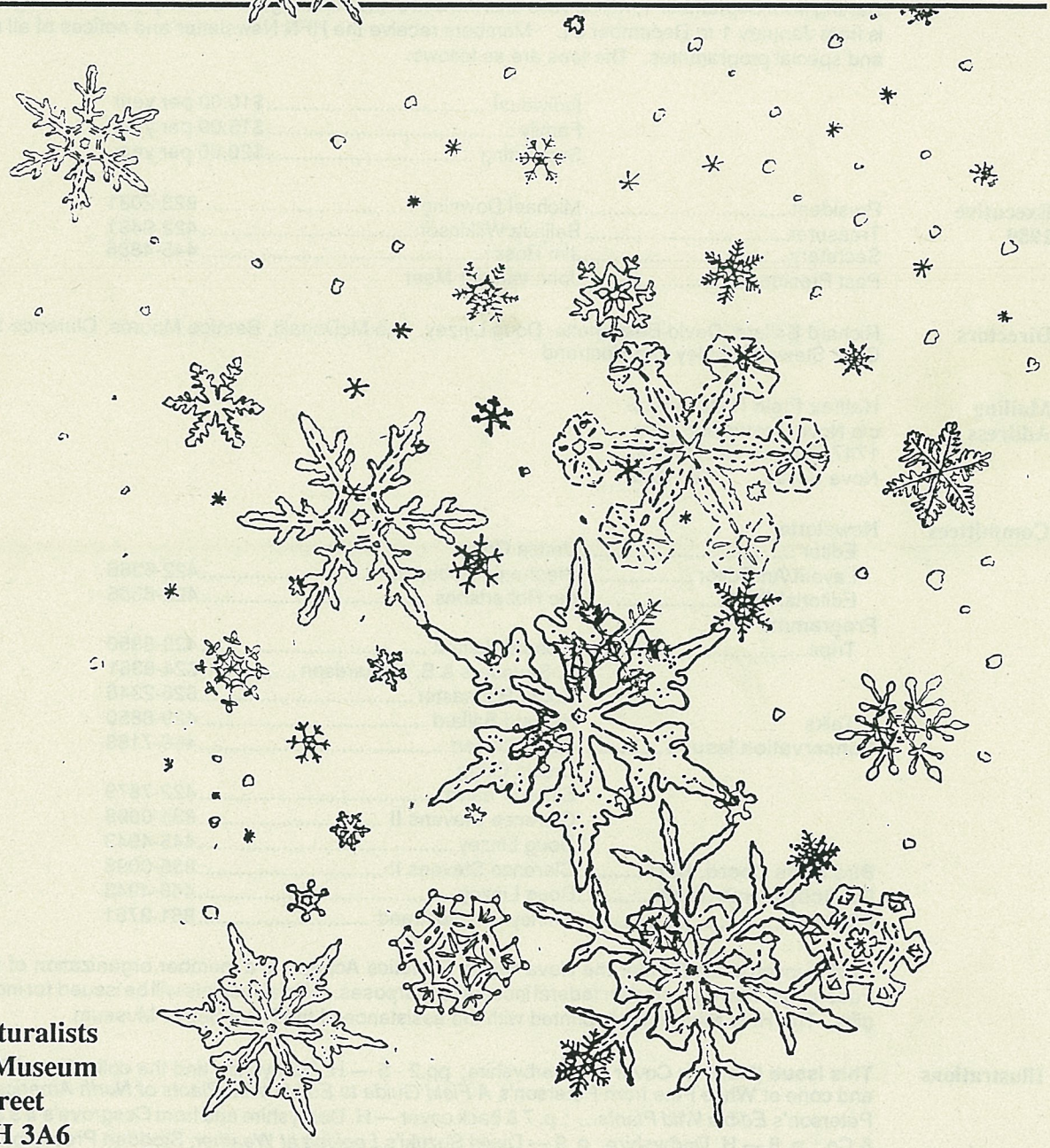
HALIFAX FIELD NATURALISTS' NEWSLETTER

December '90 to February '91 No. 61



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c/o Nova Scotia Museum
1747 Summer Street
Halifax, NS B3H 3A6

HALIFAX • FIELD • NATURALISTS

Objectives 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 On the first Thursday of every month at 8:00 pm in the auditorium of the Nova Scotia Museum, 1747 Summer Street, Halifax.

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.**

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 Chairman, Halifax Field Naturalists, c/o NS Museum. 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	$10.00 per year
Family	$15.00 per year
Supporting	$20.00 per year

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HFN is incorporated under the Nova Scotia Societies Act and is a member organization of the Canadian Nature Federation. It is registered for federal income tax purposes. Official receipts will be issued for individual and corporate gifts. The HFN Newsletter is printed with the assistance of the Nova Scotia Museum.

Illustrations **This Issue (No. 61):** Cover - H. Derbyshire; pp.2 - 5 — H. Derbyshire and the collection of Doris Butters, conifers and cone of White Pine from Peterson's *A Field Guide to Edible Wild Plants of North America*; p. 6 — lichens from Peterson's *Edible Wild Plants...* ; p. 7 & back cover — H. Derbyshire and from Cosgrove's *It's Snowing!*, Dodd Mead & Co.; p. 8 — H. Derbyshire; p. 9 — David Suzuki's *Looking at Weather*, Stoddart Press; p. 10 from the collection of Doris butters and H. Derbyshire; p. 11 — Tide Table courtesy Dept. of Transport.

HFN NEWS AND ANNOUNCEMENTS

EDITORIAL

NEWSLETTER/BARK BEETLE SURVEY

This newsletter contains no heavy tidings about conservation or the lack of it - no articles were sent in! There are no field trip reports for the same reason. This has allowed us to print a condensed version of the HFN report on the bark beetle population of Point Pleasant Park, which was submitted to the Point Pleasant Park Commission and its Technical Advisory Committee on November 21st. This important survey was coordinated and written by Stephanie Robertson and carried out with the help of several other people. We will round up those field trips and other reports and put them in the next newsletter, for which the deadline is 15th February, 1991.

For the rest, we have articles of general interest from several sources, including one from Karen Leigh Casselman on the importance of protecting lichens, and an almanac of natural events at Rick Ballard's cottage in Guysborough County.

RECYCLED PAPER

This is our final choice for recycled unbleached paper. The paper was ordered from Ontario we are sad to say, but it was half the price there because it came directly from a recycled-paper manufacturer called the Paper Source. If bought in Nova Scotia, it would have had to go through first a paper company (not the manufacturer of course) and then a printing company, before we could have purchased it. It arrived four days after being ordered (Nova Scotia businesses, take note).

T-SHIRTS AND CALENDARS

In addition to our pins and note paper HFN now has a stock of S, M, L and XL (adult male sizes) Nova Scotia Endangered Spaces t-shirts for $15.00 each. The profits support our Endangered Spaces efforts. We are also selling 1991 Borealis calendars ($8.00) in support of the Canadian Parks and Wilderness Society.

NEW AND RETURNING MEMBERS

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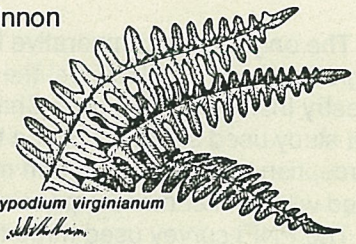

Rock Polypody ***Polypodium virginianum***

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SPECIAL REPORTS

POINT PLEASANT PARK REPORT

BARK BEETLE SURVEY

The bark beetle survey which HFN conducted in Point Pleasant Park for the Technical Advisory Committee to the Point Pleasant Park Commission is finally finished! Gareth Harding, HFN member, and Rick Ballard, HFN Director, persevered with me during the summer and fall months in picking insects off sticky stovepipe traps, straining backs to move heavy logs, counting beetle holes, and gathering trapsite information (forest floor cover, canopy and understorey, and surrounding flora etc.). I found it very enjoyable and rewarding work. Thank you Gareth and Rick for an important survey well done.

Barry Wright, Entomologist at the Nova Scotia Museum, helped me very much in moving logs to get at their undersides; I doubt whether I could have done that bit alone. I would also like to thank Gareth for his patience in reading the report and giving useful, wise advice on the manuscript. Ursula Grigg, HFN Newsletter Editor, also gave continuing support in this regard. The most frustrating part of the job was finalising the report; mistakes kept leaping out at me every time that I thought it was finished! The Nova Scotia Museum gave a lot of help with their laser printer, photocopier, and binding machine. Thank you, NSM.

Following are some excerpts from the final report,

a copy of which is in the NSM library:

FROM THE INTRODUCTION...

One of the factors that had alarmed the PPPC was the observation of bark beetles in the park's conifers by various members of the forestry sector. The Commission had stated that this problem was 'getting worse every year'. Various other PPPC releases and reports from 1984 to 1986 mentioned bark beetle and other insect infestations, but no specific, empiric field surveys had been done on site. The health of the trees, especially the White Pines, was also a focus of concern, defined as being of 'low vigour', and 'overmature'. The soil had been judged to be of poor quality, having been tested in 1984, giving pH values of 3.5 to 3.9 (Marks, 1984). The TAC toured the park with Dr. T. Smith , Manager, Entomological Services, N. S. Dept. of Lands and Forests, to view evidence of bark beetle infestation at various sites. One indication was the presence of whitish "pitch tubes" (the hardened tracks of tree-leaked sap on the bark of the trees).

COMPARATIVE SURVEY RESULTS

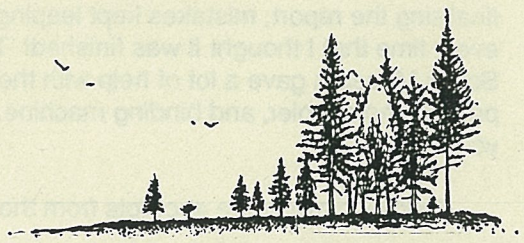
The only known comparative bark beetle trapping programme was conducted at the Petawawa National Forestry Institute (PNFI) near Chalk River, Ontario. That study used sticky stovepipe traps, flight interception traps, and Lindgren multiple-funnel traps baited with conifer monoterpenes and ethanol.

The PNFI survey used three types of traps at each of 12 sites from which beetles were collected for seven weeks. The PPP survey set out three types of traps at each of 30 sites and collected beetles for five weeks. Since park staff inadvertently removed 16 of the log traps before sampling, and two of the log traps had insufficient bark for sampling, figures had to be adjusted.

All Trap Yields, Unadjusted Figures
PNFI 36 traps/7 weeks gave 6,205 = 25 beetles/trapweek
PPP 90 traps/5 weeks gave 2,638 = 6 beetles/trapweek

All Trap Yields, Adjusted figures (for missing/barkless logs)
PNFI 36 traps/7 weeks gave 6,205 = 25 beetles/trapweek
PPP 90 traps/5 weeks gave 4,902 = 11 beetles/trapweek

Sticky Stovepipe Trap Yields
PNFI 12 traps/7 weeks gave 4,629 = 55 beetles/trapweek
PPP 30 traps/5 weeks gave 1,017 = 7 beetles/trapweek



Results from the three types of traps set at Petawawa showed that the sticky stovepipes were the most successful for capturing insects (75% of their total catch). These sticky stovepipe traps caught eight times as many as those in PPP though they were set out in an area in which there was perceived to be no major insect or disease problems. PNFI trapped beetles from 20 families. One of those families, the Scolytidae, yielded 13 species, nine of which were the same as those captured in PPP. The PPP survey captured only Scolytid bark beetles, which were represented by 19 species.

Neither survey captured the destructive Spruce Bark Beetle, *D. rufipennis* (Kirby).

FROM THE DISCUSSION...

Later Collections 24 *Polygraphus rufipennis* Kirby, which had constituted 4% of the total sticky stovepipe catch, were collected on October 15 from three conifer trunks (Sites A, B, and C, - map). Their host material is usually dead or dying spruce. From a conifer stump (Site D) there were 11 *P. rufipennis* Kirby, three *Dryocoetes affabar* (Mannerheim), and one *D. autographus* (Ratzeburg). No new species were identified.

Girdled-tree Traps/Bark Beetle Flight
Contrary to expectations, these trap types did not attract enough beetles to gather useful landing pattern data from their cardinal markings. It was conjectured that the girdled trees showed little bark beetle infestation because they had not been girdled early enough to catch the first of the bark beetle flights. Literature was researched to explore this issue, (bark beetle flights start with certain threshold temperatures in late spring-early summer). It was found that the trees had been girdled in time for the first of the bark beetle flights, and also that they were too healthy to be attacked right after girdling, since it was also found that PPP's beetles species prefer well-weathered, long-dead wood.

Regarding the one relatively badly infected girdled tree (site 10 — 101 beetle holes out of a total of 112 girdled-tree counts from 30 sites), the high infestation may be related to the fact that it stood nearest to a site of poor drainage and standing water for most of the year. Of standing live trees that become infected with Spruce Bark Beetles, those beside creek bottoms are the preferred site (Schmid and Beckwith, 1975). This may be a related factor in the high infestation of this standing girdled tree.

General Observations The bark beetles were not at all attracted to living or newly-dead trees. There are many older, reputedly unhealthy, sparsely-needled White Pines in the park that have no

indications of any bark beetle or long-horned beetle infestation. At the end of the survey, slash was investigated in the firewood dump site and found to show many bark beetle holes. The sticky stovepipe traps gave the most meaningful and successful results, and this was also the case in the bark beetle survey at PNFI.

Long-horned Beetles Some standing dead spruce had been observed to have the very much larger long-horned beetle holes in the spring. In the fall it was observed that the smaller bark beetles had also been successful in burrowing into their bark. Bark samples were taken from these trees in November. The underside of the bark showed typical long-horned beetle galleries. The wood surface showed no engraved galleries of any type; only the large entrance holes of these beetles were present. Three species of long-horned beetles were taken in the stovepipe traps: *Stenocorus inquisitor* (Say.), *Asemum striatum* (L.), and *Tetropium cinnamopterum* Kby. This last species, the Eastern Larch Borer, is known to feed in living and dying conifers other than larch and is believed to be the long-horned beetle responsible for the larger holes in the dead standing spruce.

Pitch Tubes Regarding the evidence of pitch tubes as indications of bark beetle infestation in PPP, it was found that pitch tubes are occasionally formed by the tree's resin flowing out of the entrance holes made by attacking beetles. If the tree successfully repels the beetles, the pitch tubes are usually white; if the beetles are successful, the pitch tubes become reddish brown. Clear or congealed pitch from the region of the lowest branches of the crown frequently results from sapsucker activity or cracks in the bark and is not by itself a reliable indicator of an infested tree (Cottrell 1978). The pitch tubes observed in Point Pleasant Park were all white.

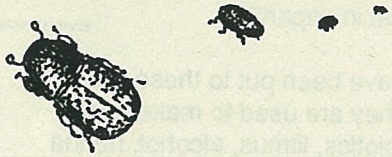
WHITE PINE

Bark Beetle/Soil Relationship There are two active slash sites in PPP (one for log and gravel storage, the other for the cutting and storing of firewood, and refuse storage). They are located on natural features of exposed slate bedrock. Stumps, logs, and slash are the preferred wood for *H. rugipennis pinifex* Fitch and *T. lineatum* Fitch, therefore it is reasonable to assume that these large, centralised slash sites are good breeding areas for the park's two predominant bark beetles. These insects play an important role in hastening the decay and break-up of dead trees and stumps, returning essential nutrients to the park's soil. Since most of the accumulated logs are removed out of the park periodically, the firewood is burned at park picnic sites, and the branch and twig slash is burned on the waterfront, the soil in the forested areas is being deprived of nutrients and organic enrichment that would normally be derived from decaying wood. Bark beetle infestation in stump, root, and slash increases the rate of wood decay. Like earthworms, the beetles recycle and enrich organic matter, thereby improving the forest soil and contributing to the maintenance of sufficient nutrient levels for succeeding generations of trees.

In 1984, PPP soil samples were investigated by the Soil & Crops Branch, N. S. Dept. of Agriculture and Marketing, near nine Red Spruce which at that time had high populations of spruce spider mites. The pH which ranged from 3.5 to 3.8 was considered lower than preferable (rainwater has a pH of 5.6); measured calcium and magnesium showed levels ranging from 70 to 481 kg/ha for Ca, and a range of 39 to 103 kg/ha for Mg. The low pH was was considered to be a significant stress factor for the Pine and Spruce in PPP. PPP has a relatively shallow Halifax Series glacial till overlying slate bedrock. Therefore it already has a relatively low nutrient status (as compared to Nova Scotian Lawrencetown soils, for example). The following table is taken from Goldsmith, 1978:

Soil Series	Depth, cm	KG per HA			
		Ca	Mg	K	P
Halifax	43 cm+	490	228	264	96
L'town	122 cm+	69226	1813	2282	3933
Ratio	3	141	8	9	41

Lawrencetown Series Soils are better able to withstand whole-tree removal, as the nutrients can be continually renewed from the greater depth of the soil. Halifax Series Soils cannot. "For each clearcut of a forested area there will be removed additional amounts of nutrients up to 513 kg/ha Ca, 30 kg/ha Mg, 240 kg/ha N, and 146 kg/ha K." (Goldsmith, 1978). PPP has undergone clearcutting twice in the past during its close historical association with the military (McNeill, 1990), and this, along with the regular yearly 'cutting through' that has continued in the park (Appendix D), could be a significant stress factor for the older trees.



Continuous removal of whole trees over time prevents natural return not only of nutrients but also of organic matter. The downed and felled trees in PPP are returning neither nutrients nor organic matter to the park's soil. "Soils with a high organic content are better able to withstand the effects of acid rain". "Whole-tree harvesting is not sustainable and the end cost of it is greater than sustainable management " (Goldsmith 1977).

CONCLUSIONS...

The most destructive beetle to the forestry industry, *Dentroctonus rufipennis* (Kirby), was not present. Of the next major forestry pest, *Dendroctonus valens* LeConte, only two were present out of a total of 1017 sticky stovepipe observations.

No conifer bark beetles were detected in healthy, standing trees.

The degree of conifer bark beetle infestation in the standing girdled-tree traps was extremely small; 2 % (adjusted) of the total observed bark beetle activity. If the hole counts for one tree near a standing body of water are removed, observed standing timber bark beetle infestations are < 1%.

This survey in Point Pleasant Park observed a conifer bark beetle population of 13% the level of those trapped in a similar sticky stovepipe trap survey conducted by the Petawawa National Forestry Institute. No major insect or disease problems were evident in the forest surveyed there, suggesting in comparison, that Point Pleasant Park definitely does not have a problem of conifer bark beetle infestation.

It would appear from this survey that virtually all of the bark beetle activity in Point Pleasant Park conifers takes place in older stumps, roots, windthrows, and in the older logs and firewood in the dump/storage areas.

It was observed that there are a number of standing dead Spruce in the park, many of which have larger beetle holes caused by long-horned beetles. This was noted at the end of the bark beetle survey and was not further investigated. Perhaps it should be.

POINT PLEASANT PARK BARK BEETLE SPECIES

SPECIES	COUNT	% TOTAL
Hylurgops rugipennis pinifex Fitch	601	59%
Trypodendron lineatum Fitch	269	26%
Xyloterinus politus (Say)	12	1%
Polygraphus rufipennis (Kirby)	36	4%
Gnathotrichus materarius (Fitch)	22	2%
Pityophthorus sp.	3	< 1%
Hylastes porculus Erichson	5	< 1%
Orthotomicus caelatus (Eichhoff)	5	< 1%
Dendroctonus valens LeConte	2	< 1%
Pityophthorus puberulus (LeConte)	2	< 1%
Dryocoetes autographus (Ratzeburg)	43	4%
Dryocoetes affabar (Mannerheim)	4	< 1%
Phloeotribus piceae Sw.	2	< 1%
Crypturgus borealis Sw.	1	< 1%
Xylechinus americanus Blkm.	1	< 1%
Conophthorus sp.	1	< 1%
Trypodendron rufitarsus Kirby	2	< 1%
Pityogenes hopkinsi Sw.	4	< 1%
Cryphalus ruficollis Hopk.	2	< 1%
TOTAL COUNT	**1017**	

- S. Robertson

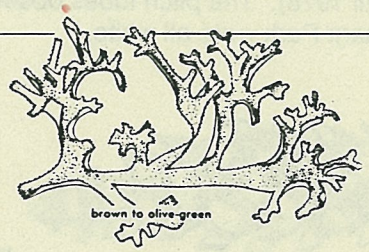
SPECIAL ARTICLES

LICHENS AND THEIR DISAPPEARING HABITAT

If someone asked you to answer these questions, would you know that a single category of plants provides ALL of the answers?

- what did the Egyptians use to stuff mummies?
- what is a common ingredient in Indian curries?
- what do reindeer eat?
- what was the 'manna from heaven' in the Bible?
- what is a gourmet treat in Japan?

REINDEER MOSS



ICELAND MOSS

Historically lichens have been put to these and many other uses. Now they are used to make such diverse products as antibiotics, litmus, alcohol, henna and pot pourri.

Lichens are unique in the world of botany. They are formed by algal and fungal cells coexisting in a symbiotic partnership. Whether they look like a 'beard' or a tiny 'British soldier', each type of lichen has highly specialised habitat requirements. Latin names are not that hard to learn, for they actually describe the physical characteristics of each species. As well, these names often reflect the historical use of the plant. For example, *Lobularia pulmonaria* was used in medieval times to treat lung disorders.

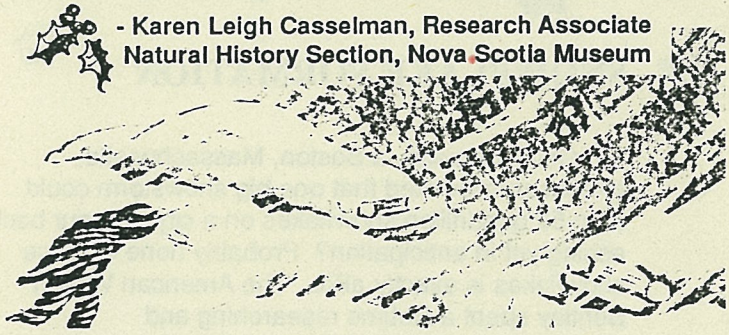
Hardy and adaptable, lichens often thrive where nothing else will grow. A barren piece of ground, a rock ledge, the edge of a gravel road - all these surfaces are colonised by lichens. But increasingly, that habitat is under attack. As lichens are now used by scientists to monitor levels of pollution, it is important to protect the places where they flourish.

If a rare flower is threatened, a cry of alarm is raised by those who walk, hike, birdwatch, canoe, photograph, study or otherwise enjoy nature. Yet only a handful of people understands how entire lichen communities are endangered when trees are felled or boulders blasted away. Much of this type of habitat destruction is occuring in 'wilderness' areas of Nova Scotia, often in the name of 'recreational development'.

Average people can do their part to see that lichens are not damaged in their areas. Many rock gardeners carry lichen-covered stones into their yards to add a touch of winter colour. This 'lichen gardening' is encouraged in Europe, as it helps spread reproductive particles that may form new plants.

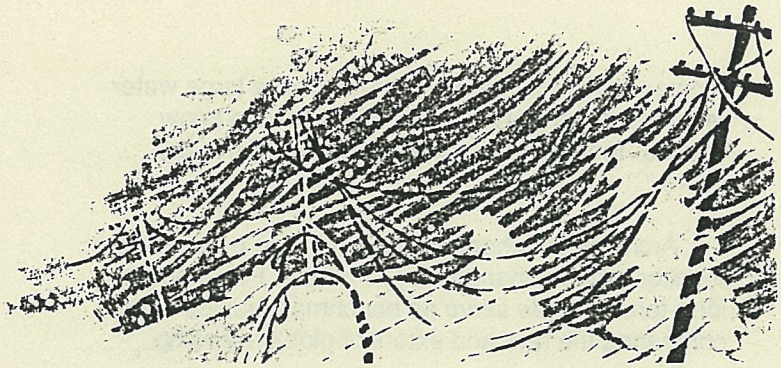
The presence of a lichen on another plant does it no harm, so leave the *Hypogymnia physodes* that forms a delicate bluish ruffle on the twig of your Rhododendron and remember that without these special plants, the growing pollution problem cannot be so accurately measured and monitored. J.R. Laundon, an eminent British authority, has written how lichens add an aesthetic element to the landscape, often in the most unexpected of places. If that's your yard, then relax and enjoy their beauty.

- Karen Leigh Casselman, Research Associate
Natural History Section, Nova Scotia Museum



PRESENT USES FOR OLD CANADIAN WEATHER RECORDS

In September 1840, a British army lieutenant set up a weather station on the grounds of what later became the University of Toronto. Today, his observations rank as the oldest in Canada's continuous, 150-year-old weather record — a record that climate experts say is becoming more useful every year.



"There are some very practical things you can do with old weather data" comments David Phillips, a climatologist with Environment Canada's Atmospheric Environment Service. Archived records can help make life "safer, more comfortable, and more profitable."

AES has close to three billion observations stored in its computers — the product of more than 8,000 active and once-active weather stations. In addition, it has countless cloud and radar photos, plus data from remote-sensing satellites.

Climate information on file encompasses daily temperature, humidity, wind, and precipitation readings from across the country. It also includes "at least a dozen weather elements that never make it on the airwaves — things like soil moisture, lake levels and snow pack conditions."

The data help AES staff respond to a steadily increasing demand for climate information. In 1990 alone, the service expects to process more than 250,000 queries.

Queries range "from the mundane to the sophisticated,"says Phillips. The vast majority involve helping school teachers, Sunday sailors and others schedule outdoor events. "Somebody may want to know when to expect ideal ski conditions in Banff. In other words, when are five hours of sunshine, a suitable snow base and a minimum wind chill factor most likely to happen at once."

For such a request, "we could ask our computer to calculate the frequency of these conditions. Based on 100 years of records, it might recommend the last week of February."

A body of archived climate data is an invaluable resource for farmers. It can help them make better decisions on almost every aspect of farming, from choosing suitable crop varieties to deciding when to plant or harvest.

Other beneficiaries include architects and engineers, who often have to take climatic extremes into account when designing structures. Likewise,

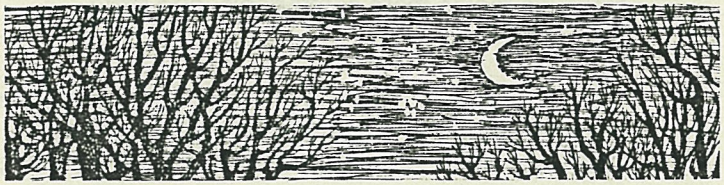
"someone planning the construction of a large water reservoir in northern Ontario might wish to know whether there will be enough water to fill it in dry years."

Archived weather records have also been used to monitor climate change, says Phillips. For example, long-term records serve as benchmark values when comparing the rate and extent of global warming.

However, the causes of long-term climate and weather changes are complex and difficult to sort out. As Phillips points out," we know that Toronto is now about 2 degrees Celsius warmer than it was one hundred years ago. But most of that was caused by urban growth, not global warming."

- John Eberlee, Canadian Science News

NATURAL HISTORY



DOG STARS

People who walk dogs early and late spend a lot of time outside in the dark. They become skywatchers willy-nilly, and can predict the weather and talk about the stars. Everyone seems to know the constellations which never set in these latitudes: the Big Dipper (known in England as the Great Bear or the Plough), Little Bear with the North Star at the tip of his tail, Cassiopeia, and the tadpole-shaped cluster of the Pleiades just above the horns of Taurus the Bull.

The big event of the fall is the arrival of Orion the Hunter, who sets in the west in the pre-dawn sky, and is fully visible in the evening in the southeast by about the end of October, depending on the topography of one's local park. The Hunter, with his own two dogs confronting the rushing Bull, is greeted with pleasure each fall, but he is the constellation of winter, and walkers secretly enjoy seeing him pass out of view to the west in March and April.

So star-watching is not only a hobby, or a scientific discipline; people still recognise some star-groups as casually as dandelions, and pause for a moment to exchange comments on the night sky. The writer Samuel Butler mentions an encounter with the Great Bear in 17th century London — his report is on page 12 — so apparently they always have done. Orion has been greeted in the northern hemisphere for more than 2,000 years, always as a hunter or a warrior. In prechristian Britain, he was called Herne the Hunter, the Holly King who ruled the winter from Hallowe'en to May Day, and helped humans who needed hunting success to ensure survival until the next growing season.

In the next few weeks, after-midnight dog-walkers will see the Geminid meteor showers, which will be at their best on the night of December 13-14, with perhaps 50 meteors an hour. The showers last for about six days, and are seen in the south east.

The planet Mars is once again close to earth, in the eastern evening sky, between the Pleiades and the Hyades (the horns of Taurus). It will appear to move west until early January, when it will stand still and then reverse its motion. Mars is reddish in colour and does not twinkle. Meanwhile, Jupiter rises in the east before midnight in November and December, and its travels can also be watched.

- Ursula Grigg

SNOWFLAKE FORMATION

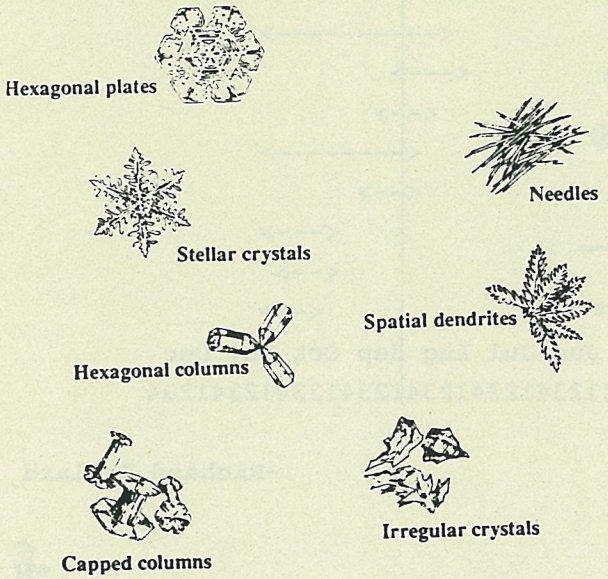
Once long ago, a Boston, Massachusetts, professor calculated that one big snowstorm could drop 50 quadrillion snowflakes on a city. Is your back aching yet in anticipation? Probably none of these snowflakes is exactly alike. The American Wilson Bentley spent a lifetime researching and photographing 6,000 of them, and each one was at least a little different from the other. They can still be seen and admired in his book, "Snow Crystals".

A water molecule, as everyone probably knows, consists of three units — two atoms of hydrogen and one of oxygen arranged in such a way that when it freezes to form a snowflake, this produces either a three-sided or a six-sided figure. Thus we have the beautiful hexagonal stellars and plate-snowflakes that artists portray on Christmas cards and other publications.

There are seven basic shapes of snowflakes or snow crystals: plates; stellars; columns; needles; spatial dendrites; capped columns; and irregular crystals; and three types of other solid precipitation: graupel, sleet, and hail. Which will form depends upon different combinations of air temperature, air humidity, height of formation and length of time of formation, and the changing conditions which the growing snowflake encounters as it falls to earth.

The needle snowflakes are the ones that sting when blown hard against faces; hail, and graupel — tiny, window-rattling snowballs,— also sting. Sleet consists of frozen raindrops or melted and refrozen snowflakes; hail is formed of layered spheres of ice.

It takes about 10^{18} water molecules to make up one snowflake. Snow crystals, like raindrops, are started in clouds, with a water droplet condensing into ice around a bit of dust; but only in clouds colder than 0^{0} C. The water vapour molecules in the cloud then start to adhere to this ice particle, building up in the typical hexagonal patterns around it. If a cloud doesn't have much water vapour (which it won't if it is very cold, because warmer air can hold more moisture), the snow crystals will be small and simple in shape. If a lot of water vapour is present (in warmer air), snow crystals can grow bigger. Under these conditions, complicated forms of crystals will cling together to form flakes that may consist of up to 100 crystals; their diameter can be as much as one inch across! The largest and most beautiful hexagonal and stellar snowflakes are formed at temperatures around -15° C. This is why the snowiest part of the world is from about latitude 66° to latitude 40°, whereas the air around the North and South poles is so cold that snowfalls there are relatively light, but once fallen, do not melt.



So, ladies and gentleman, as science so often proves, the old sayings are sometimes true — "Little snow (size of flake), big snow (depth on ground); big snow (size of flake), little snow (depth on ground)". When flakes are large it is an indication of warm temperatures that are likely to go up and turn snow to rain; in cities where pavement retains heat, the snow melts when it reaches the ground so can't build up any depth. The smaller flakes point to lower temperatures which are more likely to support continuous snowfall, creating greater depths and all those snowdrifts that we love to shovel.

- S. Robertson

THE MARITIME BREEDING BIRD ATLAS

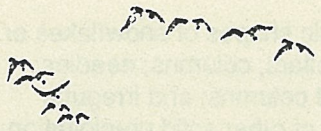
The five years of surveying atlas squares for the breeding bird atlas are over! In a special newsletter, Brian Dalzell closes the books and begins the audit. All the data should be in the computer by the time this issue appears, and the Atlas of Breeding Birds of the Maritime Provinces may be in print by the end of 1991.

HFN has contributed to this survey by adopting two squares, and many members have worked on other squares on their own. Other people have reported on single nests in their vicinities, to bring the number of observations to more than 150,000.

Brian Dalzell asks that any more observations, or adventures, relating to the breeding bird atlas be sent to him by the end of November; this newsletter will not appear before that, but perhaps anyone reading this note and responding to him immediately, might find the deadline elastic. In any case, he hopes that the project will continue in another form, perhaps concentrating on the less common species. Brian Dalzell's address is: Bird Atlas, c/o Nova Scotia Museum, 1747 Summer Street, Halifax, N.S., B3H 3A6.

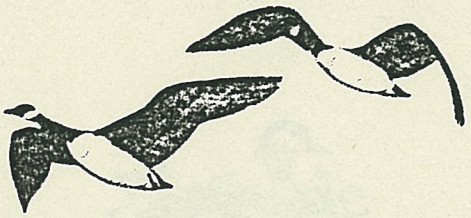
- Ursula Grigg

NATURAL EVENT CALENDER

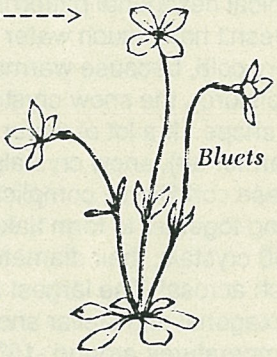


Valid for Port Hilford, Guysborough County, Nova Scotia

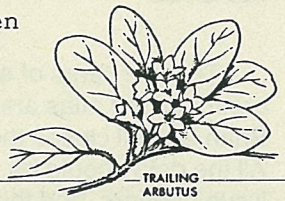
Compiled by Richard Ballard, from 1985-1989 journal entries. The dates seem to be about two weeks or so behind Halifax. The asterisks represent very short periods of time; the single-headed arrows indicate the start-time but not a definite end-time. Dashes mean a definite presence; dots mean that the presence is probable but not confirmed.



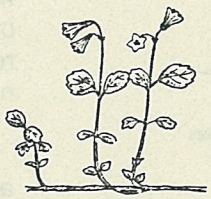
```
month:          Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
quarter:        1234123412341234123412341234123412341234123412341234
max monthly temp  +9  +5  +8 +13 +22 +23 +29 +30 +26 +21 +16 +10
min monthly temp -22 -20 -17  -2  -2   0  +7  +9  +4  -2  -6 -15
geese in V                     *                               *
lake ice free                  <---------------------------------->
loons                          <------------------------------->
trout season                   <--------------------------->
leaves on trees                   <-----------------------turn->
fiddleheads                       *
```




```
any wildflowers in bloom          <---------------------------->
 coltsfoot, trailing arbutus      <...
 goldthread,bluets,violets          <...
 painted trillium, starflower       <...
 bunchberry, Canada mayflower          <...
 blueflag,sorrel,twinflower                <...
 one flowered wintergreen                  <...
 white fringed orchid                         <...
 grass pink orchid                            <...
 horned bladderwort                           <...
```




```
blackflies                     <--...
luna moths                        <->
gaspereaux run                    <->
biting midges                     <-------->
strawberries                      <--->
fireflies                         <-->
chantrelles                       <-------->
bakeapple berries                 <-->
rasp/blackberries                    <--->
caterpillars                         <-->
dewberries                           <-->
month:          Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
week:           1234123412341234123412341234123412341234123412341234
```



-Richard Ballard

HALIFAX AST Z+4

TIDE TABLES

1991

JANUARY–JANVIER

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0210	1.2	.4	16	0205	1.7	.5
	0755	6.8	2.1		0810	5.9	1.8
TU	1445	-0.1	.0	WE	1435	.9	.3
MA	2045	6.2	1.9	ME	2045	5.6	1.7
2	0305	1.2	.4	17	0235	1.7	.5
	0850	6.7	2.0		0850	6.0	1.8
WE	1535	-0.1	.0	TH	1505	.8	.2
ME	2135	6.4	2.0	JE	2120	5.7	1.7
3	0400	1.3	.4	18	0315	1.7	.5
	0940	6.6	2.0		0925	5.9	1.8
TH	1630	.1	.0	FR	1540	.9	.3
JE	2225	6.4	2.0	VE	2155	5.8	1.8
4	0500	1.4	.4	19	0355	1.7	.5
	1030	6.3	1.9		1000	5.8	1.8
FR	1720	.4	.1	SA	1615	1.0	.3
VE	2310	6.3	1.9	SA	2230	5.9	1.8
5	0600	1.5	.5	20	0435	1.8	.5
	1120	6.0	1.8		1035	5.7	1.7
SA	1815	.8	.2	SU	1655	1.1	.3
SA	2355	6.1	1.9	DI	2305	5.9	1.8
6	0655	1.6	.5	21	0530	1.9	.6
	1210	5.6	1.7		1115	5.5	1.7
SU	1905	1.2	.4	MO	1740	1.3	.4
DI				LU	2345	5.9	1.8
7	0040	5.9	1.8	22	0630	1.9	.6
	0750	1.6	.5		1155	5.3	1.6
MO	1300	5.2	1.6	TU	1830	1.5	.5
LU	1955	1.6	.5	MA			
8	0130	5.6	1.7	23	0030	5.8	1.8
	0845	1.7	.5		0730	1.9	.6
TU	1400	4.9	1.5	WE	1250	5.1	1.6
MA	2045	1.9	.6	ME	1930	1.8	.5
9	0220	5.4	1.6	24	0120	5.7	1.7
	0935	1.6	.5		0835	1.8	.5
WE	1505	4.7	1.4	TH	1355	4.8	1.5
ME	2140	2.2	.7	JE	2035	1.9	.6
10	0320	5.3	1.6	25	0225	5.6	1.7
	1030	1.6	.5		0945	1.6	.5
TH	1615	4.7	1.4	FR	1510	4.8	1.5
JE	2235	2.3	.7	VE	2150	2.0	.6
11	0420	5.3	1.6	26	0340	5.7	1.7
	1120	1.4	.4		1055	1.2	.4
FR	1715	4.8	1.5	SA	1635	4.9	1.5
VE	2330	2.3	.7	SA	2305	1.9	.6
12	0515	5.4	1.6	27	0450	5.9	1.8
	1210	1.3	.4		1155	.8	.2
SA	1805	5.0	1.5	SU	1750	5.2	1.6
SA				DI			
13	0015	2.1	.6	28	0010	1.6	.5
	0605	5.6	1.7		0555	6.2	1.9
SU	1250	1.1	.3	MO	1255	.4	.1
DI	1850	5.1	1.6	LU	1850	5.7	1.7
14	0055	2.0	.6	29	0105	1.4	.4
	0650	5.8	1.8		0655	6.5	2.0
MO	1330	1.0	.3	TU	1345	0.1	.0
LU	1930	5.3	1.6	MA	1945	6.0	1.8
15	0130	1.8	.5	30	0200	1.1	.3
	0730	5.9	1.8		0750	6.6	2.0
TU	1400	.9	.3	WE	1430	-0.1	.0
MA	2010	5.5	1.7	ME	2030	6.3	1.9
				31	0250	1.0	.3
					0840	6.7	2.0
				TH	1520	.0	.0
				JE	2115	6.5	2.0

FEBRUARY–FEVRIER

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0340	1.0	.3	16	0255	1.3	.4
	0925	6.6	2.0		0900	5.9	1.8
FR	1605	.2	.1	SA	1515	.8	.2
VE	2200	6.5	2.0	SA	2125	6.1	1.9
2	0430	1.1	.3	17	0335	1.3	.4
	1010	6.4	2.0		0935	5.9	1.8
SA	1650	.5	.2	SU	1550	.9	.3
SA	2240	6.4	2.0	DI	2200	6.1	1.9
3	0525	1.2	.4	18	0420	1.3	.4
	1055	6.0	1.8		1015	5.8	1.8
SU	1740	.9	.3	MO	1630	1.1	.3
DI	2320	6.1	1.9	LU	2240	6.1	1.9
4	0615	1.4	.4	19	0505	1.4	.4
	1140	5.7	1.7		1055	5.6	1.7
MO	1825	1.4	.4	TU	1715	1.3	.4
LU				MA	2320	6.0	1.8
5	0000	5.8	1.8	20	0605	1.5	.5
	0705	1.5	.5		1140	5.3	1.6
TU	1225	5.3	1.6	WE	1810	1.6	.5
MA	1910	1.8	.5	ME			
6	0040	5.5	1.7	21	0005	5.8	1.8
	0755	1.6	.5		0710	1.6	.5
WE	1315	4.9	1.5	TH	1230	5.1	1.6
ME	2000	2.1	.6	JE	1920	1.9	.6
7	0130	5.2	1.6	22	0055	5.5	1.7
	0845	1.7	.5		0825	1.5	.5
TH	1415	4.6	1.4	FR	1335	4.8	1.5
JE	2055	2.3	.7	VE	2035	2.1	.6
8	0230	5.0	1.5	23	0200	5.4	1.6
	0940	1.7	.5		0935	1.4	.4
FR	1525	4.5	1.4	SA	1500	4.7	1.4
VE	2155	2.4	.7	SA	2150	2.1	.6
9	0335	5.0	1.5	24	0320	5.4	1.6
	1040	1.7	.5		1040	1.1	.3
SA	1640	4.5	1.4	SU	1635	4.9	1.5
SA	2250	2.3	.7	DI	2300	1.9	.6
10	0445	5.1	1.6	25	0445	5.6	1.7
	1130	1.5	.5		1140	.8	.2
SU	1740	4.7	1.4	MO	1745	5.3	1.6
DI	2340	2.2	.7	LU			
11	0540	5.3	1.6	26	0000	1.6	.5
	1215	1.4	.4		0550	5.9	1.8
MO	1825	5.0	1.5	TU	1235	.5	.2
LU				MA	1840	5.7	1.7
12	0020	2.0	.6	27	0100	1.3	.4
	0630	5.6	1.7		0645	6.2	1.9
TU	1255	1.2	.4	WE	1325	.2	.1
MA	1905	5.3	1.6	ME	1925	6.1	1.9
13	0100	1.7	.5	28	0150	1.0	.3
	0710	5.8	1.8		0735	6.4	2.0
WE	1330	1.0	.3	TH	1415	.1	.0
ME	1940	5.5	1.7	JE	2010	6.4	2.0
14	0140	1.5	.5				
	0750	5.9	1.8				
TH	1405	.9	.3				
JE	2015	5.8	1.8				
15	0215	1.4	.4				
	0825	6.0	1.8				
FR	1440	.8	.2				
VE	2050	6.0	1.8				

MARCH–MARS

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0235	.8	.2	16	0155	1.1	.3
	0820	6.5	2.0		0755	5.8	1.8
FR	1455	.2	.1	SA	1410	.8	.2
VE	2050	6.5	2.0	SA	2015	6.2	1.9
2	0320	.7	.2	17	0235	.9	.3
	0905	6.4	2.0		0835	5.9	1.8
SA	1540	.5	.2	SU	1450	.8	.2
SA	2130	6.5	2.0	DI	2055	6.3	1.9
3	0405	.8	.2	18	0320	.8	.2
	0945	6.2	1.9		0915	5.8	1.8
SU	1620	.8	.2	MO	1530	.9	.3
DI	2205	6.3	1.9	LU	2130	6.3	1.9
4	0445	.9	.3	19	0405	.8	.2
	1030	5.9	1.8		0955	5.8	1.8
MO	1700	1.2	.4	TU	1615	1.1	.3
LU	2245	6.0	1.8	MA	2215	6.2	1.9
5	0525	1.1	.3	20	0455	.9	.3
	1110	5.6	1.7		1040	5.6	1.7
TU	1740	1.6	.5	WE	1705	1.4	.4
MA	2320	5.7	1.7	ME	2255	6.0	1.8
6	0610	1.3	.4	21	0555	1.1	.3
	1150	5.2	1.6		1130	5.3	1.6
WE	1820	2.0	.6	TH	1810	1.7	.5
ME				JE	2345	5.7	1.7
7	0000	5.3	1.6	22	0705	1.2	.4
	0700	1.5	.5		1225	5.1	1.6
TH	1240	4.9	1.5	FR	1925	2.0	.6
JE	1915	2.2	.7	VE			
8	0045	5.0	1.5	23	0040	5.4	1.6
	0755	1.7	.5		0815	1.2	.4
FR	1330	4.6	1.4	SA	1330	4.8	1.5
VE	2010	2.4	.7	SA	2040	2.1	.6
9	0140	4.8	1.5	24	0150	5.2	1.6
	0850	1.8	.5		0920	1.1	.3
SA	1435	4.4	1.3	SU	1500	4.8	1.5
SA	2110	2.4	.7	DI	2150	2.0	.6
10	0250	4.7	1.4	25	0310	5.1	1.6
	0950	1.8	.5		1020	1.0	.3
SU	1555	4.4	1.3	MO	1635	5.1	1.6
DI	2205	2.4	.7	LU	2255	1.8	.5
11	0405	4.8	1.5	26	0435	5.3	1.6
	1040	1.7	.5		1120	.8	.2
MO	1700	4.7	1.4	TU	1735	5.5	1.7
LU	2300	2.2	.7	MA	2355	1.5	.5
12	0510	5.1	1.6	27	0540	5.6	1.7
	1130	1.5	.5		1215	.6	.2
TU	1750	5.0	1.5	WE	1820	5.9	1.8
MA	2345	1.9	.6	ME			
13	0600	5.3	1.6	28	0045	1.1	.3
	1215	1.3	.4		0635	5.8	1.8
WE	1830	5.3	1.6	TH	1305	.5	.2
ME				JE	1905	6.2	1.9
14	0030	1.6	.5	29	0135	.8	.2
	0640	5.5	1.7		0720	6.0	1.8
TH	1255	1.1	.3	FR	1350	.5	.2
JE	1905	5.7	1.7	VE	1940	6.4	2.0
15	0115	1.3	.4	30	0220	.6	.2
	0720	5.7	1.7		0800	6.1	1.9
FR	1330	.9	.3	SA	1430	.7	.2
VE	1940	6.0	1.8	SA	2020	6.4	2.0
				31	0300	.5	.2
					0845	6.0	1.8
				SU	1510	.9	.3
				DI	2055	6.3	1.9

NATURE NOTES

SEPTEMBER

- The northern lights have put on several fine shows this summer; Doug Linzey saw them from Digby Pines in the first week of August.
- A young Turkey Vulture was seen over Dartmouth; these birds seem to be extending their range in this direction steadily.
- A question was asked about the whale named Filip; apparently it has not been sighted since its namesake Filip Volckaert returned home. It's suggested that the whale followed him and may now reside in seas near Belgium!
- Two Snapping Turtles have been found in a garden near the Dingle; two Pine Siskins also spent the summer there. Ospreys apparently nested successfully; there are four always about the Dingle.

OCTOBER

- Lesley Butters heard humming noises from the vicinity of a wasp's nest at her cottage near Kejimkujik Lake, and wondered if they were caused by many wings ventilating the nest or raising the temperature at sundown on a cooling day.
- SOMEONE climbed a precipice in Acadia National Park, Maine, and looked down on two aerobatic Peregrine Falcons, a fantastic sight.

NOVEMBER

- Doug Linzey saw Gannets diving for fish in Northumberland Strait, quite close to the Wood Island Ferry.
- S. Robertson several times has seen a pair of snow buntings feeding on the seaward side grass of Shore Road in Point Pleasant Park.
- Ursula Grigg reported that the sand thrown into the mouth of the river draining the West Marsh at Conrad's Island in 1989 by Hurricane Gabriel has now consolidated. Sand dune vegetation has begun to spread on it, and the marsh outlet at its head is now nearly fresh. As a result, the species of plants and animals, including wildfowl, have changed considerably in that area. The only drainage now is through the outlet under the bridge in the parking lot; the environment there is also becoming more brackish because the only sea water is that coming up the outflow with the rising tide.

THE GREAT BEAR

Last night Jones was walking down with me from Staple Inn to Clifford's Inn, about 10 o'clock, and we saw the Great Bear standing upright on the tip of his tail which was coming out of a chimney pot. Jones said it wanted attending to. I said: "Yes, but to attend to it properly we ought to sit up with it all night, and if the Great Bear thinks that I am going to sit by his bedside and give him a spoonful of barley-water every ten minutes, he will find himself much mistaken."

From Samuel Butler's Notebooks

! NEXT DEADLINE !
February 15 for March Issue
Contributions to the Editor, HFN
c/o NS Museum or phone 455-8126

Don't forget to renew your membership in order to receive your newsletter and to support HFN! The January GST will not apply to membership dues. When renewing, don't forget to complete the volunteer section of the membership form.