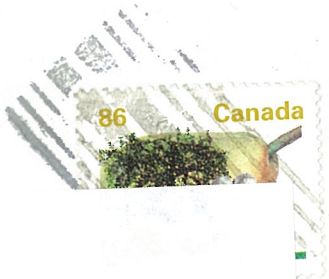
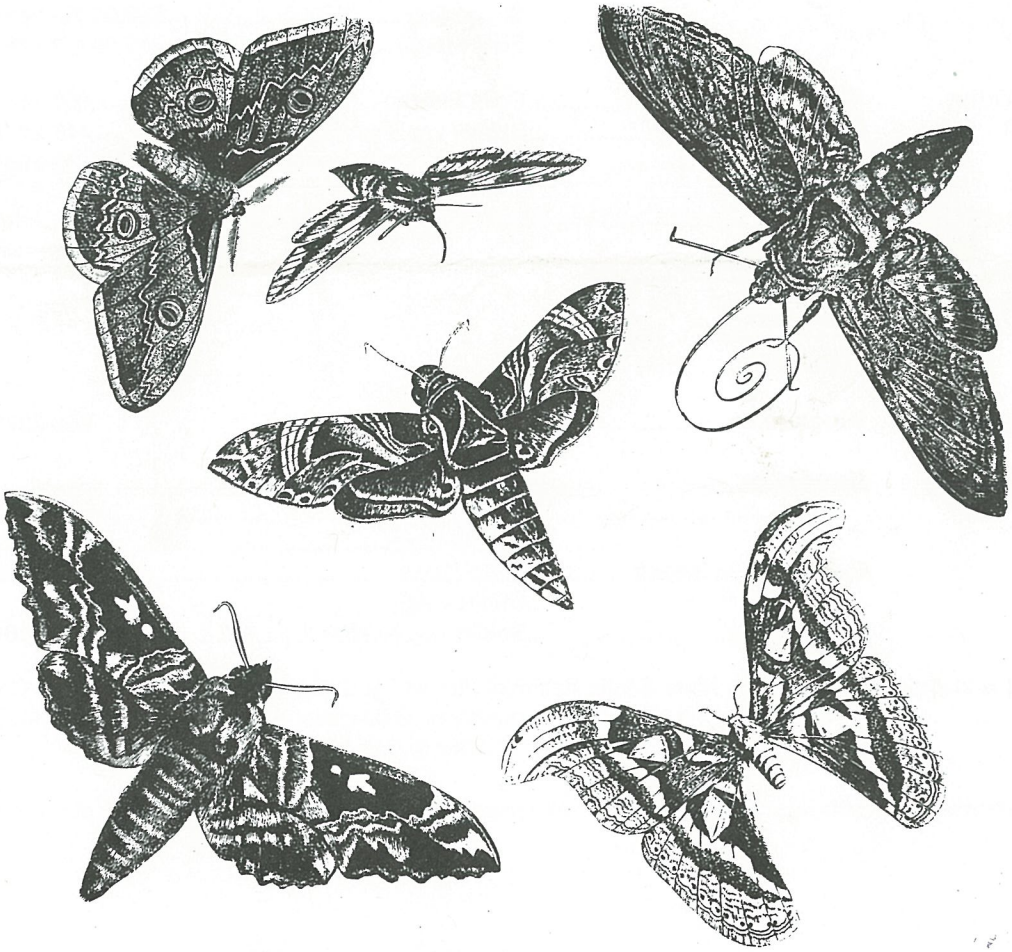


HALIFAX FIELD NATURALISTS' NEWSLETTER

June to August 1993

No. 71



Return address:
Halifax Field Naturalists
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
FNSN (opt.)	$5.00 per year

Executive 1993

President	Colin Stewart	466-7168
Treasurer	Shirley van Nostrand	445-2776
Past President	Michael Downing	823-2081

Directors Jane Carlisle, Patricia Chalmers, Ursula Grigg, Bob McDonald, Bernice Moores, John Newbery, Mary Primrose,

Mailing Address

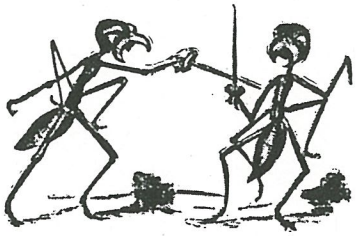
Halifax Field Naturalists
c/o Nova Scotia Museum
1747 Summer St., Halifax
Nova Scotia B3H 3A6

Committees

Programme	Roy John	868-2373
	Jane Carlisle	
Newsletter		
Editor	Ursula Grigg	455-8160
	Connie Mack	477-1469
Conservation Issues	Colin Stewart	466-7168
	Ursula Grigg	
Membership	Shirley van Nostrand	1-624-9361

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. 71):** p. 11 — tide table courtesy Dept. of Transport;; all other illustrations from copyright-free sources.



HFN NEWS AND ANNOUNCEMENTS

EDITORIAL

At the annual general meeting, the club thanked five Directors, who had resigned due to pressure of work or relocation, including Clarence Stevens II and Stephen Saunders, who had served for many years, and Lesley Butters, Tony Lock, and Stephen Ward, who joined more recently.

Five new directors were elected: Patricia Chalmers, Jane Carlisle, Ursula Grigg, Roy John and John Newbery; all except myself are first-time members. Colin Stewart continues as President, Michael Downing as Past President, and Shirley van Nostrand agreed to continue as Treasurer, with the help of Bernice Moores and Bob McDonald. The Secretary's place remains unfilled and will rotate monthly among directors.

The Treasurer's report is on pages 4-5 of the Newsletter. HFN remains financially healthy in spite of undertaking new activities. The motion adding the setting of dues to the Directors' tasks was passed; dues can now be changed without an eighteen month wait before the change takes effect.

Let's hope our late summer and fall are less boisterous than the spring has been, and that we have plenty of personal opportunities for adventure and enjoyment of the Province's wild spaces.

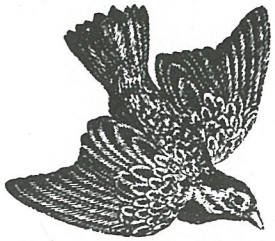
Ursula Grigg

CALENDAR

Parks are for People is holding field trips throughout this summer and fall, arranged by various groups; if you don't already have a programme, contact the Nova Scotia Department of Natural Resources or the N.S. Museum

The Friends of McNab's Island are running a McNab's Island Campout on August 14-15; numbers are limited. To register, call Dusan (422-1045) or Cathy (434-2254). Look out as well for details of a September 19th Beach Sweep and Island Appreciation Day.

As always, there will be a show of falling stars in August; the best date is expected to be August 11th. Lie back on a dark field and enjoy the fireworks.



IN MEMORY OF EARL OSBORNE

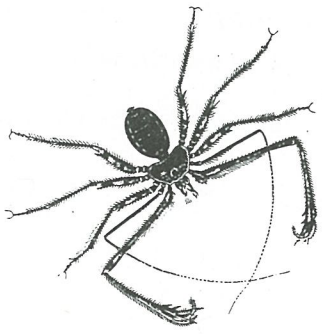
HFN has received a donation of $245 in memory of Earl Osborne, of Dartmouth, who died in November 1992, after a lifetime of backyard birding. The money was designated for bird protection, and has been placed in the Piping Plover Fund until a suitable project is found. HFN appreciates the kindness of Mr. Osborne's family in making this donation.

PIPING PLOVER T-SHIRTS

The stock of Piping Plover T-shirts is nearly gone; some sizes are no longer available, and there have been requests for a new supply. More can be printed if enough people want them, and sweat shirts are also a possibility. So if you'd like to sport Piping Plovers on your summer togs, please call Cathy Strugnell at 835-8289 and tell her so.

NEW AND RETURNING MEMBERS

Branimir Gjeteaj
Barbara MacKay
Roger Pocklington
Mark White



CONTENTS

Halifax Field Naturalists

Receipts and Disbursements
for the year ended December 31 1993
(unaudited)

	1992	1991	
RECEIPTS			
Membership dues	1831.00	1909.54	
Interest Income	497.00	214.54	
Other Income(schedule 1A)	807.40	98.00	
Project income (schedule 1B)	3910.76	10,745.85	
TOTAL INCOME	7046.40	12,967.93	
DISBURSEMENTS			
Meeting expenses	54.52	58.76	
Newsletter/stationery/postage	1880.61	1017.74	
Bank charges	22.00	64.14	
Chartered Accountant	o.00	277.50	
Memberships:			
Canadian Nature Federation	35.00		
RANS	55.00	100.00	2 yrs.
N.S. Trails Federation	50.00		
Federation of N.S. Naturalists (membership + affiliated)	245.00	100.00	
N.S. Environmental Network		10.00	
Liability Insurance - Bell & Grant	130.00		
Administration -RANS	20.00	40.00	2 yrs.
Donations		20.00	
Conference fees		19.99	
Expenses with F.N.S.N.	17.60	198.00	
Projects (see Schedule 2B)	5390.86	3581.02	
Sundry (office supplies)	224.25	-	
TOTAL DISBURSEMENTS	8124.85	5487.15	
Excess of Receipts over Disbursements	-1078.45	7480.78	
Surplus account balance at beginning yr	12,925.54	5631.71	
Adjustment on inventory over previous		186.70	
Surplus Balance at end of year	11,847.14	12,925.59	

Halifax Field Naturalists
Schedules to the financial statement
for the year ended 31 December 1992

		1992	1991
Schedule 1A			
Other Income			
	Hasty notes	4.00	44.00
	Lapel Pins	0.00	15.00
	Donations (incl. Govt.Canada	$50.00	39.00
	From Projects(see 2B)	253.40	
		807.40	98.00
Schedule 1 B			
Project Income			
	Endangered Spaces SHow	49.98	298.00
	Endangered Spaces T-SHirts	0.00	136.00
	Endangered Species Project	1616.78	2309.40
	Environment Week	0.00	1005.00
	Last Wilderness Show	0.00	610.60
	Piping Plover Fund	819.00	5188.85
	Sacred Earth Show	0.00	1198.00
	Envir.Canada Color Book	1200.00	
	In Memorian (End. Bird)	225.00	
		3910.76	10,745.85
Schedule 2 B			
Project Disbursements			
HFN cr. 10.50	Endangered Spaces Show	0.00	337.48
	Endangered Spaces T-Shirts	0.00	gifts 24.03
	Endangered Species Project	2841.50	750.00
	Environment Week Project	0.00	608.78
	Last Wilderness Show	o.00	1510.80
HFN share 242.90	Sacred Earth Show	859.88	338.12
	Point Pleasant Park Study	0.00	11.81
	Piping Plover Brochure	489.49	
	Envir. Canada Color Book	1200.00	
		5390.87	3581.02

SPECIAL REPORTS

A WALK IN THE PARKS - 1

It's a sunny spring day. There are lots of things to see again - or for the first time. So why am I depressed?

Over the past few years my job has become working on 'species and spaces' more or less full time - some paid, much voluntary. There seem to be many opportunities where doing a little could help a lot.

MCNABS ISLAND PROVINCIAL PARK

I guess that's part of it: March disappeared into Harbour Cleanup Hearings - "the McNab hearings". It's not that anyone is against cleaning up the harbour, there's just no need to jeopardize a park-in-the-making to do so.

Two years back Provincial Parks was ready for a public consultation on the development of McNabs - essentially what facilities should be where? If there had been no sewage treatment plant proposal I believe we would now have basic trails with some picnic areas, secure access to the island and the ability to schedule trips. Instead, Garrison Pier is closed, ferry operation uncertain, and the feds and province apparently deadlocked pver some aspect of the land transfer required to consolidate the park. (Garrison Pier was reopened in June 1993 - Ed.)

In short, a lot of people who have been keen on seeing the responsible development of a major natural area at Metro's front door - which could do more for Halifax than Stanley Park has done for Vancouver - have been diverted to protecting the integrity of the site. We had thought this accomplished in 1974 with the designation of the area as a regional park and in 1983 with the transfer of responsibility to the province.

Well, the report of the Environmental Assessment Review Panel is due out in late June. The Ministers then have about 30 days to announce a decision. By late August we should know whether we move towards a park, or whether we still have to insure that it is an attractive place to visit.

CONRADS BEACH

There has been some progress on this section of Cole Harbour Lawrencetown Coastal Heritage Park. In the late 80's we set out to secure protection for Conrads Island. Hurricane Gabrielle has since filled in the channel, reattaching it to the mainland: so it's once again Conrads Beach. The property was finally transferred to the province for a park; the parking lot was fenced and a boardwalk built to the beach. Now we only need the gate, and the 'Provincial Park' signs. The signs need an order-in-council - which has been delayed by the election.

Incidentally, did you go for a walk on a beach this winter? The sand actually formed ice cliffs up to 2 meters high in places! This appears to have been caused by (fresh?) water freezing between the sand particles. I have no idea what erosional effects this had, but on beaches with short distances back to the vegetation it could be significant. In late February, on the stony section of Rainbow Haven we had the frozen sand above the height of the cobble barrier, and several meters out from it. Sand that during the summer is usually only visible at low tide was thus frozen above high tide. Seaward of this we had perhaps a hundred meters of seawater so close to freezing that the only thing preventing ice pan formation was the relentless pounding of tide and waves. Very dramatic! Conrads and Martinique also had these sand formations, and I assume the South Shore beaches were similar.

The natural history of Conrads is fascinating. The marshes on both sides of the parking lot are changing. The West Marsh must now drain under the bridge (a major artificial constriction), so the marsh is both higher and less salty than previously. The area east of the bridge is also higher and probably fresher - flooded by the water that comes from the marsh throughout the tidal cycle. The plants and animals are still responding to the changes, and will be for years yet.

The front of the beach has also been affected. More water flows between Stoney Beach and Conrads, and the current along Conrads' main beach is no longer slowed by a channel halfway along, although a shoal is building there, which should have some effect. The long-shore current carries the sand which builds (or erodes) the beach, moving it from

east to west.

Formerly the middle channel provided a strong outflow during ebb tide which slowed the long-shore current enough for sand to be deposited to the east and may have prevented from getting to the west end of the beach at all. The rising tide nowadays probably does not compensate for the lost ebb tide deposits.

Do you know the buried ship to the left toward Fox Point (now Fox Island?)? It was more exposed on May 2 than I've ever seen it; a lot of sand has gone. The current is eroding sand here. Summer currents usually deposit more than winter ones, so we'll have to wait to see what the year-to-year effect is. Perhaps there will now be more deposition at the west end of the beach than at the east.

On the other side of Fox Point on the beach facing MacDonald House (Lawrencetown), erosion and deposition are occurring within feet of each other. A partial barrier across the outflow has been developing for a couple of years. Walking back from Fox Point one sees serious erosion on the dune face; there are large, connected clumps of dune grass lying partially buried at the high tide line. An old stump has recently been exposed at the base of the dune. It looks more like a cast-up that was buried years back (100?, 500?, who knows?) than a forest tree that once stood there and was subsequently buried.

Less than 30 metres further we hit the spot where the building spit encounters an eroding dune face. Young sprouts of beach pea and marram grass show that colonisation and above-the-tide dune expansion have begun. We can watch this ecological process with interest for years.

Back on the main beach, the former channel is colonising nicely. The first summer saw a few beach peas and clumps of beach grass. Each year the grass clumps get larger, and new ones appear. There are the telltale lines of small, in line, evenly spaced shoots coming up from the spreading rhizomes of the pioneers; the effectiveness of these plants in trapping sand can be seen around their bases. Three years ago these plants covered maybe 1/10,000 of the former channel area; now they are between 1 and 10%, and the spread is accelerating.

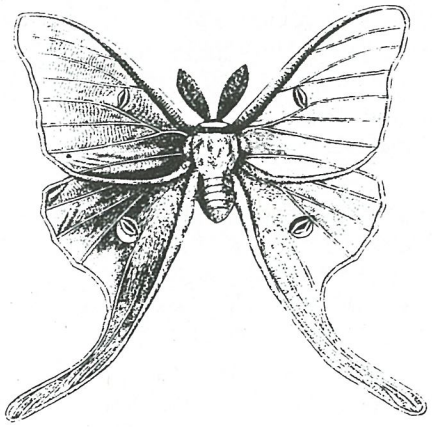
SHUBIE PARK (DARTMOUTH)

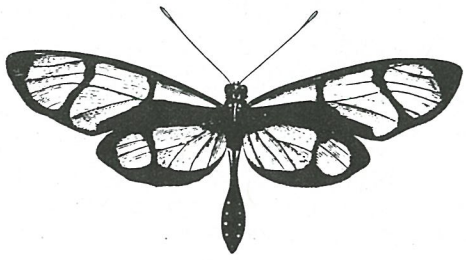
When is a park not a park? When a city forgets to buy the land! Through some oversight about half of this park is still privately owned. Negotiations between Dartmouth and the landowner reached an impasse last year, and the landowner had some of his trees cut, and left lying, to make the point. I believe the situation is still unresolved.

Shubie Park is covered with regenerating woods with a few old trees thrown in for variety; unfortunately the trees that were cut were some of the older ones. There is a nice walk from the Fairbanks Center downstream on either side of the canal, then right to the other parking lot, and left by its entrance to a long trail along the lake. This is the section with the cut trees, and, in early June, a few hundred Lady's-slippers. This trail eventually runs into another; the short way back from there is to the right. But go left, cross a dirt road, and follow that track until it joins the canal path. (The trail that goes straight where the surfacing ends stops short at the highway.) Turn left on the canal path, cross the bridge, and follow the other side of the canal back to your start.

It will be a very nice park when it grows up - if it is allowed to.

Colin Stewart, President





SPECIAL ARTICLES

THE COLOUR OF BIRDS

At a recent meeting some people asked why birds are coloured the way they were. To understand why we see such glorious colours in Bluebirds and Cardinals we need to understand something of light and ourselves.

Every day we are bathed in energy from a nuclear fission reactor we call the sun. Some of this energy we can see (light), some we can feel (heat or infrared radiation) and some we notice indirectly (ultra-violet or U.V. radiation, which causes sunburn and skin cancer). To see birds we use that radiation called "light", actually white light.

White light is composed of a broad range of different lights (or energies) we call colours. We see these in a rainbow: red, orange, yellow, green, blue, indigo, violet. When added together, they form a brighter light, white.

Light can be bent, scattered or focused; the reflector in your flashlight reflects and focuses light into a beam. Tiny particles also can bend (refract) light but do not bend all colours to the same extent. Blue is more strongly scattered than other colours and this is what gives the sky its colour (Why is the sky blue, Daddy?) Raindrops or water particles give us rainbows and dust in the air provides sunsets and sunrises.

This light alteration is called Tyndall scattering and is the way birds get "blue" feathers. Each feather has a transparent outer layer covering a spongy, bubble-filled layer that scatters light in the same way as atmospheric dust. Other light energies (colours) are absorbed by a layer of black pigment called melanin.

The second way to achieve colour is with pigment, a substance that absorbs light. What we see is the light that is not absorbed but reflected back. So a "red" pigment absorbs blue and green light but not red. Birds synthesise red, orange and yellow pigments from the carotene (as in carrots) they get from plants. Black, grey, brown, (including variations like chestnut) are made internally from amino acids by the bird. The only birds I know with green pigment are touracos; their pigment is called touracoverdin. Pigments are soluble and can be extracted by grinding in alcohol or fat; blue colour cannot be extracted because it is an illusion of light. (Although you can see the melanin in a Blue Jay's feather by holding it against the window. You will be using transmitted rather than reflected light.)

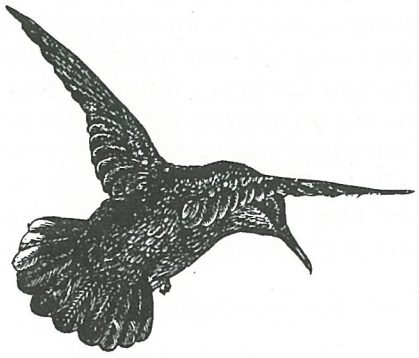
If we have a Budgerigar, which is naturally green, but has lost its yellow pigment it looks blue. If we breed out its spongy feather cells it no longer reflects blue light, it reflects all light and so looks white.If we take out the spongy cells but leave the pigment, it looks yellow.

The discussion at the meeting centred on the Green-backed Heron, which did not look green in a photograph. The colours you see on this bird will depend on the light; under rare conditions with the light at an extreme angle, it can be a stunning royal blue. More typically you will see blue light shining through yellow pigment to give green. If the light is poor without enough energy to pass into the feathers and out again, the bird will look dirty brown or black.

As pigments are subtractive, the more you add the duller your colour. remember mixing all the paints in your paint-box as a child? You got muddy brown. Light is additive, so combining colours makes things brighter; so the reflected light on a Humming-bird's red throat is shiny and bright rather than soft and matte like the red on a Robin's stomach.

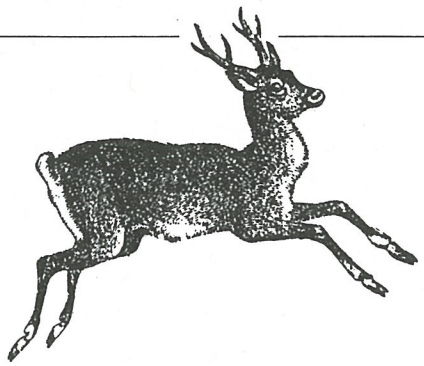
Now when you look at a bird, even a Starling, you can wonder at the clever tricks nature has pulled to make it look that way.

Roy John



FIELD TRIPS

DEER INTERPRETATION AT KEJIMKUJIK NATIONAL PARK



DATE: SUNDAY NOVEMBER 8TH, 1992
WEATHER: RAW, COLD, +5C
LEADER: PETER HOPE
PARTICIPANTS: 20 (4 HFN AND 16 ANNAPOLIS FIELD NATURALISTS)

At 8.30 a.m. at the Nova Scotia Museum, four adventurous H.F.N. members set off in one car to join some Annapolis Field Naturalists in a "Deer Walk" and interpretation at Keji National Park.

The day was overcast and very cold with frost covering everything we saw, making the scenery look very wintry indeed!

When we arrived at Keji Interpretation Centre, we met the Annapolis Field Naturalists and awaited our deer expert - Peter Hope. After Peter had introduced himself and told us what we would be doing for the day, he showed us some slides pertaining to the deer and Keji Park as a habitat.

As he told us about the deer, we interjected periodically with questions and were soon quite enthused with Peter's answers and expert knowledge of the deer.

Afterwards, Peter had us do a hands-on quiz: he had a box full of various deer jaw-bones that hunters had had to hand in. The jaw-bones were from deer of different ages, and we had to estimate the age of the half jaw-bones that Peter gave each of us. On a framed board were jaw-bone halves with their ages in years and months written above them. We measured our halves up to those on the board and then each of us told Peter what we thought were the ages of the bones he had given us. We certainly had fun learning how to tell the age of a deer by the length of its jaw-bone and the wear and tear on the teeth!

Our lunch stop was at Mills Falls Centre in Keji; it was just a short drive down the road from the main interpretation centre. The falls were very low due to the lack of rain and therefore were not as impressive as they are after a downpour.

Then Peter led us off in our convoy to a place down the road where there was a well-used deer marked area. In the fall, the bucks wander the woods in search of fertile does. When a buck enters the territory of a doe or does in heat, he will rub his eye on a twig of a tree, leaving scent from a gland underneath the corner of his eye. At the same time and the same tree, he paws and scrapes the ground and then urinates down his hind legs to release scent from another gland on each heel. Combined with the urine, his scent is then pawed into the ground to let "his girls," as Peter phrased it, know that he is in the vicinity. "The girls" do the same ritual, to let him know where they are.

The bucks also scrape the velvet off their antlers during the rut to sharpen the points for possible sparring with each other. Broken twigs and worn-off bark on trees can be seen in the woods during the fall, indicating the presence of bucks.

Our last stop was at the centre that at one time had been a Fisheries Department building. There Peter had Bobcat and Coyote pelts, and told us about the Coyote packs that roam the park, and how the prosperity of the pack depends on the number of deer. The Coyotes in the park are being studied to assess their health, age, and population.

As Peter was giving us the information on Coyote packs' dependency on deer, a doe and her fawn in full winter coats walked across the still green lawn outside The doe was very wary of us, but the fawn stood still and allowed us to take pictures while we were dispersing to our cars.

During the day we saw several Porcupines along the roadside, also Ruffed Grouse; a Nuthatch, Chickadees, a Red-eyed Vireo's nest and two bucks were seen by one or two naturalists

It had been a knowledge-packed day, and a very interesting though chilly day. Thanks go to Peter Hope for a very worthwhile trip to Keji and for his expert answers to our eager questions.

Susan Hawkins

NATURAL HISTORY

SUMMER IS FOR INSECTS

It's a pity that most stories and advertisements cast insects as villains. Some are obnoxious, but most are harmless and beautiful. They provide pollination, silk thread, pink dye, varnish, and above all, food for nestling and wintering birds. So now that the excitement of spring bird arrivals and nesting is over, it's time to look at insects.

How can you recognise an insect? Well, they have six jointed legs and two pairs of wings. Their young ones generally have six jointed legs too, but have no wings, and a few insects have lost their wings (fleas) or never had them (silverfish). So the presence of three pairs of jointed legs is the best way to recognise an insect.

The body is divided into three sections, sometimes with an exaggerated "neck" and "waist," as in ants, sometimes rather stubby, as in ladybugs. The head has eyes (usually compound), antennae and a mouth. The thorax bears both legs and wings, and the abdomen contains reproductive and excretory organs, padded with stored fat.

Any animal with eight legs and a two-part body is an arachnid, probably a spider or tick. An animal with many legs is not an insect but belongs to some other group of jointed-legged beings.

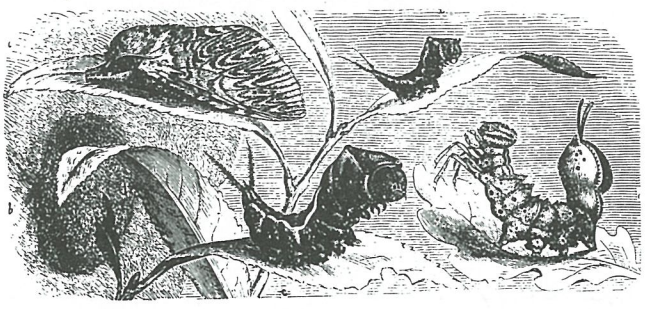
In our cold climate, insects are only active in summer, spending the winters as eggs or hidden in protected corners, where chickadees find them. Silverfish come out from behind the bath in late February to start the insect year, while window flies take shelter in October, and a few small moths dance in the porch lights to finish off the season. Meantime there are the summer beauties of the butterflies and moths, the lanterns of glow-worms and the iridescent colours of some beetles and bugs - colours produced in the same ways as those in birds' feathers.

There are several good books on insects, but A Field Guide to the Insects of America North of Mexico, by Donald R. Borror and Richard E. White (Houghton Mifflin Company Boston, 1970), is a fine place to start. The keys on the end-papers will get any insect into its Order, and the text tells one something of its habits.

Studying insects does not involve much equipment. The kits sold for school-age children have useful containers for making observations, but a Mason jar or a covered drinking glass is usually enough. The insect should be released after a while, but a small pot or pill vial containing wet cotton should be provided, for insects dry out quickly. A magnifying glass (5x or 10x) is needed for seeing details. This sort of lens is found in University bookstores or places selling binoculars to birders.

Insects can be picked off plants, or watched where they are, but a net is used for flying ones. Cartoon jokes about the zany butterfly collector always get the net right - the bag is long so the end can be folded over to trap the captive. Nets can be made from nylon netting on the frame of a big old aquarium net, or best of all, a landing net. A frame made from a coathanger lacks style but works well; fasten it to a four foot dowel with electrical tape and elastic bands. Please don't use an insect net for fishing in ponds; make a shorter net for that; an aquarium net from the pet store, fastened to another four foot dowel, will net lots of water beetles. and some amazing insect larvae.

Ursula Grigg



1993

JULY–JUILLET

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0540	5.1	1.6	16	0520	4.6	1.4
	1210	1.3	.4		1125	1.8	.5
TH	1750	5.8	1.8	FR	1725	5.4	1.6
JE				VE			
2	0050	.3	.1	17	0010	.8	.2
	0635	5.3	1.6		0615	4.9	1.5
FR	1305	1.2	.4	SA	1215	1.6	.5
VE	1845	5.9	1.8	SA	1815	5.6	1.7
3	0140	.2	.1	18	0100	.5	.2
	0730	5.4	1.6		0700	5.2	1.6
SA	1355	1.1	.3	SU	1305	1.3	.4
SA	1935	5.9	1.8	DI	1905	5.8	1.8
4	0225	.1	.0	19	0145	.3	.1
	0815	5.6	1.7		0745	5.5	1.7
SU	1440	1.1	.3	MO	1355	1.2	.4
DI	2020	5.9	1.8	LU	1950	6.0	1.8
5	0305	.2	.1	20	0230	.0	.0
	0900	5.7	1.7		0835	5.8	1.8
MO	1520	1.2	.4	TU	1445	1.0	.3
LU	2105	5.9	1.8	MA	2040	6.1	1.9
6	0345	.4	.1	21	0315	.0	.0
	0940	5.7	1.7		0920	6.1	1.9
TU	1605	1.3	.4	WE	1535	1.0	.3
MA	2150	5.7	1.7	ME	2125	6.1	1.9
7	0425	.6	.2	22	0400	.0	.0
	1020	5.7	1.7		1005	6.2	1.9
WE	1645	1.4	.4	TH	1635	1.0	.3
ME	2230	5.6	1.7	JE	2215	6.0	1.8
8	0500	.9	.3	23	0455	.2	.1
	1100	5.6	1.7		1050	6.3	1.9
TH	1730	1.5	.5	FR	1735	1.0	.3
JE	2315	5.3	1.6	VE	2305	5.8	1.8
9	0540	1.2	.4	24	0550	.4	.1
	1135	5.5	1.7		1135	6.2	1.9
FR	1815	1.6	.5	SA	1835	1.0	.3
VE	2355	5.1	1.6	SA	2355	5.5	1.7
10	0615	1.4	.4	25	0650	.7	.2
	1215	5.3	1.6		1225	6.0	1.8
SA	1900	1.6	.5	SU	1940	1.0	.3
SA				DI			
11	0040	4.8	1.5	26	0050	5.2	1.6
	0700	1.6	.5		0750	1.0	.3
SU	1255	5.2	1.6	MO	1320	5.7	1.7
DI	1945	1.6	.5	LU	2040	1.0	.3
12	0125	4.6	1.4	27	0150	4.9	1.5
	0740	1.8	.5		0850	1.3	.4
MO	1340	5.1	1.6	TU	1420	5.5	1.7
LU	2035	1.5	.5	MA	2140	.9	.3
13	0220	4.4	1.3	28	0305	4.7	1.4
	0830	2.0	.6		0955	1.5	.5
TU	1435	5.0	1.5	WE	1530	5.4	1.6
MA	2125	1.4	.4	ME	2240	.8	.2
14	0325	4.3	1.3	29	0425	4.7	1.4
	0925	2.0	.6		1100	1.5	.5
WE	1535	5.0	1.5	TH	1640	5.4	1.6
ME	2220	1.3	.4	JE	2340	.6	.2
15	0425	4.4	1.3	30	0535	4.9	1.5
	1025	2.0	.6		1155	1.4	.4
TH	1630	5.1	1.6	FR	1740	5.5	1.7
JE	2320	1.1	.3	VE			
				31	0030	.5	.2
					0630	5.1	1.6
				SA	1250	1.3	.4
				SA	1830	5.6	1.7

AUGUST–AOUT

Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0120	.4	.1	16	0030	.5	.2
	0715	5.4	1.6		0635	5.4	1.6
SU	1335	1.2	.4	MO	1245	1.3	.4
DI	1920	5.8	1.8	LU	1840	6.0	1.8
2	0205	.4	.1	17	0120	.2	.1
	0755	5.6	1.7		0725	5.9	1.8
MO	1420	1.2	.4	TU	1335	1.0	.3
LU	2005	5.8	1.8	MA	1930	6.2	1.9
3	0240	.4	.1	18	0205	–0.1	.0
	0835	5.7	1.7		0810	6.2	1.9
TU	1455	1.2	.4	WE	1425	.8	.2
MA	2045	5.8	1.8	ME	2020	6.3	1.9
4	0315	.6	.2	19	0250	–0.1	.0
	0915	5.7	1.7		0855	6.5	2.0
WE	1530	1.2	.4	TH	1520	.7	.2
ME	2125	5.7	1.7	JE	2110	6.3	1.9
5	0345	.8	.2	20	0340	.0	.0
	0950	5.7	1.7		0940	6.6	2.0
TH	1605	1.3	.4	FR	1615	.6	.2
JE	2205	5.5	1.7	VE	2155	6.1	1.9
6	0415	1.0	.3	21	0435	.2	.1
	1025	5.7	1.7		1025	6.5	2.0
FR	1640	1.3	.4	SA	1715	.7	.2
VE	2240	5.3	1.6	SA	2245	5.9	1.8
7	0450	1.2	.4	22	0530	.6	.2
	1100	5.6	1.7		1115	6.3	1.9
SA	1720	1.4	.4	SU	1815	.7	.2
SA	2320	5.1	1.6	DI	2340	5.5	1.7
8	0525	1.5	.5	23	0630	.9	.3
	1135	5.4	1.6		1200	6.0	1.8
SU	1805	1.4	.4	MO	1920	.8	.2
DI				LU			
9	0000	4.8	1.5	24	0035	5.2	1.6
	0605	1.7	.5		0735	1.3	.4
MO	1210	5.2	1.6	TU	1255	5.6	1.7
LU	1855	1.5	.5	MA	2020	.9	.3
10	0040	4.6	1.4	25	0135	4.8	1.5
	0655	1.9	.6		0840	1.5	.5
TU	1255	5.1	1.6	WE	1355	5.3	1.6
MA	1950	1.5	.5	ME	2120	.9	.3
11	0130	4.4	1.3	26	0250	4.6	1.4
	0750	2.0	.6		0940	1.7	.5
WE	1340	5.0	1.5	TH	1510	5.1	1.6
ME	2050	1.5	.5	JE	2220	.9	.3
12	0230	4.3	1.3	27	0415	4.7	1.4
	0850	2.1	.6		1045	1.7	.5
TH	1440	4.9	1.5	FR	1625	5.2	1.6
JE	2145	1.4	.4	VE	2320	.8	.2
13	0340	4.3	1.3	28	0525	4.9	1.5
	0950	2.0	.6		1140	1.6	.5
FR	1550	5.1	1.6	SA	1725	5.3	1.6
VE	2245	1.1	.3	SA			
14	0450	4.6	1.4	29	0010	.7	.2
	1055	1.8	.5		0615	5.2	1.6
SA	1650	5.3	1.6	SU	1230	1.5	.5
SA	2340	.8	.2	DI	1815	5.5	1.7
15	0545	5.0	1.5	30	0055	.7	.2
	1150	1.6	.5		0655	5.4	1.6
SU	1750	5.7	1.7	MO	1315	1.3	.4
DI				LU	1900	5.7	1.7
				31	0135	.6	.2
					0730	5.7	1.7
				TU	1355	1.2	.4
				MA	1940	5.8	1.8

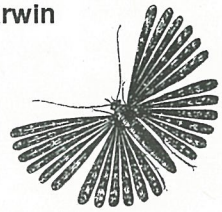
SEPTEMBER–SEPTEMBRE

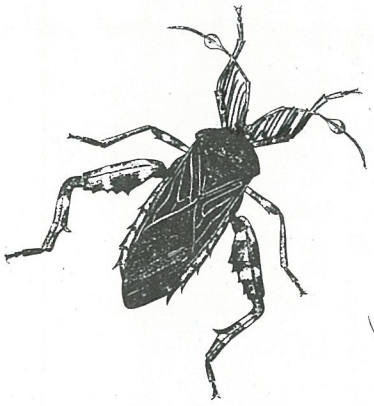
Day	Time	Ht./ft.	Ht./m	Jour	Heure	H./pi	H./m
1	0210	.7	.2	16	0140	.0	.0
	0805	5.8	1.8		0745	6.6	2.0
WE	1430	1.1	.3	TH	1410	.5	.2
ME	2020	5.7	1.7	JE	2000	6.4	2.0
2	0240	.8	.2	17	0230	.0	.0
	0840	5.9	1.8		0830	6.8	2.1
TH	1500	1.1	.3	FR	1505	.3	.1
JE	2100	5.7	1.7	VE	2050	6.4	2.0
3	0310	1.0	.3	18	0320	.2	.1
	0915	5.8	1.8		0915	6.8	2.1
FR	1530	1.1	.3	SA	1555	.3	.1
VE	2135	5.5	1.7	SA	2140	6.2	1.9
4	0335	1.2	.4	19	0410	.4	.1
	0950	5.7	1.7		1000	6.6	2.0
SA	1605	1.1	.3	SU	1655	.4	.1
SA	2210	5.3	1.6	DI	2230	5.9	1.8
5	0405	1.4	.4	20	0510	.8	.2
	1025	5.6	1.7		1050	6.3	1.9
SU	1640	1.2	.4	MO	1755	.6	.2
DI	2250	5.1	1.6	LU	2320	5.6	1.7
6	0440	1.6	.5	21	0615	1.2	.4
	1055	5.4	1.6		1140	5.9	1.8
MO	1725	1.3	.4	TU	1855	.8	.2
LU	2325	4.9	1.5	MA			
7	0520	1.8	.5	22	0015	5.2	1.6
	1130	5.3	1.6		0720	1.5	.5
TU	1815	1.4	.4	WE	1235	5.5	1.7
MA				ME	2000	.9	.3
8	0005	4.7	1.4	23	0120	4.9	1.5
	0615	2.0	.6		0825	1.7	.5
WE	1210	5.1	1.6	TH	1335	5.2	1.6
ME	1915	1.5	.5	JE	2100	1.0	.3
9	0050	4.5	1.4	24	0230	4.8	1.5
	0715	2.1	.6		0925	1.8	.5
TH	1300	5.0	1.5	FR	1445	5.0	1.5
JE	2015	1.5	.5	VE	2155	1.1	.3
10	0145	4.4	1.3	25	0355	4.8	1.5
	0825	2.2	.7		1025	1.8	.5
FR	1400	5.0	1.5	SA	1605	5.1	1.6
VE	2115	1.4	.4	SA	2250	1.1	.3
11	0300	4.5	1.4	26	0500	5.1	1.6
	0930	2.1	.6		1120	1.7	.5
SA	1510	5.1	1.6	SU	1705	5.2	1.6
SA	2210	1.1	.3	DI	2340	1.1	.3
12	0415	4.8	1.5	27	0545	5.3	1.6
	1030	1.9	.6		1210	1.5	.5
SU	1620	5.4	1.6	MO	1755	5.4	1.6
DI	2305	.8	.2	LU			
13	0520	5.3	1.6	28	0025	1.1	.3
	1130	1.6	.5		0625	5.6	1.7
MO	1720	5.7	1.7	TU	1250	1.3	.4
LU				MA	1835	5.6	1.7
14	0000	.5	.2	29	0105	1.1	.3
	0610	5.8	1.8		0700	5.8	1.8
TU	1225	1.2	.4	WE	1330	1.2	.4
MA	1815	6.0	1.8	ME	1915	5.7	1.7
15	0050	.2	.1	30	0140	1.1	.3
	0700	6.3	1.9		0735	5.9	1.8
WE	1320	.8	.2	TH	1400	1.0	.3
ME	1910	6.3	1.9	JE	1955	5.7	1.7

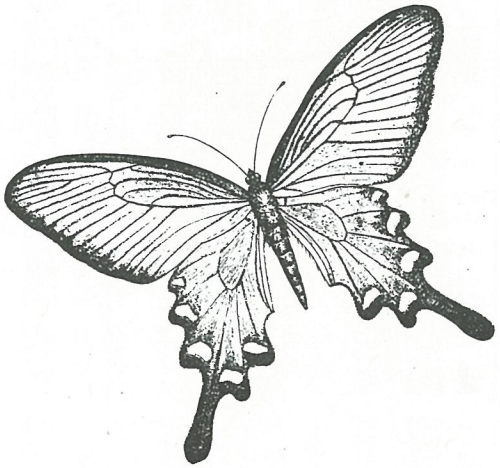
REST, SILVER BUTTERFLIES

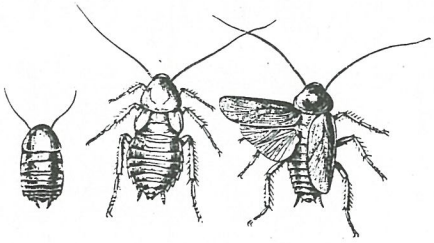
Rest, silver butterflies, your quivering wings;
Alight, ye beetles, from your airy rings;
Ye painted moths, your gold-eyed plumage furl,
Bow your wide horns, your spiral trunks uncurl;
Glitter, ye glow-worms, on your mossy beds;
Descend, ye spiders, on your lengthened threads;
Slide here, ye horned snails, with varnished shells;
Ye bee-nymphs, listen in your waxen cells!...
Say on each leaf how tiny graces dwell;
How laugh the pleasures in a blossom's bell;
How insect loves arise on cobweb wings,
Aim their light shafts and point their little stings.

from a poem by Erasmus Darwin









! NEXT DEADLINE !
15 Aug. for Sept. Issue

Contributions to the Editor, HFN
c/o NS Museum or phone 455-8160