

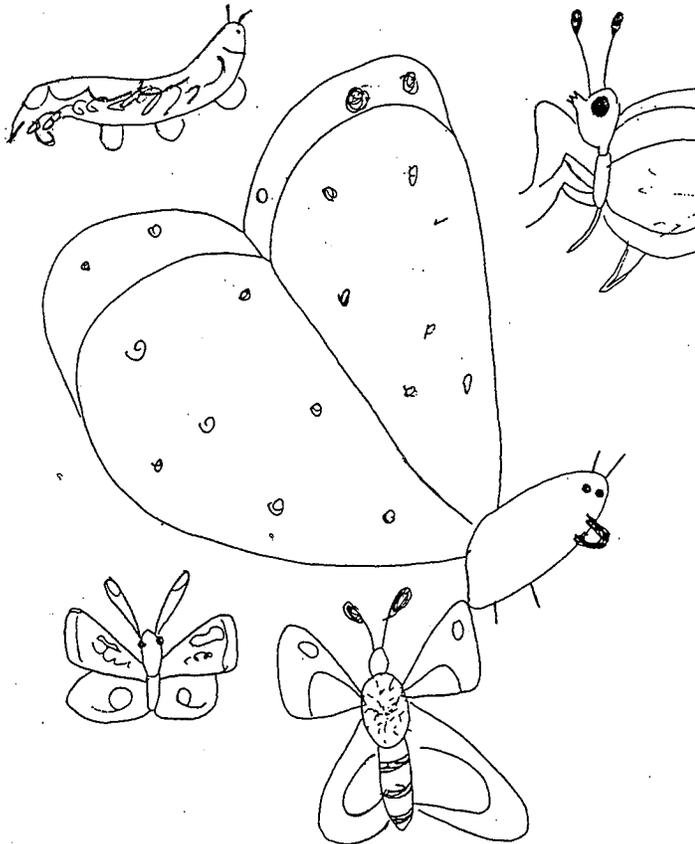
# MASSACHUSETTS

## BUTTERFLIES *Spring 2001, No. 16*

BUTTERFLIES

etc

MOMOKO  
5/14/00



*MASSACHUSETTS BUTTERFLIES* is the semi-annual publication of the Massachusetts Butterfly Club, a chapter of the North American Butterfly Association. Membership in NABA - MBC brings you *American Butterflies*, *Butterfly Garden News*, *Massachusetts Butterflies*, MBC newsletter with count and field trip schedules for the year, and all of the benefits of the association and club, including field trips and meetings. Regular annual dues are \$25.00. Those joining NABA - MBC for the first time should make their checks payable to NABA and send it to our treasurer, Lyn Lovell, at the address listed below. Membership renewals are handled through the national office: NABA, 4 Delaware Road, Morristown, NJ 07960; telephone 973-285-0907.

**Officers of NABA - Massachusetts Butterfly Club**

President - Tom Gagnon  
175 Ryan Rd., Florence 01060 (413-584-6353)

Vice-president East - Madeline Champagne  
7 Pond Ave., Foxboro 02035 (508-543-3380)

Vice-president West - Carl Kamp  
P.O. Box 111, Royalston 01368 (978-249-9675)

Secretary - Barbara Walker  
33 Woodland Rd., Auburn 01501-2149 (508-754-8819)

Treasurer - Lyn Lovell  
198 Purchase St., Milford 01757-1120 (508-473-7327)

**MASSACHUSETTS BUTTERFLIES Staff**

Records Compiler - Tom Dodd  
33 Mechanic St., Upton 01568 (508-529-3392) [tdodd@gis.net](mailto:tdodd@gis.net)

Editor - Alison Robb  
Box 186, Woods Hole 02543 (508-540-2408) [alisonr@capecod.net](mailto:alisonr@capecod.net)

**Submission of Articles, Illustrations and Season Records Deadlines**

We encourage all members to contribute to *Massachusetts Butterflies*. Articles, illustrations, sightings, out-of-state sightings, adventures, book reviews are welcome. Please send 4th of July counts to Tom Dodd by August 1 for the Fall issue and your season sightings and records to Tom by December 1 for the Spring issue. Sending your records periodically during the season will make data entry an easier task for Tom. He will turn all our records into a summary and inclusive tabulated record, as has been done in the past. Send all other material to Alison Robb by August 30, and January 15.



## Contents

**Cover**      **"Butterflies"**      *Momoko Schafer*

Our cover art work was done by Momoko Schafer, then six years old, while accompanying her grandfather, Bill Schafer of Florence, Massachusetts, on an MBC Amherst Butterfly Institute field trip on June 7, 2000. Momoko is the daughter of David and Hiroko Schafer of Natick, Massachusetts, and is now in the first grade.

Congratulations to Momoko on her excellent art work.

*Tom Gagnon*

<b>Page 1</b>	<b>Contents</b>	
<b>2</b>	<b>Fall 2000 Migration Watch at Westport - South Dartmouth, Massachusetts</b>	<i>Brian Cassie</i>
<b>7</b>	<b>Brian Cassie Appointed</b>	<i>Madeline Champagne</i>
<b>8</b>	<b>Season Records and Summary</b>	<i>Tom Dodd</i>
<b>28</b>	<b>Glory and Splendor</b>	<i>Madeline Champagne</i>
<b>29</b>	<b>Migration</b>	<i>Tor Hansen</i>
<b>37</b>	<b>President's Message</b>	<i>Tom Gagnon</i>

## Fall 2000 Migration Watch at Westport - South Dartmouth, Massachusetts

*Brian Cassie — with very important contributions from  
other members of NABA-MBC*

Following the success of the 1999 migration watch project, NABA-MBC set up a series of weekly fall programs in the Horseneck Beach, Westport, to Allen's Pond, South Dartmouth, coastal region for autumn of 2000. The goals of this year's project were the same as in 1999: To document the scope of butterfly, bird and dragonfly migrations in this short section of the Buzzard's Bay coastline during the traditional period of maximum fall migratory movements, as well as to gather general additional information on invertebrates and vertebrates of the region.

This year's corps of observers spent 113.7 hours on 23 dates from September 5 to November 2 watching for migrants and documenting both resident and migrant species. The observers were Susan Barry, Stan Bolton, Walter Bosse, Bob Bowker, Sheila Carroll, Brian Cassie, Paula Chasan, Madeline Champagne, Tom Dodd, Richard Hildreth, Gail Howe, Carl Kamp, Jill Lopato, Mark Lynch, Alyce Mayo, JoAnn Mullen, Mimi Murphy, Blair Nikula, Alison Robb, Barbara Walker and Rick Walker.

Results of the 2000 Migration Watch were gratifying. Even though the Monarch experienced an "off" year, several migrant butterflies appeared in good numbers and one, the Common Buckeye, appeared in record-setting numbers. The three traditional large butterflies other than Monarch that are regularly observed in direct, non-stop migratory flight — Red Admiral, Question Mark and Mourning Cloak — were noticeably common on a number of days. The total numbers counted of each for the duration of the watch were 72, 81 and 200 respectively.

Following are synopses of the various groups of animals observed:

### BUTTERFLIES

**Black Swallowtail.** Almost all Black Swallowtails in the study area have been found in the fields at Allen's Pond and across the road to the west. The most seen on any day were 5 on September 14.

**Cabbage White.** As many as 600 Cabbage Whites have been counted on an autumn day in the past at Gooseberry Neck, where they are always one of the most common butterflies. This year, the single day maximum was 289 for the whole area, which compared favorably with the 1999 high count of 246.

**Checkered White.** Mark Lynch and Sheila Carroll had a great day at Gooseberry Neck on September 10 when, along with finding 2 Hooded Warblers, they observed a Checkered White near the towers at the south end. This is the fourth Checkered White that has been found at Gooseberry in the past five years. All have been singletons observed on a single day in September. These are the only Massachusetts records known to the author in the last half century.

**Clouded Sulphur.** This bright yellow sulphur is always less common here than its orange cousin. No more than 33 were found in a day in fall 2000.

**Orange Sulphur.** There was certainly no lack of Orange Sulphurs this past fall in the Westport - South Dartmouth region. This butterfly was, in fact, the most common species on many of our count days. The September 22 count of 926 is six-and-a-half times higher than the 1999 maximum. In southern New Jersey very large numbers of Orange Sulphurs were noted streaming along in migration with Monarchs, Red Admirals, and other brushfoots. At Buzzard's Bay, though, we did not record Orange Sulphurs in direct migrational flight.

**American Copper.** Compared with past years, 2000 saw a bumper crop of American Coppers, principally at Gooseberry Neck, where several dozen were noted on occasion in September, with a maximum of 63 on September 10.

**Gray Hairstreak.** Never common, this species was not easy to find in the study area. No more than one or two Gray Hairstreaks were seen on any day in the field in fall 2000.

**Eastern Tailed-Blue.** Small numbers of this delicate butterfly occur annually, mostly in the fields at Allen's Pond and vicinity. The high count was 5 on two dates in September.

**Summer Azure.** Azures are apparently scarce in this area in September. In 1999, two were observed (one at Sylvan Nursery and one at Allen's Pond) while in 2000 only one was found, at Gooseberry on September 22.

**American Snout.** On the first day of the fall 2000 survey, only five species of butterflies were observed and one of those was the rarely seen American Snout, which was discovered a few hundred yards south of the parking area at Gooseberry Neck. It was a "one day wonder" — as are seemingly all American Snouts in Massachusetts.

**Variegated Fritillary.** This was a good year, in general, for this southern species in Massachusetts. It was seen in the study area from late September to late October, with as many as four found in one day.

**Pearl Crescent.** There are lots of asters (Pearl Crescent food plant) in the area but, in the autumn at least, there have been few Pearl Crescents. The most on any day last fall were three on September 9.

**Question Mark.** Along with the Mourning Cloak and Red Admiral, the Question Mark is typically seen "on the move," that is, in low, direct migrational flight. True, some stop to imbibe nectar at goldenrods and other wildflowers, but the majority are observed in rapid flight. We saw quite a few this fall, with a maximum of 20 recorded on October 13.

**Mourning Cloak.** From the Canadian border to Westport and points south, migrating Mourning Cloaks were found in fine numbers in September - October 2000. The Westport area had several excellent flights in the four weeks from September 22 to October 20, with 34, 48, 40, 17, 21, 27, and 14 butterflies noted on September 22, 23, 27 and October 8, 12, 13, and 14, respectively.

**American Lady.** Generally speaking, there were very good numbers of American Ladies present. This migratory species has scarcely been observed in the actual process of migrating here — in the recent past or in the fall of 2000. It is an avid flower visitor, and individuals may slowly work their way across the study area taking nectar between short flights. On September 23 a high count of 51 was made.

**Painted Lady.** Small numbers of Painted Ladies were found from mid-September to the fourth week of October, with a maximum of 6 on September 29. None was seen in migratory flight — all were visiting flowers.

**Red Admiral.** For six weeks, from the second week of September onward, Red Admirals were observed in low to excellent numbers, usually in rapid, uninterrupted flight. Double digit flights were noted on September 22 and October 12, 13, and 14 when we counted 13, 10, 46, and 20, respectively.

**Common Buckeye.** The summer flight of Common Buckeyes into most corners of Massachusetts was not unprecedented, but the 165 individuals of this southern species counted in the study area on September 22 was a remarkable total. Most of the Westport - South Dartmouth Buckeyes exhibited behavior typical of the species — resting in the open on a patch of ground and flying up to meet any butterflies passing nearby. On at least a few occasions, though, small numbers of Common Buckeyes were observed migrating westward low over the dunes.

**Viceroy.** A single Viceroy was found near the parking lot at

Gooseberry Neck on September 16.

**Monarch.** Monarchs were disappointing as migrants in fall 2000. Not only did they fail to appear in significant numbers, but also they were scarcely seen actually migrating. Most were found at flowers, especially Seaside Goldenrod.

**Horace's Duskywing.** Two Horace's Duskywings were observed at the rocky overlook at Allen's Pond on September 10. One was photographed.

**Least Skipper.** Many more Least Skippers were found in 2000 than 1999. A total of 10 was observed on September 9.

**Peck's Skipper.** The Westport-South Dartmouth area is skipper-poor in the fall. In 2000 there were but two Peck's Skippers observed; in 1999 there were none.

**Ocola Skipper.** This southern butterfly is extremely scarce anywhere in Massachusetts in September, its only known month of occurrence here. Therefore, we were overwhelmed and delighted to have found an Ocola Skipper at Allen's Pond on September 22 and another individual exactly a week later at Gooseberry Neck.

Other butterflies which have been noted in the area in past autumns but which were not seen in fall 2000 are Spicebush Swallowtail, Eastern Tiger Swallowtail, Cloudless Sulphur, Little Yellow, White M Hairstreak, Great Spangled Fritillary, Silver-bordered Fritillary, Common Ringlet, Long-tailed Skipper, Fiery Skipper, and Northern Broken-Dash. Some of these are migratory insects and others are permanent residents. All will likely be seen again in future years.

#### DRAGONFLIES AND DAMSELFLIES

At times, dragonflies are a conspicuous element of the fall coastal migratory movement. The most numerous migratory dragonflies in the Northeast, at least along the coast in the late summer and fall, are Common Green Darner, Black Saddlebags, and Wandering Glider. Much smaller numbers of other species of dragonflies join in many flights.

At our Westport - South Dartmouth study site, we observed dragonflies actively migrating on fifteen dates in the fall of 2000. Usually, we saw very small numbers of migrating dragonflies. For instance, the average number of migrant dragonflies observed on 13 of the 15 days we found them was 26. On the other two days there were 131 (September 25) and 1658 (September 22). On September 22, the composition of migrating dragonflies was as follows: Common Green Darner, 1438; Black Saddlebags, 205; Wandering Glider, 13; Carolina

Saddlebags, 1; Common Whitetail, 1.

#### BIRDS

Birdwatching was carried on throughout the day but many of the best birds and many of the good numbers of migrants were found in the hours before 9:00 a.m., official start time for serious butterfly watching. We observed 158 species of birds in the area between September 5 and November 2, including such unusual species as Sandhill Crane, Northern Goshawk, Orange-crowned Warbler, Mourning Warbler, Hooded Warbler, Yellow-breasted Chat, Lark Sparrow, Clay-colored Sparrow, Dickcissel, and Blue Grosbeak. In 1999, we tallied 138 species. Our two-year total of 177 species represents a very good birdwatching effort.

#### MAMMALS

Mammal watching is strictly opportunistic and not a planned activity for us at the study area. This fall we observed ten species of mammals (8 alive, 2 freshly killed) in the course of our time in the field. They included an unidentified bat (several), Striped Skunk, Mink (dead), Gray Fox (dead), Coyote, Raccoon, Eastern Gray Squirrel, Eastern Chipmunk, Meadow Vole and White-tailed Deer. Many other mammals live in the local area, of course, and a competent tracker could very likely add several species to our list merely by studying the numerous tracks in the Westport sand dunes.

#### REPTILES

The single reptile observed in fall 2000 was a Common Garter Snake at Sylvan Nursery.

#### AMPHIBIANS

Fowler's Toads are extremely abundant at Gooseberry Neck and, at times, one has to take care not to tread upon them. The only other amphibian observed was a Pickerel Frog at Sylvan Nursery.

\*\*\*\*\*

One final word for readers of *Massachusetts Butterflies*: Our migration watch area in Westport and South Dartmouth is a very beautiful place. Why don't you drive down there some morning in the fall of 2001 and experience it?

## **Brian Cassie Appointed to State Advisory Committee**

Brian Cassie has been appointed as an Associate Member of the Nongame Advisory Committee (soon to be known as the Natural Heritage and Endangered Species Program Advisory Committee). This Committee was established by the Fisheries and Wildlife Board in 1981 to provide the Massachusetts Division of Fisheries and Wildlife with independent scientific advice on the conservation and protection of over 400 species of wild plants and animals that are not hunted, fished, or trapped.

The Commissioner of Fisheries, Wildlife and Environmental Law Enforcement, with the approval of the Fisheries and Wildlife Board, appoints the members. Appointments are for three years, and may be renewed. There are 7 Committee Members and an equal number of Associate Members. The Committee meets monthly, typically at the Division of Fisheries and Wildlife Field Headquarters in Westborough. The public is invited to attend.

This Committee reviews the status of species proposed for listing or delisting as Endangered, Threatened or Species of Special Concern, and makes recommendations to the NHESP staff and to the Board. It reviews NHESP's research proposals and reports of completed research, the budget, and other aspects of NHESP activities. Past recommendations have included banning lead shot, banning grass carp, legalizing ferrets, and have covered issues involving exotic animals, invasive plants and zebra mussels.

With a broad background in all aspects of nature, Brian's butterfly experience includes: participation in the Massachusetts Butterfly Atlas Project (1986 - 1990), founding the Massachusetts Butterfly Club in 1991, serving as Editor of *Massachusetts Butterflies* for a number of years, and conducting many butterfly field trips and presentations for MBC as well as for schools and other groups. He has been monitoring the rare and endangered butterfly populations in Massachusetts, and in 1999 he instigated the September-October Monarch Migration Watch in Westport, MA, which now also includes migrating Mourning Cloak and Painted Lady species.

Massachusetts butterflies (and moths and dragonflies) are indeed fortunate to have such a knowledgeable and energetic advocate!

*Madeline Champagne*

## 2000 Season Summary and Records

### *Tom Dodd*

This year 100 species were reported (counting Eastern and Canadian Tiger Swallowtails, Spring and Summer Azure, and counting Red-spotted Purple and White Admiral as a single species). Thank-you to the observers listed below for submitting their records. A significant number of these records were scoured from the Massachusetts Lepis Internet list server. Others sent them via e-mail or postal. There were an astounding 24 new early records and 10 late records.

Because of the method I used to enter records, I mistakenly entered two Hoary Edge records as Hoary Elfins last year. This was an unfortunate error that can cause confusion in later years. Please update last years records of June 15, 1999 and June 30, 1999 Hoary Elfin to indicate Hoary Edge. Thank you to those who brought this to my attention. Please let me know of any errors you may find in these records.

#### Observers

AK, A Keith | AM, A McGinnis | AR, A Robb | BB, B Bowker | BC, B Cassie | BN, B Nikula | BS, B Speare | BW, B Walker | RWa, R Walker | BWr, B Wright | CDo, C Dodd | CK, C Kamp | CT, C Tibbets | DC, D Case | DF, D Furbish | DLr, D Larson | DLU, D Ludlow | DMA, D Marotte | DMi, D Minear | DPo, D Potter | DPPr, D Price | DR, D Rhoda | DS, D Savich | DSm, D Small | EN, E Nielsen | ES, E Solberg | FG, F Goodwin | GH, G Howe | JM, J Mullen | JS, J Sones | KHa, K Haviland | KHo, K Holmes | KP, K Parker | LL, L Lovell | LS, L Stillwell | MC, M Champagne | MF, M Fairbrother | MK, M Kasprzyk | ML+SC, M Lynch+S Carrol | MPe, M Pelikan | MPo, M Polana | MR, M Rines | NY, N Young | PW, P Weatherbee | RH, R Hildreth | RP, R Pease | SBa, S Barry | SBo, S Bolton | SP, S Perkins | SS, S Stichter | TD, T Dodd | TFi, T Fiore+K Wallstrom | TG, T Gagnon | THa, T Hansen | TM, T Moore | VL, V Laux

#### Locations

Barre Falls Dam/Rutland State Park, Barre [BFDAM] ---MAS Broad Meadow Brook Wildlife Sanctuary, Worcester [BMBS] --- Butterfly Institute Field Trip [BMBS BI] ---MAS Broadmoor Wildlife Sanctuary, Natick [BMOOR] --- Butterfly Institute Field Trip [BMOOR BI] ---Crane WMA, Falmouth [CRFAL] --- Crane Pond WMA, Groveland [CRGRO] ---Draper Park, Hopedale [DPHOPE] --- Delaney WMA, Stow [DSTOW] ---Daniel Webster Wildlife Sanctuary, Marshfield [DWWS] ---Fannie Stebbins Refuge, Longmeadow [FANST] --- Gooseberry Neck, Westport [GOOS] ---MAS Ipswich River Wildlife Sanctuary, Topsfield [IRWS] --- Martin Burns WMA, Newbury [MBNEW] ---Massachusetts Butterfly Club Field Trip [MBC] ---MAS Wellfleet Bay Wildlife Sanctuary, Wellfleet [WELLF]

## 2000 Season Summary

### SWALLOWTAILS

Tom Gagnon remarked that the Tiger Swallowtail flight was poor this year. Most of the sightings tallied less than ten. In comparison, last year had two records in the 200's, and other records in the 20's-50's. Lyn Lovell thought that Black Swallowtails were everywhere, finding nine and 14 of these black beauties at locations within Worcester County. Pipevine Swallowtails had a good year, as well. Spicebush Swallowtails seemed to have only an average year.

### WHITES AND SULPHURS

The whites staged an early season, with Mustard, West Virginia, and Cabbage all appearing on record early dates. The two records for Cloudless Sulphur observed by Allan Keith on June 25 and 30, are almost 1-1/2 months earlier than previous records. You would think that having arrived so early, their numbers would be grand by the fall. But, only one more sighting was made after these in September.

### COPPERS, HAIRSTREAKS, ELFINS, AND BLUES

A copper penny for every American Copper counted at Wachusett Reservoir on July 9 would earn you \$18.74. This is \$18.11 more than reported anywhere else in the state. The other coppers were either not well reported or hiding in the till. In 1998, at Draper Park in Hopedale, I noticed a number of Banded Hairstreaks that were a lighter brown color. Some of the butterflyers present thought these might be Hickory Hairstreaks. This year, a few more people got looks at these butterflies, and it was determined that some of these were Hickory. The Hopedale Hickory Hairstreaks (say that 3 times fast!) had wider post-median bands (than Banded), bordered by white, and the hw median double bars were aligned. The outer blue spot seemed to extend further than Banded. There were two base colorations of the Banded Hairstreak at this site. Some were grayish, while most others were a lighter brown. Due to the somewhat subjective nature of the field marks, the proportion of each species at this location was difficult to ascertain. The White M Hairstreak, a gorgeous butterfly to behold, was seen in a number of locations. Glassberg states in *Butterflies through Binoculars, The East*, that they are extending their range north. This year one was sighted in West Boylston at Wachusett Reservoir. The other hairstreak species didn't seem to have a particularly great year, particularly Acadian and Edwards'. The Hoary, Henry's, and Eastern Pine Elfins all put in an early appearance this year. Silvery Blues were not well reported this year, with the exception of its stronghold in Stow.

### BRUSH-FOOTED BUTTERFLIES

Brian Cassie observed a rare American Snout at Gooseberry Neck, on a record late date of September 5. This species was last seen on July 31, 1995 in Gloucester. The fritillaries had an average year, but there weren't any Atlantis reported, and Aphrodite numbers seemed to be way down. The checkerspots and crescents had an average flight. The Question Mark and Eastern Comma had normal flights, but

a Compton Tortoiseshell was pretty hard to come by. There were three late records for Milbert's Tortoiseshell in October. The last one was one month later than ever before. American Lady and Common Buckeye arrived 11 and 14 days earlier this year. Buckeyes were present in great numbers (165) during September at Westport. The "2000 Biodiversity Days" results indicated 21 towns reporting Painted Lady's and 24 reporting American Lady's. With only a handful of MBC reports of Painted Lady for the year and lots of Americans, I would guess there's some misidentification occurring. But, Brian Cassie saw one that weekend in a schoolyard and suggested that this is the time that classes raise and release them. Incidentally, there were 15,000 participants in the Biodiversity Days program statewide! This surely will raise the environmental consciousness of the public. MBC members should strongly support this yearly event. A White Admiral on Martha's Vineyard was reported to Matt Pelikan second hand. Matt has seen a few individuals showing "faint indications of the 'White Admiral' pattern" and historic island records suggested intermediate forms were common and that "White Admirals" were not scarce in the past. Hackberry Emperors had a fair year, and the more uncommon Tawny Emperors were sighted on two occasions. The pearly-eyes, browns, satyrs, ringlets, and wood-nymphs all had average flights this year. On a whale watching trip to Stellwagon Bank, Brian Cassie watched a feeding Humpback Whale swallow a fallen Monarch not 30 seconds after it hit the water. I doubt this event can account for the poor Monarch flight this year. There were 24,000 Monarchs observed in September 1999. This year, during the same time period, only 1,000 flapped and glided past the east coast of Massachusetts.

#### SKIPPERS

There seems to be some kind of warming trend going on in the Florence area. For the last three years, Tom Gagnon has managed to record the latest Silver-spotted Skipper observation. In 1998, it was September 19, the next year it was October 1, and this year it's October 12. Very few Southern Cloudywing appeared this year. The duskywings had an average flight, but Sleepy seemed a little more tired than last year. There were no reports of any from Martha's Vineyard where, last year, there were a couple reports over 10. Common Sootywing are usually not too numerous, but Barbara Walker, along with the BMBS Butterfly Institute, found 28 of them in Stow. There were no exceptional counts of European Skipper — is it just that people are getting tired of counting them? Although their numbers were down from last years banner year, Fiery Skippers made a slightly earlier appearance (by three days) this year. Cobweb Skipper counts were down, as well as Indian Skipper, which had a good flight last year. Zabulon Skippers have been on the increase in the Connecticut River valley. Total sightings for the last three years are 16, 58, and 83. This year they appeared as far north as Amherst. Brian Cassie, Richard Hildreth, and Tor Hansen were rewarded for their September coastal butterflying efforts with an Ocola Skipper. For the past five of six years, this vagrant species has been seen only once a year. Not too much can be said for the other skipper species. There were no Dion Skipper or Two-spotted Skipper records this year.

## 2000 Butterfly Records

\*=**n**ew early flight date, \*\*=**n**ew late flight date, high counts in **bold**

<b>Pipevine Swallowtail</b>					
Jul	14	Northampton	1		NY
Aug	19	Amherst	1		DMi
	22	Florence	1		TG
	27	Florence	1		TG
Sep	7	(also 9/8,11,14,21,27), Northampton	1		NY
	25	Comm Garden, Northampton	1		DMi
<b>Black Swallowtail</b>					
May	3	Northampton	1		TG
Jun	3	Mansfield (all males)	6		BC
Jul	3	Blue Hill summit, Canton	6		BC
	16	DPHOPE	4		TD,CD
	21	Florence	4		TG
Aug	5	Worcester Airport, Worcester	14		LL
	19	Halibut Point, Rockport   W Brookfield	3   9		ML,SC   LL
Sep	14	GOOS, Allen's Pond, Westport	1,4		BC,RH,AR
	14	Chilmark   Sunderland	1   2		AK   DC
Oct	20	Natick	1		LS
<b>Eastern, &amp; Canadian Tiger Swallowtail</b>					
("C" indicates reported as Canadian)					
Apr	29	* E Longmeadow	1		KP
May	3	Sunderland   E Longmeadow	1   1		DC   KP
	6	C Amherst-Turners Falls-Sunderland	1		TG
	8	C Florence	2		TG
	16	Wenham Canal, Wenham	5		FG
	26	Amherst	7		KP
Jun	4	C Mt Greylock	4		MF
	10	Hawley	70		ML,SC
	20	Cape Ann	4		DS,CT
	30	C Mt Greylock	11		TG
Jul	3	Blue Hill summit, Canton	5		BC
	16	Larkin Rec. Area, Northbridge	5		RH
Aug	5	Forest Park, Springfield	4		TG
	17	Hingham	5		DLr
	20	Florence	5		TG
Sep	6	Cape Ann	2		DS,CT
	10	E Longmeadow	1		KP
	20	Mt. Wachusett, Princeton	1		AR

<b>Spicebush Swallowtail</b>				
May	6	Beebe Woods, Falmouth	3	AR
Jun	28	BMBS	5	GH
Jul	8	Peppercorn Hill, Upton	5	TD,CD
	16	CRFAL	7	THa et al
	22	BMBS	9	GH
Aug	10	Borderland State Park, Easton	3	DLr
Sep	18	Florence	1	TG
<b>Checkered White</b>				
Sep	10	Westport (female)	1	ML,SC
<b>Mustard White</b>				
Apr	8 *	Lenox	1	RP
	16	Lenox	30	RP
May	30	Lenox	4	TFi
<b>West Virginia White</b>				
Apr	6-12 *	Sunderland	max 5	DC
	16	Mt Tom	4	RP
May	6	Amherst-Turners Falls-Sunderland	3	TG
	13	Mt Greylock	1	PW
	30	Mt Greylock	4	TFi
<b>Cabbage White</b>				
Mar	16 *	Foxboro	1	BC
Apr	29	Plum Island	24	ML,SC
May	3	Plum Island	56	RH
	6	Airport, Worcester	30	ML,SC
Jun	2	DSTOW	24	BMBS BI
	25	Arnold Arboretum, Boston	50	DR
Jul	9	Landfill, Worcester	58	ML,SC
	24	Newburyport	121	ML,SC
Aug	5	Plum Island	80	ML,SC
	17	Hingham	74	DLr
Sep	3	Airport, Worcester	130	ML,SC
	18	GOOS	247	BC
Oct	3	Plum Island	70	RH
	25	Westport	46	RH
	26	Northampton	40	TG
Nov	17	Chilmark	1	AK
<b>Clouded Sulphur</b>				
Apr	29	Millis   Plum Island	1   1	BB   ML,SC
	30	W Tisbury	80	MPe
Jun	1	Ipswich	15	FG
Jul	4	Southwick	25	ML,SC
	16	CRFAL	31	THa et al
Aug	17	Turkey Hill, Hingham   Cape Ann	4   17	DLr   DS,CT
Sep	3	Airport, Worcester	150	ML,SC
	16	BFDAM	85	ML,SC
Oct	13	Katama Plains, Edgartown	30	ML,SC
	21	Waring Field, Rockport	28	FG
Nov	4	Katama   Upton	7   1	MPe   TD

<b>Orange Sulphur</b>			
Apr	20	Chilmark	1 AK
May	7	Chilmark	10 AK
Jun	2	DSTOW	16 BW,BMBS BI
	17	Calahan St. Park, Framingham	20 BMOOR BI
Jul	6	Cape Ann	12 DS,CT
	15	MV	50 AK
Aug	2	Cape Ann	20 DS,CT
	21	Cape Ann	48 DS,CT
Sep	3	Airport, Worcester	70 ML,SC
	9	Westport   Katama	101   300 BC et al   AK
	22	Westport	926 BC,RH
Oct	12,20	Westport	331, 352 RH
	25	Westport   Katama	152   ~250 RH   MPe
Nov	4	Katama	~80 MPe
	28	Tisbury   Katama	3   3 AK   AK
<b>Cloudless Sulphur</b>			
Jun	25,30 *	Chilmark	1 AK
Sep	22	Chatham	1 RP
<b>Harvester</b>			
Jun	17	Grafton	1 BMBS BI
Jul	7	Amherst	1 DMi
Sep	3	Peppercorn Hill, Upton   Hadley	1   1 TD,CD   DC
<b>American Copper</b>			
Apr	15	Wellfleet	1 JS
May	14	Milford	18 RH
	16	Wenham Canal, Wenham	24 FG
Jul	9	Wachusett Reservoir, W Boylston	1874 BC,MP,LL
	16	CRFAL	30 ToHa,
Aug	31	Wachusett Reservoir, W Boylston	10 SBa
Sep	6	Oak Bluffs	60 MPe
	10	GOOS	63 ML,SC
Oct	25	Katama	~5 MPe
Nov	4	Katama	2 MPe
<b>Bronze Copper</b>			
Jul	9	Sudbury	1 EN
<b>Bog Copper</b>			
Jun	28	Cape Ann	9 DS,CT
Jul	3,6,13	Cape Ann	max 10 DS,CT
<b>Coral Hairstreak</b>			
Jul	14	(during past week) WELLF   CRFAL	1   3 JS   AR
	22	Truro	9 AR
	29	Petersham	✓ DSm
<b>Acadian Hairstreak</b>			
Jul	5	Woburn	2 RL
	13	Florence	1 TG

<b>Edwards' Hairstreak</b>					
Jul	2	E Longmeadow	1	KP	
	5	Woburn	5	RL	
	8	Tisbury   W Tisbury	3   10	AK   AK	
	16	Holliston   DPHOPE	1   2	RH   TD,CD	
<b>Banded Hairstreak</b>					
Jun	23	Royalston	1	CK	
	30	Woburn	5	MR	
Jul	5	Woburn   Cape Ann   Natick	5   4   1	RL   DS,CT   ES	
	10	Milford	9	RH	
	16	DPHOPE   Upton	77   6	TD,CD   TD,CD	
	21	DPHOPE	8	RH	
	22	Evens Field, Provincetown	3	AR,THa	
	22	Mt Holyoke   Upton   BMBS	1   4   7	TG   TD,CD   GH	
	29	Milford   DPHOPE	8   39	BB et al   TD,CD	
Aug	17	CRGRO	2	FG,SS	
<b>Hickory Hairstreak</b>					
Jul	10	Milford	2	RH	
	16	Forest Park, Springfield	2	TG	
	20	Milford   Northampton	1   1	RH   NY	
	21,24	DPHOPE (see summary)	>2	RH	
	23	DPHOPE (see summary)	1-2	TD,CD,BC	
Aug	5 **	Foxboro	1	BC	
<b>Striped Hairstreak</b>					
Jul	1	E Longmeadow	3	KP	
	10	Milford	11	RH	
	23	DPHOPE	4	TD,CD,BC	
	30	Holliston	4	RH	
Aug	17	Holliston	4	RH	
	25	Cape Ann	1	DS,CT	
<b>Southern Hairstreak</b>					
Jun	29,30	Woburn	1	MR	
Jul	13	Florence	1	TG	
	16	DPHOPE   Upton	2   1	TD,CD	
<b>Brown Elfin</b>					
Apr	2	Cape Ann   Truro	1   1	DS,CT   BN	
	8	Pamet, Truro	12	BN	
	30	Topsfield   MV	2   9	FG   MPe	
May	7	Sherborn	5	RH	
	25	BMBS	4	GH	
	26	Mt Everett, Washington   BMBS	1   3	PW   GH	
<b>Hoary Elfin</b>					
Apr	13 *	MV	2	MPe,VL	
	20	Edgartown, Oak Bluffs	3	MPe	
	30	State Forest, MV	4	MPe	
May	14	Pamet, Truro	6	BN	
<b>Frosted Elfin</b>					
May	6	Amherst-Turners Falls-Sunderland	6	TG	
	7	Sherborn	3	RH	

	14	Westfield	5	TG
	23	Katama	2	MPe,VL
	28	BMBS	1	GH,DPr
	30	Westfield	2	TG
		<b>Henry's Elfin</b>		
Apr	15 *	IRWS	1	FG,DMa
May	2	Holliston	2	RH
	3	IRWS	2	FG
	7	Pilgrim Heights, Provincetown	5	AR
	16	BMBS	1	GH
		<b>Eastern Pine Elfin</b>		
Apr	2 *	Topsfield	1	FG
	29	Amherst   New Salem   E Longmeadow	14   4   6	TG   TG   KP
May	7	Sherborn	11	RH
	8	Royalston	15	CK
	14	Amherst	7	TG
Jun	4	Upton	10	TD,CD
	28	Florence	1	TG
		<b>Juniper Hairstreak</b>		
Apr	29 *	Norfolk	3	BB
May	6	Oak Bluffs	27	MPe
	9	Amherst	12	DC
	14	Amherst	47	TG
Aug	5	Norfolk	5	BB
	6	Amherst	20	DMi,TG
	17	Oak Bluffs	few	MPe
		<b>Hessel's Hairstreak</b>		
May	15	Ponkapoag bog, Canton	2	TD,CD
		<b>White M Hairstreak</b>		
May	9	Florence	1	TG
Jul	9	Wachusett Res., W Boylston	1	BC,MPo
	14	CRFAL	1	AR et al
	23	DPHOPE	1	TD,CD,BC
Aug	16	Cape Cod Canal, Bourne	1	JT
	17	Mansfield	1	RH
	22	Milford	2	RH
Sep	early	Holliston	1	J Pierce fide BB
Oct	1	Waring Field, Rockport	1	FG
		<b>Gray Hairstreak</b>		
Apr	29	Norfolk	3	BB
May	6	Norfolk	9	BB
Jul	14	CRFAL	8	AR
Aug	5	Worcester Airport, Worcester	2	LL
Sep	9	Westport	2	BC et al
Oct	20	Allen's Pond, Westport	1	RH
	21	Waring Field, Rockport	1	FG

		<b>Early Hairstreak</b>		
May	30	Mt Greylock	6	TFi
Jun	4	Mt Greylock	1	TG
	4	Mt Greylock	1	MF
		<b>Eastern Tailed-Blue</b>		
Apr	20 *	Cape Ann	1	DS,CT
	29	Sunderland   Norfolk	3   16	DC   BB
May	7	Oxbow NWR	30	ML,SC
	18	Falmouth, Falmouth	8	AR
Jul	5	Woburn	17	RL
	8	W Tisbury	10	AK
	20	Milford	9	RH
Aug	6	Airport, Worcester	15	SBa
	17	Turkey Hill, Hingham	16	DLr
	18	Milford	19	RH
	26	MBNEW	17	FG
Oct	3	Cape Ann	7	DS,CT
Oct	21	Waring Field, Rockport	2	FG
		<b>Spring Azure (spp)</b>		
Mar	2	Natick	6	ES
Apr	2	BMOOR, Natick (4L,1M)	16	BB
	14	Larkin Rec Area, Northbridge	17	RH
	15	Mansfield	21	RH
	30	MV	40	MPe
May	3	IRWS (M,V)	41	FG
	16	BMBS   Mansfield	33   13	GH   RH
	16	Wenham Canal, Wenham	36	FG
	16	Cape Ann   E Longmeadow	18   23	DS,CT   KP
	26	IRWS	44	FG
Jun	2	DSTOW	10	BW,BMBS BI
Jul	8	Fowl Meadows, Milton	14	EN
	9	Landfill, Worcester	18	ML,SC
	20	Sherborn	9	RH
Aug	13	BFDAM	7	ML,SC
	28	Cape Ann	1	DS,CT
Oct	2	Sunderland	1	DC
		<b>Silvery Blue</b>		
May	4 *	Larkin Rec Area, Northbridge	1	RH
	14	Amherst	4	TG
	27	DSTOW	65	BW
	30	Lenox	6	TFi
Jun	2	DSTOW	118	BMBS BI
	4	DSTOW	6	ML,SC
		<b>American Snout</b>		
Sep	5 **	GOOS, Westport	1	BC
		<b>Variegated Fritillary</b>		
May	27	Mt Greylock	1	TFi
Jun	13	Cape Ann	2	DS,CT
Jul	~14	Brewster	3	JS

Aug 5	Forest Park, Springfield	2	TG
24	Clinton	3	BW
Sep 10	Amherst	2	DMi
18,19,27	Comm garden, Northampton	2	TG
22	Westport	2	BC,RH
Oct 11	Cape Ann	2	DS,CT
20	Westport	4	RH
Nov 21	World's End, Hingham	1	DLr,WPeterson
<b>Great Spangled Fritillary</b>			
Jun 20	Florence	1	TG
25	Royalston	5	CK
Jul 5	Woburn	4	RL
11	BMBS	5	GH
19	Charlton	5	RH
22	BMBS	40	GH
Aug 15	Florence	10	TG
19	W Brookfield	19	LL
26	MBNEW	27	FG
Sep 18	Comm garden, Northampton	4	TG
18	Milford   Holliston	3   1	RH   RH
<b>Aphrodite Fritillary</b>			
Jun 10	Hawley	1	ML,SC
25	Royalston   Woburn   BFDAM	3   1   1	CK   MR   ML,SC
Jul 20	BMBS	2	GH
Aug 19	Rutland   W Brookfield	1   3	ES   LL
Sep 9	Upton	3	TD,CD
17	E Longmeadow	1	KP
<b>Silver-bordered Fritillary</b>			
May 26	Cape Ann	7	DS,CT
Jun 1	Ipswich	72	FG
20	Cape Ann	11	DS,CT
23	Evens Field, Provincetown	6	AR
Aug 9	Cape Ann	22	DS,CT
Sep 6,17	Cape Ann	51,63	DS,CT
9	Upton	20	TD,CD
Oct 3	Waring Field, Rockport	9	FG,DS
12 **	Cape Ann	1	DS,CT
<b>Meadow Fritillary</b>			
May 7,8,9	Williamstown	max 2	PW
8	Royalston	2	CK
13	Mt Greylock	2	PW
Jul 1	Sheffield	1	ML,SC
<b>Harris' Checkerspot</b>			
May 26	BMBS	2	GH
Jun 18	BMBS   MBNEW	1   14	GH   SS et al
25	Royalston	12	CK

<b>Pearl Crescent</b>				
May	6 *	Norfolk	1	BB
	16	Wenham Canal, Wenham	32	FG
	26	CRFAL   Milford	45   65	AR   BB
Jun	4	Upton   BMBS	224   27	TD,CD   GH,BB
	4	North Common Meadow , Petersham	75	EN
	25	BFDAM	80	ML,SC
Jul	23	Cumberland Farms, Westborough	26	TD,CD
Aug	4,11	CRFAL	50,60	AR
	18	Milford	50	RH
	29	Mary Dunn Pond, Hyannis	30	AR
Sep	17	Cape Ann	6	DS,CT
Oct	3	Wareing Field, Rockport	2	FG,DS
<b>Baltimore Checkerspot</b>				
Jun	25	W Newbury	205	FG
	28	Cape Ann	2	DS,CT
Jul	2	Turkey Hill, Hingham	1000	DLr
	13	CRFAL   DWWS	1   2	AR   DF
<b>Question Mark</b>				
Apr	10	Falmouth	1	AR
May	31	Cape Ann	2	DS,CT
Jun	17	Grafton	2	BMBS BI
Aug	5	Forest Park, Springfield	2	TG
Sep	27	Westport	7	RH
Oct	14	GOOS   Gay Head Area	18   18	BC   ML,SC
	20	Westport	20	RH
Nov	2	Northampton	1	TG
<b>Eastern Comma</b>				
Mar	9 *	IRWS   BMBS	1   1	FG   BW
	23	IRWS	6	FG
Apr	1	IRWS	12	FG
May	4	Larkin Rec Area, Northbridge	4	RH
	13	Middleboro	1	KHo
Jul	16	Larkin Rec Area, Northbridge	5	RH
Aug	11	Uxbridge	2	RH
Sep	3	Hadley	1	DC
Oct	1	Uxbridge	2	RH
Nov	7	IRWS	1	FG
<b>Compton Tortoiseshell</b>				
Mar	8 *	IRWS	1	FG
	9	BMBS	1	GH
Apr	8	Uxbridge   Westwood	1   1	RH   EN
May	7	Bolton	1	ML,SC
Aug	28	DWWS	1	DF,DLu
<b>Mourning Cloak</b>				
Mar	2	Provincetown	1	JS
	9,23	Cape Ann	5,7	DS,CT
	25	Dunback Meadows, Lexington	5	MR
Apr	1	IRWS	15	FG

	15	IRWS		15	FG,DMa
Jun	25	BFDAM		7	ML,SC
Aug	17	Mt Everett		2	PW
Sep	22	Westport		34	BC,RH
	23	Westport	50		BC,SBa,MC,GH,BW,MM
	27	Chilmark   Cape Ann   Westport	8   4   40		AK   DS,CT   RH
	28	Katama	~15		MPe
Oct	12	Westport   Northampton	21   5		RH   TG
	14	GOOS   Gay Head area	14   17		BC   ML,SC
	20	Westport	9		RH
Nov	12	Belmont	1		AM
<b>Milbert's Tortoiseshell</b>					
Apr	15	Northampton	1		GLEbaron, MassBird
Jun	28	Mt Grelock	2		TM
Aug	4	Williamstown   Sunderland	1   1		PW   DC
Oct	21	Northampton   Petersham	1   1		TG   DS <sub>m</sub>
	27	** Tower Hill, Boylston	1		KHa
<b>American Lady</b>					
Apr	1	* Holliston	1		RH
May	5	Newbury	3		SS
	7	MBNEW	6		FG
	14	Pamet, Truro   Cape Cod	28   15		BN   BN
	14	Race Point, Provincetown	lots		SP
	16	Wenham Canal, Wenham	53		FG
Jun	17	Grafton	5		BMBS BI
Jul	13	CRFAL	10		AR
Aug	8	Nelson's Island, Newbury   Milford	2   4		DLr   RH
	22	CRGRO   Milford	1   5		FG   RH
Sep	19	Cape Ann   Cape Pogue, MV	49   8		DS,CT   DS <sub>m</sub>
	27	Westport   Cape Ann	42   19		RH   DS,CT
	30	GOOS	41		BC,BB,WBosse
Oct	12,25	Westport	37,14		RH
	25	Woods Hole	3		AR
Nov	17	Worcester	1		BW
<b>Painted Lady</b>					
May	9	Woods Hole	1		AR
	28	Milford	5		BMOOR BI
Jul	14	Natick   Stelwagon Bank	1   1		ES   BC
Aug	8	Middleboro	1		KHo
Sep	29	S Dartmouth Area, Westport	6		BC
Oct	12,25	GOOS	2,1		RH
	15	Chappaquiddick, MV	2		ML,SC

<b>Red Admiral</b>			
Apr	1	Falmouth   Woods Hole	1   1 AR   AR
May	7	Foxboro	1 MC
	16	Mansfield	4 RH
Jun	25	Arnold Arboretum, Boston	5 DR
Jul	16	Larkin Rec Area, Northbridge	17 RH
Aug	5	Forest Park, Springfield	6 TG
Sep	22	Westport	13 BC,RH
	28	Katama	~15 MPe
Oct	14	Gay Head area	51 ML,SC
	20	Westport	4 RH
Nov	17	Woods Hole	1 AR
<b>Common Buckeye</b>			
May	16 *	Wenham Canal, Wenham   Worcester	1   1 FG   BW
	23	BMBS	1 JM,DPr
Jun	20,21,27	Chilmark	1,1,1 AK
Jul	~14	Eastham	4 JS
Aug	8	Milford	8 RH
	10	Borderland State Park, Easton	6 DLr
	26	Uxbridge	5 TD,CD et al
Sep	14	GOOS	40 BC,RH,AR
	18	Allen's Pond, GOOS, Westport	14,51 BC
	22	Westport	165 BC,RH
	27	Westport	54 RH
Oct	20	Edgartown   Westport	2   13 AK   RH
Nov	4	Katama (mating pair)	4 MPe
<b>White Admiral</b>			
Jun	10	Florence	1 TG
	24	IRWS	1 BS
	25	BFDAM	2 ML,SC
Aug	4	Sunderland	1 DMi
	25	Amherst	1 DMi
Sep	21	MV (probable - 3rd hand report)	1 MPe
<b>Red-spotted Purple</b>			
May	16	Wenham Canal, Wenham	1 FG
Jun	18	MBNEW	4 SS et al
	25	BFDAM	5 ML,SC
Aug	17	IRWS	3 FG,SS
Sep	13	Goat's Peak Res. Mt Tom	2 TG
	18	Edgartown	2 AK
<b>Viceroy</b>			
May	26	Cape Ann	1 DS,CT
Jun	4	BMBS	6 GH,BB
	17	Grafton	2 DPr,BMBS BI
	18	MBNEW	3 SS et al
Jul	20	Sherborn   Milford	3   1 RH   RH
	29	DSTOW   Petersham	4   ✓ ML,SC   DSm
Aug	5	Worcester Airport, Worcester	6 LL
	8	Milford	7 RH

	26	Uxbridge   MBNEW	6   9	TD, CD, et al   FG
Sep	10	W Newbury   Easton	4   2	FG   BC
Oct	1	Sterling	1	ML, SC
<b>Hackberry Emperor</b>				
Jul	8	Forest Park, Springfield	2	BB, BTyning
Aug	5	Forest Park, Springfield	2	TG
	30	Springfield	1	DC
Sep	10 **	Springfield	2	DC
	10 **	Forest Park, Springfield (one was ovipos)	4	TG
<b>Tawny Emperor</b>				
Jul	22	Mt Holyoke	2	TG
Aug	5	Forest Park, Springfield	3	TG, MBC
<b>Northern Pearly-Eye</b>				
Jun	23	Royalston	3	CK
Jul	14	Royalston	3	CK
	22	Tom Swamp, Petersham	1	ML, SC
Aug	21	Larkin Rec Area, Northbridge	2	RH
<b>Eyed Brown</b>				
Jul	1	IRWS	1	FG, DMa
	9	Sudbury	10	EN
	20	Sherborn	8	RH
Aug	3	Falmouth	4	AR
	4	Williamstown	1	PW
	24	Holliston	1	RH
<b>Appalachian Brown</b>				
Jun	23	BMBS	1	DPr
Jul	8	Fowl Meadows, Milton	2	EN
	16	Falmouth   CRFAL	3   7	MK   THa
	29	power lines, Milford	10	BB et al
Sep	4	Norfolk	1	BC
<b>Little Wood-Satyr</b>				
May	13	Middleboro	1	KHo
Jun	3	Hale Reservation, Westwood   IRWS	80   40	EN   FG
	4	CRGRO   BMBS	31   47	FG   GH, BB
	10	Dighton Rock, Berkley	30	EN
	11	IRWS	51	DMa, WTatro
	17	Grafton	30	DPr, BMBS BI
	25	BFDAM   Arnold Arboretum, Boston	18   10	ML, SC   DR
Jul	12	Cape Ann	19	DS, CT
	16	Larkin Rec Area, Northbridge	16	RH
Aug	22	CRGRO	1	FG

<b>Common Ringlet</b>			
May	16	Wenham Canal, Wenham	2 FG
	26	IRWS	61 FG
	30	Lenox	100 TFi
Jun	2	DSTOW	80 BW,BMBS BI
	3	Callahan State Park, Framingham   IRWS90	50 BB   FG
	4	North Common Meadow, Petersham	90 EN
	17	IRWS	34 DMa
Aug	11	CRFAL   Uxbridge	12   30 AR   RH
	31	Wachusett Reservoir, W Boylston	41 SBa
Sep	7	TTR's Appleton Farms, Hamilton	19 FG
	9	Upton	4 TD,CD
<b>Common Wood-Nymph</b>			
Jul	7	Edgartown	2 AK
	16	CRFAL   DPHOPE	57   206 THa et al   TD,CD
	24	Chappaquidick,	25 AK
Aug	4,9	Cape Ann	52,46 DS,CT
	8	Nelson's Island, Newbury	30 DLr
	13	BFDAM	25 ML,SC
	18,28	Cape Ann	35,24 DS,CT
Sep	4	Cape Ann	9 DS,CT
	18	Airport, Worcester	1 SBa
<b>Monarch</b>			
Apr	29	Chilmark	1 VL
Jun	10	Hawley	17 ML,SC
Jul	14	CRFAL	5 AR
Aug	5	Forest Park, Springfield	12 TG
Aug	22	Chappaquidick	10 AK
Sep	16	Edgartown   BFDAM	5   12 AK   ML,SC
	18	Cape Ann	80 DS,CT
	22	Westport	445 BC,RH
	22	Chilmark   Cape Ann	20   12 AK   DS,CT
	27	Westport	124 RH
	30	GOOS, Westport	94 BC, BB, SBo, WBosse
Oct	12	Cape Ann   Westport	32   51 DS,CT   RH
	14	N Monomoy	26 BN
	14	GOOS, Westport	52 BC
	14	Gay Head area, Chappaquidick	31,33 ML,SC
	26	Northampton	7 TG
Nov	9	Chilmark	1 AK
<b>Silver-spotted Skipper</b>			
May	23	Florence	1 TG
Jun	18	MBNEW	3 SS et al
Jul	1	IRWS	9 FG,DMa
	9	Wachusett Res, W Boylston	112 BC,MPo,LL
	16	DPHOPE	13 TD,CD
	21	Florence   BMBS	33   10 TG   GH
	23	Uxbridge	18 RH
Aug	6	Sterling	37 TD,CD
	19	W Brookfield   IRWS	7   2 LL   FG,SS

Oct	12	**	Florence	1	TG
			<b>Hoary Edge</b>		
Jun	10		Sunderland	1	TG
	25		Woburn	4	MR
Jul	5		Woburn	8	RL
	23		DPHOPE	2	TD,CD,BC
Aug	5	**	Norfolk	1	BB
			<b>Southern Cloudywing</b>		
Jun	8		Florence	1	TG
	18		BMBS	1	GH
Jul	4		Southwick	1	ML,SC
	8		W Tisbury	1	AK
			<b>Northern Cloudywing</b>		
May	21		Cape Ann	1	DS,CT
Jun	4		BMBS	26	GH,BB
	17		Grafton	5	DPr,BMBS BI
	25		Royalston	2	CK
			<b>Dreamy Duskywing</b>		
Apr	16	*	Westfield	2	TG
May	7		Oxbow NWR	6	ML,SC
	16		BMBS	18	GH
	26		IRWS	5	FG
Jun	4		Upton	16	TD,CD
	17		Dauphinais Park, Grafton	6	DPr
	24		Mt Holyoke	1	TG
			<b>Sleepy Duskywing</b>		
May	16		Mansfield	1	RH
	26		Power Line, Milford	1	BB
	27		DSTOW	3	BW
Jun	8		Florence	1	TG
			<b>Juvenal's Duskywing</b>		
Apr	13	*	MV	1	MPe,VL
	30		Sherborn   MV	9   7	RH   MPe
May	6		BMBS	30	JM,DPr
	7		MBNEW	51	FG
	9		Chilmark	30	AK
	16		Mansfield	36	RH
Jun	2		DSTOW	4	BW,BMBS BI
	4		Upton	11	TD,CD
	11		Harvard Forest, Petersham	12	ML,SC
	23		BMBS	1	DPr
			<b>Horace's Duskywing</b>		
May	27		MV (state Forest)	1	MPe
Jul	23		DPHOPE   Uxbridge	1   1	TD,CD,BC   RH
Aug	5		Woburn	1	BWr
	5		Worcester Airport, Worcester	2	LL
	19		W Brookfield	3	LL
Sep	3		Easton	1	BC

<b>Wild Indigo Duskywing</b>			
Apr	16 *	Westfield	1 TG
May	7	MBNEW	6 FG
Jun	2	DSTOW	24 BW,BMBS BI
	8	IRWS	7 AR
Aug	4	CRFAL	27 AR
	17	Mansfield	6 RH
	24	West Hill Dam, Uxbridge	3 BB
<b>Common Sootywing</b>			
May	14	E Longmeadow	1 KP
Jun	2	DSTOW	28 BW,BMBS BI
Jul	22	Comm garden, Northampton	6 TG
Aug	5	Forest Park, Springfield	5 TG
	6	Airport, Worcester	3 SBa
	8	Milford   Middleboro	2   1 RH   KHo
Sep	9	Northbridge	1 ML,SC
<b>Arctic Skipper</b>			
May	30	BMBS	2 GH
Jun	2	DSTOW	2 BW,BMBS BI
	4	Windsor   Upton	4   1 TG   TD,CD
	10	Royalston	1 CK
	25	Paxton	1 SBa
<b>Least Skipper</b>			
Jun	20	CRGRO	2 FG
	25	BFDAM	11 ML,SC
Aug	5	Forest Park, Springfield	13 TG
	18	Milford	12 RH
	21	Larkin Rec Area, Northbridge	23 RH
Sep	7	Chilmark   Hamilton	15   19 AK   FG
Oct	3	Cape Ann	1 DS,CT
<b>European Skipper</b>			
Jun	11	IRWS	11 DMa,W Tatro
	17	Grafton	100 DPr,BMBS BI
	25	W Newbury	300 FG
	28	Cape Ann	116 DS,CT
Jul	8	Windsor	44 ML,SC
	11	BMBS   Mansfield	5   5 GH   RH
	28	Cape Ann	1 DS,CT
Aug	12	Northbridge	2 ML,SC
<b>Fiery Skipper</b>			
Jul	12 *	Wenham Canal, Wenham (m)	1 FG
Aug	28,30	DWWS (2m),(2m,2f)	2, 4 DF,DLu
Sep	6	Quabbin gate 35, Petersham	1 DSm
	14	DWWS (1m)	1 DF,DLu
	15	DWWS (1f)	1 DF
	22	DWWS	1 DF
Oct	15	Northampton	1 DC
	21	Waring Field, Rockport	1 FG
	24	Sunderland	1 DC

<b>Leonard's Skipper</b>					
Aug	15	Leverett	1	DC	
	26	Uxbridge	4	TD,CD, et al	
Sep	1	Edgartown	5	AK	
	6	Oak Bluffs	40+	MPe	
	9	CRGRO   Upton	2   5	FG   TD,CD	
	19	Cape Pogue, MV	4	DSm	
	22	Northampton	1	TG	
<b>Cobweb Skipper</b>					
May	7	Sherborn	1	RH	
	14	Pamet, Truro	1	BN	
	14	Natick   BMBS	1   4	ES   BW,RW	
	16	BMBS	16	GH	
	20	Sherborn	5	BB	
	29	Norfolk Field	1	BB	
<b>Indian Skipper</b>					
May	17 *	Sherborn	1	RH	
	31	W Newbury	5	FG	
Jun	4	Upton   BMBS	3   3	TD,CD   GH,BB	
	4	North Common Meadow, Petersham	4	EN	
Jul	9 **	N Worc 4th July Cnt - Princeton	1	TD,CD	
<b>Peck's Skipper</b>					
May	23	Holliston   Oak Bluffs	1   1	RH   MPe,VL	
Jun	1	Ipswich	33	FG	
	23	Royalston	20	CK	
Jul	14	Royalston	20	CK	
Aug	11	Essex County	14	FG	
	17	Boxford	12	FG,SS	
Sep	7	TTR's Appleton Farms, Hamilton	36	FG	
Oct	1	Waring Field, Rockport	1	FG	
<b>Tawny-edged Skipper</b>					
May	18	E Longmeadow	1	KP	
Jun	10	Hale Reservation, Westwood	4	EN	
Aug	10	Borderland State Park, Easton	10	DLr	
	16-17	Oak Bluffs	6	MPe	
	28	DWWS	5	DF,DLu	
Sep	10	Cherryhill Reservoir, W Newbury	1	FG	
<b>Crossline Skipper</b>					
Jun	30	Woburn	1	MR	
Jul	8	W Tisbury	6	AK	
	19	Charlton	4	RH	
	21	DPHOPE	5	RH	
Aug	8	E Longmeadow   Milford	1   5	KP   RH	
	22	Milford   Northbridge	2   2	RH   RH	
	25 **	Sherborn	2	RH	

<b>Long Dash</b>			
Jun	3	Upton   Framingham	1   2 TD,CD   BB
	11	IRWS	11 DMA,WTatro
	18	MBNEW	11 SS et al
Jul	11	Mansfield	1 RH
<b>Northern Broken-Dash</b>			
Jun	23	Royalston	1 CK
Jul	16	DPHOPE	11 TD,CD
	22	BMBS	10 GH
Aug	17	Hingham	7 DLr
Sep	9	CRGRO	1 FG
<b>Little Glassywing</b>			
Jun	10	Hale Reservation, Westwood	2 EN
Jul	5	Woburn	5 RL
Aug	6	E Longmeadow	4 KP
	19	Wenham Canal, Wenham	2 FG,SS
	22	Milford	1 RH
<b>Delaware Skipper</b>			
Jun	1	Mt Meadow Preserve, Williamstown	2 PW
	4	North Common Meadow, Petersham	2 EN
Jul	5	Woburn	6 RL
	10	Cape Ann	2 DS,CT
	16	DPHOPE	7 TD,CD
	20	BMBS	5 GH
	29	Petersham	1 DSm
<b>Mulberry Wing</b>			
Jul	20	Sherborn   Milford	2   2 RH   RH
	29	Southboro Rd, Upton	2 TD
Aug	10	Borderland State Park, Easton	2 DLr
<b>Hobomok Skipper</b>			
May	16 *	E Longmeadow	1 KP
	26	Amherst	6 KP
Jun	8	Florence	5 TG
	19	Cape Ann	8 DS,CT
	25	Arnold Arboretum, Boston	2 DR
	25	1 Pochahontas, Royalston	3 CK
Jul	8,10	Cape Ann	2,1 DS,CT
<b>Zabulon Skipper</b>			
Aug	5	Forest Park, Springfield	2 TG
	19	Forest Park, Springfield (1m)	3 TG
	19	Longmeadow (42m,17f)	59 TG
	20	Florence (m)	1 TG
	21	Florence (f)	1 TG
	22,27	Florence (m,m)	1 TG
	27	E Longmeadow   Amherst	1   1 KP   DC
Sep	3	E Longmeadow   Amherst (m)	3   1 KP   DMi
	10	Longmeadow, Springfield	1,1 DC
	10	Northampton (m)	1 NY
	10	Forest Park, Springfield (m)	1 TG

	17	E Longmeadow	3	KP
	18	Comm garden, Northampton (m)	1	TG
	27 **	Amherst (m,f)	2	DMi
		<b>Broad-winged Skipper</b>		
Jul	12	Wenham Canal, Wenham	15	FG
	22	BMBS	8	GH
Aug	3	Cape Ann	8	DS,CT
	8	Edgartown	5	AK
	13	BMBS	4	BW,RW
	22	Milford	1	RH
		<b>Black Dash</b>		
Jun	25	BFDAM	1	ML,SC
Jul	2	Greenfield	1	TG
	20	Sherborn   Milford	4   4	RH   RH
Aug	3	Cape Ann	4	DS,CT
		<b>Dun Skipper</b>		
Jul	5	Woburn	4	RL
	15	Tisbury	8	AK
	20	BMBS	11	GH
	29	Milford   DPHOPE	20   19	BB et al   TD,CD
Aug	6	Sterling, W Boylston   MBNEW	21,4   9	TD,CD   FG
	19	W Brookfield	5	LL
Sep	10	Easton	1	BC
		<b>Dusted Skipper</b>		
May	26	BMBS	4	GH
Jun	2	DSTOW	5	BW,BMBS BI
	4	BMBS	9	GH,BB
	10	Hale Reservation, Westwood	11	EN
		<b>Pepper and Salt Skipper</b>		
May	28	BMBS	1	GH,DPr
Jun	2	DSTOW	1	BW,BMBS BI
	4	Tom Swamp, Petersham	2	EN
	4	Mt Greylock   BMBS	1   3	MF   GH,BB
	30	Mt Greylock	1	TG
		<b>Common Roadside-Skipper</b>		
May	2 *	Sunderland	1	DC
	31	Mt Holyoke, Hadley	2	DC
Jun	10	Sunderland	2	TG
	24	Mt Holyoke	1	TG
		<b>Ocola Skipper</b>		
Sep	9 *	Truro	1	THa
	22	Allen's Pond, Westport	1	RH
	29	GOOS, Westport	1	BC

## Glory and Splendor, A Century Later

*Madeline Champagne*

As I pull open a shallow drawer filled with small cases of butterfly specimens, I gasp out loud in amazement at the colors and patterns. And as I examine each case, and become familiar with the style of handwriting, I wonder if the person who captured the butterfly, or the person who inscribed the data on the case, ever imagined that 100 years later someone else might be studying these cases.

For over two years I have had the privilege of cataloging the Denton Brothers collection of butterflies, moths, and a small number of other insects, at the Wellesley Historical Society. As was accepted in that time, the Denton brothers collected natural objects, including shells and fish as well as insects, as a profession. There are about 1500 specimens in this collection, from all over the world. I work there most Thursday evenings, and have cataloged over 500 specimens so far. Last spring Sharon Stichter also worked on the collection, and will be working on it again this year.

Cataloging a specimen involves a number of tasks: assigning the accession number and writing it on the case; recording what is written on the case (the name, the collector, date, site, town, state, country); checking reference books to verify the name or identifying changes in the name or trying to identify the specimen if it has not been named; measuring the case and the specimen, evaluating the condition of the case and the specimen, and cleaning the case. Finally I record the location of the case in the collection.

Then comes the hardest and most enjoyable task — describing the specimen. For this I need to study the patterns and colors, and this is where my appreciation grows. A quick look at a butterfly or moth does not do it justice — in scrutiny every color and every pattern is divulged to me. Subtle patterns become as special as the bold ones; soft colors become as special as the bright ones; simple patterns become as special as the intricate ones; the soft sheen on a wing is as special as a bright iridescence. I marvel, and I revel, for each one wears its own glory, each one has its own splendor.

## Migration

*Tor Hansen*

The greening of Cape Cod is making a tremendous difference for actively supporting migratory fauna, but at the same time great care to preserve and maintain remnant butterfly habitats wherever sylvan environs enhance productivity is essential. For centuries since its creation and the melting of the Pleistocene ice, certain species once again streamed northward to increase and find suitable habitat, following age-old patterns of growth and adaptation as best they could to locate and flourish in familiar mosaics or pioneer the undiscovered country.

Why migration is so compelling for a small handful of species is related to specific affinity to secure food sources for their larval offspring and nectaring oases for adults, and has evolved in some as a means to overcome climatic limitations and temperature extremes. So hard to say with realistic surety is that butterflies leave the security of their original mosaic, a cornucopia imbued with plentiful reservoir of diverse nectar wells, because they become bored or tired of the same old place.

For example, Baltimore Checkerspot born in the Twinefield mosaic in North Truro have at their disposal plenty of lanceolate plantain to feed their larvae and sufficient queen Anne's Lace and Yarrow to nectar all the fledglings. But for what reason do so many adults go vanguarding far afield into the undiscovered country via the hazardous Atlantic shoreline? (Hansen: "Of Mystery and Migration," *The Cape Naturalist*. Cape Cod Museum of Natural History, 1993-94.) In successive years I found, first in late June '90 with thick fog lifting, some 45 Baltimores dashed by the turbulent waves strewn along two miles of Atlantic Ocean shoreline (5 were feebly alive), and again one year later along the same Coast Guard Beach on June 23, '91 some 5 shipwrecked Baltimores cast up at the tideline with several other species including Red Admiral, Laurel Sphinx Moth and Cabbage White. Presuming they may have flown away from a nearby mosaic, my inland search led me to discover a thriving mosaic at Twinefield, still annually home to 400-500 Baltimore larvae, and the only Baltimore mosaic on the outer cape from Provincetown to Brewster some 30 miles southwest.

Natural dispersal functions much like osmosis across a permeable membrane at the cellular level and may be a built-in means

to reduce burdensome concentrations of larvae and adults known to skyrocket, to alleviate potential exhaustion of the local food sources, and to decrease attacks by alerted predators that could doom the entire breeding population.

Borne on the wing imagos seem to abandon a better common sense to remain in the horn of plenty, for example our Baltimore Checkerspot emerging in Twinefield where Milkweed, Queen Ann's Lace and Yarrow provide copious nectar. Instead they choose to vanguard their entire existence at the mercy of the clement wind, perhaps in search of some place with less adversity, few predatory threats, or more profuse nectaries, or better larval leaf, or to rebuild a distant dwindling mosaic by gene pooling. Bearers of out-bound instincts have given rise to meta-population studies that today encompass several species in addition to *Euphydryas phaeton* known to recolonize in flying far afield.

Harris' Checkerspot, *Chlosyne harrisii*, is expected on Cape, is meta-migratory, but its absence reflects a specialized life style — the larvae feed almost exclusively on Flat-topped Aster, *Aster umbellatus*, by no means found everywhere. Since they easily pass for the Pearl Crescent Fritillary, they may go unnoticed. Meta-migratory urges span both Checkerspots and Fritillaries; Edith's Checkerspot of California and the Glanville Fritillary of Europe and Great Britain both undergo seasonal migrations. In North America 30 checkerspot species exist. Each species evolves along its own migratory pathways in relation to thermo-regulation and specific food sources, with distance as small as verticle movement on mountain slopes.

The burgeoning of Baltimore mosaics has been called the most spurious and bountiful of colonial butterflies, according to Brian Cassie, referring to a brimming mosaic at Hingham. Virtually thousands arise in localized blooms, with no hungry predatory birds hovering over them, larvae feeding predominantly on lanceolate plantain, not on Turtlehead. Are happenstance matings linking new DNA, bridging isolated mosaics due to age-old patterns just seldom observed? These sudden population blooms may be attributed to migratory influx of fresh vanguard genes inherited when mating revitalizes a declining mosaic.

For that matter can the rare phenotype *Euphydryas phaeton superba* found at Twinefield be brought about by the union of local genes and distantly isolated chromatin, as a direct result of meta-migrations? Perhaps enough genetic variability within the DNA of 500 larvae can perpetuate an advancing colony in terms of genetic recombination. Yet these same localized mosaics appear to be self-sustaining year after year without observed introduction of any new breeding adults. Thus far no tagging program is in place to verify new Baltimore influx.

Apparently genetic plasticity within the Baltimore genome may provide sufficient genetic recombination to drive the mosaic for many years. We may wonder when this Twinefield mosaic will reach an end point in declining vitality, so commonly the case in lepidoptera regarding inbreeding. Annual sightings of only several Baltimores nectaring at milkweed, or adults found singly in borderline plantain at the Crane WMA, Falmouth, and at the Cape Cod Airport fringe are not followed by "spurious colonial bloom." These lone rangers may be male or females whose eggs were laid previously elsewhere. No larvae are seen, although lanceolate plantain is abundant. So much typically under-utilized habitat across Cape may be due to absence of tall grasses (*Poaceae*) obvious in established mosaics like Twinefield.

Bear in mind that most species alive today have survived huge segments of geological time, from remote origins of precursor moths in the Triassic Period (200,000,000 years ago) and forerunner butterflies, the Skippers, *Hesperiidae*, in the Jurassic Period (some 130,000,000 years ago). Accepted dating depends on a scanty but substantial fossil record of moths and later butterflies embedded in limestone, shale, and amber surviving in fossil form only for our identification. Indeed a wonder itself, given the fragile nature of soft anatomy, is how some butterflies underwent mineral replacement under the intense heat of overlying layers of various sedimentary rock in the making, as further erosion swept away and virtually erased many missing layers of would-be complete earth prehistory.

Initial species diversified as continents drifted apart with the break up of supercontinent Pangea at 130 million years ago, no doubt taking with them diverging ancestral gene pools that may explain the distant similarity of today's genera. Much species radiation into diverse niches occurred during the early Cenozoic Era in the Paleocene-Eocene Epochs some 40-60 million years ago that coincided with diversification of the angiosperms (flowering plants). Still further genetic recombination and speciation modified ancestral stock into the present day species, with striking similarity to today's fauna (fossil *Prodryas persephone* — much like *Baronia brevicordis* of Mexico) found in shale at Florissant Fossil Beds National Monument in Colorado, estimated to be buried in active volcanic ash rain 34,000,000 years ago when the climate was sub-tropical.

Testing their flexibility and resilience to the rigors of spurious orogeny (land mass upbuilding) and continental drift, enduring ancient and modern pressures of natural selection and adaptation, has no doubt profoundly influenced present day patterns of speciation and migration. Migratory patterns developed with an elasticity as North America and

South America stretched farther apart, later to be joined at last with the Costa Rica-Panama land bridge thrust into place only some four million years ago, enabling still further mixing of gene pools. New World butterflies have endured spurious volcanic eruptions and gradual changes in floral evolution, and withstood harsh climatic influences, including prolonged cooling from tropical to temperate, four Pleistocene Ice Ages and two advancing glaciers directly preparing habitat for the Cape Cod fauna.

For the migrators that accomplish amazing distances to arrive at green pastures, there must be a consummate temptation in surroundings profuse with assorted scents, lush vegetation, and hints of unlimited nectaries. Just after emerging from inverted calico porcelain-like chrysalids, a hatful of Twinefield Baltimore females mate and lay some 100 fertile eggs in each cluster on Lanceolate Plantain near the ground as they nectar leisurely for days. And suddenly many imagos vanish. Most adults leave their progeny behind to maintain their larval anchors in Twinefield without a visual hint of blueprint guidance for larvae to construct their own overwintering silken webs.

But do the migratory fly on to mate again, to start a new generation in still other fertile mosaics beyond a more familiar fringe? Should we accept what we call value judgements made by so small a mind coping without observable vocalization, or is it the same instinctual *Zugunruhe* (migratory restlessness as in birds) as found to be most effectively an overriding engine that empowers their actions, namely migratory urges fueled by secretions of synergistic hormones and, like a Monarch, taking a flight path governed by celestial bodies, keying on the sun and on earthly geological features, like archipelago islands, mountain ranges, or navigating along seashores laden with yellow Seaside Goldenrod festooning in copious profusion?

What innate behavior and gray matter is at work to promote and accomplish migration, virtually running the deceptive gauntlet, competently deciphering assorted signals, let alone perceiving the immediate world around it adorned with nourishing and warning stimuli so redolent of enticing temptations? I am reminded of a time at Horton's Camping Resort when a Spicebush Swallowtail, usually at home on the grassy knoll sipping milkweed nectar, approached a motorist's sign painted in red letters, and persisted for 30 seconds to try to locate and imbibe unsuccessfully its would be nectar!

Even though innate behavioral patterns permeate the lives of insects, many instinctual responses to stimuli must be learned in application in trial and error, often at great risk. And when a butterfly's inherited substance and imprinted models bend in applied

action, in its naivety it is unaware of unforeseen hazards of deception, and makes complete migration all the more incredible!

Separate species react differently to a hazardous maze. Black Swallowtails are non-migratory and show considerable difficulty in finding a way around a glass windbreak, where it may helplessly beat its wings to a frazzle trying to fly straight through clear window glass, whereas just after abrupt nightfall in the lowland jungle of Costa Rica, while at my desk I beheld a beautiful blue spotted brown moth fly through the open doorway and alight on my wall poster of Jesus Entering Jerusalem in sumptuous Russian iconography. I called Peter Knudsen, the chief lepidopterist, who entered the room with net in hand, but on approach the miracle moth darted out through the door and escaped in a flash before the net was in motion! So little is known about night movements of anonymous visitors.

Oases remotely familiar to the butterfly may be imprinted into an internal data bank as an internal guiding force in what is called genetic memory, and is believed by some to be passed along to the next generation, a kind of educated inheritance. The invaluable eye so essential in visually linking each organism to the external geography transfers information like a navigator reading a treasure map. In this dawning of the Age of Aquarius inconclusive research hints at underlying deposits of elemental iron in the brain ganglia and plexi of the nervous system in diverse animals ranging from whales down under, to birds and butterflies aloft in magnetic drift and steering by the stars by night. (Consult "Zugunruhe and Effects of Gonadotrophins in Coturnix Quail." D. Lehrman: Rutgers University Zoological Record.)

Just recorded this October 14, 2000, at Twinefield's glacial sandplain overrun with Bushy Honeysuckle, I witnessed something which reshaped my recent understanding of migratory habits enhancing longevity in semi-migratory Red Admirals known for their life-sustaining imbibing at streams or surface groundwater rich in minerals. With new data revealing imbibing honeysuckle sap, *Vanessa atalanta* has shown me how Tartarian Honeysuckle can no longer be regarded as a nothing shrub; in fact *Lonicera tatarica* joins the list of plants utilized to nourish butterflies presumed to migrate, relying on tappable sustaining energy.

Since few people know to where and how far Red Admirals really migrate, these new widespread oases may indeed provide much-needed energy to sustain Red Admirals and likely other anglewings hopscotching along migratory pathways, and in their sedentary dormancy down under the leaf litter (or overwintering in boxes provided by the thoughtful carpenter). Search carefully underneath overhanging

thick branches of aging honeysuckle and conserve significant stands of six or more bushes to form small protective groves that can offer respite and refuge and quaff the needy.

Focusing on the roles of sensory organs such as antennae, chemoreceptive tarsal toes, and those marvelous eyes, we come closer to understanding the riddles that enshroud the unsolved mysteries of the migratory. On a global scale the scintillating potpourri includes Monarchs, Painted Ladies, Cloudless Sulphurs, sphingids, skippers, and checkerspots that inhabit the holarctic zone or temperate regions, and neotropical denizens like the shimmering swallowtail-like, dazzling day-flying moths of the genus *Urania* are observed migrating in dispersed predictable patterns across Belize and the vast Amazonia, all no doubt influenced by solar cycles and lunar rhythms.

Does magnetite ( $\text{Fe}_3\text{O}_4$ ) permeate all butterfly brains and if so why don't all butterflies migrate? Is magnetite a chief proponent that guarantees migration as the butterfly follows a magnetic field or vector? Certain whales are known through necropsy to have minute particles of magnetite in their brain tissue alleged to assist them in charting old and not so familiar migratory pathways. As contours of land masses change over time in protracted continental drift, new geographical barriers arise, and shifting magnetic anomaly exerts a force possibly felt by whales. Here data are inconclusive. Some effective research shows speciation is influenced by changing geography, but in butterflies migration cannot be primarily controlled upon reaction to an abstract magnetic grid alone.

Lab analysis reveals magnetite present in the butterfly brain that may help the Monarch navigate along the magnetic vectors of continental terrain. We wonder if whale strandings are caused by confusion in analyzing old and new migratory "maps" imprinted in the minds of contemporary Pilot Whales and those of their precursors when negotiating the treacherous shoals of Cape Cod and the coastal profile before Cape Cod was on the map, as compounded by storm tides and high winds.

Buckeyes, Cloudless Sulphurs, and Monarchs when blown east to Chatham undergo disorientation and often flit about for a day or so quaffing their thirst at seaside oases. Familiarizing certain sylvan settings in and about town until clear skies assure their readiness to resume a lengthy flight, or leisurely riding the steady jet stream to a known destination, hopefully the energized Monarchs configure on a specific degree of arc as the sun crosses the azure sky, and reach a specific latitude with each day as the sun drops farther south and well ahead of a deep frost.

Imprinting plays an important role in butterflies but is not taught by parents, and to what extent is it important? In another amazing example of animals possessing an innate ability to navigate long migrations without parental guidance, consider Wilson's Petrel nesting on Kent Island in the Bay of Fundy, New Brunswick. Ornithologist Chuck Huntington has documented unusual seaside nesting habits as adult birds feed fish to fluffy chicks deep inside tunnels dug under conifer trees. When fully grown the chicks are abandoned by the parents who migrate south independently and leave their unrehearsed chicks to find their own way to Venezuela where they do indeed overwinter!

Word of mouth of anonymous peoples and the art of ancient traditions hint of a long-standing belief that a migrating butterfly will orient on the sun and move according to its daily arc in the sky. Thanks to innovative research involving Monarchs, Sandra Perez, Rudolf Jander, and Chip Orly Taylor (Lepidopterist Society, Annual Meeting, Yale University, 1997) show us that an innate sun clock within each Monarch recognizes landmarks, or a compass rose of sorts, that can clarify a geographical orientation and thus centers the host on its way, indeed fixing on the sun's position in the sky.

This conforms with the concept of circadian rhythms active in many migratory organisms not always in conjunction with gonad or increased hormonal activity. Since Monarchs migrate south without sex hormone stimulation when hormones are senescent, flightpath rather favors a model working through memory channels, on a nearly daily timetable. Until still more sophisticated technology is applied to fine tune the synergistic roles of the incredible eye and the internal workings of the nervous system our understanding remains nebulous. Although butterflies aloft are thought to be nearsighted, one may suspect their clear eyesight of the shifting topography below to be invaluable. However, current research shows butterflies do not have crystal-clear vision of their distant surroundings, but more definitive research is necessary to accurately define the complete capability of image resolution.

Only the Monarch completes such a mammoth journey flying southward as much as 3000 miles from as far north as Alberta, and Quebec, and northern U.S.A. all the way to remote canyons in the high sierras of Michoacan, Mexico, where they overwinter cloaking the Oyamel Firs and pines. After spending the winter in a state of semitorpor, they return to northern sites to mate and procreate a second generation along the manifold tributaries of the Mississippi River. After eclosure second generation adults fly east to arrive at Cape Cod

roughly June 1. Eggs for a third generation are laid on milkweed before the late summer bloom, and can thrive to procreate three broods per growing season on the Cape.

Nearly one dozen overwintering sites dot the California coastline where thousands gather to drape the Eucalyptus Trees, from all over the terrain west of the continental divide of the Rocky Mountains. But not all Monarchs migrate great distances, especially those in Costa Rica and Central and South America. An evolutionary sensibility is at work in tropical elevations where they stay to avoid the cold of northern latitudes.

Cape Cod is home to two species of Painted Ladies, now distinguishable as the American or Virginia Lady, *Vanessa virginiensis*, and The Painted Lady, *Vanessa cardui*, which is the more migratory of the two. After the first brood is fledged, they fly northward with the warming weather, and appear here as early as late June, well into August and September, searching for nectar and larval food plants Circium Thistle, Pearly and Sweet Everlasting, two hearty nutrient-poor soil-tolerant weeds (the latter very perishable underfoot, barely two inches high and home to minute first instars) that grow in vacant lots, grassy meadows, and seaside just above the tideline in the upper beach and back dune margins .

The counterpart *V. cardui* of the west coast occurs in such numbers as to exhaust their larval food source and undertake long migrations up the coast into Oregon and Washington as the summer advances, thought to indicate global warming. Buckeyes also exhibit migrations often heading south to Cape Cod shorelines in peak cyclical years, but their larval absence here on Cape is puzzling since its preferred Common Plaintain and figwort are found here.

A wealth of restless species migrate northward especially in the "endless summer" days of September. Visit South Cape Beach in Falmouth, in a sedgy bog on Great Flat Pond Trail where a stronghold of non-migratory, and rare on the Cape, Appalachian Brown, *Satyroides appalachia*, is found. Watch for opulent Cloudless Sulphurs, *Phoebis sennae*, among the most striking of butterflies to catch the drift up from the sub-tropical zone, along with Buckeyes found in downtown Mashpee. Look for tiny sparkling Marine Blues and Longtail Skippers (with iridescent blue-green marginal hairs) along the southern Cape shoreline and no doubt reaching the Elizabeth Islands.

## President's Message

Tom Gagnon

As I sit here on this cold evening in February it is difficult to think about butterflies. With two feet of snow on the ground, wind chill hovering around zero, our butterfly season seems so far off. The Butterfly Club is helping to coordinate three Institutes this Spring across the state. The Institutes have helped to increase our club memberships and the field trips have found new butterfly hot spots. One other benefit has been that many new friendships have been made.

On behalf of the officers of the club I would like to thank all who sent in their butterfly records for 2000. In checking past issues of *Massachusetts Butterflies* I see that we have made great strides in our overall reports from across the state. In this coming year we hope to help the Massachusetts Division of Fisheries and Wildlife to come up with a new list of our Endangered, Threatened and Special Concern species. Hope you all have a wonderful Spring and Summer butterflying.

---

*[ The second part of the article "Migration" by Tor Hansen will appear in the next issue of MB, No. 17, and will cover the migration of Monarchs in North America and migration of local species on the Massachusetts islands of Martha's Vineyard and Nantucket. The entire article will appear in the book Butterflies of Cape Cod, by Tor Hansen and Mark Mello, to be published by the Cape Cod Museum of Natural History, Brewster, Massachusetts. ]*

---

\*\*\*\* Publishing this journal has become MBC's greatest expense. We want to make it the best in content and appearance. Our income sometimes does not quite cover the printing and postage of *Massachusetts Butterflies* and our newsletters. We ask that members who are willing donate \$20., \$50., \$100. or whatever they can so that we may publish all the fine articles and illustrations that come in. Please make checks payable to MBC, and send to Alison Robb, Box 186, Woods Hole, MA 02543.

**Massachusetts Butterfly Club  
33 Woodland Road  
Auburn, MA 01501-2149**

