

ANNUAL
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NOTE: THIS IS A REPORT TO MEMBERS OF THE IMA. INFORMATION CONTAINED IN THIS REPORT MUST NOT BE USED FOR SCIENTIFIC PUBLICATIONS.

TO OUR ASSOCIATES
FROM
NORAH AND FRED URQUHART

It has been a most peculiar Monarch year. Some of the associates have reported an unusual number of monarchs while others have reported a marked scarcity. In our area of Ontario there was a marked reduction in numbers so much so that we had to travel to the more northern regions of Ontario in order to collect a few specimens for a series of cross experiments with megalippe. We also noted that although a few females visited our extensive patch of milkweed, we were unable to find many larvae. We have no answer for this peculiar occurrence.

Another interesting occurrence was the few recaptures and of these only three were for fairly long distances. Fortunately, the latter were most important in our studies since they indicated the route that some of the migrants take down the Atlantic coast and eventually to Florida and Yucatan.

We have a number of requests for copies of the Monarch Butterfly book that was published in 1960 and which has been long out of print. We made enquiries to a company that will, for a fee, try to locate copies of a particular book. It came as a surprise to us that the book is now considered a "rare book", and hence on the collector's list and to obtain a copy the going price is \$55.00. If any of our associates wish to obtain such a costly book please let us know and we will put in a request for it.

Our study of the movements of the Monarch butterfly in New Zealand will be discontinued since we now have a great deal of material which we will analyze for future publication. The associates in New Zealand have been most generous of their time and have supplied a great deal of information from their field observations. We are most grateful for their cooperative efforts in the study of the Monarch butterfly.

Our cross-experiments with megalippe and plexippus were most successful, although we did have a great deal of trouble with an infestation of aphids, the latter infesting our milkweed plants and, of course, we could not use an insecticide so that three times a week the plants had to be washed to get rid of the aphids. These aphids were most persistent; even after all the plants seemed free of them, within a day or two they were back on the plants. I believe we must have brought them in from the garden in the soil. However, we now have a very large series of crosses for male/female and female/male of each subspecies. The range of colour is such that we can now

show that, for one thing, portoracensis as found in Puerto Rico is not a subspecies but is a cross between megalippe and plexippus.

We will not be publishing separate small science papers for a year or so since we wish to bring all our data together in one large publication which will include what worthwhile material was contained in the Monarch Butterfly book together with recent and unpublished data and conclusions.

We have decided to send our report as "printed material" since, our little experiment has shown, that whether the material is sent first class or not it receives about the same treatment even though the latter is much more costly. We wish to thank those who reported to us when last year's report was received on the basis of which we have made the foregoing decision. It is indeed interesting to note that "first class" mail receives about the same treatment as "printed matter".

We trust that you are looking forward to another summer of monarch investigation and sincerely hope that we will have much more meaningful returns to report to you in the next report.

DISCONTINUE TAGGING OF SPECIES OTHER THAN THE MONARCH

Since we now have a great deal of data dealing with the movements of species of butterflies (other than the monarch) and moths, we will be discontinuing this part of the research.

From a cursory examination of the recaptured specimens it seems obvious that there is very little that one can do to add to our present knowledge. The returns on such tagged specimens has been rather meagre and has shown that, unlike the monarch, other species do not engage in long distance movements.

We hope that the data now on hand will show some sort of annual movement even though small.

Therefore, please do not tag species other than the monarch until further notice.

REPRINTS OF PUBLISHED PAPERS AVAILABLE TO ASSOCIATES AT COST (\$2.00 each)

- ___ 1. Fluctuation in the numbers of monarch butterflies.
- ___ 2. Mechanism of cremaster withdrawal and attachment.
- ___ 3. A continuous breeding population of monarch butterflies.
- ___ 4. Autumnal migration routes to the overwintering site in Mexico.
- ___ 5. Vernal migration from the overwintering site in Mexico.
- ___ 6. Reprint from News of the Lepidopterists Society - an autobiographical account of monarch migration studies.
- ___ 7. Aberrant Migration
- ___ 8. Breeding areas and overnight roosting sites in Ontario
- ___ 9. Overwintering site of the eastern population.

Name: _____

Address: _____

Date requested _____

No. of papers requested _____

Amount of money enclosed _____

Note: The above are available only as long as the present supply lasts.
Cost for each paper: \$2.00

PUBLICATION OF RESEARCH DATA BY ASSOCIATES

Please note that associates who help to collect data re research on the migration of the monarch butterfly are not permitted to use such data for publication in scientific journals since the data belong exclusively to the Insect Migration Association, Scarborough College, University of Toronto, Toronto, Canada.

RECAPTURE RECORDS OF TAGGED MONARCH BUTTERFLIES FOR 1980

This has been a rather mixed year for the tagging of monarchs. Some of our associates have reported that monarchs were late in arriving in the spring and that their numbers were considerably reduced from the numbers observed in 1979. Other associates have reported a normal number in their areas while still others reported a large population for the 1980 season.

As usual some areas were more productive of monarchs than others. Some associates were fortunate enough to find roosting trees, while others had to eke out a small number of monarchs by rearing them. For many areas adverse weather conditions and the reappearance of the virus reduced the population of monarchs very sharply.

In all, we received reports that 7,576 monarch butterflies were tagged in 1980. Of those 27 were reported to us as being recaptured or observed during the migration. Since we do not have enough space to publish data about all of the recaptured specimens, we are reporting only a few as follows:

| <u>Associate</u> | <u>No. of Tag</u> | <u>Tagged at</u> | <u>Tagged on</u> | <u>Recaptured at</u> | <u>Date of Recapture</u> |
|------------------|-------------------|----------------------------------|-------------------------------|----------------------|--------------------------|
| V. Allgrove | B00043 | Madison, Conn. | Sept. 27/80 | Cape May, N.J. | Oct. 5/80 |
| V. Allgrove | B00125 | Madison, Conn. | Sept. 27/80 | Manning, S.C. | Oct. 21/80 |
| **V. Allgrove | B00193 | Madison, Conn. | Sept. 27/80 | Titusville, Fla. | Oct. 13/80 |
| W. Hatch | B07321 | Port Carling, Ont. | Sept. 9/80 | Doylestown, Ohio | Oct. 4/80 |
| W. Keeney | A848 | Hudson, N.H. | Aug. 10/80 | Cape Hatteras, N.C. | Aug. 23/80 |
| *M. Monica | B01148 | Westfield, N.Y. | Oct. 13/80 | Staten Island, N.Y. | Oct. 16/80 |
| **G. & M. Smith | 00431 | Lyndonville, N.Y. | Sept. 4/78 | Point Pelee, Ont. | Sept. 15/78 |
| **J. Stull | 27572 | Presqu'ile State Park, Erie, Pa. | SEPTOR REPORTED TO US IN 1980 | | |
| | | | Sept. 28/80 | Venice, Fla. | Nov. 3/80 |

See Notes on Page 6.

*This flight although not a long one is interesting in view of the fact that the butterfly flew east, not southwest as would normally be expected during the fall migration. Such flights may occur due to certain weather conditions as reported in our paper "Aberrant Migration".

**The two flights to Florida show how the migration can become split with flights on both the east coast at Titusville and the west coast at Venice. Flights of this type are also discussed in the paper "Aberrant Migration".

***This flight from Lyndonville, N.Y. to Point Pelee, Ontario, would appear to be an anomaly as the butterfly flew from the U.S. to Canada during the fall migration. However, if you examine the map you will see that it must have flown along the southern shore of Lake Ontario, then along the northern shore of Lake Erie, making this a south-western flight as we would anticipate during the fall migration.

REPORTS OF TAGGING BUTTERFLIES

We would like to thank all of you who sent in your reports of tagging promptly. We would like very much to be able to acknowledge the receipt of tagging reports but unfortunately the pressures of writing scientific papers, the answering of correspondence and the many other activities which are necessary to keep this research going do not permit us sufficient time. We would like to emphasize the importance of receiving your reports as soon as your tagging is done.

PLEASE KEEP DUPLICATES OF ALL YOUR REPORTS SINCE THE ORIGINALS MIGHT BE DAMAGED OR LOST IN THE MAIL.

HOLDING LIVE MONARCHS IN STORAGE

Some of our Associates have had a supply of live butterflies which they wished to keep, awaiting the arrival of more tags. If you wish to do so, do not keep them in a cage since they will damage their wings in the attempt to escape. Place them, wings folded, in a plastic container, the type you buy at the store for sandwiches and the like. Introduce into the plastic container a small piece of cotton or paper towel, about the size of your thumb nail, that is slightly damp so as to maintain the humidity. The sandwich wrapper can be held flat, so as to prevent the monarchs from moving about, by using pins or paper clips. You can keep them alive without harm for a period of up to a week or more. We use this method to keep live monarchs during the winter months; the pieces of cotton were treated with a honey solution so as to give humidity and sustenance. Keep the plastic envelopes in a cool place; in your refrigerator if the temperature is not below 40°F, or in a cool part of your basement.

MILKWEED SEEDS AVAILABLE

In order to increase the available milkweed plants as food for the larvae for the monarch butterfly, we are asking members of the IMA to plant milkweed in their gardens; to ask neighbours to do the same; to make it a school project to plant seeds in vacant lots and along roadways and railway lines. The milkweed plant is a most interesting one because of its unusual method of cross-fertilization which, at times, may trap insects feeding upon the nectar. It is also interesting as a family of plants since it exhibits such a wide range of forms from large plants, five or six feet in height, to small plants that hug closely to the ground. Some plants look like miniature spruce trees while others are climbers. But, as far as we know, the monarch butterfly larvae can feed on all members of the genus *Asclepias* and other genera, such as *Gonolobus*, as well.

We will send milkweed seeds to you on request - the seeds are from *Asclepias syriaca* one of the most ubiquitous members in North America and it grows in a variety of habitats but preferably sandy soil. If you live in a very warm part of North America or in a semi-desert area, then you should find out what species of milkweed is indigenous to the area and plant these seeds. Your high school biology teacher or the University can assist you in locating native species of milkweed.

QUESTIONS MOST FREQUENTLY ASKED

The following questions are repeated from last year's report together with a few new ones. The questions are being repeated since there are always a few new associates who would like to have the answers.

Why is the Monarch butterfly called "monarch"?

It was so named by the early settlers from Europe. Since it was orange in colour it reminded the settlers of the name involved in King William of Orange. The names King Billy because of William. It is, of course, also referred to as the "milkweed butterfly" because of the food habits.

How long does a monarch butterfly live?

Migrants can live up to 11 months; non-migrants live for approximately 30 days the females dying after laying their full complement of eggs. There may be two or more generations of non-migrants thus increasing the population of the final brood that migrate.

What causes the production of migrants?

In late summer when the amount of daylight has been reduced owing to shorter days together with the advent of low temperatures, in some manner not clearly understood, the reproductive organs do not develop and these individuals then become migrants. It is similar to what takes place in the case of migrating birds.

How fast can a monarch fly?

A cruising flight of about 12 miles per hour. A rapid flight as much as 20 miles per hour. Of course, with a strong tail wind, the butterfly would travel much faster.

How many miles can a monarch fly in one day?

We have one record of a recaptured specimen that flew 80 miles in one day. However, with a strong wind the distance would quite likely be much further; the record of 80 miles took place during a period of very light winds and hence the distance travelled was under the control of this particular specimen.

Do monarch fly in flocks like birds?

Monarchs travel individually, not in flocks. The many records received and our numerous observations of many hundreds flying together is due to the sudden departure from an overnight roosting location where they do appear in great numbers together. Under unfavourable weather conditions the monarchs might remain quiet on bushes or tall grasses; with improved weather conditions they leave en masse thus giving the impression of travelling in flocks.

Why do the migrants cluster on overnight roosting trees?

Monarch butterflies, like all butterflies, are diurnal, meaning that they are active only during the day. As the sun sets and the daylight begins to fade the migrant monarchs choose trees upon which to spend the hours of darkness. During periods of rain and particularly strong winds, they will tend to cluster together in rather solid masses; this prevents the limb of the tree from being thrashed about by the wind which would dislodge the migrants; as a mass the limb tends to sway in the wind rather than acting as a whip.

m. Can monarchs fly in cold weather?

Monarch butterflies are unable to fly at temperatures below 10°C (50°F).

How long does it take a monarch to fully develop from the egg stage?

The egg hatches in from three to five days; the larva reaches maturity in 13-21 days; the adult hatches from the pupa in 11-17 days. The difference in times is due to the rates of development at high and low temperatures. The body temperature of the larva and adult butterfly is approximately the same as the surrounding air.

What good is a Monarch butterfly?

i- One might ask the question, "What good is anything"? Indeed, if you asked a monarch butterfly "What good is Man?" I fear he would have some very nasty things to say about what we are doing to our small planet. There is a very strong esthetic value; it is a beautiful creature and has filled the memories of countless generations of children. It is an amazing butterfly because it migrates like a bird over thousands of miles. It is used in many Universities for various studies dealing with the physiology of insects. It is used in many elementary and secondary schools to teach the life cycle and habits of insects. You could no doubt add many other uses for the monarch butterfly. We would be pleased to receive your suggestions.

Why study the migrations of the Monarch butterfly?

As scientists we are interested in many problems whether they are of economic importance or not. It is termed "pure research" and many marvelous developments have arisen from such research projects. Were it not for the investigations in the realm of pure science there would be no X-ray, no antibiotics, no methods of controlling bacterial growth. Indeed, ultimate investigations, that produce some advantage to man started as a pure science. In the study of the migration of the monarch butterfly we not only answer the question of where does the monarch go in the winter time but also how does it accomplish such a feat? The answers help to understand the migrations of insects that are considered harmful to crops, such as the migratory locusts. As a result of our work there is considerable interest being shown concerning the physiology of the monarch butterfly particularly with respect to the utilization of the fat stored in the body of the migrant. What other important discoveries will be made we can only conjecture. The important thing to bear in mind is that of
KNOWLEDGE FOR KNOWLEDGE SAKE!

How many eggs are laid by a female?

Although we were able to obtain as many as 700 eggs from females under laboratory conditions, perhaps the number would exceed this or perhaps be much less. Since the female lives a relatively short time as a non-migrant flying from one milkweed plant to another, it is most likely that much fewer eggs are laid in nature. Under mass rearing conditions to obtain specimens for tagging, one would rarely obtain more than seventy or eighty eggs from a female. However, it is still a matter of conjecture as to the number of eggs laid on an average under various conditions.

What factors control the numbers of monarchs?

A virulent polyhedrosis virus can greatly reduce the population of monarch butterflies giving rise to their marked fluctuations in numbers. There are at least 50 strains of bacteria. There are four species of parasitic flies and at least one species of parasitic bee. There are a number of predators that will feed upon the larvae such as various species of predaceous bugs, praying mantids, and spiders. In the overwintering sites, especially in Mexico, insectivorous birds will eat some of them, removing the wings and devouring the bodies. Birds, however, rarely attack butterflies while flying freely in nature.

Will removing the scales from the Monarch's wing hamper its flight?

The scales act as sort of waterproofing, like tiny shingles on a roof. It is the membrane of the wing that makes flight possible, not these scales. You can remove nearly all of the scales from the wings of the monarch and it will still be able to fly.

Are Monarch butterflies found in other places beside North America?

Being such a remarkable flyer and having been transferred by ocean-going vessels, it is found in many parts of the world. The Canary Islands; New Zealand; Australia; islands of the Caribbean. In the latter there is, as previously mentioned, a problem to be solved with respect to the presence of the subspecies megalippe. There are many species that belong to the same genus as the Monarch, the genus being Danaus. These are found in South America, Central America, Africa and Asia.

Do Monarchs leave a scent on the overnight roosting trees?

Because it often happens that the monarchs will choose the same group of trees upon which to spend the hours of darkness, it has been concluded, without scientific investigation, that the monarchs leave some sort of scent which will attract the migrants the following years. We have found by careful experimentation that this is not so. The choice of trees is dependant entirely upon the presence of such trees in the line of migration; topography; and the presence of nectar-bearing flowers in the vicinity which tends to attract them to a particular area. We have carried out experiments using various techniques and we have found that the presence of the live butterflies upon a given tree will attract others to the particular branches. These data have not yet been published but we are hoping to include this in the large publication we are now working on.

Do monarchs return to the same fields each year?

So long as the field still contains flowering plants and milkweed, you should be able to collect specimens in the same field each year.

What kinds of flowers attract Monarchs?

Any flowers that produce nectar, such as members of the Compositae such as goldenrod, asters. In your garden, zinnias are exceptionally good and we always plant this flower in our front garden for this purpose. It is not necessary to have milkweed flowers, although monarchs are also attracted to the blooms of the various species of this plant.

How long should one wait before placing the wing tag after the monarch has emerged from the pupa?

At least four days, depending on temperature. Outdoors in the sun about four days; in buildings allow at least another two or three days. We have always waited for six days so that the wings have become thoroughly hardened, otherwise the wings can be seriously damaged.

How do you locate roosting trees?

One of the most expedient methods is to have the Editor of your local paper report to you on the presence of large masses of monarchs on neighbouring trees. On your own, travel about the countryside in the evening, just when the sun is setting and make notes of the direction of flights of the migrants as they fly across the roads or over fields. Note where there are fairly large groups of tall trees preferably near areas where there is an abundance of nectar-producing flowers, particularly the goldenrod.

Why does the Monarch appear to have only two pairs of legs?

As in all insects, there are three pairs of legs. The first pair of legs in the case of the monarch butterfly and many of its relatives, are small and located under the head. These small legs seem to have some sort of tactile function, but as far as we know, very little is known about their possible function.

Why can't you find pupae in nature?

With rare exceptions, the mature larva of the monarch butterfly, as well as other species of butterflies, will leave the milkweed plant and travel considerable distances to find a suitable support for hanging the pupa such as under fence rails, eaves of buildings, and so on. You will very rarely find a pupa attached to the underside of the milkweed plant.

Will monarch butterflies fly during stormy weather?

Rarely. So rare that one might state that they never fly in stormy weather unless shaken from a roosting tree or disturbed in some other manner.

Where do you look for eggs?

When the minute larva emerges from the egg it has very tiny mandibles. Hence, the female lays her eggs on the underside of the leaves of very small milkweed plants, rarely on the large leaves. These small seedling leaves are very tender as compared to the more mature, leathery leaf. Look for eggs on the leaves of plants that are about six or eight inches tall, even when hidden in tall grass. It is most remarkable how the female will actually work her way down through tall grass in order to reach a particular milkweed seedling.

How does a monarch butterfly distinguish a milkweed plant from any other plant?

On the underside of the tarsi (feet) of the adult monarch butterfly there are a number of minute structures known as "scent receptors". If the monarch is resting on a milkweed leaf the scent receptors will respond and the female will then deposit an egg. You can try some rather interesting experiments with a female that is laying eggs. Place the butterfly holding it in your hand with wings closed, so that its tarsi touch a milkweed leaf but the tip of the abdomen might rest on your finger or a piece of paper. She will deposit her egg on your finger or the paper. We have watched countless times a female trying to locate a milkweed plant; landing on other plants that seem to resemble milkweed and finally landing upon the right plant.

How high do monarchs fly?

During migration they usually fly close to the ground, within a foot or so. Here, because of friction with the grass and plants, the wind is not so strong. Rarely would a monarch fly above five hundred feet. In cities they will, of course, fly over tall buildings. In mountain areas they may fly as high as 10,000 feet, but one should remember that in doing so they still fly close to the ground; sea level has little to do with it in so far as height is concerned.

Does the direction of flight depend on wind direction?

No! Monarchs fly in a southwesterly direction in the fall and a northeasterly direction in the spring migration. Wind can blow them off course and carry them for many miles out over the ocean. But, in their general migratory flight wind is not a factor.

Are Monarch butterflies attracted to perfume?

Although we have never experienced it, a few of our associates have recorded that, at times, Monarchs are attracted to a person and this attraction is thought to be related to the perfume on the person. However, colour, as mentioned above, also attracts monarchs and, it is sight which seems to attract first and odour second.

What light and heat conditions are best for rearing monarchs?

High temperatures will hasten development and low temperatures will slow it up. If you wish to hasten the development a temperature of 28°C (80°F) and continuous artificial light will reduce the time for development by approximately one third.

Parasitic Flies

Unlike the egg-laying habits of the parasitic bees that deposit their eggs inside the body of the host by means of the long ovipositor, parasitic flies deposit their small, white oval-shaped eggs on the surface of the body of the larva. The young of the fly, referred to as a maggot, bores a hole through the skin of the caterpillar thus gaining access to the cellular tissue on the inside. The maggot grows within the larval body with no apparent damage until the maggot has reached its full stage of development at which time it will attack the nerve tissue thus paralyzing the larva. The maggot then bores its way out of the larval body and drops to the ground, first suspended by a mucous secretion. The larva dies shortly after the emergence of the maggot. The maggot then burrows into the ground there to enter the pupa stage, referred to as a puparium in the case of a fly since the pupa is surrounded by the skin of the adult maggot. You may have seen these oval, brown, seed-like objects on the bottom of your rearing jars or cages. The fly that emerges resembles a rather stout, hairy house fly. At times the maggot does not emerge until the pupal stage of the Monarch butterfly. When this happens you may notice a small hole surrounded by a brown discoloration which is the exit hole of the maggot.

In order to prevent attacks by these parasitic flies, rearing from eggs should be carried out in jars or screened cages. Larvae brought in from nature may already be parasitized.

SPECIAL ACTIVITIES OF OUR ASSOCIATES

Mary Henshall was involved with school and church groups in connection with the research on the monarch butterfly. She also gave a slide presentation to the State Convention of the Daughters of the American Revolution.

Eva Kendrick supplied larvae and chrysalids to a councillor at a summer camp. Mrs. Kendrick has also started a senior citizens' group called "The Monarch Butterflies".

Donna Kessler invited her third grade class to her home to observe the stages of development of the monarch butterfly. Donna also delivered a program "Celebrate New Life" based on the metamorphosis of the monarch butterfly. The lecture was given at the local Lutheran Church; Donna received many reports of monarch butterflies being seen in the community after she had delivered the lecture.

SPECIAL ACTIVITIES con't.

Jenny Ortt gave a demonstration of banding at her 4H group and in her class.

Ellen Roush introduced the school biology teacher to the monarch research work. She donated a monarch chrysalis to a local nursery school for the children to observe and later gave a talk to the children about the monarch butterfly. Ellen also gave an illustrated talk on monarchs for a grade in her speech and drama class.

PUBLICITY

We would like to thank all of those who have sent us newspaper articles and clippings about their activities with the monarch research. Some of the articles were very well illustrated and all of them made very interesting reading. If you are interested in seeing any of these articles we would be pleased to send you a xeroxed copy.

The articles appeared in Agriview, State Journal, Clinton Herald, Today, Houston Chronicle, National Retired Teachers Journal, Democrat and Chronicle, Maryanne's Viewpoint, Sunday World Herald, Toronto Star, The Maui Sun, Stern (Germany), Empire, The Idaho Statesman, The Globe, The Sault Star, The Star Ledger.

The above were sent to us by, Jessie Glynn, Barbara Hagenson, Alta Horr, Mabel Jenkins, Eva Kendrick, Van Luxenberg, Marjorie Mathes, Molly Monica, Joseph Moss, Walter Regula, Beatrice Ridgeway, Fay Sutherland, Edna Sutton, Maryanne West and Dorothy Yeager.

SPECIAL DONORS TO OUR RESEARCH FUND

We are very grateful to those who sent donations in excess of that we suggested in the application form and the membership renewal form. The extra funds are especially welcome at a time when our funds for doing this research have been sharply reduced due to the depletion of funds of the National Research Council of Canada; we were granted only one fifth of the support requested this past year making your donations more important than ever to the progress of our work.

We would like to express our sincere thanks to the following for their generous donations: Bob Allen, Jerome Barry, Betsy Briggs, Kenneth Brooks, Gabriel and Ralph Brown and Elaine Kasmer, Erma DeWitt, Margaret Elliott, Gary Fairfoul, Jim Gilbert, Jessie Glynn, Barbara Hagenson, Carol Hillman, Mary Holliday, Mabel Huber, Mrs. Franklin Hupp, Judy and Christopher Keats, Woody Keeney, Evelyn Kendrick, Donna Kessler, Ron Lachelt, Van Luxenberg, Harold Mahan, Mr. and Mrs. Charles Mallery, Roland Matson, Ruth Anne McKee, The Ray Miller Family, The Naturalists Club of Broome County, Steve Powers, Walter Regula, Dale Reichert, Beatrice Ridgeway, Morry Running, Millicent Scott, Russell Siegel, Marion and George Smith, Sally Spooner, Edna Sutton, Maryanne West, Audrey Wilson, Alice Woodcock.

MAIL DELIVERY

In the past we have been sending our annual reports by First Class Mail. However, many of our associates reported that they had either not received the report or that it was delivered weeks after having been mailed from Toronto. So, as mentioned in our report to our associates, we decided to run an experiment. We divided the associate list into two: Those whose names commenced with A-L had their reports mailed First Class; those with names from M-Z were mailed by Printed Matter. One associate whose mail went as First Class never received the report; another whose mail was sent Printed Matter also did not receive the report. Unfortunately only a few of the associates reported to us the date they received the report but of those who did we concluded that there is little advantage in sending reports by First Class Mail even at the much higher rate.

We trust that you will receive your report and that the delay will not be more than a year. Our mail service is indeed in rather bad shape.

MONARCH BUTTERFLY BOOK

The book under the title of Monarch Butterfly and published by the University of Toronto Press has long been out of print. As previously mentioned, a number of our associates and others have requested copies.

In Toronto there is a firm, Old Favorites Book Shop Limited, member of antiquarian booksellers association of Canada who, for a fee, will obtain copies of books that are out of print. We made a request to this firm for copies of the Monarch Butterfly and were very much surprised that it would cost \$55.00 per copy. Apparently the book is now considered a "collector's item" and hence very difficult to obtain. However, if you would wish a copy we would be most pleased to submit your request to the Old Favorites Book Shop Limited. We have an order in for a copy at the present time on behalf of one of my colleagues.

PRIZES AND AWARDS

Jenny Ortt won a superior grade in her school science fair and at the district fair with a project based on the banding of monarch butterflies. She also received an outstanding grade on her demonstration of banding monarchs at the state fair.

Ellen Roush presented a talk on the life cycle of the monarch butterfly at the 4H group and received second prize in her division. She also won best over-all special interest trophy at 4H for her butterfly rearing project.

Con't. page 16.

PRIZES AND AWARDS con't.

Audrey Wilson won the Richards Education Award for 1980 presented by the Federation of Ontario Naturalists for "exceptional contribution in natural history education". Audrey has been greatly in demand in the U.S. and Canada for assistance in outdoor programs due to her reputation for effective outdoor education. The Federation of Women Teachers summer training program was held at the facility at Northumberland Newcastle where Audrey is head of the outdoor education program.

THE ARRIVAL OF SPRING MIGRANTS

Do you keep track of the date when monarchs arrive in your area during the spring and early summer?

We would be very much interested in learning when the monarchs first arrive in your part of the continent during the spring and early summer in order to be able to trace the progress of the spring migration northward from Mexico. Here are some reports received about spring migrants.

Monarchs first sighted by Dorothy Yeager at Pearsall Texas on
March 9, 1980

Monarchs first sighted by Jim Gilbert, Carver County, Minnesota on
May 28, 1980

Monarchs first sighted by Wendy Hatch, Port Carling, Ontario on
June 5, 1980.

Please keep track of the date on which you first observe the monarchs in your area in the spring and early summer and report this to us along with your tagging. The date may vary from year to year because of changing weather conditions.

RESEARCH ASSOCIATES 1980-1981

Those listed below are research associates actively involved in the study of the ecology and migrations of the Monarch butterfly for the period 1980-81.

Note: If your name does not appear on this list it is because you joined our group after this issue was submitted for publication.

A.

Allen, Bob L. San Luis Obispo, California.
 Allgrove, Valerie. Windsor, Connecticut.
 Anderson, Carolyn. Madison, Wisconsin.
 Anderson, Timothy. Richfield, Minnesota.
 Armstrong, Fred. Red Bank, New Jersey.

B.

Baden, Dave. Burnsville, Minnesota.
 Barry, Jerome J. Bedford, New Hampshire.
 Black, Gladys. Pleasantville, Iowa.
 Bracher, Ray W. South Bend, Indiana.
 Green, Jean. Brookfield, Connecticut.
 Briggs, Eetsy. Marshfield, Massachusetts.
 Brooks, Kenneth A. Conowingo, Maryland.
 Brown, Gabriel and Ralph. Baltimore, Maryland.
 Buchanan, Frances B. New Paltz, New York.
 Buckingham, Stacey. Bruneau, Idaho.
 Bugler, Richard P. Staten Island, New York.

Carpenier, Fairbank. Far Hills, New Jersey.
 Carter, Gray. Winston-Salem, North Carolina.
 Cheevers, Anthony P. Boston, Massachusetts.
 Clemente, Michael F. Atlantic City, New Jersey.
 Clements, Marta. West Paris, Maine.
 Coleman, Wm. J. Ventura, California.
 Constantaros, Gus. North Olmstead, Ohio.

Montes, Sra. Barbara M. Can Cun, Quintana Roo, Mexico.
 Pfeiffer, M. Carl, Battle Creek, Michigan.
 Witt, Erma, R. New Paltz, New York.

Lott, Margaret Drake. Muskegon, Michigan.
 Fry, Calvin. Nevada, Missouri.

Fairfoul, G. L. Toronto, Ontario.

G.

Garner, Peggy. Le Claire, Iowa.
Gilbert, James R. Waconia, Minnesota.
Glovas, G. S. Bethlehem, Pennsylvania.
Glynn, J. Limehouse, Ontario.
Goldman, Jeri. Harrisburg, Pennsylvania.
Grant, Mrs. A. and Geoffery. Barrie, Ontario.

H.

Hagenson, Barbara. Clinton, Iowa.
Halmi, Chris. Erie, Pennsylvania.
Hansen, R. E. Staten Island, New York.
Hatch, Wendy. Port Carling, Ontario.
Henshall, Mary S. Nampa, Idaho.
Hill, John A. Lyndhurst, New Jersey.
Hillman, Carol B. Harrison, New York.
Holck, Bert. Landenberg, Pennsylvania.
Holliday, M. Reno, Nevada.
Horr, Alta L. Gretna, Nebraska.
Hoskins, Dorothy, M. Weston, Massachusetts.
Houck, Harvey and Lorraine, Decorah, Iowa.
Huber, Mabel L. Fernley, Nevada.
Hupp, Mrs. Franklin. Hinton, Virginia.

I.

Irwin, Ann D. Bloomfield Hills, Michigan.

J.

Jenkins, Mabel S. Canton, New York.
Johnson, James Edward. Bridgeton, New Jersey.
Johnston, A. S. Bernardsville, New Jersey.
Jordan, Gina. Battle Creek, Michigan.

K.

Karrow, Niel. Waterloo, Ontario.
Katz, Margaret. Riverdale, New York.
Keats, Christopher. Clearwater, Florida.
Keeney, Norwood H. Hudson, New Hampshire.
Kendrick, E. Sault Ste. Marie, Ontario.
Kessler, Leo R. Audubon, Iowa.
Kester, Patricia A. Appleton, Wisconsin.
Klass, Judith. Leonia, New Jersey.
Knutson, Debbie. Iron Mountain, Michigan.
Korte, Jeff. St. Cloud, Minnesota.
Kough, Ruth. Dysart, Pennsylvania.

Lachelt, Ren. Minneapolis, Minnesota.
 Lake Oswego School. Lake Oswego, Oregon.
 Lankford, Lynne. Baytown, Texas.
 Larson, Kirk L. Ann Arbor, Michigan.
 Larson, Donald W. Minnetonka, Minnesota.
 Locher, Tamian. Chesterland, Ohio.
 Lopina, Marion T. Wauwatosa, Wisconsin.
 Lorimer, John and Family. West Bloomfield, Michigan.
 Luxenberg, Van Castle Rock, Colorado.

M.

Mahan, Harold. Cleveland, Ohio.
 Malik, Patricia. Stevens Point, Wisconsin.
 Mallory, C. Vestal, New York.
 Marts, George E. Naples, Florida
 Mathes, , G. Eldred and Marjorie. Pontiac, Michigan.
 Matsen, R. R. Minneapolis, Minnesota.
 Maynard, Charles D. Houston, Texas.
 McClain, T. M. Geneseo, Illinois.
 McLee, Ruth Anne. Stockton, California.
 McLaughlin, Roberta. Bloomfield, Connecticut.
 Meled, Dave. London, Ontario.
 Milani, Ruth. Meaford, Ontario.
 Miller, Donna. Ottawa, Ontario.
 Miller, Ray. Lancaster, California.
 Monica, Molly. Berkeley Heights, New Jersey.
 Moss, Joseph. Boanoke, Louisiana.
 Murray, Sarah M. Tuscola, Illinois.

N.

Nationalist Club of Broome County. Vestal, New York.

O.

Oendleton, Emily V. Montevallo, Alabama.
 Oenn, Linda. Toledo, Ohio.
 Ozzini, Mark Alan. Avondale, Pennsylvania.
 Powers, Steve. Philadelphia, Pennsylvania.
 Oxleitner, Gary. Dowling, Ontario.
 Preston, Vicki L. Whiteford, Maryland.

P.

Pilens, Elizabeth. Tenants Harbor, Maine.
 Porse, Randy. Newark Valley, New York.
 Regula, Walter F. Hamilton, Ontario.
 Reibert, D. Hanover, Pennsylvania.
 Riboway, Beatrice M. R. North Eastham, Massachusetts.
 Riden, Lynn. Lynchburg, Ohio.
 Rensing, M. H. Two Harbors, Minnesota.
 Rutherford, Kathleen M. St. Catharines, Ontario.

S.

Scott, Millicent. Casper, Wyoming.
 Senghas, Joan. Mount Clemens, Michigan.
 Severson, Lu. Middleton, Wisconsin.
 Shienvold, Susan. Harrisburg, Pennsylvania.
 Siegel, Russell, Danbury, Connecticut.
 Sieker, W. E. Madison, Wisconsin.
 Sinclair, Mary Lu. Falls Village, Connecticut.
 Smith, Leslie V. Citrus Heights, California.
 Smith, Marion E. and George Smith. Lyndonville, New York.
 Smith, Susie. Bountiful, Utah.
 Smith, Trudy. Mumford Cove, Connecticut.
 Spafford, Michael and Mark. Saunemin, Illinois.
 Spooner, Sally. Lakeville, Massachusetts.
 Stifel, Doris N. Toledo, Ohio.
 Stull, Jean H. Waterford, Pennsylvania.
 Sutherland, Faye. Boise, Idaho.
 Sutton, Edna M. Richland Centre, Wisconsin.
 Swain, Eileen. Glen Carbon, Illinois.
 Swanson, Severin. Omro, Wisconsin.

T.

Teed, L. B. Wichita, Kansas.
 Terry, Willie G. Baytown, Texas.
 Timothy, Katherine W. Kaysville, Utah.
 Totton, Larry W. Granger, Iowa.

U.

Union County Outdoor Education Center, Berkeley Heights, New Jersey.

V.

Vipperman, Anne B. Martinsville, Virginia..

W.

West, Maryanne. Gibson Landing, British Columbia.
 Williams, Gary. Glen Ellyn, Illinois.
 Wilson, Audrey. Cobourg, Ontario.
 Wilson, Roger L. Merville, Iowa.
 Woodcock, Alice P. Upper Montclair, New Jersey.

Y.

Yeager, Dorothy. Pearsall, Texas.