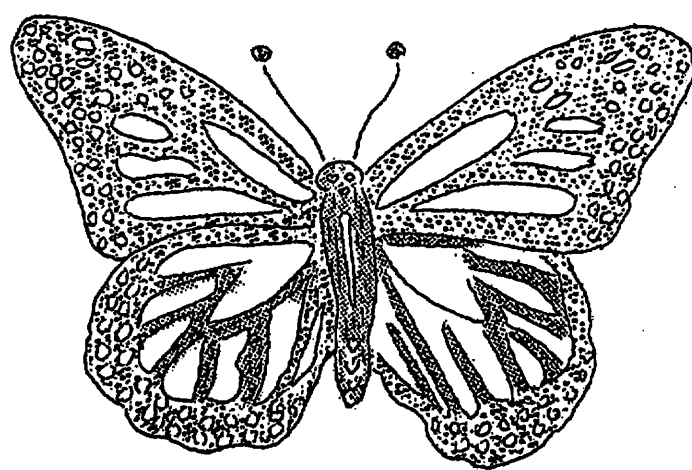


# INSECT MIGRATION STUDIES



NEWSLETTER to  
RESEARCH ASSOCIATES

VOL. 2.

MARCH

1965

MONARCH BUTTERFLY RESEARCH PROJECT

Department of Zoology,  
University of Toronto,  
TORONTO 5, Canada.  
February, 1965

Dear Research Associate:

It is nearing the time of year when we will again be issuing tags to those who wish to continue as research associates in the Monarch Butterfly Research Programme.

We sincerely hope that you enjoyed tagging Monarch butterflies last year and that you will be able to work with us again this season.

This year, in order to facilitate our clerical work and our book-keeping, we are asking each research associate to fill in the form below and to enclose \$1.00 for the fee for the 1965-66 newsletter. This will eliminate the necessity of canvassing the associates for the newsletter fee and will simplify our work accordingly.

When we receive the completed form and the \$1.00 for the newsletter, we will then send you the tags which you require.

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THIS NEWSLETTER HAS BEEN PRODUCED IN ORDER TO INFORM OUR ASSOCIATES OF WHAT HAS BEEN DONE AND MUST NOT BE USED FOR SCIENTIFIC PUBLICATION. ANYONE WISHING SCIENTIFIC DATA SHOULD CONTACT THE EDITOR, MISS AUDREY E. WILSON, R.R. #5, COBOURG, ONTARIO, CANADA.

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FROM PROFESSOR URQUHART

HEAD OF MONARCH RESEARCH PROJECT

In our Newsletter last year we expressed our delight at the number of associates joining our research team. Although this has resulted in a great deal more secretarial work, nevertheless the results have certainly been worth the effort.

It is interesting to note that only 10 percent of those writing to us stating that they would like to assist in our tagging program were sufficiently interested to pay the three dollar fee. As we pointed out last year, this eliminated a great many who would not have done a very good job.

The results of the past three years of tagging (not including 1964) made it possible for us to prepare a scientific paper which will appear in the next issue of the Proceedings of the Entomological Society of Ontario. Although only the name of the person writing the paper appears with the title, nevertheless our sincere thanks is extended to all of our associates for their contribution to this paper and with special mention to those who did such an excellent job in carrying out the transfer experiments. Incidentally these were successful in that we obtained most valuable information about our western populations; some of this material appears in the above-mentioned scientific paper, but the majority of it will not appear until a second paper is prepared dealing specifically with the movements of the western populations together with the final population concentrations in California, Mexico and Florida.

We wish to take this opportunity to thank all of those who contributed financially, above the regular fee, to our efforts during the past year. Although Research Grants are available for our laboratory, field and graduate studies, we do not have financial assistance to produce this Newsletter or to employ the necessary clerical help needed in carrying out the various items necessary in what is the equivalent of a "Research Organization".

We know that you would like to join us in thanking Miss Audrey Wilson, our Newsletter Editor, for her work in preparing this

personal letter to you. She would appreciate your comments and suggestions. Perhaps, if sufficient funds are available, we will be able to include more "news items" than space now permits.

### TAGGING RETURNS FOR 1964

Although we had expected a drop in the numbers of monarch butterflies this year, most of our associates reported them being as abundant as in previous years with the result that over 17,000 of the migrating monarchs were tagged. An additional 10,000 were tagged in the overwintering population in northern California.

The following associates deserve special mention for their tagging:

L. Beamer, Meaford, Ontario.	E. Keith, Windsor, Ontario.
P. Beard, Davis, Calif.	Miss I. LeMon, Topsfield, Mass.
W. Bechtel, Reno, Nevada.	J. Malick, Steven's Point, Wis.
Mrs. G. Brewer, Newton Highl'ds, Mass.	Mrs. H. Marsi, Binghamton, N.Y.
R. Brownlee, San Jose, Calif.	E. McDonald, Port Hope, Ont.
Miss M. Chambers, Tulalake, Calif.	F. Munger, Whittier, Calif.
T. Currie, Toronto, Ontario.	J. Peplinski, Erie, Pa.
J. Delap, Paris, Ill.	N. Sibley, Whittemore, Mich.
G. Feiszli, Vermilion, Ohio.	G. Smith, Eden, N.Y.
Mrs. R. Fender, Riverton, Iowa.	F. Stricker, Kitchener, Ont.
Miss L. Fish, Terre Haute, Ind.	J. Stull, Waterford, Penna.
Miss R. Haigh, Niagara Falls, Ont.	S. Sweet, Manchester, Conn.
H. Hedges, Toronto, Ont.	Mrs F. Throm, Overland Pk. Kans.
Miss N. Hoeflich, Arlington, Mass.	Audrey E. Wilson, Cobourg, Ont.
F. Hough, Accord, N.Y.	B. Wilson, Coldwater, Ont.
L. Johnson, McGregor, Iowa.	Mrs. K. Yeager, Pearsall, Texas.

There are certain areas where the monarch butterfly occurs in great numbers and hence it is possible for an associate to tag more specimens than one who is in an area where monarchs are scarce. A few specimens tagged in an area where monarchs are of rare occurrence might give us most important information for such areas as the foothills, mountain regions and the northern extension of the monarch's range. In areas where monarchs overwinter, of course, tagging in numbers is much easier accomplished; for instance, in the overwintering sites we have been able to tag 1,000 specimens in a very short time.

This year we broke all previous records of tagged butterflies returned to us by receiving a total of 298 tagged specimens, a very gratifying number. Some of these flew very long distances and those which had been transferred from one part of the country to another in some cases established new flight patterns. In cases of transferred butterflies being recaptured we have given credit to both the original tagger and the person who released the tagged specimen.

Each associate will find a list attached to his Newsletter with his returns for his own tagging. If such a list is not included then it means he did not have any of his specimens recaptured.

<u>TAGGED BY</u>	<u>AT</u>	<u>RECAPTURED AT</u>
Bill Bechtel	Reno, Nevada	Morro Bay, Calif.
Paul Beard	Monterey, Calif.	Gilroy, Calif.
David Bridge	Kent Point, Md.	Biscoe, N.C.
David Bridge	Kent Point, Md.	Marietta, Georgia.
Bob Brownlee	Santa Cruz, Calif.	Seaside, Calif.
Ted Currie	Toronto, Ont.	Hamilton, Ont.
Ted McDonald	Port Hope, Ont.	Beaumont, Texas.
Ted McDonald	Willow Beach, Ont.	Cheela, Georgia.
Ted McDonald	Port Hope, Ont.	DeLand, Florida.
Francis Munger	Whittier, Calif.	Capistrano Beach, Calif.
Francis Munger	Whittier, Calif.	Garden Grove, Calif.
James Stull	Waterford, Pa.	Candler, N.C.
Audrey E. Wilson	Grafton, Ont.	Potsburg, Alabama.
Audrey E. Wilson	Cobourg, Ont.	Erath, Louisiana.
Audrey E. Wilson	Cobourg, Ont.	Greenville, S.C.
Lloyd Beamer, Meaford, Ont.		Vancouver, B.C.
released by Mrs. West, Gower Point, B.C.		
Ted McDonald, Port Hope, Ont.		Bishop, Calif.
released by Bill Bechtel, Reno, Nevada.		
Ted McDonald, Port Hope, Ont.		San Luis Obispo, Calif.
released by Bill Bechtel, Reno, Nevada.		

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#### NEWSLETTER - 1965

#### DONATIONS TO MONARCH BUTTERFLY RESEARCH FUND

In our last newsletter, we appealed for contributions to our research fund on which we must depend for payment of clerical help and for the newsletter and many incidental items necessary for our program.

We now wish to thank those who responded so generously to our request for financial assistance to further our research:

Mr. Lloyd Beamer, Meaford, Ont.	Mr. D. Miner, Barre, Mass.
Mr. H.F. Brevoort, Glenbrook, Conn.	Mrs. A.E. Mohr, Brookfield, Wis.
Mrs. Brewer, Newton Highl'ds, Mass.	Derek Morton, Port Arthur, Ont.
Mr. B. Cobb, Falls Village, Conn.	Miss Mary Pearse, Peabody, Mass.
Miss Elizabeth Corey, Concord, Mass.	Mrs. L.G. Senghas, Mt. Clemens, Mich.
Mrs. R. Fender, Riverton, Iowa.	Mrs. S. Sweet, Manchester, Conn.
Mrs. C. Kuschke, Oreland, Penna.	Mrs. F. Throm, Overland Pk, Kans.
Mr. B. Major	Mr. A.C. Warrick, Windsor, Ont.

### LIST OF RESEARCH ASSOCIATES

This year we had so many items that we knew would be of interest to all of those who receive the newsletter that we were forced to omit publishing the list of research associates, much to our regret.

### HELP WANTED!!!!

The number of research associates registered this year has risen to a very large number and we are grateful for the tremendous effort that many of you have made on behalf of the monarch research. But, as in any expanding program, we could use many more helpers. If you know of any one who might be interested please tell them to get in touch with us. This is particularly true of the area of the southwestern states.

### CATCHING MONARCHS ON HORSEBACK

If you think you have difficulty catching monarchs, consider the plight of Marcia Chambers of Tulalake, California, who has to chase them over rocks infested with rattlesnakes! She and her friends have solved this problem by taking to cars and horseback. Even under these circumstances Marcia was able to tag 142 monarchs. Congratulations!

### ASSOCIATES ORGANIZE GROUPS

Showing unusual initiative are those research associates who have organized their own tagging groups and who pass the information on to this office to be used in the research. These are Mr. Beamer, Miss Hoeflich and Miss LeMon. In this way we find that not only is there a very active program of tagging but much interest is aroused in addition.

### SLIDES AVAILABLE FOR LECTURES

Occasionally we have had requests for illustrative material. We now have a number of good quality coloured slides and could have duplicates made which would be available on request if we have a number of people who are interested in using them. Let us know if you could use such material. The slides could be arranged in series illustrating the life cycle or tagging procedure. Send your inquiry to F.A. Urquhart, University of Toronto. The charge for renting a set of slides would be \$2.00 to associates and \$5.00 to non-associates.

### ABUNDANCE

Although many of our associates reported the monarch as being more abundant this year than last, a few reported them scarce.

Mrs. B. Weitegenant of Minneapolis, Wis., G.A. Stricher of Kitchener, Ontario, J.H. Johnson of Peterborough, Ontario, Karin Bergen of Waterloo, Ontario, Mary Lair of Oxford, Pennsylvania, and Marietta Rumberg of Diamond, Missouri, all reported monarchs as being scarce or less abundant than last year.

Sister Mary Grace of Kenosha, Wisconsin on her western trip reported that in early and late August the monarchs were abundant in southern Wisconsin, northern Illinois and Iowa. As she travelled westward through western Iowa, Nebraska, northern Kansas and eastern Colorado they became progressively less abundant and none were seen in the mountains. This is the difference one would expect in comparing the populations from east to west.

As a result of the unusually heavy degree of parasitism, the monarchs may not be as abundant this coming summer as they were this past year. However, so much depends upon late spring and early summer temperatures, that it is likely that heavy parasitism may have little effect on the numbers prevalent in any one year. This should be a most interesting summer to watch for a decrease in numbers.

A careful record of abundance should be kept by each associate and included in the report submitted. This estimate should not be based on one or two cursory trips into the countryside. One can only make a good estimate on the basis of at least twenty or thirty separate trips into areas where the monarchs have been known to occur in other years.

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### SPRING MIGRATION

Since there are many more monarchs moving southward in the fall of the year, and hence more tagging is done, we have learned a great deal about this phase of the study. In the spring, however, there are relatively few monarchs and hence only a few can be tagged. To this difficulty is added the fact that they fly in a direct path to the northeast, pausing at rare intervals to visit what few flowers are in bloom along the way. They are difficult to capture at such times and, since they are not attracted to the flowers around houses in towns and villages, they are rarely seen and hence tagged specimens are not easily captured.

Mrs. Kerry Yeager of Pearsall, Texas, one of our most enthusiastic associates and one who has contributed a great deal of most valuable information, writes the following descriptive note concerning the activity of the migrating monarchs passing through her area in the spring:

"During the peak of migration, winds were from the north and very brisk; butterflies had a difficult time making any headway, they were often blown backwards, but still kept going in a definite north-east direction, did not detour around buildings but flew up and over".

Mrs. Yeager goes on to explain that they are very difficult to capture at this time.

As to the time of arrival and departure, Mrs. Yeager submits the following information:

"Many monarchs sighted from about the 12th of March to the 26th; they they dropped off. From then on, only a very few were sighted here and in our vicinity. After about the 22nd of April only one every other day or so sighted and the one tagged on May 12th was the last one seen."

Mrs. Yeager has raised many hundred of specimens in her area and has aroused a considerable amount of interest in this subject. The fact that she had so much trouble raising her specimens and the further fact that many of the adults that did finally emerge were later found dead is most valuable information although we are at a loss to find an explanation for it at the present time. We will look forward to more reports from Mrs. Yeager, particularly on this subject, since we are of the opinion that it will eventually fit into a picture concerned with the fluctuations of numbers from year to year.

Derek Morton of Port Arthur, Ontario, presented an interesting report and observation. He found the first adults in his area on May 23, 1964 which is a most important record for this far north. But the report which we are at a loss to explain adequately is that of seeing specimens in his area flying to the north-west, we would have expected a continued north-easterly direction. He explains, however, that they did not appear to follow any particular course and it may be that the specimens, having arrived in this far northern area, were looking for milkweed and hence the movement was a random one. On June 10th, 1964 he was able to tag two specimens. We sincerely hope that Mr. Morton will continue his study of the populations in his area; it would give us much needed information from the northern fringes of the monarch's range.

A tagging program in the spring and early summer is most important. This is the period when we can contribute more new information to the study. Any sight observations, together with direction of flight, would be welcome; but more important is to try and capture such specimens and tag them. It has been suggested that our associates in the south-west might send specimens to associates in the north-east for liberation. Unfortunately, at the time they are most abundant in the south-west, as Mrs. Yeager has pointed out, those of us living in the north-east have not thrown off the cold of winter so that milkweed is not above the ground and the cold would immobilize the specimens. However, it is



Spring Migration - concluded

hoped that rearing might be commenced in March from specimens sent to us from the south-west so that by the time the warmer weather arrived we would have adults for liberation - these of course would be second generation individuals and not original migrants, but it would be interesting to follow their movements. Perhaps some of our associates might like to try this experiment.

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CALIFORNIA

We know that the monarchs overwinter along the coast of California from the Monterey Peninsula south for a distance of a hundred miles or so. However, except for the recaptures of the Bechtel specimens, we do not know the origin of these populations. Nor do we know the final destination of these California specimens when they leave the coast in late winter.

We are most fortunate to have two most enthusiastic associates, Mr. Paul Beard and Mr. Robert Brownlee, concentrating on the California populations. They have drawn up plans for next winter's activities in which a close watch, by tagging, will be kept on the movements of the monarchs in California. As a result of their work we may eventually learn from whence they came, where they go and their minor migratory activities within California during the winter months. We also hope to learn more about the so-called diapause state in conjunction with our laboratory experiments.

Mr. Francis Munger of Whittier, California is carrying out a very extensive rearing program. In this area the milkweed plants are not abundant and so he has had to devise a method whereby the work can be carried out with a minimum amount of food material. He has milkweed plants growing in his yard. The caterpillars are reared in separate containers, each container covered with a sheet of glass. When the caterpillar pupates on the glass cover, the latter is removed and placed on a specially designed rack. In this way Mr. Munger is able to raise a number of specimens to the adult stage as well as make observations.

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FROM THE FOOTHILLS TO ...?

Although we can plot, with a fair degree of accuracy, the migration of the monarchs in eastern North America (roughly east of the Mississippi drainage) we know very little about the populations in the plains, foothills and mountain regions. It is difficult to obtain sufficient data from such areas because the monarch butterflies are not so abundant and, hence relatively few specimens can be tagged; since

human population is sparse there is not as much chance of a tagged specimen being recaptured.

This past summer, through an active tagging program and assisting in transfer experiments, Mr. Bechtel, who was residing in Reno, Nevada, succeeded in tracing specimens from this area to California. The exciting advance here being that these recaptured specimens reached the Pacific coast just north of Los Angeles. Based on these recaptures we have been able to postulate the probable origin of the monarchs in this area and to the south. We are sorry that Mr. Bechtel will not be living in Nevada, having changed his abode to Pennsylvania. He will continue working with us however, and we are hoping he will be able to obtain active associates in Nevada to continue his excellent work.

We hope to continue our transfer experiments to the west on an increased scale this summer. Those who have been tagging many hundreds of specimens each summer will be asked to join this group of researchers. I am certain that we will be able to work out the migration of the western populations within the next few years, as a result of our transfer experiments.

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#### FROM MEXICO - WHERE??

As a result of the tagging program that has been carried out over the years, we have been able to follow the migrations of the monarch butterfly from the north-eastern to the south-western parts of our continent. But there remains one big question mark among the little ones. Where do the monarchs go after they arrive in Mexico? Do they remain as free-flying nomadic individuals, as we have concluded, or do they continue their flight finally reaching the Pacific coast of Mexico or of the Central Americas? And do they congregate in a particular area?

This question can be answered only when sufficient specimens are recaptured along the route through Mexico. This is where our associates in Texas are going to contribute so much in the years that lie ahead. It would certainly be of great assistance to have associates in Mexico and if any of associates know of possible associates in this area we would be pleased to receive their names. In the meantime, we will continue to assist our Texas associates by sending them hundreds of our northern specimens to be released, along with specimens collected in their own area, in the hope that many of them will be returned to us as they journey to whatever part of the continent is their final winter destination.

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### TRANSFER EXPERIMENTS

Although we do not know in detail the various migratory paths taken by the monarchs as they move from north to south, we have been able to work out many of them. We can now plot with a fair degree of accuracy the migratory movements in North America from the north to the south. But, the final destinations are still unknown. For example, we know now that members of our north-eastern populations travel to the south-west, passing through southern Texas and then into Mexico. Do they continue through Mexico into Central America? Or do they continue to the Pacific Coast in the vicinity of the Gulf of California? Perhaps there is a mingling of populations in this area.

In order to answer some of these questions and also to find out whether or not butterflies sent from one part of the continent to another would change their migratory habits, we instigated last summer a series of transfer experiments. This consisted of sending specimens by air mail from one associate to another. The following associates were involved:

Lloyd Beamer of Meaford, Ontario, sent specimens to Mrs. Maryanne West of Gower Point, Gibson's, B.C.; Ruth Haigh of Niagara Falls, Ont. sent her specimens to A.L. Brandhorst of Denver, Colorado; Audrey E. Wilson of Cobourg, Ont. sent her specimens to Mrs. Kerry Yeager of Pearsall, Texas; Mr. H. Hedges of Scarborough, Ont. sent his specimens to Ezra Day of Salt Lake City, Utah; Mr. E. McDonald of Port Hope, Ont. sent specimens to W. Bechtel of Reno, Nevada and also to Mrs. H.W. Gathings of Quemado, Texas; Mr. T. Currie of Toronto sent specimens to Miss Cleo Wierenga of Rapid City, South Dakota; Norah and Fred Urquhart sent specimens to Mr. J.D. Shorthouse of Lethbridge, Alberta and to Mrs. L. Luxemburg of Tonopah, Arizona.

Although there were very few recaptures, nevertheless we did obtain some valuable information which has been included in a scientific publication, mentioned elsewhere.

We intend to increase our activities in this phase of the work next summer. Although those taking part will not have the satisfaction of having many recaptures they will have the satisfaction of contributing most valuable information.

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### REPORTS

We would like to make special note of those who sent in such detailed and meaningful reports:

Mr. L. Beamer who submitted voluminous observations which will be of great value when the research data is processed for publication.

Reports - cont'd.

Mr. J. Morris sent in a splendid report outlining his progress in considerable detail. We will keep this on file for future consideration. Embodied in this report is the following comment regarding the research associates, "I believe it is necessary to note that all the persons I have met in this organization are quite extraordinary. More than in any other nature association to which I belong, the members' unselfish devotion to "the cause" creates the strength and esprit de corps that make this banding program such a successful operation."

Miss Hoeflich submitted a particularly lucid and detailed report of her own and her 43 helpers' observations. She also sent in the special sheet of her own instructions which she sends to each of her helpers.

Many thanks should go to all of those who sent in their data promptly and neatly written or typed and well organized. Such reports are of invaluable assistance to those of us who process the data involved.

CHIT - Chat

Ruth Haigh has continued her scientific observations this year and has noted the following; that she was able to force breed a male monarch to several females, she then kept track of the viability of eggs from these different matings. She noted that the male, who was used once a day, stayed with each female over twelve and one half hours.

Mr. J. Stauffer who has been observing the spring migration as it goes through Reynoldsville, Pa. is looking forward to an active year of tagging in 1965 after a long siege of ill health.

Both Mrs. Brewer and Miss Haigh report that they had females each of which laid over 700 eggs.

Mrs. F. Throm reports that she was able to lure monarchs to the bushes, in the heat of the day, by spraying the bushes with water in a fine mist.

PARASITES

Those of us who were involved in regular monarch butterflies from larvae were aware of a high parasite rate this past year. Many of the specimens, both in the larva and pupa stages, developed a disease which turned the specimens black and when damaged a black inky fluid exuded. In addition there were many reports of parasitism caused by the two species of tachinid flies by an unidentified species of braconid.

Mrs. Yeager of Pearsall, Texas reported that although the adults emerged from the pupae they were deformed. This condition persisted even when the caterpillars were reared in the house which was air-

Parasites - cont'd.

conditioned. Also the eggs did not hatch and some of the early migrants laid eggs which hatched but the larvae died. We are most interested in Mrs. Yeager's observations since any lethal effects in her area would, in so far as the spring migrants are concerned, have a profound effect on the final population in the breeding grounds to the north-east. We hope Mrs. Yeager will continue her studies of this condition particularly with respect to the early migrants.

James Malick of Stevens Point, Wisconsin, found that thirty-seven percent of the larvae were parasitized by tachnids and braconids.

Joan Senghas of Mt. Clemens, Michigan found that the late larvae were less parasitized than the earlier ones.

Ruth Haig of Niagara Falls, Ontario found that half of the caterpillars found in the fields were parasitized by tachnids. She also noted that older caterpillars failed to moult properly and died; some of them attempted to enter the pupa stage but died in the process becoming "black and rotten". Of those that survived through to the emergence of the adults, many were unable to extricate themselves from the pupa skin resulting in distorted specimens and others that fell to the bottom of the cage.

Mrs. Brewer of Newton Highlands, Massachusetts, noted many of the larvae developed a pathological condition indicated by much enlarged head capsules and that such larvae failed to moult at the proper time.

As yet very little is known about the diseases, their origin and physiological effects, of the monarch butterfly. This subject is of direct concern to our studies of the migratory habits since such diseases and parasitism might be responsible for the marked fluctuations in numbers of monarchs which we have witnessed over the years. However, it is impossible to include such a study in our program at the present time. But we will continue to make observations and record data received in our files for use by students in the future; hence, such valuable information will not be lost.

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PUBLICITY AND SCIENTIFIC PROJECTS

This year, thanks to the efforts of some of our very enthusiastic research associates, the monarch butterfly project has been featured in many ways; scientific displays, radio programs, T.V. programs and newspaper coverage. The following are some items which have come to our attention:

Publicity & Scientific Projects - cont'd

Joe Shorthouse of Lethbridge, Alberta, had an excellent project displayed at the Lethbridge and District Science Fair. He also was heard on radio and had coverage in the local newspaper, all concerning the monarch butterfly project.

Mrs. K. Yeager of Pearsall, Texas, was responsible for many articles appearing in the San Antonio papers and involved many enthusiastic helpers through her Campfire Girls. Mrs. Yeager was also heard on the radio and had a monarch display in the Pearsall Library.

Mrs. M. West of Gower Point, B.C. released transferred butterflies which received much publicity in the Vancouver papers. One of these live butterflies was packed with fresh flowers and flown back to our laboratory. The data from these transfers has proven to be very valuable and will soon appear in a scientific publication.

Mrs. Leo Sanders of Johnstown, Penna. displayed a very successful monarch butterfly project, prepared by the 4-H Entomology Club of which she is the leader, at the Cambria County Fair.

E.R. McDonald of Port Hope, Ont. wrote an article re monarchs for "The Curlew", published by the Willow Beach Field Naturalists, and edited by Audrey Wilson, Cobourg.

Arthur Cook of Charlottesville, Virginia, won the award of "Future Scientists of America" for his studies and original research which were reported in the September 16, 1964 edition of "Science World".

Fred Hough of Accord, N.Y., wrote an article on the monarch butterfly which was published in the January, 1964 edition of the Natural Science Series by the John Burroughs Natural History Society.

Marcia Chambers of Tulelake, Calif., had an article and photograph printed in the Tulelake Reporter. Marcia reports that monarch chasing in her rattlesnake infested area is accomplished by pursuit in cars and on horses!

Linda Oldfield of Gretna, Nebraska, displayed a science project at the Science Fair at Nebraska City. Linda's picture and an article about her project appeared in the Evening World-Herald of Omaha Nebraska.

Miss Ivy LeMon of Topsfield, Mass. won the "Conservation Award" for her T.V. program about monarch butterflies.

Paul Beard of Davis, Calif had an article and photographs featuring his banding activities published in the Monterey Peninsula Herald.

ON FILE

We have established in our laboratory a filing system such that all meaningful reports are kept until necessary information is extracted from them. We keep running records of abundance, flight direction, parasitism, and natural history notes. Some of these records are used directly in a publication while others are used in conjunction with many other reports in order to substantiate a certain conclusion.

We keep a complete record of all recaptures. Included in this record are: The name of the person recapturing the specimen, his address, the date of recapture and the place. This is indexed to the person who tagged the specimen, when it was tagged, where and under what conditions.

Since we are studying a single, migrating population throughout North America it is more satisfactory to keep all records in one office. In this way, any discrepancies may be investigated, and, when necessary, data changed. We do not file or accept "sight records" of tagged specimens. If, for example, a person writes to us stating that he "saw" a butterfly with a tag on its wing and the number was 2345, this is not considered authentic unless the actual tag has been received. We have found from past experience, that you cannot rely upon such records, since the number is very often read incorrectly. We therefore ask all associates to report directly to our laboratory for the principle reason that it keeps all records uniform and as free from error as is possible. Anyone may refer to these records when he so desires.

Some of our associates have suggested carrying on a tagging program in their own area since they feel that this would assist us in recording the information. Unfortunately, we find that more work is entailed in trying to correct inaccuracies or attempting to understand the composite report submitted than to have had the original tags sent out from our laboratory and recaptures returned directly to us. Also, it is necessary to continually record recaptures throughout the entire continent rather than attempt to do so at any one time from one particular area when a large report is received. We would point out, however, that any associate who wishes to carry out some phase of the research on his own is encouraged to do so, but the actual tagging should refer the specimens back to us. Where such data is sufficiently complete and meaningful, credit is given to the person or persons involved.

SCIENCE REPORTS

From time to time when sufficient accurate information is available, the results of our work will be published in some scientific journal. A report on our transfer experiments, upper air data and a review of the tagging program has been submitted to the "Proceedings of the Entomological Society of Ontario". This should appear within the next three months.

If you wish to obtain a copy of this science report please write and request the copy. They will only be sent on request and they are available only to our associates. Since this part of the work is financed by the National Research Council of Canada, there is no charge for this publication. There will, of course, be only a limited number available since we do not wish to order too many copies and have them collecting dust on our shelves, nor do we wish to make undue charges against our research grant.

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