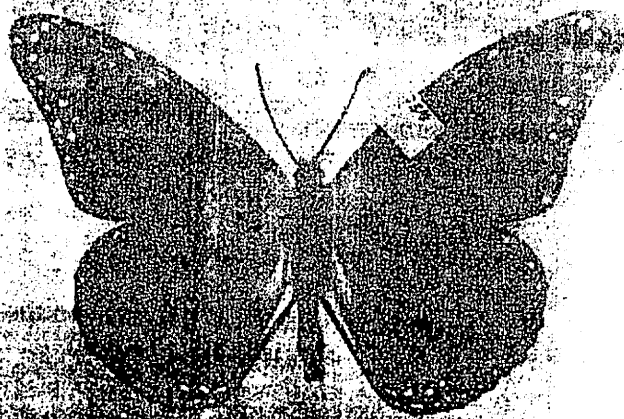


*Insect  
Migration  
Studies*



*Newsletter  
to  
Research Associates*

VOL. 5 MAY 1968

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.

\* \* \*

FROM PROFESSOR URQUHART

HEAD OF MONARCH RESEARCH PROJECT

RESEARCH

Our laboratory at the University of Toronto is engaged in a number of phases of research on invertebrate animals - at the present time our efforts are confined to species of insects.

We have working with us a graduate student, Miss Chang from the University of Taipei, Taiwan. Miss Chang is making a study of the photoreceptor mechanisms of lepidopterous pupae. Included in this study is a histological and physiological consideration of the "gold spots" found on the pupa of the monarch butterfly.

Mrs. P. Dampney, a graduate student from the University of Australia and a post-graduate student of the University of Tasmania, is carrying out a study of the chemoreceptor mechanisms in the larva of Lepidoptera. She is using a technique of microcauterization to kill the receptor cells. Mrs. Dampney is also an instructor in our Department.

Mr. Brian Kelly, a Senior undergraduate student, will commence a study of Batesian Mimicry this summer in addition to acting as our laboratory technician.

We are completing a study of the alar glands of the monarch butterfly and advancing our study of the polyhydrosis virus infection.

The above studies are supported financially by the University of Toronto and the National Research Council of Canada.

\* \* \*

We are also continuing our interest in the study of the migrations of the monarch butterfly. These studies include, in addition to the tagging programme in which we are all involved and from which we derive much pleasure, a consideration of the resident populations of monarch butterflies in California and Florida.

Dr. Smithers of the Natural History Museum in Sydney, Australia, will be visiting our laboratory this summer and we hope to commence the preparation of a joint publication with him dealing with the resident populations in Australia.

These studies are supported by contributions from those interested in this field of research and by the fees paid by our associates. Such funds are held by the Office of Research Administration of the University of Toronto and are used for defraying costs involved specifically with our migrations studies.

As reported elsewhere in this Newsletter, our programme has expanded so that we may now turn our attention to a study of the movements of other species of Lepidoptera and many of our associates have tagged various species of butterflies and moths this past year. This is indeed a most happy event and we are hoping to obtain definitive data which has never before been possible.

## PROFESSOR URQUHART'S REPORT (CONTINUED)

The study of the migrations of the monarch butterfly, as well as other species of butterflies and moths, is a most enjoyable one. We receive many hundreds of letters every month from our associates and others expressing their delight at taking part in this research. Published results make our findings available to scholars all over the world and we receive requests for copies of such publications from them and exchange our ideas. We all share in these accomplishments.

\* \* \*

I would like to thank Miss Audrey Wilson, our editor, for her help in proofreading and arranging to have the Newsletter printed and mailed to our associates.

\* \* \*

### TAGGING RETURNS FOR 1967

<u>TAGGED BY</u>	<u>A T</u>	<u>RECAPTURED AT</u>
Mrs. Gladys Black	Pleasantville, Iowa	Denham Springs, Louisiana
Mr. Edward Keith	Long Point, Ontario	Emmitsburg, Md.
Mrs. C. R. Orr	Houston, Texas	Carmona, Mexico
Mr. David Minasian	Sacramento, California	Los Angeles, California
Mr. David Portal	San Jose, California	Ventura, California

Of the hundreds of returns of tagged monarchs that we have had this year space permits us to mention only a few which have made significantly long flights.

Please note: Many report sheets have not as yet been returned. We would like to have them returned as soon as possible as our recording of data is being held up in the meantime.

\* \* \*

### NOTICE RE RETURNING TAGS

Please note that it is no longer necessary to return any tags that you have left over from the previous season. Simply be sure to record the year in which the tags are used.

Even if you have tags left over and do not need additional ones for the coming season, it is still necessary for you to pay your renewal fee which covers the Newsletter, correspondence and research.

\* \* \*

### NEW BUTTERFLY TAGGING REPORTS

Please note that we have changed the format of the butterfly tagging report sheets since we are now involved in tagging not only monarch butterflies but many other species of butterflies in addition to the monarch.

### NEW BUTTERFLY TAGGING REPORTS (CONTINUED)

To this end we have added a column for "species" and we would ask you to fill in this column so that we shall know definitely what species of butterflies have been tagged. Do not assume that we know what species you have tagged or that we shall learn this from the recaptured specimen as sometimes only the tag or a fragment of wing is returned to us and we then have to check the species in order to keep our records from getting confused.

You will also note that we would like you to indicate whether the specimen was "reared" or "wild" as we study the behavior of butterflies with a view to finding if the reared specimens behave differently from the wild specimens. If you have reared butterflies please append a note describing the source of light and the temperature of the rearing cage so that we may compare these conditions with those of the natural environment.

The final column indicating "sex" of the butterfly should only be used when you are tagging monarch butterflies, the sex of which, as you know, is very easy to determine by the black spot on the hind wings of the male - this black spot is not on the hind wings of the female.

The sex of other species is very difficult to determine and therefore we expect you to record this only for the monarchs. However, we would like to emphasize the importance of recording the sex of the monarchs since we are interested in comparing the behavior of males and females.

\* \* \*

### NEW SPECIES TAGGED

As mentioned in our Newsletter of last year we are interested in expanding our programme to include species of butterflies other than the monarch with a view to studying the migration of other butterflies. This data would be unique as up to the present only sight records have been recorded for species other than the monarch.

We are pleased to report that some of our research associates have been experimenting with new species and to date have recorded tagging common eastern swallowtails, tiger swallowtails, red admirals, Lorquin's admiral, mourning cloaks and cecropia moths.

We would like to encourage all of our associates to experiment with tagging new species as this information would be new to science.

\* \* \*

### DONATIONS TO MONARCH BUTTERFLY RESEARCH FUND

It is very encouraging to us to have so many of our research associates donate money to our research fund as it shows more than a normal amount of interest on their part. This year we have had more donations than we have ever had before in spite of the scarcity of monarchs and the consequent drop in the numbers tagged.

We would like to thank the following for their donations:

Mr. Brent Beam, Burlington, Ontario	Mr. James Malick, Stevens Point, Wis.
Mrs. Gladys Black, Pleasantville, Iowa	Miss Linda Malick, Wayne, Neb.
Mrs. Faye Boyles, Ft. Lauderdale, Florida	Mrs. Frederick Marsi, Binghampton, N.Y.
Mrs. Geo. Brewer, Auburndale, Mass.	Mr. Bill Menten, Hasbrouck Hts. N.J.
Mr. Wm. Castello, Ann Arbor, Mich.	Mr. David Miner, Barre, Mass.
Mr. Boughton Cobb, Falls Village, Conn.	Mrs. C. R. Orr, Houston, Texas
Mr. Donald Davis, Colborne, Ontario	Mrs. Francis Rafool, East Peoria, Ill.
Mrs. Paul Elliott, Muskegon, Mich.	Mr. Nicholas Schaefer, Walnut Creek, Cal.
Mr. Glenn Feiszli, Vermillion, Ohio	Mrs. John C. Schmid, Greenwich, Conn.
Mrs. Ruby Fender, Riverton, Iowa	Mrs. L. G. Senghas, Mount Clemens, Mich.
Mr. and Mrs. E. F. Fergus, Lampe, Mo.	Mr. Samuel Sweet, Manchester, Conn.
Mrs. Jessie Glynn, Limehouse, Ontario	Mrs. Frank Throm, Overland Park, Kansas
Mrs. Richard P. Klein, Geneva, Ohio	Mrs. Maryanne West, Gibson's, B.C.
Mr. John Klipstein, Wausau, Wis.	Mrs. Sterling White, Whitney, Texas
Litton Industries, Rexdale, Ontario	Mrs. Nancy Willison, Midland, Mich.
Dr. and Mrs. L. Luxenberg, Tonopah, Arizona	Mr. E. A. Wilson, Island Lake, Man.
	Mrs. Marjorie Wilson, Napa, Calif.

\* \* \*

#### APPEAL FOR FUNDS

In our recent letter to you explaining the strain under which our research fund has been placed, we suggested that some of our research associates might make contacts with institutions or firms re financial support for our project. It was very heartening indeed to learn that some associates had taken up the cause and we should like to thank the following for their efforts on behalf of the fund. They are listed along with the contacts that they made:

Mr. Stephen Auburn - Kodak Co. and National Geographic  
Miss Margaret Fuzek - Two industrial plants in Kingsport, Tenn.  
Mr. Monroe Kulberg - An airline company, Time-Life Inc. and the Mayor of Pacific Grove, California.  
Mrs. Richard Nielsen, North American Wildlife and Natural Resources Federation of Houston, Texas  
Mr. Richard VanDenBerg - a manufacturer in Milwaukee, Wisconsin.

Perhaps the above contacts will serve to promote other suggestions which we hope will occur to you in connection with much needed support for our research. In this connection we have recently approached the Department of University Affairs, (University of Toronto) and Air Canada with a view to obtaining their support.

\* \* \*

#### SUPPLY OF REARING STOCK

Since the virus infection almost totally destroyed our local population of monarch butterflies, we were without breeding stock for our laboratory and we are therefore very grateful to the following for supplying us with breeding stock with which we have been able to carry on a very important part of our research:

Mr. Paul Beard of Monterey, California, Mr. Paul Cherubini of Castro Valley, California, and Mrs. Sue Reuter, of Bradenton, Florida.

\* \* \*

*Sue Reuter*

### SLIDES FOR RENT OR SALE

Our sets of 24 coloured slides depicting the life history of the monarch butterfly are still available for rent at \$2.00 per set plus postage.

These slides are also for sale at the rate of \$5.00 each to research associates who wish to use them for their own collection. However, if research associates wish to use the slides for commercial purposes such as the publication of articles or books or for paid lectures, the charge is \$25.00 per slide. The proceeds are deposited in our research fund.

\* \* \*

### INCREASE IN FEES

When we first initiated a fee for research associates joining this project the contact that we had with our research associates was minimal; we sent out hand written tags and report sheets and once a year, along with the Newsletter we informed the associates of their tagged butterflies that had been recaptured.

During this period we relied mostly on volunteer clerical help which was sufficient at the time, however, over the years our contact with our research associates has become more frequent and to a greater depth. We now send a Newsletter to each new associate, along with tags which are typed on a special typewriter. Copies of scientific papers are available and we supply some material for those taking part in science fairs etc. Those who have tagged butterflies recaptured are informed, as soon as possible throughout the year, of the date and place of recapture. Therefore it is obvious that our workload has increased considerably and we now find it necessary to employ part-time stenographic assistance to cope with our correspondence.

Due to these changes we find it necessary to increase the initial fee for research associates to \$5.00 with an annual renewal fee of \$2.00.

Will you please note the increased annual renewal fee which we have indicated on the membership renewal sheet which is included in the Newsletter.

\* \* \*

### PUBLICITY AND SCIENTIFIC PROJECTS

Mr. Norman Sibley of Whittemore, Michigan, was the subject of a feature article in the Tawas Herald of Tawas City, Michigan, in connection with his extensive work with our monarch tagging programme. Since Mr. Sibley also lives in Florida part of the year, he wrote an article for the Florida Naturalist about the monarch programme. The article was profusely illustrated with pictures which should kindle the interest of Florida naturalists in our programme.

Miss Paulette Samuelson of Pleasantville, Iowa, won first place at her local science fair with her essay "Effect of the Virus Epizootic on the Monarch". Paulette also won first gold medal in Biology in the District Science Fair, and second place in the Hawkeye State Science Fair.

Mrs. Sue Reuter of Bradenton, Florida, has received much favorable publicity from "The Brown Pelican" of the Sarasota Audubon Society and from the "Bayshore Banner" in connection with her rearing and tagging of monarch butterflies in her area.

PUBLICITY AND SCIENTIFIC PROJECTS (CONTINUED)

Donald Davis of Colborne, Ontario, won second prize with his project "Insect Migration Studies" at the Belleville Annual Science Fair.

Margaret Fuzek of Kingsport, Tenn., placed in the Mead Science Essay Contest with her essay on migration.

\* \* \*

SCIENCE PAPER AVAILABLE

"Laboratory Techniques for Maintaining Cultures of the Monarch Butterfly", F. A. Urquhart and R. W. Stegner.

\* \* \*

RE ARTICLES AND BOOKS SOLICITING RESEARCH ASSOCIATES

Due to the popular appeal of the monarch butterfly and also to the lively interest that the public has in scientific research, our work has been the subject of many articles and books. Most authors, without consulting us, advise readers to get in touch with us if they desire to become research associates. Some authors have not stressed the fact that would-be associates must pay a fee in order to participate in our project and some misunderstandings have arisen because of their omission. We would like to make it clear that these articles and books are usually written without our prior knowledge and therefore we have no control over statements made on our behalf.

\* \* \*

MONARCH BUTTERFLIES RELEASED AT SEA

It is a matter of controversy as to whether or not monarch butterflies are capable of flying over large bodies of water - see F. A. Urquhart, "The Monarch Butterfly". Recently we have had an unique opportunity to test the monarchs' ability to fly over water because of the cooperation of one of our research associates, Paul Cherubini of Castro Valley, California.

Paul's father, who is Chief Mate on the "S. S. Hawaii", which runs between Alameda, California and Honolulu, Hawaii, has been releasing tagged monarchs at sea and recording the weather conditions involved. As a result of this we now have excellent data as to the conditions of the butterflies' release and we are now waiting with anticipation in the hope that some of these butterflies being returned to us. If you have any contacts in the southern Pacific islands, you might bring the possibility of their finding a tagged monarch to their attention.

\* \* \*

### HELP NEEDED WITH SPANISH AND PORTUGUESE TRANSLATIONS

Since we have already had several tagged monarch butterflies returned to us from Mexico and we suspect that there are overwintering populations of monarch butterflies there, we are hoping to make contacts with interested individuals in Mexico and involve them in our tagging programme. If this can be done we would then be able to have monarch butterflies tagged before they begin their northward flight and might then be able to learn what routes they follow when they return north in the spring.

Also, since there are monarch butterflies in South America we would like to interest naturalists there in our programme with a view to studying monarchs' flight patterns there.

These efforts will necessitate carrying on correspondence and writing articles in both Spanish and Portuguese. So far we have used a local translation service for our correspondence but this is proving very expensive. For this reason we would like to find out if any of our research associates can write either Spanish or Portuguese and would volunteer to translate letters and articles without charge. This would make a valuable contribution to the expansion of our programme.

If you would be willing to help us in this way, please get in touch with Professor Fred A. Urquhart, Scarborough College, West Hill, Ontario.

\* \* \*

### MONARCH POPULATIONS

There was a slight increase in the numbers of monarchs in the eastern part of the continent in some areas last summer, but for the most part they remained scarce. They were, however, of common occurrence in the western States. On the basis of this, we anticipate an increase in numbers throughout most of the United States and Canada, but more particularly in the northwestern States. They will, however, continue to be uncommon in the eastern United States and eastern Canada.

It is interesting to note that throughout this decline in numbers in most parts of the Continent, the population remained high in California; our associates in this State reported them as being of the same abundance throughout the entire period and with an increase during this past year. This leads us to consider two populations, one migrating southwest through southern Texas and into Mexico, and the California population. The Gulf Coast population is the one that has suffered drastic reduction in numbers owing to the virus infection and it is this population that, through its migrations, populates the eastern United States and eastern Canada. A study of the feasibility of this idea is being considered and we have, in our laboratory, virus particles taken from the eastern and western populations with which we shall investigate the susceptibility of the two populations to this particular virus strain.

\* \* \*



" HEMISFAIR 68 "

You will be interested to learn that the Canadian government has asked us to supply material for a display on animal migration for " Hemisfair 68 ", a world's fair, the theme of which is " the confluence of civilizations in the Americas ". Our work has been selected for the display since the monarch butterfly is known to occur in South America as well as North America and therefore represents a link between the two continents. " Hemisfair 68 " is being held in San Antonio, Texas, starting in April, 1968, and continuing for six months.

If any of our research associates attend " Hemisfair 68 " we would be interested in learning about their reaction to the display on migration.

\* \* \*

OFF TO THE UNIVERSITY OF TEXAS

As a result of my years of service to the University of Toronto, I have been granted a "sabbatical" leave of absence. We, Mrs. Urquhart and I, will be joining our colleagues at the Texas A & I University in Kingsville, Texas, next winter. We hope to carry on our studies there in a location that will permit an on-the-spot investigation of the movement of the monarchs along the Gulf Coast, into Mexico and perhaps to the Pacific Coast.

In addition to carrying out this most delightful phase of our studies, we hope to complete four scientific papers for publication.

We shall be reporting to you concerning our experiences and the results of our studies in a future Newsletter.

\* \* \*

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