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ANNUAL NEWSLETTER TO RESEARCH ASSOCIATES

OF THE INTERNATIONAL ASSOCIATION OF INSECT MIGRATION RESEARCH

IMA

PRODUCED BY SCARBOROUGH COLLEGE, UNIVERSITY OF TORONTO

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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

Although more than 9000 migrant monarchs were tagged this past summer, none of any significance were recaptured. We were most disappointed in the results of the transfer of specimens since we were unable to obtain any new and important recaptures.

Our interest in the monarch butterfly has been expanded to various parts of the world. The work in New Zealand has progressed most favourably and we are looking forward to analyzing the data now on hand in preparation for a publication. Also, the data on Australia will, we hope, be prepared during this calendar year.

We now receive requests for our publications from many parts of the world by interested scientists: Japan, China, India, Spain, Italy, United Kingdom, Germany, Czechoslovakia, Finland, Denmark.

As the result of receiving specimens from various parts of the Greater and Lesser Antilles, together with those from the Central Americas, a new and exciting migratory investigation is emerging. We have published the data available so far with an explanation for the occurrence of monarchs in these Caribbean areas and the possible flight routes to an overwintering Site. Perhaps the most exciting is the relationship between the two sub-species, our North American one and the southern one, Danaus megalippe. In our last field trip to the Antilles we brought back material for research. For this purpose we had a small greenhouse erected on our property, the purpose being to raise megalippe and eventually cross it with our North American sub-species. However, it did not work out too well; owing to an error in closing the lids of the rearing jars, most of the larvae were killed by the excessive heat. We were finally able to obtain nine pupae of which eight produced adults. Of these only one was a male and he died two days after emergence. So ended further experimentation. But we will return for more material and continue this fascinating part of monarch research.

Scientific journals now charge for each printed page of an article. Our last paper cost $420.00 plus extra charges for reprints. At one time papers in scientific journals were published free of charge but as a result of increased cost of labour and materials journals have found it necessary to charge for publication. In order not to deplete our I.M.A. fund we find it necessary to ask for a donation for each paper requested.

As reported in our last Insect Migration Studies, we have had to discontinue making slides available, again owing to costs involved.

We trust that you have had a most interesting summer working with us in the study of the monarch butterfly and we will look forward to working with you again this summer.

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

_____ 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 autobriographical account of monarch migration studies.

_____ 7. Aberrant Migration

Please check which ones you want.

Name: _____

Address: _____

_____

_____

Date requested: _____ Number 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 FOR 1979

Even though we received scattered reports of diseased larvae and pupae from Associates in different areas of Canada and the U.S. this was a good year, comparatively speaking, for tagging monarch butterflies. According to the reports of tagging that we received 9,487 monarchs were tagged. This represents a great deal of work on the part of our Associates and we appreciate their efforts on behalf of the research. However, this was not a particularly interesting year for recapture records. A total of 63 tagged butterflies were reported to us and all of the Associates whose tagged butterflies were reported have been notified.

Having been involved with this work for many years, we realize that tagging butterflies and gathering data on the migration are rather like panning for gold - it takes a lot of work and a high degree of enthusiasm to produce meaningful results. With this in mind we hope for more meaningful results next year.

In any case we enjoyed doing the research this past year and from your enthusiastic letters we know that you did too.

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 MAILS.

MORE ASSOCIATES NEEDED IN ARIZONA, FLORIDA, NEW MEXICO, TEXAS AND MEXICO

We have very little data on the movements of the monarch butterfly through Texas although we know that they pass through this state on the way to Mexico. We do not know a great deal about monarch butterflies in Arizona or New Mexico and we are at present in need of more data from Florida in order to add to our present knowledge of the migrations to Yucatan.

We would appreciate receiving names and addresses of anyone you believe would be interested in assisting in this research in these areas.

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.

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HOLDING LIVE MONARCHS IN STORAGE con't.

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 intersting 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

Why is the monarch butterfly called "monarch"?

It was named after King William of Orange, because of its colour. Hence "monarch" and "King Billy".

How long does a monarch 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 migrants.

How are migrants produced?

In late summer owing to lowering temperatures and decreased amount of daylight, the reproductive organs do not develop in the larval stage - the effect is on the larvae, not the adults. This gives rise to the migrating phase which is inherent in the genetic complex of this species that has evolved over the past millenium of its existence.

How fast can a monarch fly?

A cruising flight of 12 miles per hour; a rapid flight of 20 miles per hour. With a strong tail wind the effect of the wind can double or triple this speed.

How many miles can a monarch fly in one day?

We have an authentic record of a recaptured alar tagged specimen that flew 80 miles in one day. As with maximum flight speed, plus a strong tail wind the monarchs undoubtedly can fly a much further distance than this one record would indicate.

Do monarchs fly in flocks like birds?

Monarchs travel individually, not in flocks. The many records we have received and our own numerous observations of many hundreds apparently flying together, is due to the sudden departure from an overnight roosting location where they do appear in great numbers on roosting trees.

Why do the migrants cluster on overnight roosting trees?

When the temperature falls below 50°F, the monarchs are unable to fly. As the sun sets and temperature begins to fall, they cluster on the trees, on the leeward side, there to remain until warmer temperatures makes flight possible; also, monarchs, as well as other species of butterflies, do not fly during these periods of darkness - they are strictly diurnal.

How long does it take a monarch to develop?

The egg hatches in 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 rates of development at high and low temperatures.

What good is a monarch butterfly?

What good is anything? A Van Gogh painting is only good to the beholder or the value placed upon it. A beautiful sunset or sunrise is also of value to those who can appreciate them. The monarch is a beautiful creature and, because of its remarkable migrations, a most amazing butterfly. Aside from this esthetic value, there are other attributes: it is used for teaching the life cycle and habits of insects in most schools in North America; it is used for experimental purposes in studying cellular physiology and insect behaviourin at least eleven Universities; as the result of our studies, much more is now known about the habits of migrating insects in other parts of the world.

Why study the migrations of the monarch; what value is it?

As scientists we are interested in scientific investigations. It is a case of "knowledge for knowledge sake". This is sometimes referred to as "pure science" since it does not involve the results being used for economic purposes, such as manufacturing a new type of motor car or a new refrigerator. However, from pure science comes the ecomonic value. Were it not for the pure science investigators of the past, there would be no X-ray, no antibiotics, no methods of controlling bacterial growth, etc. etc. etc. It is quite likely that as a result of our interest in the habits and biology of the monarch butterfly, some very important discoveries will be made of which, at the present time, we have not the least conception. KNOWLEDGE FOR KNOWLEDGE SAKE! That is what is most important.

How many eggs are laid by a female?

We have been able to obtain as many as 700 eggs in our laboratory females. Perhaps in nature the amount might exceed this.

What diseases affect the monarch?

A virulent polyhedrosis virus can greatly reduce the monarch population giving rise to their fluctuations in numbers. There are at least 50 strains of bacteria that affect the larval and pupal stages. Tachinid flies, of at least five species, lay their eggs on the larvae which hatch into small, white grubs that devour the internal organs. There are a few parasitic wasps that lay their eggs on the larvae, some of these are about the size of a small house fly while others are not much larger than the head of a pin. There are many predators such as various species of Hemiptera (true bugs), praying mantis, spiders (monarchs caught in the webs of the larger species). Birds, with the possible exception of the black-billed cuckoo and some of the smaller hawks (sparrow hawk) do not attack butterflies. It has been suggested that the reason birds do not attack the monarch butterfly is because of its "unpalatability". This is quite an erroneous hypothesis because birds do not attempt to eat any species of butterflies except under exceptional circumstances.

If the scales are removed from the wing of the monarch, will this hamper their flight?

We have removed nearly all the scales from the wings of experimental monarchs and found that they could fly quite well without their scales, so long as the wing membrane had not been damaged.

Are monarchs found in other places besides North America?

Being such remarkable travellers, the monarchs are found in many parts of the earth; throughout many of the islands of the Pacific, the Caribbean, the Atlantic and in South America and Central America. Those found in the last two areas are presenting a bit of a taxonomic problem which we are presently investigating.

Do monarchs leave a scent on the overnight roosting trees?

After many years of recording the appearance of roosting monarchs we have concluded that no scent is left - it is a matter of direction of flight, availability of flowering plants, and topography. We are engaged in experimental studies to obtain definitive data on this question.

SPECIAL ACTIVITIES

Some of our Associates have reported special activities that they have initiated in connection with the study of the monarch butterfly:

Linda Penn has been teaching enrichment classes for children at a summer session at the University of Toledo. The title of her course is "Beginning Biology with Butterflies". In addition, Linda has been rearing monarch butterflies in her classroom all year round.

Faye Sutherland has made many speeches and has appeared on television on behalf of monarch research. Faye also has a special exhibit on monarch rearing at the Boise, Idaho Zoo. Faye has receive a letter of congratulations from the Governor of Idaho for her work with monarch research.

Edna Sutton gives lectures to school children and adult groups on the subject of the monarch butterfly in the Richland Center, Wisconsin area.

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SPECIAL ACTIVITIES con't.

Mary Ann Tretter leads children's nature groups for the Lehigh Valley Conservancy. The Special project this year was to incorporate a butterfly garden into the Backyard Nature Trail at Pool Wildlife Sanctuary in Emmaus, Pennsylvania.

Nancy Ziebur prepared an exhibit of live monarch material for the children's room of the Cooperstown, N.Y. public library.

PUBLICITY

It is always interesting and gratifying for us to learn that many of our Associates have received press coverage of their research in connection with the monarch butterfly. We are very grateful to those who have sent us press clippings from many papers and magazines in the U.S. and Canada - our thanks to the following for their contributions:

Jim Anderson, Gladys Bick, Ray Bracher, Marsha Briggs, Betty Carlson, Marta Clements, Gina Gordon, Virgil Inman, Mabel Jenkins, Judy and Christopher Keats, Ron Lachelt, Lynne Lankford, Jan Masshardt, Beatrice Ridgeway, Kathleen Rutherford, Faye Sutherland, Maryanne West, Dorothy Yeager.

BUTTERFLY CONSERVATION IN NEW YORK STATE

Dick Buegler has had limited success in his attempt to prevent a road being built in the Great Kills-Crookes Point area. The authorities have promised to close down the road while the monarchs are roosting in the area. Perhaps further efforts on the part of Dick's group will succeed in shortening the road in order to protect the butterflies.

IN MEMORIAM

We would like to extend our sympathy to Patricia Malick, whose father, James Malick, passed away last year. James Malick was a longtime Associate whose membership in our group commenced in 1964. We shall miss our association with Mr. Malick but are gratified that Patricia will continue as a research associate.

We would also like to express our sympathy to Alice Woodcock whose husband died recently. We are please to report that Mrs. Woodcock is going to continue her association with us after a pause of some years.

SPECIAL DONORS TO RESEARCH FUND

We would like to thank all of those who sent in donations to our research fund which was badly depleted last year. Our sincere thanks to those who responded so generously to our special appeal and who made donations in excess of the suggested amount: Jerome Barry, Betsy Briggs, Kenneth Brooks, Ralph and Gabriel Brown, Frances Buchanan, Betty Carlson, Joan DeWind, Erma DeWitt, Mrs. Paul Elliott, Mrs. C.F. Farwell, Jean Craighead George, Jim Gilbert, Jessie Glynn, Carol Hillman, Mary Holliday, Mabel Huber, Mrs. Franklin Hupp, Mabel Jenkins, Margaret Katz, Christopher and Judy Keats, Evelyn Kendrick, Donna Kessler, Ron Lachelt, Van Luxenberg, Ruth Anne McKee, Alan Morris, Mary Jane Rabatin, Walter Regula, Beatrice Ridgeway, Virginia Spafford and Family, Maryanne West, Roger Wilson and Nancy Ziebur.

WHEN DID YOU RECEIVE YOUR 1980 COPY OF INSECT MIGRATION STUDIES?

Last year we had many reports from Associates informing us that they did not receive their copy of Insect Migration Studies until several weeks after they had been mailed by us. Others stated that they did not receive a copy at all.

When you are filling out your renewal of membership form would you please inform us of the date when you received your copy of I.M.S. so that we can tell whether or not the extra expense of using first class mail is justified.

We will be sending some copies by first class mail and others by third class mail and we will compare the results.

RESEARCH ASSOCIATES 1979-80

Those listed below are research associates who have been actively involved in our research for the year 1979-80.

Please note: If your names does not appear on this list, it is because you joined our group after this issue was submitted for publication.

A.

Allgrove, Valerie. Windsor, Connecticut
Anderson, Carolyn. Madison, Wisconsin
Anderson, Timothy P. Richfield, Minnesota
Armstrong, Fred. Red Bank, New Jersey

B.

Barry, Jerome J. Bedford, New Hampshire
Beauchaine, Mrs. Willard. Elk River, Minnesota
Belknap, Ralph. Ann Arbor, Michigan
Black, Gladys. Pleasantville, Iowa
Blythe, Greg. Tranquillity, California
Bracher, Ray W. South Bend, Indiana
Brady, Wm. S. Brewster, Massachusetts
Breen, Jean. Brookfield, Connecticut
Briggs, Betsy. Marshfield, Massachusetts
Brooks, Kenneth A. Glen Arm, Maryland
Brown, Gabriel & Ralph. Baltimore, Maryland
Brownlee, Louise. Dryden, Ontario
Buchanan, Frances B. New Paltz, New York
Buckingham, Stacey. Bruneau, Idaho
Buegler, Richard P. Staten Island, New York

C.

Carlson, Betty N. Lake Oswego, Oregon
Carpenter, Fairbank. Far Hills, New Jersey
Carter, Gray. Winston-Salem, North Carolina
Cieniuch, Gary A. Dearborn Heights, Michigan
Clemente, Michael F. Atlantic City, New Jersey
Clements, Marta. West Paris, Maine
Coleman, Wm. J. Ventura, California
Conroy, Philip. Paterson, New Jersey

D.

DeMar, Sharon J. Romeo, Michigan
deMontes, Sra. Barbara M. Can Cun, Quintana Roo, Mexico
DeWind, Joan M. Sherman, Connecticut
DeWitt, Erma R. New Paltz, New York

E.

Eller, Lilliam. Mason City, Iowa
Elliott, Mrs. P.A. Muskegon, Michigan
Emery, Mrs. Calvin. Nevada, Missouri

F.

Fairfoul, G.L. Toronto, Ontario
Farwell, Mrs. C.F. Bala, Ontario

G.

George, Jean Craighead. Chappaqua, New York
Gilbert, James R. Waconia, Minnesota
Glovas, G.S. Bethlehem, Pennsylvania
Glynn, Mrs. J. Limehouse, Ontario

H.

Hagenson, Barbara. Clinton, Iowa
Halmi, Caris. Erie, Pennsylvania
Hansen, Mrs. R.E. Staten Island, New York
Hatch, Wendy. Port Carling, Ontario
Haws, Karl W. Welch, Oklahoma
Henshall, Mary S. Nampa, Idaho
Hillman, Carol B. Harrison, New York
Holliday, Mrs. M. Reno, Nevada
Hopf, Alice. New York, New York
Horr, Alta L. Gretna, Nebraska
Hosea, Kerman F. LaFayette, Louisiana
Hoskins, Dorothy M. Weston, Massachusetts
Houck, Harvey & Lorraine. Decorah, Iowa
Huber, Mabel L. Fernley, Nevada
Hughes, Lee Ann. Palmgra, New York
Hupp, Mrs. Franklin. Hinton, Virginia

I.

Inman, Virgil. South Bend, Indiana
Irwin, Ann D. Bloomfield Hills, Michigan

J.

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

K.

Katz, Margaret. Riverdale, New York
Keats, Cnristopher. Clearwater, Florida
Keeney, Norwood H. Hudson, New Hampshire

K. con't.

Kendrick, Mrs. . Sault Ste. Marie, Ontario
Kessler, Mrs. Leo R. Audubon, Iowa
Kister, Patricia A. Appleton, Wisconsin
Klass, Judith. Leonia, New Jersey
Knutson, Debbie. Iron Mountain, Michigan
Korte, Jeff. St. Cloud, Minnesota
Kough, Ruth. Dysart, Pennsylvania
Kupas, Douglas F. New Kensington, Pennsylvania

L.

Lachelt, Ron. Minneapolis, Minnesota
Larson, Donald W. Minnetonka, Minnesota
Locher, Tamian. Chesterland, Ohio
Lopina, Marion T. Wauwatosa, Wisconsin
Lorimer, John & Family. West Bloomfield, Michigan
Luxenberg, Mrs. Lester. Castle Rock, Colorado

M.

Mahan, Harold D. Cleveland, Ohio
Malick, Patricia. Stevens Point, Wisconsin
Mallery, Mr. & Mrs. C. Vestal, New York
Manos, Marilyn. Provincetown, Massachusetts
Masshardt, Jan. Brooklyn, Wisconsin
Masuoka, James. Chardon, Ohio
Mathes, G. Eldred & Marjorie. Pontiac, Michigan
Matson, R.R. Minneapolis, Minnesota
McClusky, J.V. Fredericksburg, Texas
McKee, Ruth Anne. Stockton, California
McLeod, Dave. London, Ontario
Meyer, Tim & Sandra. Milwaukee, Wisconsin
Milani, Ruth. Meaford, Ontario
Miller, Donna. Ottawa, Ontario
Mockli, Gary C. Lakewood, California
Monica, Molly. Berkeley Heights, New Jersey
Morris, Alan. Brigham City, Utah
Mueller, Kimberly Ann. Brookfield, Wisconsin
Murray, Sarah M. Tuscola, Illinois

N.

Neale, J.H. Berkeley Heights, New Jersey

O.

Ortt, Marilyn & Jennifer. Marietta, Ohio

P.

Patent, Dorothy H. Missoula, Montana
Pauly, Christina M. Brookfield, Wisconsin
Pendleton, Emily V. Montevallo, Alabama
Penn, Linda. Toledo, Ohio
Pizzini, Mark Alan. Arondale, Pennsylvania
Podnieks, Vizma M. Edina, Minnesota
Powers, Steve. Philadelphia, Pennsylvania
Preston, Mrs. Barry W. Whiteford, Maryland

Q.

Quinn, Joanne M. White Plains, New York

R.

Rabatin, Mary June. Chardon, Ohio
Raver, Jackie. Salem, Illinois
Reese, Randy. Newark Valley, New York
Regula, Walter F. Hamilton, Ontario
Reichert, D. Hanover, Pennsylvania
Ridgeway, Beatrice. North Eastham, Massachusetts
Roush, Ellen. Lynchburg, Ohio
Running, M.H. Two Harbors, Minnesota
Rutherford, Kathleen M. St. Catharines, Ontario

S.

Scott, Mrs. George C. Casper, Wyoming
Senghas, Joan. Mount Clemens, Michigan
Siegel, Russell. Danbury, Connecticut
Sicker, W.E. Madison, Wisconsin
Sinclair, Mary Lu. Falls Village, Connecticut
Smith, Leslie V. Citrus Heights, California
Smith, Susie. Bountiful, Utah
Smith, Trudy. Groton, Connecticut
Spafford, Michael & Mark. Saunemin, Illinois
Spears, Ian. Toronto, Ontario
Spooner, Sally. Lakeville, Massachusetts
Stull, Jean H. Waterford, Pennsylvania
Sutherland, Faye. Boise, Idaho
Sutton, Edna M. Richmond Centre, Wisconsin
Swanson, Severin. Omro, Wisconsin

T.

Teed, Mrs. L.B. Wichita, Kansas
Timothy, Katherine W. Kaysville, Utah
Totton, Larry W. Granger, Iowa
Tretter, Mary Ann. Emmaus, Pennsylvania

U.

Union County Outdoor Education Center, Berkeley Heights, N.J.

V.

Votava, Nancy. South Bend, Indiana

W.

Wardwell, Wayne. Caldwell, Idaho
Weber, Lois. Clearwater, Florida
West, Maryanne. Gibson Landing, British Columbia
Williams, Gary. Glen Ellyn, Illinois
Wilson, Audrey. Cobourg, Ontario
Wilson, Roger L. Moville, Iowa
Wolf, Lesley Ann. Newton, Iowa
Woodcock, Alice P. Upper Montclair, New Jersey

Y.

Yeager, Dorothy. Pearsall, Texas

Z.

Ziebur, Nancy K. Binghamton, New York