

your calls and seeing you out there on our weekly bird walks and at our monthly meetings. Again, thank you for taking the time to read the *Skimmer*.

WELCOME NEW MEMBERS

Marion Yavarkovsky

We are happy to welcome the newest additions to the South Shore Audubon "family." Our family values include a concern and love for our natural environment. We hope you will join us in our quest for beauty and knowledge. Our weekly bird walks and monthly meetings are for you. Join the family!

[For information on SSAS membership, please call our Membership Chairperson, Marion, at 379-2090. The best time to call is after 4 P.M., Monday through Friday.]



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It's Tuesday afternoon. For the past several months, instead of going home after school, a group of 5th and 6th grade students have gathered together at Oaks School #3 in Oceanside. They have been learning how to identify trees, measure their circumference and height, and take scientific measurements involving atmosphere and climate, hydrology, and water chemistry. These members of the GLOBE Club have been training to take scientifically sound measurements in anticipation of the day that they will return to Brookside Preserve, where they will perform these experiments and study the biology and geology unique to the preserve.

Because of a generous grant from South Shore Audubon Society (which manages the County-owned preserve), the students were able to select this beautiful and natural location as a study site. They began their investigations in mid-November, when they were given a guided tour of Brookside.

GLOBE (Global Learning and Observations to Benefit the Environment) is an international science and environmental education partnership initiated by Vice President Al Gore. GLOBE students hope to contribute to a better understanding of the planet by making regular environmental observations at thousands of locations around the world and sharing their information via the Internet. Their data is combined with input from other GLOBE schools around the world and with other science sources, such as satellite imagery, to create dynamic, online images of the Earth. All students will be able to map the precise location of the study areas using a global positioning system (GPS) receiver. The GPS unit is accurate to within 15 meters, an accuracy essential to the scientists who will be using the student-produced data in research projects.

Any person with a World Wide Web-capable connection to the Internet can view the image maps generated by GLOBE student data. Just link up to GLOBE at <http://www.globe.gov>.

[Editor's Note: Kathy Chapman, an Oaks School teacher, is the GLOBE Club's leader.]

CAMP SCHOLARSHIP WINNERS

Carole A. Adams

Congratulations to the Audubon camp scholarship recipients. William Werner of Seaford was honored with the Youth Camp Scholarship and South Shore Audubon's very own Diane Singer was honored with the Adult Camp Scholarship. On behalf of SSAS, I congratulate them both and look forward to hearing about their Maine camp experiences. Many thanks to those of you who sent in scholarship applications. The Education Committee looks forward to considering your applications for next year. If only we could send everybody!

pattern more often compared to birds' migration than to that of other insects. The Monarch butterfly is a species widespread throughout most of the world. It is considered a tropical insect and migrates from areas subjected to prolonged cold spells. In America, Australia, and New Zealand, the Monarch travels long distances to form vast wintering colonies.

What is the normal life cycle and breeding habits of a Monarch butterfly? It takes four or five generations of Monarch butterflies to complete one full migratory cycle. The "warm generations" live roughly one month, mating throughout their short lives as they slowly make their way north following the blooming of the milkweed. In contrast, the southward bound Monarch lives much longer — from six to nine months and sometimes up to one year — mating primarily from January to March.

The female lays each of her 600 eggs underneath a separate milkweed leaf. From egg to adult, the Monarch evolves through five stages. The larval, or molting, phases of the caterpillar take from three to five weeks, with the last caterpillar forming a beautiful chrysalis (the pupa) that looks like a blue-green colored Chinese lantern studded with gold nuggets. Ten days later, the chrysalis becomes transparent, revealing the butterfly's shape and colors. It hatches in about 80 seconds! The butterfly then pumps water into its crumpled wings, waits until they are dry, and a few hours later flies away as a splendid butterfly.

How do the Monarchs know where to migrate? Because the Monarch is too fragile to sustain the perils of traveling thousands of miles and because it does not live long enough to complete even one migration, the butterfly cannot benefit from the migrating route experience of its elders, as do birds and other migrating animals. Scientists agree that the Monarch performs a navigational feat, yet they don't agree fully on how it does so.

Its eye contains a device — the ocelo — which records the subtle changes in the angle of the sun. The ocelo may trigger the Monarch's decision to travel. Some naturalists feel that the butterfly "marks" its territory before leaving it, thus making it easier for the next generations to return. Others think that the magnetite particles inside the Monarch's body are responsible for the butterfly reacting to changes in the earth's magnetic field. The Michoacán region has a higher level of magnetic iron than the surrounding country, which could explain why this area was chosen as the wintering roost in the first place. For controlling flight orientation, the butterfly possesses at the base of its antennae a keenly sensitive instrument (the Johnston organ), a sort of compass with a time machine.

What does a Monarch look like? Do males differ from females? With a wingspan of 3 to 4 inches (7.6 to 10.2 centimeters), the Monarch is one of the largest in the Lepidoptera family. The male is larger than the female. Its wing veins are thinner and each hind leg bears a scent pouch. The male also has different markings on the back wings, called "alar" spots. Both male and female are bright mandarin

orange and black, with tawny or whitish specks on the upper side, while the underside is duller brown and tan.

What do the Monarchs eat? What is their relationship to milkweed? The Monarch's scientific name is *Danainae*, meaning milkweed butterfly. While the butterfly eats nectar, the caterpillar's only food is milkweed (*Asclepia*). Milkweed contains a cardiac glycoside, *cardenolide*, a toxin which remains in the body of the mature butterfly during its entire life. This poisonous toxin is a built-in protection against predators. Among the 2000 species of milkweed in the world, about 100 are found in North America, with each species growing in a different region. Because the different milkweed species vary chemically from region to region, scientists can determine where a specific butterfly had its first milkweed meal, still chemically recorded in its body. Thus, they can know where any individual Monarch was born. (For example, the Texas milkweed examined in a butterfly body leaves a different pattern of spots than would an Alabama milkweed.)



What are their predators? To name but a few, the Monarch's natural predators are mice, birds, praying mantis, and spiders. Wind, rain- and hailstorms, cold temperatures, cars, drowning, etc., also kill millions of Monarchs. It is believed that one out of five dies of starvation each year. Of course, the greatest threats to the Monarch's survival are the use of pesticides and the growth of urban development, both of which destroy milkweed habitat. In addition, continuing deforestation reduces the roosting areas and, alas, even tourism is detrimental as it brings more and more traffic into the reserves and disrupts the Monarch's colonies. Sightseers are encouraged to stay on marked trails accompanied by a guide.

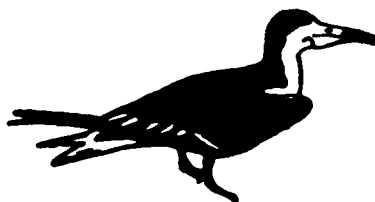
Since the Monarchs are tropical insects, why do they choose the mountains of central Mexico instead of a warmer place? It does seem paradoxical. However, the butterflies have found a perfect solution for survival. The mountain forests offer humidity and protection from the bitter cold. The temperatures are low enough to inhibit movement, breeding, and aging. In such a "semi-dormant" state, the butterfly saves precious energy. In the same way, when the low sun angle and cooler temperatures of autumn arrive, the Monarch stops mating to concentrate all its energy on eating. The nectar is transformed into lipids, needed for the long journey south and the winter months where food is scarce.

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