CHICAGO AUDUBON SOCIETY
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Periodicals

COMPASS

Navigating the world of birds and nature

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Not all Sweetness and Light

by Jack Connor

Every birder knows that hummingbirds have a symbiotic relationship with certain wildflowers. Browse through any textbook about bird biology, and you will almost surely find a section detailing the connection—complete with photographs of the birds nectaring and diagrams of bills, tongues, stamens, pistils, and corollas. Because they are tubular and showy, and often red, the plants gain pollinators with long memories, who return to the same flowers again and again. And because their bills are long and their tongues flexible and grooved, the birds have access to energy sources not readily available to other animals. The birds probe the flowers to collect the nectar at the bottom of the corollas and come away dusted with pollen, which they carry from flower to flower. The birds are fueled; the plants are fertilized.

Hummingbirds and "hummingbird" plants make such an eye-catching ecology lesson that textbook authors repeat it in book after book, and birders often fail to see that it's not the whole story. What's easy to forget is the proviso that most texts generally mention in a sentence or two but rarely illustrate: "Hummingbirds supplement their sugar diets by feeding on small arthropods." Most of us know this truth, but my sense is that too many of us consider it a trivial point. How many birders have made a determined effort to watch how hummingbirds feed themselves away from flowers? And how important is that supplement, anyway?

One problem may be that we don't know what to look for. In a fairly lengthy library and Internet search, I found few illustrations of arthropod-hunting by hummingbirds (although it's easy to find photographs and drawings of the much rarer activity of hummingbirds being killed by praying mantises). The oldest explanatory images I could find dated to 1946 and appear in an article by German ornithologist Helmuth O. Wagner titled, "Food and Feeding Habits of Mexican Hummingbirds," published in The Wilson Bulletin.

Wagner studied the foraging behaviors of more than a dozen species in Mexico during the 1940s. He illustrates the techniques used by starthroats, sabrewings, violet-ears, and other hummingbirds to capture flying insects from the treetops, over cornfields, and above forest streams. Several hummers are drawn in silhouette flying up from tree branches to snatch insects from the sky, kingbird-style—a foraging technique that today would be called sally-hawking. He also describes hummingbirds gleaning prey from bark, leaves, and even water surfaces.

Based on his field observations, his work with captive hummingbirds, and the stomach contents of collected specimens, Wagner concluded that insects and spiders were far more important in hummingbird diets than is generally understood and that nectar was not as essential as many authorities believed. Hummingbirds adapt their foraging to whichever sources are available, and arthropod prey often replaces nectar. "The food of hummingbirds is determined primarily by habitat and season," he wrote. "A given species may feed mainly on nectar or mainly on insects, depending on the time of year. The majority of the hummingbirds in Mexico are not dependent on flowers."

Although few researchers have claimed that hummingbirds can go without nectar indefinitely, a number of them have argued that arthropods are more important in the birds' diets than is generally supposed. A 1980 study published in The Condor involved just a single individual hummingbird, but it is frequently cited. Robert D. Montgomerie and Catherine A. Redsell tracked the foraging activities of a female Broad-tailed Hummingbird for two weeks in May in and around her nest in Rose Canyon in Arizona's Santa Catalina Mountains. The researchers surveyed for nectar plants in the nearby landscape

Hummingbird stealing insects from spider web. Photo by Amber Coakley.

(in a one-kilometer-diameter circle around the nest) and found none in bloom that were appropriate for hummingbirds. Over several subsequent days, they recorded time budgets for the female's activity for 10-minute intervals during each daylight hour (6:00 A.M. to 8:00 P.M.) and followed all her movements away from the nest as best they could. "During the 19 foraging bouts…that we observed," they reported, "the hummingbird spent all her time either flycatching, gleaning from leaves, probing among lichens on tree trunks, or flying between foraging sites." Their conclusion: "[T]he bird must have subsisted only on arthropods for at least two weeks."

A much larger study by J. V. Remsen, F. G. Stiles, and P. E. Scott published in 1986 in The Auk examined the stomach contents of more than 1,600 individuals of 140 species of tropical hummingbirds and found that 79 percent held arthropod remains. "The data indicate that most hummingbirds, at any given moment during the day, are digesting arthropods [and suggest that] most hummingbirds feed on arthropods on a daily basis and probably at regular intervals throughout the day."

Why don't we notice hummingbirds hunting more often? Could it be that they spoil us—chasing each other through our yards, preening in the open on leafless perches, or, best of all, zooming right up under our noses to nectar at our feeders and garden plants? In those situations they make themselves hard to miss. Hunting for insects, however, they seem to keep a lower profile, noted often only by those who are most alert.

In a report published in The Condor in 1995, summarizing his 18 years of hummingbird observations in the lowland forest in La Selva, Costa Rica, F. G. Stiles describes and illustrates four primary methods tropical hummingbirds use to capture arthropods. Do temperate-zone hummers use the same?

The first method, hover-gleaning, looks like nectaring: the bird holds itself in the air a few inches from a spider web or a leaf and reaches for the prey with bill and tongue. This may be the most easily observed of the four methods. If you witness this behavior, you might try to determine the bird's target—sometimes it's the spider, but hummers also parasitize from the webs, taking insects the spider has already captured. (And, of course, female hummers often steal the threads from webs as adhesive building material for their nests.) A second method, hover-hawking, also involves hovering, but here the bird zigzags through swarms of insects, picking them off one by one, almost as a swallow might. The final two methods are probably the hardest to notice because both involve the bird sitting quietly and mostly motionless, scanning for prey. In sally-hawking, the bird flies up to snatch a single flying insect and then returns to its perch. In sally-gleaning, the hummer flies up to pick an insect off a leaf and returns to perch.

Stiles' superb and lengthy article cannot be summarized adequately in the space available, but here are a few highlights:

More than half of all foraging efforts Stiles recorded (both nectaring and predation) involved hunting for arthropods. Nectaring is actually the less-frequent activity.

Hawking is more frequent higher in the vegetation; sally-gleaning and hover-gleaning are more common at lower heights. Foraging activity of all types is most intense early in the morning, when the birds are at their hungriest.

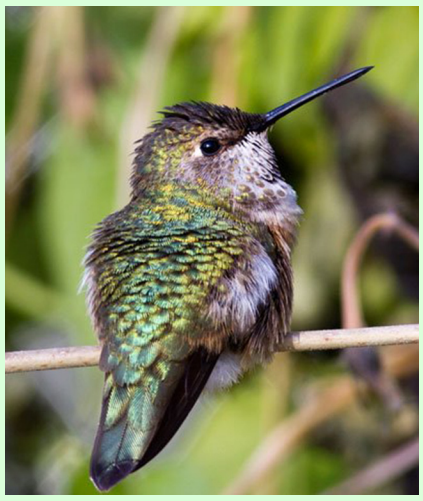
Spiders are a favored prey among many species; some tropical hummers feed almost exclusively on them. Stiles even noticed some spiders retreating from their webs when the birds hovered near, and he suggests this might point to a competitive advantage for hummingbirds with longer bills, which can still probe and grab without alerting their prey by the whir of their wings.

During the nesting season (at La Selva at least), females spend three to four times more time searching for arthropods than males do. In fact, the importance of arthropod foraging may be one reason why female hummers in many species—including several North American species— have longer bills than their mates. In all hummingbirds, females are the sole caretakers of their nests and young, obligated to gather all the food for their nestlings, which need protein for growth.

Can observers equipped only with binoculars study these phenomena? The answer is an unqualified yes. Stiles depended extensively on his visual observations of birds in action in compiling his data, as did Wagner in the 1940s, when binoculars were much weaker instruments than they are today.

Searching for them out away from our feeders is one key, of course. That involves a little extra legwork. As is the case in many other birding challenges, however, the real challenge is mental: to learn how these birds truly live their lives, we must make the effort to look past their flash and dazzle to the grittier reality just beyond.

Courtesy of Cornell Lab of Ornithology.



Above: Broad-tailed Hummingbird, Oak Park, Illinois 2011. Photo Jerry Goldner.

Right: Broad-tailed hummingbird with tail feathers displayed. Photo Jerry Goldner.

How Do Pigeons Find Their Way Home?

Unlocking The Secret Of How Birds Navigate

By Justine E. Hausheer

The pigeon is far more mysterious than meets the eye. Considered a nuisance by many, these birds are the stars of ongoing research into birds' sixth sense: navigation.

From the ancient Romans to the Allied forces in World War II, humans have long used pigeons to carry messages because of their remarkable ability to find their way home. Pigeons and many other migratory birds are thought to use the earth's magnetic fields to stay the course, but scientists aren't sure how our feathered friends detect and process magnetic information. New research is answering some of these questions.

In May scientists reported that brainstem cells associated with the inner ear are activated when a pigeon is exposed to magnetic fields. "The brain cells signal the direction, intensity, and polarity of the earth's magnetic field," says J. David Dickman, a neuroscientist at Baylor College of Medicine in Houston, who lead the research, published in Science. "These signals could be used like a GPS."

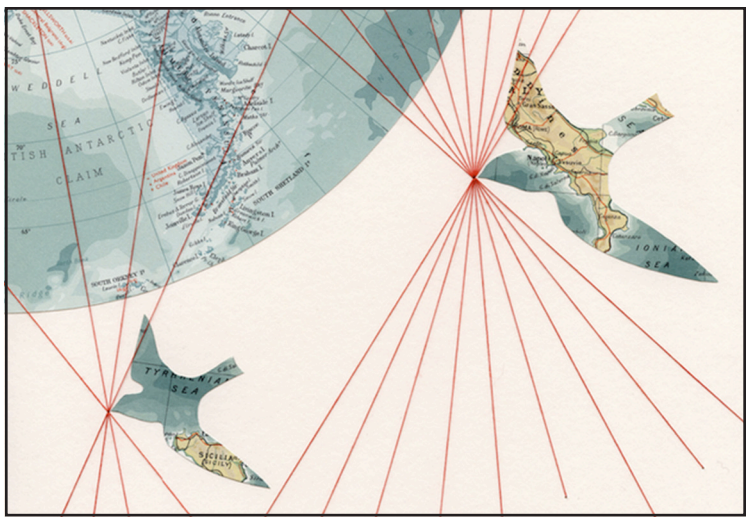


Illustration by Shannon Rankin/Selflesh.etsy.com

Other creatures have internal compasses—trout detect magnetic information through their nose, and migrating loggerhead turtles pick up on both latitude and longitude—but most navigation research has focused on birds.

Until recently, scientists thought that iron-rich neurons in pigeons' beaks transmitted information about magnetic fields to their brains. But another team unexpectedly disproved this theory in April. The researchers discovered that the iron-rich beak cells aren't neurons at all but actually macrophages, or white blood cells that help the bird's immune system. They're loaded with iron because they recycle old red blood cells, says David Keays, lead researcher and a neuroscientist at the Institute of Molecular Pathology in Vienna, Austria. "We found them all over the bird, from the skull to the wings," he says. "They're on patrol for pathogens."

The discovery means that scientists must continue the search for the magnetic field-sensing cells. But they aren't flying blind: Dickman's work hints that those just might be found in the inner ear.

Golden-crowned Kinglet

Golden-crowned Kinglet. Photo by Dave Rintoul.

A tiny, continuously active bird, the Golden-crowned Kinglet is most often found in coniferous woods. Despite being barely larger than a hummingbird, the kinglet winters northward to Canada and Alaska.

Formerly breeding almost exclusively in the remote, boreal spruce-fir forests of North America, this diminutive bird has been expanding its breeding range southward into spruce plantings in Pennsylvania, Illinois, Indiana, and Ohio. They usually raise two large broods of young, despite the short nesting season of the northern boreal forest.

The female feeds her large brood only on the first day after they leave the nest. She then starts laying the second set of eggs while the male takes care of the first brood. Despite having eight or nine young to feed, the male manages to feed them, himself, and occasionally the incubating female as well.

Each of the Golden-crowned Kinglet's nostrils are covered by a single, tiny feather.

Golden-crowned Kinglet. Photo by Kelly Azar.

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Chicago Peregrine Program

Monitoring Peregrines

Photo courtesy of The Field Museum.

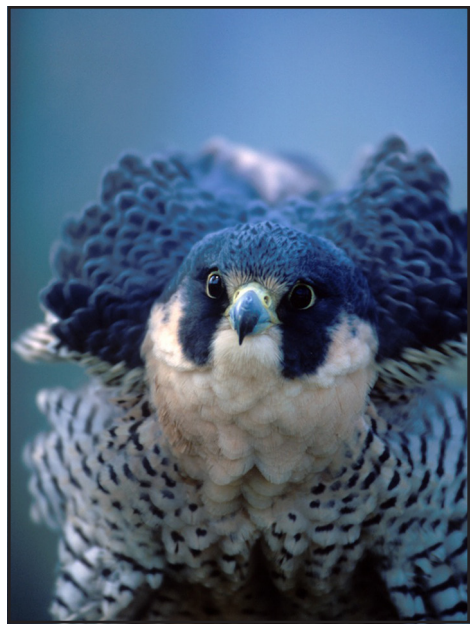
Monitoring our state's over 20 pairs and their territories is definitely a team effort. Over the last 20 years, Mary Hennen and her fellow team members on the Chicago Peregrine Program have helped to successfully reintroduce these beautiful birds back into the Midwest. The team currently monitors nest sites, tracks parent identification, as well as watches over offspring as they hatch, mature, and fledge (take their first flight). Through these observations, scientists can determine how well their efforts are working to create a self-sustaining population of Peregrines. Over 20 years of banding has allowed us to look at the dispersal and longevity of the peregrines found in Illinois and the Midwest.

Historically, an estimated 400–500 pairs of Peregrines once nested in the Midwest and eastern United States. But by the 1960s, the species had been extirpated (wiped out regionally) and few were seen during migration. Once a federally endangered species, Peregrine Falcons had all but completely disappeared from the Midwest by the 1960s, due to the use of DDT. The primary cause was the buildup of organo-chlorines—DDT and its byproducts—in the birds. These accumulated chemicals caused addling of eggs (causing an egg to become infertile), abnormal reproductive behavior in adults, and thinning of shells, which led to egg breakage.

In 1972, the government banned the use of DDT in the United States, and a year later, placed the Peregrine Falcon on the Federal Endangered Species List. During this same time period, the Peregrine Fund was established. It oversaw the reintroduction of Peregrines in the east using a process called hacking, a delicate method of releasing birds back into the wild.

The Midwest launched its own release programs in the 1980s under the coordination of the Raptor Center in Minnesota. The Chicago Peregrine Program began in 1985 as a cooperative effort between the Chicago Academy of Sciences, Lincoln Park Zoo, Illinois Department of Conservation, and Illinois Audubon Society.

From 1986-1990, the Peregrine Program released a total of 46 Peregrines from four different hack sites. The goal was to help re-establish Peregrines on a regional basis in the Midwest, with the hope that some birds would return to Illinois to breed. This regional falcon dispersal can be seen through the identity of our adult Peregrines. Over the years,



Peregrine Falcon. Photo by Jack Ballard.

Illinois-based birds have originated from nest sites located in Indiana, Minnesota, Iowa, and Wisconsin.

When population levels in the Midwest finally began to rise, the focus of Peregrine programs shifted from releasing birds to monitoring nesting pairs. Illinois' peregrine population has gone from extirpation in the state by 1951, to a single breeding pair at the Chicago-Wacker site in 1988, to 12 breeding pairs in over 23 different territories by 2011, to a current level (2012) of 25 territories.

For more information, go to fieldmuseum.org.

Faux Feathers:

Incredible Hunk of Hematite Mimics Bird Wing

By Julie Leibach

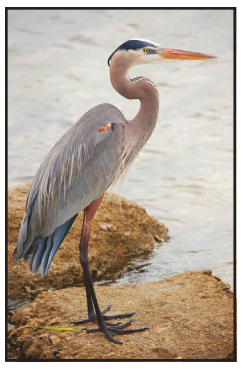
A hunk of hematite. This image is one of many that feature specimens from Philadelphia's Academy of Natural Sciences and appear in the book entitled A Glorious Enterprise. Photograph by Rosamond Purcell.

An Arresting Photograph Blurs the Lines Between Animal and Mineral

No, it's not what you think. In fact, the aerodynamic object isn't even organic, let alone avian. Bearing a resemblance to bird wings, it's a hunk of hematite, a mineral formed from iron and oxygen. Photographer Rosamond Purcell shot this specimen for *A Glorious Enterprise*, a 464-page tome commemorating the bicentennial of the Academy of Natural Sciences in Philadelphia, America's oldest natural history museum.

Aptly christened "Bird Wing" by museum curators, this chunk of hematite represents one of about 466 mineral specimens collected by William Sansom Vaux (his namesakes include the Vaux's swift). A Quaker and lawyer by training, Vaux was also a passionate mineralogist, particularly drawn to aesthetically appealing specimens—especially hematite. He procured this shimmery, dusty-rose piece from the English Midlands, once a hotbed for quarrying. Upon his death in 1882, Vaux left a 6,000-piece mineral collection to the Academy.

Courtesy of Audubon Magazine.



CHICAGO BIRD COLLISION MONITORS

Bright lights from buildings, along with reflective or transparent window and lobby glass, are hazards for birds migrating through Chicago.

Each year Chicago Bird Collision Monitors recover more than 7000 birds that have suffered collisions in the downtown area.

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Transport birds to wildlife rehabilitation centers.
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For more information:
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Please watch for our Annual Appeal 2012 mailing coming in late November. This is one of our most important fundraisers of the year. All donations are extremely important to our goals and programs. We thank you for your past support and hope you will be able to help us again this year.

Reminder to our readers:

The Compass can be read and enjoyed in color on our website, chicagoaudubon.org. Just click on the word "Compass" in the top row of links on the homepage to visit our archives. Don't miss these wonderful birds in living color! For historical value, we have added a link to the very first Chicago Audubon newsletter. This link is sitting on top of the Archive list. Enjoy!

Clymene Moth. Photo by Roger Shamley.

Calendar of Events November/December 2012

Birdwalks, Workdays, Special Events

WOODED ISLAND BIRDWALKS. JACKSON PARK. EVERY WEDNESDAY AT 7:00 A.M. AND EVERY SATURDAY AT 8:00 A.M. These wonderful walks continue throughout the year. Bring binoculars, field guides, and dress for the weather. Many species are seen. Meet at Clarence Darrow Bridge, just south of Museum of Science and Industry. *For details and directions, contact Pat Durkin at pat.durkin@comcast.net. Everyone is welcome!*

SKOKIE LAGOONS WORKDAYS. 10:00 A.M. MONTHLY, EVERY SECOND SATURDAY. These workdays are continuous throughout the year. The Chicago Audubon Society sponsors regular monthly workdays at Skokie Lagoons every second Saturday of the month. Activities include buckthorn cutting, brush pile burning and other management activities. Meet at the Tower Road parking lot, east of the lagoon bridge. *For further information, please call Dave Kosnik at 847-456-6368. Everyone is welcome!*

MONTROSE POINT MAGIC HEDGE STEWARDSHIP WORKDAYS. Volunteers needed to help with weeding, mulching, planting native shrubs and trees. We have also been establishing a prairie. *For information about work dates, to sign up, and for directions, please contact David Painter at 773-383-0721 or email at dvdpaint@yahoo.com. Everyone is welcome!*

CHICAGO URBAN CHRISTMAS BIRD COUNT. SUNDAY, DECEMBER 16. Compiler Jeffrey Sanders, yellowstart5@yahoo.com.

To our readers and their families and friends, our best wishes for the coming holidays and for a Wonderful and Happy New Year!

Important Notice to our Readers

There has been some confusion about the difference between a National Audubon membership and a Chicago Chapter membership. A National membership by itself does not financially support the Chicago Audubon Chapter. National Audubon and the Chicago Chapter (and all other chapters) have entirely separate budgets (except for a small yearly stipend from National). In other words, the Chicago Chapter has always carried the burden of all costs of producing and mailing this newsletter and other types of mailings that we have been sending to both the Chapter members and the National members in this area. Because of this separation in budgets and because we need local support, we are asking that you consider becoming a Chapter member at this time. Chapter membership will not only help with our immediate need to reduce costs related to the newsletter, it will give direct financial support to our local programs and goals and enrich the energy and support of the Chapter membership base. If you would like to become a Chicago Audubon Chapter member, please fill out the form to the right and send it to our office at:

Chicago Audubon Society
5801-C North Pulaski Rd
Chicago, Illinois 60646

Chicago Audubon Membership Form

You may charge your membership online using our secure website, chicagoaudubon.org, or call the office at 773-539-6793 and charge your membership over the phone, or mail in this form.

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Minimum yearly membership: $25
New Members at $65 or above receive a nice hat.

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Chicago Audubon Society does not rent, lease, trade, or otherwise disclose any membership information whatsoever.