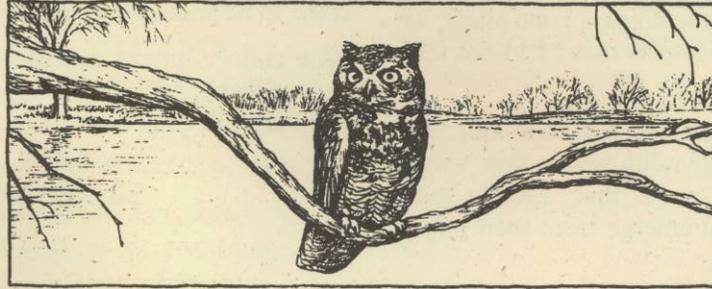


STILLMAN NEWSLETTER



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INSECTS: THE ORIGINAL TRANSFORMERS

-- Mark Spreyer

For the last three springs, Stillman has hosted every first grade class from Barrington District 220. This autumn, we'll be welcoming all of District 220's second graders.

The theme we'll be pursuing with the second graders is insect metamorphosis: meta = change, morphe = form. Before continuing, a brief disclaimer is in order.

While researching this subject, I realized that not all entomologists agree on the terminology used and which insects should be filed under which varying category of metamorphosis.

For this article, I have settled on three patterns of metamorphosis based on my experiences with a bug net in hand.

Simple Silverfish

This first category hardly involves any change in form. The critter simply gets bigger hence the term simple or direct metamorphosis.

To be a bit more precise, after the egg hatches, the young insect, called a nymph, grows through a series of stages known as instars.

Since bugs have an inflexible exoskeleton, they can only grow by shedding their "skin," so to speak. Each time it molts, the nymph moves from one instar to the next.

A common example of simple metamorphosis can be found under your kitchen sink, the silverfish. (O.K. maybe just under my sink.) As a silverfish develops (see illustration on p. 2), it only changes in overall size and body proportions.

Grasshoppers go through a similar gradual development. As they mature, they develop functional wings as well. In both of these examples, adults and young feed on the same food and live in the same habitat... or cabinet, in the case of my silverfish! Some folks put grasshoppers under incomplete metamorphosis (see below) which is

fine by me; but in my sweep net, that immature grasshopper looks just like a tiny adult.

Complete Caterpillars

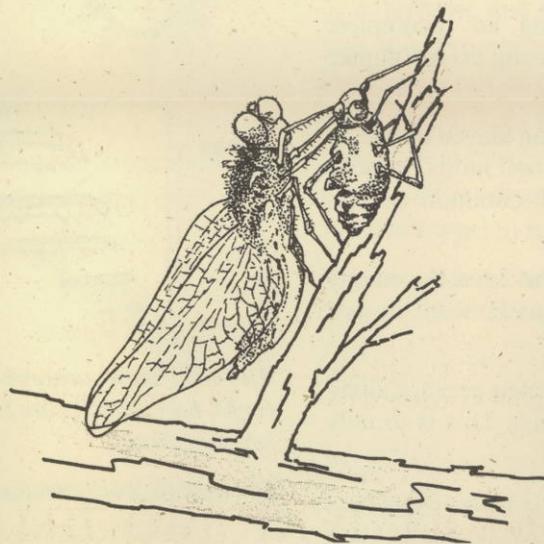
There's little disagreement over which insects undergo complete metamorphosis. The most colorful examples are caterpillars that transform into moths or butterflies. Some beetles, wasps, and flies also undergo complete metamorphosis.

Of course, we have to learn some different terminology. When the eggs hatch, the young, that are called larvae, look dramatically different from the adults.

As was the case with gradual metamorphosis, the larva grows by molting from one instar to the next.

Once the larva reaches its last instar, its outer skin hardens forming a pupa. Sometimes the larva prepares a tough protective covering for the pupa that is known as a cocoon.

Whether it is a woolly bear emerging as an Isabella moth or a rat-tailed maggot transformed into a hover fly, the adult bears little resemblance to the larva.



A dragonfly leaving behind its aquatic skin to emerge as an adult. See details on p.2.

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In addition, larvae and adults of the same insect are often found in different habitats feeding on different foods.

Early this past June, I was reminded about how different a larva can be from its adult. While doing a pond study, we scooped up a couple of small insects that I had not seen here at Stillman before.

Once we got out a hand lens for a closer look, we figured out that these were pyralid larvae that would later turn into moths. Think about that; aquatic, gill-breathing caterpillars that will emerge from their pupae as terrestrial moths.

Incomplete Intermediates

As long as we're in the pond, every first grade class that visits Stillman has scooped a dragonfly nymph out of the water. When the nymph is identified, somebody will exclaim, "That's a dragonfly?"

When comparing the nymph to an adult, this is a reasonable question. The nymph has gills while the adult does not. The nymph can walk but it can't fly. The adult can fly but it can't walk.

To most people, a young dragonfly would not be confused with an adult. Yet, some entomologists list it as having a simple metamorphosis. This insect's transformation doesn't seem that simple to me.

Others classify dragonflies as having an incomplete metamorphosis. This means that the young do not pupate before becoming an adult. Fair enough.

A dragonfly nymph usually sheds its skin eleven or twelve times as it develops. Each time the nymph molts, it looks a little bit more like the adult. Some common species require two years to become adults.

When they reach the final instar, the insect's energy is devoted to preparing adult tissues underneath its last wingless exoskeleton.

Next, they crawl a few feet out of the water, perhaps along an exposed tree root or the post of a pier. This is usually done in the morning.

Finally, the nymph's skin splits along its back revealing a soft-bodied version of the adult dragonfly. It usually stays put for about half an hour as the adult expands to its full size (see cover illustration).

Now if an insect successfully develops from an egg to an adult, is that not a completed transformation? From this writer's perspective, intermediate metamorphosis would be a more accurate term than incomplete.

Other aquatic nymphs we catch with the first graders, such as damselflies and mayflies, also demonstrate an incomplete or intermediate metamorphosis.

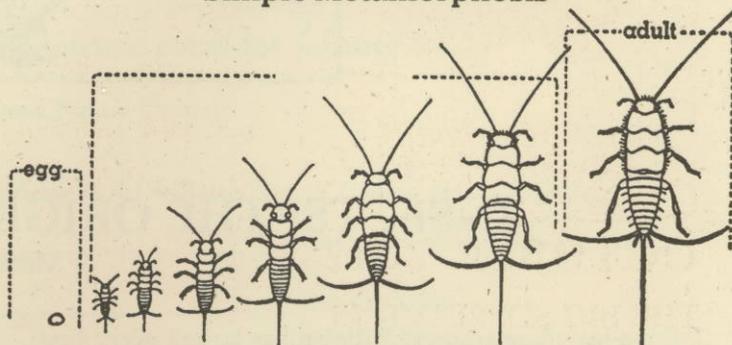
As you might expect, we are hoping that the second grade students will connect the adult insects they see this fall with the younger versions they saw last spring as first graders.

Interns & Instars

All of which reminds me of a past summer intern. She took an inordinate amount of pleasure in reminding me that she had first come to Stillman on a field trip as a second grader.

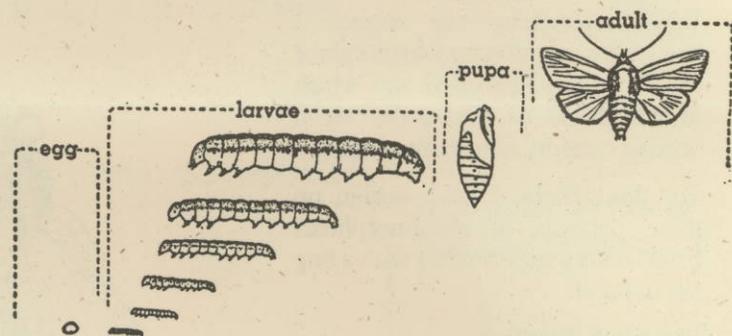
With college interns and second graders in mind, here's hoping each of them undergo both a gradual and complete metamorphosis from larva to adult.

Simple Metamorphosis



In simple metamorphosis, the newly hatched nymphs look like tiny adults. Silverfish, bristletails, and springtails (aka snow fleas) are some of the insects that go through simple metamorphosis.

Complete Metamorphosis



With complete metamorphosis, the larva forms a pupa. Butterflies, moths, bees and flies are just some of the insects that undergo complete metamorphosis.

Metamorphosis illustrations from Insect Guide by Ralph Swan



"I suppose you are an entomologist?"

"Not quite so ambitious as that, sir. I should like to put my eyes on the individual entitled to that name. No man can be truly called an entomologist, sir; the subject is too vast for any single human intelligence to grasp."

--Oliver Wendell Holmes, *The Poet at the Breakfast Table*

PROGRAMS

Program Basics: PLEASE CALL OR FAX US AT (847) 428-OWLS(6957), OR EMAIL STILLMAN: stillnc@wildblue.net TO MAKE RESERVATIONS for programs. Remember to include your name, phone number, and the number of people that will be attending.

If less than five people plan to attend two days prior to a program, the activity could be cancelled. So, don't forget to call the nature center in advance. If you discover that you are unable to attend, please call to cancel your reservations. This courtesy will be greatly appreciated.

SOLAR OBSERVING ON SUNDAY

Join the **Northwest Suburban Astronomers** and observe our nearest star with special telescopes and filters. See sunspots and solar prominences in remarkable detail! This will be a fun and safe activity for the entire family. After observing the sun, take a hike on your own or join a walk led by Stillman's naturalist.

Dates: Sunday, Sept. 2
Time: Noon-3:00PM
Fee: None



SUNDAY MORNING BIRD WALKS

Mark Spreyer will lead a morning bird walk. Binoculars and field guides are a must. If you don't have any, don't worry, Stillman does.

Date: Sundays, Sept. 9 & Oct. 28
Time: 8:00AM
Fee: None



A DROUGHT WALK

We'll investigate how the plants and animals of Stillman are adjusting to this year's drought. If current weather conditions persist, we may be able to walk across the evaporated marshland. We haven't been able to do that since 1988! Come join us for this rare opportunity to explore normally inaccessible areas of the nature center.

Date: Sunday, Sept. 16
Time: 2:00PM
Fee: None



FRIDAY NIGHT CAMPFIRE

Join us for stories and roasted marshmallows. Say goodbye to summer and listen for the sounds of nocturnal wildlife. Speaking of which, we'll end the evening with a visit to our resident owls.

Date: Friday, Sept. 21
Time: 7:00-8:00PM
Suggested Donation: \$2.00



TREE I.D. OR THIS BUD'S FOR YOU!

As the leaves turn color, join Stillman's naturalist as he shows you how to identify some of our Midwestern trees. Easy to remember tips and simple hand-outs will inspire you to open your own "branch office." Come prepared to be out in the weather.

Date: Sunday, Sept. 30
Time: 2:00PM
Fee: None



YULE LOG OPEN HOUSE

The dynamic duo of Susan Kowall and Susan Allman will show you how to make this festive seasonal decoration out of natural materials. It makes a great centerpiece. Kids are welcome but no scout groups, please. Stop by anytime between 2:00 and 4:00PM. Also, please call in advance to let us know if you are coming. We don't want to run out of supplies!

Date: Sunday, Dec. 2
Time: 2:00-4:00PM
Member's Fee: 1st one free
Non-Member's Fee: \$5/log

NEW YEAR'S DAY WALK

Join us for the annual New Year's Day walk along Stillman's trails. Over the years, we've seen everything from bluebirds and shrikes to the remains of multiple coyote kills. If you like winter, don't like football, or need to sober up; this is the walk for you.

Date: Tuesday, Jan. 1
Time: 10:00AM
Age: 10 years and up

Please note that the Stillman Nature Center is also available, by reservation, during the week to school classes. Also, we can bring our raptors to your meeting place. For more information just call, email, or visit our website: stillmanncc.org

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If you aren't already a member, please consider joining us.

- Yes, I'd like to become or continue as a member of the Stillman Nature Center.
I enclose my tax deductible contribution of \$_____.
- I'd like to help as a volunteer with programs or land management at the Stillman Nature Center, please call me.
- Please send a gift membership from _____ to the name and address listed below.

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