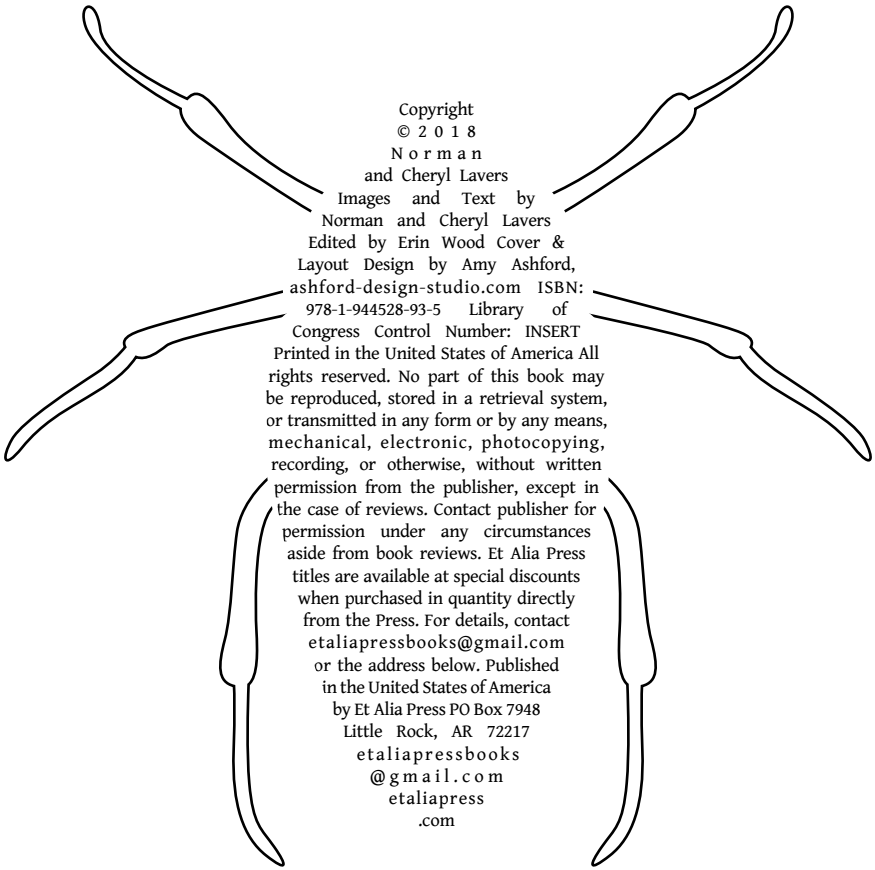
100
insects of arkansas and the midsouth

· PORTRAITS & STORIES ·

by Norman and Cheryl Lavers



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For Gareth

We want to thank Jeffrey Hoeper for looking at parts of this MS and making useful suggestions. And special thanks to Herschel Raney for inspiring us at the beginning of this century with his website *Random Natural Acts*, and insisting that we get digital cameras.

Introduction

Whether you rarely notice insects, or already spend significant time experiencing the natural world, we have written this book to pique your curiosity as to the astonishing lives of insects. Perhaps you've been revolted by insects in the past, but we hope this book might help you reconsider, and that perhaps you'll pass along the stories that helped change your mind. Just underfoot are some of the great miracles of our world that are almost always overlooked.

The fact is, insects don't need any more enemies; they desperately need friends. And their lives are more intimately connected to our own than we may understand or acknowledge. We hear all about the charismatic insects. Many of us know, for example, that in 2016, the number of Monarchs was down over 70 percent since the mid-1990s. That's terrible enough, of course. But what scientists are also beginning to realize is that the less celebrated species, the ones we don't pay attention to, are disappearing just as rapidly as the Monarchs.[1] The insects that pollinate fruits, vegetables, and wild flowers in spring; the insects that chew up our dead and decaying vegetation and convert it back into soil and new life; the insects that provide us with a host of other services . . . they are quietly vanishing. Insect-eating birds (including most of our songbirds) are also disappearing at frightening rates. Bird populations are declining in sync with the declining rates of the insects which provide their food base. It's the usual causes—clearing the natural landscape to build houses or grow crops, pouring tons of poisons on everything—as the weather becomes ever more unpredictable. Perhaps if we understood the essential roles of these insects better, we'd rethink some of our actions.

We sometimes teach classes on insect ecology for the Arkansas Audubon Society, or do programs for Master Naturalists. Here is how our classes go: After a minimum of formal class work, we all go outside—usually a state park or somewhere similar—to walk and look for insects. The walk is the part we all enjoy most. With so many sharp eyes, we only go a few steps before we spot some interesting insect. We identify it if we can, and usually there is something special to say about the life of that particular creature. A few more steps, and someone will spot another, because insects are everywhere.

You might experience this book like one of our walks, starting with a photograph of an insect, rather than an actual sighting. We'll say something about its life, its strategies, its interactions with other creatures, and then we'll go on to the next image. Themes running through the book include mimicry, warning coloration, the strategies plant-eaters use to avoid being predated, and the strategies predators use to catch enough insects to avoid starving.

The whole finely tuned balance has been negotiated over millions of years: the vegetarians eat enough plants to keep the vegetation from running wild and smothering its own environment, the predators eat enough plant-eaters to keep them from destroying all the plants, the hyper-predators rein in the predators, and the janitors come in and clean up everything left over. In this way, the book is not just an introduction to this insect or that, but an introduction to insects in general, going largely unnoticed, doing all the thankless but necessary work required to keep our world running.

Our hope is that after you read this book you might consider adding some native plants to your garden to attract insects, stop using poisons to eliminate them, and take greater pleasure in the richness of life that is often right before our eyes.

Let's go find our first insect.

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[1] See Black, Scott Hoffman. "North American Butterflies: Are Once-Common Species in Trouble?" Wings, Journal of the Xerces Society 39 [2016] 314.

Dogbane Beetle (*Chrysochus auratus*)

Coleoptera: Chrysomelidae

Every way this spectacular beetle turns, it flashes greens, golds, and bronzes. It feeds only on dogbane. When you see "bane" in the name of a plant, it signifies that it is poisonous. In fact, dogbane is related to milkweed, the poisonous plant on which Monarch caterpillars feed, making them and the Monarch butterfly they turn into poisonous to anything that tries to eat them. The Dogbane Beetle similarly becomes poisonous eating dogbane. For that reason, it can sit calmly in the open, flashing its colors to the world without worrying about predators. Many brightly colored insects turn out to be unpalatable, so predators immediately find them suspicious.

Lady Beetles (Coccinellidae)

Coleoptera: Coccinellidae

"Ladybird, ladybird fly away home . . ." This one is just taking off, giving us a picture of beetle anatomy: It has raised the hard protective forewings (the elytra) out of the way, so the soft flying wings can be unfurled.

There are some 500 species of this very familiar insect in America. Many are some color of red or orange with black spots, but many others (black, white, variously patterned) you might not recognize. The one pictured here (top left) is the Multicolored Asian Lady Beetle (*Harmonia axyridis*), which comes in a bewildering number of patterns and colors. It was introduced to our country from Eurasia and is now common everywhere.

Beetles (Order: Coleoptera) are among the advanced insects that have complete metamorphosis. That is to say, when the egg hatches, a larval form emerges which is altogether unlike the adult form, as can be seen in the larval lady beetle on the top left side of the twig, pictured center. When the larva reaches its full growth, it will become a pupa (see below the larva on the left side), an immobile state in which it changes its internal parts so completely that when the adult lady beetle emerges (there is an empty pupal case on the right side from which a beetle recently emerged) it is virtually a new animal. Among other changes, the adult has wings and mature genitalia, so that it can move around quickly and find a mate to create the next generation.

The Multicolored Asian Lady Beetle was introduced to this country to help us fight agricultural pests. Indeed, they help us by feeding voraciously on aphids, but we are less pleased with their immense hibernation aggregations, which become a nuisance when they are in our houses or on us (like those swarming Cheryl at a wildlife reserve, top right).

However, here is a lady beetle (bottom left) that is probably too small to ever be a nuisance to anyone, but is worthy of mention because of its wonderful name, The Twice-stabbed Lady Beetle (*Chilocorus orbus*).

Tiger Beetles (*Cicindela* spp.)

Coleoptera: Carabidae

Walking down a path through the woods, you will sometimes see a half-inch long bright metallic green insect running along ahead of you, flying on ahead if your footsteps get too close. This will likely be a Six-spotted Tiger Beetle *(Cicindela sexguttata)*, a species which is usually found in openings in woods, often running back and forth on the bare trunk of a large fallen tree. Most of the other approximately twenty species of tiger beetles in Arkansas are found in open country, paths through pastures or open fields, muddy or sandy beaches, or abandoned quarries. The reason they want to be on smooth ground with not much in the way is that, allowing for their size, they are among the fastest running creatures on earth. When a fly or a bee lands on one side of a path, they can run over from the other side, catch the prey in their jaws, and rip it apart before it has a chance to take off.

Whenever you are on a dirt path in the countryside, there will almost always be one or more tiger beetles around. They come in many patterns and often bright colors, but you can always tell them from other kinds of beetles by this mark: with their bulging eyes, their head is wider than their thorax.

Tiger Beetles are predators and their jaws are formidable. Here, at bottom right, is a close up of the jaws of another species, the Hairy-necked Tiger Beetle *(C. hirticollis)*.

Their larvae are equally fierce. They live in a burrow in the ground with just the top of their head and their wide-open jaws at the surface, ready to seize anything that comes near and drag it underground. Locally, the larvae are called "chicken-chokers" because it is thought that if a chicken grabbed one and tried to swallow it, it would grip the inside of the chicken's throat and not let go. Children quickly learn that if they put a grass stalk down the hole, the beetle larva will clamp on to it, and they can pull the larva out.

Mottled & Golden Tortoise Beetle (*Deloyala guttata & Charidotella sexpunctata*)

Coleoptera: Chrysomelidae

Tortoise Beetles look like they have had transparent turtle shells placed over their backs. They are common on morning glory plants. They are small and quite beautiful, which is more than can be said for their larvae, which, like many small beetle larvae, protect themselves from being eaten by piling their own excrement over their backs.

Horned Passalus or Bess Beetle (*Odontotaenius disjunctus*)

Coleoptera: Passalidae

You sometimes see these enormous wood-eating beetles lumbering along from one decaying log to another, often with a number of parasitic mites on their head. These mites feed on their bodily fluids but don't seem to harm them. If you accidentally break open an old stump, you might uncover a family group. The adults, male and female, all help care for the larvae, feeding them a slurry of chewed wood covered with cellulose-digesting bacteria from the parents' saliva. This is how the parents introduce the bacteria into the system of the larvae so that the young will be able to digest their own food.

Adults and young have stridulating devices on their bodies and can make up to seventeen separate squeaking sounds, the most elaborate system of sound communication of any arthropod. When they all make their sounds together, it seems to discourage predators.[2]

[2] See http://entnemdept.ufl.edu/creatures/misc/beetles/horned_passalus.htm (accessed March 20, 2018).

Eyed Click Beetle (*Alaus oculatus*)

Coleoptera: Elateridae

Click beetles (of which there are nearly a thousand species in North America) have the ability to snap a spine they have into a groove on their underparts. This makes a loud click and propels them several inches in the air, presumably to startle a predator into releasing them, and also to right themselves when they fall on their backs. The huge eye-like marks on this species call attention to it whenever people see it. A similar species we have seen in Costa Rica flies at night, its eye-spots glowing brighter than a firefly's light. They look like they are flying around with their headlights on high-beam. The locals in Costa Rica call them "Fords."

(facing page)

Firefly (*Photinus* sp.)

Coleoptera: Lampyridae

Fire "flies" or, their other popular name, lightning "bugs" are, technically speaking, neither flies nor bugs. They are beetles. If you don't worry too much about keeping your lawn and garden tidy, leave a few scruffy unmowed places and you might have a good population of fireflies in your yard. In the twilight, the males will begin flashing. If there is still enough light to see the individual insects when they are not flashing, it's fun to try to photograph them on the wing just as they flash. Usually, if we get them in focus they aren't flashing, and if we get them flashing, they aren't in focus. The males flash the proper code for their species. If a female, sitting in the bushes watching, is suitably impressed, she will flash back in the proper code for her gender, and they get together. A problem is, females of another genus, *Photuris*, sometimes fake a female *Photinus*'s signal, and when the male rushes over, the *Photuris* kills and eats him.

Whirligig Beetles (*Dineutus* sp.)

Coleoptera: Gyrinidae

On a hot day, in a shaded corner of a lake, you may see a raft of black beetles extending over several feet resting quietly next to the shore. If you come closer, they begin swimming around in slow curves, and if you come even closer, they suddenly start spinning off wildly in every direction. Whirligig Beetles. Nearly everybody recognizes them. They are nocturnal. This is only the place where they sleep during the day. It's part of their defensive strategy to be in a mass and in plain sight, because when they go into their wild gyrations it will totally disorient any potential predator. At night they take out singly and swim around the lake on their own, looking for insects that have accidentally fallen into the water. They swim on the surface, but are also able to dive, taking a bubble of air down with them. A nice feature: They have double eyes—one pair of eyes above the surface so they can see what's above the water, one pair below the surface.

American Carrion Beetle (*Necrophila americana*)

Coleoptera: Silphidae

Don't confuse the similar-sounding name of this common species, the American Carrion Beetle, with that of the rare and endangered American Burying Beetle. But it is in the same lugubrious business: helping to clean up corpses. Its name *Necrophila* means "lover of dead bodies." When they get a whiff of roadkill, they head straight for it. They fly fast and directly, at about eye-height, and something odd occurs. They are suitably black for their job, but note the yellow thorax with a dark patch at its center. On the ground it doesn't look like anything special, but this is the pattern of a bumble bee, a fat black body and hairy yellow thorax with a dark bald spot in the center of it. Until you see this beetle flying, you can't believe how utterly convincing it is as a bumble bee. A bird would hesitate to snatch it out of the air for fear that it had a formidable stinger. This sort of mimicry is very common among insects.

Once it arrives at the kill, it feeds on the abundant fly maggots and lays its own eggs. When they hatch (by this time the other scavengers have picked the body clean), the specialist hatchlings begin feeding on the skin and dried bits of sinew the other scavengers can't handle. Quickly cleaning up what would otherwise be horribly stinking carcasses is one of the innumerable services insects perform for us without our even noticing.

Fiery Searcher (*Calosoma scrutator*)

Coleoptera: Carabidae

Often when you are following a trail through woods, this large brightly colored beetle will appear, walking at top speed, and quickly disappear ahead of you. They seldom stop even for a moment, which makes them very frustrating to try to photograph. Look at the jaws on this one, reminiscent of a heavy duty pipe cutter. Fiery Searchers are looking for large fat caterpillars. When they find one, they make short work of it with those jaws.

During caterpillar invasion years they become particularly numerous, and you can frequently see these handsome beetles climbing the trunks of trees after caterpillars and disappearing among the leaves.

Polyphemus Moth (*Antheraea polyphemus*)

Lepidoptera: Saturniidae

These spectacular big moths come to our lighted windows at night. This is a pair mating, the male on the left showing his hugely plumey antennae which can detect the tiniest mile-away trace of the female's pheromone, the female's much reduced antennae showing on the right. She doesn't have to find him; he has to find her. The caterpillars do all the feeding. The adults do all the mating and egg-laying, but they must be quick, because they have no feeding mouthparts, and only live for a few days.

Luna Moth (*Actias luna*)

Lepidoptera: Saturniidae

We can't imagine there is anyone who doesn't know the Luna Moth. This one has only recently emerged (eclosed is the technical term) from its cocoon down in the leaves. It is a male, as can be seen by his plumy antennae which have so many odor sensors on them he can identify a female Luna from a great distance with only a molecule of her scent. The main part of his life, really, was lived as a green, finger-sized caterpillar feeding on the leaves of a tree. Now, it has all come to a culmination. He has no eating mouthparts and will not feed again during the remaining few days of his life. He is essentially a mobile set of genitalia looking for a female to mate with and die, as she, after mating with him, is looking for a place to lay her eggs before she dies. There is, however, one nice little touch. They have to make these few days count, but they are big night-flying morsels of protein which a bat would love to pluck out of the air. This brings up their magnificent tails. They are not simply for beauty; It has only recently been learned that their swishings and swooshings around in flight actually scramble the bat's ability to echo-locate and thus make them harder to catch.[4]

[4] See http://www.sciencemag.org/news/2015/02/luna-moth-s-tails-fool-bat-sonar (accessed March 20, 2018).