

## ***Deep Nature: Photographs from Iowa***

Photographs by Linda Scarth & Robert Scarth  
*Small Places, Unbounded Spaces*, essay by John Pearson

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This page is for readers of ***Deep Nature: Photographs of Iowa*** who may want to know more about the images. Pictures usually speak for themselves artistically but sometimes elicit the need to know more about the subject, its location and techniques employed. We think that books and web pages can and should be integrated to augment one another. The information here comes from our collection of natural history books, our observations and several authoritative web sites.

As we planned the book, we were charged with looking closely at small inhabitants of Iowa. We selected images that covered a range of species and habitats found in Iowa and the Midwestern United States. Iowa is at the intersection of eastern, western, northern and southern habitats so it provides a cross section of the vast variety of species in North America. You may encounter examples in this collection that also appear in your habitat.

Because we work together from choosing locations for photography, to the final optimized image in our digital darkroom, we co-sign all our work, even though in rare occasions only one has been able to visit a location. Approximately half of the images in this book began life in each of our minds and cameras.

The arrangement and progression of images was carefully chosen. In the introductory portion, we started with one of our specialties - representational and abstract refractions in dew and rain-drops. Then in the body of the book we chose the fringed gentian and hoverfly image to elicit the comment "What is that?" From there on we selected facing page pairs that had a compositional, color or subject connection. The compositional relationship was also important from one pair to the next throughout the book. The three last images were selected especially for their graphic nature that is best expressed in an image and hard to explain in even a thousand words.

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This PDF may be cropped to fit as an insert in the back of your copy of *Deep Nature: Photographs from Iowa*. We suggest 8.5 x 8.5 inches.

*facing contents* Looking closely at dew and rain drops can sometimes yield the proverbial world not in a grain of sand but a drop of water. Drops can be spherical lenses or funhouse mirrors, depending on their shapes and the distance to the object refracted through the drop. These drops are almost perfectly round and act like 'fish-eye lenses'. The same pink and yellow blossoms that appear in miniature as normal refractions in the drops provide the out of focus background colors.

Our drop images usually start with native prairie grasses. These grasses seem to hold drops longer and more securely than exotic grasses. The stems and leaves are textured with tiny hairs along leaf edges and minute channels on the stems. The refracted flowers are about 8 to 12 inches (20-30 cm.) behind the drops. They also provide the out of focus background colors. Even when the morning is very still we shield against the possibility of wind and diffuse the light with white umbrellas or translucent sheets. Because the depth of field is so shallow, it is important to place the tripod and camera so that the lens is parallel vertically and horizontally with the subject. One must also be careful not to dislodge the dew or rain by bumping the plants. The purple coneflowers (*Echinacea purpurea*) and brown-eyed susans (*Rudbeckia triloba*) are repeated in each drop. These are favorite flowers to create dew or raindrop images.

*overleaf contents* A misty overcast day with light rain, the droplets on the backside of a maple leaf lying on a path acted like magnifying glasses to provide a fantasy of bubbles. The path was our driveway and trip to the mailbox between the showers was the occasion for spotting this almost monochromatic image of a maple leaf where the color is implied and the leaf cells magnified. We have noticed that dew and raindrops form better on the waxy underside of some tree leaves, rather than the top side. Among our equipment are rain coats for our macro lenses and cameras so that damp weather need not be a deterrent.

*page 21* ***Hoverfly on fringed gentian at Becky's Fen.*** Fringed gentians (*Gentiana crinata*) are one of the species indicating a high quality fen. Its scientific name describes a gentian with long hairs. Fens are peat soils with permanent water seepage. Most fens in Iowa were drained and plowed. Some fens resisted and remain special places to observe plants that grow nowhere else. We are looking down on an unfurling blossom as it pinwheels open. The hoverfly came in to turn an abstract image into a celebration of Becky's Fen. There are several hundred hoverfly species found around flowers. Some are wasp mimics and others are bee mimics. Their translucent wings pick up the colors of their backgrounds and add an iridescence. We regard them as the jewelry that flowers wear.

John Pearson speaks of this important location, landform and habitat on pages 3, 5, 6 and 17 of his essay "Small Places, Unbounded Spaces" in *Deep Nature: Photographs from Iowa*. In our opinion, the saving and celebrating of Becky's Fen is an important milestone in Iowa.

*page 22* **Land snail on autumn leaves.** There are well over 100 species of land or terrestrial snails in Iowa. This handsome one is approximately 25 mm across and both blends in and is a contrast to the leaf litter where he was found. Though most Iowa terrestrial snails are shades of tan, cream and brown, they make handsome focal points in close-up compositions like these old leaves. The classic golden mean spiral shape of the shell with its stripes of unequal width and silky sheen provide an almost geologic feel.

*page 23* **Polyphemus moth wing.** Lepidoptera (butterflies and moths) are almost all works of art onto which we humans apply our imaginations. This is a 1:1 or life-size image of the wing section. The slide was scanned and the digital image prepared for printing.

The section of a the overlapping wings of a polyphemus moth (*Antheraea polyphemus*) is a bit sinister. It could be an animal peeking under a lowering brow. The eye spot does its job of staring back at and discouraging a would be predator. The hair like scales add texture and further confuse the eye.

As well as this red-brown phase, there is also a lighter tan one. The large eyespot on the rear wings is the reason it is named after the one-eyed giant of Greek mythology. Their caterpillars are also handsome – bright green with red and silvery spots and yellow lines.

*page 24* **Blue-flag iris.** This image is also on the front of the book jacket. Irises like this unfurling petal are found in wetlands and wet prairies throughout the north-central part of North America. Look for it in marshy soils along streams and ponds. The original Iris was a Greek goddess who traveled in the company of the rainbow. The most common wild iris in Iowa is *Iris shrevei*. The common name blue-flag comes from the Middle English word for a rush: *flagge*.

John Pearson mentions blue-flag irises on page 5.

*page 25* **Dew-covered blue-flag iris petal.** This section of an iris petal shows the varying drop sizes of rain drops or condensing dew. The natural magnifying glasses are occasionally compound as small drops perch on larger drops as occurred on the left side of this image.

*page 26* **Red-breasted nuthatch.** This tiny (10 gram) winter visitor in Iowa cheers up many a bird feeding station. They usually nest in the north woods. It is much smaller than its more common relative, the white-breasted nuthatch. Both species feed while walking up and down trees. They sometimes wedge seeds in bark crevices and hammer to open them. In winter red-breasted nuthatches (*Sitta canadensis*) are occasionally seen in mixed feeding flocks of small birds. *Sittè* is ancient Greek for bird and was the name given by Linnaeus. We referred to this one as RB as it spent much of the

winter with the chickadees in our neighborhood.

- page 27* **Prairie warbler.** The visit of a prairie warbler (*Dendroica discolor*) to the upper Midwest is an unusual, but increasing, occurrence as birds expand their breeding ranges northward and westward. This one spent part of the summer in an Iowa state park defending its territory and calling unsuccessfully for a mate. In spite of prairie in its name, it is a member of the wood-warbler group and is usually found in open second growth woodlands. Its range has expanded since European settlement.
- page 28* **Dwarf larkspur.** The dwarf larkspur (*Delphinium tricornis*) is found in shades of blue and purple and is smaller than the creamy white prairie larkspur. We found dwarf larkspurs in southern Iowa, on the western edge of its range. *Delphinium* is Greek for dolphin, referring to the classic sculpture shape of the buds. *Tricornis* is three-horned; another reference to its shape.
- page 29* **Virginia bluebells buds.** Virginia bluebells (*Mertensia virginica*) are one of the harbingers of spring. It blooms early with the bloodroot, hepatica and rue anemone. The buds are pinkish lavender and become light blue as they open. Leaf edges may be a soft purple when leaves are small and developing. Like most native flowers with widespread distribution across the country, there are many common names. Gentleman's breeches and old ladies' bonnets are especially descriptive. *Mertensia* is for a German botanist, Franz Karl Mertens.

John Pearson mentioned bluebells on page 12.

- page 30* **American bittersweet.** This American bittersweet (*Celastrus scandens*) plant provided a fun selection of images after a year end ice storm. American bittersweet is increasingly being displaced by the aggressive invasive oriental bittersweet. Bittersweet fruits are toxic to mammals but are winter food for at least 15 bird species. The whole plant has toxic properties though parts have been used medicinally by the original Americans and European settlers. It was one of the first native plants cultivated by European settlers. *Celastrus* was a Greek name for plants that keep their fruit over winter and *scandens* refers to climbing.
- page 31* **Northern flicker.** Though not small, this handsome male northern flicker (*Colaptes auratus*) was selected to compliment the ice-covered bittersweet on the facing page. The black malar stripe behind his beak identifies the male. The prominent white rump and bouncing flight are keys to flicker identity on the wing. He is the largest bird in the book and is likely to be found on the ground eating ants.

Flickers are found throughout North America and have the largest number of common names of any native bird. Most have yellow under-wings (yellow-shafted). A

western sub-species, with orange-red under-wings (red-shafted) and a red malar strip, is sometimes seen in the Midwest. The *auratus* in its scientific name means gold or golden. Individual birds have large ranges and one is indeed lucky to see their head bobbing and other displays.

- page 32*     **American copper chased by bee on prickly pear bloom.** The American copper butterfly (*Lycaena phlaeas*) was feeding on the prickly pear (*Opuntia macrorhiza*) blossom with one of our cameras poised for a capture when the bee hit the butterfly and the shutter clicked. Flash was used to make this image. The American copper (*Lycaena phlaeas*) in Iowa is probably a European immigrant coming in here with the earliest settlers. It is also native to the far northern reaches of North America. This butterfly likes sandy areas where one might find prickly pear blossoms. This prickly pear was found at Big Sand Mound, an important private preserve along the Mississippi River. *Opuntia* refers to succulent plants and *macrorhiza* has its origins in large footed. Not all introduced species are pests though this bee seems to think so.
- page 33*     **Pasqueflowers.** Pasqueflowers (*Anemone patens*) are the earliest bloomers on dry prairie patches. The North American species is found in dry prairies from northern Canada to the southern United States. This includes the Loess Hills where it is often seen, though there are a few sites in eastern Iowa, eastern Minnesota and western Wisconsin. In the northern plains, they are sometimes called blue crocus. *Anemone* comes from the Greek for wind and *patens* from the Latin for spreading. Pasqueflowers have a long history in herbal medicine.
- John Pearson mentioned pasqueflowers on page 9.
- page 34*     **Jack-o-lanterns.** This repetitive pattern of overlapping jack-o'-lantern (*Omphalotus illudens*) fungi was found at the base of a large oak tree and on its roots. One of its characteristics is gills that glow in the dark. Some fungi have this luminescent quality and may contribute to tales of foxfire. The deep orange color is a warning that this is a toxic mushroom causing violent gastrointestinal distress. Beauty sometimes has a dark side.
- page 35*     **Green metallic bee on butterfly milkweed.** Native bees, like green metallic bees (*Agapostemon splendens*), evolved with native flowers. The bright orange blossoms of butterfly milkweed (*Aclepias tuberosa*) attract butterflies and other insects providing the common name. The genus *asclepias* is named for a Greek god of medicine and the root was widely used in folk medicine. The green bee is a ground dweller that stores pollen for its larvae.
- page 36*     **Female red-winged blackbird.** This red-winged blackbird female (*Agelaius phoeniceus*) brought beaks full of caterpillars for her brood in a nest among the cattails. We watched her forage in willow trees a long way from her nest in the marsh

and come back repeatedly with her beak full. She would briefly scold us in spite of the full beak and then disappear into the cattails. These brief stops to scold provided the photo opportunities from a boardwalk in a county conservation area. Her mate also patrolled the area yelling loudly at the intruders.

John Pearson mentioned red-winged blackbirds on page 2.

- page 37* **Tree swallow.** The metallic blue-green of an adult male tree swallow's (*Tachycineta bicolor*) back is a challenge for film or digital capture. It is one of the most beautiful jewel colors in nature. The swallow looks formally dressed with its contrasting bright white throat and underside. When tree cavities are unavailable they will use nest boxes like this one on a wildlife management area in northern Iowa. Its genus name is made of *tachip* (swift) and *kineo* (move).
- page 38* **Blue cohosh buds.** The graceful blue cohosh (*Caulophyllum thalictroides*) can be found rich woodlands with adequate moisture. The common name comes partly from the blue-green to purple color of the stems and leaves early in spring. The small flowers are a greenish yellow sometimes tinged with reddish-brown. Native peoples and settlers used parts of the plant medicinally. Similar shaped plants and blooms must have inspired art nouveau artisans to abstract them into their designs. *Caulophyllum* translates as stem-leaf. It is descriptive of the compound leaf at the top of the stem. In this image the compound leaf is beginning to unfurl. And the Greek origin of *thalictroides* may mean to grow green, like meadow rue.
- page 39* **Prairie trillium.** One of at least six trillium species in Iowa, the prairie trillium (*Trillium recurvatum*) varies in shades of red, maroon and red-brown. Most other trillium species are white. It is a woodland species despite its common name. As its name *trillium* indicates, its petals and leaves are in groups of three. *Recurvatum* describes the bent down sepals. It is a very graphic plant where the contrast of mottled leaves and vivid blossom can be composed in many ways.
- page 40* **Candy-striped leafhopper.** This tiny candy-striped or red-banded leafhopper (*Graphocephala coccinea*) was caught in the web of a black-and-yellow argiope (*Argiope aurantia*) Don't worry. It escaped by twisting when the camera came too close. Most of the 2500 leafhopper species in North America are in shades of green and tan. Even this vividly colored species is little noticed and is a pleasure to find. It was made in soft early morning when the web was still pearly with dew.
- page 41* **Big bluestem inflorescence.** Grasses do bloom. This big bluestem (*Andropogon gerardii*) plume close-up emphasizes the parts of each little 'bloom.' The rose and orange colors are worthy of a closer look. This is one part of the cluster that is responsible for this grass to sometimes be called 'turkeyfoot'. *Andropogon* dissected is man (*andro*) and beard (*pogen*). A gardener and barber-surgeon John Gerard

(*gerardia*) published *Herbal* in 1597.

John Pearson mentioned big bluestem on pages 2, 6 and 8 of his book essay.

*page 42*     **Cotton-grass in fen.** The presence of cotton-grass (*Eriophorum angustifolium*) in a fen is the sign of its value. Another example of Iowa at the ecological crossroads, cotton-grass (not a grass but a sedge) is more a northern species. It lives in a few fens here in Iowa. Fens are special permanently wet landforms related to peaty soils and have plants that live nowhere else. The furry clusters are a group of spikelets that are sometimes called hare's tails. The scientific name comes from the Greek *erion* for wool and *phorus* means bearing. *Augustifolium* refers to having impressive narrow leaves. The tall cotton-grass is an Iowa species of special concern. We found this one in northwest Iowa.

John Pearson mentions cotton-grass on page 4.

*page 43*     **Showy orchis.** Showy orchis (*Galearis spectabilis*) is one of the 31 orchid species (plus two hybrids) that have been recorded in Iowa since 1843. The blossom is helmet-like, hence *galearis*. And *spectabilis* is showy. It is frequently found along woodland trails or other lightly disturbed areas where there is more light. This lovely orchid is the one most likely to be seen on a walk in the woods in late spring. Though commonly seen, it has highly specific habitat needs and does not often transplant successfully. Enjoy it where it is found.

*page 44*     **Crab spider on purple coneflower bud.** This transverse-banded crab spider (*Xycticus transversatus*) is waiting in ambush on purple coneflower bud (*Echinacea purpurea*). Crab spiders like to hunt from plants and places that blend with their coloring. Some species can change their colors to hide in plain view. Like other crab spiders the transverse-banded has good eyesight and waits with front legs spread to grab prey. *Xycticus* is from the ancient Greek for scraper.

*Echinacea* refers to the spiny nature of the flower center. *Ekhinos* is the Greek word for hedgehog or sea urchin. The repetition of form across species is intriguing.

*page 45*     **Wild ginger.** Wild ginger (*Asarum canadense*) blossoms are an extra benefit of this lovely woodland ground cover. This one was growing on a steep bank providing a good view of bloom and young leaves. Beetles pollinate the ground level flowers that hide under the velvety leaves. The flowers have no petals but the sepals form the red/brown bell shape. Its root was used by natives and settlers alike as a spice and folk medicine.

John Pearson mentions wild ginger on page 12 of his essay.

*page 46* **Pale gentian. The darkness at the base of the right-hand bloom is a bee at work inside.** Pale or plain gentians (*Gentiana alba*) are occasionally found in moist prairies and woodland edges. They are threatened or endangered in several Midwestern states. Like the more common blue or purple bottle gentian (*Gentiana andrewsii*), they are pollinated by bees. Bumblebees have to push their way between the tightly closed petals to harvest the pollen and carry it to their next 'break and enter'. The darkness at the base of the right hand bloom is a bee at work inside. This particular plant was part of a native plant rescue in central Iowa prior to heavy equipment preparing the property for construction.

John Pearson describes the behavior of bees and bottle gentians on page 5 of his essay.

*page 47* **Green blow fly on coneflower bud.** The metallic back and red eyes of this large green blow fly (*Lucilia sp.*) are striking. Blow flies are common residents of carrion though this one was resting on a coneflower bud. It sat quietly as the camera with 180 mm macro lens was inched forward while making images. Everybody has a purpose in nature.

*page 48* **Dickcissel.** Dickcissels (*Spiza americana*) are at home in open grassy areas. Although adult males look a bit like miniature meadowlarks, Dickcissels are in the cardinal family. They are long distance migrants that are declining here in the Midwest because of habitat loss in North America and because they are considered pests in their wintering areas in South America. They are heard and seen singing from the taller perches in their territories. This increases opportunities to photograph them against distant out-of-focus backgrounds. *Spiza* is from the ancient Greek for finch-like bird.

*page 49* **Squirrel corn.** This full-figured relative of dutchman's britches and bleeding hearts is sometimes found in rich forest soil. We also find it on rocky slopes in eastern Iowa. Squirrel corn (*Dicentra canadensis*) corms or bulbs are pale yellow and though toxic to humans is much enjoyed by wild turkeys, squirrels and mice. Just because one or more species eat parts of a plant or fungi, it does not mean it is safe for humans. *Dicentra* means two-spurred, best observed in dutchman's britches and *canadensis* is of Canada.

John Pearson mentions squirrel corn on page 12.

*page 50* **Erratum** We and others who looked at this image during the selection process thought it an abnormal **Fireweed** (*Epilobium angustifolium*). None of us thought about **Meadow Beauty** (*Rhexia virginica*) which has a similar blossom and occurs in several sandy areas in eastern Iowa. We are grateful to the alert botanist who

suggested we look again.

Meadow Beauty grows only in a few damp, sandy locations here in eastern Iowa. Its flowers are usually in cymes or flat topped clusters, while Fireweed's blossoms are in spikes. This group of blossoms is intermediate, leading to our mislabeling this image. The leaves on this image are not definitive. On reconsideration, the buds are definitely Meadow Beauty. Leaves and tubers are said to be tasty additions to salads. The name *Rhexia* was used by the Roman naturalist, Pliny, though not for which plant.

*page 51* **May apple.** Though may apples or mayapples or may-apples (*Podophyllum peltatum*) are mostly white, sometimes there are pinkish ones that are fresh; not fading, as happens with many white flowers. A brief comment in a 1915 issue of *The American Botanist* noted a pink form of may apples in Iowa. We found this lacey pink one in east central Iowa. The plant is named because of its leaf which is thought to be foot or shield shaped. The plant is toxic though fully ripened fruit loses its toxicity and was used by settlers to make a fruit preserve.

John Pearson mentions may apples on page 12.

*page 52* **Great spangled fritillary on coneflower.** Fritillaries often need close inspection to identify which species. The great spangled fritillary (*Speyeria cybele*) is widespread in Iowa. Adults visit many flowers while the larvae are very specific; only eating violet leaves. A macro lens allows a good view of its intricate eye. Butterflies seem to be particularly sensitive to environmental changes and degradation.

*page 53* **Hoverfly on marsh marigold.** There are many hoverfly species which are wasp mimics. They are common in all habitats cruising among the blossoms. This one has alighted on a marsh marigold (*Caltha palustris*) which takes its name from many sources. *Caltha* means cup or goblet in Greek. *Palustris* is Latin for marsh or swamp. *Caltha* is also a mythical German maiden who fell in love with the sun god and when she died, a marigold grew in the spot. One of our favorite places to photograph marsh marigolds and skunk cabbage is Hanging Bog, a TNC (The Nature Conservancy) preserve in eastern Iowa.

John Pearson mentions Marsh Marigolds on page 5.

*page 54* **Wild rose, Iowa's state flower, with hoverfly.** There are many wild rose species and all are the Iowa State Flower. However, the meadow rose (*Rosa blanda*) is often credited as **the** one. *Blanda* means mild or thornless. It takes a wild rose expert to determine the exact species. Most are seen in prairies and on woodland edges. Rose parts were eaten by natives and settlers, especially in hard times. Rose hips are important wildlife food. Look closely to see the hoverfly's translucent wings that

appear pink.

Weather, especially wind, is always a factor in outdoor photography. This lovely rose was photographed at the Hayden Prairie Preserve in northern Iowa. The wind was relentless and we used all our umbrellas and 'wind fences' to prevent the flapping of leaves.

John Pearson mentions wild roses on pages 6 and 8.

*page 55*    **American goldfinch, Iowa's state bird.** The American goldfinch (*Carduelis tristis*) is an All-American bird. As well as Iowa, it is also the state bird for New Jersey and Washington. It is a cheerful little seed eater found in towns enjoying gardens, as well as in the prairies, where it nests later than most birds. It waits until seed crops and insects are adequate to support its brood. Goldfinches visit the pretend prairie in our city garden each late summer and autumn waiting for coneflower seeds to ripen.

*page 56*    **Cardinal flower.** Cardinal flower (*Lobelia cardinalis*) red is almost impossible for film or digital capture and for modern printers to reproduce this vibrant colored bloom. It is really "out of gamut." We think we came close with this one. Cardinal flowers like moist woods and stream edges. They are short-lived perennials that move about a garden from year to year. Ruby-throated hummingbirds are the main pollinator. Hummingbirds visiting our garden seem to prefer the cardinal flowers to trumpet vine and feeder. *Lobelia* were named for a Flemish botanist and surgeon, Mathias de l'Obel (1538-1616) who referred to himself as Lobelius. And *cardinalis* is scarlet red.

John Pearson mentions cardinal flowers on page 12.

*page 57*    **Zebra spider.** This alert jumping zebra jumping spider (*Salticus scenicus*) watched carefully as the camera moved in closer. These daytime hunters spot prey (especially sleepy flies) up to three feet away with their large central eyes. This one seems to be deciding whether the large lens eye is friend or foe. Spiders, like other species, serve a useful purpose in nature.

*page 58*    **Fly agaric.** Amanita are the poison mushrooms of fairy tales and reality. Midwestern fly agaric (*Amanita muscaria*) varies greatly in color and range from dark red to light yellow. At this early stage the yellow-orange is peeking through the crusty surface which will become white scaly patches as it opens. When open, they make sturdy stools for elves in children's book illustrations. We look for them near pine trees and other evergreens.

*page 59*    **Green-flowered milkweed.** Green-flowered milkweed (*Asclepias viridiflora*) is an

unusual rocky prairie milkweed with green and pink flowers requiring close examination to see their intricacy. We found this plant on a trip to the Loess Hills. *Aesculapius* (*Asclepias*) was the Greek god of medicine. *Viridiflora* refers to the greenish flowers.

John Pearson mentions green-flowered milkweed on page 7.

*page 60* **Northern blue monkshood with bee.** Bumble bees are one of the pollinators of this very rare and threatened species. Northeast Iowa has most of the known locations of northern blue monkshood or northern wild monkshood (*Aconitum noveboracense*). Most are blue or purple with white trim. Occasionally, a white blooming plant will be found. *Aconitum* was a hill in Pontus (modern Turkey) where poisonous aconite (monkshood) was raised. *Noveboracense* is from New York. We enjoy these rare beauties even though photography opportunities require long hot walks in late June. On a walk with an National Wildlife Service biologist in late May, the soil temperature in near monkshood was in the 30s.

*page 61* **Differential grasshopper.** This differential grasshopper (*Melanoplus differentialis*) is most likely found in tall vegetation like this autumnal bluestem grass. The herringbone pattern on its hind leg is a distinctive identifier. The intricate architecture of a grasshopper's exoskeleton offers interesting views from all angles. They most certainly are the inspiration for science fiction creatures and vehicles.

*page 62* **Hepatica.** *Hepatica* means 'of the liver' as indicated by another common name, liverwort. The three lobed leaves resemble the liver in shape and color. A walk in an upland woods in spring will often reveal hepatica (*Hepatica americana*) among the dry leaves. *Hepatica americana* have rounded leaf lobes while *Hepatica acutiloba*'s are pointed. Both are found in Iowa. The pastel flowers vary from white through pinks to lavender blue. Because they bloom so early before there are many insects, they self pollinate. We especially like the woodland of Palisades Kepler State Park in spring for hepatica and spring beauty.

John Pearson mentions hepatica on page 12.

*page 63* **Eastern tailed-blue.** This active little eastern tailed-blue (*Everes comyntas*) butterfly is seen all spring and summer. Males are bluer than the females. This one battled another for property rights to this stem and then rested while it was ready to guard its perch.

*page 64* **Bee on leadplant.** Pollinators are the companion animals of plants. The beauty of leadplant (*Amorpha canescens*) is sometimes hard to capture with its soft silhouette and subtle colors. In fact, the Greek *amorphos* means without shape referring to the

little one-petaled flowers along the spike. *Canescens* is Latin for gray and hairy, clearly visible in this image. The bee has collected the orange pollen on its legs.

John Pearson mention leadplant on pages 6 and 8.

*page 65*     **Yucca.** *Yucca (Yucca glauca)* are native to the Great Plains and found in western Iowa, especially the well drained soil of the Loess Hills. *Yucca* has a symbiotic relationship with a small moth needed for pollination. A stem of fresh blossoms is an voluptuous subject to capture. *Yucca* flowers, fruit and stems were widely used for food and medicine and roots for soap by natives and settlers. Fibers from the leaves were used for thread, rope and weaving. And the leaf points served at needles. *Yuca* was a Carib (Haitian) word. *Glauca* is from ancient Greek and refers to its gray-green color.

*page 66*     **Shooting star.** Iowa prairies become spangled with shooting stars (*Dodecatheon meadia*) in May. A visit to a preserved prairie cemetery almost always includes shooting stars as settlers chose pretty places for their cemeteries. This pastel beauty may be white, pink or lavender. It is also found on dry ridges and prairies throughout the state. *Dodecatheon* is an ancient Greek name meaning twelve-gods. *Meadia* is for Richard Mead (1673-1754) was an English physician.

*page 67*     **Plains gayfeather.** One of probably 25 species of *liatris* in North America, this plains gayfeather or blazing star (*Liatris pycnostachya*) has densely spaced flowers on clusters of spikes. Gayfeathers are the classic prairie flower sprinkled among the grasses and other forbs. Sometimes after prairie burns, dense patches of purple plumes appear to thrill the viewer. Many members of the genus have been used medicinally. The origin of *liatris* is unknown but *pycnostachya* mean dense ear of corn referring to the flower spikes.

John Pearson mentions gayfeathers on page 9.

*page 68*     **Lichen on locust branch.** Nature repeats motifs in various settings. The encrusted branch is reminiscent of a coral reef. Lichen species are amazing symbiotic combinations of alga and fungi that have many shapes and colors. Sometimes they also contain a cyanobacteria. This mutualism benefits all members. Lichens are sensitive to air pollution.

*page 69*     **White-throated sparrow.** Birds are often fastidious and this white-throated sparrow (*Zonotrichia albicollis*) is no exception. Autumn brings the return of white-throated sparrows which sort through the leaves and plant debris while feeding. Baths are essential. They nest in the taiga of Canada and winter in eastern and southern US.

- page 70*     **Sugar maple leaf.** Sometimes a sugar maple (*Acer saccharum*) leaf will show several stages of revealing its underlying colors as the green chlorophyll subsides in autumn. The reds and yellows of this leaf were especially intense. This image was made life size (1:1) on film. Most years this tree turns yellow quickly but some years it slowly changes from green to red, orange and yellow. The Latin *acer* means sharp and refers to hard wood and *saccharum* is sweet. John Pearson mentioned sugar maples on page 12.
- page 71*     **Buckeye on New England aster.** Butterflies and skippers like to feed on the nectar rich New England aster (*Aster novae-angliae*). We stop for aster patches in ditches near woodlands in the fall. Buckeyes (*Junonia coenia*) preparing for their migration to the southern states stop to feed and pose. We agree with many commentators that New England asters are worthy of its scientific name - star of New England.
- page 72*     **Tenpetal blazingstar.** The tenpetal blazingstar or ten-petaled mentzilia (*Mentzelia decapetala*) is a western species found in Iowa mostly in the Loess Hills. It is a species of special concern. Its flowers open late in the day when the light is most mellow. Iowa and nearby states are at the crossroads of the eastern woodlands and western plains. This lovely evening blooming flower is occasionally found east of the Loess Hills. It is named for Christian Mentzel, a 17th century German botanist. *Deca* is ten and *petala* is petal.
- page 73*     **Eastern prairie fringed orchid.** More rare than the western prairie fringed orchid, the eastern prairie fringed orchid (*Plantanthera leucophaea*) is a plant of special concern on the Iowa threatened and endangered species list. With only a few known locations in Iowa, it is a special orchid to be watched for as one explores wetlands. Its rarity is probably due to habitat destruction – draining of wetlands. All fringed orchid species are to be treasured. *Plantanthera* means flat anthers (pollen bearers) and *leucophaea* is dusky white.
- page 74*     **Michigan lily.** Sometimes called Turk's cap lily, in spite of not having the green throat of that species, the Michigan lily (*Lilium michiganense*) is one of the vivid natural colors that is hard to capture in a photograph. It seems to glow with red-orange fire from within. It photographs best when the background is far enough back to be out of focus. Our favorite patch on a nearby preserve was displaced by invading day lilies and is no more.
- page 75*     **Ornate box turtle in sand prairie.** This handsome mature male ornate box turtle (*Terrapin ornata*) is a member of a threatened species in Iowa. Sand prairies are necessary for their life style. Humans also like to build on them. They are small, sturdy, somewhat round turtles that grow slowly and live a long time if their habitat remains. This fellow is part of a population studied by a biologist friend. We know it is

a male because of the cinnamon candy red eyes.

*page 76*     **Eastern wood-pewee.** The eastern wood-pewee (*Contopus virens*) is solitary, quiet bird that is fairly common but often overlooked. It is a tyrant flycatcher that forages for insects from the mid to upper tree branches, flying out to capture an insect and circling back to the same perch. Like many other species in this group, it lives along woodland edges and where two habitats intersect. Its song contributes to its name as it plaintively calls "peeaweee". We found this one at a Whiterock Conservancy Bioblitz.

*page 77*     **Monarch caterpillar, chrysalis, emerging adult, and adult.** In our opinion, everyone should be 'foster parent' to a monarch (*Danaus plexippus*) caterpillar to see it grow, 'chrysalize', hatch and spread its wings. Monarchs may have several generations during the course of a Midwestern summer beginning with spring migrants heading north and the new butterflies migrating through on their way back south to Mexico. Both parts of its scientific name are the names of characters in Greek mythology.

Our 2009 foster caterpillar was newly hatched and less than 1/4" long when found. It grew to 2 1/2 inches over two weeks on a diet of common milkweed. After 9 days as a chrysalis, a female hatched. Females have thicker black lines and do not have a gland spot on their rear wings. She was last seen flying over our garage.

*page 78*     **Coral woodcrust.** Sometimes we find logs with what appears to be pink blobs of frosting trimmed in white. This example of coral woodcrust (*Phlebia incarnate*) is particularly attractively formed. It causes a white rot as it breaks down fallen hard woods. This species (also called *Merulius incarnatus*) is found in the eastern and southeastern U.S. This fresh and clean group was found on a Prairie States Mushroom Club foray to Brown's Woods in Des Moines.

*page 79*     **Painted lady.** You are likely to encounter this lady in almost any habitat type in summer. Painted ladies (*Vanessa cardui*) are found on all continents but Australia and Antarctica. We encountered one in the Falkland Islands in 2009 that had blown in from South America. They do not breed in the Falklands. One of the 'blue' spots on this hind wing photographed as violet. Colors may be pigments or caused by surface structures that bend light waves.

*page 80*     **Prairie smoke.** The demure prairie smoke (*Geum triflorum*) flower head sometimes hangs down and then raises to blow its smoke when it fruits. *Geum* is from the Greek and may have connections to fragrance or taste and is related to the ancient Greek word for stimulant. Another of its pretty common names is 'cowboy's rose.' Natives and settlers made a tea from the roots.

page 81 **Purple prairie clover.** Colors never clash in nature. Both purple and white clovers are often found together in well drained prairie soils. Purple prairie clover (*Petalostemum purpureum*) is really more pink and red than purple. This one was quite magenta. Prairie clovers contribute nitrogen to enrich prairie soil. *Petalostemum* refers to the fact that petals and stamens are joined.

John Pearson mentions purple prairie clover on pages 7 and 8.

page 82 **Twelve-spotted skimmer.** The twelve-spotted skimmer (*Libellula pulchella*) is a large robust dragonfly seen patrolling its territories in all summer in the upper Midwest. It is an attractive addition to the landscape. When photographing dragonflies, we look for their favorite perches and try to stay low so as not to appear as a threat. Many dragonfly and damselfly species are territorial and claim several cubic meters of air space to defend. We made this image at Wickiup Hill Outdoor Learning Center in Linn County, a favorite photography location.

page 83 **Red admiral on nodding plumeless thistle.** Some call the red admiral (*Vanessa atalanta*) patriotic because, besides its red stripes and white dots, there are also some small blue markings on upper and undersides of its wings. The vividly colored nodding plumeless thistle (*Carduus acanthoides*) is an invasive weed. Many butterflies are opportunists, taking advantage of the nectar, no matter what the source. *Carduus* is ancient Latin for thistle. *Acanthoides* means resembling *Acanthus*, the nymph Acantha, who Apollo turned into a prickly plant in Greek mythology.

page 84 **Ohio spiderwort.** Ohio spiderworts (*Tradescantia ohioensis*) are usually blue or purple but may also be white, pink, or lavender. Look for fresh blooms early in the day. They usually close and shrivel in the midday heat. Spiderworts were once considered a cure for spider bites. Wort is from an Old English term for plant or herb.

page 85 **These nine violets are a sample of the colors found across the many habitat types in Iowa. The lavender bird's foot violet (center) is easy to identify by its thinly divided leaves.** Violets are ...' Violet species are hard to determine in the field where microscopes are few. The blue and purple ones are hardest to identify as to species. The lavender birdsfoot violet (*V. pedata*) is easy to identify by its thinly divided leaves and lavender bloom. Yellow ones in Iowa woodlands are likely to be *V. pubescans* – downy yellow. All these hues and more are found in Iowa woodlands and prairies. All are interesting photographic subjects.

page 86 **Northern pearly-eye.** Some butterflies like sap as much as, or more than, nectar.

The northern pearly-eye (*Enodia anthedon*) lives in moist woodlands mostly in the southern half of Iowa. It is often seen fluttering low to the ground on woodland paths in mid-summer. This image was made with a long telephoto lens rather than our usual macro lenses.

- page 87*     **Showy lady's slipper.** This orchid is found in very few places in Iowa and is classified as threatened in the state. The showy lady's slipper (*Cypripedium reginae*) is the Minnesota State Flower and may be found in ditches throughout the northern part of that state. It has a few outliers here in Iowa and surrounding states. Leave them where you find them. *Cypripedium* is Greek for Venus's shoe. The Latin *reginae* is appropriate because it is a very regal queen of the north.
- page 88*     **Skunk cabbage spathe surrounding the spadix.** We have found the spathes (red/maroon outer portion) around the spadix (the yellow little club holding the tiny flowers) in winter as well as early spring. Smelling more like carrion than skunks, it is pollinated by beetles and flies. Skunk cabbage (*Symplocarpus foetidus*) is one of the plants that generates enough heat to melt snow and offers a nice warming hut to early spring insects. *Symplocarpus* means connected fruits on the spadix and *foetidus* is fetid or fowl-smelling.
- page 89*     **Spotted lady beetles on dandelions.** This native spotted lady beetle (*Coleomegilla maculata*) is valuable, not only for its beauty, but because it eats aphids. There were hundreds feeding on a patch of non-native dandelions. Native dandelions are more delicate than the common introduced species. Photographing beetles at ground level is easier on the knees when wearing gardeners' knee guards.
- page 90*     **False hellebore in southern Iowa.** False hellebore or Wood's bunchflower (*Veratrum woodii*) blossoms are purplish-brown and green. We have only seen this in southern Iowa in what must have once been savannahs. This somewhat rare species is inconspicuous but lovely when discovered. A zoom lens was needed because of its location in the woods. The zoom allowed the plant to be isolated with a narrow angle of view. *Veratrum* refers to the black roots of the plant. Alphonse Wood was a 19th century American botanist.
- page 91*     **Blue-eyed grass, white form.** Not a grass, but an iris relative with long narrow leaves, blue-eyed grass (*Sisyrinchium sp.*) is a very variable plant. Some blooms are white with others shading through pale blue and lavenders, all the way to a vivid blue. The blue ones in Iowa are likely to be *S. campestre*. This white one is probably *S. albidum*. *Albidum* is white. We see white and blue ones in prairie patches and preserves. *Campestre* is Latin for 'of the fields'. Blue-eyed grass prefers sandy soils. *Sisyrinchium* means pigs nose because pigs like to dig the roots. Like many native plants, blue-eyed grass had medicinal uses by the original Americans.

John Pearson mentioned blue-eyed grass on pages 7 and 13.

*page 92*     **Grey treefrog on blunthead milkweed in sand prairie.** Far from the nearest tree a grey treefrog (*Hyla versicolor*) on a blunthead milkweed (*Asclepias amplexicaulis*) was a wonderful find on Cedar Hills Sand Prairie in northeast Iowa. *Hyla* means tree. Treefrogs' skin can change colors (spotted greys and greens) depending on the surroundings. The treefrog had taken refuge in a shaded leaf. We used white umbrellas to shade and diffuse the light as this was found in the middle of the day. Sometimes it is necessary to alter the weather and provide a thin overcast sky. Blunthead milkweed leaves embrace the stem (*amplexicaulis*).

*page 93*     **Yellow and small white lady's slippers.** Small white lady's slippers (*Cypripedium candidum*) are a species of special concern on the Iowa threatened and endangered list. Yellow lady's slippers (*Cypripedium calceolus*), both large and small, are more frequently found. Near this small yellow and small white we found some cream-colored ones. One of the reasons orchid enthusiasts throughout the world are fascinated by orchids is their propensity to hybridize. One of lady's slipper's charming common names is whippoorwill shoes. *Candidum* is whitish and *calceolus* is like a small shoe.

John Pearson mentions small white lady's slippers on pages 7 and 8.

*page 94*     **Blazing star.** At least eight liatris species are found in Iowa. This blazing star (*Liatris pycnostachya*) pair of twining stalks was found in a patch of traditionally straight flower heads. One of the challenges of photography is to present the unconventional or unusual in representational compositions. Among the common names for blazing stars are: gayfeather, button snakeroot, and colicroot.

John Pearson mentions gayfeathers on page 9.

*page 95*     **Dewdrop refraction of coneflowers.** Our dewdrop images are the ultimate of our efforts to look closely at the small details of nature. They are magnified several times life size on film or digital capture. The purple coneflowers (*Echinacea purpurea*) and brown-eyed susans (*Rudbeckia triloba*) refracted in the drops are accented by the black background used to minimize the strong dappled sunlight. This is reminiscent of the colors of a black opal. The stems and drops need to be completely parallel with the film or sensor plane because of the extremely shallow depth of field at this magnification. The elder Olaf Rudbeck (*Rudbeckia*), botany professor at Uppsala University, was Linnaeus' mentor.

*page 96*     **Lichen on pink Sioux quartzite.** The oldest exposed rock in Iowa is found at

Gitchie Manitou State Preserve in the far northwest corner. The band of pink Sioux quartzite surfaces along a line from southwest Minnesota, through the northwest corner of Iowa, on to northeast Nebraska. It is estimated to be 1.6 billion years old and was later exposed by glaciers. The outcrops at Gitchie Manitou State Preserve were the ones used to first describe it in the geologic literature. Lichens are communities of algae and fungi and sometimes cyanobacteria that are slow growing and long lived. This pattern is probably composed of several lichen species. John Pearson mentioned lichens on rock on page 13.

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**Rattlesnake master.** Rattlesnake master (*Eryngium yuccifolium*) is a handsome plant with bluish green yucca-like leaves and spherical flower heads. The pale colored bracts on the flower heads are stiff and prickly. It is found in many prairie habitats across the state. We like macro lens for many reasons; chief among them is the ability to isolate subjects from their backgrounds, as demonstrated here. *Eryngium* is reference to its prickly character.

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**Sweet flag.** The sword-shaped leaves of sweet flag (*Acorus calamus*) grow in pairs with one sheathing the other at the base. The flowers are usually inconspicuous on the spadix that protrudes from a stem that becomes a spathe above the protrusion. This spadix shows the cross-hatch pattern of the tiny blossoms. The common name comes from the aroma of the root which was used in native and pioneer folk medicine. A candy was also made from the roots. *Acorus* is Latin for *acorum*, the ancient Greek name for iris, and *calamus* is a reed.