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Various and William Kerr Higley**

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Title: Birds and Nature, Vol. 12 No. 4 [September 1902]

Author: Various  
Editor: William Kerr Higley

Release date: January 5, 2015 [EBook #47884]

Language: English

Credits: Produced by Chris Curnow, Joseph Cooper, Stephen Hutcheson,  
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# BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

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VOL. XII.

NOVEMBER, 1902.

No. 4

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## NOVEMBER.

When thistle-blows do lightly float  
    About the pasture-height,  
And shrills the hawk a parting note,  
    And creeps the frost at night,  
Then hilly ho! though singing so,  
    And whistle as I may,  
There comes again the old heart pain  
    Through all the livelong day.

In high wind creaks the leafless tree  
    And nods the fading fern:  
The knolls are dun as snow-clouds be,  
    And cold the sun does burn.  
The ho, hollo! though calling so,  
    I cannot keep it down;  
The tears arise unto my eyes,  
    And thoughts are chill and brown.

Far in the cedars' dusky stoles,  
    Where the sere ground-vine weaves,  
The partridge drums funereal rolls  
    Above the fallen leaves.  
And hip, hip, ho! though cheering so,  
    It stills no whit the pain;  
For drip, drip, drip, from bare branch-tip,  
    I hear the year's last rain.

So drive the cold cows from the hill,  
    And call the wet sheep in;

And let their stamping clatter fill  
The barn with warming din.  
And ho, folk, ho! though it is so  
That we no more may roam,  
We still will find a cheerful mind  
Around the fire at home!

—C. L. CLEVELAND.

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## THE PILEATED WOODPECKER. (*Ceophloeus pileatus.*)

In years gone by, when large sections of the United States were covered with deeply wooded virgin forests frequented only by denizens of the wildwood, the Pileated Woodpecker was an abundant resident through nearly all of North America. A bird citizen of the deeper and more extensive forest regions, it has gradually retreated before the advance of man, and it is a very rare visitant in the Eastern States and is only found in the thickly settled and heavily timbered bottom lands which the human intruder seldom penetrates. In the Southern States it is more common and may be considered abundant in some sections.

Mr. Manly Hardy says: "The Pileated Woodpecker is a constant resident of Maine, but rarely leaves the vicinity of large timber. It prefers places where large hemlocks abound, especially those localities where a few have been killed by camp building or small fires." A strange feature of its distribution is that, though it is distributed quite generally throughout North America, there are many heavily timbered areas, well suited to its habits, in which it is not found. If it occurs at all it is very rare in the Southern Rocky Mountain regions, and is also rare in Alaska.

The Pileated Woodpecker is a beautiful bird of great size and strength. Its bill is both large and powerful. In fact, it is exceeded in size by but one of the Woodpeckers—the ivory-billed species—which is a resident of the Southern States. It is quite variable in its habits. In some sections it is very shy and retiring, while in others it is quite tame and becomes quite accustomed to man if not ruthlessly annoyed. Mr. Hardy, writing of his experience with this bird in the woods of Maine, says: "I once had two so tame they would allow me to sit within four paces of them, and put my hand upon the tree when they were not ten feet above my head." Mr. Chapman, writing of its habits in the cypress swamps of Florida, says: "There, contrary to the experience of Audubon, I found it by no means a wild bird. Indeed, flickers were more difficult to approach," and he also writes: "I have called these birds to me by simply clapping my slightly closed palms, making a sound in imitation of their tapping on a resonant limb." Another writer states that when called in this manner, "they seem to lose their usual shyness and seem stupefied at not finding their mate, as they had expected."

Few birds are more useful in the preservation of the forest from destruction by insect pests. "A workman is known by his chips." The energy and perseverance of the Pileated Woodpecker, as it seeks for the destructive borers or other injurious insects, in the bark and wood of afflicted trees, is amply attested by numerous denuded trees and by the strips of bark and piles of chips lying on the ground. The hammering of the more familiar species of woodpeckers is but a light tapping when compared with the loud and resounding whacks of its powerful strokes. It has been known to "chisel holes six or eight inches deep in cedar and other soft-wood trees, and as large as the holes in a post-and-rail fence," and to "pick a large hole through two inches of frozen green hemlock to get at the hollow interior." It seldom, if ever, attacks healthy trees and it is a constant resident of extensive forests that have been swept by destructive fires and the bare tree trunks left to decay.



PILEATED WOODPECKER.  
(*Ceophloeus pileatus*).  
½ Life-size.  
FROM COL. CHI. ACAD. SCIENCES.

Mr. Wilson, that enthusiastic student of bird life, writes in his usual interesting manner concerning the habits of the Pileated Woodpecker. In his "American Ornithology" he says: "Almost every old trunk in the forest where it resides bears the marks of his chisel. Wherever it perceives a tree beginning to decay, it examines it round and round and with great skill and dexterity strips off the bark in sheets of five or six feet in length, to get at the hidden cause of the disease, and labors with a gayety and activity really surprising. I have seen it separate the greatest part of the bark from a large, dead pine tree, for twenty or thirty feet, in less than a quarter of an hour. Whether engaged in flying from tree to tree, in digging, climbing or barking, he seems perpetually in a hurry." 149

During the mating season it is exceedingly noisy, not only spending much time in drumming, but also frequently uttering its love notes which to Mr. Nehrling sounds like "a-wuck, a-wuck." Mr. Chapman describes their usual call note as a "sonorous cow-cow-cow, repeated rather slowly many times," and when two birds come together they utter a "wichew note" similar to that of the flicker. Its note of alarm has been likened to an oft-repeated ha-he, ha-he, ha-he. The same observer hears in its call note a constant repetition of a-wick, a-wick and at times tack-tack-tack.

For its nest the Pileated Woodpecker excavates cavities in tree trunks at heights varying from twenty to eighty feet above the ground. Both sexes assist in the work of making the cavity which, Major Bendire states, "vary from seven to thirty inches in depth, and is gradually enlarged toward the bottom, where it is about six inches wide." He also says that it takes from seven to twelve days to complete it and when completed it is quite an artistic piece of work, the walls of the cavity being quite smooth and the edges of the entrance being nicely beveled. The eggs are usually deposited on a layer of chips. Not infrequently every chip, as soon as it is loosened, is removed to a distance in order to remove every trace of the nesting site.

Birds as well as other animals are afflicted with parasitic worms. Mr. Langdon found on dissecting a Pileated Woodpecker, a "slender tape-worm about fifteen inches long and one-thirty-second of an inch wide," and in the tissues beneath the skin of the neck "were two thread-like, round worms of a pale pinkish tint and about three-fourths of an inch in length."

Of this wonderful bird we may truthfully say with Mr. Langille, "Whether one notes his strong flight, his elastic bounding and springing along the trunks of the trees, the effective chiseling of his powerful bill, or his sonorous cackling, one is particularly impressed with the spirit and immense energy of the bird."

## SABBATH BY THE LAKE.

Peace smiles above the scene. The waters lie  
As still and blue as the arched sky they love.  
No sound salutes the ear, save that, far off,  
A bird recites to his fond mate his joy;  
And silence seems but deeper for the slender sound.  
The butterflies, that frolic noiselessly,  
Think Earth is Heaven and live by loving flowers.  
The trees in social groups, link branch to branch  
And root to root and smile beneath the sun.  
In harmony with all about I rest.  
Within my soul there dwells a thought that knows  
No words, but silent, sweet, it sings to me.  
Peace smiles above the scene, 'tis Sabbath day.

CARRIE B. SANBORN.

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### **"HAMMOCK STORIES." MRS. FIG TREE'S FAMILY HISTORY.**

It was a nice, bright, sunshiny day, and the trees were freshly washed from a warm rain the night before, but it seemed to me when I first lay down in my hammock that they were not in as good humor as usual. Mrs. Pepper Tree had lost her sprightly manner, and her voice was quite peevish when, seeing some children pass on their way from school, she exclaimed:

"It beats me what those children do day after day, and year after year! They can't be very smart or they would have learned all their lessons long ago."

Grandma Liveoak reminded her that according to what she had heard tell, children had a lot more to learn than trees; that they were obliged to study about people and everything they ever did, and about stones and birds and the sky and the flowers, and bugs and flies and the rest, and she expected it took them some time.

"I presume they spend a great deal of their time studying my family history," said Mrs. Fig Tree. "It is a very old and important one, and even grown people go to big buildings when the bells ring, and read and learn about my family."

Her voice was as satisfied, oh, just as satisfied as could be, and she seemed to be quite pleased over something while she was talking. Mrs. Pepper gave her branches a toss, as she crossly exclaimed:

"I don't see what there is in Fig Trees to study over much! All they have anyhow is queer awkward looking leaves in the spring, then green figs growing right out of the branches, no flowers or anything, then by and by all the leaves dropping off again! I wouldn't think that would take much time or was worth much time either, and for my part I wouldn't have leaves I couldn't keep all the year round."

Mrs. Fig answered her in a very polite tone, just as if she was talking to company: "Excuse me, Mrs. Pepper, but probably you never heard that it was my family that gave the first man and woman who ever lived in the world their clothes!"

Mrs. Pepper said she never heard it, and she guessed no one else ever did either. But you could see she was getting curious, and so were the other trees, and they finally asked Mrs. Fig to tell them, and so she began.

"Long, long ago there was the most beautiful garden that ever was heard or thought of and every lovely flower that grows, and every tree that amounts to anything, was there. But the rose bushes had no thorns, and there were no spiders or bugs or worms to bother the trees and shrubs, but only great butterflies as bright as the rainbow. And there were no brambles or thistles or burrs, but only violets and clover blossoms and other flowers, and all the birds sang more sweetly than the nightingale, and the fountains were clear and sparkling, and the fruit was always ripe, and everything was just as beautiful as could be, and the first man and woman were the most beautiful of all, only they didn't have any clothes."

Mr. Pine rustled his needles in an embarrassed sort of way, and Grandma Liveoak said that didn't seem just the right thing, somehow; but Mrs. Fig calmly remarked: "That was what they thought too and so they made themselves lovely clothes out of fig leaves."

Mrs. Pepper guessed that that wouldn't help them much; that clothes made out of fig leaves would amount to no clothes at all. But here Mr. Pine spoke, saying:

"If I might with propriety venture a suggestion on so delicate a subject, I think possibly it was bathing suits the first man and woman made of the fig leaves. My friend, the East Wind, assures me that"—

"Rubbish," cried Mrs. Pepper, "rubbish! I don't believe that they ever made any clothes of her old leaves at all, so there!"

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And now Mrs. Fig's voice was so polite it made me quite nervous, and she spoke very slowly. "The first man and woman went to all of the other trees and looked their leaves over very carefully, but none of them were good or pretty enough, and finally they came to the Fig tree." Here Mrs. Fig made a long pause, repeating, "Finally they came to the Fig tree. And the first woman said: 'Oh, aren't these leaves just too lovely for anything! The Fig tree is the best and prettiest of all. We will make our clothes out of her leaves. And so they did, and what's more, they got into a whole lot of trouble just because they had something to do with another tree besides the Fig."

Mrs. Pepper rubbed two branches together, and it made the most sneery sound you ever heard, as she asked: "I suppose you want me to believe that 'other tree' was the pepper?"

"No," replied Mrs. Fig, "I don't think there were any pepper trees in the garden at all."

Then you should have seen how angry Mrs. Pepper grew and I did wish that Grandma Liveoak would hurry and say something so there would be peace; but sure as you live, when she spoke her voice sounded strange and very dignified, and she only said:

"The other trees may have family histories too, Mrs. Fig, if they chose to boast of them!"

"A poet once said," began Mr. Pine.

But Mrs. Orange Tree interrupted him to ask what they were saying about her; that she heard "best and prettiest leaves" mentioned.

Mrs. Fig told the story all over again, and I wanted to explain to her that I had never heard it just that way; but her stubby branches were standing very firm and determined, and I knew it wouldn't do a bit of good.

"Poets," said Mr. Pine, "are the wisest people in the world, and one of them"—

"I don't care a twig for the first man or the first woman," said Mrs. Pepper crossly. "I know all the painters choose me, and they put my leaves and my clusters of white blossoms and red berries on paper and boards, and painters are the people of all the earth who know what is beautiful, so that proves the first place mine."

"This poet once said of our family," Mr. Pine began again.

"The brides all choose me," cried Mrs. Orange, "and who in the world is so important as a bride? And if they choose me, I must be first and prettiest."

"As I remarked," said Mr. Pine, "this poet"—

But such a noise you never heard, and even Grandma Liveoak as bad as the rest, and Mrs. Pepper and Mrs. Fig and Mrs. Orange, all claiming so many things for their family. And they got to saying unkind things to each other—they really did—and you have no idea how dreadfully sarcastic trees can be. But just as I was wondering however it would all come out Mrs. Pepper stopped still for a minute, then leaned her graceful boughs fringed with fine narrow leaves way over until they kissed Mrs. Fig's bare branches, and said gently: "I am sure it was a great honor to have your pretty leaves chosen by the first man and woman, and I am very sorry I was cross."

Grandma Liveoak gave a little laugh, exclaiming, "Well, what a silly old tree I am! Do you know, I came very near being a little put out there, just for a second, simply because another tree mentioned her family." Then she praised Mrs. Fig and told her it was a good thing to think well of one's own sap and wood. And Mrs. Fig said she might have been mistaken about what the first woman said, and that probably she took the fig leaves because they were the handiest or something. And Mrs. Orange got the wind to blow over some of her prettiest blossoms to the other trees, while high above Mockingbird was singing and over on the hedge a meadow lark gave its call, and it was all very sweet and pretty.

"As I was saying," calmly remarked Mr. Pine, "a poet once said of our family:

Who is the king of all the wood?  
Be it distinctly understood  
It is the Pine!"

KARRIE KING.

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## BUILDING FOR BIRD TENANTS.

When on walking through a city park on a blustery winter day one suddenly spies the little bird houses, built by the custodian and perched high up among the branches of the trees, a smile invariably creeps over the face and a thought of summer steals into the tired brain. Would that the building of bird houses became more fashionable among our boys!

One of the simplest and most artistic of them may be formed from a cocoanut shell. The opening may be so made that the piece of shell cut out can be turned up like a little porch roof over the door. If these be fixed just at nest-building time and the architect should kindly leave the nut inside the shell the birds will be most grateful.

Down south many of the door-yard trees seem to be growing gourd fruit. In reality the gourds (with an opening in

the side of each) are tied on or hung there by means of their own crooked necks to make nests for the birds.

Sometimes one may see whole rows of them upon a pole which is nailed to a stable roof and often they are found hanging to the ragged edge of the roof of a negro cabin. As far as I can learn, the idea originated with the colored people, who take great pride in the number of birds they can attract about them by this and other kindly means. The little yellow houses seem to delight the birds so much that one is seldom put up in vain, and the tenants pay lavishly with coins of song and many a trill of joy.

LEE McCRAE.

## THE LIGHT OF THE LEAVES.

Hurry, skurry through the air  
Leaves are falling everywhere.  
Gold and crimson meet or miss  
Smile or blush at the frost king's kiss.

Whirling, twirling, o'er the ground,  
Forced by merry winds around;  
Piled by childish hands on high,  
There, like martyred saints, to die.

Crackle crackle, sound their knells,  
Imprisoned sunshine in them dwells  
Like tiny tongues, 'twixt earth and sky  
They whisper love to passers by.

Falling, ever falling, they,  
Consumed to make the world more gay;  
The misty cloud of smoke o'erhead  
Seems like the veil Shakina spread.

Down and down comes memory's leaf,  
Bright with hopes or sere with grief;  
The brightest one in life's huge pile  
Is that from which our bonfires smile.

—CORRA MAY CRATTY.



## THE STARLING. (*Sturnus vulgaris*.)

The Starling belongs to an interesting family of birds, represented in America by but one species and that one only recently introduced. In the Old World, however, there are about two hundred species which are widely distributed throughout Europe, Asia and Africa.

The common Starling is a native of Europe and northern Asia and is admitted to the bird fauna of North America both because of its accidental occurrence in Greenland and of its introduction into the parks of New York city. Regarding its introduction into this country, Mr. Chapman says that it has been brought across the ocean on several occasions, but only in the case of the last importation was the effort to make it establish a home within our borders a success. "The birds included in this lot, about sixty in number, were released in Central Park, New York city, in 1890. They seem to have left the park and to have established themselves in various favorable places in the upper part of the city. They have bred for three successive years in the roof of the Museum of Natural History and at other points in the vicinity. In the suburbs about the northern end of the city they are frequently observed in flocks containing as many as fifty individuals." From the fact that it is a resident throughout the year and has endured our most severe winters Mr. Chapman thinks that the species may be regarded as thoroughly naturalized.

The common Starling easily adapts itself to its environment and can withstand quite a diversity of climatic conditions. However, while it was introduced with difficulty in the eastern United States, efforts made to introduce it into the State of Oregon have not met with success. Wherever the conditions are favorable it breeds rapidly and not uncommonly a pair will rear two broods in a season.

This engaging bird has commanded the attention of observers for centuries. Pliny speaks of it in his Natural History, and one writer has said that "its varied song, its sprightly gestures, its glossy plumage, and, above all its character as an insecticide—which last makes it a friend of the agriculturist and the grazier—render it an almost universal favorite." Some of the notes of the Starling's song are harsh but on the whole the song is pleasing and "heard as they are, at a season when every sign of returning spring is eagerly looked for and welcomed, are certainly one of the most cheerful sounds that greet the ear." Its whole energy is thrown into the song, which is uttered with ruffled feathers. It is also a mimic of no mean order. One authority says that it delights "in reproducing familiar sounds with the greatest fidelity to truth. We have heard individual Starlings reproduce the call notes of the skylark, goldfinch, wagtail, and other small birds; sometimes we have been startled on a winter's day to recognize the cry of the common sandpiper or the grating call note of a fern owl in the middle of a crowded city, and have discovered the author of our astonishment in the person of a Starling, that is pouring forth his rhapsodies from some neighboring chimney top." Pliny says: "Agrippina, the wife of Claudius Caesar, had a thrush that could imitate the human speech, a thing that was never known before. At the moment that I am writing this, the young Caesars have a Starling and some nightingales that are being taught to talk in Greek and Latin; besides which, they are studying their task the whole day, continually repeating the new words that they have learnt, and giving utterance to phrases even of considerable length." The young birds are very noisy and while feeding and training them the parents are scarcely less so. So great, in fact, is this noisy babble that it often becomes very unpleasant. 156

The Starling is a gregarious bird at all times, but this habit is more marked after the breeding season has passed. It has its favorite haunts and, though a flock may be dispersed during the daytime while feeding, all will congregate in the favorite locality at nightfall. Mr. William Yarrell, in his "British Birds," gives an interesting anecdote regarding the abundance and social habits of the Starling. Speaking of an English estate, he says, "This locality is an evergreen plantation covering several acres, to which these birds repair in an evening—I was going to say, and I believe I might truly say—by millions, from the low ground about the Severn, where their noise is something altogether unusual. By packing in such myriads upon the evergreens, they have stripped them of their leaves, except just at the tops, and have driven the pheasants, for whom the plantation was intended, quite away from the grounds."

Regarding their nesting and mating habits Mr. Henry Seebohm says: "Early in April, sometimes not until the beginning of May, the Starlings have mostly mated and gone to their breeding holes. Previous to this, however, much quarreling goes on for the choice of suitable sites. The strong gain the best holes, while the weak seek quarters elsewhere. The Starling will build its nest almost anywhere, and it needs but slight encouragement to take up its quarters in any suitable hole or box placed for its reception. It will even dislodge large tiles and burrow considerable distances under the eaves, and its bulky nest often stops up some spout, to the dismay of the householder. A hole in the gable or inside the dovecot are also favorite places, while its partiality for holes in the trees is none the less. It also commonly breeds in ruins, churches, and old masonry of every description. In the wilder portions of the country the Starling selects a hole either in a tree or a rock for its purpose, and it will often breed in great numbers in caves or in crevices of the ocean cliffs." The nest is not a fine piece of bird architecture. It is coarse and slovenly constructed with dry grass, fibers, twigs, small roots, rags, twine, paper and in fact of any substance that strikes the fancy of the bird. It is lined, though not always, with wool, vegetable down and feathers. At times when the nest is placed in hollow trees the bedding consists of powdered wood. The Starling returns to the same site year after year, but always builds a new nest.



Though the Starling will often pilfer fruit trees, especially late in the season, it is of great service to man, for its chief food consists of worms, larvae and various adult insects. It is a voracious feeder and thus destroys a large number of forms of insect life, many of which are very destructive to plant life. It "is almost as closely associated with man as the sparrow," but unlike the sparrow it is much more able to adapt itself to a change of surroundings.

## NOVEMBER.

November sits at the door of her wayside tent looking out upon the valleys and mountain tops. She has torn from the trees their faded banners of yellow and their worn fringes of crimson. November is an old dame, gray-haired, somber-eyed and strong-featured. Clad in garments of dun and dusky brown, she sits resting and smoking; and that is why we get such smoky days toward the last of her stay.

Yes, November is an old gypsy dame, but she is not always melancholy. She is the month of whom artists are especially fond. While she lacks the glow of midsummer, there is compensation for the absence of bloom and radiance in the ripening of all vegetation; there is still a touch of splendid color on the hills, and the grass is green with the aftermath of summer. Beautiful mists veil the mountain tops. There is an exquisite beauty in the tints of sepia and the rich brown tones of the landscapes and in the tender grays and clear blues of November skies.

Ah, she knows, does November, that she, too, in her old age, gives promise of something sweet to come. All the trees are filled with next year's buds; the trailing things of the woods, too, are budded and wait but a few months until the first snows are gone to blossom in fragrance and gladden the bright wedding days of Spring.

Calmly she smokes, the dear old dame, sitting at the door of her tent. Near by, dim and misty, are the marshy fens, in which stand the herons like sculptured figures, where the bulrushes have turned yellow amongst the tawny tussocks. Around her the Indian creeper weaves its still brilliant strands of red and gold. Softly the willow bands drop their trailing leaves. Heavy and purple still hang the berries on the elder boughs that languidly wave in the faint breeze as if they still felt the ghosts of summer kisses.

The nut-brown face of old November looks impassively on all the changes of her season. She knows nothing is dying about her that shall not live again. Her eyes, dark, liquid, somberly deep and tranquil, have seen all the things beautiful that our eyes have missed—the wild flowers trodden down by careless feet; moonlight on far off lakes at midnight; the first pink flush of dawn on stately mountains. Ah, yes, she knows of Love; of dead folded hands, and she remembers the buds of her last year's reign. She knows that, like the sleeping buds about her now, Love shall give all things back again in the sweet springtime of Paradise, even as these same buds shall waken to bloom and beauty when their winter sleep is over.

But now the night is coming on. Deep shadows are filling the dusky stalls of the drooping hemlocks on yonder hill. Faint spicy odors of sweet fern and illusive witch hazel rise on the misty air. Dame November rises slowly, knocks the ashes from her pipe, gazes broodingly for a few moments over the fading landscape, then turns and softly closes her door. All night the solemn winds intone the requiem of Spring and Summer glories past, but at intervals listen and you will hear the sweet, thin flute of the wood-frog, faintly but hopefully voicing the promise of another Spring, with more bloom, more gladness and glory to come.

Dear old Dame November! A few more days and she will no longer be sitting at the door of her wayside tent. We love her mists, her mellow rains, her dull, rich tones of brown and faded gold. December shall disturb the brooding calm that she has left with us, but we know he cannot harm with his icy mail and glittering frost spears the tightly folded promises which the gypsy November has prepared for next year's blooming.

BELLE A. HITCHCOCK.

## THE ARKANSAS GOLDFINCH.

(*Spinus psaltria.*)

The Goldfinch, social, chirping, bright,  
Takes in those branches his delight.  
A troop like flying sunbeams pass  
And light among the vivid grass,  
Or in the end of some long branch,  
Like acrobats, in air they launch,  
And in the wild wind sway and swing,  
Intent to twitter, glance and sing.

—ROSE TERRY COOKE, "My Apple Tree."

These lines of the poet were inspired by the beautiful goldfinch so familiar to all, and usually called yellow-bird and thistle-bird. They form an appropriate introduction to a few words regarding the thistle-bird's sister species of the Pacific coast—the Arkansas Goldfinch. This bright and sprightly bird enlivens the shrubby ravines and weedy places from Oregon southward through the United States, and from the Pacific coast eastward into Colorado. Throughout its range it is quite common and nests on the plains and also in the mountains to a height of nine thousand feet. Abundant in many mountainous regions, it has been given the name Rocky Mountain

Goldfinch, and the olive-green color of the plumage of its back has given it the very appropriate name Arkansas Green-backed Goldfinch.

Like the common thistle-bird, it has a social disposition and feeds with its fellows in flocks of a greater or less number. Not infrequently several individuals will alight on the same plant and immediately begin a diligent search for their food of seeds. Active and of a seemingly impatient temperament, it seldom remains long in any one locality, yet a garden rich in sunflower blossoms or a field full of blooming thistles furnished so tempting a larder that a flock may patiently labor therein for some time, gathering an abundance of goldfinch dainties.

Its notes are similar to those of the thistle-birds. "The ordinary note is a plaintive mellow, whistling call, impossible to describe and so inflected as to produce a very mournful effect." While pursuing its undulating flight, it utters a sweet song which is in harmony with the rise and fall of its onward motion and is indicative of its sweet disposition. Its nest is a dainty structure built of fine bark and other vegetable fibers, fine grasses and moss compactly bound together and quite thickly lined with plant down.



ARKANSAS GOLDFINCH.  
(*Spinus psaltria*).  
Life-size.  
FROM COL. CHI. ACAD. SCIENCES.

## TRAGEDY IN BIRD LIFE.

For the friends of birds there are, in cold days of wind and storm, opportunities of loving service.

In the drama of bird-life the scenes are ever shifting, and struggle for existence is not always under sun-lighted, genial skies.

It is true that creative love has endowed the birds with facilities for resisting the havoc of storms. The feathered tribes, nested in chosen coverts, defy the elements and shake out their plumage in fearless defiance of tempests before which man stands in dismay.

A little bit of feathered anatomy will sway cheerily on unprotected twigs, disdaining the shelter close at hand, while the storm beats on wayside.

The endurance of these creatures of the air may well astonish men, who, with all their vitality and size, succumb, of necessity, to the warring elements.

But, in spite of their powers of endurance, the storm-periods are for the birds bitter intervals of life, when hunger and thirst and cold combine to sweep them into the vortex of the lost.

It is not the cold, unaccompanied by other influences, which devastates the ranks of the birds during extreme winter storm-periods, however; it is, chiefly, the dearth of food.

While the harvest of seeds over the meadows is available the bleak blast moans about our birds innocuously; but it is when the feathery snowflakes cover this well-stocked granary, clinging about the seed-vessels of weed and flower, and closing it in a frozen locker, or the ice-storm wraps it in glittering ice, that the lairds are beaten before the winds, and perish of cold and starvation.

There are few, if any, bird lovers who have not some scene of tragedy to recount; some memory of storm-periods when the birds flew to the habitations of men for help, finding no hope but in the fragments cast away by some human hand.

That more thought is not given to the needs of the birds about our doors, at such periods, is due more to the prevailing impression that the birds have the means of providing, even in times of emergency, for their own needs, than to a disregard of the interests of these little friends of the air.

Unless we have awakened to pathetic struggle of bird life under some conditions we are not apt to be aroused to any obligation in the matter of aiding in providing for birds in seasons of peril.

But it is true, nevertheless, that the little visitor upon our doorsill who stays with us during the long winter suffers the anguish of cold and hunger, frequently of starvation, during the periods of intense cold and storm—anguish which might be prevented by a little thoughtfulness on man's part, in casting a trifle of food in sheltered nooks—crumbs from the table; cracked corn or coarse meal; cracked nuts; a bit of suet, the latter being best served by being nailed upon some neighboring tree, high enough to be beyond the reach of any but the intended guests.

By such provision one phase of the tragedy of bird-life would be abated, and the friendliness of the little strangers developed, to the pleasure of many bird lovers, who would receive in return for their kindness the gladness sure to be theirs in watching the feast of the joyous birds.

The day when earth and sky meet in one maze of blinding snow, or in the mist of rain which freezes where it falls, is hard enough for the birds; but while there is light there is also a hope of a scanty meal to be caught somewhere through the swirl of the storm. But, when this hope fails and darkness lowers into deepening night; when bleak winds rage on every side; the forests creak and moan; the tormented air sobs and wails like a tortured soul; when every sound is swept into the cadence of despair and the outposts of hills are lost in the labyrinth of tumultuous night, then how bitter is life's tragedy for the hunger-racked birds; how marvelous it is that so many little storm-beaten breasts survive to meet the struggle for existence at the dawn of a new storm-beaten day.

GEORGE KLINGLE.

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## THE LIFE OF AIRY WINGS.

One beautiful day last May my mother laid a tiny green egg on the under side of a leaf on a milkweed plant. I know that its color was green and that it was laid on the back of the leaf because Mother Milkweed Butterfly did not want any fly or worm to eat me up, so she made its green like the leaf and hid it away in a safe place. There I rested quietly within the egg for about four days, when I burst open the shell to see what was out in the world.

I shook myself and found that I could crawl. I was also very hungry. I had come out a green caterpillar with a black head. How strange that was! Now I expected to be a butterfly with wings to sail through the air. Never mind, I thought, if I am a caterpillar I must do all that a caterpillar ought to do, and not make a fuss because I am not a handsome butterfly.

The first thing a caterpillar has to do is to eat his eggshell so that the ichneumon fly—the fellow is an enemy to my family—will not be able to find any traces of him on the leaf. Where did I learn that? I think Mother B. must have folded that thought in the eggshell, for it came out with me. After doing that duty I was so hungry that I ate the leaf on which I found myself, all day long and far into the night. Then I curled up and went to sleep feeling very quiet and comfortable.

When I awakened the sun was up. I was warm and hungry, so I began to eat again. Suddenly I heard a buzzing noise overhead. Oh, dear me! I was frightened and kept perfectly still, for I thought it was that miserable fly after me, but it proved to be only a jolly bumble-bee, and I went on eating.

After several days of this life—eating, and watching for enemies—something happened. I suppose that I had eaten so much milkweed that my skin got too tight to hold me, for it felt very uncomfortable and then began to crack. I had spun a little silk on the leaf to get a better foot-hold and remained very quiet for I did not feel like moving. I stretched my head a little, after awhile, and the old head-case came off, falling to the ground. Then I made violent exertions, or movements, with the muscles of my body, and finally the old skin came off. I was very much fatigued and was quiescent, not caring to stir, for several hours. I thought of the fly too, that might sting me now while my new jacket was soft, and that kept me still also. When it became harder I had to eat up the old one, and then was hungry as ever.

Eat! Why I did nothing for about four weeks but devour milkweed, keep a watch out for enemies and grow too big

for my jacket. I moulted four times in all, and at the end you should have seen me. My body was striped yellow, black and green, and was nearly two inches long. My head was black-banded; my face yellow with two parallel black bows, and I had two pairs of long slender, flexible filaments, like a hair, on my body.

I had grown so large and strong that I wanted to see more of the world. I crawled off my leaf, down the stalk of the plant onto the ground. What a queer sensation it was, to be sure, to feel the grass and the ground! There was a rail-fence near my old home. I began to feel very weary and sleepy. I crept cautiously along until I reached the fence; crawled up to next the top rail and under it to rest awhile. My, how tired I was! I did not want anything to eat. I did not care to move, nor to speak. I caught hold of the rail and hung there for about twelve days.

I have learned since, that I was a chrysalis and was a beautiful object of emerald green, with gold and black dots. I was fastened to the fence-rail by a slender shining black peduncle, or stem. Nothing disturbed me, and on 163 the eleventh day the bright green disappeared, the golden spots faded, and on the twelfth day I burst open the shell of the chrysalis, found that I had wings and sailed away through the air. How delightful! So much easier than crawling. At last I was a butterfly. This is what patience and perseverance does for the "ugly duckling," at least that is what a friend on the milkweed leaf told me one day.

I saw another butterfly a short distance ahead of me having the same colors I had—yellow and black with white dots on the wings—and I flew faster to catch up with her. She was very beautiful and knew more of the world than I did, therefore I determined to keep close to her. I found her very modest and unassuming. She made me feel as if I knew it all, and that is the chief qualification that even a butterfly wants in a wife. After a little hesitation I asked her to be my mate. She said she would, and away we raced in the sunshine to a field of clover. She showed me how to get honey out of the flowers with my tongue, which is like a watch-spring coiled up in the lower part of my head. When I am excited in probing to the bottom of a flower it uncoils and half coils again, "acting like a little force-pump" to bring up the juice of the flower.

My mate and I had a jolly time flying over the clover-field, where we met more of our family, the milkweed butterflies, and others. The flowers we like best are the clover, milkweed, goldenrod, thistle and phlox.

I soon discovered that birds and insects did not trouble us much, because we do not suit their appetites. They say that we taste bitter and disagreeable, like the milkweed, so they seldom disturb us, and we lead a happy-go-lucky life. We often spread our wings wide and float along in the air with little fear of foes. They see our colors—yellow and black, the badge of the milkweed butterfly—and off they go seeking a choicer tidbit.

Whenever there is a heavy wind storm I fly out to battle with it. What fun to have the angry wind hurl you back—only to get your wings fluttering again, and flying a distance to meet another fling! It is great sport.

I must tell you of something that happened to my mate one day. She was flying near a piazza where there were some phlox plants. She darted down towards them, keeping an eye out on a sparrow that had been flying after her, when her right wing caught in a spider-web that was in the piazza rail. She fluttered and fluttered, frightening the spider out of his web, until she got her wing loose; but it was not so strong after that, as a little piece was torn off.

I saw some beautiful flowers lying on a table on the same piazza soon afterwards and, as no one was out there, winged down on them. Queer: they had no honey in them. A little girl in the window exclaimed, "Oh, sister! a butterfly is on our paper flowers."

Then a boy sprang out with a hat in his hand and I flew quickly away. My mate and I were so terrified that we did not go near that piazza again.

The lovely warm summer passed very soon and I had such a happy time that I was sorry when our family flocked together and began to talk of going South in September. We held our meetings on the underside of the branches of trees and, perhaps, some of you saw us there.

Oh! the life of a butterfly is sweet, and there is just enough excitement in keeping out of the reach of enemies to make the struggle for existence interesting.

M. EVELYN LINCOLN.

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## **THE CELESTIAL BIRD.**

The ancients called the eagle the celestial bird because it flies high with its eye fixed on the sun.

According to the myths of the birds they are older than the gods and to them mankind is deeply indebted; for the hawk created man, the wren, and not Prometheus, brought down fire for his use, the crow taught him marital laws, while the eagle gave him the brew from the fountain of song. Just why the eagle—who is no musician—should have interested himself in this way, legend does not explain, but, as he is of majestic appearance, and imperial in character, there can be no possible objection to his acting as cup-bearer to the poets! They all like him—or, at least, like to describe him. Tennyson says—

He clasps the crag with crooked hands  
Close to the sun in lonely lands  
Ring'd with the azure world he stands.  
The wrinkled sea beneath him crawls,

He watches from his northern walls,  
And like a thunderbolt he falls.

But the eagle takes part in the affairs of birds and beasts, as well as in those of men, for, according to an oriental legend, in ancient times beasts and birds were at war with each other. While victory was still uncertain the owl withdrew from the winged army quite prepared to go over to the enemy. But the eagle fought with such valorous prowess that the birds were finally victorious. The owl, seeing this, flew back to join them. But the eagle observed his movements, and forbade him ever again to mix with his subjects or show his face to the sun.

Although the eagle is a bird of prey he is used as a national emblem on Persian, Roman and United States coins. Indeed, the eagle is often used for heraldic emblems, standards and various emblematic devices. The eagle is cosmopolitan. The so-called bald-eagle takes three years to complete its plumage; it is called the "black" eagle the first year, the "gray" the second and the "bald" the third year, when the white plumage on neck and head, which gives it the name, is complete. After shedding its feathers in the spring, even the old birds assume the appearance of youth, hence David speaks of the "youth which is renewed like the eagle's." An unusual fact in reference to this bird is that the female is said to be larger and braver than the male.

A story is told of a pair of eagles in the New York Zoological Park who made a nest in the root of a tree, in a cavity of the ground and lined it with moss. As no eggs were yet ready the birds brought a smooth round stone to the nest on which they sat, male and female, on alternate days. Some such habit as this may account for the idea of the ancients that the eagle carried stones to her nest to facilitate the laying of her eggs.

The eagle lives to be very old. It is not especially difficult to tame. A young one caught in the Territory could not be bought. The Indian woman who was taming it refused all offers. She said, "Ah-cha-fa-tona wants young eagle, she not want white man's money!"

"Old Abe"—named for Lincoln—was caught and tamed by soldiers during the civil war. He went through the war delighted with battles. One of his feathers, dropped on the battlefield, was framed and now hangs in Washington.

BELLE PAXSON DRURY.



BLACK-BELLIED PLOVER.  
(*Charadrius squatarola*).  
½ Life-size.  
FROM COL. CHI. ACAD. SCIENCES.

## **THE BLACK-BELLIED PLOVER.** **(*Charadrius squatarola*.)**

The Black-bellied Plover is quite cosmopolitan, though its range is practically confined to the northern hemisphere, passing southward in the winter to the West Indies and northern South America and breeding in the far North. Not only is its range extensive, but also its list of common or local names. Some of the better known of these are Whistling Field Plover, May Cock, Beetle-head, Black-breast and Bottle-head. Its large head has given it the name Bull-head and its large, brilliant and expressive dark colored eyes, which in summer are surrounded by

a white ring, have led some of its admirers to call it the Ox-eye.

The Black-bellied Plover is grouse-like in appearance and differs from all the other plovers in having a rudimentary hind toe. It varies greatly in the color of its plumage, both with age and with the seasons. As it stands upon the beach, decked in its summer plumage, it is a striking and beautiful bird. As winter approaches its plumage assumes a more somber hue and becomes a mixture of dark brown and gray above, while below the plumage is white with lines and spots of dark brown on the neck and breast.

This bird is one of the largest of the plover species. It will run rapidly for a few yards and suddenly stopping will elevate its head and closely survey its environment. The older birds are shy, but the younger ones will quite readily respond to the call of the hunter and will usually approach his decoys. Its call notes are of two kinds. One is loud and penetrating and may be heard at a long distance. This call consists of a number of distinct notes, the second of which is accented. The notes of the other call are uttered in a low and satisfied tone as if the bird were perfectly contented. Mr. George H. Mackay found much to admire in the life of this Plover. He says: "There is something very aristocratic in the bearing of the adult birds as you watch them standing on the marsh with their heads erect, their black and white plumage strikingly defined, and their large, dark, liquid eyes ever on the alert for danger. With the yellowish green marsh grass for a background, they make a most interesting study in black and white, which, coupled with that clear penetrating note of alarm when danger is discovered, cannot fail to impress one."

When migrating it may fly alone or in flocks. At times the flocks will assume a wedge-shaped or a crescent-like form. The latter seems to be the more common form, and the ends of the crescent may point either forward or backward. The solitary birds are more frequent in the interior, while the flocks are more common near the sea coast. The slow and measured stroke of the long wings is well fitted to a continuous and prolonged flight. When tired from flying at sea it will rest on masses of seaweed or float upon the water.

The Black-bellied Plover feeds largely on minute mollusks, shrimps, worms, sea insects and on various larvae found in the marshes. It also eats grasshoppers and late in the season, at the North, berries form a large part of its diet. It is at this time that its flesh is most eagerly sought by the connoisseur of game food. Food is gathered with a quick stroke and from the surface, for the bird cannot probe for its food as do the sandpipers.

This Plover is a tide bird, "seeking a large portion of its food on those extensive sand flats left by the receding waters, which may be adjacent to marshes where the grass is short, and which are interspersed with barren places where there is no grass, also to uplands and fields where the grass is scanty or closely fed down by sheep or cattle. It is to such places that they like to resort when driven from their feeding grounds on the sand flats by the incoming tide. They also frequent, at such times, the crest and dry sand of the beaches and shoals; here they remain until the tide has sufficiently ebbed to permit them again to return to feed." 168

The Black-bellied Plover gives but little attention to home building. Its nest is a mere depression in the ground lined with grass and leaves.

## **SOME BIRD WONDERS.**

Geologically considered, the migration of birds had its origin in the beginning of the Post-Tertiary period of our globe's history. Prior to the Glacial Epoch there was no migratory instinct among the feathered tribes of the earth's fauna for the simple reason that there was no necessity for such a change of habitat.

Thus the annual recurrence of this phenomenon has been going on not since the creation, as many suppose, but for units of ages whose lapse can be reckoned only by millenniums of calendar years. It is not the time and place here to discuss the means by which this length of time can be even approximately determined, but there are certain inferences and conclusions which are well endorsed by scientific research.

For our present purpose it is quite sufficient to say that the Glacial Epoch wholly changed the climatic relations of the polar and middle latitude regions of our globe. From the semitropical conditions which once perennially existed there, these regions have since and for ages been subject to the intense cold which now periodically prevails within those limits.

There is a growing conviction among geologists that the intense cold of the Glacial Epoch was caused by a change in the eccentricity of the earth's orbit. If this be true, then the "Great Winter" of astronomers was reigning in all its severity 210,000 years ago.

The wild goose, his near relatives, the brant and swan, and other aquatic feathered races, made their appearance on the fifth day of creation. "And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven."

Now this fifth day of creation very nearly corresponds to the Triassic and Jurassic periods of Mesozoic Time in Geology.

Although "every winged fowl after his kind" is included in the bird category of this creative act, it has been thought, and for good reasons, that the more highly organized birds other than the aquatic tribes, did not make their appearance till the sixth day of the Mosaic account, which would be exactly represented by the Tertiary Period of Cenozoic Time. According to this view, then, the wild goose is an older denizen of our world than the smaller birds of passage which make their home on the land only.

But Geology fills up many niches and supplies many details left blank in the first chapter of Genesis. It is now one of the firmly established tenets among geologists that between the Mesozoic and Cenozoic times there came a tremendous disturbance in the earth's crust.

In his "Story of the Earth," Dr. J. Dorman Steele says, "The Mesozoic time, like the Palaeozoic, was closed by mighty upheavals. The conditions of life were changed. All the Mesozoic types disappeared; hardly any species survived the shock." A few individuals did survive, however, and among them was our venerable friend, the wild goose. 169

Having now finished the prefatory portion of our story, the reader will be better able to understand what may follow.

There is something wonderful, a conception, indeed, which smacks little short of the sublime in contemplating the protracted journeyings of the larger aquatic birds of passage. Especially is this true of the American wild goose, the brant and the swan. The brant is the wild goose of Great Britain and continental Europe; a much smaller bird than his American relative; and its migrations are of comparatively short range.

The European domesticated swan, remains, of course, the year round in the country of his adoption.

Not so, however, with the American goose and swan. Both the former, *Anseres hyperboreas*, and the latter, *Cygnus buccinator*, rear their young in the Arctic regions and spend the succeeding winter with their offspring in the Gulf States and Central America.

Think of these magnificent birds, those on the Pacific coast flying from the shores of the Arctic ocean in northern Alaska and British America, crossing the Rocky Mountains, and, after a journey of four or five thousand miles, complacently settling down in Texas, Mexico, Yucutan, or Nicaragua, as the experienced leaders may determine. Then turn to those on the Atlantic side of the continent and watch them as they leave the Baffin's Bay country, cross the great lakes and the Appalachian mountain system to make a short winter sojourn among the everglades of southern Florida.

In the tactics of these great birds while performing their immense journeys there is something remarkable even to the casual observer. More than two thousand years ago it was recorded by a student of natural history that, "Olores iter facientes colla imponunt praecedentibus; fessos duces ad terga recipiunt."

"Swans performing a journey rest their necks upon those preceding; and the leaders receive the weary ones upon their backs."

And this significant remark has often been confirmed by modern observation.

Owing to the fact that they are more sparsely distributed, that they fly much higher and in smaller numbers than wild geese, the swans are comparatively seldom seen during their migratory flights save in the fastnesses of mountainous districts or at the extreme points of arrival and departure. Hence we see why so little is known concerning the details of their aerial movements.

On the contrary, the semi-annual passage of wild geese is not only a folk-lore phenomenon, but a familiar spectacle to the residents of cities and towns as well as those who spend their days in the rural districts. Now, there is more military precision in the alignment of a large flock of wild geese than the most careful observer ever dreamed of or science investigated.

Here in the fastnesses of our Rocky Mountains there are many exceptionally good opportunities for watching the marvelous evolutions of these birds.

While their flight may be a mile high or more when spanning a level scope of country, as in the prairie districts, they barely clear the more elevated peaks while crossing lofty mountain ranges. Hence it will be seen that an observer on either slope is much nearer the passing birds than an inhabitant of the lower levels or plains.

The well known acute angled form assumed by wild geese in their annual journeys is not a mere fortuitous conceit on the part of the birds, but a true pattern of that diagram formulated by the anserine leaders of long ago prehistoric ages; brave old heroes that piloted their snowy hosts over the storm-lashed wastes of northern latitudes while frost and fire and glacier and drift were so radically changing the topography of our globe.

It can be shown that this particular form of alignment in the flight of geese is just as essential to the convenience and vital interests of the birds as the hexagonal form of honeycomb cells is to the bees that construct and fill them with honey. Nay, it is also true that no other form of alignment in flight could fulfill the conditions required; but we cannot here explain the principles involved in the interesting discussion.

L. PHILO VENEN.

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## THE DIAMOND.

The Diamond is generally conceded to be the most beautiful as it is the most important of precious stones. While other stones at times exceed it in value, weight for weight, in total importance as an article of commerce other gems are hardly to be compared with it. Out of thirteen and one-half millions of dollars' worth of precious stones imported into the United States in 1900, twelve million dollars' worth were Diamonds. Not all this amount was

employed for jewelry, since there is a large utilization of the stone for industrial purposes, but even for jewelry the Diamond has a largely preponderating use. Its points of superiority are its hardness, high refractive powers and hence play of colors, its transparency and its luster. In all these qualities it excels any other known mineral. Hence when in addition to these it exhibits different body colors, as is sometimes the case, no other gem can equal it in value.

Usually the Diamond is colorless or white, although shades of yellow are also common. It is also known in shades of red, green and blue and in brown and black. The two latter are rarely transparent and grade into the varieties known as bort and carbonado, which have no value as gems but are highly important for industrial purposes.

In composition the Diamond is pure carbon, thus not differing chemically from graphite or such forms of carbon as lamp-black, bone-black, etc. It is crystallized, but this can be said of graphite as well. Why carbon should assume the form of Diamond in one case and graphite in another, as well as being amorphous in other occurrences, is not known. Such behavior of a substance is known as dimorphism, and numerous illustrations of it are to be found in Nature.

Being pure carbon, Diamond can be burned in the air. The finely divided dust can be burned in the ordinary blow-pipe flame, and for stones of ordinary size a temperature of about 900° C is sufficient. The possibility of consuming the Diamond by heat is said first to have been suggested by Sir Isaac Newton, who reasoned from the high refractive index of the stone that it was "an unctuous substance coagulated," and hence probably combustible. Following this suggestion two Italians, Averani and Targioni, succeeded in 1695 in burning some Diamonds in a furnace, and since then the experiment has been repeated many times. The Diamond does not fuse in burning, but after becoming heated to redness gradually grows smaller, emitting sparks, till it entirely disappears. It leaves no ash except in the case of the impure form known as carbonado. The gas given off has been collected and analyzed and found to be carbon dioxide just as would result from the combustion of other forms of carbon. If protected from the air or free oxygen, the Diamond can be exposed to high heat without change.

Being a crystallized substance and excessively hard the Diamond is usually found in the form of more or less perfect crystals. These have forms such as the cube, octahedron, etc., which belong to the isometric system, and it is in this system that the Diamond crystallizes. The crystals do not possess, however, the highest isometric symmetry, but belong to the class designated by Groth as hexakistetrahedral, being tetrahedral with inclined face hemihedrism. It is very common for the faces to be curved instead of flat and to show etching figures of various kinds. The crystals are often considerably distorted so as to produce pointed and rounded forms, and twin crystals are common. Although so excessively hard the edges of the crystals as found in the beds of streams are often rounded from the wear of the other pebbles, probably chiefly quartz. Only the wear of centuries could produce such a result, however, for, as is well known, it is only with its own dust that the Diamond can be abraded to any appreciable degree by any of the means now used for cutting it.



DIAMOND AND CORUNDUM.  
FROM BAUER'S EDELSTEINKUNDE.



First row:

Sapphire Crystal.

Diamond in Matrix (Brazil).

Cut Sapphire.

Second row:

Ruby Crystal.

Cut Ruby.

Third row:

Diamond in Matrix (South Africa).

Fourth row:

Bort.

Black Diamond, Carbonado (Brazil).

Fifth row:

Spinel Crystal, Rubicelle.

Spinel Crystal, Balas-ruby.

One important property of crystallized Diamond is that of cleavage parallel to the faces of the octahedron. This cleavage is of much service in preparing the gem for cutting, as by taking advantage of it, broad, flat surfaces can be obtained without grinding. This property also distinguishes Diamond from quartz, for which its crystals as found in sands are sometimes mistaken. Quartz has no cleavage. The fracture of the two minerals is the same, however, being conchoidal. 173

The massive forms of the Diamond known as bort and carbonado possess little or no cleavage, thus increasing their value as abrasives and for setting in drills, saws, etc. The true bort occurs as rounded forms made up of a confused aggregate of crystals and is harder than ordinary Diamond. Fragments of crystals of no value as gems or any crude Diamond dust are also known as bort in trade. Carbonado is a name given to black Diamond which has more or less crystalline structure. This graduates into the crystallized mineral. Either of these is more valuable than the crystallized Diamond for industrial purposes, although of no value as gems.

As already noted, Diamond occurs of various colors, about half the stones found being tinged to some degree. If the color is but slight, the stone is considered less valuable than if perfectly colorless, but a Diamond of pronounced color is the most valuable gem known.

Among colors of Diamonds, blue is the rarest. The largest and most valuable colored Diamond known is the Hope Blue, weighing  $44\frac{1}{2}$  carats. This is valued at about one hundred thousand dollars. It has a brilliant deep blue color and is without a flaw. A deep blue Diamond weighing  $67\frac{2}{16}$  carats was long worn in the French crown, but it was stolen in 1792 and has never been recovered. Red Diamonds vary in hue from ruby red to rose, the latter being the most common. No large red Diamonds are known, the largest being one of 32 carats in Vienna. Another famous one is that in the Russian treasury, for which Paul I paid one hundred thousand roubles. It is of a ruby color. The finest green Diamond known is the "Dresden Green" preserved in the Green Vaults of Saxony. It was purchased by August the Strong in 1743 for sixty thousand dollars. It is apple green in color and weighs 40 carats. Diamonds of yellow color are comparatively common, many of the Cape Diamonds being lowered in value by possessing a yellow tinge. It is said that this injurious yellow tinge can be overcome by dipping the stone several times in a solution of potassium permanganate, the violet color of the latter neutralizing the yellow of the Diamond. The yellow tinge usually also disappears in artificial light. Of large Diamonds possessing a yellow color the Florentine and the Tiffany are the best known. The color of colored Diamonds is generally permanent, but that of some is said to fade on exposure to light. It can also be destroyed or changed by heat.

The luster of the Diamond is a peculiar one, and such as is possessed by few other minerals. In reference to its occurrence in the Diamond it is known as the adamantine luster. It combines the peculiarity of an oily luster with that of glass and that of a metal. It is doubtless due to the high refractive power of the mineral, which causes more than the ordinary number of rays of light to come to the eye. In the impure forms of Diamond the greasy or oily luster becomes more pronounced. Once the eye becomes accustomed to the peculiar luster of Diamond the stone may easily be distinguished by it from glass or minerals with a vitreous luster, such as quartz. Certain other minerals, however, such as cerussite, zircon, and to some extent sphene, exhibit the adamantine luster. In the glass known as strass, used to make imitation Diamonds, the adamantine luster is well imitated.

Diamond is usually transparent, but it may be translucent and even opaque, especially the black varieties. Even otherwise transparent Diamond often contains inclusions which cloud and interrupt its clearness. These constitute the "flaws" which so often injure the value of a Diamond and prevent it from being of the "first water." 174 These inclusions may be simply small cavities, sometimes so numerous as to make the stone nearly black, or they may be particles of other minerals, such as chlorite, hematite or carbonaceous matter. If the latter, the flaws can sometimes be burned out by careful heating.

As already remarked, the refractive power of the Diamond is very high. The rays of light entering it are bent at a high angle, causing a large degree of what is called total reflection within the stone. The effect of this is to light the stone's interior. Moreover, the rays of light are concentrated on a smaller part of the surface than is the case with less highly refracting minerals and thus also internal illumination is produced. The most important result of the high refractive power of the Diamond is the wide dispersion of the spectrum, causing the red rays to be widely separated from the blue rays and strong lights of one color to be transmitted to the eye as could not be the case were the different rays less widely separated. It is this power of flashing different colored lights which gives the Diamond one of its chief charms. The index of refraction ranges from 2.40 for the red rays to 2.46 for the violet rays. Ordinary glass has an index of refraction for the red rays of only 1.52 and for the violet 1.54, making the spectrum only about half as long as that produced by the Diamond.

Another pleasing property of the Diamond is the fact that it is usually more brilliant by artificial light than by

natural, although some individual stones have a reverse behavior.

Diamond is much the hardest substance known in Nature, and as the proverb says only the Diamond is able to "cut Diamond." It is ranked 10 in the scale of hardness on which minerals are classified, corundum being the next below it. It is really separated by a wide gap from the latter mineral, however, and its hardness is as much greater than that of corundum as that of corundum is greater than that of the first mineral in the scale. This hardness of Diamond affords a ready means of identifying it, as it will scratch all other substances. It is popularly supposed that Diamond is the only mineral which will scratch glass to any extent, and a stone found is often reported to be Diamond because it will do this. As a matter of fact, however, all quartz will scratch glass and the harder minerals, garnet, topaz, beryl and others will do so easily. Minerals which will scratch glass are therefore common. The Diamond cuts glass instead of scratching it, and is the only mineral that will do this. Although the Diamond is so hard, it is not tough, and can be easily broken with the blow of a hammer. It was a tradition of the ancients that if a Diamond were put upon an anvil and struck with a hammer, both hammer and anvil would be shattered without injuring the Diamond in the least. One occasionally hears this statement made even at the present day. It is entirely untrue, however, the Diamond being as brittle as at least the average of crystallized minerals. The specific gravity of the Diamond is about three and one-half times that of water, determinations showing variations between 3.49 and 3.53. Carbonado is lower, ranging between 3.14 and 3.41. Diamond is thus a comparatively heavy mineral, the only ones among the gems which much exceed it in specific weight being hyacinth, garnet, ruby, sapphire and chrysoberyl.

Diamond becomes strongly electric on friction so that it will pick up pieces of paper and other light substances. It does not retain its electricity long, however, usually not over half an hour. It is not a conductor of electricity, differing in this respect from graphite, which is a good conductor. Diamond becomes phosphorescent on rubbing with a cloth, giving out a light which is visible in the dark. Some stones emit such a light after being exposed to the sun's rays for a time, as if they took it up from the sun and gave it out again. This has often been stated to be a property of all Diamond, but this is not true, only certain stones exhibiting it. As first suggested by Mr. Geo. F. Kunz, it is probable that this phosphorescence is due to minute quantities of hydrocarbons which emit light on being heated by the friction given the stone. It is curious to note that the light is in some cases given out only from certain crystal faces of the stone. Thus Diamonds are known which give out light from the cubic faces but not from the octahedral, while others are reported as giving out light of different colors from different faces. 175

The name Diamond comes from the Greek *adamas*, which means unconquerable. This term was doubtless applied because of the great resistant power assigned to it by the ancients. Besides the well known tradition that it could not be broken by hammer and anvil, they believed that it could be subdued or broken down only when dipped in warm goat's blood. Our words *adamant* and *adamantine* are also derived from *adamas*, the latter term still being used to describe the luster of the Diamond. The change of *adamas* into the word *Diamond* is thought by some to have come from prefixing to it the Italian *diafano*, transparent, in allusion to its possessing this property.

According to classical mythology the Diamond was first formed by Jupiter, who turned into stone a man known as Diamond of Crete, for refusing to forget him after he had ordered all men to do so. Many medicinal virtues were ascribed to the Diamond, it being regarded as an antidote for poisons and a preventive of mania.

The world's supply of Diamonds has come almost wholly from three countries—India, Brazil and South Africa. Up to the beginning of the eighteenth century India was the only source of Diamonds known. The Diamond fields of India occur chiefly in the eastern and southern portions of the peninsula. The famed region of Golconda is in the southern part. This is the territory whence have come the most celebrated Indian stones, such as the Kohinoor and the Hope Blue. The French traveler Tavernier reported when he was there in 1665, that sixty thousand men were then employed in these mines. Now the mines have all been given up and the region is abandoned.

The present yield of Indian Diamonds comes almost wholly from mines in a district south of Allahabad and Benares. The Diamonds occur here, as universally in India, in a conglomerate or sandstone made up of the remains of older rocks.

The mines are worked almost wholly by natives of the lower caste, attempts of Europeans to conduct the mining not having met with success. The natives separate the Diamonds by washing, or where the rock is too hard for such methods, break it up by heating and throwing cold water upon it. The production of Diamonds from all of India is at the present time very small, not reaching a million dollars a year in value. It is likely in time to disappear altogether since most of the old mines have been abandoned and even their location forgotten and the returns from the present mines are not very profitable.

The Brazilian Diamond fields were the first important ones to become known after those of India. Diamonds were first found here in 1729 in river sands which were being worked for gold by adventurers who penetrated into the region from the coast. The gold miners paid no attention to the bright crystals sometimes seen in the bottoms of their pans, but a monk who had seen Diamonds mined in India recognized them as gems indeed. While for many years the Diamonds obtained came wholly from the river sands, later, upland deposits were discovered which now afford a part of the supply. Diamonds have been found in the following provinces of Brazil: Bahia, Goyaz, Matto Grosso, Minas Geraes and Parana. In all except Bahia and Minas Geraes the mining is desultory and consists simply in washing river sands by means of wooden bowls. Enough Diamonds are thus obtained to afford a precarious living to the *garimperos*, as they are called, who follow this occupation. The chief Diamond bearing region of Brazil at the present time is in the province of Minas Geraes, centered about the city of Diamantina. The black variety of Diamond known as carbonado comes chiefly from the province of Bahia and is in large demand for industrial purposes. The Brazilian Diamonds are as a rule small, but exceed all others in luster. The largest Brazilian Diamond known is that named Star of the South, which weighed in the rough 254.5 carats and was valued at one hundred and seventy-five thousand dollars.

As is generally known the chief source of Diamonds at the present time is South Africa. As in Brazil, Diamonds were first discovered here in the river sands and these still afford a small supply. These were first known in 1867, but in 1871 the deposits in place near Kimberley were found and these constitute today the world's great Diamond mines. The mines now being worked are four in number, and all occur within an area hardly three miles square. Geologically the formation seems to be that of a filling of old volcanic necks by an influx of mud from below. It is this mud which now considerably hardened contains the Diamonds. The largest Diamonds of the world have been obtained from these mines, some exceeding the Kohinoor in size. Their quality is also generally good, although sometimes injured by a yellow tinge.

Besides the above countries, Diamonds have been found in Australia, the Ural Mountains, British Guiana and the United States. The finds have usually been in the beds of streams and are not of sufficient abundance to make systematic mining profitable. The localities where Diamonds have been found in the State of Wisconsin, in this country, are on the terminus of a moraine which came from the North, somewhere in the region of Hudson's Bay. It is hence not improbable that the "mother lode" will some day be found there.

Finally it is interesting to know that Diamonds occur in meteorites, and hence doubtless exist in other worlds than ours.

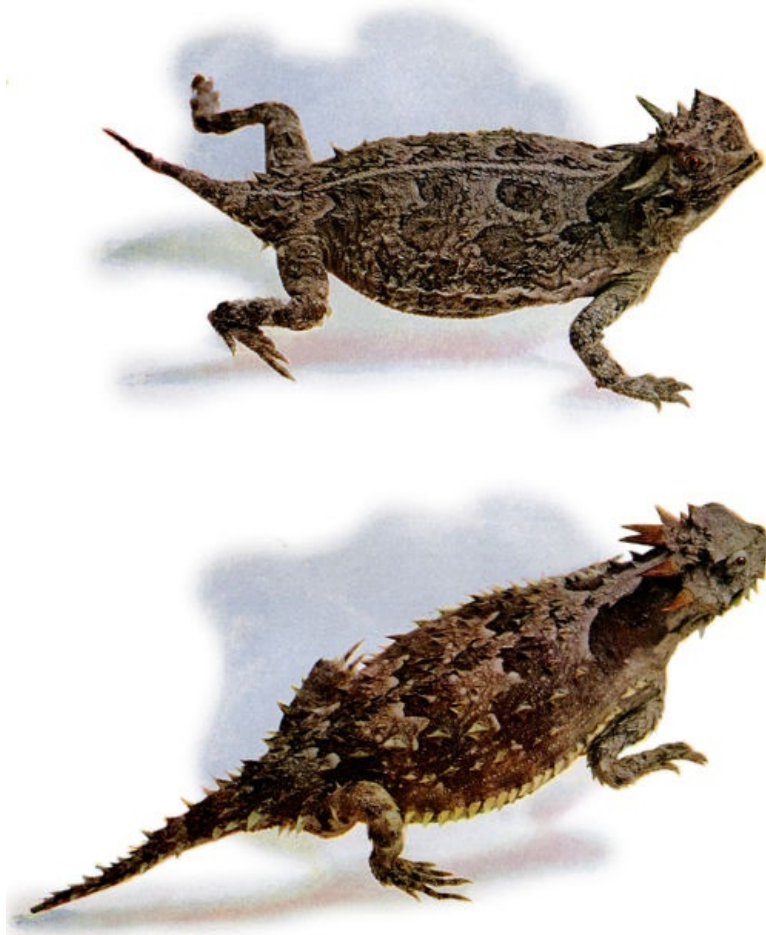
OLIVER CUMMINGS FARRINGTON.

## INDIAN SUMMER.

With your hazy distances,  
And your fine insinuations,  
    Of russet, amber, brown,  
From what region dost thou journey  
Hither to our fields a-tourney,  
    Flinging thy dim gauntlet down?  
Dost thou come from Southern seas?  
Or from mountain fastnesses?

Ho, we call thee Indian Summer,  
O thou late and languid comer,  
    Loitering our forest aisles;  
Idling with the sunshine dreamy,  
As with wandering a-weary,  
    Chary, ever, of thy smiles.  
Thou hast come to claim the glamour  
Of the dear, departed Summer.

—M. D. TOLMAN.



HORNED TOADS (LIZARDS).  
*Phrynosoma cornutus* (Texas).  
*Phrynosoma coronatum* (California).  
 Life-size.  
 FROM COL. CHI. ACAD. SCIENCES.

## THE HORNED TOADS.

The Horned Toads form an interesting group of Lizards which are related to the iguanas of the tropical forests of America. They are, however, terrestrial lizards, inhabiting the plains of Southwestern United States and Mexico. Their short, broad and more or less flattened bodies, rounded heads and short tails give these animals quite a striking resemblance to the common toad. Hence their common name. In one respect, however, they are not at all like the toad. The head is armed behind with a row of quite formidable horny spines, and in some of the species shorter ones are also present on the top of the head and on various parts of the body. As these lizards are slow in motion, the horns constitute one of their chief means of defense. When in the presence of an enemy "the muzzle is depressed and the horns are elevated. The back is also arched." The utility of the horns as a means of defense has been amply proven. The dead bodies of snakes have been found with the horns protruding through the skin of the body near the head. But this is not their only means of defense. From birds they are protected by their coloration, which is a somber mixture of brown, black and yellowish, and when quietly resting on sands or rocks in the open they quite closely resemble stones covered with lichens of varying shades of color. Abundant as they are in some arid regions of the Southwest, they frequently escape the notice of the observer because of their coloration. In such regions, too, they can take refuge beneath the protecting spines of the Agaves and the branches of the prickly Opuntias. Dr. Leonhard Stejneger considers the Horned Toads a most striking illustration of protective mimicry. Of one species he says: "In the cedar and pine belts of the San Francisco Mountains the dark color of the soil and stones covering the surface is closely matched by the ground color of the Horned Toad, while the greenish gray and orange-colored markings which somewhat irregularly adorn their backs are perfect imitations of the lichens covering the rocks and pebbles among which these odd looking creatures live. Near the rim of the Grand Canyon of the Colorado, on the other hand, the ground is covered with small pebbles of variously colored sandstone, ranging from a clayey white to brick red and dark brown, and the specimen which I collected there is such a faithful reproduction of the surroundings that it would undoubtedly have remained undetected had it not been moving. Even more remarkable are the specimens which Dr. Merriam collected in the black lava belt. One of these was brought to camp alive." Dr. Stejneger made a careful study of this specimen and found that it had very closely imitated the color of the lava, including even its glossy appearance.

One of the most remarkable habits of at least one of the species, and possibly of all the Horned Toads, is the power of ejecting jets of blood from the eyes. This power is rarely exercised and seemingly only when greatly irritated. Professor L. M. Underwood relates the following instance, which also illustrates some of the other habits of the Horned Toads when angered: "In 1885 a student of mine received a specimen of Horned Toad from California. In examining the animal I took occasion to turn him on his back, using a lead pencil for the purpose.

The animal resented this treatment and showed considerable anger, opening his mouth and puffing up his body. Irritating the animal still more, he grew more and more enraged, until finally blood spurted from just above his eye, which was fired at least a foot from the animal, as several spots struck my arm considerably above my wrist. After spurting the blood the toad became limp and collapsed, and remained in a stupor for some time, and, 180 when handled, behaved as if dead. After a time, possibly not over five or six minutes, certainly not over ten, the animal revived and commenced to run about the table." Irritating him again in the same manner, Professor Underwood caused the toad to go through the operation a second time, which was followed, as in the first instance, by collapse and stupor. "No amount of irritation could produce a third discharge, although the animal showed some anger."

This habit of the Horned Toads has been observed by a number of scientists and it is said that the Mexicans have called them Sacred Toads, "because they wept tears of blood." An examination with a microscope clearly shows that the ejected liquid is blood. As to the purpose of this habit, Dr. O. P. Hay says: "It appears to me quite likely that it is done in order to defend itself from the attacks of its enemies, although it would not seem likely that blood would hurt the eyes much. Nevertheless a discharge of blood into the eyes of some persevering bird or snake might so seriously interfere with its clearness of vision that the lizard might make its escape while the enemy was wiping its eyes." One investigator, at least, has had the experience of having the stream of blood enter his eye. It was followed by pain which lasted for some time, but was relieved as soon as the blood was entirely wiped from the eye. Some inflammation followed, but soon it disappeared.

Unlike some of the other lizards, the Horned Toads are not provided with a protrusive tongue. This fact, together with their clumsy form, prevents them from preying on the more lively insects. They chiefly feed upon the beetles and other slowly moving insects that inhabit the region in which they live. The food is captured in the evening, and if undisturbed the toads remain quite passive throughout the day. In captivity they are interesting pets and if they will take food they bear confinement for a long time. "They not infrequently, however, starve themselves to death, though their capacity to live without food is marvelous."

## **DOWN IN DIXIE-LAND.**

One never has to travel very far from home to see something new and interesting; so I wonder if all of the readers know of the "frizzled chicken" which is so popular among the colored people of our southern states.

It is of ordinary size and like the rest of the chicken family, except that its feathers stand on end like the quills of an angry porcupine. It reminded me of a chicken perpetually blown before a March wind. Of course, their feathers become ragged and "frizzled," like the hair of their proud possessors, and I imagine the motherly inclined do not find their sittings quite so comfortable as do our meek-looking hens.

As a rule, the negroes are very humane in their treatment of domestic animals. The dogs are treated as well as the children, and nearly every cabin door has a hole cut in it for the entrance and exit of the family cats. As the weather is seldom cold, these ventilators are really good for the larger inmates.

LEE McCRAE.

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## **MY BAT.**

When I discovered the bat he was hanging by his hind feet, head downward between the blind and the window. I could not see him breathe and thought he must be dead, but he was only sleeping.

We closed the shutters of the blind as softly as we could, but it awoke him, and he began to wiggle and twist. He could not get away and we lowered the window from the top and grabbed the little fellow.

How he did scold and snap his jaws together! His little teeth were sharp and he tried his best to bite us.

We put him in a box and put a piece of coarse wire netting over the top.

Mr. Bat did not enjoy being made a prisoner, and did not quiet down until he found he could hang head downward from the netting.

He was quite a pretty little animal, his body being about two inches long, with soft, thick, reddish brown fur on its upper and under part and on his head. His eyes were small and dark, and his head looked like a tiny bear's, but there was no hair on his ears.

His wings also were without hair and nearly black in color. When hanging by his hind legs he kept his wings folded tightly against his body.

The bat's hind feet were very small, having five tiny toes with the smallest possible nails. By having one toe around the wire of the netting he could hold himself suspended in the air.

The little fellow's mode of walking on the bottom of the box was very awkward. He would thrust forth the claw at the end of one of his wings and hook it into the box, then advance the hind foot and tumble forward, repeating the

process with the opposite side, thus tumbling and staggering along, falling first to one side, then to the other.

If he wanted to hang from the netting he would reach up a hind foot and gain a foothold in the side of the box, then raise the other, thus climbing backwards until he could clasp the netting.

In the evening the bat got out of the box and was flying about the room before we knew he had escaped. He flew round and round in a circle, sometimes striking the walls of the room. His wings made considerable noise and he looked many times larger when flying.

We thought we should have to shut him up in the room until morning, but at last succeeded in catching him by hitting and knocking him to the floor with a coat, then throwing it over him.

The little fellow struggled and tried his best to get away, but it was no use. We put him back into the box and put a weight on the netting. He scratched around in the box and scolded all the evening, but he did not get away again.

The next morning I thought he would be hungry and tried to get him to eat and drink. He lapped a little water and a little milk out of a teaspoon, running out his tiny red tongue and making a little hacking noise.

He would not be tempted to eat a fly, shaking his head and spitting the flies out as fast as I could put them into his mouth.

As he would not eat we thought the little fellow would starve if I did not let him go. I waited until evening and took the box outdoors. He was hanging to the netting, and I took it off and turned it over so he could fly. He spread out his wings and away he went, glad to be at liberty once more.

I have looked every morning to see if the bat is hanging against the window, but have not seen him since I set him free.

MARTHA R. FITCH.

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## THE ATLAS MOTH. (*Attacus atlas.*)

India is not only noted for its large and ferocious beasts, but also for its gorgeous flowers and beautiful insects. Among these is the splendid Atlas Moth, noted not alone for the extravagance of its coloring, but also for its immense size, for it is the giant of the moths and butterflies. The largest specimen recorded is now in the British Museum. Expanded and measured from tip to tip of the fore wings, it is only one-quarter of inch less than one foot. Measured in the same manner, the specimen of our illustration is a trifle over ten inches. The average expansion, however, is only about eight or nine inches. Its large size influenced Linnaeus to give this moth the specific designation of Atlas, the name of one of the Greek gods, by whom the pillars of heaven were supposed to be supported. In later years the word has been used in a figurative sense indicative of an ability to sustain a great burden. Truly no other name would be more appropriate, for the large wings of the Atlas Moth enable it to fly swiftly and to long distances, though its flight is somewhat erratic.

The larvae or caterpillars of this regal moth are fully as interesting and beautiful as the adult insect. They have a long, thick and fleshy body, which bears several rows of tubercles, crowned with spiny hairs. When young they are black with white spines, but afterwards become a rich green color and bear bluish-green or black spines. It is said that the larvae eat their skins after moulting and it has been suggested that the object of this habit is to prevent the cast off skins from indicating their presence to birds and other enemies.

The Atlas Moth varies considerably in the color of its wings and, when compared with the expanse of its wings, its body is very short. A peculiar and striking characteristic is the large and triangular transparent spot near the center of each of the four wings.

Among its allies are some of the most important of the silk producing moths of India, China and Japan, and the common emperor moth of England. Other species of the genus *Attacus* inhabit Central and South America, but they are much smaller and not as beautiful as the Atlas.

## A BUTTERFLY.

Lazily flying  
Over the flower-decked prairies, West;  
Basking in sunshine till daylight is dying,  
And resting all night on Asclepias' breast;  
Joyously dancing,  
Merrily prancing,  
Chasing his lady-love high in the air,  
Fluttering gaily,  
Frolicking daily.



ATLAS MOTH (INDIA).  
 (Attacus atlas).  
 About ½ Life-size.  
 SPECIMEN LOANED BY W. E. LONGLEY.

## WHEN BILLIE CAME BACK.

Billie is the handsomest Flicker that comes to the grove of oaks on the north campus of the college and that is saying a great deal. For several years he has occupied a splendid house hollowed out with much labor in the great oak by the power house. Just above the portico of his house Billie has his xylophone. This remarkable instrument is just seasoned enough and has just the correct spring in its splinters. Here every morning, at this season, he beats a series of tunes, monotonous perhaps, but rather pleasing to Billie and me. After beating a tune, he screams at the top of his voice, "Get up; get up." He is an alarm clock and a great nuisance to those who love their morning nap, but I would not allow him to be disturbed, he seems so business-like and earnest. My wife was disposed to disparage his musical attainments, but when she saw the marvelous rapidity of his strokes and the beauty of his red crest flashing in the slanting sunlight she became a partisan.

It should be said, of course, that after the brief season of courtship is over and Billie's wife is busy about her housekeeping, he is less musical and we do not have our reveille so regularly.

Early last spring a pair of English sparrows took possession of Billie's house and worked with a diligence worthy a better cause to fill it with sticks and bits of straw. I was interested at once and waited eagerly to see what Billie would do when he should return. I did not have many days to wait. One fine day I heard Billie hammering a gay tune. I watched and was soon rewarded. Billie seemed taken aback, but soon recovered from his surprise and proceeded to clean house at a great rate. Meantime the sparrows could do nothing but scold, and I confess to a degree of satisfaction in their discomfiture. For once the speckled little Ishmaelites were impotent.

Finally the last straw was thrown out and Billie perched upon the limb that served as a portico for his house, screamed with defiance and satisfaction. Soon he flew to a distant part of the grove in search of the future Mrs. Flicker, I suppose, and was gone for perhaps an hour. The sparrows worked desperately and had nearly all of the material replaced when Billie, disappointed in his quest and in no very good humor, returned. This time Billie's patience was entirely gone and he threw sticks right and left, stopping occasionally to scream with anger. He seemed to know there would be little use in chasing the pesky sparrows. He did not go far from home after that, so that the sparrows were compelled to go house hunting elsewhere.

Billie mounted guard over his fireside and his altars for several days, treating us to a quantity if not a variety of drum solos, and the seductive notes of his cross cut saw of a voice were in constant evidence. He never knew the sorrow of the human performer of like merit when his best friends are willing for him to rest.

One fine day a demure looking female, attracted by his music, came and critically examined the house. I knew she was already won, but Billie did not, and it was amusing to watch his antics. Did you ever see a Flicker desperately

in love? It was evidently love at first sight with Billie. He spread his wings, showed the jet black crescent on his vest, displayed the crimson glory of his crest, played his most catchy tune on the xylophone and sang his most melodious song. Meantime the coy female, already decided, still appeared to be unable to make up her mind. She made as if to go on, and Billie was in despair, and redoubled his persuasion. She had never heard such a tattoo, nor seen such a xylophone, nor yet so fine a fellow as Billie. Soon she stopped her pretended search for larvae under the loose bark and made another inspection of the house. She exemplified the maxim, "To hesitate is to be lost," and soon she and Billie were busy with their housekeeping. The sparrows got no further chance to occupy Billie's summer home. A happy family was reared and educated and in the autumn disappeared.

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As I write Billie has returned and is beating a merry tune, while six or more sparrows sit around listening as if to learn how. Mrs. Flicker has not yet returned, but I believe the sparrows have given up the idea of taking his house. I am in doubt about Mrs. Flicker, but I know Billie. He is larger and handsomer than ever. I have studied his every beautiful feather. Sometimes I think he jumps behind a limb just to tease me, but I am fond of him and I hope he may return for many years.

ROWLAND WATTS.

## BEAUTIFUL VINES TO BE FOUND IN OUR WILD WOODS.

### II.

A vine of great beauty in our autumn woods, with its great masses of scarlet berries, is the *Celastrus scandens*—Climbing Bittersweet or Wax-work.

It belongs to the order Celastraceae—Staff tree family—to which family belongs the wahoo or burning-bush, with which we are all familiar, from seeing its abundant red berries in the autumn woods and in the parks.

The flowers of the *Celastrus* or Bittersweet are small, greenish and regular, growing in clusters at the end of the branchlets, the staminate and pistillate forms usually on separate plants, which accounts for the fact that we often see a beautiful vine that has bloomed profusely bearing no flowers; the flowers have five distinct spreading petals, inserted with the alternate stamens on the edge of the disk that lines the base of the calyx. Its five united sepals form a cup-shaped calyx. It has five stamens, one thick style and a three-celled ovary, with three to six seeds. It can be found in full blossom about the first of June.

The leaves of the Bittersweet are from two to three and a half inches in length, simple alternate, slightly fine-toothed, and are found from egg shaped and oblong to the reversed of egg shaped, the apex always pointed, while the base is sometimes pointed and sometimes rounded. The fruit of the Bittersweet is about one-third of an inch in diameter, round and a deep orange color, three-celled with two seeds in each cell; when it is ripe, it opens into three parts, showing six bright scarlet berries within.

The *Celastrus* is a strong, woody climber, twining upon itself in coils and swirls, over fences and walls and bushes to great distances, often to the top of immensely high trees.

It is immensely showy and beautiful in the very late fall when its leaves are all fallen off and its woody branches are left thickly studded with its orange and scarlet fruit. I remember especially one Christmas eve, in Kentucky, that we gathered great bunches of it; we found it growing over an old stone ruin in great masses and gathering it, with large bunches of mistletoe, it made ideal decorations for our Christmas festivities.

J. O. COCHRAN.

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## COMPTIE.

When winter, with its blasting, icy hand, has touched every green thing exposed to its wantonness, and Thanksgiving, Christmas, New Year's and other feast days call loudly for the festive greenery with which to adorn churches, halls and dwellings, longing eyes are turned towards the Southland, where King Winter's scepter is unknown and green things flourish the year around.

A walk through the dark hummuck woods—so dark that owls overhead hoot at one in the daytime—holds the naturalist and the florist spell-bound.

The numerous varieties of chirping and twittering birds, the many-hued spiders, lizards, bugs and beetles, and, yes, the wriggling snakes, with now and then the sounds of snarling 'coons or 'possums, the scream of a wild-cat, or the dashing by of the deer suddenly aroused from his noon siesta—all this makes the naturalist feel as though he had entered into an enchanted land; but he who loves "the green things growing" more than the things flying, creeping or snarling will feast his eyes on the ever varying verdure.

Tall palmettos, wide-spreading oaks, orchids, trailing vines and festooning mosses sweeping the greener mosses beneath, ferns, lilies!—but, 'twould fill a volume to enumerate the many beauties which meet the eye at even a single glance, each plant and flower in itself being worthy of a chapter.

There is one plant which especially attracts our attention and admiration; and this plant is one of the prettiest and



most useful of the greeneries used for decorations in the far north in winter. It is called, variously, "Comptie," "Coontie," "Starch-root," or "Indian-bread." The two latter names are due to its large, bulbous root, which, when grated, makes a good starch, and which was also made, by the primitive Indians, into ash-cake, or bread—as Indians knew bread.

It is fern-like; but, unlike most ferns, it is of a sturdy, independent growth, bearing handling as well as cedar, yet with all the graceful pliancy of the more tender ferns. Its stems grow two or three feet long; the fronds on each side of the stem being three or four inches in length, and of a glossy dark green color. From one to two dozen such stems put out from a single stalk, growing up into the most graceful curves.

Seeds, deep crimson in color, and of the size of a chestnut, form in the center of the plant, and so compactly as to present one continuous bulbous form, the size and shape of a round quart bottle with part of its neck broken off. This crimson seed-form, surrounded by the dark green foliage, is, of itself, a pretty curiosity, more novel than a flower.

The reason why it is especially valued for decorations is, because it can be had at all seasons of the year, and retains its verdure for several weeks, even after it has been shipped long distances. Many of these plants, cut close to the ground, have been shipped from Florida to Canada, and have retained their fresh, glossy appearance for two months. Even without placing the stems in water, using them for motto work, they will last two or three weeks.

And this is but one of Florida's novelties in plant life.

MARY STRATNER.

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## THE RIVER PATH.

There's a path beside the river,  
Winding through the willow copse  
Where I love to walk in autumn  
Ere the season's curtain drops.

On far hillsides beech and maple,  
Touched by early nipping frost,  
Have their brown and crimson jackets  
To the boisterous breezes tossed.

Still the willow leaves are clinging,  
Latest foliage of fall,  
Shading yet my river pathway  
Underneath the osiers tall.

On the wimpling water's surface  
Drift a million truant leaves,  
Stolen from the woodland reaches  
By the wind, the prince of thieves.

All along the river edges  
Verdure's turned to brown and gray,  
Rustling through the dying sedges  
Autumn's low voiced breezes play.

Nowhere sweeter walk or rarer  
Than my path beside the stream.  
There I love to stroll in autumn,  
There to loiter and to dream.

—FRANK FARRINGTON.



EGG PLANT FRUIT.  
(*Solanum esculentum*).

**EGG PLANT.**  
(*Solanum esculentum* L.)

The Egg-plant, also known as bringal, aubergine, egg-apple and mad-apple, is an herbaceous plant belonging to the Nightshade family (*Solanaceæ*), therefore kin to the potato and tomato. It is a tender annual, readily killed by the early frosts. It has rather large, simple, somewhat incised leaves. The fruits are large, egg-shaped, tomato-like in structure, hence berries.

It is quite extensively cultivated in gardens. The seeds are sown in hot beds early in April but transplanting is not done until about the first of June, when all danger of frost is past. The soil should be very rich and the plants set about three feet apart. Like most transplanted plants they require shading and watering for a few days. Careful cultivation is required during the entire season. Propping may be necessary to keep the large, heavy fruits from the ground. The Colorado beetle is a very annoying enemy of the growing plants and must be effectually fought to insure a crop.

There are several varieties of Egg-plant. The purple variety is by long odds the greatest favorite. There are also white and yellow varieties.

Most people consider the properly prepared fruit of the Egg-plant a delicacy. In some tropical countries it forms an important article of diet. The ripe fruit is prepared for the table by peeling and boiling. After boiling the fruit is sliced, seasoned and fried until well browned, in rolled crackers or bread crusts and a liberal supply of butter. When well prepared it is a very palatable article of diet but when insufficiently cooked or fried it is indigestible. It does not seem to be prepared in other ways nor does it seem to have any noteworthy medicinal properties.

ALBERT SCHNEIDER.

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There comes, from yonder height,  
A soft repining sound,  
Where forest leaves are bright,  
And fall, like flakes of light,  
To the ground.

It is the autumn breeze,  
That, lightly floating on,  
Just skims the weedy leas,  
Just stirs the glowing trees,  
And is gone.

—WILLIAM CULLEN BRYANT, "The Voice of Autumnn."

## A MYSTERY.

I saw the wheat in billows roll,  
 A verdant ocean, stirred with joy,  
 It set a-throbbing in my soul  
 The madcap freedom of a boy:—  
 The blue sky bended far above,  
 A stagnant sea from pole to pole,  
 Clouds, like aerial ice-bergs, drove  
 On that still ocean, without shoal:—

The subtle spirit of the sky,  
 Alastor of my solitude,  
 Thrilled all my working pulses high  
 With visions of life's magnitude—  
 (The wondrous vision of the whole!)  
 At once upon my startled eye,  
 Stood naked the primeval law,  
 Life's noiseless currents eddied by,  
 The universal heart I saw,  
 Swayed by the cosmic oversoul.—

I trembled but I did not fall,  
 I ceased, and yet I did not die,  
 But from my eyes there fell the pall,  
 My soul no longer wondered why:  
 I knew the secret of the world,  
 Of night and day, of life and death,  
 For one brief instant, onward whirled,  
 My being breathed with godlike breath:  
 The sky spun like a mighty bowl,  
 I saw the wheat in billows roll.

EDWARD O. JACKSON.

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