The beautiful is as useful as the useful.—*Victor Hugo.*

BIRDS AND NATURE

CONTENTS

EDITED BY WILLIAM KERR HIGLEY

ILLUSTRATED BY COLOR PHOTOGRAPHY

$1.50 a Year. 20 Cts. a Copy

A. W. MUMFORD & CO., Publishers

378 Wabash Ave., Chicago, Ill.

Entered at Chicago Post Office as second class matter

BIRDS AND NATURE

Monthly, except July and August

TERMS AND CONDITIONS OF PUBLICATION

PRICE. Subscription price is one dollar and fifty cents a year, payable in advance; with 50 assorted pictures, $2.00; single copy, 15 cents.

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

THE MORNING-GLORY

Glory of the morning's breaking,
Rapture of the day's awaking!
Only flower that knows the story
Of my childhood's dawn auroral!
Like a dewy transcript floral
Flushed with lights of rosy splendor,
Folded lies the record tender
In deep blooms of Morning-Glory.

That first chapter of my being
Lies fast closed to all my seeing,
Like some spell-bound, charméd palace!
But if e'er there glows before me
At day-dawn, a Morning-Glory,—
Flashes back in sudden vision,
All that early life Elysian,
From the fragile flower-chalice.

O, what world is this of splendor!
Can a flower so swiftly render
To our hearts sweet childhood's rapture?
Rapture, like a rose-mist glowing,
Golden, melting, heavenward going,
Evanescent, pure, prophetic!
Thus shall we, one day ecstatic,
All the infinite recapture!

—Mrs. Merrill E. Gates.

THE ARKANSAS KINGBIRD

(*Tyrannus verticalis.*)

The Arkansas Kingbird, or Arkansas Flycatcher as it is frequently called, is a native of the western United States from Kansas and western Iowa to the Pacific Ocean. Stray specimens have also been reported from Maine, New York, New Jersey, and Maryland. Its range also reaches from British Columbia south through Lower California and western Mexico to Guatemala. Both the habits and ways of the birds of this species are like those of our common and familiar kingbird. In his "Birds of the Northwest," Dr. Coues quotes the observations of Mr. Allen, who says: "The Arkansas Flycatcher occurs abundantly as far east as Fort Hays, Kansas, where it is one of the most numerous and characteristic of the woodland birds. It seems even more pugnacious than its relative the kingbird, the males fighting with each other almost constantly; and it is equally alert in driving other birds from the vicinity of its nest. Its notes are harsher and louder than those of the kingbird, though at times rather more musical; they are marked by the same general character. It is more graceful on the wing than the latter bird, possessing rather superior powers of flight, yet resembling it closely in general habits." Because of the earnest and courageous defense of their nests, smaller birds seem to realize that their nests, eggs and young are safer when in the vicinity of those of the Arkansas Kingbirds, and quite a number are thus constructed and thus receive the protection of the Kingbirds which have sufficient courage to drive away predatory birds from their homes.

It seems too bad that these beautiful birds have one habit which is against them. They feed to a certain extent upon bees and will sometimes frequent the vicinity of hives. It is, however, much better to frighten them away than to kill them for they are very useful to the agriculturist as they destroy very large numbers of insects which are noxious, and are thus very beneficial.

At the time of their spring migrations groups of males appear first and quarrel among themselves until those which are victorious have selected their mates. Their nests are described by some observers as being very large and bulky and the walls are constructed with rather large stems of plants, and they are lined with finer and softer materials, such as hair and wool. Mr. Oliver Davie states that these birds build their nests in any convenient place, such as the "framework of a windmill, the cornice of a house, on fence posts, in the forks of trees at heights ranging from five to fifty feet." He also speaks of one instance where a nest was started on a horizontal blade of a windmill. An occasional breath of air would slightly turn the mill and bring another and then another of the blades into a horizontal position. Upon each of these blades a nest was begun by depositing the first materials used. Thus several nests appeared in different stages of construction but, of course, not one was completed. This well illustrates the persistent character of these Kingbirds. Dr. J. G. Cooper, describing a nest which he found at Santa Barbara, California, says: "This nest was built on a branch of a low oak near the town, was five inches wide, and constructed of lichens, twigs, coarse grass, and wool, lined with hair, and the four eggs it contained were creamy-white, spotted with purple of two shades near the large end." In the building of their nests, however, any available materials are used, such as twigs, stems of plants, grass and sometimes rags and strings. They are lined with hair, cotton, wool, strings, feathers, and in fact any soft materials which may be at hand. They are also known to construct their nests, at times, in garden shrubbery. Frequently the nests are fastened to the

ARKANSAS KINGBIRD.
(Tyrannus verticalis).
¾ Life-size.

branches, on which they are built, by the use of pieces of string. The sets of eggs vary from four to six.

These Kingbirds are seldom found at elevations higher than seven thousand feet. Mr. Nuttall speaks of them as bold and querulous birds. He speaks of their notes as a discordant, clicking warble sounding like *tsh'k-tsh'k-tshivait* and not unlike the creaking sound of a rusty door-hinge. Mr. William Rogers Lord in his "Birds of Oregon and Washington" says of this Kingbird: "Though a 'King of the Birds,' he is not, as is generally supposed, a tyrant king, unless he is very unlike his eastern counterpart, 'The King-bird.' On the other hand, like the bulldog among dogs (unless the bulldog has been spoiled in training), the bird is just and tolerant."

While the Arkansas Kingbirds are known to eat bees, it has been shown by Professor Beal of the United States Department of Agriculture that this habit is not very serious. He reports that in the examination of over two hundred of their stomachs he found only fourteen which had bees in them and that injurious insects formed fully sixty per centum of the contents. He also found that the larger number of the bees were drones. The work of Professor Beal speaks strongly in favor of the protection of these birds by the agriculturists.

BIRDS AROUND MY HOME

One June day my neighbor who had hunted birds with me through all the spring-time made a most pleasing discovery. Low in the lilac bushes across the country road which runs close to her home, only a foot from the ground was a bird's nest, and the mother bird, covering her eggs; it was a red-eye and so tame or so devoted that we went often to visit her and could approach within a step or two and she would not fly until we were near enough to put out a hand and touch her, when she would flutter off and hide in the same clump till we were gone. One egg was discovered on the ground one morning and returned to the nest but the mother bird knew better than we, for only two tiny birds hatched instead of three. We loved to peep in and see the atoms of bird-dom, for we knew a life was in them that one day would make many happy by their cheerful songs. But they were only a promise now, day after day they ate and slept but the time came when we found one perched on the edge of the nest to inspect the world around him before he started on his wanderings. A few hours later returning we found number two on the edge and the bolder one in a neighboring tree; the next day neither one could be found and the wonder rises in one's mind why the nestlings just learning to use their wings can go out of one's knowledge so quickly. Perhaps they are only in a tree or bush a few feet away but they are not seen again. Why is it that I've never seen the baby orioles though their nest hangs year after year from the elm tree and I hear their voices calling "something to eat" as a certain small boy used to do at the table when his plate became empty.

The young barn swallows will linger a few days. I saw a pretty sight once, five baby swallows in lustrous blue, on the top rail of the garden fence, clinging for safety and watching for their mother. As soon as they caught the sound of her coming the little wings would flutter and mouths fly open for the tidbit and one fortunate youngster would get it. I watched to see if the same bird caught the second bite, but he didn't, another one in the line was the lucky recipient when she appeared again. Sometimes these young birds, not little, as we say of so many nestlings, come into the barn to sleep for a few nights and I have seen two perch in the gutter over the great barn door for the last night before they disappeared.

I had often longed to see some bluebirds just after they left their nest and

this season I had my wish. Hearing sounds in the tall ash tree on the highway, I stood under it and had to bend my neck far backward to find the little fellow in blue so short and chubby. perched over the road on one of the smaller branches. Cries of *"here, here,"* were sounding all over the great tree as the mother called to them continually but search as hard and long as I could, till my neck ached, no other could be found, but I knew they were there and looked doubtless exactly like the one still on his perch. He did not seem to dare to move—it was his first trip doubtless and he was timid, seeing so much space around him instead of the snug woodpecker's hole in a dead branch thirty-five feet from the ground. Every season a pair of bluebirds would investigate this apartment, clean and airy, and free of rent, but for seven years I had seen no couple occupy it. However it had been the home of this "little brother of the air" who left it the first opportunity he had, and never returned as so many of our brothers do to see their birthplace, step over the threshold and go through the rooms of their early home. The birds apparently do not sing, "There's no such place as home."

In late summer while walking on the edge of the garden I spied a nest in an old gnarled apple tree and heard the cry of the tiny birds. Now, I thought, I mean to watch and see the mother bird feed her babies, so I stood at a respectful distance and looked toward the nest, but instead of seeing the bird feed her brood saw her fly away and she had quietly slipped in on the opposite side of the nest. I moved to that side and the same thing happened again. She had seen me and dubbed me an intruder, yet had not kept her babies waiting which I considered a smart manœuvre for a chipping sparrow.

But the little birds filled only a part of the summer's observations. More warblers came into view than any season before; the first was the black-poll warbler on May third, black and white with a black cap. The year before a flock of them stayed in our neighborhood for two or three weeks and then went North. The warbler which resembles the black-poll so closely, the black and white creeping warbler, I saw two days later and many times through the summer going up and down the branches with its simple song of *zee-zee-zee*. On the same day I saw the black-throated green warbler, a beauty in his attire and with a fuller song. How many times I've listened to it and, as Mr. Torrey did, imagined it sang "trees, trees, murmuring trees," and so appropriately, too, for it spends the days in the pines mostly and builds its wee nest in one. A little later, on the seventh, I saw the chestnut-sided warbler with its yellow cap and chestnut sides, a cheery songster, often seen singing on some birch tree. On the eleventh as my neighbor and I were loitering by the bridge over Pye Brook which separates us and which is our common meeting ground to exchange notes or watch for the latest arrivals we looked over the bank and saw our very first black-throated blue warbler on a dead branch just below, quite different from his relatives, of a beautiful blue. The oven-bird was the next warbler on my list and though so often heard he has to be approached very cautiously for one to obtain a view.

The redstart seems to be a rare visitor here, only twice have I seen one and it was a sight to be remembered—the tiny bird with its extremes of black and salmon color, flirting its tail as if to show off its beauty. One warbler, the Maryland yellow-throat, escaped me, though usually seen every year in the bushes which cover the meadow.

I saw two more warblers in May, one the common yellow bird with its bright dress and pretty song and the other, the rarest of all and most highly prized—the Blackburnian warbler. I was leaning over the brook where we watch the water go down with a rush and a roar over the rocks when the water which floods the meadow is let down. The vivid orange color first caught my eye and I watched the little stranger, here for only a few days, as he flew from one tall tree to another unconscious of any spectator and feasted my eyes on his beauty. Once I saw one in an apple tree

in blossom, the most enchanting sight one could hope for and rarely attained. This was the last warbler—the climax.

"How pleasant the life of a bird must be,
Flitting about in each leafy tree;
In the leafy trees so broad and tall,
Like a green and beautiful palace hall,
With its airy chambers light and boon,
That open to sun, and stars, and moon,
That open unto the bright blue sky,
And the frolicksome winds, as they wander by."

In the last days of March the flocks of fox sparrows were a novel sight, flying one after another along the brook and the ridge above. I did not learn their song, even hardly heard it but Thoreau said it would be memorable if we hear it long enough. He says, "Is not the coming of the fox sparrow something more significant than I have dreamed of? Have I heard what this tiny passenger has to say while it flits from tree to tree? Can I forgive myself if I let it go to Rupert's Land before I have appreciated it?" Another migratory sparrow is the white-throated or Peabody bird. We were favored only two days with their company and though I failed to distinguish the Peabody, I heard them advise us to *"sow wheat, sow wheat."*

Thoreau said also, "We cannot well afford not to see the geese go over a single spring and so commence the year regularly." We failed to do this for we saw or heard none until November. Among the sixty birds identified this year, beginning with the winter birds fed during the snowy days have been the warblers already described, and a grebe which was picked up disabled in the snow far from any water and which lived awhile but could never fly again and finally died in captivity; another rare bird was the rose-breasted grosbeak which delighted us one Sunday morning in May and was seen by all the family. His song attracted me first as a robin's but I soon discovered that it was a stranger and he obligingly gave us a good view of his fine points.

Then there was the great host of the more common birds which give us joy and pleasure without a long walk or weary search—the chewinks, singing cheerfully at the top of a pine or scratching under the lilacs or junipers with considerable bustle, the red-winged blackbirds seen on the daily drive to the post office, and the friendly chickadees and phœbes.

"From the orchard calls the robin,
Leader of the feathered throng,
Chirps the hair-bird from the hedge-row,
Trills the sparrow's matin song.

"Overhead the swallows twitter.
And the purple martins, too,
Sailing swiftly, this way, that way,
Underneath the vaulted blue.

"Orioles, in the elm-top swaying,
Pipe their brilliant bugle-call,
And the blue-bird's mellow warble
Sweetly sounds from maple tall."

LUCIE A. PEABODY.

TO A BIRD

If Life were an eternal spring,
I wonder if the soul would pine!
Or, well contented, would it sing
That Life away, as thou dost thine?
The days to thee can not seem long,
Rocked on the rose-tree's swaying bough:
Sing on, sweet bird! and may thy song
Forever be as glad as now!

—GEORGE WILLIAM PHILLIPS, JR.

A TRUE SQUIRREL STORY

No tenant of the woods is brighter than the squirrel, and none better able to take care of himself. He is always active, alert, and cheery.

The little Red Squirrel, much as he loves his freedom and his home in the tree tops, has a tender little heart toward human kind and easily makes friends with those who show him he has nothing to fear. We watch our little friends in feathers and fur and think we are very well acquainted with them. But how many ever guessed that they have games of their own, and play tricks and love fun as much as any boy or girl?

A little Red Squirrel once became our neighbor and was good enough to allow us to see the "sunny side" of his nature. Perhaps he felt he owed us this much in return for the tangles of tow he industriously tore from our hammock, and that, under our very eyes, as well as for the nuts he purloined. The nuts had been gathered and stored in the barn. Great was the cry that arose one day when it was discovered that every walnut was gone. Many were the conjectures as to who could have carried them off. The riddle was answered at last when the pile was discovered in an old shed more easy of access than the barn, and there the squirrel was seen to go for his breakfast.

That our little friend in fur was the depredator was first suspected, however, when after unaccountable noises had been heard in the chambers, our Mr. Squirrel was seen vaulting from a tree into an open window with a nut between his teeth. This he deposited with several others in a corner of the closet.

Squirrels are wise little "bankers." They make their deposits in different places so that if one hoard is lost, others are in reserve. The remembrance of their hiding places seems to be seldom lost.

But there is a story I wish to tell that opened our eyes to the fun going on in the animal and bird world. Our Squirrel had a prying spirit under his fur, and seeing a barrel one day near his tree, he proceeded to investigate it. The barrel was a wreck of its former greatness—both ends being out, and the barrel that was left was lying on its side in the grass. Master Squirrel went in, making his examinations, cautiously at first. His little red head and intelligent eyes turned quick as a flash this way and that. His sharp little ears were erect and sensitive. But finding all was well and that something he liked still clung to the staves of the barrel, he was soon too busy to notice that he was a prisoner. And what do you think? A sparrow at each open end of the barrel was a self-appointed sentinel, and "just for fun" said: "No, you don't!" when the Squirrel proposed to go home.

Quick as was the Squirrel, the sparrows were even quicker, darting down with outspread wings and threatening beaks, each time the little prisoner attempted to make his escape.

This was kept up for several minutes, and great was the evident fun of the sparrows. Possibly the birds may have felt that they had an old score to settle with young Mr. Squirrel—for I am sorry to say that he had a bad reputation for filching birds' eggs, and even for sometimes robbing nests of their fledglings.

Perhaps you have supposed that squirrels live only upon nuts, but if you will really be on good enough terms with them to be admitted into their confidence, you will find that they have quite a varied diet.

Many lesser seeds, you will learn that they count as delicacies. They are not averse to a lunch upon some of the insects, and certain berries tempt them. Their noses too are keen for savory toadstools and mushrooms.

Most delightful do they consider a "salad" of young beech leaves.

But improvident little fellows they are when they indulge in eating the young and tender beech buds, for should they not be wise enough to know that they are then eating scores of beech nuts in a single "salad?"

MRS. A. S. HARDY.

THE CANADA GOOSE

(*Branta canadensis.*)

The range of the Canada Geese covers temperate North America. They breed in the northern United States and in the southern portions of the British Possessions, Canada, Newfoundland, Labrador, and to some extent in the vicinity of Hudson Bay. They are well known and characteristic birds and as they winter as far south as Mexico, they migrate northward in the spring and southward in the fall in flocks which are usually large and noisy. The migration of very few birds attracts more attention than that of these birds. Mr. Chapman has said: "Ornithologists talk of 'waves' and 'flights' of migrants passing in the night, but the biannual pilgrimage of the Canada Goose appeals to us all with the directness of a personal experience. We see the living wedge of long-necked birds passing high overhead; the unbroken sound-waves bring the sonorous 'honks,' with unexpected distinctness to our ears; and we receive an impressive lesson in the migration of birds. They are embarked on a journey of several thousand miles, but they come and go as surely as though they carried chart and compass." In their migrations, the Canada Geese or Common Wild Geese, as they are quite generally called, do not follow the courses of streams but fly over forests, fields and even towns. The flocks are led by a gander, and they move northward so early in the spring that the expression harbingers of spring seems appropriate when applied to them.

As a rule these birds build their nests upon the ground, in hollows excavated in the sand, on the grassy borders of bodies of water, or on open prairies. Usually a few sticks are laid around the depression, and the nests are lined with down. They have also been known to nest on the stumps of trees and on rocky ledges. Dr. Coues has reported that they sometimes nest in trees in some portions of the United States and that they take possession, in such instances, of the deserted nests of ospreys or other large birds of prey. Dr. Merrill has published the following statement, in the Bulletin of the Nuttall Club: "When these geese nest among the branches of a tree I do not think they ever construct the nest entirely themselves, but take possession of a deserted nest of the fish hawk, and repair it with twigs and a lining of down. They have been seen to carry small sticks to the nest for this purpose."

The principal food of the Canada Geese consists of sedges, the roots of aquatic plants, grain to be found in stubbles, corn, wild berries, and leaf buds. As breeding-places, the Canada Geese select sites which furnish solitude and a plenty of food. "In winter the birds are very regular about their meals, rising punctually at daybreak and flying inland to feed for two or three hours in the grain fields. The middle of the day is passed quietly upon the pond, dabbling for water-cress and duck-weed, or enjoying one-legged slumbers of the sand-bar." These words of Mr. Dawson well describe the experiences of many hunters who are familiar with the habits of the Canada Geese. In the afternoon they must seek food again, and they seem to realize that this is a dangerous time of day, and they are very watchful and vigilant.

It is said that the Canada Geese are easily domesticated and will breed in captivity. In the January Auk of 1885, Mr. Dutcher relates the experience of Captain Lane at Shinnecock Bay, Long Island. He says: "Captain Lane has had remarkable success in breeding Canada Geese in confinement, and has kindly furnished me with the following information regarding their habits during the breeding season: 'They make their nests of dried grass, raising them about twelve inches from the ground. They feather them when they begin to lay. None lay

under three years old; the first season four eggs are laid, five the second season, and when older six or seven. The gander never sits on the nest, but while the goose is sitting never leaves her." He also states that the young, soon after they are hatched, are quite able to care for themselves for they can walk and swim and will feed on grass. In six weeks they are quite fully grown. There are many other records of the successful keeping of the Canada Geese in captivity. When swimming the young are led by the gander and followed by the mother goose.

THE OLD BROWN PULLET

A subdued peep, peep, and little cracking, rattling sounds from a warm corner of the wash room one morning in early June, hastened my steps in that direction to gaze with delight on the downy, fluffy balls with bright, beady eyes that were tumbling over themselves and each other in my incubator. Such a lot of them of all colors common to baby chicks. The eggs were procured from half a dozen different neighbors so I found it quite as interesting as watching the opening of some new flowers—the transformation of those balls of black, brown, yellow and white down, into the different varieties of mature biddies and their mates. One little yellow beauty, more fluffy if possible than the others, took my eye from the first, and as it was of a very gentle disposition, it became the especial pet of the family and developed into a trim little pullet of the buff cochin breed.

My little boy would often carry her about in his arms, she seemingly enjoying the situation as much as he.

Early the next spring she rewarded our care with a nice brown egg every other morning. From that time on, the "Little Brown Pullet" was always busy except for a short time in the moulting season, for with the advent of her first brood we discovered what a jewel we had, for she was never known to peck a chick but would mother any little orphan, although it might be weeks younger than her own brood. One spring I took from her her nicely feathered family that had grown so independent that she was obliged to follow them instead of their following her, and gave her a brood of little downy, young things, which, after a little persuasion, she adopted and raised as carefully as any mother could be expected to, although she looked longingly after her half-grown sons and daughters as they scampered across the yard in quest of stray bugs and flies.

But alas! the "Old Brown Pullet," (as the children call her) who was now about eight years old met with a serious mishap. She followed my husband into the barn one day and on hearing a squawk of pain and fright, he turned to find her poor foot held fast under the hoof of a large horse. From that time on, she lived without scratching. We could turn her into our choicest flower bed sure that not a seed would be disturbed. It was funny to see her with her next brood, for her maternal instincts were never trampled upon. Whenever she elected to set, she was allowed to. Every morning when let out of her box, she made a "bee line" for the sunniest corner of the yard, taking a very short step with one foot and a very long one with the other, clucking vigorously to her brood. Upon reaching the desired corner, she would seat herself and there she would sit the greater part of the day, keeping a sharp lookout for danger and giving an occasional cluck to enable her frisky brood, who were industriously hunting bugs, to keep their bearings. She raised every one of those eighteen chicks.

But I had not yet sounded the depths of her motherly heart, for in the September following her tenth summer, one morning I found two very wild hens,

who had stolen their nests, with five chicks each. I took the ten little chicks and tucked them under a Plymouth Rock biddy that had been keeping a china nest egg warm for several days, left them over night and the next morning took her off and put her in a coop with them and went into the house feeling quite satisfied that all was well. On coming out a half hour later there lay three little mutilated dead chicks and the rest gave evidence of pretty rough treatment. That hen spent a week in solitary confinement on bread and water. But what to do with those seven little motherless things? After a little perplexed study, I bethought myself of the "Old Brown Pullet," so old now that she no longer tried to get upon the roost at night, but cuddled down in the corner of a nice warm box. She had not been laying for some time and of course had no notion of setting. I went to the chicken yard, picked her up, put her in a shallow box and placed the little ones by her. She got up and walked away at first, but I brought her back and after surveying the chicks first out of one eye and then the other with a puzzled expression, it seemed to dawn upon her what was wanted and she gathered them to her motherly breast and raised every one of them. The following winter, after a cold storm, we found her one morning stiff in death. She was almost eleven years old. The children dug a little grave at the foot of the orchard and laid tenderly away all that remained of the "Old Brown Pullet."

ELLA A. MCKINLEY.

THE GLADSOME SPRING

The darkest time is just 'fore day
Before the shadows steal away:
Before the winter's frost and sting
Has melted into glorious Spring.

The gentle winds so soft and low
From summer land began to blow,
And waking from her wintry dream
Dame Nature now with life doth teem:
While hill and valley lands are seen
Fast taking on their tints of green.
The maples late so brown and bare
Are dressing up in raiment fair.
The orchard lands are gay and bright,
Adorned with blossoms pink and white,
While sweet perfume from laden trees
Is borne on every passing breeze.

The birds, those blossoms of the air,
Now nesting with the tend'rest care,
Are singing from each bush and tree
The softest, sweetest melody.

—E. V. BENEDICT.

THE BRÜNNICH'S MURRE

(*Uria lomvia.*)

The Brünnich's Murres are birds which have a decidedly northern range which is very limited within the United States where it is only a winter visitor. Their range is well known and may be given as the coasts and islands of the North Atlantic and eastern Arctic Oceans, southward to the lakes of northern New York and the coast of New Jersey. Their nesting range extends from the Gulf of St. Lawrence northward. During the winter season of some years they have been observed quite a distance west of their usual range. In his "Birds of Ohio," Mr. Dawson says: "In the winter of 1896-1897 a driving storm from the Labrador coast caught up a considerable number of these multitudinous seafowl and swept them far inland. When the storm had spent its fury, the Murres were found promiscuously stranded in the lakes and water-ways, or wandering about dazed and helpless in the fields of Ohio, Indiana, and neighboring states. * * * The first published record for Ohio was of the one taken by Rev. J. M. Keck, of Mentor, on December 19, 1896. A score of others have since come to light, all taken at about the same time or a few days later. This memorable inundation by Brünnich's Murres was general throughout the Eastern States and records were made as far south as South Carolina." During the winter, however, the Brünnich's Murres frequent the open sea and keep quite far from land. They are very expert in the water, and when disturbed by the approach of man they will suddenly dive, and using their wings as well as their feet, they will swim for long distances under water.

In his "Birds of Indiana," Mr. Amos W. Butler saw them during the month of December, 1896. This was the same month and year that they appeared in Ohio. Mr. Butler writes as follows: "Brünnich's Murre has, as I have been informed, been reported the present winter from other interior localities. It has, I believe, however, never before been authentically reported far from the ocean. Mr. Robert Ridgway informs me that they have this winter ranged down the Atlantic Coast as far as South Carolina. It would seem probable that some storm had driven them far out of their usual range. Evidently those mentioned herein were carried inland and dispersed about the same time, perhaps by the same storm. They were all taken within a few days. Only twenty-one days elapsed from the date when the first was obtained until the last was in the hands of a naturalist." These are the only Indiana records which are verified by specimens taken.

The Brünnich's Murres nest in groups, frequently very large communities, almost touching each other as they sit upon their single eggs, for but one is ever laid by a Murre, upon the bare ledges of rocky cliffs. The single eggs are laid upon the rocky surface and no attempt is made to build a nest. General Greely in his "Three Years of Arctic Service" says of the Brünnich's Murres on the bird cliffs of Arveprins Island (Northern Greenland): "For over a thousand feet out of the sea these cliffs rise perpendicularly, broken only by narrow ledges, in general inaccessible to man or other enemy, which afford certain kinds of sea-fowl secure and convenient breeding-places. On the face of these sea-ledges of Arveprins Island, Brünnich's Guillemots, or Loons, gather in the breeding season, not by thousands, but by tens of thousands. Each lays but a single gray egg, speckled with brown; yet so numerous are the birds that every available spot is covered with eggs." He also calls attention to the fact that each bird knows its own egg. The eggs are said to be very fine food, and the flesh of these Murres is highly praised by all who have partaken of it. General Greely

BRUNNICH'S MURRE.
(Uria lomvia).
⅜ Life-size.

says that to his taste it is the best flavored of any of the Arctic sea-fowls.

The one egg laid by the Brünnich's Murre is fortunately pear-shaped. The eggs are frequently laid near the precipitous edges of the ledges of rocky cliffs where, if they were more truly spherical in form, they would be rolled off the ledge and broken, for they are started rolling when the birds are suddenly startled. The pear-shaped eggs of the Murres instead of rolling some distance, simply turn around on their axes and move but a very short distance from the places in which they laid. Sometimes on the breeding ledges these birds will be so numerous that when sitting on their eggs they will quite or nearly touch each other. It is evident in such crowds that when the birds are disturbed and caused to move suddenly, their eggs are quite surely moved and in danger of being broken. Fortunately the shells of the eggs are quite hard and easily resist much roughness.

THE FIRST SWALLOW

(A SPRING SONG OF OLD GREECE *)

She comes, she comes, the Swallow blithe!
Her bonny breast gleams white!
Her back is black! Her wing is lithe!
She brings the seasons bright!
We're merry lads. We roam the street.
We dance and eat and sing.
We pound your door. We beg a treat,
The heralds glad of spring.

Roll out from your fat house a spread,
Some cakes and tarts and cheese,
A drop of wine, some wheaten bread,
The Swallow spurns not these.
If not, we'll bear your wee wife off
(She is so very small)
And sack your house of sweets and stuff—
Shelves, cellar, pantry, all.

She comes, she comes, the Swallow blithe!
Her bonny breast gleams white!
Her back is black! Her wing is lithe!
She brings the seasons bright!
Old men? Not we! We're boys once more!
We dream and feast and sing.
Come in, come in—fling wide the door—
Ye heralds glad of spring.

* The song is its own commentary. It tells an obvious and jolly custom. It is not translated too literally.

—J. Vallance Brown.

WHEN NATURE PUTS HER CHILDREN TO SLEEP

The summer was young; the bloom of spring had faded; the grass of meadow, pasture and roadside was resplendent in its luxuriance; the air had lost every vestige of springtime chillness. All day the sun had been sifting his life-giving rays on field and wood and vegetation was shooting upward in response to his influence. The juncos and tree-sparrows had bade us good-by and taken their flight to their more congenial summer homes in the far north. The fox sparrows had completed their transient visit and passed on. The white-throat and the white-crown were no more to be found in brush piles or along the hedges. The kinglets no longer tantalized one by their restless flitting amid the opening buds. Already the robins and larks and bluebirds had their nests completed and were intent upon the sober cares of life. All day long, field and lawn, orchard and wood, were vocal with song. The thrasher and catbird, from the tree tops, were repeating their medley; the jays were more than busy; they were officiously active overseeing the building operations of their neighbors as well as conducting their own. That is why they construct so clumsy a nest for themselves; they are too much intent on the labors of others to waste time on their own structure and are content with a great jumble of sticks loosely thrown together. The woodpeckers, the downy, the hairy, the red-bellied and the golden-winged had completed their excavations and were resting from their arduous labors, while the red-head had just arrived and was prospecting for a proper dead trunk or branch in which to construct a home. The sparrows, the chipping, the field, the song, the grasshopper, and the vesper, had taken the places of their cousins who had left us, and all day long were enlivening the air with their simple songs. The warbling vireo from its perch in the top of the tree sounded its monotonous notes from morn till night, while deep in the shade the golden-crowned thrush, startled with its explosive call of "teacher, teacher, teacher." The liquid notes of the golden robin and the no less pleasing song of the orchard oriole, enlivened orchard and grove, while the rosebreast added his mellow tones to the orchestra. And the warblers—who would dare to attempt to name that bevy of bright colors and restlessness that keep the twigs of the trees a-quiver as they dart from branch to branch, only stopping now and then to pour forth their gladness in happy song, so sweet and simple and satisfying that one is easily captivated by the happy family? The goldfinch was there and the summer yellowbird, the redstart with his conspicuous dress and proud ways, the indigo bunting singing and scolding alternately, the blue-winged and the prairie warbler, while from the dense thicket the Maryland yellowthroat called, "wichety, wichety, wichety," easy to be heard but hard to be seen. Overhead the grackles added their voices to the wood orchestra and the mournful cry of the wood pewee was mingled with the sprightly chickadee's song, and the wren for his size outdid them all. When the day was nearly done and the shadows of the woods had crept far out across the pasture, I took my way to the forest to hear and see how nature puts her children to bed.

All day the wind had blown through the branches of the trees and they had swayed and the leaves had rustled in its freshness, but as the night came on, calm rested on field and forest. As I entered the wood the air was heavy with the delicious perfume of the crab apple bloom. How exquisite is their fragrance unequaled by any other bloom save that of the wild grape! Though the sun was yet above the horizon, within the wood was the dimness of the twilight. The bird orchestra of field and wood was in full chorus, and not a moment was there

of silence. Deep within the shade I seated myself on the stump of a venerable tree that for many years, through sunshine and storm, in summer's heat and winter's cold, had lifted its proud head above its fellows, but had at last succumbed to the will of man, and that pathetic stump and pile of discarded branches was all that remained of its greatness. There I rested and waited. As the shadows deepened the bird notes became less constant. Though there did not seem to be the loss of a single member, yet certain of the singers became more prominent as others were less often heard. Plainly to be heard were the robins, while the voluble thrasher was persistent with his medley as he sat in the top of a crab apple tree, and the field and vesper sparrows from their perches in isolated trees outside of the wood repeated over and over again their pleasing melody. A belated crow came brushing past through the tree tops, and perched on a limb of a tree near his mate who was hovering their brood.

But it grew dimmer there in the wood each moment. With startling distinctness the ovenbird uttered its exclamatory cry, then flitted silently away through the gloom to a new vantage ground and there repeated its call. One by one the voices of the day ceased or became infrequent. Occasionally a redstart or indigo bunting uttered a few notes as if disturbed, but these soon ceased altogether and the voices of the day were superseded by the voices of the night. From the distant marsh came the sound of croaking frogs subdued in volume by the distance. There was a quick rustling among the dead leaves and a shrill whistle, as a chipmunk skirried with elevated, jerking tail from log to stump. Still, though darkness is rapidly settling over all the earth, the clear call of "bob white" comes from across the fields and a robin is intermittently calling "cheer up," while the thrasher repeats only a part of his medley, as though half asleep and the vireos and warblers and grackles have become altogether silent. Occasionally amid the branches overhead could be heard the fluttering of wings as some belated bird flits past, seeking shelter for the night. The melancholy cry of the whippoorwill sounds from afar, then comes nearer until it wakes the echoes in the woods. Then silence falls over all the forest. The last beam of light from the departing sun faded, and to the silence added darkness. Still I sat upon the stump and listened. I have said that there was silence through the forest, yet there were sounds around and above. No breeze stirred the branches of the trees, no song of bird or cry of beast broke the stillness, and who can say what were the sounds that made the silence vocal? A branch would suddenly stir, then lift itself from the cramped position in which wind or resting bird had forced it in the day, as though turning itself to an easier posture for the night. A branch of dry leaves covering an expanding plant down there in the rich mould, would audibly rustle as the life beneath forced its way upward. These were the voices of the night, the mighty silent forces of life in tree and shrub and plant.

At such a time and in such a place, man is a different being from the sordid creature that a few hours before was a part of the rushing, grasping world, striving to outdo his fellows in the battle of life. Then and there he is a part of that pure nature surrounding and enveloping him—helpless as are his fellow creatures, protected as are his fellow creatures by the protecting care of the Father of all. It is well to sometimes retire from contact with our kind and associate with nature in its virgin forms and there learn our dependence and the oneness of all created things.

L. O. Mosher.

THE ADVANTAGE OF COLOR TO A FLOWER

"A primrose by a river's brim
A yellow primrose was to him,
And it was nothing more."

Poor Peter Bell! That he should never even wonder why it was yellow.

And that introduces the question, "What advantage is color to a flower?" Each one who has hovered over a row of sweet peas, bowed adoringly before a pansy-bed, or exulted in a sweep of nodding Shirley poppies will exclaim, "What greater advantage could anything have than to so glorify and lighten this earth of ours?"

But there is a selfish use in the radiant hues of the flower. The perpetuation of its species depends upon its color, scent and form. If one has not studied flowers the parts of a blossom serve but to make up an harmonious whole, beautiful in texture, shading and design. But to the knower, every flower possesses two sets of organs, the male and the female. In an ordinary flower the erect middle part with a lobe or enlarged base is the female part, capable of producing the seed, while the many little outposts guarding her are the male members. In some species the sexes are distinct, the male being produced on individual plants and being of different shape from the female. Meadow-rues, begonias, and some trees exemplify this feature.

In order that the pistil or female part should become fertile, its sensitive tips must receive the quickening, life-giving power contained in the powdery pollen on the ends of the stamens. And that is effected, mostly, by bees, butterflies, and moths who are attracted by the color and sweetness and aided in the process of fertilization, by the form of the flower. The early April flowers, those that you must look up for, not down, are mainly inconspicuous in color and simple and small in shape and size, appearing before the leaves develop. And the minute anthers are crowded to bursting with pollen grains. That is because they are fertilized by the winds which waft the pollen from flower to flower, from tree to tree. It is a little too changeable weather to depend entirely on the bees, so instead of trying to attract them, they bend all their energies to producing pollen, sure, that with so much pollen and so many breezes every little female will receive her share of the valuable yellow dust. But, when the insects are numerous, every flower hangs out its advertisement in glaring yellow, red or blue or some accompanying soft tint, which reads, "Honey here, unadulterated. First class material for bee-bread—fresh daily." And some, as a double inducement, exhale their sweet breath through all the garden.

Many and marvelous are the devices of the flowers, but they all manage in some way so that as the bee enters the blossom he receives a generous coating of pollen, some of which adheres to the pistil of the same flower, if it is mature at that time. But more of it is carried to flowers of another plant, by which means cross-fertilization which is best, is effected. It is true and strange that the insects always confine themselves to some particular species on each journey, so no hybrids are produced.

If you will wander among your plants in the twilight you will notice that the most conspicuous flowers are the daturas, moon flowers, nicotanias and night blooming cereus. These depend upon moths for fertilization so they are either creamy-white or pale-yellow, which colors are most noticeable in the dusk, and, generally, evening flowers are very fragrant. If you will examine them, you will find that most every flower has an original way of fertilization and of protection after the seed is set.

"Flower in the crannied wall,
I pluck you out of the crannies,
I hold you here, root and all, in my hand,
Little flower—but if I could understand
What you are, root and all, and all in all,
I should know what God and man is."

MARY ALICE MOYLE.

DOWNY WOODPECKER.
(Dryobates pubescens).
Life-size.

THE DOWNY WOODPECKER

(*Dryobates pubescens.*)

To most people the mention of "woodpecker" brings to mind at once the red-head or the flicker. Everybody is acquainted with these birds and knows the day they make their appearance in spring; they announce their coming with a display of color and vociferous cries, the red-head with his "clerk" or "dare-dare-dare" and the yellow-hammer with his "flicker, flicker, flicker," and everyone hears and notes those sonorous tappings with which they call their mates. Comparatively few are acquainted with the one that is in many ways the most interesting of them all, the Downy, and of those who do know him by sight, he is usually called by a slanderously incriminating name "Sapsucker," and his manner of life viewed with suspicion.

There are few better examples of modest worth hidden in obscurity than in the case of the little Downy. If all the woodpeckers were to alight in the same tree in equally conspicuous positions, the Downy would be the last to be seen, and the last to know he was seen. He would be too busy attending to work to pay attention to observers, while the red-head and yellow-hammer appear to have more of the self-consciousness that goes with a handsome appearance.

Of all our woodpeckers the Downy is the smallest of all except one, which almost exactly resembles him in color. He is the most plainly colored, his color consisting of black, more or less spotted with white above, a white streak along the middle of the back, white stripes on the sides of the head, and, in the male, a small red crescent on the crown; this last bit of color is absent in the female.

For several reasons the Downy Woodpecker is the best worth knowing of all the family. He is with us the year around, winter and summer, bright days and dark, and on gloomy days of winter when all his relatives except the hairy are safely housed or down in warmer climates. A trip along a copse-bordered road or open woodland, or through an orchard or even a city avenue lined with trees, is likely to result in the discovery of one of these birds busily engaged in search of insects. There are certain plants and situations he prefers to others. He is particularly fond of pecking at small willows, or, in autumn to peck at the seedpods of the dead mullein stalks.

Not only is he with us out of doors the year around, but he is the most sociable of his kind, or rather, he is too intent on business to be easily frightened by being watched. He comes into cities more than the others and can occasionally be seen on the trees that line broad avenues. He stays in orchards more or less, and rids the apple trees of insect pests.

He can be studied better than most of the woodpeckers, as one can approach him quite closely while he is busied, and study him at near view. He is too eagerly intent on getting that grub to let a little watching bother him. When approached altogether too closely he makes off with a heavy undulating flight, each wing-beat making an audible stroke against the air, toward the base of a neighboring tree, which he carefully ascends to the tips of some of the upper twigs, searching dliigently for insects and larvæ. On the whole, the Downy seems to prefer to work among smaller trees than do the others of his family. He leaves the great trees of the forest to his larger relatives, while he specializes among the saplings and shrubs.

The bird has as little, either in voice or action, as he has in color to attract attention to himself. The usual sound he makes is a rather clear shrill call, only made at occasional intervals, easy enough to hear and recognize indeed, but by no means forcing itself on one's attention. The bird is never given to making fierce brandishing dashes at neighbors as does the red-head, nor to

cutting up silly capers as the flicker does in the spring. It is possible that he drums up his mate in spring-time like the others of his sort, but I have no distinct memory of having seen it done, and if he does the sound is of a subdued tone compared with the sonorous tattoo of his conspicuous relatives.

However it is done he and his mate happen to discover each other sometime about April, and go to housekeeping in an excavation in a dead tree or stub, usually not far from the ground. From three to six glossy white eggs are laid, and both birds take turns hatching them for about twelve days.

Both the habitat and breeding range of the Downy is greater than that of any other of our woodpeckers. It extends from Florida to the northern part of Alaska, and from Maine into parts of California.

The only bird with which one is likely to confuse the Downy is the hairy woodpecker. They are almost exact counterparts in color, habits, and voice, the hairy however is larger and more confined to the deeper woodlands so that it is much less often seen.

Of all our woodpeckers, the Downy is probably the most useful. His food, like the others, consists mostly of insects, and the fact of its being obtained in orchards and other places associated with man, makes the bird particularly serviceable in a place where service is especially effective.

H. Walton Clark.

BIRD LEGENDS IN RHYME

THE NIGHTINGALE AND THE ROSE

When first in the garden of Eden
Stood Adam with Eve, sweet and fair,
We are told that words left him speechless
For nothing with her would compare.

And seeking some kind of a token
To offer, his great love to show,
He turned to the myriad flowers
That round him grew row upon row.

But none were there of such beauty
That they with his love might compare,
And he sighed, the first sigh in Eden—
When a soft voice was heard on the air—

And a rosebush stood trembling before him
With beautiful buds covered o'er,
Each swelling and bursting in beauty
As tho' they would homage implore.

He gazed and without hesitation
Took rosebuds pure, fragrant and fair
To Eve, who with ecstasy kissed them
And twined thro' her bright, golden hair.

When the rose bush so sweet and so queenly
Appeared, all the flowers great and small,
Bowed their fair heads in silence and whispered
"Her beauty surpasses us all."

"Our bright queen she must be forever;
The birds must all sing in her praise,"
But the songsters were silent, not daring
To offer their roundelays.

Only one—the gay peacock—said proudly,
"Why cease from your singing so sweet,
What beauty find you in this flower
With no name? Why fall at her feet?"

So scolding and fretting, the peacock
Grew hoarse in his jealous tirade;
And spreading his feathers out proudly,
Cried, "See, these fine colors won't fade!"

When at last, evening came in the garden,
There was heard such a song on the air,
That the birds in their nests woke to hear it
While trembled the rose sweet and fair.

And Adam and Eve paused to listen
While naming their flowers o'er and o'er,
They thought that the bird sang of "Rosebud,"
So that name should be hers evermore.

Thus the Nightingale sang his first love song
To the flower that was given birth,
That Adam might have a love token
For his loveliest flower of the earth.

—Edith Drury Lenington.

CRABBING IN FLORIDA

There is no sport so interesting to me as catching crabs in the St. John's River in Florida. The way to catch them best, is by tying pieces of beef or raw fish to long strings and throwing them far out in the deep water by the docks. The crabs are very greedy and bite easily, several catching on and scrambling after the same piece of meat. Then there is nothing to do but pull the string gently up, slip the crab scoop under them, and turn them into a bag. One day last summer, two little companions went with me, and in three hours we caught seventy-six. The crabs are full of fight, ready to bite everything in reach. I broke off one of the claws accidentally and put my finger to the detached claw, and was severely bitten. Sometimes I keep them over night in shallow water feeding them on corn-meal. After they are boiled in salted water they are a beautiful brilliant red.

Once at Pablo Beach, one of the boys brought some crabs out of the sea, and put one down on the floor of the pavilion. It ran all over the place in the most comical manner, and even started toward a little puppy that ran whining under the seats. Everyone laughed, and we had quite a chase before Mr. Crab was safely quartered in an old shoe box. still looking saucy and defiant.

These are called blue crabs, and are considered by many as a great delicacy. They are called soft shell when they have just cast aside their old shells. The best time for crabbing is in spring and summer.

Loring M. Hewen.

THE NESTING HABITS OF SOME BIRDS

The eggs we illustrate in this issue are mainly those of well known birds, some of which are common and quite widely distributed over North America.

The Catbirds *(Galeoscoptes carolinensis)*, delightfully intelligent birds and charming singers, have an extensive breeding range covering the eastern United States from the Gulf of Mexico northward to New Brunswick, the Saskatchewan, and British Columbia. Their ragged appearing nests are well constructed with twigs, fine roots, grasses, bark fibers, stems of weeds and are lined with very fine rootlets usually, but sometimes with moss and leaves. The nests are generally placed in bushes or heavily foliaged trees and usually not very high above the ground. The sets of eggs vary from three to five in number and in color they are a rich greenish blue and very attractive. These birds are devoted to their young and are always helpful to any of their kind which may be in trouble, and they are known to care for the young which have lost their parents.

The Robins *(Merula migratoria)* are birds with which nearly all persons may be acquainted for they frequent North America, east of the Rocky Mountains from Mexico northward to Alaska and they breed from about the latitude of Virginia and Kansas northward to the Arctic coast. Their rather rough and bulky nests are built with grasses, fine rootlets, leaves, twigs and stems. They are strengthened by an inner layer or wall neatly made of mud and lined with fine grasses. Sometimes hair and wool is used in the construction and they are quite generally placed in shade or orchard trees at a height of from four to forty feet above the ground. The sets of the beautiful eggs vary from three to five.

The Chickadees *(Parus atricapillus)* are intelligent and delightful friends of the human race. Their breeding range seems to extend from southern Pennsylvania and the Ohio River northward to Labrador. They are also known to nest in the Alleghanies as far south as North Carolina. Their nests are built in deserted woodpecker holes, cavities in decayed trees or stumps, hollow fence posts and similar places. The nests are constructed with various materials such as moss, feathers, grasses, vegetable down, the fibers of plants and animal hairs. They are seldom more than fifteen feet above the ground and sometimes the holes are made by themselves in decayed wood of trees. The sets of eggs vary from five to eight.

The Long-billed Marsh Wrens *(Cistothorus polustris)* have quite an extensive breeding range covering the eastern United States from the Gulf States northward to Manitoba and Massachusetts. Their nests are quite bulky and are globular in form and built in reeds or bushes. The materials used in their construction are grasses, stems of reeds and weeds which are closely interwoven and sometimes plastered with mud. The opening is upon one side and is frequently concealed. The nests are lined with fine grasses or the down of plants. The eggs in the sets vary from five to nine and are so thickly covered with various shades of brown that the white background is nearly always absent.

The Brown Thrashers *(Harporhynchus rufus)* breed from the Gulf States to Maine, Montreal and Manitoba. Their nests which are built upon the ground or in low bushes are built with twigs, rootlets, tendrils, shreds of bark, and leaves, are quite rough and bulky. They are lined with fine rootlets, animal hairs and feathers. The sets of eggs vary from three to six. The males are rich toned musicians, singing in the morning or evening, from an exposed position.

The Yellow Warblers *(Dendroica æstiva)*, often called the Wild Canary or Summer Yellow Bird, breed quite

EGGS.
Life-size.

1. Cat Bird. 2. Robin. 3. Chickadee. 4. Long-billed Marsh Wren. 5. Brown Thrasher. 6. Yellow Warbler. 7. Red-eyed Vireo. Loggerhead Shrike. 9. Cedar Waxwing. 10. Cliff Swallow. 11. Martin. 12. Rose-breasted Grosbeak. 13. Scarlet Tanager. 14. Tow- 15. Song Sparrow. 16. Chipping Sparrow. 17. Vesper Sparrow. 18. Great-tailed Grackle. 19. Bronzed Grackle. 20. Baltimore Oriole. Orchard Oriole. 22. Meadow Lark. 23. Red-winged Blackbird. 24. Blue Jay. 25 Prairie Horned Lark. 26. Wood Pewee.

throughout their North American range as far to the north as the Arctic regions. Their beautiful nests which are generally built in the shrubs and trees of lawns, parks and orchards, are made of grayish hempen fibers, fine stems, leaves, grasses, plant down and the silky threads of caterpillars, and they are lined with plant down, long hairs, fine grasses and feathers. The number of eggs in the sets varies from three to five.

The Red-eyed Vireos *(Vireo olivaceus)* breed from the Gulf States northward to Labrador and Manitoba. The nests of these joyful songsters are pensile and hung by the rim to forked twigs to which they are securely laced. They are cup-shaped, varying from four to forty feet above the ground, and made of well woven strips of fibrous bark, grasses, plant fibers, spiders' webs, plant down and pieces of paper. They are lined with fine grasses, fibers, tendrils, hair and feathers. The sets of white eggs vary from three to five.

The Loggerhead Shrikes *(Lanius ludovicianus)* or Butcher Birds breed east of the Alleghanies from the Gulf States northward to Virginia, and occasionally to southern New Jersey. West of these mountains they nest, northward to the Great Lakes and through western Pennsylvania and New York to the New England States. The nests are quite bulky and loosely constructed with twigs, pieces of fibrous bark, vegetable fibers, grasses, leaves and weed stems. They are lined with grass and frequently with feathers or wool. They are placed in hedges or trees at less than ten feet above the ground. The number of eggs in the sets vary from three to five.

The Cedar Waxwings *(Ampelis cedrorum)*, Cedar-birds or Cherry-birds have a breeding range which extends from "Virginia, the southern Alleghanies, Kentucky, Kansas, Arizona northward." Their nests are quite bulky and made of shreds of bark, rootlets, twigs, grasses, weeds, rags and twine. Sometimes mud and other materials are also used. They are usually placed in fruit, shade or orchard trees at an altitude from five to twenty-five feet above the ground and the nests are lined with either fine grasses, hair, wool or feathers. The sets of eggs vary from three to five.

The Cliff Swallows *(Petrochelidon lunifrons)* or Eave Swallows breed throughout their summer range from a short distance north of the Gulf States to Labrador, on the Atlantic Coast, and in the interior quite to the Arctic Ocean. Their nests are built of mud, at times with the addition of grass fragments, and they are lined with feathers and grass. They are built beneath the eaves or rafters of buildings or beneath cliffs. The number of eggs in the sets of these Swallows, which nest in colonies, varies from four to five.

The Martins *(Progne subis)* breed throughout their summer range which extends as far north as Newfoundland and the Saskatchewan region. Their nests of straws, twigs, grasses or, in fact, of any available material are generally built in houses or other good receptacles erected for them. The birds also, at times, build their nests in buildings. The eggs are white and vary from four to five in the sets. These birds are much more common in the southern than in the northern portion of their range.

The Rose-breasted Grosbeak *(Habia ludoviciana)* breeds from Kansas and the higher regions or North Carolina and Virginia northward to Manitoba and Maine. The nests of these beautiful and musical birds are built in bushes, vines or trees at an altitude of from five to twenty-five feet. The shallow nests are built of fine twigs, vines, weeds, small rootlets and grasses. The sets of eggs vary from three to five.

The Scarlet Tanagers *(Piranga erythromelas)* have a breeding range which extends from the Ohio River and Virginia northward to New Brunswick and Manitoba. They build their nests in almost any tree from those of orchards and roadsides to the deep woods. The nests are not strong structures and have a thin wall built of fine twigs, rootlets and straws. They are lined with fine vine tendrils, blossom stems and sometimes hairs and feathers. They are usually built near the end of a horizontal branch and from five to twenty-five feet above the ground. The sets of eggs of this at-

tractive bird and cheery songster vary from three to five in number.

The Towhees *(Pipilo erythrophthalmus)* or Chewinks breed from Georgia and the lower Mississippi Valley, northward to Maine, Ontario, and Manitoba, and westward as far as Dakota. Their nests are usually placed on the ground or sometimes in bushes in woods, sunny slopes or in clearings which are thickly covered with grass. The large nests are made of strips of bark, rootlets, fine twigs, dead leaves, and are lined with fine grass. The sets of eggs vary from four to five.

The Song Sparrows *(Melospiza fasciata)* breed from Virginia and northern Illinois northward to the Fur Countries. Their nests are usually built upon the ground in fields or woody places or occasionally in bushes at a height of not over five feet above the ground. Their nests are usually quite coarse and made of coarse grasses, rootlets, weeds, strips of bark, dry leaves and lined with hair and fine grasses. However, they are at times much more delicate and made of grass with a lining of finer grasses and hair. The sets of eggs of these attractive birds vary from four to five.

The Chipping Sparrows *(Spizella socialis)* breed from the Gulf States northward to Newfoundland and the Great Slave Lake. Their nests are built in trees or bushes at a height of from two to twenty-five feet above the ground. They are made of fine twigs, rootlets and grasses and well lined with hairs which may be quite long. The sets of eggs of these common and social Sparrows vary from three to five.

The Vesper Sparrows *(Poocætes gramineus)* or Grass Finches, breed from Virginia, the Ohio River and Missouri to New Brunswick and Manitoba. Their nests are built upon the ground at the base of bushes or coarse weeds and generally in open fields. They are made of coarse grasses, moss, or rootlets and lined with fine grass, hair or fine rootlets. The sets of eggs vary from four to five.

The Great-tailed Grackles *(Quiscalus macrourus)* have a limited range extending through eastern Texas and southward through eastern Mexico and Central America. The nests are usually placed in mesquite trees and "strongly built of straws, leaves and grasses, mud being used freely. Where Spanish moss is plentiful, the nests are sometimes entirely of it." The sets of eggs vary from three to five but the former number is more common.

The Bronzed Grackles *(Quiscalus quiscula æneus)* breed, according to Mr. Chapman: "From Texas to Great Slave Lake, east to the Alleghanies as far north as Pennsylvania, and north of this, eastward to Connecticut and northward to Labrador." Their nests are placed in bushes or trees, sometimes in hollow stumps or trees, at a height from five to sixty feet above the ground. The coarse and bulky nests are composed of twigs, grasses and rootlets often more or less cemented with mud. They are lined with fine grasses and wool. The sets of eggs vary from three to six.

The Baltimore Orioles *(Icterus galbula)* breed from the Gulf States northward to Ontario, and their pensile nests, six to eight inches in depth, are securely fastened to the twigs at or near the end of a branch from fifteen to forty feet above the ground. They are built with grasses, shreds of fibrous bark, hair, strings, vegetable down and wool. They are lined with wool and fine grasses. The sets of eggs of these charming birds vary from four to six.

The Orchard Orioles *(Icterus spurius)* have a breeding range nearly co-ordinate with that of the preceding species. Their nests are also pensile and built near the extremity of a branch, from ten to twenty-five feet above the ground. They are carefully made by weaving a quantity of fresh grass and lacing it to twigs and leaves. The sets of eggs vary from three to five, and the nests are generally in orchards or in the trees of our lawns.

The Meadowlarks *(Sturnella magna)* or Field Larks breed throughout the eastern United States from the Gulf of Mexico to New Brunswick and Minnesota. The nests of these birds are built of grasses and are frequently more or less arched. They are on the ground in

open fields of high grass or grain. On account of their nesting habits their name is most appropriate. As the nests are usually placed in tufts of tall grass, they are nearly always very hard to locate. The sets of eggs of these interesting birds vary from four to six.

The Red-winged Blackbirds *(Agelaius phœniceus)* breed from the Gulf of Mexico northward into the British Possessions. Their nests are built in tussocks of grass, reeds, or low bushes in or near a swamp or marsh. They are sometimes built in bushes which grow in the water and in a few instances they are located in trees or on the ground. The materials used in the construction of the nests are quite variable, but usually coarse grasses, strips of sedges or rushes, or stalks of weeds are used. They are lined with hair or fine grasses. The number of eggs in the sets vary from three to five.

The Blue Jays *(Cyanocitta cristata)* breed throughout the United States east of the Great Plains from the Gulf of Mexico northward into the British Possessions. Their nests are built usually in the crotches of trees or high shrubs, from five to forty feet above the ground. They are even built, at times, in vines growing on the sides of houses. The nests consist of rudely though strongly interwoven rootlets, twigs, vegetable fibers, and quite often yarn, strings, wool, rags and pieces of paper. The eggs in the sets vary from three to six.

The Prairie Horned Larks *(Otocoris alpestris praticola)* breed in the upper Mississippi Valley and eastward through New York to western Massachusetts and Long Island. The nests of this prairie loving species are built on the ground in shallow depressions usually in dry meadows and corn-fields. The nests are quite compactly constructed of dry grasses and the leaves of corn. They are lined with animal hairs, feathers and sometimes vegetable down. Two or three broods are reared in a season and there are three or four eggs in the sets.

The Wood Pewees *(Contopus virens)* breed throughout eastern North America from Florida to Newfoundland and westward to the eastern edge of the Great Plains. Their nests are usually saddled on a limb of a tree from fifteen to fifty feet above the ground. They are sometimes built in the fork of a branch. They are constructed with fine grasses, moss, rootlets and strips of bark. The outside of the wall is covered with a copious coating of lichens which are held in place by webs. The walls are thick, but the floors are very thin, and sometimes the branches upon which the nests are saddled form a portion of the floor of the nest. The sets of the beautiful eggs of this Pewee number from three to four.

THE GREEDY GULL OF LOCH LOMOND

The sky was clear and the lake smooth as glass, on a lovely day in July as a boat filled with tourists passed Ben Lomond whose tall head overlooks the other hills in a lordly way as if conscious of the beauty he was adding to the lake scenery.

A flock of gulls had been following the boat for some time. The children aboard clamored for permission to feed the birds, so a bag of bread crusts was secured from the cook and a merry play ensued.

The leader of the flock was the largest of the gulls and he disdained to swoop down to the water to catch the bits of bread when they were thrown upon it as the rest of the gulls were happy to do, for he was an adept at catching them in the air. Seeing his skill, a young man offered to throw the bread for the children to see if the leader would not secure every bite, if well thrown. Sure enough, five times out of every six "Sir Greedy Gull" secured the crust. If one chanced to fall to the water, he left it for the others to dive for, while he flew on, ready for the next bite which seemed to fly right into his bill.

Great was the amusement of the children, but, at last, as the bag of scraps was emptied, they began to fear that the

Greedy Gull would die of distension of the crop, for he really looked almost deformed, it was so enlarged.

"Sir Greedy" was so tame that when the young man, instead of throwing it, placed the last crust on the boat railing, he flew close to get it but it fell into the water just as he reached the spot and he left it for the hungry rabble following him to pick it up.

The older passengers enjoyed the sport quite as much as the children and when it was ended they discussed the peculiarities of the various kinds of Gulls at home and abroad. The "Laughing Gull" with its peculiar cry which sounds like a peal of laughter, and the "Herring Gull" which has an economic value as a scavenger, came in for a share of attention. An ornithologist spoke of how nature provides long, narrow wings when the bird's life requires it to move in high winds and ocean storms, like the Gull and other sea birds. Some one else suggested that birds sail in the air as boats do in the water, only birds are able to "tack" in so many directions that they have the advantage of a clumsy boat.

Often Gulls form a white-winged fleet to accompany a vessel far out to sea. Most picturesque they seem as they winnow the air, or circle to the clouds, or dart headlong downward to surprise the wary fish. It is always with a feeling of regret that passengers bid farewell to these ocean wanderers.

Belle Paxson Drury.

KITTY CLOVER

When I was a little girl I had a pet cat, a dainty gray with a white, angelic-looking face and large blue-gray eyes. This cat my aunt named for me, "Kitty Clover."

She was almost a perfect cat-being, for besides her beauty she had exquisite manners and the most correct morals, being honest, tidy, industrious, respectable, motherly, loyal. I might also say that she was religious, for she loved and adored me, who was, I've no doubt, a god in her eyes, possibly her only god.

But her most striking trait, her crown of female cat-hood, was her motherliness. In her mother's nest, a strawy place in the bottom of some barrel or box, she was in her element. There, fairly hugged and squeezed and rampaged over by her numerous offspring, little wriggling, homely, blind babies, she spent her time washing them all to the perfection of neatness and sleepiness, singing them to sleep with her rhythmic and crooning purr, and occasionally taking a cat-nap herself. When I went to visit her, she met my rapt look with one from her half shut eyes, of the most passionate love for her blind babies, and of the utmost faith in me.

Let me recount one little incident of her life. One spring day father brought up from the fields, where he had been ploughing, three tiny puff-balls of fur with pink dots for nose and mouth, and little dents where the eyes would sometime open, in fact, three little homeless rabbits; their mother had been killed and they were most hungry, squeaking, forlorn orphans. Now Kitty Clover had a nest of very small babies, just two, three others having disappeared on the first day.

"She is so good," said little I. "I am going to see if she won't let the poor little bunnies get some dinner with her kitties."

So I tucked them in very carefully beside the kitty-babies. Sure enough, Kitty Clover did not resent the liberty, but, smelling of them cautiously at first, she then hospitably tidied them all over with her rough tongue. As soon as they felt her life-giving licking and her soft fur, they poked their little noses ravenously into the warm feeding-ground, and in a trice were luxuriating over the warm, sweet dinner.

Let me add that this is a true story, and that the generous cat mothered these orphans until they were large enough to jump out of the box.

Amanda M. E. Booth.

BROWN CREEPER.
(Certhia familiaris americana)
Life-size.

THE BROWN CREEPER

(*Certhia familiaris americana.*)

The springtime is truly the paradise of the bird lover; at this period the feathered hosts which have been spending the winter in the far south begin their northward journey to fill the woods and fields with beauty and song. Among the thousands of migrating birds which pass northward to rear their young, the Brown Creeper generally passes unnoticed, owing to its small size and the almost perfect manner in which it is concealed by its sombre coloration. Notice him as he creeps up yonder tree! Now he creeps up perpendicular like a woodpecker, proping himself with his long, stiff tail, and again he creeps around the tree several times in his ascent. Unlike the nuthatches, which delight to descend the tree trunk head downward, the Brown Creeper always crawls upward.

The manner in which this bird is concealed when on a tree trunk is truly wonderful. Its back is dark brown marked by several longitudinal stripes of grayish, the space between these two colors being marked like the striations on the bark of a tree. When this Creeper remains perfectly quiet on the bark of an oak or of an elm tree, it is well nigh impossible to see it. This is a good case of protective coloration and it is a notable example of one of the many ways in which nature takes care of her children. The structure of the Brown Creeper is peculiar and well adapted to its habits. The tail is rather stiff and is used as a brace in much the same manner as the tail of the woodpecker. The claws of the feet are long and sharp, and curved in such a way as to allow of a strong purchase on the bark of the tree. The bill is rather long and slender, and is not used for digging into trees, but for picking up those insects which live on the bark of trees, such as bark-lice, those beetles which live on the outside of trees, and other insects which infest such localities. Spiders who make up a portion of its food, as well as pine seeds and fungi.

The flight of the Brown Creeper is very quick and it seems always in a nervous hurry. Though generally rather shy, it is at times quite tame, as I experienced a few days ago while walking through the woods, engaged in bird study. This patch of woods was rather open and the trees were mostly large elms with high branches and almost smooth trunks. A Brown Creeper was busily engaged in securing his morning meal and he allowed me to approach within several feet of him before taking flight. Its peculiar habit of creeping up one trunk and then flying to the base of another, to repeat the operation, was noted. On this occasion the golden crowned kinglets were observed feeding upon the ground and were so tame that one could almost touch them.

The note of the Brown Creeper is very characteristic and one may often hear the call without being able to see the bird. Mr. Wilson Brewster thus speaks of their notes during the breeding season: "Their notes are varied and warbling, and somewhat confused; some of them are loud, powerful and unsurpassingly sweet, others are more feeble and plaintive. Their song usually ends with their accustomed cry, which may be represented by cree-cree-cre-ep."

The nest of this bird is built in a peculiar location, and is difficult to locate so securely is it hidden. A tree trunk is selected in which the bark is loose, or has sprung enough to leave a cavity of sufficient size. In this a nest is built, consisting of dried twigs arranged somewhat in the form of a crescent, and lined with lichens, spiders' webs, shreds of bark, feathers and fine rootlets. The nest is built from five to fifteen feet from the ground; five to six brown spotted eggs

are laid, measuring three-fifths by half an inch. Egg laying begins late in April or early in May.

The Brown Creeper is a common migrant in eastern North America, where it ranges from the Gulf states northward; it breeds from Illinois, Indiana, and Pennsylvania northward. In Illinois and Indiana its winter and breeding ranges somewhat overlap. It has been known to winter at Chicago, Illinois, in several places in northern Indiana and in parts of Michigan and Wisconsin.

Together with the chickadees, titmice, and kinglets, the Brown Creeper is a valuable insect destroyer and should be protected by both bird lovers and agriculturists.

COLLINS THURBER.

THE OLIVE TREE

Pallas Athene, the Grecian goddess of Wisdom, wears a crown of olive leaves the emblem of Peace. According to mythical story, in a controversy with Neptune regarding the right to bestow a name upon a city, she caused an Olive Tree to spring out of the ground. The tree was considered more useful than the horse which her competitor caused to appear, and so the city, Athens, was named for her. It is possible that the myth has its origin in the first planting of the Olive in Athens. The tree thrives in calcareous soil and delights in sea-breezes, and thus it finds a congenial home on the limestone crags of Greece.

It is probably a native of Syria and the coast of Asia Minor, and its cultivation must have begun in very early times. In Homer's Iliad olive oil is mentioned, but only as a luxury of the wealthy. The Bible contains frequent references to the Olive, its first mention being in the story of the flood and the return of the dove with an olive leaf. The reason for its early cultivation is found in the fact that it yields with little labor, the oil which is essential to healthy life in the hot, dry countries where it grows, and thus supplies a pleasing substitute for the animal fats which northern races consume. Naturally, it became the symbol, not only of peace, but of prosperity and plenty. A spray of wild Olive was used to crown the Olympian victor and the Roman conquerer, for "War is made only that peace may follow."

In a wild state the tree is usually small and straggling, with thorny branches. In cultivation it loses its thorns but is generally small and slender. Its opposite, evergreen leaves are grayish green above and almost white beneath. In the breeze and sunshine of California the foliage glistens with a silvery sheen.

The tree is of very slow growth, and though it is hardly more than a shrub in this country it sometimes attains considerable size when it is allowed to develop naturally. The botanist, DeCandolle, mentions an Olive Tree that was more than twenty-three feet in circumference. It was supposed to have lived seven centuries. Some of the Olive Trees in Italy are said to have been in their youth during the early days of the Roman Empire. The trees upon the Mount of Olives are pictured as large, and showing marks of age.

Olive wood is yellow or of a light, greenish brown, often finely marked with darker veinings. Hence it is of value to the cabinet maker and turner. Travelers in Palestine often bring home as souvenirs small articles made of olive wood.

The Olive is the typical member of the family to which it belongs, and from its classical name, *Olea,* the family name, *Oleaceæ*, is derived. The name has the same root as the word oil. To the Olive family belong the sweet Jessamine, the Lilac, the Forsythia, or "yellow bells," one of the earliest blossoming of cultivated shrubs, and the Ligustrum or Prim, which is often planted for ornament in California and is sometimes used to make hedges. The Fringe tree and the Ash are also its relatives. A sister species is the fragrant Olive of China and Japan, the flowers of which are used to perfume tea. All of these plants have

regular flowers with only two stamens, and generally four divisions to the corolla. The flowers of the Olive are small and creamy white, in slender, branching sprays.

The first Olive Trees of California were planted at the mission of San Diego about one hundred and thirty-five years ago. With cuttings taken from these trees the Spanish Fathers planted orchards at the other missions, and hence the species acquired its name, the "Mission Olive." In recent years the Olive industry has grown rapidly in California and there are now more than two million trees in the State, ranging through a territory six hundred miles in length and extending as far north as the foot of Mt. Shasta. New plants are generally propagated from sprouts or cuttings, but may be raised from seed. The seeds require two seasons to germinate but produce hardier plants than those from cuttings.

The tourist in California is often induced to try a green olive, fresh from the tree, but he never cares to repeat the experiment. The first sensation is that of concentrated bitterness mixed with oil and alum, and the final taste is even worse than the first,—a combination of pepper and pucker long to be remembered. It is a wonder that any one ever thought the fruit of the Olive could be made edible, or ever invented the efficacious treatment with lye and brine that renders it palatable. And yet, pickled olives, retaining their flavor, have been found amid the ruins of Pompeii.

The "bitter" is removed from the fruit, either by the use of lye or by repeated daily immersions in fresh water, but the latter process must be continued at least a month, and therefore lye is generally used. After the lye has been washed out with fresh water the olives are put into a weak brine which is gradually made stronger. Thus the fruit is kept from shrinking and from growing tough, and in boiled brine it may be preserved many years.

In California ripe olives are much preferred to the green ones. The latter are only a relish but the former have a food value and are not only healthful and nutritious but are generally more pleasing to the taste than the green pickled olives. Ripe olives contain more than twenty-five per cent of oil but the green ones have only about half that amount.

In the manufacture of olive oil the process is much the same as that employed thousands of years ago. The ripe fruit is spread on trays which admit free circulation of air, and afterward it is crushed by stone rollers. After the first oil has been extracted a second grade of oil may be obtained from a second pressing, and sometimes the process is again repeated. The oil that still remains in the pulp is used in the manufacture of castile soap, and the residuum makes a good fertilizer.

Imported olive oils are all more or less adulterated and sometimes contain eighty or ninety per cent of cotton-seed oil. California can produce oil enough to supply all the United States but the industry needs protection against cotton-seed oil sold under the name of olive oil.

The clear, light colored oils are most in demand at present, but they require repeated filtering which impairs the flavor and produces what is, in reality, an inferior article.

California is now the principal state in which the Olive is cultivated but there will probably come a time when, with increased means of irrigation, it will be planted extensively in Arizona and New Mexico. In the East and in the West, in its earliest habitat and in its latest home, may the sign of the Olive prove true in all nations. May it flourish world-wide as the emblem of Wisdom, the symbol of Peace.

Alice M. Dowd.

THE OLD-SQUAW DUCK

(*Clangula hyemalis.*)

The Old-squaw Duck bears a number of popular names. In the New England states it is called Old Injun or Scolder; in Canada Caca-wee; in Ontario Coween or Cowheen; in Newfoundland Hound. It is also quite generally known by the names Old Wife, Old Billy, and Old Molly. It is called Ha-ha-we by the Indians of the Hudson Bay region. Because of its long tail feathers it is commonly and well named the Long-tailed Duck. It is also given the name South Southerly because some persons have thought that its notes resembled the words *south-south-southerly,* but Dr. Brewer could not see this resemblance and thought that the names Old Wife and Old Squaw were much more appropriate, for when they are assembled in numbers their notes are like a confused gabble. Mr. George H. Mackay has likened its notes to the sound of the following syllables, *o-onc-o-onc-ough, egh-ough-egh.* These Ducks are not only noisy but their notes are uttered in a somewhat scolding tone. They fly very swiftly and usually near the water. Mr. Mackay says that when shots are fired at them while on the wing, they will occasionally dive into the water directly from their flight. He also speaks of their towering habit, saying: "Usually in the afternoon, collecting in mild weather in large flocks if undisturbed, and going up in circles so high as to be scarcely discernible, often coming down with a rush and great velocity, a portion of the flock scattering and coming down in a zigzag course similar to the scoters when whistled down."

The range of these interesting and handsome ducks is the northern hemisphere. They breed only in the far north, and in America they winter as far south as the Ohio River, and occasionally as far southward as the Gulf of Mexico. Their nests are built of grasses among low bushes or tall grass. They are usually lined with down and feathers, and are always on the ground near bodies of water. Dr. William H. Dall in a report on the "Birds of Alaska" says that Old Squaws are very common on the seacoast of Alaska, but very rare on the Yukon. He also says: "The long tail-feathers when the bird is at rest on the water, stick up at an angle of sixty degrees. Breeds abundantly on every beach, in a very simple nest without any lining." The birds of this species stay as far north during the winter as the ice and snow will allow them to do, and they may often be seen swimming and diving on bodies of water in which there is a quantity of floating ice.

During their migrations there is no use of hunting them for use as food, for their flesh is very rank and tough. Their feathers, however, are in great demand for making pillows. Their plumage is very thick and fine, and upholsterers will purchase large quantities in fact all that they can obtain each season.

Their food consists of fish, mollusks, crustaceans, and some water plants. While seeking fish food by diving they have been caught many times in set nets and drowned. Neltje Blanchan has well said that they are "famous divers and swimmers; strong, swift flyers; noisy, restless, lively fellows, that live in a state of happy commotion; gregarious at all seasons, and strongly in evidence wherever they find their way." Mr. Dawson in "The Birds of Ohio" has given an excellent idea of their beauty when on the water. He says: "A pair of them seated upon the water are handsome enough to merit the name applied to them by the hunters of the Pacific Coast, 'Lord and Lady.' Their fief is some icy cliff or bleak island in the far north, and they quit home only reluctantly, upon compulsion of the great white scourge."

In his "Birds of Alaska," Mr. E. W. Nelson gives some very interesting notes

FROM COL. F. M. WOODRUFF

OLD-SQUAW DUCK.
(Clangula hyemalis).
¼ Life-size.

regarding the Old Squaw, which is the first duck to arrive in these high northern latitudes in the spring. He says: "During all the spring season until the young begin to hatch, the males have a rich musical note, imperfectly represented by the syllables *a-leedle-a, a-leedle-a,* frequently repeated in deep reed-like tones. Amid the general hoarse chorus of water-fowl at this season, the notes of the Old Squaw are so harmonious that the fur traders of the Upper Yukon have christened it the 'Organ Duck,' a well-merited name. I have frequently stopped and listened with deep pleasure to these harmonious tones, while traversing the broad marshes in the dim twilight, at midnight, and while passing a lonely month on the dreary banks of the Yukon delta I lay in my blankets many hours at night and listened to these rythmical sounds, which with a few exceptions were the only ones to break the silence. These notes are somewhat less common during the day."

CATERPILLARS WHICH FEED ON DILL AND PARSNIP PLANTS

Out in the vegetable garden there are rows of carrots and parsnips, and beds of dill, parsley, and caraway; in summer these plants which are of one family have the same kind of "worms" feeding upon their leaves. But the "worms" are not dressed alike at all times; each little one has a dark skin with a light patch on its back, while the big fellows, some at least two and a half inches in length, have stripes of green and black running around their bodies and on the black stripes there are bright orange spots. You see every caterpillar as it grows bursts through its tightly fitting skin and comes forth in a new one, and after a time the new one with these caterpillars who belong to the Black-swallow Tail family, will show the green, black and orange colors.

The Black-swallow Tail larva and the larvæ of all Swallow tails in fact, have each a V-shaped organ of defense concealed at the back of the head. This is shot out when the "worm" is annoyed or angered, and at the same time a very unpleasant odor is emitted. Do not be frightened, however, at the antics of these worms, for they are harmless individuals who can neither bite nor sting you.

I have noticed that the "worms" grow restless and somewhat quarrelsome when they become full sized. They are then ready to lay aside their caterpillar clothes and may dimly realize that a great change is in store for them. To prepare for this change, a caterpillar spins a silken carpet on the side or beneath some friendly support and fastens into it, the claspers on its last pair of legs. It then makes a fine rope of silk and attaches this to the support in such a manner that a loop is formed about its person. In this the insect rests until its skin splits and wrinkles off, leaving a queer irregular closed box containing the living pupa. The box is called a chrysalis and may be green, blotched with yellow, or a wood brown in color, and it holds a future Black-swallow Tail butterfly When it opens and the inmate comes out into the sunlight and shakes down its black velvety wings, we see that they are crossed by lemon yellow spots and lines, while if the butterfly be "My Lady" she will have in addition a fine showing of blue on her upper surface.

The Black-swallow Tails are a double brooded family, and the summer butterflies emerge from the pupa or dormant state in from nine to ten days after the chrysalides are formed; they mate and the females lay their tiny eggs on such plants in our gardens as the dill and the parsnip. These eggs hatch into wee caterpillars who as they grow, devour a lot of green stuff. The insects pass the cold weather within their odd little casket chrysalides, but when spring calls, they are out and doing.

ELLEN ROBERTSON MILLER.

THE SONGS OF OUR BIRDS

All in all, June is the best month of the year to study bird-song. Then, most of the birds are nesting and sing most typically and frequently. In May, conditions are still unsettled; besides our time would best be spent with the migrants. When July brings its hot days, nesting is almost over, and one by one the birds drop out of the chorus; the bobolink's rollicking song is one of the first to be missed, and the thrasher and chat soon follow. August announces the advent of the molting season, and, consequently an almost total muteness among the birds; and the disappointed ornithologist must seek refuge in botany and entomology. Late September marks a brightening, a short period of song preceding migration; but the young of the year join in tentatively and hopelessly confuse the student. This period is so soon over, and with it the migration, that before we are aware of any vital change, all the robins have left, goldenrod, and boneset are fast fading, and another cold season is at hand.

Among the great variety of songs, the student will first begin to pick out those that seem to exhibit sentiment and feeling. It is not likely that because the pewee's note is pathetic and doleful, he partakes of these feelings. If this were so, the screech owl, nature's chief mourner, would be the most unhappy being in existance. Yet we are prone to contemplate on the various songs in this way and refer to the mournful cooing of the dove, the merry laugh of the flicker, the petulant dissuasion of the phœbe, the plaintive chant of the field sparrow, the drowsy notes of the warblers, the uncouth monosyllables of the chat, the sad-voiced meadowlark, and the like. But such adjectives are very good from a literary standpoint; unless they are taken too literally they are more colored in a descriptive sense than such trite expressions as clear, and loud, and sweet.

Mentioning the variation in songs, it might be noted that the value of the song as a thing of beauty is determined only from our cultivated, but narrow, human standpoint, and that therefore to the ears of the grackle his coarse, rusty notes are inestimably better music than the spiritual chants of the thrushes. Were it not so that each species possesses its peculiar musical sense, acknowledging the hermit thrush as the finest singer, evolution would produce a tendency to sameness among the birds, the thrush song being the object to be attained; for in courtship the radical finch or vireo would assume a higher type of music, nearer related to the thrush. This would be more pleasing to the female finches or vireos (for by hypothesis, they have a common musical sense, with the thrush as the highest form) and the male with iconoclastic voice would meet with success. Others of his tribe would do likewise, until the very existence of every finch or vireo would force him to adopt the betterment. Thus a gradual evolution resulting in the thrush form of song would become universal. Now, of course, this is not and will not be the case. The chipping sparrow's unbeautiful trill (unbeautiful of course from the human standpoint) wins the heart of the female as well as the male hermit thrush's sublime notes call forth the admiration of the opposite sex.

Another feature of bird-song that elicits speculation is the morning chorus. It is a quarter before four o'clock on a May morning. Not a vestige of light is tinging the eastern horizon. Not a sound disturbs the still air. Fifteen minutes pass thus. Suddenly a few subdued notes issue from a tree. They sound ghostly, as if the singer were frightened by the sound of his own voice. But another robin hears the song and joins in with greater vigor, a full carol. Then the first robin starts with fresh spirit. Another bird sings afar off, and another and another, till a half hundred, a mighty throng, swell the chorus. Gray light is appearing in the east, but the chorus con-

tinues for a full half hour. No thought of seeking food, hungry as the birds may be after a night's fast. Each robin must partake in the matins.

What causes this morning chorus, as regular as the rising of the sun? Why do not the birds feed first and then sing? My theory may be fanciful, but I trust there is a spark of reason in it. At one time the birds did not sing in a great chorus like this in the morning. They fed at once. But one day, in wooing season, an experimental individual started to sing as soon as he awoke. The subdued, religious light of dawn and the absolute stillness formed an effective background for his lay. His beloved, at roost, awaking and hearing the stirring notes, admired them so truly that he won her. Meanwhile the rival mates, spectators of this, one after another began to sing to exhibit their ability. But they were too late; once again the early bird caught the worm. Thus, in time, it became a regular custom, when courting, to sing in the morning. In time also, this became a habit, and every morning the matins were sung. All this sounds very fanciful, but who will suggest something better?

Which is the earliest songster of the day? I think the robin, undoubtedly. The chipping sparrow has often been denominated the first bird, but I have never heard it before the robin. The following table of a morning chorus indicates at what time the given birds enter the chorus on a June morning in the Alleghany Mountains, with the point of audience constant:

3:45-4:00 A. M.—Robin, vesper sparrow, field sparrow.
4:00-4:10 A. M.—Song sparrow, wood pewee.
4:10-4:20 A. M.—Chipping sparrow, towhee, catbird, crow.

The turning point of the chorus is earlier with the field birds, I believe, than with those of the woods. Perhaps the degree of light has something to do with it, for it is as dark in the woods at 4:30 as outside at 4:00 a. m. At any rate, the highest point of the chorus is reached by the field birds at about 4:15, but by the wood birds not until 4:45 a. m.

When heat begins to be felt, about ten or eleven o'clock, there is a very marked decline. From twelve to four few birds sing frequently. Then there is another marked change, an increase in the number of voices, which attains its climax just before the sun sinks, and dies out rapidly at twilight.

During the middle of the day, when few birds are singing and each can be heard distinctly, go forth to some field or pasture where the meadowlark is found. Listen to two birds in different parts of the field. One sings a few notes which seem incomplete, leaving the musical sense suspended, until from another part of the pasture come the answering notes that completely satisfy the ear. It is as fitting and expected as the apodosis after the protasis. Such singing is termed antiphonal, and is common among the birds. The towhee and wood thrush are also notable in this respect. From this it would seem that the birds possess some inherent harmonical sense. Another evidence in favor of this belief is illustrated by Mr. Oldys, who tells of a meadowlark that habitually sang the first four notes of the Carmen toreador song. Other similar instances might be cited, but, in my opinion, these do not go to show that the birds possess our laws of harmony but have distinct laws, and that these resemblances are merely coincidental.

It is interesting to note the places birds frequent in delivering their songs. Harmony with their surroundings most often decides this. For instance, the meadowlark, when it arrives here in the spring, finds the grass short and light green, where its brown back and yellow breast would be ill-protected. So in spring the meadowlark sings in tree tops like most other brilliant birds. But when the hay is almost high enough to be mown, perfectly concealed in the tall, brown grass, the lark sings in the fields, or on a jutting fence rail from which he may readily descend into the covert of the dense grass.

As a rule, we shall find that soberly-plumaged birds like the sparrows, sing near the ground, and brightly colored tanagers, indigo buntings, cardinals, orioles, and the like are more partial to

higher situations. The Baltimore oriole, chat, bobolink, meadowlark, and song sparrow, and occasionally the indigo bunting, prairie horned lark, ovenbird, Louisiana water thrush, and Maryland yellowthroat sing on the wing. Courtship is the primal motive here. The prairie horned lark and bob-white sing on the ground. Robins are familiar singers on house roofs. As to telegraph wires—robins, song sparrows, indigo buntings, catbirds, chipping sparrows, bluebirds, and phœbes are often seen singing there; and occasionally I have found the wood thrush so far forget his dignity. Many birds are partial to the high dead branches of living trees; such are the indigo buntings, Carolina wren, cardinal, crested flycatcher, cowbird, meadowlark (in spring), red-winged blackbird, pewee, kingbird, thrashers, et cetera. The flycatchers have especially good motives, as they use these situations as points from which to sally.

The frequency of the song is also an interesting point. As a rule, if the song is long, there are fewer repetitions per minute than if it is short. Five times per minute seems to be the song sparrow's average. On a quiet June evening I listened to a vesper sparrow's inspiring notes; his song averaged seven times to the minute.

Imagine a meadow that contains about six song sparrows and six vesper sparrows. Together, one of each species sings twelve times per minute and six of each seventy-two times per minute. In five minutes, then, we shall have heard three hundred and sixty songs from these two species alone!

The maximum number of repetitions is given, I believe, by the short-songed whippoorwill, fifty-nine times per minute being his average. Generally he begins to sing about 8:00 p. m. and for a half hour at least continues almost uninterruptedly. This means three thousand five hundred and forty repetitions in that brief time, including the almost inaudible "cluck" that precedes the song; he sings in a single hour seventeen thousand seven hundred notes. We are prone to wonder where he gets the breath for that effort.

We often speak about certain songs having a "woodsy" flavor, and of others that are "songs of the pasture." This is because in most cases there is a subtle harmony between the song and its surroundings. Imagine, who can, a veery, instead of rolling out his ethereal strains while in a pensive, meditative mood, sing while gyrating in aerial evolutions! Take the demure wood pewee into the city and he loses half of his charm; and the wood thrush beside a city "artery" (where I have heard him) is very different from the wood thrush of the woods.

NORMAN FOERSTER.

THE MERTENSIA

In a dingle moist and chilly,
Habitation of the lily,
Underneath the frowning hill,
Where the crystal spring-drops spill,
Just beyond the flowing river,
Where the willows bend and quiver,
So, the blue Virginia flower,
With the fronded ferns and grasses,
And the perfumed zephyr passes,
Through the aisles of Sylva's bower:
Purely blue, the clustering bells,
Emulates and oft excels
The cerulean depths of morning,
Nature's tangled wilds adorning,
Where the twilight, moist and chilly,
Gathers round the vestal lily.

—CHARLES F. FUDGE.

FROM COL. CHI. ACAD. SCIENCES.

WHITE FACED GLOSSY IBIS
(Plegadis guarauna).
½ Life-size.

THE WHITE-FACED GLOSSY IBIS

(*Plegadis guarauna.*)

The White-faced Glossy Ibis which is essentially a southern bird has an interesting range. In the United States it may be given as the western states extending from Texas to California and northward to Oregon. It has also been seen in British Columbia. New Mexico, Kansas, Arizona, Utah, and Nevada are also within its range, and the species is quite common in suitable localities It has been found breeding in Florida. Mr. W. W. Cooke says that it is a rare summer visitant in Colorado, and Mr. Ridgway concludes, because it is found within the state during the summer, that it breeds there in the marshes and valleys. Its range also extends southward through the West Indies and Mexico to South America.

There about thirty species of the ibises and they are natives of the warmer portions of the world. Of this number only four are found in North America. The food of the ibises consists mainly of small fish, frogs, crustaceans, mollusks, worms, and insects. They are gregarious and are quiet birds, frequenting the shores of bodies of water, both fresh and salt.

The White-faced Glossy Ibises are probably the best known of those species of this interesting family which inhabit North America. They are not particularly shy birds, and they are in some danger of extinction, as there is quite a demand for the beautiful reddish-bronze feathers.

One of the best localities where these birds can be studied to advantage, is along the coast of the Gulf of Mexico, in Texas. At intervals between Brazos and Corpus Christi there are deep and narrow channels opening sharply into the Gulf, and gradually widening and spreading backward into the land, forming quite large muddy lakes. One of these lakes, the name of which I was unable to learn, was at least five square miles in extent at low tide. It is quite a sight to see the mass of shells and even large gar fish exposed in this great mass of mud during the period of low tide. The attraction of such a locality for countless numbers of ibises and herons may well be understood, and it is a marvelous sight to observe the long lines of the Glossy Ibises, herons, curlews, and terns, arriving and alighting in the mud, almost regardless of danger. Then it is that the hunter of bird plumes performs his deadly work, and these localities are the ones where lax legislation does not reach the offender. The poorly paid wardens do not care to risk their lives by arresting the hunters at points so far from cities.

Here and there, at short distances from the lakes mentioned, are small sloughs and ponds which are bordered, mostly with a heavy growth of flags, and frequented by many alligators. In these areas the nests of the White-faced Glossy Ibises are placed. They are, as a rule, placed lower than are those of the herons, and their eggs are more elongated and more highly polished. Often the great and little white egrets, as well as other birds and the herons, nest in the same localities with the beautiful Ibis of our illustration. The nests of the Glossy Ibises are built in the reeds which grow to a height of six or more feet above the surface of the water in the sloughs. These reeds are beaten down to form a foundation for the nests, or at times, the dead stalks of the previous season are used for the same purpose. Dr. James C. Merrill gives the following description of their nests as he observed them in the reeds of a shallow lagoon in southern Texas. He says: "Both nests and eggs of the Ibises were quite unlike those of any of the herons, and could be distinguished at a glance. The nests were made of broken bits of dead tules (reeds), sup-

ported by and attached to broken and upright stalks of living ones. They were rather well and compactly built, and were usually well cupped, quite unlike the clumsy platforms of the herons. The eggs were nearly always three in number, and at this date (May) were far advanced in incubation; many of the nests contained young of all sizes."

FRANK MORLEY WOODRUFF.

GOD IN NATURE

Down through fields of daisies
The whispering zephyrs blow.
Up through skies of azure
The lark his song doth sow.
North, the rippling river
Is dreaming of the sea.
East, the aisles of maples
Bespeak solemnity.
South, the gentle roses
Breathe fragrance most divine.
West, the sunset artist
Paints clouds with tints sublime.

Is not all such beauty
Both real and true and free?
Is it not a symbol
Of immortality?
Yes, the daisy fields are
Miraculous, divine
And the sunset artist—
He paints in tints so fine
Even skillful genius
Declares his art sublime.

"God in nature dwelling—"
Is the secret of the spheres,
Hence the soul's rejoicing
'Mid the passing of the years.
So, in temple shadows
'Neath the pines so dark and tall,
Universal anthems
Sing:—"God is all in all."

—FREDERICK FORTUNE.

Vol. IV. SEPTEMBER, 1906 No. 2

The beautiful is as useful as the useful.—*Victor Hugo.*

BIRDS AND NATURE

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A. W. MUMFORD & CO., Publishers

378 Wabash Ave., Chicago, Ill.

Entered at Chicago Post Office

BIRDS AND NATURE

Monthly, except July and August

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

SOME ANIMAL PROPENSITIES.

IT is not quite agreeable to contemplate many of the shortcomings, from a moral point of view, of certain of the animal creation, and even less to be compelled to recognize the necessity of them. Thievery in nature is widely extended, and food is the excuse for it. Civilization has made the practice of the humanities possible among men, but the lower animals will doubtless remain, as they have ever been, wholly subject to the instincts with which nature originally endowed them.

Huber relates an anecdote of some Hive-bees paying a visit to a nest of Bumble-bees, placed in a box not far from their hive, in order to steal or beg the honey. The Hive-bees, after pillaging, had taken almost entire possession of the nest. Some Bumble-bees, which remained, went out to collect provisions, and bringing home the surplus after they had supplied their own immediate wants, the Hive-bees followed them and did not quit them until they had obtained the fruit of their labors. They licked them, presented to them their probosces, surrounded them, and thus at last persuaded them to part with the contents of their "honey-bags." The Bumble-bees did not seem to harm or sting them, hence it would seem to have been persuasion rather than force that produced this instance of self-denial. But it was systematic robbery, and was persisted in until the Wasps were attracted by the same cause, when the Bumble-bees entirely forsook the nest.

Birds, notwithstanding their attractiveness in plumage and sweetness in song, are many of them great thieves. They are neither fair nor generous towards each other. When nest-building they will steal the feathers out of the nests of other birds, and frequently drive off other birds from a feeding ground even when there is abundance. This is especially true of the Robin, who will peck and run after and drive away birds much larger than himself. In this respect the Robin and Sparrow resemble each other. Both will drive away a Blackbird and carry away the worm it has made great efforts to extract from the soil.

Readers of Frank Buckland's delightful books will remember his pet Rat, which not infrequently terrified his visitors at breakfast. He had made a house for the pet just by the side of the mantel-piece, and this was approached by a kind of ladder, up which the Rat had to climb when he had ventured down to the floor. Some kinds of fish the Rat particularly liked, and was sure to come out if the savor was strong. One day Mr. Buckland turned his back to give the Rat a chance of seizing the coveted morsel, which he was not long in doing and in running up the ladder with it; but he had fixed it by the middle of the back,

and the door of the entrance was too narrow to admit of its being drawn in thus. But the Rat was equal to the emergency. In a moment he bethought himself, laid the fish on the small platform before the door, and then entering his house he put out his mouth, took the fish by the nose and thus pulled it in and made a meal of it.

One of the most remarkable instances of carrying on a career of theft came under our own observation, says a writer in *Cassell's Magazine*. A friend in northeast Essex had a very fine Aberdeenshire Terrier, a female, and a very affectionate relationship sprang up between this Dog and a Tom-cat. The Cat followed the Dog with the utmost fondness, purring and running against it, and would come and call at the door for the Dog to come out. Attention was first drawn to the pair by this circumstance. One evening we were visiting our friend and heard the Cat about the door calling, and some one said to our friend that the cat was noisy. "He wants little Dell," said he—that being the Dog's name; we looked incredulous. "Well, you shall see," said he, and opening the door he let the Terrier out. At once the Cat bounded toward her, fawned round her, and then, followed by the Dog, ran about the lawn. But a change came. Some kittens were brought to the house, and the Terrier got much attached to them and they to her. The Tom cat became neglected, and soon appeared to feel it. By and by, to the surprise of every one, the Tom somehow managed to get, and to establish in the hedge of the garden, two kittens, fiery, spitting little things, and carried on no end of depredation on their account. Chickens went; the fur and remains of little Rabbits were often found round the nest, and pieces of meat disappeared from kitchen and larder. This went on for some time, when suddenly the Cat disappeared—had been shot in a wood near by, by a game-keeper, when hunting to provide for these wild kittens, which were allowed to live in the hedge, as they kept down the Mice in the garden. This may be said to be a case of animal thieving for a loftier purpose than generally obtains, mere demand for food and other necessity.

That nature goes her own way is illustrated by these anecdotes of birds and animals, and by many others even more strange and convincing. The struggle for existence, like the brook, goes on forever, and the survival, if not of the fittest, at least of the strongest, must continue to be the rule of life, so long as the economical problems of existence remain unsolved. Man and beast must be fed. "Manna," to some extent, will always be provided by generous humanitarianism. There will always be John Howards. Occasionally a disinterested, self-abnegating soul like that of John Woolman will appear among us—doing good from love; and, it may be, men like Jonathan Chapman—Johnny Appleseed, he was called from his habit of planting apple seeds wherever he went, as he distributed tracts among the frontier settlers in the early days of western history. He would not harm even a Snake. His heart was right, though his judgment was little better than that of many modern sentimentalists who cannot apparently distinguish the innocuous from the venemous.

It does seem that birds and animals are warranted in committing every act of vandalism that they are accused of. They are unquestionably entitled by every natural right to everything of which they take possession. The farmer has no moral right to deny them a share in the product of his fields and orchards; the gardener is their debtor (at least of the birds), and the government, which benefits also from their industry, should give them its protection. —C. C. M.

THE PETRIFIED FERN.

IN a valley, centuries ago,
Grew a little fernleaf, green and slender,
Veining delicate and fibres tender,
Waving when the wind crept down so low;
Rushes tall, and moss, and grass grew round it;
Playful sunbeams darted in and found it,
Drops of dew stole in by night and crowned it;
But no foot of man e'er came that way,
Earth was young and keeping holiday.

Monster fishes swam the silent main—
Mountains hurled their snowy avalanches,
Giant forests shook their stately branches,
Mammoth creatures stalked across the plain;
Nature reveled in wild mysteries,
But the little fern was not of these,
Did not number with the hills and trees,
Only grew and waved its sweet wild way—
No one came to note it day by day.

Earth one day put on a frolic mood,
Moved the hills and changed the mighty motion
Of the deep, strong currents of the ocean,
Heaved the rocks, and shook the haughty wood,
Crushed the little fern in soft moist clay,
Covered it and hid it safe away.
Oh, the long, long centuries since that day!
Oh, the agony, Oh, life's bitter cost
Since that useless little fern was lost!

Useless? Lost? There came a thoughtful man
Searching Nature's secrets far and deep;
From a fissure in a rocky steep
He withdrew a stone, o'er which there ran
Fairy pencilings, a quaint design,
Veining, leafage, fibres, clear and fine,
And the fern's life lay in every line.
So, methinks, God hides some souls away,
Sweetly to surprise us some sweet day.

—ANON.

WATER AND ANIMALS.

TO SHOW the importance of water to animal life, we give the opinions of several travelers and scientific men who have studied the question thoroughly.

The Camel, with his pouch for storing water, can go longer without drink than other animals. He doesn't do it from choice, any more than you in a desert would prefer to drink the water that you have carried with you, if you might choose between that and fresh spring water. Major A. G. Leonard, an English transport officer, claims that Camels "should be watered every day, that they can not be trained to do without water, and that, though they can retain one and a half gallons of water in the cells of the stomach, four or five days' abstinence is as much as they can stand, in heat and with dry food, without permanent injury."

Another distinguished English traveler, a Mr. Bryden, has observed that the beasts and birds of the deserts must have private stores of water of which we know nothing. Mr. Bryden, however, has seen the Sand-Grouse of South America on their flight to drink at a desert pool. "The watering process is gone through with perfect order and without overcrowding"—a hint to young people who are hungry and thirsty at their meals. "From eight o'clock to close on ten this wonderful flight continued; as birds drank and departed, others were constantly arriving to take their places. I should judge that the average time spent by each bird at and around the water was half an hour."

To show the wonderful instinct which animals possess for discovering water an anecdote is told by a writer in the *Spectator*, and the article is republished in the *Living Age* of February 5. The question of a supply of good water for the Hague was under discussion in Holland at the time of building the North Sea Canal. Some one insisted that the Hares, Rabbits, and Partridges knew of a supply in the sand hills, because they never came to the wet "polders" to drink. At first the idea excited laughter. Then one of the local engineers suggested that the sand hills should be carefully explored, and now a long reservoir in the very center of those hills fills with water naturally and supplies the entire town.

All this goes to prove to our mind that if Seals do not apparently drink, if Cormorants and Penguins, Giraffes, Snakes, and Reptiles seem to care nothing for water, some of them do eat wet or moist food, while the Giraffe, for one, enjoys the juices of the leaves of trees that have their roots in the moisture. None of these animals are our common, everyday pets. If they were, it would cost us nothing to put water at their disposal, but that they never drink in their native haunts "can not be proved until the deserts have been explored and the total absence of water confirmed."—*Ex.*

THE HERRING GULL.

JUST how many species of Gulls there are has not yet been determined, but the habits and locations of about twenty-six species have been described. The American Herring Gull is found throughout North America, nesting from Maine northward, and westward throughout the interior on the large inland waters, and occasionally on the Pacific ; south in the winter to Cuba and lower California. This Gull is a common bird throughout its range, particularly coast-wise.

Col. Goss in his "Birds of Kansas," writes as follows of the Herring Gull :

"In the month of June, 1880, I found the birds nesting in large communities on the little island adjacent to Grand Manan ; many were nesting in spruce tree tops from twenty to forty feet from the ground. It was an odd sight to see them on their nests or perched upon a limb, chattering and scolding as approached.

"In the trees I had no difficulty in finding full sets of their eggs, as the egg collectors rarely take the trouble to climb, but on the rocks I was unable to find an egg within reach, the 'eggers' going daily over the rocks. I was told by several that they yearly robbed the birds, taking, however, but nine eggs from a nest, as they found that whenever they took a greater number, the birds so robbed would forsake their nests, or, as they expressed it, cease to lay, and that in order to prevent an over-collection they invariably drop near the nest a little stone or pebble for every egg taken."

The young Gulls grow rapidly. They do not leave their nesting grounds until able to fly, though half-grown birds are sometimes seen on the water that by fright or accident have fallen. The nests are composed of grass and moss. Some of them are large and elaborately made, while others are merely shallow depressions with a slight lining. Three eggs are usually laid, which vary from bluish-white to a deep yellowish brown, spotted and blotched with brown of different shades. In many cases where the Herring Gull has suffered persecution, it has been known to depart from its usual habit of nesting on the open seashore.

It is a pleasure to watch a flock of Gulls riding buoyantly upon the water. They do not dive, as many suppose, but only immerse the head and neck. They are omnivorous and greedy eaters ; "scavengers of the beach, and in the harbors to be seen boldly alighting upon the masts and flying about the vessels, picking up the refuse matter as soon as it is cast overboard, and often following the steamers from thirty to forty miles from the land, and sometimes much farther. They are ever upon the alert, with a quick eye that notices every floating object or disturbance of the water, and as they herald with screams the appearance of the Herring or other small fishes that often swim in schools at the surface of the water, they prove an unerring pilot to the fishermen who hastily follow with their lines and nets, for they know that beneath and following the valuable catch in sight are the larger fishes that are so intent upon taking the little ones in out of the wet as largely to forget their cunning, and thus make their capture an easy one.

Very large flocks of Gulls, at times appearing many hundreds, are seen on Lake Michigan. We recently saw in the vicinity of Milwaukee a flock of what we considered to be many thousands of these birds, flying swiftly, mounting up, and falling, as if to catch themselves, in wide circles, the sun causing their wings and sides to glisten like burnished silver.

USEFUL BIRDS OF PREY.

IT is claimed that two hundred millions of dollars that should go to the farmer, the gardner, and the fruit grower in the United States are lost every year by the ravages of insects—that is to say, one-tenth of our agricultural product is actually destroyed by them. The Department of Agriculture has made a thorough investigation of this subject, and its conclusions are about as stated. The ravages of the Gypsy Moth in three counties in Massachusetts for several years annually cost the state $100,000. "Now, as rain is the natural check to drought, so birds are the natural check to insects, for what are pests to the farmer are necessities of life to the bird. It is calculated that an average insectivorous bird destroys 2,400 insects in a year; and when it is remembered that there are over 100,000 kinds of insects in the United States, the majority of which are injurious, and that in some cases a single individual in a year may become the progenitor of several billion descendants, it is seen how much good birds do ordinarily by simple prevention." All of which has reference chiefly to the indispensableness of preventing by every possible means the destruction of the birds whose food largely consists of insects.

But many of our so-called birds of prey, which have been thought to be the enemies of the agriculturist and have hence been ruthlessly destroyed, are equally beneficial. Dr. Fisher, an authority on the subject, in referring to the injustice which has been done to many of the best friends of the farm and garden, says:

"The birds of prey, the majority of which labor night and day to destroy the enemies of the husbandman, are persecuted unceasingly. This has especially been the case with the Hawk family, only three of the common inland species being harmful. These are the Goshawk, Cooper's Hawk, and the Sharp-shinned Hawk, the first of which is rare in the United States, except in winter. Cooper's Hawk, or the Chicken Hawk, is the most destructive, especially to Doves. The other Hawks are of great value, one of which, the Marsh Hawk, being regarded as perhaps more useful than any other. It can be easily distinguished by its white rump and its habit of beating low over the meadows. Meadow Mice, Rabbits, and Squirrels are its favorite food. The Red-tailed Hawk, or Hen Hawk, is another. It does not deserve the name, for according to Dr. Fisher, while fully sixty-six per cent of its food consists of injurious mammals, not more than seven per cent consists of poultry, and that it is probable that a large proportion of the poultry and game captured by it and the other Buzzard Hawks is made up of old, diseased, or otherwise disabled fowls, so preventing their interbreeding with the sound stock and hindering the spread of fatal epidemics. It eats Ground Squirrels, Rabbits, Mice, and Rats.

The Red-shouldered Hawk, whose picture we present to our readers, is as useful as it is beautiful, in fact ninety per cent. of its food is composed of injurious mammals and insects.

The Sparrow Hawk (See BIRDS, vol. 3, p. 107) is another useful member of this family. In the warm months Grasshoppers, Crickets, and other insects compose its food, and Mice during the rest of the year.

Swainson's Hawk is said to be the great Grasshopper destroyer of the west, and it is estimated that in a month three hundred of these birds save sixty tons of produce that the Grasshopper would destroy.

THE RACCOON.

ON ACCOUNT of the value of its skin, this interesting animal is much sought after by those who take pride in their skill in securing it. It is commonly known by its abbreviated name of Coon, and as it is of frequent occurrence throughout the United States, every country boy is more or less acquainted with its habits. As an article of food there is much diversity of opinion respecting its merits. It is hunted by some for the sport alone, which is doubtless to be lamented, and by others who enjoy also the pleasure of a palatable stew. As a pet it is also much prized.

The food of the Raccoon consists in the main of small animals and insects. The succulent Oyster also is a favorite article of its diet. It bites off the hinge of the Oyster and scrapes out the animal in fragments with its paws. Like the Squirrel when eating a nut, the Raccoon usually holds its food between its fore paws pressed together and sits upon its hind quarters when it eats. Poultry is also enjoyed by it, and it is said to be as destructive in the farm yard as the Fox, as it only devours the heads of the fowl.

When taken young the Coon is easily tamed, but often becomes blind soon after its capture. This is believed to be produced by the sensitiveness of its eyes, which are intended only to be used by night. As it is frequently awakened by day it suffers so much from the glare of light that its eyes gradually lose their vision. If it must be confined at all it should be in a darkened place. In zoological gardens we have frequently seen several of these animals exposed to the glaring sunlight, the result of ignorance or cruelty, or both.

Unlike the Fox, the Raccoon is at home in a tree, which is the usual refuge when danger is near, and not being very swift of foot, it is well that it posesses this climbing ability. According to Hallock, the Coons' abode is generally in a hollow tree, oak or chestnut, and when the "juvenile farmer's son comes across a *Coon tree*, he is not long in making known his discovery to friends and neighbors, who forthwith assemble at the spot to secure it." The "sport" is in no sense agreeable from a humane point of view, and we trust it will cease to be regarded as such by those who indulge in it. "The Raccoon makes a heroic struggle and often puts many of his assailants *hors de combat* for many a day, his jaws being strong and his claws sharp."

The young ones are generally from four to eight, pretty little creatures at first and about as large as half-grown Rats. They are very playful, soon become docile and tame, but at the first chance will wander off to the woods and not return. The Coon is a night animal and never travels by day; sometimes it is said, being caught at morning far from its tree and being unable to return thither, it will spend the hours of daylight snugly coiled up among the thickest foliage of some lofty tree-top. It is adroit in its attempts to baffle Dogs, and will often enter a brook and travel for some distance in the water, thus puzzling and delaying its pursuers.

A good sized Raccoon will weigh from fifteen to twenty pounds.

The curiosity of the Raccoon is one of its most interesting characteristics. It will search every place of possible concealment for food, examine critically any object of interest, will rifle a pocket, stand upright and watch every motion of man or animal, and indeed show a marked desire for all sorts of knowledge. Raccoons are apparently happy in captivity when properly cared for by their keepers.

WILD BIRDS IN LONDON.

Their Number and Variety is Increasing Instead of Diminishing.

WHETHER in consequence of the effective working of the Wild Birds' Charter or of other unknown causes, there can be no doubt in the minds of observant lovers of our feathered friends that of late years there has been a great and gratifying increase in their numbers in and around London, especially so, of course, in the vicinity of the beautiful open spaces which do such beneficent work silently in this province of houses. But even in long, unlovely streets, far removed from the rich greenery of the parks, the shabby parallelograms, by courtesy styled gardens, are becoming more and more frequently visited by such pretty shy songsters as Linnets, Blackbirds, Thrushes, and Finches, who, though all too often falling victims to the predatory Cat, find abundant food in these cramped enclosures. Naturally some suburbs are more favored than others in this respect, notably Dulwich, which, though fast losing its beautiful character under the ruthless grip of the builder, still retains some delightful nooks where one may occasionally hear the Nightingale's lovely song in its season.

But the most noticable additions to the bird population of London have been among the Starlings. Their quaint gabble and peculiar minor whistle may now be heard in the most unexpected localities. Even the towering mansions which have replaced so many of the slums of Westminster find favor in their eyes, for among the thick clustering chimneys which crown these great buildings their slovenly nests may be found in large numbers. In some districts they are so numerous that the irrepressible Sparrow, true London gamin that he is, finds himself in considerable danger of being crowded out. This is perhaps most evident on the sequestered lawns of some of the inns of the court, Gray's Inn Square, for instance, where hundreds of Starlings at a time may now be observed busily trotting about the greensward searching for food. Several long streets come to mind where not a house is without its pair or more of Starlings, who continue faithful to their chosen roofs, and whose descendants settle near as they grow up, well content with their surroundings. House Martins, too, in spite of repeated efforts on the part of irritated landlords to drive them away by destroying their nests on account of the disfigurement to the front of the dwelling, persist in returning year after year and rebuilding their ingenious little mud cells under the eaves of the most modern suburban villas or terrace houses.

—*Pall Mall Gazette.*

THE PIGMY ANTELOPE.

THE Pigmy Antelopes present examples of singular members of the family, in that they are of exceedingly diminutive size, the smallest being no larger than a large Rat, dainty creatures indeed. The Pigmy is an inhabitant of South Africa, and its habits are said to be quite similar to those of its brother of the western portion of North America.

The Antelope is a very wary animal, but the sentiment of curiosity is implanted so strongly in its nature that it often leads it to reconnoitre too closely some object which it cannot clearly make out, and its investigations are pursued until "the dire answer to all inquiries is given by the sharp 'spang' of the rifle and the answering 'spat' as the ball strikes the beautiful creatures flank." The Pigmy Antelope is not hunted, however, as is its larger congener, and may be considered rather as a diminutive curiosity of Natures' delicate workmanship than as the legitimate prey of man.

BIRDS OF ALASKA.

NO sooner had the twilight settled over the island than new bird voices called from the hills about us. The birds of the day were at rest, and their place was filled with the night denizens of the island. They came from the dark recesses of the forests, first single stragglers, increased by midnight to a stream of eager birds, passing to and fro from the sea. Many, attracted by the glow of the burning logs, altered their course and circled about the fire a few times and then sped on. From their notes we identified the principal night prowlers as the Cassin's Auklet, Rhinoceros Auk, Murrelet, and varieties of Petrel. All through the night our slumbers were frequently disturbed by birds alighting on the sides of the tent, slipping down with great scratching into the grass below, where our excited Dog took a hand in the matter, daylight often finding our tent strewn with birds he had captured during the night. When he found time to sleep I do not know. He was after birds the entire twenty-four hours.

In climbing over the hills of the island we discovered the retreats of these night birds, the soil everywhere through the deep wood being fairly honeycombed with their nesting burrows. The larger tunnels of the Rhinoceros Auks were, as a rule, on the slopes of the hill, while the little burrows of the Cassin's Auklet were on top in the flat places. We opened many of their queer abodes that ran back with many turns to a distance of ten feet or more. One or both birds were invariably found at the end, covering their single egg, for this species, like many other sea birds, divide the duties of incubation, both sexes doing an equal share, relieving each other at night.

The Puffins nested in burrows also, but lower down—often just above the surf. One must be very careful, indeed, how he thrusts his hand into their dark dens, for should the old bird chance to be at home, its vise-like bill can inflict a very painful wound. The rookeries of the Murres and Cormorants were on the sides of steep cliffs overhanging the sea. Looking down from above, hundreds of eggs could be seen, gathered along the narrow shelves and chinks in the rocks, but accessible only by means of a rope from the top.—*Outing.*

THE RED-SHOULDERED HAWK.

You have heard of me before. I am the Hawk whose cry Mr. Blue Jay imitated, as you will remember, in the story "The New Tenants," published in BIRDS.

Kee-oe, kee-oe, kee-oe, that is my cry, very loud and plaintive; they say I am a very noisy bird; perhaps that is the reason why Mr. Blue Jay imitates me more than he does other Hawks.

I am called Chicken Hawk, and Hen Hawk, also, though I don't deserve either of those names. There are members of our family, and oh, what a lot of us there are—as numerous as the Woodpeckers—who do drop down into the barnyards and right before the farmer's eyes carry off a Chicken. Red Squirrels, to my notion, are more appetizing than Chickens; so are Mice, Frogs, Centipedes, Snakes, and Worms. A bird once in a while I like for variety, and between you and me, if I am hungry, I pick up a chicken now and then, that has strayed outside the barnyard. But only *occasionally*, remember, so that I don't deserve the name of Chicken Hawk at all, do I?

Wooded swamps, groves inhabited by Squirrels, and patches of low timber are the places in which we make our homes. Sometimes we use an old crow's nest instead of building one; we retouch it a little and put in a soft lining of feathers which my mate plucks from her breast. When we build a new nest, it is made of husks, moss, and strips of bark, lined as the building progresses with my mate's feathers. Young lady Red-shouldered Hawks lay three and sometimes four eggs, but the old lady birds lay only two.

Somehow Mr. Blue Jay never sees a Hawk without giving the alarm, and on he rushes to attack us, backed up by other Jays who never fail to go to his assistance. They often assemble in great numbers and actually succeed in driving us out of the neighborhood. Not that we are afraid of them, oh no! We know them to be great cowards, as well as the crows, who harass us also, and only have to turn on our foes to put them to rout. Sometimes we do turn, and seizing a Blue Jay, sail off with him to the nearest covert; or in mid air strike a Crow who persistently follows us. But as a general thing we simply ignore our little assailants, and just fly off to avoid them.

RED-SHOULDERED HAWK.
¼ Life-size.

THE RED-SHOULDERED HAWK.

THE Hawk family is an interesting one and many of them are beautiful. The Red-shouldered Hawk is one of the finest specimens of these birds, as well as one of the most useful. Of late years the farmer has come to know it as his friend rather than his enemy, as formerly. It inhabits the woodlands where it feeds chiefly upon Squirrels, Rabbits, Mice, Moles, and Lizards. It occasionally drops down on an unlucky Duck or Bob White, though it is not quick enough to catch the smaller birds. It is said to be destructive to domestic fowls raised in or near the timber, but does not appear to search for food far away from its natural haunts. As it is a very noisy bird, the birds which it might destroy are warned of its approach, and thus protect themselves.

During the early nesting season its loud, harsh *kee-oo* is heard from the perch and while in the air, often keeping up the cry for a long time without intermission. Col. Goss says that he collected at Neosho Falls, Kansas, for several successive years a set of the eggs of this species from a nest in the forks of a medium sized oak. In about nine days after each robbery the birds would commence laying again, and he allowed them to hatch and rear their young. One winter during his absence the tree was cut down, but this did not discourage the birds, or cause them to forsake the place, for on approach of spring he found them building a nest not over ten rods from the old one, but this time in a large sycamore beyond reach. This seemed to him to indicate that they become greatly attached to the grounds selected for a home, which they vigilantly guard, not permitting a bird of prey to come within their limits.

This species is one of the commonest in the United States, being especially abundant in the winter, from which it receives the name of Winter Falcon. The name of Chicken Hawk is often applied to it, though it does not deserve the name, its diet being of a more humble kind.

The eggs are usually deposited in April or May in numbers of three or four — sometimes only two. The ground color is bluish, yellowish-white or brownish, spotted, blotched and dotted irregularly with many shades of reddish brown. Some of them are strikingly beautiful. According to Davie, to describe all the shades of reds and browns which comprise the variation would be an almost endless task, and a large series like this must be seen in order to appreciate how much the eggs of this species vary.

The flight of the Red-shouldered Hawk is slow, but steady and strong with a regular beat of the wings. They take delight in sailing in the air, where they float lightly and with scarcely a notable motion of the wings, often circling to a great height. During the insect season, while thus sailing, they often fill their craws with grass-hoppers, that, during the after part of the day, also enjoy an air sail-

THE DOVES OF VENICE.

VENICE, the pride of Italy of old, aside from its other numerous curiosities and antiquities, has one which is a novelty indeed. Its Doves on the San Marco Place are a source of wonder and amusement to every lover of animal life. Their most striking peculiarity is that they fear no mortal man, be he stranger or not. They come in countless numbers, and, when not perched on the far-famed bell tower, are found on the flags of San Marco Square. They are often misnamed Pigeons, but as a matter of fact they are Doves of the highest order. They differ, however, from our wild Doves in that they are fully three times as large, and twice as large as our best domestic Pigeon. Their plumage is of a soft mouse color relieved by pure white, and occasionally one of pure white is found, but these are rare. Hold out to them a handful of crumbs and without fear they will come, perch on your hand or shoulder and eat with thankful coos. To strangers this is indeed a pleasing sight, and demonstrates the lack of fear of animals when they are treated humanely, for none would dare to injure the doves of San Marco. He would probably forfeit his life were he to injure one intentionally. And what beggars these Doves of San Marco are! They will crowd around, and push and coo with their soft soothing voices, until you can withstand them no longer, and invest a few centimes in bread for their benefit. Their bread, by the way, is sold by an Italian, who must certainly be in collusion with the Doves, for whenever a stranger makes his appearance, both Doves and bread vender are at hand to beg.

The most remarkable fact in connection with these Doves is that they will collect in no other place in large numbers than San Marco Square, and in particular at the vestibule of San Marco Church. True, they are found perched on buildings throughout the entire city, and occasionally we will find a few in various streets picking refuse, but they never appear in great numbers outside of San Marco Square. The ancient bell tower, which is situated on the west side of the place, is a favorite roosting place for them, and on this perch they patiently wait for a foreigner, and proceed to bleed him after approved Italian fashion.

There are several legends connected with the Doves of Venice, each of which attempts to explain the peculiar veneration of the Venetian and the extreme liberty allowed these harbingers of peace. The one which struck me as being the most appropriate is as follows:

Centuries ago Venice was a free city, having her own government, navy, and army, and in a manner was considered quite a power on land and sea. The city was ruled by a Senate consisting of ten men, who were called Doges, who had absolute power, which they used very often in a despotic and cruel manner, especially where political prisoners were concerned. On account of the riches the city contained, and also its values as a port, Venice was coveted by Italy and neighboring nations, and, as a consequence, was often called upon to defend itself with rather indifferent success. In fact, Venice was conquered so often, first by one and then another, that Venetians were seldom certain of how they stood. They knew not whether they were slave or victor. It was during one of these sieges that the incident of the Doves occured. The city had been besieged for a long time by Italians, and matters were coming to such a pass that a surrender was abso-

lutely necessary on account of lack of food. In fact, the Doges had issued a decree that on the morrow the city should surrender unconditionally.

All was gloom and sorrow, and the populace stood around in groups on the San Marco discussing the situation and bewailing their fate, when lo! in the eastern sky there appeared a dense cloud rushing upon the city with the speed of the wind. At first consternation reigned supreme, and men asked each other "What new calamity is this?" As the cloud swiftly approached it was seen to be a vast number of Doves, which, after hovering over the San Marco Place for a moment, gracefully settled down upon the flagstones and approached the men without fear. Then there arose a queer cry, "The Doves! The Doves of San Marco!" It appears that some years before this a sage had predicted stormy times for Venice, with much suffering and strife, but, when all seemed lost, there would appear a multitude of Doves, who would bring Venice peace and happiness. And so it came to pass that the next day, instead of attacking, the besiegers left, and Venice was free again. The prophet also stated that, so long as the Doves remained at Venice prosperity would reign supreme, but that there would come a day when the Doves would leave just as they had come, and Venice would pass into oblivion. That is why Venetians take such good care of their Doves.

You will not find this legend in any history, but I give it just as it was told me by a guide, who seemed well versed in hair-raising legends. Possibly they were manufactured to order by this energetic gentleman, but they sounded well nevertheless. Even to this day the old men of Venice fear that some morning they will awake and find their Doves gone.

There in the shadow of the famous bell-tower, with the stately San Marco church on one side and the palace of the cruel and murderous Doges on the other, we daily find our pretty Doves coaxing for bread. Often you will find them peering down into the dark passage-way in the palace, which leads to the dungeons underneath the Grand Canal. What a boon a sight of these messengers of peace would have been to the doomed inmates of these murder-reeking caves. But happily they are now deserted, and are used only as a source of revenue, which is paid by the inquisitive tourist.

Venice still remains as of old. She never changes, and the Doves of San Marco will still remain. May we hope, with the sages of Venice, that they may remain forever.—*Lebert, in Cincinnati Commercial Gazette.*

BUTTERFLIES.

IT may appear strange, if not altogether inappropriate to the season, that "the fair fragile things which are the resurrection of the ugly, creeping caterpillars" should be almost as numerous in October as in the balmy month of July. Yet it is true, and early October, in some parts of the country, is said to be perhaps the best time of the year for the investigating student and observer of Butterflies. While not quite so numerous, perhaps, many of the species are in more perfect condition, and the variety is still intact. Many of them come and remain until frost, and the largest Butterfly we have, the Archippus, does not appear until the middle of July, but after that is constantly with us, floating and circling on the wing, until October. How these delicate creatures can endure even the chill of autumn days is one of the mysteries.

Very curious and interesting are the Skippers, says *Current Literature.* They are very small insects, but their bodies are robust, and they fly with great rapidity, not moving in graceful, wavy lines as the true Butterflies do, but skipping about with sudden, jerky motions. Their flight is very short, and almost always near the ground. They can never be mistaken, as their peculiar motion renders their identification easy. They are seen at their best in August and September. All June and July Butterfles are August and September Butterflies, not so numerous in some instances, perhaps, but still plentiful, and vying with the rich hues of the changing autumnal foliage.

The "little wood brownies," or Quakers, are exceedingly interesting. Their colors are not brilliant, but plain, and they seek the quiet and retirement of the woods, where they flit about in graceful circles over the shady beds of ferns and woodland grasses.

Many varieties of the Vanessa are often seen flying about in May, but they are far more numerous and perfect in July, August, and September. A beautiful Azure-blue Butterfly, when it is fluttering over flowers in the sunshine, looks like a tiny speck of bright blue satin. Several other small Butterflies which appear at the same time are readily distinguished by the peculiar manner in which their hind wings are tailed. Their color is a dull brown of various shades, marked in some of the varieties with specks of white or blue.

"Their presence in the gardens and meadows," says a recent writer, "and in the fields and along the river-banks, adds another element of gladness which we are quick to recognize, and even the plodding wayfarer who has not the honor of a single intimate acquaintance among them might, perhaps, be the first to miss their circlings about his path. As roses belong to June, and chrysanthemums to November, so Butterflies seem to be a joyous part of July. It is their gala-day, and they are everywhere, darting and circling and sailing, dropping to investigate flowers and overripe fruit, and rising on buoyant wings high into the upper air, bright, joyous, airy, ephemeral. But July can only claim the larger part of their allegiance, for they are wanderers into all the other months, and even occasionally brave the winter with torn and faded wings."

BUTTERFLIES.—Life-size.—Third Series.

Melitæa chalcedon.
Thecla crysalus.
Anthocharis sara.

Papilio thoas.
Papilio philenor.
Argynis idalia.

Limenitis arthemis var. lamina.
Cystineura dorcas.
Thecla halesus.

THE FOX.

"A sly dog."

Somehow people always say that when they see a Fox. I'd rather they would call me that than stupid, however. Do I look stupid in my picture?

"Look pleasant," said the man when taking my photograph for BIRDS, and I flatter myself I did —and intelligent, too. Look at my brainy head, my delicate ears—broad below to catch every sound, and tapering so sharply to a point that they can shape themselves to every wave of sound. Note the crafty calculation and foresight of my low, flat brow, the resolute purpose of my pointed nose; my eye deep set—like a robber's—my thin cynical lips, and mouth open from ear to ear. You couldn't find a better looking Fox if you searched the world over.

I can leap, crawl, run, and swim, and walk so noiselessly that even the dead leaves won't rustle under my feet. It takes a deal of cunning for a Fox to get along in this world, I can tell you. I'd go hungry if I didn't plan and observe the habits of other creatures. For instance: I love Fish. When I want one for my supper off I trot to the nearest stream, and standing very quiet, watch till I spy a nice, plump trout in the clear water. A leap, a snap, and it is all over with Mr. Trout.

Another time I feel as though I'd like a crawfish. I see one snoozing by his hole near the water's edge. I drop my fine, bushy tail into the water and tickle him on the ear. That makes him furious — nobody likes to be wakened from a nap that way—and out he darts at the tail; snap go my jaws, and Mr. Crawfish is crushed in them, shell and all.

Between you and me, I consider that a very clever trick, too. Don't you?

Summer is my favorite season of the year. How I love the green fields, the ripening grain, the delicious fruits, for then the Rabbits prick up their long ears, and thinking themselves out of danger, run along the hillside; then the quails skulk in the wheat stubble, and the birds hop and fly about the whole day long. I am very fond of Rabbits, Quails, and other Birds. They make a very satisfactory meal. For dessert I have only to sneak into an orchard and eat my fill of apples, pears, and grapes. You perceive I have very good reason for liking the summer. Its the merriest time of the year for me, and my cubs. They grow fat and saucy, too.

THE GRAY FOX.

THE only Foxes that are hunted (the others only being taken by means of traps or poison) are the Red and Gray species. The Gray Fox is a more southern species than the Red and is rarely found north of the state of Maine. Indeed it is said to be not common anywhere in New England. In the southern states, however, it wholly replaces the Red Fox, and, according to Hallock, one of the best authorities on game animals in this country, causes quite as much annoyance to the farmer as does that proverbial and predatory animal, the terror of the hen-roost and the smaller rodents. The Gray Fox is somewhat smaller than the Red and differs from him in being wholly dark gray "mixed hoary and black." He also differs from his northern cousin in being able to climb trees. Although not much of a runner, when hard pressed by the dog he will often ascend the trunk of a leaning tree, or will even climb an erect one, grasping the trunk in his arms as would a Bear. Nevertheless the Fox is not at home among the branches, and looks and no doubt feels very much out of place while in this predicament. The ability to climb, however, often saves him from the hounds, who are thus thrown off the scent and Reynard is left to trot home at his leisure.

Foxes live in holes of their own making, generally in the loamy soil of a side hill, says an old Fox hunter, and the she-Fox bears four or five cubs at a litter. When a fox-hole is discovered by the Farmers they assemble and proceed to dig out the inmates who have lately, very likely, been making havoc among the hen-roosts. An amusing incident, he relates, which came under his observation a few years ago will bear relating. A farmer discovered the lair of an old dog Fox by means of his hound, who trailed the animal to his hole. This Fox had been making large and nightly inroads into the poultry ranks of the neighborhood, and had acquired great and unenviable notoriety on that account. The farmer and two companions, armed with spades and hoes, and accompanied by the faithful hound, started to dig out the Fox. The hole was situated on the sandy slope of a hill, and after a laborious and continued digging of four hours, Reynard was unearthed and he and Rep, the dog, were soon engaged in deadly strife. The excitement had waxed hot, and dog, men, and Fox were all struggling in a promiscuous melee. Soon a burly farmer watching his chance strikes wildly with his hoe-handle for Reynard's head, which is scarcely distinguishable in the maze of legs and bodies. The blow descends, but alas! a sudden movement of the hairy mass brings the fierce stroke upon the faithful dog, who with a wild howl relaxes his grasp and rolls with bruised and bleeding head, faint and powerless on the hillside. Reynard takes advantage of the turn affairs have assumed, and before the gun, which had been laid aside on the grass some hours before, can be reached he disappears over the crest of the hill.

Hallock says that an old she-Fox with young, to supply them with food, will soon deplete the hen-roost and destroy both old and great numbers of very young chickens. They generally travel by night, follow regular runs, and are exceedingly shy of any invention for their capture, and the use of traps is almost futile. If caught in a trap, they will gnaw off the captured foot and escape, in which respect they fully support their ancient reputation for cunning.

AMERICAN GRAY FOX.
(Urocyon Cinereo-argenteus).
⅛ Life-size.

MISCELLANY.

RURAL BIRD LIFE IN INDIA.—"Nothing gives more delight," writes Mr. Caine, "in traveling through rural India than the bird-life that abounds everywhere; absolutely unmolested, they are as tame as a poultry yard, making the country one vast aviary. Yellow-beaked Minas, Ring-doves, Jays, Hoopoes, and Parrots take dust baths with the merry Palm-squirrel in the roadway, hardly troubling themselves to hop out of the way of the heavy bull-carts; every wayside pond and lake is alive with Ducks, Wild Geese, Flamingoes, Pelicans, and waders of every size and sort, from dainty red-legged beauties the size of Pigeons up to the great unwieldy Cranes and Adjutants five feet high. We pass a dead Sheep with two loathsome vultures picking over the carcass, and presently a brood of fluffy young Partridges with father and mother in charge look at us fearlessly within ten feet of our whirling carriage. Every village has its flock of sacred Peacocks pacing gravely through the surrounding gardens and fields, and Woodpeckers and Kingfishers flash about like jewels in the blazing sunlight."

WARNING COLORS.—Very complete experiments in support of the theory of warning colors, first suggested by Bates and also by Wallace, have been made in India by Mr. Finn, says *The Independent*. He concludes that there is a general appetite for Butterflies among insectivorous birds, though they are rarely seen when wild to attack them; also that many, probably most birds, dislike, if not intensely, at any rate in comparison with other Butterflies, those of the Danais genus and three other kinds, including a species of Papilio, which is the most distasteful. The mimics of these Butterflies are relatively palatable. He found that each bird has to separately acquire its experience with bad-tasting Butterflies, but well remembers what it learns. He also experimented with Lizards, and noticed that, unlike the birds, they ate the nauseous as well as other Butterflies.

INCREASE IN ZOOLOGICAL PRESERVES IN THE UNITED STATES—The establishment of the National Zoological Park, Washington, has led to the formation of many other zoological preserves in the United States. In the western part of New Hampshire is an area of 26,000 acres, established by the late Austin Corbin, and containing 74 Bison, 200 Moose, 1,500 Elk, 1,700 Deer of different species, and 150 Wild Boar, all of which are rapidly multiplying. In the Adirondacks, a preserve of 9,000 acres has been stocked with Elk, Virginia Deer, Muledeer, Rabbits, and Pheasants. The same animals are preserved by W. C. Whitney on an estate of 1,000 acres in the Berkshire Hills, near Lenox, Mass., where also he keeps Bison and Antelope. Other preserves are Nehasane Park, in the Adirondacks, 8,000 acres; Tranquillity Park, near Allamuchy, N. J., 4,000 acres; the Alling preserve, near Tacoma, Washington, 5,000 acres; North Lodge, near St. Paul, Minn., 400 acres; and Furlough Lodge, in the Catskills, N. Y., 600 acres.

ROBINS ABUNDANT.—Not for many years have these birds been so numerous as during 1898. Once, under some wide-spreading willow trees, where the ground was bare and soft, we counted about forty Red-breasts feeding together, and on several occasions during the summer we saw so many in flocks, that we could only guess at the number. When unmolested, few birds become so tame and none are more interesting.

THE GRAY SQUIRREL.

EAST of the Missouri River the Gray Squirrel is found almost everywhere, and is perhaps the most common variety. Wherever there is timber it is almost sure to be met with, and in many localities is very abundant, especially where it has had an opportunity to breed without unusual disturbance. Its usual color is pale gray above and white or yellowish white beneath, but individuals of the species grade from this color through all the stages to jet black. Gray and black Squirrels are often found associating together. They are said to be in every respect alike, in the anatomy of their bodies, habits, and in every detail excepting the color, and by many sportsmen they are regarded as distinct species, and that the black form is merely due to melanism, an anomaly not uncommon among animals. Whether this be the correct explanation may well be left to further scientific observation.

Like all the family, the Gray Squirrels feed in the early morning just after sunrise and remain during the middle of the day in their hole or nest. It is in the early morning or the late afternoon, when they again appear in search of the evening meal, that the wise hunter lies in wait for them. Then they may be heard and seen playing and chattering together till twilight. Sitting upright and motionless on a log the intruder will rarely be discovered by them, but at the slightest movement they scamper away, hardly to return. This fact is taken advantage of by the sportsmen, and, says an observer, be he at all familiar with the runways of the Squirrels at any particular locality he may sit by the path and bag a goodly number. Gray and Black Squirrels generally breed twice during the spring and summer, and have several young at a litter. The young mature in August and September.

We have been told that an incident of migration of Squirrels of a very remarkable kind occurred a good many years ago, caused by lack of mast and other food, in New York State. When the creatures arrived at the Niagara river, their apparent destination being Canada, they seemed to hesitate before attempting to cross the swift running stream. The current is very rapid, exceeding seven miles an hour. They finally ventured in the water, however, and with tails spread for sails, succeeded in making the opposite shore, but more than a mile below the point of entrance. They are better swimmers than one would fancy them to be, as they have much strength and endurance. We remember when a boy seeing some mischievous urchins repeatedly throw a tame Squirrel into deep water for the cruel pleasure of watching it swim ashore. The "sport" was soon stopped, however, by a passerby, who administered a rebuke that could hardly be forgotten.

Squirrels are frequently domesticated and become as tame as any household tabby. Unfortunately Dogs and Cats seem to show a relentless enmity toward them, as they do toward all rodents. The Squirrel is willing to be friendly, and no doubt would gladly affiliate with them, but the instinct of the canine and the feline impels them to exterminate it. We once gave shelter and food to a strange Cat and was rewarded by seeing it fiercely attack and kill a beautiful white Rabbit which until then had had the run of the yard and never before been molested. Until we shall be able to teach the beasts of the field something of our sentimental humanitarianism we can scarcely expect to see examples of cruelty wholly disappear.

FROM COL. CHI. ACAD. SCIENCES

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GRAY SQUIRREL.
(Sciurus carolinensis).
$\frac{5}{8}$ Life-size.

AH ME!

I killed a Robin—the little thing,
With scarlet breast on a glossy wing,
That comes in the apple tree to sing.

I flung a stone as he twittered there,
I only meant to give him a scare,
But off it went—and hit him square.

A little flutter—a little cry—
Then on the ground I saw him lie.
I didn't think he was going to die.

But as I watched him I soon could see
He never would sing for you or me
Any more in the apple tree.

Never more in the morning light,
Never more in the sunshine bright,
Trilling his song in gay delight.

And I'm thinking, every summer day,
How never, never, I can repay
The little life that I took away.

—Sydney Dayre, in The Youth's Companion

THE PECTORAL SANDPIPER.

MORE than a score of Sandpipers are described in the various works on ornithology. The one presented here, however, is perhaps the most curious specimen, distributed throughout North, Central, and South America, breeding in the Arctic regions. It is also of frequent occurrence in Europe. Low, wet lands, muddy flats, and the edges of shallow pools of water are its favorite resorts. The birds move in flocks, but, while feeding, scatter as they move about, picking and probing here and there for their food, which consists of worms, insects, small shell fish, tender rootlets, and birds; "but at the report of a gun," says Col. Goss, "or any sudden fright, spring into the air, utter a low whistling note, quickly bunch together, flying swift and strong, usually in a zigzag manner, and when not much hunted often circle and drop back within shot; for they are not naturally a timid or suspicious bird, and when quietly and slowly approached, sometimes try to hide by squatting close to the ground."

Of the Pectoral Sandpiper's nesting habits, little has been known until recently. From Mr. Nelson's interesting description, in his report upon "Natural History Collections in Alaska," we quote as follows: "The night of May 24, 1889, I lay wrapped in my blanket, and from the raised flap of the tent looked out over as dreary a cloud-covered landscape as can be imagined. As my eyelids began to droop and the scene to become indistinct, suddenly a low, hollow, booming note struck my ear and sent my thoughts back to a spring morning in northern Illinois, and to the loud vibrating tones of the Prairie Chickens. [See BIRDS AND ALL NATURE, Vol. IV, p. 18.] Again the sound arose, nearer and more distinct, and with an effort I brought myself back to the reality of my position, and, resting upon one elbow, listened. A few seconds passed, and again arose the note; a moment later I stood outside the tent. The open flat extended away on all sides, with apparently not a living creature near. Once again the note was repeated close by, and a glance revealed its author. Standing in the thin grass ten or fifteen yards from me, with its throat inflated until it was as large as the rest of the bird, was a male Pectoral Sandpiper. The succeeding days afforded opportunity to observe the bird as it uttered its singular notes, under a variety of situations, and at various hours of the day, or during the light Arctic night. The note is deep, hollow, and resonant, but at the same time liquid and musical, and may be represented by a repetition of the syllables *too-u*, *too-u*, *too-u*, *too-u*, *too-u*." The bird may frequently be seen running along the ground close to the female, its enormous sac inflated.

Mr. Murdock says the birds breed in abundance at Point Barrow, Alaska, and that the nest is always built in the grass, with a preference for high and dry localities. The nest was like that of the other waders, a depression in the ground, lined with a little dry grass. The eggs are four, of pale purplish-gray and light neutral tint. It is sometimes called Grass Snipe.

PECTORAL SANDPIPER.
½ Life-size.

EYES.

By W. E. WATT.

Why was the sight
To such a tender ball as th' eye confined,
So obvious and so easy to be quenched,
And not, as feeling, through all parts diffused;
That she might look at will through every pore?—MILTON.

"But bein' only eyes, you see, my wision's limited."—SAM WELLER.

THE REASON we know anything at all is that various forms of vibration are capable of affecting our organs of sense. These agitate the brain, the mind perceives, and from perception arise the higher forms of thought. Perhaps the most important of the senses is sight. It ranges in power from the mere ability to perceive the difference between light and darkness up to a marvelous means of knowing the nature of objects of various forms and sizes, at both near and remote range.

One the simplest forms of eyes is found in the Sea-anemone. It has a colored mass of pigment cells and refractive bodies that break up the light which falls upon them, and it is able to know day and night. An examination of this simple organ leads one to think the scientist not far wrong who claimed that the eye is a development from what was was once merely a particular sore spot that was sensitive to the action of light. The protophyte, *Euglena varidis*, has what seems to be the least complicated of all sense organs in the transparent spot in the front of its body.

We know that rays of light have power to alter the color of certain substances. The retina of the eye is changed in color by exposure to continued rays of light. Frogs in whose eyes the color of the retina has apparently been all changed by sunshine are still able to take a fly accurately and to recognize certain colors

Whether the changes produced by light upon the retina are all chemical or all physical or partly both remains open to discussion.

An interesting experiment was performed by Professor Tyndall proving that heat rays do not affect the eye optically. He was operating along the line of testing the power of the eye to transmit to the sensorium the presence of certain forms of radiant energy. It is well known that certain waves are unnoticed by the eye but are registered distinctly by the photographic plate, and he first showed beyond doubt that heat waves as such have no effect upon the retina. By separating the light and heat rays from an electric lantern and focusing the latter, he brought their combined energy to play where his own eye could be placed directly in contact with them, first protecting the exterior of his eye from the heat rays There was no sensation whatever as a result, but when, directly afterward, he placed a sheet of platinum at the convergence of the dark rays it quickly became red hot with the energy which his eye was unable to recognize.

The eye is a camera obscura with a very imperfect lens and a receiving plate irregularly sensitized; but it has marvelous powers of quick adjust-

ment. The habits of the animal determine the character of the eye. Birds of rapid flight and those which scan the earth minutely from lofty courses are able to adjust their vision quickly to long and short range. The eye of the Owl is subject to his will as he swings noiselessly down upon the Mouse in the grass. The nearer the object the more the eye is protruded and the deeper its form from front to rear.

The human eye adjusts its power well for small objects within a few inches and readily reaches out for those several miles away. A curious feature is that we are able to adjust the eye for something at long range in less time than for something close at hand. If we are reading and someone calls our attention to an object on the distant hillside, the eye adjusts itself to the distance in less than a second, but when we return our vision to the printed page several seconds are consumed in the re-adjustment.

The Condor of the Andes has great powers of sight. He wheels in beautiful curves high in the air scrutinizing the ground most carefully and all the time apparently keeping track of all the other Condors within a range of several miles. No sooner does one of his kind descend to the earth than those near him shoot for the same spot hoping the find may be large enough for a dinner party. Others soaring at greater distances note their departure and follow in great numbers so that when the carcass discovered by one Condor proves to be a large one, hundreds of these huge birds congregate to enjoy the feast. The Condor's eyes have been well compared to opera glasses, their extension and contraction are so great.

The Eagle soars towards the sun with fixed gaze and apparent fullness of enjoyment. This would ruin his sight were it not for the fact that he and all other birds are provided with an extra inner eyelid called the nictitating membrane which may be drawn at will over the eye to protect it from too strong a light. Cuvier made the discovery that the eye of the Eagle, which had up to his time been supposed of peculiarly great strength to enable it to feast upon the sun's rays, is closed during its great flights just as the eye of the barnyard fowl is occasionally rested by the use of this delicate semi-transparent membrane. Several of the mammals, among them being the horse, are equipped with such an inner eyelid.

One of my most striking experiences on the ocean was had when I pulled in my first Flounder and found both of his eyes on the same side of his head. All Flat-fish are similarly equipped. On the side which glides over the bottom of the sea, the Halibut, Turbot, Plaice, and Sole are almost white, the upper side being dark enough to be scarcely distinguishable from the ground. On the upper side are the two eyes, while the lower side is blind.

When first born the fish swims upright with a slight tendency to favor one side ; its eyes are on opposite sides of the head, as in most vertebrates and the head itself is regular. With age and experience in exploring the bottom on one side, the under eye refuses to remain away from the light and gradually turns upward, bringing with it the bones of the skull to such an extent that the adult Flatfish becomes the apparently deformed creature that appears in our markets as a regular product of the deep.

The eyeless inhabitant of the streams in Mammoth Cave presents a curious instance of the total loss of a sense which remains unused. These little fishes are not only without sight but are also almost destitute of color and markings, the general appearance being much like that of a fish with the skin taken off for the frying pan.

The eyes of fishes generally are so nearly round that they may be used with good effect as simple microscopes and have considerable magnifying power. Being continually washed with the element in which they move, they have no need for winking and the lachrymal duct which supplies tears to the eyes of most of the animal kingdom is entirely wanting. Whales have no tear glands in their eyes, and the whole order of Cetacea are tearless.

Among domestic animals there is considerable variety of structure in the eye. The pupil is usually round, but in the small Cats it is long vertically, and in the Sheep, in fact, in all the cud chewers and many other grass eaters, the pupil is long horizontally.

Insects present a wonderful array of eyes. These are not movable, but the evident purpose is that there shall be an eye in readiness in whatever direction the insect may have business. The common Ant has fifty six-cornered jewels set advantageously in his little head and so arranged as to take in everything that pertains to the pleasure of the industrious little creature. As the Ant does not move about with great rapidity he is less in need of many eyes than the House-fly which calls into play four thousand brilliant facets, while the Butterfly is supplied with about seventeen thousand. The most remarkable of all is the blundering Beetle which bangs his head against the wall with twenty-five thousand eyes wide open.

THE HUNTED SQUIRREL.

THEN as a nimble Squirrel from the wood
Ranging the hedges for his filbert food
Sits pertly on a bough, his brown nuts cracking
And from the shell the sweet white kernel taking ;
Till with their crooks and bags a sort of boys
To share with him come with so great a noise
That he is forced to leave a nut nigh broke,
And for his life leap to a neighbor oak,
Thence to a beech, thence to a row of ashes ;
Whilst through the quagmires and red water plashes
The boys run dabbing through thick and thin.
One tears his hose, another breaks his shin ;
This, torn and tattered, hath with much ado
Got by the briars ; and that hath lost his shoe ,
This drops his band ; that headlong falls for haste ;
Another cries behind for being last ;
With sticks and stones and many a sounding holloa
The little fool with no small sport they follow,
Whilst he from tree to tree, from spray to spray
Gets to the woods and hides him in his dray.

—WILLIAM BROWNE,
Old English Poet.

SUMMARY.

AMERICAN HERRING GULL.—*Larus argentatus smithsonianus.*

RANGE—North America generally. Breeds on the Atlantic coast from Maine northward.

NEST—On the ground, on merely a shallow depression with a slight lining; occasionally in trees, sixty or seventy-five feet from the ground

EGGS—Three, varying from bluish white to deep yellowish brown, irregularly spotted and blotched with brown of different shades.

AMERICAN RACCOON.—*Procyon lotor.*

Other name: Coon.

RANGE—North America.

PIGMY ANTELOPE.—*Antilope pigmæa.*

RANGE—South Africa.

RED-SHOULDERED HAWK.—*Buteo lineatus.*

RANGE—Eastern North America, north to Nova Scotia, west to the edge of the Great Plains.

NEST—In the branches of lofty oaks, pines, and sycamores. In mountainous regions the nest is often placed on the narrow ledges of cliffs.

EGGS—Three or four; bluish, yellowish white, or brownish, spotted, blotched, and dotted irregularly with many shades of reddish brown.

AMERICAN GRAY FOX.—*Vulpes virginianus.*

RANGE—Throughout the United States.

AMERICAN GRAY SQUIRREL.—*Sciurus carolinensis.*

RANGE—United States generally.

PECTORAL SANDPIPER.—*Tringa maculata.*

RANGE—North, Central, and South America, breeding in the Arctic regions. Of frequent occurrence in Europe.

NESTS—In tufts of grass.

EGGS—Four, of a drab ground color, with a greenish shade in some cases, and are spotted and blotched with umber brown, varying in distribution on different specimens, as is usual among waders' eggs.

The beautiful is as useful as the useful.—*Victor Hugo.*

BIRDS AND NATURE

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378 Wabash Ave., Chicago, Ill.

 Entered at Chicago Post Office

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Monthly, except July and August

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EARS.

By W. E. Watt.

THE air is an elastic fluid surrounding the earth. The motions of things whether alive or not, set it in a state of vibration that rarely ceases. At all times and in all places it is pulsing responsively to all that is going on.

Animals are interested in what is moving about them. It may mean life or death, pleasure or agony, and most animals are keen to know which is for them at any given period. They are therefore equipped with organs that respond to these waves of the air. They are variously equipped, some hearing certain sounds feebly where others are acute to them and deeply moved. Some sounds are full of moment to one organism arousing it to nervous activity while another organism knows nothing of what is so distinctly heard by the first.

Can a Mule hear more than a Mouse is a question which has agitated many young people who have considered the length of the former's ear and its versatility. A series of experiments once conducted in youthful sport by the writer, seemed to settle the matter that each can hear sounds which are unnoticed by the other, and that the ear of the Mouse is much better adapted in hearing powers to the occupation of the Mouse than is that of his long eared neighbor. Certain shrill sounds of whatever degree of loudness, cannot be heard by the Mule even when oats might be secured by attending to them, while distant sounds of a heavy character seem to fail to affect the ear of the Mouse.

The same is noticeable in the hearing of people. To some persons a note one octave higher than the highest note of a piano, cannot be heard. Others can hear such a tone, and yet others are made painfully nervous by it without knowing quite what the trouble is. To some the chirp of the Sparrow is the upper limit of hearing, others can hear the voice of the Bat, yet others are able to hear the notes of insects that range higher in pitch than the voice of the Bat. Dr. Wollaston says, "As there is nothing in the nature of the atmosphere to prevent the existence of vibrations incomparably more frequent than any of which we are conscious, we may imagine that animals like the Grilli (Grasshoppers) whose powers appear to commence nearly where ours terminate, may have the faculty of hearing still sharper sounds which we do not know to exist; and that there may be other insects, hearing nothing in common with us, but endowed with a power of exciting, and a sense which perceives vibrations of the same nature, indeed, as those which constitute our ordinary sounds, but so remote that the animals who perceive them may be

said to possess another sense agreeing with our own solely in the medium by which it is excited."

The human ear is capable of hearing musical sounds produced by vibrations ranging from twenty-four in a second of time to forty thousand. This indicates that humanity is confined in interest to the motions of the atmosphere within these limits. The possibilities of higher and lower fields of music are such that one writer has said that it may be that the air about us is constantly resounding to the music of the heavenly hosts while our dull ears with their limited powers are unable to catch the poorest note in that celestial harmony.

Sound travels about one thousand ninety feet in a second in the air. Through other elastic mediums it varies in speed. The beholder of an explosion of dynamite in a harbor, receives three shocks, one coming by way of the air, another by water, and the third through the earth, all arriving at different times.

It is a fortunate thing that low sounds travel as rapidly as high ones and loud sounds no faster than soft ones. Thus the playing of a band upon the water, at a distance, is beautiful, because all the tones powerful enough to reach the listener do so at the right time to preserve harmony. If it were not for this equality in traveling power, no music on a grand scale could be possible, for those sitting at a distance from the performers would be in a sea of discord from the late arrival of tones which should have blended with those gone before. In spite of the fact that our highest appreciable note is but one-third of an inch in length of wave and the wave of our lowest note exceeds forty feet in length, all sounds produced in harmony travel in harmony till exhausted in space.

The ears of various animals are beautifully adapted to their respective habits. The watch of the Dog is most valuable because distant noises are so readily detected by his faithful ear. The Thrush has been observed hopping along the ground with frequent stops to listen. So keen is his hearing that the presence of a Worm below the surface is detected by the sound of the Worm's occupation. By judiciously beating the ground he brings the Worm toward the surface as if to escape its enemy, the Mole. At the proper instant the turf is torn up and nearly always the Worm secured.

The form of the outer ear is adapted to the needs of the animal. Most grass eating animals have ears that turn readily in all directions to listen for enemies, but the ears of flesh eating animals that pursue their prey are set only to reach forward to hear the sounds of escaping prey.

Many insects and lower orders of animals are looked upon by man as incapable of the pleasures of hearing. But this is often a mistake. Snails have been known to enjoy the voice of their human friends and come forth when called by familiar voices.

The fondness of the Cobra for music and the powers of charming this hideous animal partly by appealing to his esthetic hearing are well known. Moths have good hearing as one may observe while walking in the woods where the crackling of dry sticks alarms them so they fly up from their noonday slumbers in great numbers. The antennae of the Butterfly are supposed to act as hearing organs. Crabs and Shrimps hear with their inner antennae, Clams with their feet, and some of the crustacea with the bases of the lobe of the tail.

Many animals seem to enjoy the voice of man and the sounds of the various musical instruments which he uses. Frogs and Toads may be taught to know their master's voice. Canaries, Parrots, and Doves enjoy human singing and instrumental music as well. A Woodchuck has been known to

manifest his refinement of soul by coming forth from his hole at the sound of a piano and to sit with the air of a connoisseur criticising the selections with which he was being favored.

Not only is the ability to hear different in different persons, but the thoroughness with which they hear varies largely. Few sounds consist of simple waves of air. As the waves of the sea are noticed to bear smaller waves upon them and these in turn to carry wavelets, so the waves of sound are rarely smooth, simple waves. There are many more waves upon waves in sound production than can be observed on the surface of the sea. A note from the piano not only sounds the note which the key struck represents, but also a great many tones that chord with this tone higher up the scale. These overtones are not so loud as the fundamental tone and cannot readily be detected by the uncultivated ear. But they give character to the tone. The overtones make the note of the violin and the cornet differ. No two voices have the same overtones, and while we are unable to hear these overtones by themselves, yet we are able to distinguish the voices of our friends instantly by means of them.

As voices differ in the overtones they carry, so do ears differ in the number of overtones they are able to receive. Some people enjoy hearing high voices only. For them the soprano or tenor is always in demand. Others prefer deep voices and admire altos and basses. I have stood beside a friend at a concert where a first class artist was pouring forth a baritone song with the most delicate and artistic tone and finish, and had my friend turn to me and say: "What on earth do people find in that man's voice to pay money to hear?" The singer's voice was full of rich overtones which made it valuable to the average cultured listener, but in the ear of my friend they produced a jarring that was decidedly unpleasant to him, although he was fond of the singing of the untrained voices of the members of the choir where he attended church.

A large part of the business of the voice culture expert is the adjustment of the vocal organs in singing so as to produce the right sets of overtones to give the voice a carrying quality and the richness we enjoy in the finished artist. One notable example of the production of too much of a good thing was instanced in the fate of a soprano who came to America a few years ago with an extensive operatic repertoire and a voice that could not be drowned by a full orchestra as it soared to the greatest heights and displayed a flexibility most remarkable. But she failed to please us. A neighbor of mine said to her friend: "Just wait till you hear Madame Blank begin. She has a voice that will cut you like a knife."

Both the inner and outer ear formations are responsible for the differences in hearing in different people. Cultivation does much for any sense, but for him that has no ear for music cultivation will not construct an ear. It is easy to see what a difference in hearing will be produced by a slight change in the position of the outer ear. While listening to a steady sound, draw the ear forward with one finger, relax it to its normal position, then push it back against the head. The quality of the sound heard and its intensity will be varied in each instance.

So we may be lenient with our friends who do not enjoy the same sort of music with ourselves. And the same music will not always be the very same. A pistol shot upon a mountain top sounds much like a fire cracker in a valley, and the condition of the atmosphere frequently modifies music almost as much as the shape of the room in which it is produced.

THE KINGBIRD OF PARADISE.

Wouldn't you little folks like to see a number of us brilliant, gem-like Birds of Paradise flitting among the trees as do your Robins and Woodpeckers and Jays? To see us spreading our wings in the sun, and preening our ruby and emerald and topaz and amethyst tinted plumes, ribbons, and streamers?

Ah, that would be an astonishing sight, but you will have to journey to an island in the South Pacific Ocean to see that; an island whose shores are bathed by a warm sea, and where the land is covered with the most luxuriant tropical vegetation.

It was about three hundred years ago that the people of Europe first knew that such superb birds existed on this earth. Traders visited one of the Malayan islands in search of cloves and nutmegs, and upon leaving, the natives presented them with a few dried skins of a wonderfully beautiful bird. The natives called them "God's Birds," and in order to propitiate heaven for killing them, cut off the feet of the dead birds and buried them beneath the tree upon which they were found.

The dried bodies of the birds were exported as time went on, and as the people of Europe had never seen one alive, but always the skin without legs and feet, they came to consider them as heavenly birds, indeed, formed to float in the air as they dwelt in the Garden of Eden, resting occasionally by suspending themselves from the branches of trees by the feathers of their tails, and feeding on air, or the soft dews of heaven. Hence they called us the Birds of Paradise.

It was not till one hundred years after, when a writer and collector of birds visited the island, and spent years in watching and studying us, that the truth became known. Certainly, the gentleman must have laughed, when, instead of heavenly dew, he saw a Bird of Paradise catch a Grasshopper and holding it firmly by his claws, trim it of wings and legs, then devour it, head first. Fruit and insects of all kinds we eat instead of dew and air.

He also saw a party of twenty or thirty males dancing on the branches of huge trees, raising their wings, stretching out their necks and elevating their plumes all for the purpose of admiring themselves or being admired. Some of them have finer plumage than I, but only the Kingbirds of Paradise have those two dear little rings which you see in my picture.

KING BIRD OF PARADISE.
¾ Life-size.

THE KINGBIRD OF PARADISE.

THE sublime is no nearer the ridiculous in literature than in the things of nature. An instance of this is the close relation of the common Crow to the most glorious bird of them all. Not only are they very much alike in general form, including shape of feet, bill, bones, and ordinary feathering, but also in habit. They seem to delight in the same sorts of food and secure it in much the same manner. When they are happiest and attempt to pour forth their songs of joy the voice of the Crow is fully as melodious and satisfactory to the human ear as is that of the Bird of Paradise.

The old fable in regard to their having no feet and living only on the dews of heaven and the delicacies which they were supposed to be able to collect from the atmosphere as they floated perpetually free from the earth and its contaminations was so grateful to Europeans that when Antony Pigafetta, who accompanied Magellan around the world and secured a great deal of information at first hand, described them as birds with very ordinary, in fact, almost ugly, feet and legs, he was not believed, and Aldrovandus publicly brought accusations against him for audacious falsehood.

While the males have not only a splendid growth of delicate floating feathers of very unusual length and glossy fineness of texture, the females have but little more to boast of than our American Crow, and they even lack the degree of lustre which our black friend frequently exhibits. But the males are adorned with a wealth of color display, rich in velvety softness and blazing with metallic lustre. This lustre cannot be appreciated from the appearance of the faded specimens so often seen in the museums which may have suffered, not alone from dust and exposure for years to the chemical action of light but have also been sadly diminished in glory by the rude arts of the natives who fumigate the skins with burning sulphur, their principal care seeming to be to get enough of it deposited to make sure of the skins' not being attacked by insects.

To be seen to best advantage one needs to watch them as they make their short migrations in flocks from one island to another with the change of the seasons from the dry to the wet monsoon. They prefer traveling against the wind rather than with it because their plumage is so elaborate and delicate in its structure that an attempt to fly with the wind frequently brings disaster to the glorious males and causes them to tumble ignominiously to the ground, after which they are a long time in arranging affairs for another attempt at navigation of the air.

The King Bird of Paradise is a small bird, measuring but little over six inches in length. It is extremely vivacious, flying about and running with but little show of the dignity of its family. Very fond of fruits, it is not satisfied with attacking those which other birds of its size would choose, but enjoys showing its gormandizing powers by devouring as much as possible of the largest specimens within its reach.

The fan-shaped tuft of feathers which adorns each side of the bird are subject to his will, being raised and spread out or lowered as the weather or the feelings of the bird seem to demand. At the ends of the long feather shafts springing from its tail are markings which strongly resemble the eye-like ornaments of the Peacock. The shafts seem not content with stretching themselves out to a greater length than that of the bird itself, but at the extremities they curve inward coiling compactly into spiral discs flashing with emerald green.

THE PECCARY.

Looks very much like a little Pig, does'nt he, children? Well, so he is, a species of wild pig found in the canebrakes of Texas, and native of South America.

You would hardly think so small an animal could be so ferocious, but the inhabitants of South America dread and fear him as much as they do the Wild Boar. He is a fearless little creature, too, attacking any object which comes in his way no matter how big it is. Even an Elephant wouldn't scare him, though, as Elephants are not found in South America or Texas, I presume a Peccary never saw one.

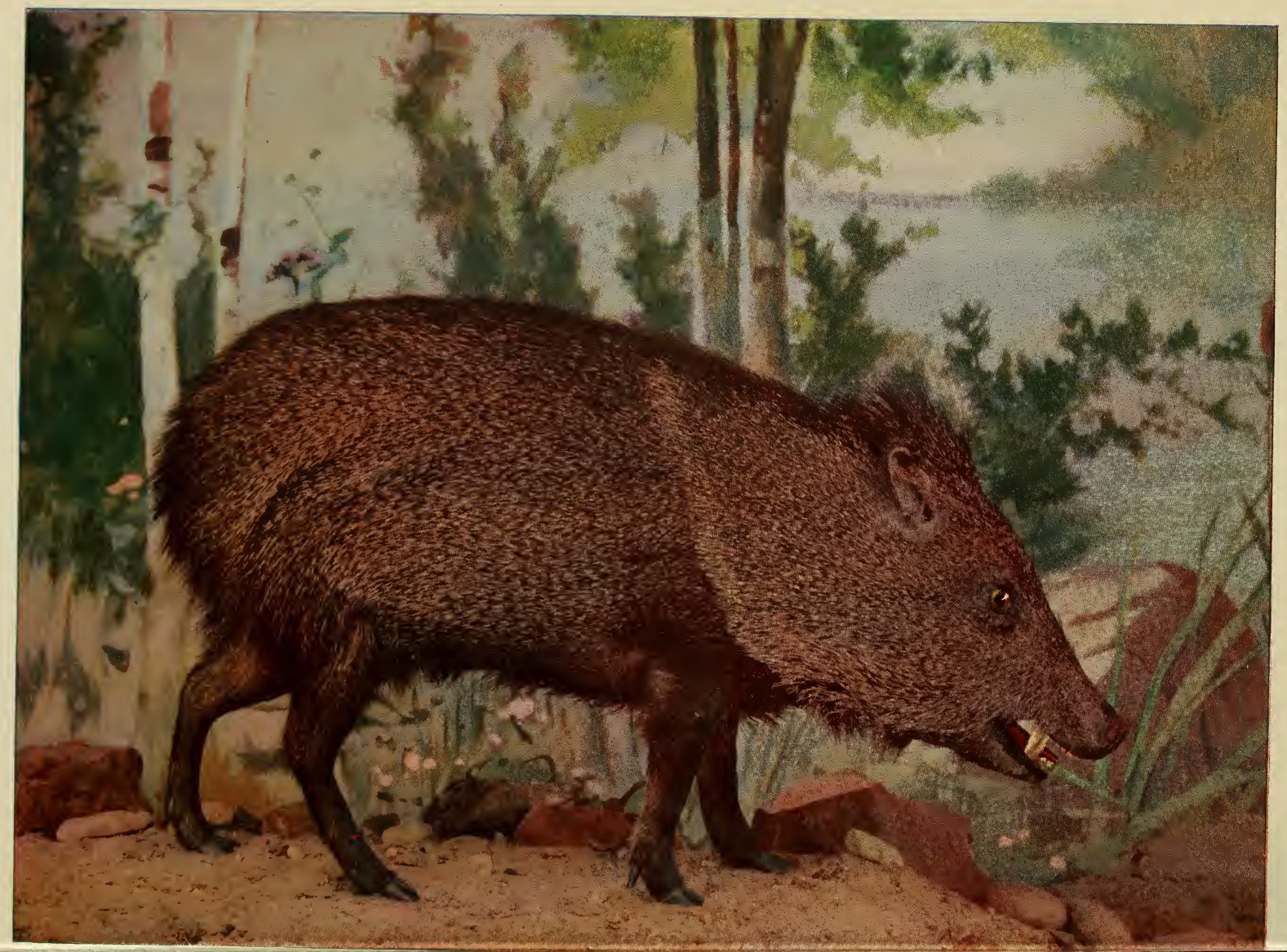
His jaws, as you see, are armed with tusks, like those of the Boar, but they are straight instead of curved, are sharp at the edges, and although no longer than your finger can inflict a terrible wound on account of the great strength of the animal's neck.

When a body of them charge an enemy they will fight till every one of them is slain. You will not wonder then that Men, Horses, and Dogs fly at the approach of a herd of Peccaries, the poor Horses being so easily brought down by having their legs cut to pieces by the sharp tusks.

In the canebrakes of Texas, where the trees are of enormous size, the Peccaries make their home. A fallen tree overgrown with thickets of the cane, matted together with strong and thorny vines, is their favorite lodging. Into one of these hollow logs a drove of twenty or thirty will enter at night, each one backing in, the last one to enter standing with his nose to the entrance and acting as sentinel.

On dark, drizzly days they never leave their lodgings, and it is on these days that the farmers who have suffered by their ravages on grain-crop and stock, succeed in putting an end to many of their enemies. As soon as daylight appears and the protruding snout and watchful eyes of the sentinel on duty can be seen, a sharp report of a rifle is heard; with a spring the sentinel leaps out and soon rolls lifeless upon the ground. Instantly a low grunt is heard, and another snout and sharp pair of eyes appear in the opening. A flash, a report, and out he leaps to his death, also; thus they go on till every "lodger" is disposed of.

Of all animals the Peccary alone, it is said, resists the terror of the gun, its flash and report serving only to enrage him.



THE PECCARY.

THIS interesting animal, which is of common occurrence throughout the forests of South America, roams through the woods in large herds and is constantly migrating, being often driven by scarcity of food to make long journeys. Rendgger, the well known naturalist, states that one may follow the Peccaries for days without seeing them. In their wanderings they keep to the open country, which ordinarily they rarely frequent, and even streams cannot stop them. If they reach a field they cross it at a run, and if they arrive at the banks of a river they do not hesitate but swim at once across it.

They have been seen crossing the Paraguay river at a place where it requires about a half hour to do so. The herd keeps together in a close throng, the males in advance, each mother having her young behind her. The noise made by the animals can be heard a long distance, not only on account of the dull, hoarse sounds which they make, but still more by reason of the cracking of the dead branches which they break in their impetuous progress.

Both day and night the Peccaries search for food. They eat all kinds of arboreal fruit and roots, and their teeth are so strong that they can easily open the hardest of palm seeds. They often do great mischief to the crops. Besides vegetable food they are said also to eat Snakes, Lizards, Worms, and Grubs, in this respect being useful animals. They are much more cleanly in their habits than the Wild Boars, and Beehm asserts that they never eat more than they require, and seek water only during periods of the most intense heat, and then they wallow only in pools. During the day they hide in tree trunks, in which they sleep also at night.

The female gives birth to a single young one, in rare instances to two. The cry of the young is like that of Goats. They are easily tamed and domesticated if treated well. The flesh is eaten by the poorer classes, the skin being chiefly used for bags and thongs. On account of a gland which the animal bears in its haunches and which has an evil effect on the meat, causing it to become unfit for use in a very short time, the flesh is not considered to be particularly excellent.

It has been said that the Peccary is totally devoid of fear. It is small, rarely exceeding eighteen inches in height, and yet it is not less dreaded than the most savage Wild Boar would be. Many an unlucky sportsman, to escape a herd of these wild creatures has been glad to climb a tree in time to save his life. Men, Horses, and Dogs fly in haste, for the Peccaries fight like a well drilled army, and by swarming about an enemy they are sure to conquer with their strong, sharp tusks. They avoid conflict with man, and shyly run into the thick woods on his approach, but when fired upon or brought to bay they seem possessed only with rage and desire for vengeance.

The Peccary is peculiar in his anatomy, having several sacs in place of a single stomach, thus resembling the cud chewing animals. This resemblance is traced still further in the feet, where the metacarpal and metatarsal bones of the two greater toes are united into a sort of cannon bone.

This specimen came from the canebrakes of Texas.

AUTUMN.

"Lightly He blows, and at His breath they fall,
The perishing kindreds of the leaves; they drift,
Spent flames of scarlet, gold aerial,
Across the hollow year, noiseless and swift.
Lightly He blows, and countless as the falling
Of snow by night upon a solemn sea,
The ages circle down beyond recalling,
To strew the hollows of Eternity.
He sees them drifting through the spaces dim,
And leaves and ages are as one to Him."

THE summer wanes; the days grow shorter and the evenings longer, heralding the advent of Autumn, and the woods and fields are mellowing under the genial glow of the sun. All Nature is taking on a warmer tinge, gladdening the eye with its fullness of beauty—rich in the promise of autumnal harvest.

It is a sad fact, but none the less true that a great many of us go through life with unseeing eyes. Why must we be *taught* to see the beauties around us? What a tale might be told by the little flower that we pass carelessly by, or tread upon in our haste; if we would but listen!

There is beauty everywhere—in the early dawning when the iris-tinted morning-glories are radiant with glittering dew drops; when the sun is high overhead; when the soft twilight has enveloped the land in its mantle of calm; whether the rain is falling or whether the skies are blue and sunny beauty is everywhere.

"How strikingly the course of Nature tells by its light heed of human suffering that it was fashioned for a happier world!" Listen to the songs of happy birds. How care-free! How joyously they outpour from over-flowing little throats their God-given melodies of love and gladness! Is not the world brighter and better for their being?

* * * * * * * * *

Overhead in the maple a little life was struggling for being. It was only a pebble thrown by a thoughtless boy "to see if he could hit it," but the cruel act was done, and the little songster, the happy bird whose early morning matins together with the carolings of his mate, had greeted us all through the summer lay in the little nest greviously wounded. The hurried, distressed movements of his little mate told of her anxiety to do what she could for the sufferer. She seemed to know it would not be long, now,—that he would never sing with her again.

After awhile everything was still in the maple bough. It was growing dark as we softly approached the nest, and we thought the remaining bird had flown away. It had not, however, for as the inquisitive face of our little girl peeped into the leafy retreat we heard a rustle of wings, and the bird flew out from its place of repose. Perhaps she was watching the little dead form of her mate, sure that her vigil would be rewarded and that he would greet her in the morning with love as he had done for so long. Who knows?

Next day we buried the little martyr and the other bird went away. She has not returned since, but the nest still remains in the old place. The boy who had done the mischief went on his way unconscious of the thing he had done, but

"He can never, never repay
The little life that he took away."
—E. S.

THE BOTTLE-NOSE DOLPHIN.

DOLPHINS, according to the best authorities, inhabit all oceans, and undertake great migrations, but are the only Whales which frequent the rivers or even spend their whole lives in them, or in the lakes connected with them. They are all gregarious, some of them collecting in very large shoals, and roaming about the sea together for weeks and weeks. Their liveliness, playfulness, and lack of shyness have earned them the friendship of sailors and poets from the remotest ages.

The Bottle-nose Dolphin is one of the best known members of the family. The snout is very long, like a beak, and protrudes from twelve to twenty-four inches. The range of this Dolphin seems to be restricted to the Arctic Ocean and the north of the Atlantic, but it is known to make regular migrations a considerable distance south of it. Occasionally it appears on the coast of Great Britain. Cuttlefish, Mollusks, and small fry compose its food.

Kuekenthal declares that its diving powers are remarkable; 300 fathoms of line were taken off by a harpooned Bottle-nose which remained forty-five minutes under water. They swim with such extraordinary speed that they not only follow the course of the swiftest steamer with ease, but gambol near it on their way, circling around it at will, and without being left behind. Occasionally one of them jerks himself up into the air, and, turning a somersault, falls noiselessly back into the water and hurriedly resumes his former position.

Several years ago we saw a school of Dolphins swimming and frolicking in the East River on the way from New York Bay to Long Island Sound. They seemed to us like gigantic Swine, their motions being similar to those that precipitated themselves, according to the New Testament, into the sea. They are very interesting to watch, and travelers find great pleasure in their company in crossing the ocean. Sometimes a small school of Dolphins will play about the ship for days at a time, affording constant amusement to the spectators.

NEW CHAMPION FOR THE SPARROW.

THE Sparrow has found an unexpected champion in the Prime Minister of France. The farmers have recently been agitating in favor of the extermination of the little bird, and succeeded so far that a decree was submitted to Premier Meline for signature, giving orders for the destruction of the bird throughout the country by all available means. Before giving his sanction to the measure the Prime Minister determined to make an investigation, in the course of which he has received so much information in favor of the birds, especially from the Forestry Department, that he has not only refused to sign the decree, but has announced that he is about to take steps to promote the increase of the species in consequence of its usefulness. It seems that the harm they do to the crops is more than counterbalanced by the benefits which they confer in destroying the Caterpillars, Worms, and other insects that are so detrimental to trees.

It seems incredible that the matter of the usefulness or noxiousness of this little bird cannot be settled finally by those vested with authority to act. It is either beneficial or a pest. We think it is both, according to circumstances.

THE VOICE OF NATURE.

Who could not sleep in this embowered room
Perched high above the suffocating ground ;
Where clinging vines, and tree-tops in their bloom
Cast grateful shade and fragrance all around ;
When, added to the magic spell of flowers,
The night bird's song fills up the witching hours!

Who could not rise refreshed at early dawn
In this same sweet, enchanted nook ;
When, to the half-unconscious ear is borne,
From Lark and Robin, Sparrow, Thrush and Rook,
The gentle warning of the opening day—
God's earliest sermon to humanity!

What soul could feel the burdening weight of sin
When, from these tiny, upraised throats,
The songs of Nature's praise begin
And Heavenward pour, in liquid dulcet notes!
We gladly join our grateful voice to theirs
And turn our thoughts to God in earnest prayers.

E. D. BARRON.

IN THE ANIMAL WORLD.

THE organs of smell in a Vulture and a Carrion Crow are so keen that they can scent their food for a distance of forty miles, so they say.

THE wings of birds are not only to aid locomotion in the air, but also on the ground and water. One bird even has claws in the "elbows" of its wings to aid in climbing.

THE Elephant does not smell with his trunk. His olfactory nerves are contained in a single nostril, which is in the roof of the mouth, near the front.

HUMMING BIRDS are domesticated by placing in their cages a number of paper flowers of tubular form, containing a small quantity of sugar and water, which must be frequently renewed. Of this liquid the birds partake and quickly become apparently contented with their captivity.

RIGHTLY considered, a Spider's web is a most curious as well as a most beautiful thing. When we were children, the majority of us supposed that the Spider's web was pulled out of its mouth, and that the little insect had a large reel of the stuff in his stomach, and that he could almost instantly add feet, yards, or rods to the roll. The facts are that Spiders have a regular spinning machine—a set of tiny tubes at the far end of the body—and that the threads are nothing more nor less than a white, sticky fluid, which hardens as soon as it comes in contact with the air. The Spider does not really and truly "spin," but begins a thread by pressing his "spinneret" against some object, to which the liquid sticks. He then moves away and by constantly ejecting the fluid and allowing it to harden, forms his ropes or wonderful geometrical nets.

BIRDS have separate notes of warning to indicate whether danger is in the shape of a Hawk or a Cat or a man. If a Cat, a Hawk, or an Owl is on the move, the Birds, especially Blackbirds, always utter a clattering note, constantly repeated, and Chickens have a special sound to indicate the presence of a Hawk. But when disturbed by man the Blackbirds have quite a different sound of alarm and the Chickens also.

TUFTED PUFFIN.
$\frac{2}{3}$ Life-size.

THE TUFTED PUFFIN.

THESE birds nest in colonies, the family consisting of about thirty species, nearly all found in the northern parts of the northern hemisphere. Audubon is said to have procured the specimen figured by him at the mouth of the Kennebec river, Maine, the only record of its occurrence on the Atlantic coast.

The Tufted Puffin breeds upon the rocks and in the Rabbit warrens near the sea, finding the ready-made burrows of the Rabbit very convenient for the reception of its egg, and fighting with the owner for the possession of its burrow. Where Rabbits do not exist, the Puffin digs its own burrows, and works hard at its labor. The egg is generally placed several feet within the holes, and the parent defends it vigorously.

Like most of the sea birds, both sexes assist in incubation, says a recent writer, referring to the birds found at the famous rookery in the open sea two hundred miles west of Fort Wrangell, an island often visited by the Indians for birds and eggs, and are close sitters, a great amount of probing with a long stick being necessary to dislodge them. A grassy hill side is a favorite retreat and here it is dangerous to travel about on account of the Puffins constantly coming blindly out of their dark holes with a force sufficient to upset one if fairly struck by the flying birds. When specimens are wanted they are easily captured with snares set over their holes during the night. The vari-colored pear-shaped eggs are well known and make good eating.

The Farrallones are the home of vast numbers of Puffins, as well as other sea-birds, though less numerous than formerly. The nests have been robbed for the eggs to an extent that threatened their extermination until a recent law was enacted for their protection. A portion of the island is a veritable rookery, the grotesque birds standing guard all about the rocks. They are very awkward on land, moving with a comical waddling stride, but on the wing are graceful, rapid flyers. They dive and swim with ease, pursuing the fish in the water, which, with crustaceans and insects, constitutes their food.

The Farrallones have become largely known from the wholesale collection of the eggs of sea birds for market purposes. As they nest chiefly in colonies, the eggs therefore being numerous, it has been, hitherto, a considerable industry. The eggers starting together soon separate to cover their various routes over the cliffs, the birds appearing in rows all over the hill side. "As an egger climbs his familiar trail toward the birds, a commotion becomes apparent among them. They jostle their neighbors about the uneven rocks and now and then with open bills utter a vain protest and crowd as far as possible from the intruder without deserting their eggs. But they do not stay his progress and soon a pair, then a group, and finally, as the fright spreads, the whole vast rookery take wing toward the ocean. Instantly the Western Gulls congregate with their hollow *kock-kock-ka* and shrill cries adding to the din, to secure their share of the booty, and the egger must then work rapidly to secure the eggs."

"THE TALK OF ANIMALS."

[This is the title of an article from the *London Telegraph*, which is so well written, and is so interesting that we cannot deny ourselves the privilege of making liberal extracts from it..]—*Ed.*

NATURALISTS have recently been discussing the interesting question whether or not Bees can talk with each other. Those best informed on the subject are, we gather, inclined to regard it as perfectly possible. Such a view would, perhaps, astonish many minds not familiar with these and others of the lower creatures by daily observation. Yet the more people live in close notice of animals and insects the less inclined they will feel to draw that very difficult line which divides instinct from reason, or to set any hard and fast limit to the wonders of Nature. In fact, the very word "lower" becomes sometimes an insult, a positive affront to the wonderful life about us, which even proud Man himself has scarcely a right to offer. There could, for instance, be nothing well conceived humbler than the Earthworm. Until the illustrious Darwin took up the subject of that despised being no one comprehended the vastness of man's debt to this poor, ugly, trampled creature. The numberless millions of that obscure tribe, none the less, have created all the loam and all the arable land of the whole globe, passing through their bodies the fallen leaves and decaying vegetable matter; and by their single sphere of labor in this respect rendering cultivation and harvests possible. When we tread on that Worm we destroy an agricultural laborer of the most respectable class. To those eternal and widespread toils of the creeping friend of men we owe the woods, the meadows, and the flowers. This is, of course, only an example of the importance, not of the faculties of the lower creatures.

Nevertheless even Worms communicate sufficiently to have and to observe their seasons of love; and Bees are so much higher in the scale of life, and so richly gifted in all details of their work, and so sociable in their habits, that it would not be at all a safe thing to say they possess no means of intercourse. Certainly no skillful and watchful bee-master would ever venture upon such an assertion. He knows very well how the sounds in the hive and those produced by individual Bees vary from time to time, and in a manner which appears to convey, occasionally at all events, mutual information. A Wasp or a strange Bee entering a hive without permission seems mighty quickly to hear something not very much to its advantage, and when two or three Bees have found a good source of honey, how on earth do all the others know which path to take through the trackless air, except by some friendly buzz or wing-hint? Now, the bee-masters tell us that there is surely one particular moment in the history of the hive when something very much like actual language appears to be obviously employed. It is when the young queen is nearly ready to move away. She begins to utter a series of faint, staccato, piping noises, quite different from her ordinary note, and just before she flies off this sound becomes altered to a low, delicate kind of whistle, as if emanating from some tiny fairy flute. How this small cry, or call, or signal, is produced nobody understands. The major portion of sounds in a hive is, of course, caused by the vibration more or less rapidly of the wings of the Bees. But whoever has examined the delicate machinery with which the Grass-hopper makes his chirp would not be surprised to find that the queen Bee had also some peculiar contrivance by which to

deliver what may be called the royal speech on the one or two great and signal occasions of her exemplary life.

We should, however, confine the subject in the boundary of far too close a fancy if it were imagined that sound was the only way in which speech and intercourse may pass among these humble creatures. Human beings naturally gather up that idea by living themselves in an atmosphere of which they agitate the waves for objects of mutual communication. No scientific Bee or highly educated Ant, if such creatures were possible, seeing and hearing men and women talk to each other, would dream that they could equally well exchange thoughts by making marks upon paper, or send their messages of love and business by seas and lands through a quivering wire. Nay, if report is to be believed, we are soon to be able to transmit, at a flash over long distances, a face, a map, a plan, a picture, a whole page of a newspaper, or an actual scene. As, therefore, those lower creatures, if they indeed could hear us speak, would have no notion of how we make the air waves into words, and still less grasp knowledge of any subtler form among human intercourse, so it is not quite safe for man to think and call all these strange families of the silent world alike dumb, or to despise them for being free of grammars and dictionaries. As a matter of fact, it is obvious that some power of mutual communication assuredly comes to all creatures that live in societies. Nobody can watch the flight of a flock of birds, the behavior of a herd of cattle, or, lower down, the marvelous accommodations for common existence of the small creeping and flying things, without perceiving that they know each other's minds in some way or other in a very satisfactory manner. Evidently there is, to begin with, a common language—a *lingua franca*—of the fields and of the forests. All sportsmen know how the particular cry of a frightened bird will put all the wild animals on the alert who would otherwise quite disregard the bird's ordinary note. And the evil success with which poachers can imitate the cries of love and defiance from denizens of the woodlands, proves that its inhabitants possess a vocabulary which can be stolen.

But, who, in truth, loving Dogs and Cats and such-like humble friends ever can doubt their high intelligence and the strong and clear significance attaching to certain among their habitual utterances? Even London cab and cart Horses, though they cannot—fortunately for some among us—speak, grow to understand the few invariable words of direction which their drivers address to them. In the inferior orders of life there are doubtless many other methods of intercourse, and almost certainly there exists a plain and very useful language of touch. Nobody can read the delightful researches of Sir John Lubbock into the habits and customs of Ants without feeling persuaded that those little beings transact their business perfectly well by touching each other's antennæ. When Ants meet, a rapid passage of these wonderfnl organs takes place, gliding like rapiers above and below, and this quickly informs them whether they be friends or enemies, which is the nearest respective road home, whether any food is to be procured nigh at hand, and what is the general news in the formicatory world. Truly it would be more desirable to learn what Bees talk about rather than to discuss the problem whether they talk at all. The views of Bees upon the purposes and colors of flowers, upon the moral duties of frugality and loyalty, and as to the real meaning and lovliness of a Rose, would be worth hearing. Of this much we may be all assured, that the little things of the world evade our knowledge as much and are quite as marvelous as the very largest and highest.

THE BUTTERFLY.

By Emily C. Thompson.

IN THE western part of England if the first Butterfly you see in the spring is white and if you succeed in killing this Butterfly, good luck will surely come to you. Some gentlemen on their way to church one day saw a friend dashing down the road wildly brandishing a cane. He could not stop to explain. He was as a rule a sedate, calm man, so this excitement alarmed them. As nothing could be done, they went on their way and soon met the father of their friend, an old man who usually hobbled painfully along on two canes. He too was excited and was doing his best to make his way down the road with only one cane. His first words were, "I'm afraid he has missed it." "Missed what?" thought the gentlemen, and finally after many efforts to quiet him enough for conversation learned from the old man that his son had seen his first butterfly, that it was white and that without more ado he had snatched his old father's cane and set off in pursuit. Still the old man was perfectly willing to hobble along as best he could, if only good luck and prosperity could be procured by the slaughter of the pretty little insect. The color of its wings is due to what seems to us a fine dust scattered over them, but in reality this dust is made up of little discs fastened by stalks to the wings, arranged usually in rows somewhat like the shingles on a house.

Notice its two great round eyes and remember that each of these is composed of thousands of perfect little eyes. Its trunk you will find coiled up under its head and sometimes this Butterfly of ours completes its toilet by opening its trunk and cleaning it. By the antennæ of the Butterfly you can tell it from the Moth, for those of the former are immovable and furnished with knobs, while those of the other have not the knobs and can be stowed away under the wings. If you wish to distinguish the Butterfly from the Moth, remember this fact, and also that Butterflies fly only in the daytime and always rest with the wings erect. These facts are trustworthy, for no Moth has ever been found to possess all three of these characteristics, though some do possess one or two.

Though curious in itself, its life history is still more curious. Man, in passing through his seven ages never loses the distinguishing characteristics which make him a man, but our Butterfly as it passes through its three ages changes so much that we seem, while studying it to be studying three distinct creatures—the Caterpillar, the Chrysalis, and the Butterfly.

In the Caterpillar our dainty little fairy presents itself as it appears in its first stage, having just spent a few days, or a month, or perhaps the whole winter in the egg. It changes its old skin many times during its Caterpillar life of twenty or thirty days, at each change gaining in weight and brilliancy, until with the last it appears as a Chrysalis "a legless, mummy-like creature," which maintains its suspended position by means of the hooks on its tail or by a silken girth around its body. A few days before the Butterfly comes forth, it can be seen through the thin cases. Finally the skin on the back bursts open and the little insect is free. For a few minutes it stands with drooping wings. Gradually the wings distend and in a short while reach four times their original size. Then our Butterfly hastens away to carry its joyful greeting to man and flower. So the cycle of Butterfly life can thus be

BUTTERFLIES.—Life-size.

Terias nicippe.
Colias philodice.
Meganostoma eurydice (Male.)

Papilio Photenus.
Limenitis ursula.
Papilio philolaus.

Terias mexicana.
Junoina Cœnia.
Meganostoma eurydice (Female.)

indicated: Egg, Caterpillar, Chrysalis, Butterfly, Egg.

Why they migrate is not known but evidence enough has been brought in by eye witnesses to prove that this does occur. One flight seen in Switzerland lasted for two hours, the continuous stream of insects being ten or fifteen feet wide and made up of the species called the Painted Lady. Similar companies have been seen at sea, as Mr. Darwin bears witness, also before and after tornadoes in certain places. In Ceylon a gentlemen drove through a cloud of white Butterflies for nine miles. But very interesting to us, is a great migration recorded to have been seen in our own country, in Massachusetts, about Oct. 1, 1876. These are strange stories, but really hardly more strange than other facts about these little animals, graceful and beautiful in form and motion, whose very presence adds greatly to the charm of mother Nature.

Such quantities of eggs are laid by the Butterflies that if certain animals did not contend against them, man would not be able to withstand the ravages of the Caterpillar. Man has one powerful ally in the birds which devour enormous quantities of these eggs, but a still more powerful ally is the Ichneumon Fly. This little insect is a parasite through its grub state and chooses as its host either the egg of the Butterfly or the Caterpillar. The full grown Fly lays its egg by means of an ovipositor, a sharp, hollow instrument with which it can pierce the skin or shell of its victim. The eggs of the fly hatch and the grubs feed upon the Caterpillar, but usually do not touch upon its vital parts until it is full grown, then they devour them and within the skin of their former host form their own cocoons. Sometimes they wait until the Caterpillar assumes its Chrysalis state before they finish their dread work, then much to the surprise of interested beholders, a little cluster of flies appears at the breaking of the cocoon, and no beautiful Butterfly.

Some of these brightly colored little messengers of gladness live through the winter. Usually they pass this trying period wrapped warmly in the cocoon or nestled under some leaf, still a Chrysalis; but a few species weather the cold and the snow and, shut up in some hollow tree or some empty shed, sleep away the happy days of Jack Frost and Santa Claus and are ready to awake with the spring, when they are not abashed in their bedraggled garments to appear among their brothers, who come forth brightly clad, fresh from the soft, warm resting place of the cocoon.

Perhaps the marvelous migration of Butterflies which occurred on Oct. 3, 1898, will be more interesting to us than those already mentioned because it happened so recently and in our own country, and perhaps, most of all, because the reason for flight is hazarded. The inhabitants of Wichita, Kansas, at 3:15 o'clock in the afternoon of that day were greeted with the sight of many Butterflies flying south. Gradually the number increased until business practically ceased, the inhabitants all turning out to view the brilliant spectacle. The stream of yellow and brown insects, with the accompanying purr and brilliant effects of fluttering wings flowed on until within a half an hour of sunset, and even after this, millions of stragglers hastened southward. But you are interested in the reason given? They say that our little friends were driven away from their customary haunts by the forest fires in Colorado. This is only one more supposition to add to the list already awaiting some enterprising student, who shall at last solve the mystery of these wonderful flights and fully acquaint us with all the other interesting facts which our little Butterflies are still keeping secret.

THE ARMADILLO.

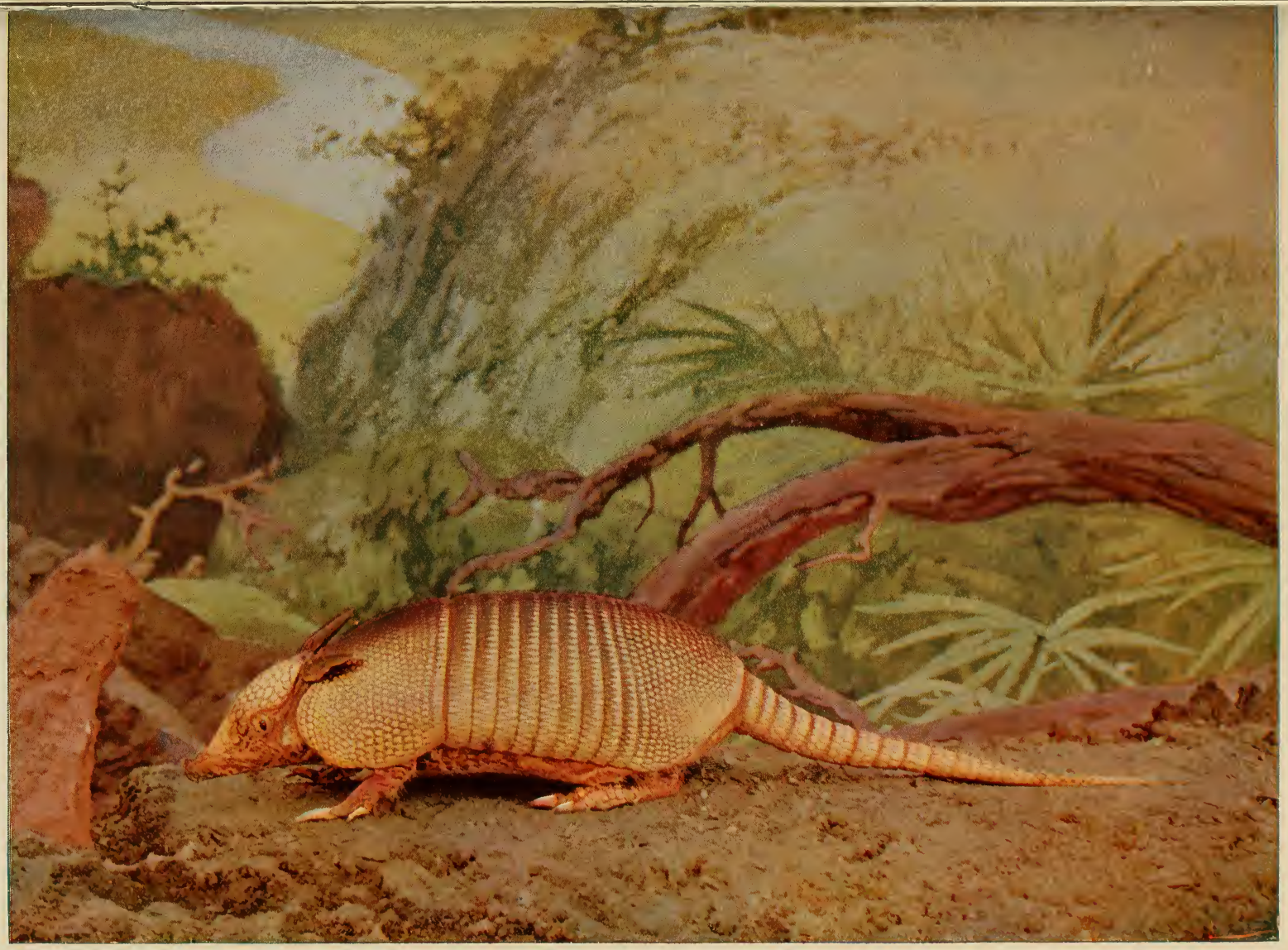
ALL Armadillos bear the name Fatu in the South American Guarau Indian language. Although the name is of Spanish origin the Indian term Fatu has also been adopted in European languages, except in the single case of the six-banded species. They are all of more or less similar appearance and habits. They are natives of the southern American belt, extending as far north as Mexico, and the specimen presented here was taken in Texas, where it is occasionally found. The Armadillos are at home in sparsely grown and sandy plains, and in fields on the edges of woods, which, however, they never enter. During the breeding season they consort together, but at all other times lead solitary lives and show no regard for any living thing except as it may serve for food.

Singular as it may appear, Armadillos do not have a regular abiding place, and they frequently change their homes. They can dig a hole in the ground five or six feet deep with such expedition that they are able to have several places of retreat. The hole is circular, at the entrance from eight to twenty-four inches wide, and at the bottom is a snug chamber large enough for them to turn around in. They are great night rovers and seldom move about by daylight, the glaring sunlight dazing them. When seen during the day it is always in rainy weather when the sky is overcast. It has been shown that Armadillos excavate their burrows under the hills of Ants or Termites, where they are able to gather their principal food with the greatest convenience by day as well as by night. Besides the foregoing they eat Caterpillars, Lizards, and Earthworms and are thus advantageous to the husbandman. Plants also constitute a part of their diet.

Armadillos are not agile but are remarkably muscular. It is said, to avoid their enemies they can cut their way into the earth in places which a hoe wielded by a strong man can pierce with difficulty. The Fatu needs only three minutes to drive a tunnel exceeding the length of its own body. The strongest man is incapable of pulling it out by the tail. Once in its hole, it is always secure from Dogs. When it is seized by Dogs, it never defends itself in any way. This is probably not from cowardice, but because it believes itself secure from danger.

Best of all, the Armadillo is a useful animal. The Indians are fond of nearly all the species. While it has an unpleasant odor of musk, it can be prepared for the table; and some think it one of the most palatable of dishes. One of the species can roll itself into a ball, which, however, it does only in extremity.

In captivity Armadillos are usually put in cages with Monkeys, who, if they do not precisely reduce them to servitude, at least use them as playthings. The Monkeys ride their backs sportively, turn them over, without the danger they might experience from Turtles, who are less harmless, and cause them no end of worry. The Armadillo, with all his coat of mail, has a fur lining on his belly, and the experienced Dog quickly turns it over and makes short work of the apparently invulnerable quadruped. The Dog quickly crunches the thin armour and leaves the poor beast lifeless. Only the powerful digging claws which might, one would think, be used in his own defense, remain to tell the tale of the only means which nature has seemed to provide him with against his ememies.



ARMADILLO.
⅓ Life-size.

NATURE'S GROTESQUE.

(THE YELLOW-BREASTED CHAT.)

THIS bird comedian is an actor, a mimic, and a ventriloquist; he has been called "a rollicking polygot," "an eccentric acrobat," "a happy-go-lucky clown, turning aerial somersaults," "a Punchinello among birds," and from my own experience I can add that he is a practical joker and "an artful dodger." His voice is absolutely unique in its range. Besides his power as a ventriloquist, to throw it in any direction, and so entice away from his nest any intruder upon his domain, he possesses the most unequaled capacity for making queer noises. On a certain summer day I was driving to Monticello, the Virginia home of President Jefferson, along a beautiful road, bordered by tall trees and a thick, leafy undergrowth where a thousand nests might be safely hidden. All along a road the Chats called *chit, chit,* or barked, whined, clucked, whistled, sang, chuckled and called overhead, or out of the bushes beside us, always invisible, or just giving a flutter to the leaves to show their presence. One of the party declared one called *Kitty, Kitty!* distinctly, and he also mimicked a puppy most successfully. Later on, in July, I was stopping near a favorite haunt of the Chats; a country place on the edge of the woods, where thickly growing shrubs and bushes filled the deep hollows between the hills and near the streams. Here they had their broods, and not only all day, but late in the evening by moonlight they could be heard, making the whole place ring with their medley of sounds, while not a feather of them could be seen.

Yet I finally succeeded in catching various glimpses of them, and in equally characteristic, though different moods. First, I saw them darting rapidly to and fro on foraging journeys, their bills filled with food, for they are most admirable husbands and fathers, and faithful to the nests that they hide with such care. They are beautiful birds, rich olive-green above and a bright yellow below, with two or three pure white lines or stripes about the eye and throat and a "beauty spot" of black near the beak. I watched one balancing on a slender twig near the water in the bright sunshine and his colors, green and gold, fairly glittered. His nest is usually near the ground in the crotch of a low branch and is a rather large one, woven of bark in strips, coarse grass and leaves, and lined with finer grass for the three or four white eggs, adorned with small reddish-brown spots. One pair had their home near a blackberry thicket, and they might be seen gobbling berries and peeping at you with bright black eyes all the while.

The Chat excels in extraordinary and absurd pose; wings fluttering, tail down, legs dangling like a Stork, he executes all kinds of tumbles in the air. It is said that a Chat courtship is a sight never to be forgotten by the lucky spectator. Such somersaults, such songs, such queer jerks and starts. Our bird is one of the Wood Warbler family, a quiet and little known group of birds. His elusiveness and skill in hiding, and his swift movements, are his only traits in common with them.

ELLA F. MOSBY.

In those vernal seasons of the year, when the air is calm and pleasant, it were an injury and sullenness against Nature not to go out and see her riches and partake in her rejoicing with heaven and earth.—MILTON.

THE RED-HEAD DUCK.

IN MANY points of structure and habits Sea Ducks, of which this is a specimen, may be distinguished from Fresh Water Ducks by the presence of a lobe or little flap of skin on the lower side of the hind toe. The legs of the former are also placed farther behind, and they are thus better fitted for swimming, though not so well adapted for walking or running on land. The feathers of Sea Ducks are more dense also, and they are all provided with a quantity of thick down next to the skin, which is of no small commercial value.

The difference in the habits of the two species is no less striking. The latter dive for their food, which the former never do; they are chiefly maritime in their distribution, although all, or nearly all, retire to fresh water lakes to raise their young.

The Red-head is said not to be common along the coast of New England, but in the winter months is found in considerable numbers along the south shore of Long Island. It is extremely abundant south of that point, and particularly so in Chesapeake Bay, where immense numbers are killed each season. Where it is enabled to feed on the well known wild celery its flesh is said to be fully equal in flavor to that of the Canvas Back. Both in spring and fall it is an extremely abundant migrant in the Western States. It generally reaches northern Illinois, says Hallock, in its spring passage about the last of March, remaining until the latter part of April. On its return journey late in October, it remains on the rivers, lakes, and sloughs until the cold weather, by freezing up its feeding grounds, forces it to go farther south. It is altogether probable that a few of these birds breed in the Rocky Mountain regions within the limits of the United States, but they usually continue northward to their regular breeding grounds, which extend from Wisconsin, Michigan, and others of the northern tier of states, to the fur countries.

The Red-head was found nesting on the St. Clair Flats, Michigan, by Mr. W. H. Collins, who, in describing some of its breeding habits, says: "I had the good fortune to find two nests of this bird containing respectively seven and eight eggs. The first was placed on some drifted rushes on a sunken log, and was composed of flags and rushes evidently taken from the pile of drift upon the log, as they were short pieces, so short, in fact, that the nest when lifted with the hands fell in pieces. The nest was four inches deep and lined with down from the female. This nest contained seven fresh eggs of a creamy color, varied in measurements and of a uniform oval shape, very little smaller at one end. The other nest was built similar to a Coot's nest; that is, of flags and grass interwoven at the base of a bunch of flags growing in water three or four feet deep. It was built in such a way that the nest would rise and fall with the water."

The food of the Red-head consists of mollusks, shell-fish, and the seeds and roots of aquatic plants.

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RED HEADED DUCK.
⅓ Life-size.

BIRDS IN GARDEN AND ORCHARD.

DURING the last year I have received quite a number of letters from all over the United States, inquiring why so few birds are found about the homes, among the ornamental shrubs and trees, and in the orchard. My correspondents also wish to know how our beautiful native songsters can be induced to take up their residence in the neighborhood of man. As the many inquiries came from the East, the West, the North, and the South, I shall treat the subject in the following manner:

The northern, eastern, and central states show but little difference as to their bird-life, and there is also little diversity in regard to the ornamental trees and shrubs of the gardens. The region included is bounded on the the north by the British possessions, on the east by the Atlantic ocean, on the west by the Rocky mountains, and on the south by the Indian Territory, Arkansas, Tennessee, and North Carolina. While living in the country I have always had birds at my home and in the neighborhood, and I shall, therefore, give my own experience.

Birds settle only where they find the surroundings perfectly congenial, and where they are protected and consequently feel safe; where dense shrubbery, evergreens, and deciduous trees abound, and where water and suitable nesting material are near at hand. In one garden they are exceedingly numerous, while in another one close by, only a few pairs, perhaps, are to be found. When protected, they soon learn to regard man as their friend. Their enemies, especially Cats, Squirrels, and Owls, must not be allowed to rove about in the garden and orchard, and such thieves and robbers as the Blue Jay, the Loggerhead Shrike or Butcher Bird, and that abominable tramp and anarchist among birds, the English Sparrow, should never be tolerated in a garden or park where other birds are expected to make their homes.

In the days of my boyhood the groves re echoed with the songs of many birds; the woods, however, have been cleared away, and in the poor remnants of the once magnificent forests there are few birds to be found today. The sweet notes of the Veery, the thundering sounds of the Ruffed Grouse, the loud hammering of the Pileated Woodpecker, are no longer heard. I have devoted much time to erecting bird houses and planting ornamental trees and shrubs for the accommodation of the birds. Here they soon took up their residences. On the top of the barn and granary Martin boxes were placed, and in the gables of the barn holes were cut to admit the pretty Barn Swallow and the Phœbe. Among the first birds to settle were the Robins and Bluebirds, both heralds of spring, appearing in the last days of March or early in April from their winter homes in our Southern States. The Baltimore Oriole suspended its beautiful hanging nest from a high horizontal branch of a Walnut tree. The Cedar Bird, quiet and retired in its habits, and a most beautiful denizen of the garden, placed its nest constructed of sheep's wool on a low horizontal branch of an Oak. The sprightly Canary-like song of the American Goldfinch, often called the Wild Canary, was heard throughout the summer, and its cozy little nest, lined warmly with thistle-down, was placed in the upright exterior branches of a Sugar Maple. In the same tree, but lower down on a horizontal branch the exquisite pendulous nest of the

Red-eyed Vireo was now and then found. This Vireo is an incessant songster as it gleans among the upper branches of the trees.

The Rose-breasted Grosbeak invariably nested in a clump of dense wild Crab-apple trees, partly overgrown with grape vines. Another inhabitant of the grove not easily overlooked, is the bold Kingbird, the guardian of the barnyard, its nest saddled on a rather strong moss-covered limb of another Oak. I could mention a number of other birds that build their nests near the dwellings of man, but space will not permit me to do so. I will add, however, that if my readers would have about them these beautiful and useful birds, which are almost the best friends of mankind, don't allow English Sparrows to come near your home, and you will soon find youself in the midst of the songsters. The incredible numbers of English Sparrows now found almost everywhere have driven our native birds away.

—Jos. F. Honecker,
Oak Forest, Ind.

GOLDENROD.

SPRING is the morning of the year,
And Summer is the noontide bright;
The Autumn is the evening clear
That comes before the Winter's night.

And in the evening, everywhere
Along the roadside, up and down,
I see the golden torches flare
Like lighted street-lamps in the town.

I think the Butterfly and Bee,
From distant meadows coming back,
Are quite contented when they see
These lamps along the homeward track.

But those who stay too late get lost;
For when the darkness falls about,
Down every lighted street the frost
Will go and put the torches out!

—*Frank Dempster Sherman.*

GOLDEN ROD.
4 5 Life-size.

OCTOBER.

AY, thou art welcome, heaven's delicious breath,
When woods begin to wear the crimson leaf,
And suns grow meek, and the meek suns grow brief,
And the year smiles as it draws near its death.
Wind of the sunny south! oh still delay,
In the gay woods and in the golden air,
Like to a good old age released from care,
Journeying, in long serenity, away.
In such a bright, late quiet, would that I
Might wear out life like thee, mid bowers and brooks,
And, dearest yet, the sunshine of kind looks,
And music of kind voices ever nigh;
And when my last sand twinkled in the glass,
Pass silently from men, as thou dost pass.

—BEZANT.

October days are stealing
All swiftly on their way;
The squirrels now are working,
The leaves are out at play;
The busy, busy children
Are gathering nuts so brown,
And birds are gaily planning
A winter out of town.

—CLARA L. STRONG.

FROM "CONSTANTINOPLE."

EDMONDO DE AMICIS.

CONSTANTINOPLE has one grace and gayety peculiar to itself, that comes from an infinite number of birds of every kind, for which the Turks nourish a warm sentiment and regard. Mosques, groves, old walls, gardens, palaces all resound with song, the whistling and twittering of birds; everywhere wings are fluttering and life and harmony abound. The sparrows enter the houses boldly, and eat out of women's and children's hands, Swallows nest over the café doors, and under the arches of the bazaars; Pigeons in innumerable swarms, maintained by legacies from sultans and private individuals, form garlands of black and white along the cornices of the cupolas and around the terraces of the minarets; Sea-gulls dart and play over the water; thousands of Turtle-doves coo amorously among the cypresses in the cemeteries; Crows croak about the Castle of the Seven Towers; Halcyons come and go in long files between the Black Sea and the Sea of Marmora; and Storks sit upon the cupolas of the mausoleums. For the Turk, each one of these birds has a gentle meaning, or a benignant virtue: Turtle-doves are favorable to lovers, Swallows keep away fire from the roofs where they build their nests, Storks make yearly pilgrimage to Mecca, Halcyons carry the souls of the faithful to Paradise. Thus he protects and feeds them, through a sentiment of gratitude and piety; and they enliven the house, the sea, and the sepulchre. Every quarter of Stamboul is full of the noise of them, bringing to the city a sense of the pleasures of country life, and continually relishing the soul with a reminder of nature.

There are seven kinds of animals, points out Cosmo that have never swallowed water. Among these are the Lamas of Patagonia and certain Gazelles of the far east, and a considerable number of reptiles—Serpents, Lizards, and certain Batrachians—that live and flourish where there is no moisture. A kind of Mouse of the arid plains of western America also exists where moisture is said to be unknown. In the London Zoological Gardens a Paroquet lived fifty-two years without drinking a drop, and some naturalists believe that Hares take no liquid except the dew that sometimes forms on the grass they eat. Even Cows and Goats in France, in the neighborhood of the Lozere, almost never drink, yet they produce the milk from which is made the famous Roquefort cheese.

ANIMALS AND MUSIC.

ONE of our poets is authority for the statement that "music hath power to sooth the savage breast," b t experiments have recently been made in Lincoln Park, Chicago, *The American Naturalist* tells us, to determine with scientific accuracy the effects of violin playing on certain animals.

"Music which was slow and sweet, like 'Home, Sweet Home' or 'Annie Laurie,' pleased the Panthers, a Jaguar, and a Lioness with her cubs. The Panthers became nervous and twitched their tails when a lively jig, 'The Irish Washerwoman,' was played to them, and relapsed into their former quiet when the music again became soothing.

"The Jaguar was so nervous during the jig music that he jumped from a shelf to the floor of his cage and back again. When the player ceased playing and walked away, the Jaguar reached out his paw to him as far as he could. His claws were drawn back.

"The Lioness and her cubs were interested from the first, though when the violinist approached the cage the mother gave a hiss, and the cubs hid behind her. At the playing of a lively jig, the cubs stood up on their hind legs and peeped over at the player. When the musician retreated from the cage, the animals came to the front of it and did not move back when he gradually drew so near as almost to touch the great paws which were thrust through the bars. When playing 'Home, Sweet Home,' the entire family seemed very attentive, and were motionless except that the cubs turned their heads from side to side. Then another jig was played and the cubs pranced about."

"The Coyotes in a den, squatted in a semicircle, and sat silently while the music continued. When it ceased, they ran up and pawed at the player through the bars. He began afresh, and they again formed in a silent semicircle. This experiment was tried several times with the same results."

Of late years the Sea Gulls have found it so much to their interest to come up to the Thames in our midst that their graceful evolutions around the crowded bridges in ever growing flocks has almost ceased to excite notice. But this year, as never before, they have descended upon the water of St. James Park in such great numbers that their presence must considerably exercise the minds of those responsible for the welfare of the other wild fowl there. They may be seen sometimes resting upon the surface of the eastern half of the lake in sufficient number almost to hide the water. And at the luncheon hour, when released workers throng bank and bridge, bestowing upon the water the scanty fragments of their frugal meals, the gulls, on ready wing, with an agility born of long practice over stormy seas, give the clumsier Ducks and Geese hard work to obtain even a small share of what is going. Not so long ago a piece of plain bread might often float uneaten until it sank waterlogged for the benefit of the fish. It is so no longer. No crumb now goes a-begging or is scouted by any of the old habitues as beneath their notice. —

London Paper.

SUMMARY.

KINGBIRD OF PARADISE.—*Cincinnurus regius.*

RANGE—New Guinea and the neighboring islands.

PECCARY.—*Dicotyles torquatus.*

RANGE—From Arkansas to Brazil. This specimen was taken in Texas.

BOTTLE-NOSED DOLPHIN. — *Tursiops tursio.*

RANGE—Arctic ocean and the north of the Atlantic.

TUFTED PUFFIN.—*Lunda cirrhata.* Other name: Sea Parrot.

RANGE—Coasts and islands of the north Pacific, from California to Alaska, and from Japan to Bering Strait. Accidental on the coast of Maine.

NEST—In crevices of rocks, often without lining.

EGG—One.

ARMADILLO.—*Tatusia novemcincta.* Other name Peba.

RANGE—From Texas to Paraguay.

RED-HEADED DUCK.—*Aythya americana.*

RANGE—North America in general, breeding from California, Wisconsin, and Maine, northward.

NEST—On low grassy grounds near the water.

EGGS—Seven to ten, grayish white to pale greenish buff; oval in form.

GOLDENROD.—*Solidago Virga-aurea.* The name is common to all the species of the genus *Solidago.*

Vol. IV. NOVEMBER, 1906 No. 4

The beautiful is as useful as the useful.—*Victor Hugo.*

BIRDS AND NATURE

CONTENTS

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ONLY MAGAZINE IN THE WORLD ILLUSTRATED BY COLOR PHOTOGRAPHY.

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A. W. MUMFORD & CO., Publishers

378 Wabash Ave., Chicago, Ill.

BIRDS AND NATURE

Monthly, except July and August

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

NATURE'S ORCHESTRA.

ALL nature is attuned to music. Man may seek the fields, the forests, the mountains, and the meadows, to escape from distracting noises of the city, but nowhere, not even in the depths of mountain forests, will he find absolute silence. And well for him that it is so, for should no noise, no vibration of the air greet his accustomed ear, so appalling would be the dead silence that he would flee from it as from the grave.

Even the Bugs make music. They may not be much as vocalists but they take part in nature's symphony with the brook, the Bird, and the deep diapason of the forest monarch swaying and humming to the gusts of the wayward wind. It is true that the great majority of our species of insects are silent, and those which do make sounds, have not true voices, breathing as they do through holes arranged along each side of their body, and not through their mouths, they naturally possess no such arrangement for making noises connected with breathing as we find in the human larynx.

The "buzzing Fly" and "droning Bee" are classed among nature's musicians, as well as the Cicadas, Grasshoppers, Crickets, Locusts, Katydids, and Beetles. Only the males are the musicians in the insect families—with the exception of the Mosquito, the lady being the musical member of that family —and the different kinds of Grasshoppers are provided with an elaborate musical apparatus by means of which they call their mates.

Chief among the insect performers is the Cicada, often confused with the Locust, though he does not belong to that family at all, who possesses a pair of complicated kettle-drums, which he plays with his muscles instead of sticks.

Directly behind the base of each hind leg is a circular plate of about one-quarter of an inch in diameter. Beneath each of these is a cavity across which is stretched a partition of three membranes. At the top is a stiff, folded membrane, which acts as a drum-head. Upon this he plays with his muscles, the vibrations being so rapid that to the ears of some listeners the noise, or music he engenders, sounds more like that of a mandolin than a drum. He is a black fellow with dull green scroll work over his thick body, lives in trees, and is generally invisible when he plays the drum.

The Grasshopper is the fiddler of the great orchestra, and the hotter the day the more energetically does he fiddle. The fellow with the short horns has a rough hind leg which he uses as a bow; this he draws across the wing cover, giving off the notes which he so dearly loves. Near the base of each fore wing is a peculiar arrangement of veins and cells. This arrangement differs in the different species, but in each it is such that by rubbing the fore wings together they are made to vibrate, and thus, some naturalists aver, they make the sounds which we hear.

The most easily observed of all insect musicians are the common Crickets. By placing a sod of growing grass in a cage with several male crickets, you can watch them play upon their fiddles. Upon the lower side of their wings you will see ridges like

those of a tiny file, and on the inner margin toward the base from the end of the principal vein, a hardened portion, which may be called the scraper. By using the files and scrapers of their fore wings the little musicians add their notes to the universal music of the world. ELLANORA KINSLEY MARBLE.

A LITTLE BIRD.

A little Bird in a tree
Made one—a man and maiden three.
'Twas not by chance that they had met!
"None see," they said; one can forget
A little Bird.

A long hot road, a strip of grass,
'Twould tempt the Fates to let it pass!
Two people linger in the walk;
There's only one to hear them talk,
A little Bird.

Long shadows stretched across the sky,
Two people parted with a sigh,
But there was no one there to see!
How do I know? and who told me?
A little Bird.

—*E. R. C.*

THE TURKEY'S FAREWELL.

I go, but I return.
The fiery furnace has no horrors for me.
Mine is a race of martyrs. I can trace
Ancestors by the score who laid their heads
Upon the axman's block. It is a little way
We have. Why should I care to flaunt
My feathered beauty on a bare November bough?
I shall appear again in a far richer dressing.
In years to come it will be said of me,
As of my ancestors, that nothing in my life
Shed so much glory as the leaving of it.
Full many a little child that now
Is prattling at its grandma's knee shall say
In future years that of all days it holds
In the most sacred memory the one
When it officiated at
The funeral of this Turk. And now
Lest some one shall say I knew not how to die,
Let the ax fall.

BIRDS.

THE BIRD is little more than a drift of the air brought into form by plumes; the air is in all its quills, it breathes through its whole frame and flesh, and glows with air in its flying, like a blown flame; it rests upon the air, subdues it, surpasses it, outraces it—*is* the air, conscious of itself, conquering itself, ruling itself.

Also, into the throat of the Bird is given the voice of the air. All that in the wind itself is weak, wild, useless in sweetness, is knit together in its song. As we may imagine the wild form of the cloud closed into the perfect form of the Bird's wings, so the wild voice of the cloud into its ordered and commanded voice; unwearied, rippling through the clear heaven in its gladness, interpreting all intense passion through the soft spring nights, bursting into acclaim and rapture of choir at daybreak, or lisping and twittering among the boughs and hedges through heat of day, like little winds that only make the Cowslip bells shake, and ruffle the petals of the Wild Rose.

Also, upon the plumes of the Bird are put the colors of the air; on these the gold of the cloud, that cannot be gathered by any covetousness; the rubies of the clouds, the vermilion of the cloud-bar, and the flame of the cloud-crest, and the snow of the cloud, and its shadow, and the melted blue of the deep wells of the sky—all these, seized by the creating spirit, and woven into films and threads of plume; with wave on wave following and fading along breast and throat and opened wings, infinite as the dividing of the foam and the sifting of the sea-sand; even the white down of the cloud seeming to flutter up between the stronger plumes, seen, but too soft for touch.—RUSKIN.

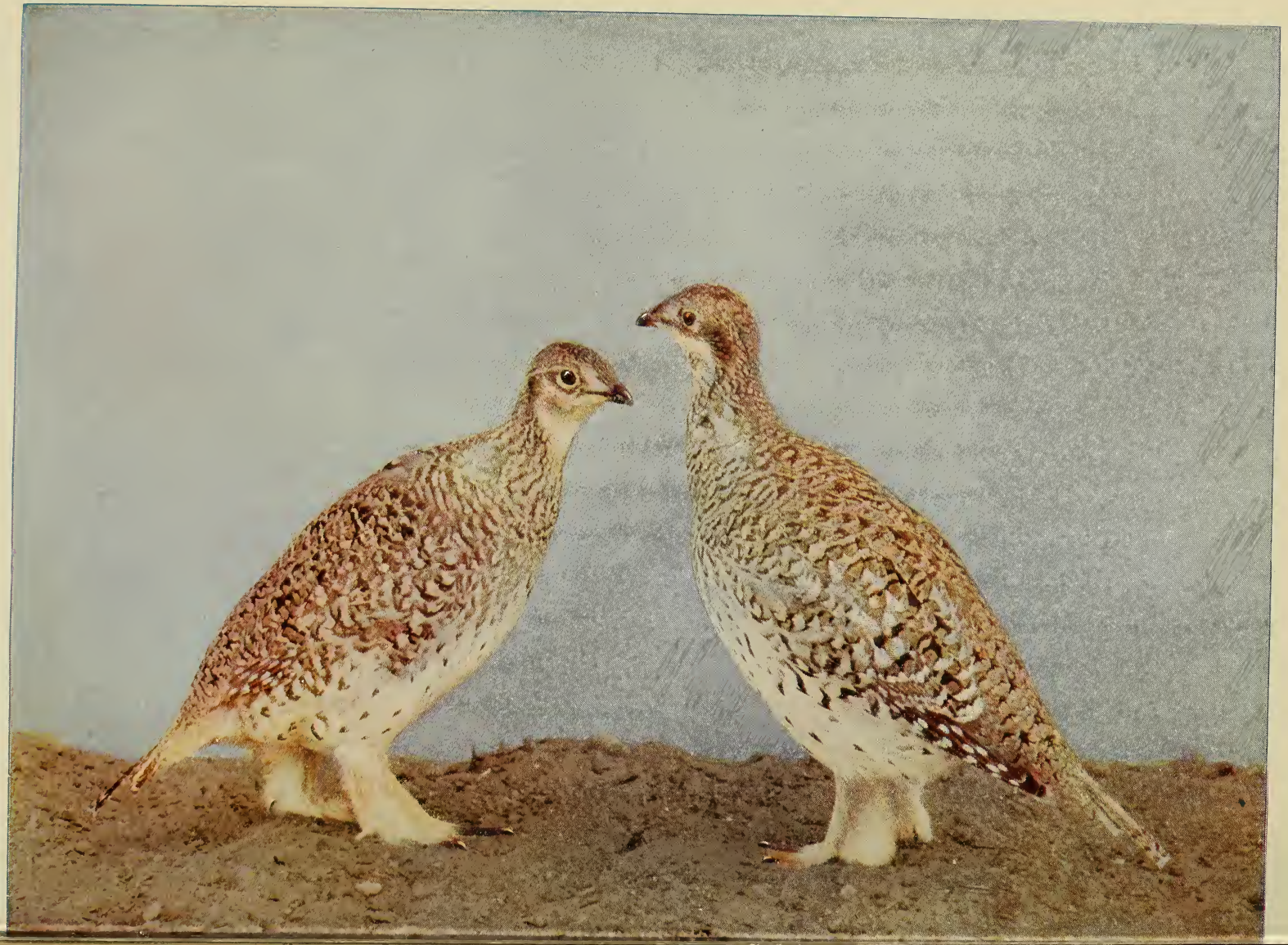
BIRDS IN STORMS.

DURING windstorms birds may sometimes be seen flying overhead at a great height. When this is observable, it is said it may be taken for granted that the upper atmosphere is comparatively quiet, and the disturbance is confined chiefly to the lower regions. Many seabirds seek the upper air of comparative quietness during tropical hurricanes. A writer in the Boston *Transcript* says that when a heavy wind or gale springs up, the Gulls, Terns and Petrels will fly back and forth over the water's surface, rising and falling, and uttering their peculiar cries of warning. If the storm extends too high up they will drift gradually with the wind, or fly away on the edge of the hurricane. Very often they get caught unexpectedly in the gales of wind, and they find themselves in a dangerous position. Then they struggle with might and main against the powers of the air currents. Knowing that danger and death face them if they once come under the dominion of the wind, they use all the strength and tactics they are capable of to combat the elements. A young Herring Gull, a Petrel, or a Tern thus surprised will beat up against the wind with powerful flight. It will rise high in the air, facing the gale, and making a little progress forward as well as upward. Then it will suddenly descend with rapid flight toward one side of the storm-swept path, but falling off at the same time in the direction of the blowing wind. Once more it will sweep around and face the storm, ascending heavenwards and striking desperately out toward the direction of the storm. By pursuing these tactics, the bird will gradually work itself to one side of the storm centre.

THE SLEEPING-PLACES OF BIRDS.

IT IS difficult to imagine a spot with fewer domestic features to adorn the home than a piece of the bare ceiling of a tropical veranda; but the attachment of animals to their chosen sleeping-places must rest on some preference quite clear to their own consciousness, though not evident to us. In some instances the ground of choice is intelligible. Many of the small blue British Butterflies have grayish spotted backs to their wings. At night they fly regularly to sheltered corners on the chalk downs where they live, alight head downwards on the tops of the grasses which there flourish, and closing and lowering their wings as far as possible, look exactly like seed-heads on the grasses. If the night is cold they creep down the stem and sleep in shelter among the thick lower growth of grass. The habits of birds in regard to sleep are very unlike, some being extremely solicitous to be in bed in good time, while others are awake and about all night. But among the former the sleeping-place is the true home, the *domus et penetralia*. It has nothing necessarily in common with the nest, and birds, like some other animals and many human beings, often prefer complete isolation at this time. They want a bedroom to themselves. Sparrows which appear to go to roost in companies, and sometimes do so, after a vast amount of talk and fuss, do not rest cuddled up against one another, like Starlings or Chickens, but have private holes and corners to sleep in. They are fond of sleeping in the sides of straw-ricks, but each Sparrow has its own little hollow among the straws, just as each of a flock of sleeping Larks makes its own "cubicle" on the ground. A London Sparrow for two years occupied a sleeping-home almost as bare of furniture as the ceiling which the East Indian Butterfly frequented. It came every night in winter to sleep on a narrow ledge under the portico of a house in Onslow Square. Above was the bare white-washed top of the portico, there were no cosy corners, and at eighteen inches from the Sparrow was the gas-lit portico lamp. There every evening it slept, and guests leaving the house seldom failed to look up and see the little bird fast asleep in its enormous white bedroom. Its regular return during two winters is evidence that it regarded this as its home; but why did it choose this particular portico in place of a hundred others in the same square?—*Spectator.*

BIRD COURTSHIPS.—When he (the Flicker) wishes to charm his sweetheart he mounts a very small twig near her, so that his foreparts shall not be hidden as he sits upright in regular Woodpecker attitude, and he lifts his wings, spreads his tail, and begins to nod right and left as he exhibits his mustache to his charmer, and sets his jet locket first on one side of the twig and then the other. He may even go so far as to turn his head half around to show her the pretty spot on his "back hair." In doing all this he performs the most ludicrous antics, and has the silliest of expressions of face and voice, as if in losing his heart, as some one phrases it, he has lost his head also. For days after she has evidently said yes, he keeps it up to assure her of his devotion, and, while sitting crosswise on a limb, a sudden movement of hers, or even a noise made by one passing, will set him to nodding from side to side. To all this she usually responds in kind.—*Baskett.*



THE SHARP-TAILED GROUSE.

In open woodlands far remote
The Sharp-tails utter their cackling note,
And on the wild prairie ground
Their simple nest and eggs are found.

Long years agone, in countless pairs
They courted, danced, and "put on airs,"
But hunters, greedy, cruel—strange!
Have driven them beyond their range.

C. C. M.

A WELL-KNOWN observer, who has spent many years in the West, says that the Sharp-tailed Grouse, being a bird of the wild prairies and open woodlands, has gradually retreated westward as the settlements have advanced, and will soon be a rare bird, to be looked for only in the sand-hills and unsettled portions of the country.

During the summer months this bird inhabits the open prairies, retiring in winter to the ravines and wooded lands, and when the snow is deep and the weather severe often hides and roosts beneath the snow. This sometimes proves the destruction of the birds, the entrance to the roosting-place being filled by falling snow and frozen over.

The Sharp-tails feed chiefly on Grasshoppers, seeds, buds, blossoms, and berries.

"When walking about on the ground they stand high on their legs, with their sharp-pointed tails slightly elevated, and when flushed, rise with a whirring sound of the wings, uttering as they go a guttural *kuk-kuk-kuk*, and swiftly wing themselves away in a direct course. The birds have several cackling notes, and the males a peculiar crowing or low call, that in tone sounds somewhat like the call of the Turkey. In the early spring, as the love season approaches, they select a mound or slight elevation on the open prairies for a courtship ground, where they assemble at early dawn, the males dancing and running about in a circle before the females in a most ludicrous manner, facing each other with lowering head, raised feathers and defiant looks, crossing and recrossing each other's paths in a strutting, pompous way, seldom fighting, each acting as if confident of making the greatest display, and thus winning the admiration of and capturing the hen of his choice. These meetings and dances are kept up until the hens cease laying and begin to sit."

These Grouse place the nest in a tuft of grass or under a low, stunted bush. A hollow in the ground is worked out to fit the body and lined with a few blades of grass arranged in a circular form. The hens attend wholly to the hatching and rearing of the young and are attentive and watchful mothers.

The flesh of the Sharp-tail is lighter in color and more highly esteemed than that of the Prairie Hen, and the bird is therefore hunted more industriously.

TAME BATS.

THE Bat is a harmless little animal, but I doubt if many of us would care to have a number of them flying around. The hotter the climate the more Bats you will find. As evening draws nigh, even in Italy, Greece, and Spain, out of their nooks and corners thousands of them fly, fluttering over the fields, through the gardens and streets of the town, through houses and rooms.

People get used to them there, and when awakened by the noise of their wings will get up, chase them from the room with a stick, and though aware they will return again when all is quiet, lie down again and go to sleep.

You would scarcely think to look at these lively little animals that they could be tamed and become strongly attached to their masters, would you? But indeed they are very intelligent and many naturalists have made pets of them, training them to take food from their hands or search for it in a glass. They will follow the one they love all over the house, and show themselves very amiable and sensible, too.

One cold spring morning a lady with a sympathetic heart—a true Christian lady I should judge, since she loved all things "both great and small"—saw a boy tossing in the air a little animal which she took to be a Mouse. Even so insignificant a creature should not be needlessly tortured, so she went at once to its rescue. Instead of a Mouse she found it to be a Bat, half-dead from cold and fright. With tender hands she placed it upon some cotton in the bottom of a basket and set it near the fire. Many times she peeped into the basket and was at length delighted to see the little creature hanging bat-fashion on the side of the basket, its keen, bright eyes watching every movement. One of its feet she found was crushed. With trembling hands she severed the bit of skin by which it hung, and applied some healing salve to the wound. The poor little creature suffered too much to taste food, but after a few days accepted a Fly from her hands, then a bit of meat, after which it folded its wings to signify it had enough.

The Bat at length became as tame as a Mouse and would hang itself to any convenient portion of its mistress' dress; would eat whatever of animal food she gave it, and lick milk off her fingers. At night it would settle upon her hair, but never went near other members of the family; would fly about the room, and go out of the window in search of insects, returning in a couple of hours, and if the window was closed hang to the window-sill, or to the sash, until admitted. Thus it lived for two years, a happy, contented Bat, till one night it flew out and never returned—a prey probably to some White Owls who for years had made their home in an old belfry near by.

RED AND BLACK BATS.

Over the houses, in the windows, fluttering everywhere,
Like Butterflies gigantic, the Bats dive through the air;
Up and down, hither, thither, round your head and away,
Look where they wander, coming ever with vanishing day.

C. C. M.

BATS are so much alike, especially those common to this country, of which there are numerous species known to naturalists, that the description of one will serve for all, with the exception of the Vampire.

The sub-order of smooth-nosed Bats is represented in this country by several species peculiar to America. The most common in all the Atlantic coast states is the Red Bat, or New York Bat, which is a busy hunter of flying insects, which it follows so persistently that it frequently flies into rooms in pursuit of its favorite prey. It flies rather slowly, but it changes the direction of its flight very rapidly, and its movements in the air are very graceful. Besides this species is the Black Bat, and several others have been observed and described, but so far the descriptions, according to Brehm, have been principally technical, and little or nothing is known of their habits, except that no North American species seems to be harmful, but the contrary, as they are all insect-eaters.

The principal food of these Bats consists of Butterflies, Beetles, Mosquitoes, and the like.

All Bats sleep by day and fly about by night. Most of them make their appearance at dusk, and retire to their hiding-places long before dawn. Some species appear between three and five o'clock in the afternoon and flicker merrily about in the bright sunshine. Each species has its own hunting-grounds in forests, orchards, avenues, and streets, and over stagnant or slowly flowing water-surfaces. It is said to be rare that they fly over open fields, for the reason that there is no game for them. In the South they haunt the rice fields, where insects are numerous. Their hunting-ground is limited, although some large species will cover a mile in their flight, and the Bats of the tropics fly over much greater distances.

Bats are in general very much averse to the ground, and never voluntarily place themselves on a level surface. Their method of walking is very curious. First the forelegs or wings are thrust forward, hooking the claw at its extremity over any convenient projection, or burying it in the ground. By means of this hold the animals draw themselves forward, then raising their bodies partly off the earth advance the hind-leg, making at the same time a tumble forward. The process is then repeated on the opposite side, and thus they proceed in a strange and unearthly fashion, tumbling and staggering along as if their brains were reeling.

It has long been known that Bats are able to thread their way among boughs of trees and other impediments with an ease that seems almost beyond the power of sight. Even utter darkness does not apparently impede their progress, for when shut up in a darkened room, in which strings had been stretched in various directions, they still pursued their course through the air, avoiding every obstacle with precision. This faculty has been found not to result from any unusual keenness of sight, but from the exquisite nervous system of their wings.

THE OTTER.

NATURE, children, as you observe, gave my family a handsome coat. Now, no bird can have fine feathers, nor beast a fine fur but men and women desire them for adornment, or possibly to keep themselves warm. So the hunters, finding it a paying business, shoot and trap us till places which once knew the Otter know us no more.

Such gentle animals as we are, too. No little girl or boy would care to have a more frolicsome playmate than a young cub Otter. He will romp with you, and play with Dog or Cat and sit up on his hindquarters, and whistle and do even many quaint tricks to make you laugh.

To make him happy you must have a little pond in the yard or a large tank, though he will run about the yard or house most of the time with the Dog. Feed him at first on bread and milk, then on fish, though you can train him to do without the latter and eat the "leavings" from the table.

Such fun as we Otters that live in the Northern part of the United States and Canada do have in winter. No school-boy enjoys coasting down hill more than we do. Though we live in the water, you may say, and are known as the fastest-swimming quadrupeds, yet, in spite of our short legs, we can run over land tolerably well, too. So we trudge along till we come to a high hill, well covered with snow; up we scramble to the top, lie down flat on our smooth jackets, bend our fore feet backward and, giving ourselves a shove with our hind legs, down we slide headforemost. Such fun as it is! Not till we get hungry or too tired to jog up the hill any more do we give it up for that day.

In summer we enjoy the same sport, too. How? Oh, all we want is a clay-bank with a good muddy surface, and down we go to turn a somersault into the water of the creek below. "Shooting the chutes" you little people would call it, I suppose, though we call it our "slide."

Our homes are always on the banks of a stream. We begin to burrow three or four feet below the surface of the water, forming a tunnel which leads to a chamber in the bank high and dry. That is called our den and we line it with grass and live very comfortably.

Being a hunted animal our senses are very acute. When on land we are always on the alert and, at the approach of danger, down we go into the water and hide in our dens. After sunset we go out to fish. We beat the surface of the water with our tails and frighten the scaly fellows so that they seek refuge under stones or in holes in the bank. Then we catch our Fish. For a change we eat Crabs, Frogs, and sometimes small birds.

THE AMERICAN OTTER.

In holes on river banks the Otter makes his home;
From solitude—wild nature haunts—he never cares to roam;
But swimming in the waters and sliding down the hills,
He plays the games of boys and girls, and fishes in the rills.
Alas! the hunter sets his traps, to take him unawares,
With springs of wire and teeth of steel unhappily he fares;
His fur is fine, and soft, and warm, and ladies vain adore it,
With ne'er a thought of pity for the little beast that bore it!

C. C. M.

IN ALL parts of temperate North America this, the most interesting of the Otter family, makes its home on the banks of nearly all streams except those from which it has been driven by man. It is much larger than the European Otter, has a longer tail, and has a nasal pad between the nostrils which is larger than that of any other species. Though closely allied to the common species, it has distinctive differences which entitle it to be classed as a separate species. Its habits resemble those of its cousins, but it has one peculiarity that is noticed by naturalists who have studied this animal, which is the habit of sliding or coasting down hill, in which it displays a remarkable skill. In Canada, and other sections where the snow is plentiful, Otters indulge freely in this sport, and, says Godman, they select in winter the highest ridge of snow they can find, scramble to the top of it." lie on their bellies with the forefeet bent backwards and then, giving themselves an impulse with their hindlegs, glide head-foremost down the declivity, sometimes for the distance of twenty yards. This sport they continue, apparently with the keenest enjoyment, until fatigue or hunger induces them to desist."

The young are born in April in the northern, and earlier in the southern part of the Otter's range, and a litter is composed of from one to three young ones.

Authorities agree that the number of the Otters is rapidly decreasing in America, because of the systematic way in which they are pursued by trappers for the value of their fur. The skin of the American Otter is in high reputation and general use with furriers, but those from Canada are said to be more valuable than those from the more southern sections.

The Otter, when taken young, is easily tamed. Audubon had several young Otters which he says "became as gentle as Puppies in two or three days. They preferred milk and boiled corn meal, refusing fish or meat till they were several months old." They became so tame that they would romp with their owner, and were very good-natured animals.

Rivers whose banks are thickly grown with forests are the favorite home of the Otter. There, says Brehm, it lives in subterraneous burrows, constructed in accordance with its tastes and mode of life. "The place of exit is always located below the surface of the water, usually at a depth of about eighteen inches; a tunnel about two yards long leads thence, slanting upwards into a spacious chamber, which is lined with grass and always kept dry. Another narrow tunnel runs from the central chamber to the surface and aids in ventilation. Under all circumstances the Otter has several retreats or homes." When the water rises, it has recourse to trees or hollow trunks.

The Otter is the fastest swimming quadruped known. In the water it exhibits an astonishing agility, swimming in a nearly horizontal position with the greatest ease, diving and darting along beneath the surface with a speed equal, if not superior, to that of many fishes.

The Otter, said an eminent naturalist, is remarkable in every way; in its aquatic life, as well as in its movements; in its hunt for food and in its mental endowments. It belongs without question to the most attractive class of animals.

THE SKYLARK.

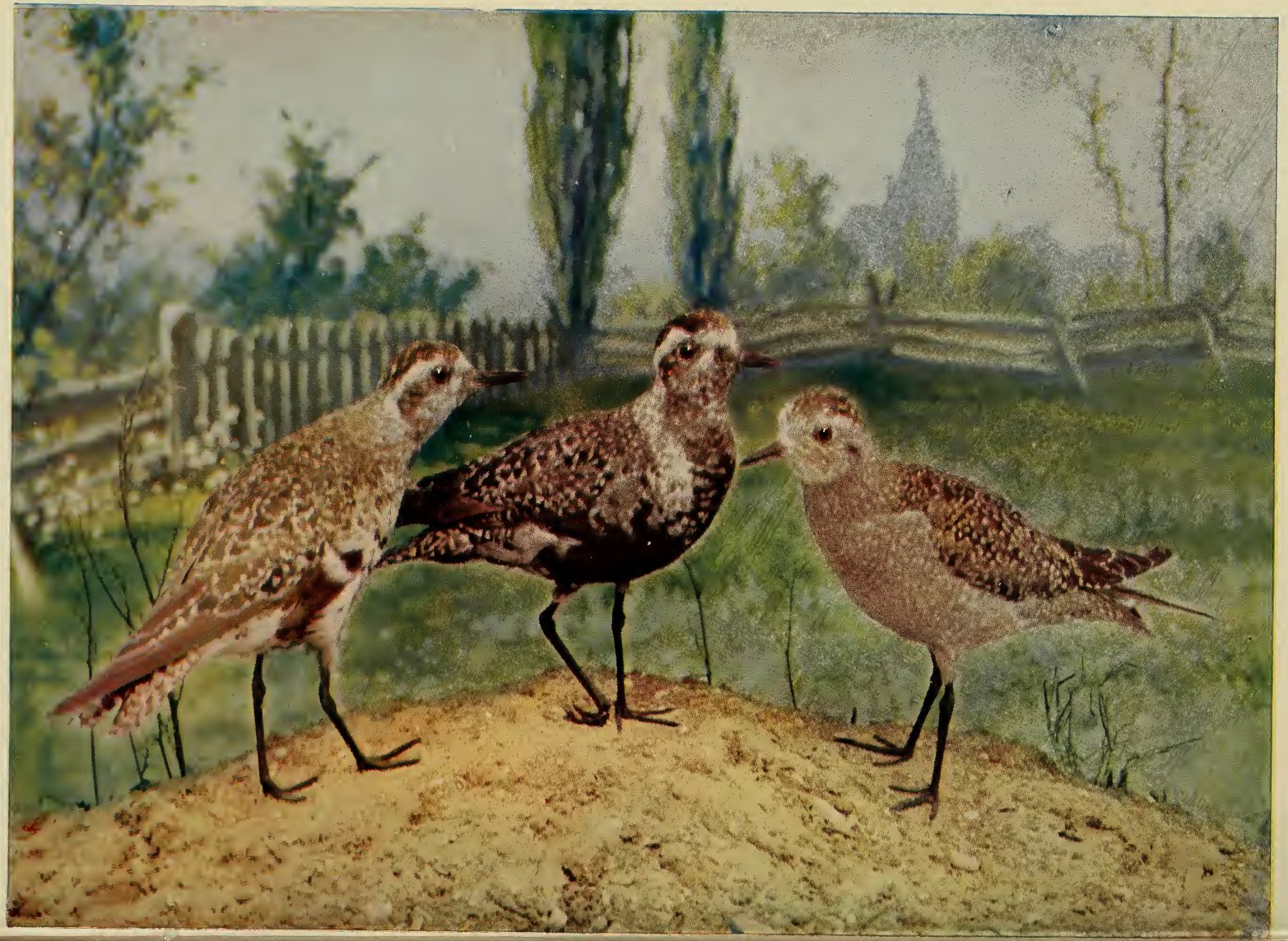
JOHN BURROUGHS relates that a number of years ago a friend in England sent him a score of Skylarks in a cage. He gave them their liberty in a field near where he lived. They drifted away, and he never heard or saw them again. But one Sunday a Scotchman from a neighboring city called on him and declared, with visible excitement, that on his way along the road he had heard a Skylark. He was not dreaming; he knew it was a Skylark, though he had not heard one since he had left the banks of the Doon, a quarter of a century or more before. The song had given him infinitely more pleasure than it would have given to the naturalist himself. Many years ago some Skylarks were liberated on Long Island, and they became established there, and may now occasionally be heard in certain localities. One summer day a lover of birds journeyed out from the city in order to observe them. A Lark was soaring and singing in the sky above him. An old Irishman came along and suddenly stopped as if transfixed to the spot. A look of mingled delight and incredulity came into his face. Was he indeed hearing the bird of his youth? He took off his hat, turning his face skyward, and with moving lips and streaming eyes stood a long time regarding the bird. "Ah," thought the student of nature, "if I could only hear the bird as he hears that song—with his ears!" To the man of science it was only a bird song to be critically compared to a score of others; but to the other it brought back his youth and all those long-gone days on his native hills!

NATURE STUDY AND NATURE'S RIGHT.

There is another study which should go hand in hand with nature-work—nature's rights, people's rights. Too many little feet are learning to trespass; too many little hands are learning to steal, for that is what it really is. Children are young and thoughtless and love flowers. But does loving and wishing for things which are not ours make it right to take them? If the teacher can develop the love of nature, can she not develop the sense of honor also? Cannot the moral growth and the mental growth of the child develop together?

To love nature is not to ruthlessly rob her of her treasures. Therefore in collecting for the school-room teach the children to use thought and care in breaking the tender branches. They should remember that each flower on the fruit-tree will in time become fruit. Mother Nature has taken time and loving care to bring forth the leaves and flowers. The different parts of the flowers may be studied without sacrificing many blossoms.

And the birds, why rob them of nests or eggs? Many ways can be found for studying nests, eggs, and birds, without causing suffering. Nature and science study, taught by the thoughtless teacher, can do much harm.—*A. G. Bullock in School Journal.*



AMERICAN GOLDEN PLOVER.

GOLDEN YELLOW RUMP is one of the names often applied to this most beautiful member of the Plover family, which is thus made conspicuous and easily recognizable. It is found everywhere in the United States, from the Atlantic to the Rocky Mountains, but is rare on the Pacific coast south of Alaska. They are seldom found far inland, their natural home being on the seacoast, occasionally frequenting marshy or wet grounds, though as a rule they prefer the sandy beach and adjacent flats and uplands. During migration their flight, especially in the spring, is hurried, direct and in the night, only stopping to rest and feed during the day, returning, it is said, in a more leisurely manner and largely along the seashore. When on the ground these birds run about on unbended legs, the bodies in a horizontal position and heads drawn down. While sleeping or resting they usually sit or stand on one leg. Captain Houdlette of the Oceanic Steamship Company caught a Plover that came aboard his ship while on its way from Alaska to Hawaii. These birds are not web-footed, and the captain seems to have solved the problem as to whether they ever rest on the water during their long flights. He says they do. "It was during the run from San Francisco to Honolulu that I saw several Plovers in the water resting. When the steamer came too near they would rise with a few flaps of their wings, but, being very tired, they would soon settle back into the water again. In its efforts to get away one of them came on board and it lived for some time. I always thought the birds made a continuous flight of over 2,000 miles, but I am now satisfied that they rest on the waves when tired."

The flight of a flock of Golden Plovers is described by Goss as swift and strong, sweeping over the prairies in a compact, wavy form, at times skimming close to the ground, then high in the air; an everchanging, circling course, whistling as they go; and on alighting raising their wings until the tips nearly touch, then slowly folding them back, a habit which is quite common with them as they move about the ground.

Plovers eat Grasshoppers, Beetles, and many forms of insect life; small berries are also a part of their diet.

Mr. Nelson, in his "Report Upon Natural History Collections in Alaska," gives a full and interesting account of their nesting-habits. He says the courtship of this handsome bird is carried on very quietly, and there is no demonstration of anger or quarreling among the rivals. When two are satisfactorily mated they quietly go about their nesting, after which each pair limits its range to the immediate vicinity of its treasures. The eggs are deposited the latter part of May in a small depression among the moss and dried grass of a small knoll, and at times a slight structure is made of dried grass. Four eggs are laid, of a pale yellowish ground color, with very dark, well-defined umber brown spots scattered profusely over the shell.

Golden Plovers on the ground,
  See them rise, and fly, and sing;
Where before was not a sound
  Now the very echoes ring.

CAN ANIMALS COUNT?

MY LITTLE readers have heard their elders when speaking of the Horse, Dog, Cat, and other dumb creatures call them the "lower" animals. Well, so they are, but when you have grown to be men and women you may possibly prefer the faithful affection and good comradeship of one of these lower animals to the disagreeable society of a cold, mean, and selfish "higher" one. Indeed, to learn how near akin are man and beast, mentally, not physically, men and women of large and tender natures have given up the greater part of their lives. Many stories have been written concerning the faithful love of animals for their masters, big and little, of their marvelous instinct and almost human cunning, but when I tell you that animals can be taught to count—and birds are animals, too, you know—why, then, if you are bright children you will wonder, as your elders do, where instinct ends and reason begins. However, these animals, of which I am going to write, may have been more than usually intelligent and capable of learning where others would not.

A few years ago a confectioner bought a Parrot, and, though the bird talked very plainly and volubly, the man was not satisfied. He desired his bird to display more cleverness than the ordinary Parrot, so he conceived the idea of teaching her to count. Polly didn't take to figures at all; but, though she listened with a great deal of patience to what her teacher had to say she uttered never a word. When at length he turned away discouraged, Polly croaked, "Shut up," and turned a double somersault on her perch, evidently very glad indeed that school was over.

Day after day Polly had her lesson, but count aloud she would not. Still the confectioner didn't give up the idea, and one day, to the bird's amazement her teacher, at lesson time, stood before the cage with a pan of water and a whisk broom in his hand. Dipping the broom in the water and flirting the drops over her head the teacher said, "One." Giving her time to think the matter over, a few more drops were sprinkled upon her head, the teacher exclaiming, "Two," and so on in this way till he had reached ten. This method of instruction went on for some time; but, though Polly came near being drowned in several of the lessons, she stubbornly refused to repeat the figures after her teacher. Arithmetic was not her forte, and the confectioner at length gave up in despair, very much I fancy to Miss Polly's relief.

A month or more went by, when one day, as the bird in her cage was hanging out of doors, it suddenly began to rain. "One," the delighted confectioner heard Polly say, as the big drops fell upon her head, then "two, three, four, five, six, seven, eight, nine, ten," in rapid succession. But to the Parrot's vexation the rain did not cease as it was wont to do when taking her lesson, and every additional drop increased her anger. Finally she could stand it no longer, and in her shrillest tones shouted: "Stop it, stop it! That's all I know, hang it, that's all I know!"

The confectioner says no amount of money can [illegible].

The Crow, an eminent doctor in

Russia says, can be taught, if you have the patience, to count up to ten, while a certain tribe of men in Polynesia, "higher" animals, you know, cannot be taught to count beyond five or six.

This same doctor had an intelligent Dog which was accustomed, like other Dogs, to bury his surplus bones in the garden. In order to test the mental powers of this animal the doctor one day gave him no less than twenty-six bones, every one of which he saw the Dog duly bury in separate places. The next day no food was given him at meal time, but he was commanded by his master to dig up the bones. This the intelligent fellow proceeded to do, but after uncovering ten came to a full stop. After whining and running about in great perplexity he finally succeeded in unearthing nine more. Still he seemed conscious that he had not found the full number and kept up the search till he had fetched to his master the other seven.

I think that was too much to ask of any Dog, don't you? Many a little boy or girl who goes to school couldn't count that number of bones, though you can, of course.

Well, the doctor then turned his attention to the Cat. When pussy was good and hungry a tempting morsel of meat was held under her nose, then withdrawn five times in succession; the sixth time she was permitted to secure it. This was repeated every day, till she got accustomed to waiting for the presentation of the meat five times; but upon the sixth Pussy never failed to spring forward and seize the meat. The doctor attempted the experiment with a higher number, but the Cat stuck to her first lesson and after counting one, two, three, four, five, six, would invariably make the spring. Had he begun with seven, pussy might have shown herself capable of counting that number as well as the Crow and the Parrot.

A farmer tells of a Horse which in plowing had acquired the habit of counting the furrows, stopping for a rest regularly at the twentieth row. The farmer at the end of the day used to estimate the amount of work done, not by counting the furrows but by remembering how many times the Horse had stopped to rest. The poor animal had never been taught his figures, and his mind did not say "one, two, three," and so on, but all the same he had his way of counting, and never failed to know when he had reached twenty.

Still another Horse was able to count the mile-posts and had been trained by its master to stop for feed when they had covered eighteen miles of a certain road. He always stopped after passing the eighteenth post. To test him they put up three false mile-posts between the real ones, and, sure enough, deceived by the trick, he stopped at the eighteenth post for his oats, unaware that he had not covered eighteen miles.

The doctor also observed another Horse which was accustomed to receiving his oats precisely at noon. Whenever the clock struck an hour the Horse pricked up his ears as if counting the strokes. If he heard twelve, off he would trot to be fed, but if a less number he would plod on resignedly at his work. The experiment was made of striking twelve strokes at the wrong time, whereupon the Horse started for his oats though he had been fed only an hour before.

All of which goes to prove that the capacity of an animal's mind is limited, and, so you may say, is that of the average man.

MRS. E. K. MARBLE.

BUTTERFLIES LOVE TO DRINK.

BUTTERFLIES have never had a character for wisdom or foresight. Indeed, they have been made a type of frivolity and now something worse is laid to their charge. In a paper published by the South London Entomological society Mr. J. W. Tutt declares that some species are painfully addicted to drinking. This beverage, it may be pleaded, is only water, but it is possible to be over-absorptive of non-alcoholics. Excess in tea is not unknown—perhaps the great Dr. Johnson occasionally offended in that respect—and even the pump may be too often visited. But the accuser states that some Butterflies drink more than can be required by their tissues under any possible conditions. It would not have been surprising if, like some other insects, Butterflies had been almost total abstainers, at any rate, from water, and had contented themselves with an occasional sip of nectar from a flower.

MALES ARE THE SINNERS.

The excess in drinking seems to be almost a masculine characteristic, for the topers, he states, are the males. They imbibe while the females are busy laying eggs. This unequal division of pleasure and labor is not wholly unknown even among the highest of the vertebrates; we have heard of cases where the male was toping at the "public" while the female was nursing the children and doing the drudgery of the household. Mr. Tutt has called attention to a painful exhibition of depravity which can often be observed in an English country lane, where shallow puddles are common, but never so well as on one of the rough paths that wind over the upper pastures in the Alps. Butterflies are more abundant there than in England, and they may be seen in dozens absorbing the moisture from damp patches. Most species are not above taking a sip now and again, but the majority may be classed as "moderate drinkers." The greater sinners are the smaller ones, especially the blues, and the little Butterfly which, from its appearance, is called the "small copper." There they sit, glued as it were to the mud—so besotted, such victims to intemperance, that they will not rise till the last moment to get out of the way of horse or man. Some thirty years ago Prof. Bonney in his "Alpine Regions," described this peculiarity, saying that "they were apparently so stupefied that they could scarcely be induced to take wing—in fact, they were drunk."

OTHER LIQUIDS ARE LIKED.

If we remember rightly, the female occasionally is overcome by the temptation to which her mate so readily falls a victim. But we are by no means sure that Butterflies are drinkers of water only. Certainly they are not particular about its purity; they will swallow it in a condition which would make a sanitarian shudder; nay, we fear that a not inconsiderable admixture of ammoniacal salts increases the attraction of the beverage. It is admitted that both Moths and Butterflies visit sugar, overripe fruit, and the like, but it is pleaded that they do this for food. Perhaps; but we fear this is not the whole truth. The apologist has forgotten that practice of entomologists called "sugaring," which is daubing trunks of trees and other suitable places with a mixture of which, no doubt, sugar is the main ingredient, but of which the attraction is enhanced by a little rum. Every collector knows what a deadly lure this is, and what treasures the dark-lantern reveals as he goes his rounds. True, this snare is fatal only to the Moth, because at night the Butterfly is asleep. If he once adopted nocturnal habits we know where he would be found, for he is not insensible by day to the charms of this mixture.

MOTHS.—$\frac{1}{15}$ Life-size.

Phylampelus Achemon.

Sphinx chersis.

Smerinthus exaecatus.
Triptagon Modesta.
Choerocampa tersa.

Phylampelus pandorus.

Coratomia amynton.

THE ENVIOUS WREN.

On the ground lived a Hen,
In a tree lived a Wren,
Who picked up her food here and there;
While Biddy had wheat
And all nice things to eat
Said the Wren, "I declare, 'tisn't fair!

"It is really too bad!"
She exclaimed—she was mad—
"To go out when it's raining this way!
And to earn what you eat,
Doesn't make your food sweet,
In spite of what some folks may say.

"Now, there is that Hen,"
Said this cross little Wren,
"She's fed till she's fat as a drum;
While I strive and sweat
For each bug that I get,
And nobody gives me a crumb.

"I can't see for my life
Why the old farmer's wife.
Treats her so much better than me.
Suppose on the ground
I hop carelessly round
For awhile, and just see what I'll see."

Said this cute little Wren,
"I'll make friends with the Hen,
And perhaps she will ask me to stay;
And then upon bread
Every day I'll be fed,
And life will be nothing but play."

So down flew the Wren,
"Stop to tea," said the Hen;
And soon Biddy's supper was sent;
But scarce stopping to taste,
The poor bird left in haste,
And this was the reason she went:

When the farmer's kind dame
To the poultry yard came,
She said—and the Wren shook with fright—
"Biddy's so fat she'll do
For a pie or a stew,
And I guess I shall kill her to-night."

—*Phœbe Cary.*

THE CANADIAN PORCUPINE.

It climbs the trees and strips them clean
Of leaf, and fruit, and bark;
Then, creeping where no life is seen,
O'er branches grim and stark,
Begins anew, the bark beneath,
The endless grind of claws and teeth,
Till trees, denuded, naked rise
Like spectres painted on the skies.
Fretful it may be, as its quills are sharp,
But with its teeth it stills the sylvan harp.

C. C. M.

FORMERLY plentiful in the northern United States, but now quite rare in this country, although not so scarce in Canada, is the Urson, otherwise called the Canadian Porcupine. It is the tree or climbing species and is distinguished from other members of the family by its slender body and tail of greater or less length. The Urson attains a length of thirty-two inches, seven and one-half of which are included in the tail. A thick set fur, which attains a length of four and one-half inches on the nape of the neck and changes into sharp spines on the under parts of the body and the tip of the tail, clothes the animal.

The Canadian Porcupine is a native of the forests of North America, ranging as far south as Virginia and Kentucky and as far west as the Rocky Mountains. "The Urson," says Cartwright, "is an accomplished climber and probably never descends a tree in winter, before it has entirely denuded the upper branches of bark. It is most partial to the tenderest roots or seedling trees. A single Urson may ruin hundreds of them during one winter." Audubon states that he passed through woods, in which all the trees had been stripped by this animal, producing an appearance similar to that induced when a forest has been devastated by fire. Elms, Poplars, and Firs furnish its favorite food, and therefore usually suffer more than other trees from its destructiveness.

The nest of this Porcupine is generally found in holes in trees or rocky hollows, and in it the young, usually two, more rarely three or four in number, are born in April or May. The young are easily tamed. Audubon says that one which he possessed never exhibited anger, except when some one tried to remove it from a tree which it was in the habit of mounting. It had gradually become very tame and seldom made any use of its nails, so that he would open its cage and afford it a free walk in the garden. When he called it, tempting it with a sweet potato or an apple, it turned its head toward him, gave him a gentle, friendly look and then slowly hobbled up to him, took the fruit out of his hand, sat down on its hind legs and raised the food to its mouth with its fore-paws. Frequently when it would find the door of the family room open it would enter, approach and rub itself against a member of the family looking up pleadingly as if asking for some dainty. Audubon tried in vain to arouse it to an exhibition of anger. When a Dog came in view matters were different. Then it instantly assumed the defensive. With its nose lowered, all its quills erect, and its tail moving back and forth, it was ready for the fray. The Dog sprang upon the Porcupine with open mouth. That animal seemed to swell up in an instant to nearly double its size, sharply watched the Dog and at the right moment dealt it such a well-aimed blow with its tail that the Mastiff lost courage and set up a loud howl of pain. His mouth, tongue, and nose were full of Porcupine quills. He could not close his jaws, but hurried open-mouthed off the premises. Although the spines were immediately extracted, the Dog's head was terribly swollen for several weeks afterward, and it was months before he entirely recovered.

CANADIAN PORCUPINE.
¼ Life-size.

THE DEATH OF THE FLOWERS.

The melancholy days are come, the saddest of the year,
Of wailing winds, and naked woods, and meadows brown and sear.
Heaped in the hollows of the grove, the autumn leaves lie dead;
They rustle to the eddying gust, and to the Rabbit's tread.
The Robin and the Wren are flown, and from the shrubs the Jay,
And from the wood-top calls the Crow through all the gloomy day.

Where are the flowers, the fair young flowers, that lately sprang and stood
In brighter light, and softer airs, a beauteous sisterhood?
Alas! they all are in their graves, the gentle race of flowers
Are lying in their lowly beds, with the fair and good of ours.
The rain is falling where they lie, but the cold November rain
Calls not from out the gloomy earth the lovely ones again.

The Wind-flower and the Violet, they perished long ago,
And the Brier-rose and the Orchis died among the summer glow;
But on the hill the Golden-rod, and the Aster in the wood,
And the yellow Sun-flower by the brook in autumn beauty stood,
Till fell the frost from the clear, cold heaven, as falls the plague on men,
And the brightness of their smile was gone, from upland, glade, and glen.

And now, when comes the calm, mild day, as still such days will come,
To call the Squirrel and the Bee from out their wintry home;
When the sound of dropping nuts is heard, though all the trees are still,
And twinkle in the smoky light the waters of the rill,
The south wind searches for the flowers whose fragrance late he bore
And sighs to find them in the wood and by the stream no more.

—*Bryant*

THE CASPIAN TERN.

The Terns are on the wing,
See them play!
They dart into the sky,
They poise, and scream, and fly
O'er the bay;
Round the ship that sails the sea,
Round the lighthouse o'er the lea—
The Terns are on the wing!

C. C. M.

THE great Caspian Tern is the largest of the family, its wings, when extended, measuring from fifty to fifty-five inches in length. It is a bird of very irregular distribution, breeding in Labrador, along the Arctic coast, on islands in Lake Michigan, on the coasts of Virginia, Texas, and California, and is numerous in Australia. Forbes found it to be more or less common about Washoe Lake and the Humboldt Marshes, Nevada, and the Great Salt Lake, Utah, where it was no doubt breeding. He says that unlike most other Terns, particularly unlike the almost equally large Royal Tern, the Caspian appears to breed in isolated pairs instead of large colonies, its nest being found far removed from that of any other bird, and consisting merely of a shallow depression scooped in the sand, in which its two eggs are laid, with little if any lining, though a few grass or sedge blades or other vegetable substance are sometimes added. It is very bold in defense of its eggs or young, darting impetuously at the intruder, uttering meanwhile hoarse barking or snarling cries.

This elegant and graceful bird is also known as the Imperial Tern. At a distance it is often mistaken for the Royal Tern, but may be distinguished from the latter by its more robust form and less deeply forked tail. Eggs and young have been taken on Cobb's Island, Virginia, in July. Dr. Merrill observed it breeding on Padre Island, near Fort Brown, Texas, in May. Large numbers of this species are said to breed on Pelican Island in the Gulf of Mexico. The eggs vary from white to greenish-buff, spotted and blotched with brown and lilac of different shades.

The Terns furnish abundant interest while flying. They seem always to be on the wing, and always hungry. Like the Gulls, they seize their food by darting upon it, tossing it into the air and catching it again, without alighting. They pick up from the surface of the water floating objects. They swim on the surface, rarely diving deep. They dart also upon fish from above, and "one plows the water in flight with a knifelike beak in hopes of running through a shoal of fishes."

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CASPIAN TERN.
⅓ Life-size.

THE FLOWERING ALMOND.

By Emily C. Thompson.

THE Sweet, the Bitter, and the Flowering Almond are all of a kin and in this kinship many include also the Peach and the Nectarine. The Flowering Almond or the dwarf Almond is a shrub which early in the spring, in March or April, sends forth its fair rosy blossoms before its leaves are sprouted. The shrub seldom exceeds three feet in height. The leaves are like those of the willow, only darker and of a more shining green. It is really a native of Calmuck Tartary but now is used extensively in gardens because it blooms so early and can easily be cultivated in any dry soil.

The Almond tree figures in history, mythology and poetry. In the Bible we find four references to it: Exodus 25:33,34; 37:19,20; Num. 17:8; Ecc. 12:5. In this connection it is interesting to note that Aaron's famous rod was the shoot of an Almond tree. Theophrastus mentions the Almond as flourishing in Greece. Cato also tells us that it was grown, but as a luxury, in Italy. The rest of its history is obscure and all we know about its cultivation in England is that it was introduced during the reign of Henry VIII. Virgil in the Georgics welcomes the Almond when covered with blossoms as the sign of a fruitful season.

In ancient times everything that was considered of any importance to the Greeks had some connection with the siege of Troy. The Almond tree here fared especially well, for two stories have come down to us in mythology relating its connection with that wonderful event. Demophon returning from Troy suffered the fate of many another Greek worthy. He was shipwrecked on the shores of Thrace. He was befriended by the king and received as a guest. While at the court he met the beautiful daughter of his host. Immediately he fell in love with the charming princess, gained her love in return, and made arrangements for the marriage. But Demophon was obliged to return home to settle up his affairs before he could take upon himself these new ties. So the youth sailed away, but never to return. The princess, faithful Phyllis, watched and waited, hoping in vain for the return of her promised lord. Her constancy was noted even by the gods who, when she was gradually pining away, turned her into an Almond tree. Since then this tree has been a sign of constancy and hope.

"The hope in dreams of a happier hour,
That alights on Misery's brow,
Springs out of the silvery Almond flower,
That blooms on a leafless bough."

Another version of the same story relieves Demophon of such gross inconstancy. It is reported by some that the marriage took place and not until after the couple were happily wedded was the hero called to Athens by the death of his father. Day by day the young wife watched for his return on the shore, but he was detained until the winter passed away and with it his faithful bride. In the spring he returned to find only an Almond tree awaiting his coming. He realized what had happened and in his despair clasped the tree in his arms when it burst forth into blossoms although it was bare of leaves.

COLOR PHOTOGRAPHS AND CONVERSATION LESSONS.

SINCE Nature Study Publishing Company, in January, 1897, put before the teaching world the first accurately beautiful representations, not only of the forms of nature but of the tints and colors also, the brightest minds have been active in noting the effectiveness of the color photograph in school. Thousands of teachers have vied with each other in applying them in nature study with most gratifying results.

An important discovery has been made almost at the same time by many of them. The lively interest aroused by the bird presented, the agreeable sensations the child experiences in relating incidents and hearing from his mates and teacher about its habits, and the reminiscences of delightful outdoor experiences, all tend to warm the child to enthusiasm.

This point of warmth is the supreme opportunity of the teacher. Instruction given under such a glow is intensely educative. A few minutes of such work is worth hours of effort where the child is but indifferently aroused.

Many of the best first primary teachers do not begin to teach reading during the first few weeks of the child in school. They aim, first, to establish a bond of sympathy between themselves and their pupils, to extend their range of ideas, and to expand their powers of expression. Expression is induced and encouraged along all lines, by words, music, drawing, color work, and physical motions.

The common things of life are discussed, experiences related, and the imagination brought strongly into play. Songs and recitations are given with the actions of birds, animals, persons, or machines, imitated joyously by groups of children. Games calculated to train the senses and the memory are indulged in. The whole nature of the child is called into play, and perfect freedom of expression is sought.

Experience shows that intelligent training along these lines is profitable. The time of learning reading and spelling is somewhat deferred, and number work is delayed, but the children who are skilfully trained in this way outstrip the others rapidly when they bring their trained powers to bear upon the things that are popularly supposed to be the business of a school. Superintendent Speer has shown that pupils whose technical instruction has been deferred for several months in this way are found at the end of the second year far superior to others of equal promise, who have been put at reading, spelling, and number work directly.

To conduct a conversation lesson requires some tact. Not tact in asking questions, nor in "talking down" to the level of the children. Direct questions are of doubtful value in the first grade. In fact, the value of the lesson may sometimes be judged by the absence of such questions put by the teacher. The question mark and the pump handle resemble each other, and often force up perfunctory contributions, and sometimes they merely produce a dry sound. Children do not care to be pumped.

Here are a few questions that give the children little pleasure and less opportunity for expression: Isn't this a very pretty bird? Do you see what a bright eye it has? How many

FLOWERING ALMOND.
Life-Size.

of you have seen a bird like this? How would you like to own him, and have him at your house? Don't you think, dear children, God is very good to us to let us have such beautiful birds in the world?

Any one of these questions by itself is not harmful, but an exercise made up of such material merely gives the class a chance to say, "Yes, ma'am," and raise their hands. All talk by the teacher and no activity by the class. With a bright smile and a winning voice, the teacher may conduct what appears to be a pleasant exercise with such material, but there is little real value in it under the best circumstances and it should be avoided systematically. It is unskilful, and a waste of time and opportunity.

Attempts to lower one's conversation to the level of little children are often equally unsatisfactory. Too much use of "Mamma bird," "baby birdies," "clothes," "sweet," "lovely," "tootsy-wootsy," and "Oh, my!" is disappointing.

Ordinary conversation opened with a class in much the same style and language as used by one adult in talking with another is found to be the most profitable. Introductory remarks are generally bad, though some otherwise excellent teachers do run on interminably with them. To begin directly with a common-sense statement of real interest is best.

Here are a few profitable opening statements for different exercises: One day I found a dead mouse hanging upon a thorn in a field. Mr. Smith told me he heard a Flicker say, "Wake up! Wake up! Wake up!" Willie says his bird is fond of fruit, and I notice that most birds that eat fruit have beautiful, bright feathers. This bird likes the cows, and I once saw him light on a cow's horn.

Such statements open the minds of young people where many times direct questions close them. Questions and regular contributions to the conversation flow readily from members of the class when the right opening has been made. Do not let the class feel that your purpose is to get language from them. Mere talk does not educate. Animated expression alone is valuable.

Have plenty of material to use if the class seem slow to respond, and have patience when they have more to offer than the time will admit. Bear in mind that a conversation lesson on some nature subject is not a nature lesson, but is given to induce correct thinking, which shall come out in good language. It may incidentally be such a nature lesson as to satisfy the requirements of your course of study in that line, but if you give it as a conversation lesson, let conversation be the exercise.

Where a few in the class tend to monopolize the time you may frequently bring a diffident one into the exercise by casually looking at him as if you felt his right to be heard. It is better not to ask him to talk, but to make it easy for him to come into the conversation by referring to something he has previously done or said, or by going near him while others talk. A hand on his shoulder while you are conversing with others, will sometimes open him to expression. Sometimes you need to refer to what Willie's father said, or what you saw at his house, or to something that Willie owns and is pleased with. Many expedients should be tried and some time consumed in endeavoring to get such a pupil into the conversation instead of saying point blank, "Now, Willie, what do you think?"

The matter of spoken language is words largely. The thinking of children is always done in words, as far as school matters go. The thoughts of

the average child are correct enough from his standpoint, and when the teacher represses him on his first attempt to carry his part in the exercise, he is hurt to such an extent that he may never recover from it, and he may always believe himself peculiarly unfortunate in that he is incapable of speaking as others do.

The truth is that all children are eloquent. They talk easily, very easily, in comparison with adults who have been frightened out of their natural tongues, and are forever trying to say what they think in terms that they do not think it in.

All children are sensitive concerning their speech. Some of the keenest hurts children experience are inflicted by those who notice patronizingly or critically the language they use. Mothers are in a hurry to have them learn English at once, and so correct them instantly when such mistakes as "runned," "mouses," and "me wants" occur. The child allowed to think in his own terms overcomes his verbal difficulties in a short time if associated at home with those who speak correctly, and he is perfectly excusable for using what we call incorrect forms until he has acquired the so-called correct ones.

There are times when the child's mind is open to acquisition of formal expertness in language. He will find these times for himself and exercise himself in forms without being driven to it at the very times when his mind is most active with other things which he tries to express to us in his moments of overflowing enthusiasm. In these moments he should not be bothered and confused by formal quibbling. In his most active states intellectually he ought not to be repressed. This applies to the child who hears good English at home. It also applies, with slight modifications, to the child who hears imperfect language at home. The child who will eventually prove capable of correct speech will learn to speak the best language he hears without direct instruction if encouraged in it and given the respect a growing child is entitled to receive.

Children learn to speak while at play. They are active and much interested when they are acquiring a natural vocabulary. Much of the vocabulary is wrong from the standpoint of the grammar and dictionary, and they have to unlearn it. They have to unlearn it at school and from the lips of pains-taking parents. One reason it is so hard for them to learn the correct forms is this unintelligent way of teaching. Another is that the incorrect conversation is heard under circumstances favorable to retention and reproduction; that is, when the child is much interested and happy; while the correct forms are given him when he is but half aroused, or when he is somewhat intense over another matter, and many times the intended instruction goes in at one ear and out at the other. When the skill of the teacher and the things of the school room become so powerfully attractive to the pupil that once hearing a new word will fix it, once seeing a word will make him master of it in all its forms, then the language lesson will not need to be given; for language, which is as natural to man as breathing, will flow in correct forms trippingly from the tongue, being so fixed in the pupil's mind from the first that he will have nothing to unlearn.

Conversation lessons are intended to take care of some of the crudest errors in speech before the child has committed the indiscretion of putting them in writing. It can be done with so much less severity in conversation than in a written lesson. Notice

silently the peculiarly bad expressions and forms of statements of the whole class, then plan your talking lesson in which those who are not guilty of those errors are allowed to lead. Then let the child whom you consider most likely to profit by hearing correct expression from his mates give you the necessary statement. If he use correct forms, let another try.

For instance, suppose you have a number of pupils who are inclined to say "The robin isn't so purty as the bluejay." The reason for this is that the parents of nearly all these pupils will make the same error. If early in their experience with you you are shocked by their speech and let them know it, you either lose their respect or make them feel that they and their parents are inferior beings with no right to speak.

It will take a few minutes to speak of something else that is pretty, and let several of your pupils who speak the word correctly give some statements concerning pretty things. Then call upon one of the offenders, without his suspecting himself to be such, and the probability is that he will say "pretty," as you wish. But suppose he fail, you must not think he does so because of dullness, for he may say "purty" for the sole reason that his mates are listening and he fears they may think he is trying to "put on style." If you pass the matter in silence that day you will find him bolder or more acute the next day, and he will speak the word correctly. In this way he will seem to himself to be teaching himself. Self-culture will begin in him and the credit will be yours. Another teacher would suppress that sort of language and compel the boy to say the word right instanter. But her pupils speak one language in school and a different one in places where they are more comfortable.

Aim to set the child to correcting his own speech by his own apparent choice. A single error is easily repressed, but the habit of looking after one's own speech is not easily acquired. It is easy to make a child feel his inferiority to you, but it is a great thing to inspire him to do the good and wise and elegant things which you are capable of doing in his presence.

The process of unlearning words has always been a failure with the majority of pupils, and most of the English speaking race are ashamed of their inability to speak. Men most eloquent and successful in business conversation, who were by nature fitted to thrill the world with tongue and pen, have been confused and repressed by this process till they believe themselves vastly inferior to others because they cannot translate their thoughts out of the terms of the street or counting room into the language of the grammar school, and so they never try to fill the large places that would have been open to them if they could but have learned to think in terms which may be spoken right out without fear of opprobrium.

Now since so much of our teaching psychology and common sense have shown to be radically wrong, let us build up our language work on the high plane of interest in real things, expressing thought directly without translation into fitter terms. Let the thinking be done in terms suitable for life. And use the color photograph to to insure that enthusiasm necessary to good thinking; be guarded as to how you deal with thoughts that come hot from growing minds, repress never, advise kindly, and know that by following the natural method in language you are not ruining the speech powers of your best pupils, as has been done heretofore.

SUMMARY.

SHARP-TAILED GROUSE—*Pediocætes phasianellus campestris.* Other names: Sprig-Tail, Pin-Tail, White Belly.

RANGE—Plains and prairies east of the Rocky Mountains; east to Wisconsin, north to Manitoba, south to New Mexico.

NEST—In a tuft of grass or under a low bush.

EGGS—Six to thirteen.

RED BAT—*Atalapha noveboracensis.* Other name: "New York Bat."

RANGE—Throughout all the Atlantic coast states.

BLACK BAT—*Scotophilus carolinensis.* Other name: "Carolina Bat."

RANGE—Common throughout North America.

AMERICAN OTTER—*Lutra canadensis.*

RANGE—All parts of temperate North America, encroaching closely on the Arctic region.

GOLDEN PLOVER—*Charadrius dominicus.* Other names: Frost Bird, Bull Head.

RANGE—Nearly the whole of North America, breeding in the Arctic regions; south in winter to Patagonia.

NEST—In a small depression among the moss and dried grass of a small knoll.

EGGS—Four, of a pale yellowish ground color, with dark umber-brown spots scattered over the shell.

CANADIAN PORCUPINE—*Erethizon dorsatus.*

RANGE—A native of the forests of North America, from the sixty-seventh parallel of north latitude south to Virginia and Kentucky, the eastern and western boundaries being Labrador and the Rocky Mountains.

CASPIAN TERN—*Sterna tschograva.*

RANGE—Nearly cosmopolitan; in North America, breeding southward to Virginia, Lake Michigan, Texas, Nevada, and California.

NEST—A mere hollow scooped in the dry sand.

EGGS—Two or three, varying from white to greenish-buff, spotted with brown and lilac of different shades.

FLOWERING ALMOND—*Amygdalus communis.* Native of Calmuck, Tartary.

The beautiful is as useful as the useful.—*Victor Hugo.*

BIRDS AND NATURE

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A. W. MUMFORD & CO., Publishers

378 Wabash Ave., Chicago, Ill.

Entered at Chicago Post Office as second class matter

BIRDS AND NATURE

Monthly, except July and August

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A GUIDE IN THE STUDY OF NATURE

VOLUME IV

CHICAGO
A. W. MUMFORD, PUBLISHER
378 Wabash Ave.
1907

THE SILKWORM.

THE Caterpillar, or Silkworm, is at first of a dark color, but soon becomes light, and in its tints much resembles the perfect insect—a circumstance common in Caterpillars. Its proper food is the Mulberry, though it will likewise eat the Lettuce, and some few other plants, on which, however, it does not thrive equally well, and the silk yielded is of a poor quality.

The Silkworm is about eight weeks in arriving at maturity, during which period it changes its skin four or five times. When about to cast its skin it ceases to eat, raises the forepart of the body slightly, and remains in perfect repose. In this state it necessarily continues for a time, in order that the new skin, which is at this time forming, may become sufficiently mature to enable the Caterpillar to burst through the old one. This operation is performed thus: The forepart of the old skin is burst; the Silkworm then, by continually writhing its body, contrives to thrust the skin back to the tail and disengage itself; this is difficult, however, since it is no uncommon occurrence for them to die from not being able to free themselves.

When full grown the Silkworm commences spinning its web in some convenient spot, and as it does not change the position of the hinder portions of its body much, but continues drawing its thread from various points, and attaching it to others, it follows that after a time its body becomes, in a great measure, enclosed by the thread. The work is then continued from one thread to another, the Silkworm moving its head and spinning in a zig-zag way, bending the forepart of the body back to spin in all directions within reach, and shifting the body only to cover with silk the part which was beneath it. In this way it encloses itself in a cocoon much shorter than its own body. During the time of spinning the cocoon the Silkworm decreases in length considerably, and after the work is done it is not half its original length. At this time it becomes quite torpid, soon changes its skin, and appears in the form of a chrysalis. In this state the animal remains about three weeks; it then bursts its case and comes forth in the imago state, the moth having previously dissolved a portion of the cocoon by means of a fluid which it ejects. The moth is short lived; the female in many instances dies almost immediately after she has laid her eggs; the male survives her but a short time.

China was the first country in which the labors of the Silkworm were availed of, and Aristotle was the first Greek author who mentions it. It was not until the fifteenth century that the manufacture of silk was established in England. The raising of Silkworms in the United States has been attempted with success in the Southern States, and especially in California. As the Silkworms in Europe are affected by disease, immense quantities of eggs are sent from this country.

Reeling from the cocoons is only performed in countries where the silk is produced. In plain silk-weaving the process is much the same as in weaving wool or linen, but the weaver is assisted by a machine for the even distribution of the warp, which frequently consists of eight thousand separate threads in a breadth of twenty inches. The Jacquard loom, invented by a weaver of Lyons, has been the means of faciliating and cheapening the production of fancy or figured silks to an extraordinary extent.

The Pan-American delegates during their tour through this country were presented with silk flags by the Woman's Silk-Culture Association of Philadelphia. The flags were made from material produced in the United States.

The eggs from which our photograph was taken are "live eggs," and if properly handled will hatch out in the spring. In order to bring about this result care must be taken that they do not become too warm; freezing will not hurt them, but heat or dampness will cause them to hatch or spoil.

Forty thousand eggs weigh about one ounce, and when hatched will produce about one hundred pounds of fresh cocoons.

HINTS ON THE STUDY OF WINTER BIRDS.

IN attractiveness to children, says James E. McDade, for the Committee of Sixty of Chicago, no department of natural history surpasses Ornithology. Birds are to be found everywhere. In the city parks and suburban groves careful observation will reveal objects of study, even in the depths of winter. The following suggestions are based on practical work which has been done in the G. W. Curtis school during the past two years.

No satisfactory work can be done until the children have been aroused to sufficient interest to observe birds for themselves. Pictures and descriptions, however valuable as auxiliaries, can never take the place of personal observation. The best method of arousing this interest is to go out with the children and study the birds. Opera glasses or field glasses will greatly facilitate observation.

As a guide in description pupils may have in mind the following points: shape and size of bird; prevailing color; marks on head, wings, throat, or tail; shape of bill; length of tail; where found (whether on the ground, in trees, or climbing tree trunks). These and other details should be emphasized.

In all this work strict accuracy must be insisted on. In the beginning, pupils are apt to give inaccurate, and, in some instances, highly imaginary descriptions of birds. A good plan is to encourage them to bring in written descriptions of birds they have seen.

Such field work may well furnish excellent subject matter for water color work, as well as a basis for written compositions. Good collections of our native birds may be found in the Field Columbian Museum and in the museum of the Chicago Academy of Sciences, and the curators of these institutions will be found ready to give teachers any aid in their power.

Mr. McDade mentions the following as the most common winter birds of this vicinity, not including swimmers and waders: the English Sparrow, the Snow Bird, the Bluejay, the Thistlebird, the Black-capped Chickadee, the White-bellied Nuthatch, the Northern Shrike or Butcherbird, the Horned Lark, and the Crow.

In many parts of the country there are good collections of birds which are accessible, and which may, by a little inquiry, be found by those interested. We do not hesitate to say, however, that the specimens of birds shown monthly in this magazine have stimulated the successful study of Ornithology to a degree never imagined as possible. The pictures are so true to nature in color and attitude that they are instantly fixed in the mind. We know several instances where children of eight and ten years have become by its use so familiar with many birds that they can draw and paint them from memory with considerable fidelity. BIRDS is indeed the best means of acquiring speedy as well as accurate knowledge of Ornithology desired by those who do not expect to pursue the study in all its scientific ramifications. We refer with confidence to the recognized authorities on the subject.

C. C. MARBLE.

THE CALIFORNIA WOOD-PECKER.

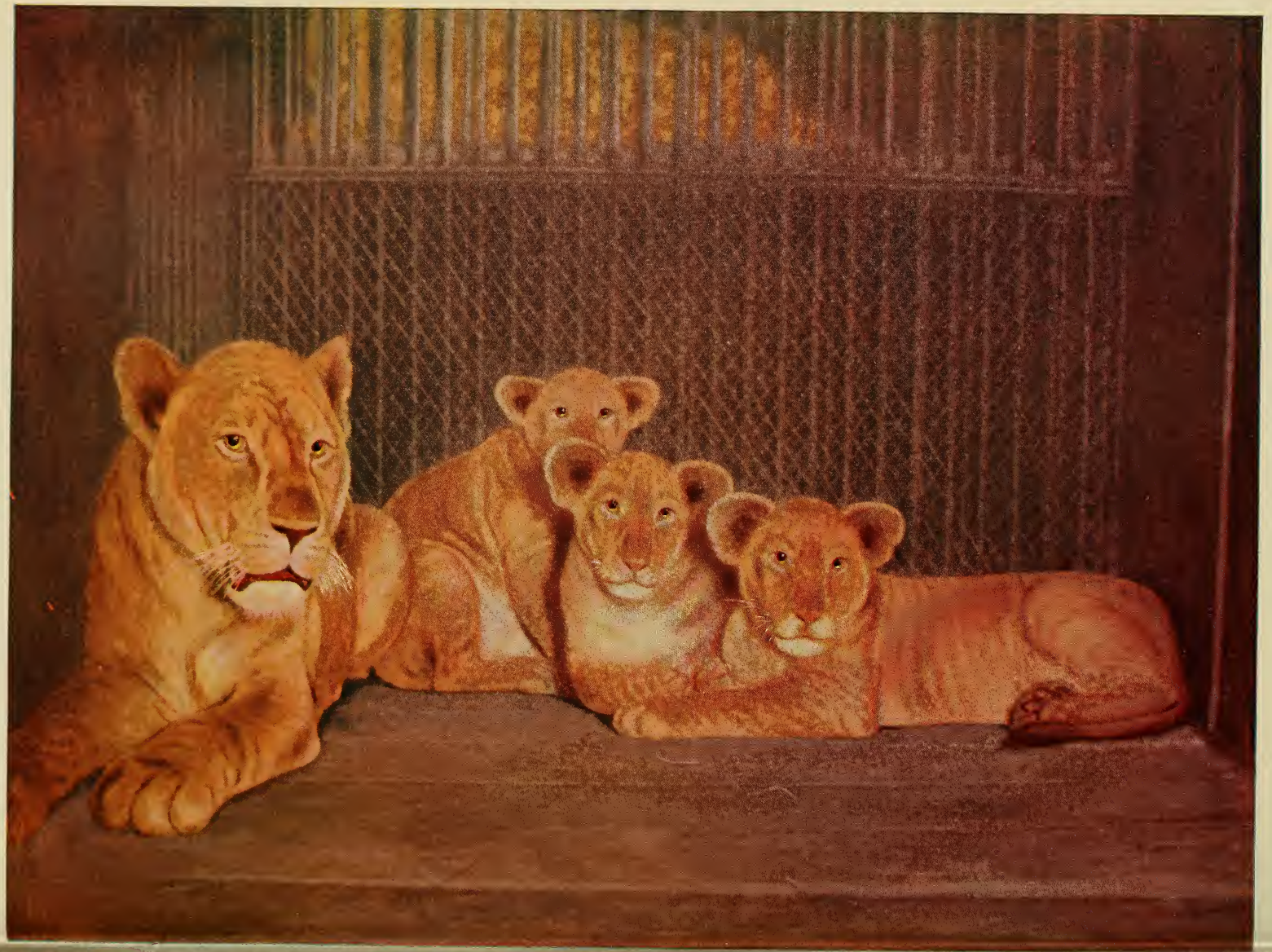
I may not be as pretty a bird as my red-headed cousin but I'm just as busy. My home is in the west among the pines on the mountains. I do not visit the east at all.

Of course I like insects and fruits just as my relations do, but I like best to eat acorns. You know, if I left the acorns on the trees and just got enough to eat at one time, after a while I would have a hard time finding any. They would drop off and roll away and get lost among the leaves and grasses. What would you do if you were I?

I have a very sharp bill, you see. So I can peck and peck at the tree until I have made a hole which will hold an acorn. Sometimes I fill my store house quite full in this way. You can see how they look in the picture. When I want to get at the meat in the acorn I drive the nut into a crack and split the shell. Then I have my breakfast easily enough.

Some of the other birds like acorns too—but I think they should find and store away their own and not try to take mine. I do not like to quarrel and so have many friends.

Then I have my nest to look after. I make it as my cousin does, by digging into a tree, first a passage way or hall—then a living-room. There are the four or five white eggs and there too soon are the little baby-birds to be taken care of. Now, have I not a great deal of work? Do you not think I am quite as busy as my cousin?



THE AFRICAN LION.

Amid the far-off hills,
With eye of fire, and shaggy mane upreared,
The sleeping Lion in his den sprang up;
Listened awhile—then laid his monstrous mouth
Close to the floor, and breathed hot roarings out
In fierce reply. —EDWIN ATHERSTONE. (1821)

THE common opinion of the Lion from the remotest times is that he is King of Beasts, and a single glance at his face of majesty is sufficient to make us accept it. His roar is terrific, and the fact is well known that all animals tremble at the mere sound of his voice. The effect of it on his subjects is said to be indescribable. "The howling Hyena is stricken dumb, though not for long; the Leopard ceases to grunt; the Monkeys utter a loud, gurgling sound and mount to the highest tree-tops; the Antelopes rush through the bushes in a mad flight; a bleating flock becomes silent; the laden Camel trembles and listens no longer to his driver's appeal, but throws load and rider off and seeks salvation in flight; the Horse rears, snorts, and rushes back; the Dog, unused to the chase, creeps up to his master with a wail." But it is said we must not think that the Lion lets his roar re-echo through the wilderness at all times. His usual sounds are a deep growl and a long-drawn tone, like the mewing of a giant Cat. His real roar is uttered comparatively seldom, and many people who have visited countries inhabited by Lions have never heard it. It is the only one of its kind, and is surpassed in fullness of tone by the voice of no living creature except the male Hippopotamus, according to Pechnel-Loesche. "The Arabs have a pertinent expression for it: *'raad,'* meaning thunder. It seems to come from the very depth of the chest and to strain it to the utmost."

This Lion is distributed all over Central and Southern Africa. They are regularly met with on the banks of the Blue and White Nile, and in the deserts of Central and Southern Africa they are of common occurrence.

The Lion leads a solitary life, living with his mate only during the breeding season. Selous says that in South Africa one more frequently meets four or five Lions together than single specimens, and troops of ten or twelve are not extraordinary. His experience taught him that the South African Lion prefers feasting off the game some hunter has killed to exerting himself to capture his own prey. This is why he regularly follows nomadic tribes wherever they go; he regards them as his tributary subjects and the taxes he levies on them are indeed of the heaviest kind.

The Cubs are usually two or three and the Lioness treats them with great tenderness. They play together like Kittens. In well-managed zoological gardens Lions are now bred as carefully as Dogs; and even in circuses, where the animals have but little room and often insufficient nourishment, they are born and sometimes grow up. The Cubs are at first rather clumsy. They are born with their eyes open and are about half the size of a Cat. Towards the close of the first year they are about the size of a strong Dog. In the third year the mane begins to appear on the male, but full growth and distinction of sex, according to Brehm, are only completed in the sixth or seventh year. Lions in captivity have lived to be seventy years old.

Brehm, who loved the Lion and was probably better acquainted with his habits than any other traveler, says: "The most prominent naturalists give the Lion credit for qualities which in my opinion include nobility enough. And whoever has become more closely acquainted with that animal; whoever has, like myself, intimately known a captive Lion for years, must think as I do; he must love and esteem it as much as a human being can love and esteem any animal."

THE SPARROW HAWK.

Killy–killy–killy–killy!

That's my song and I don't sing it very low either. It is for that reason some people call me the Killy Hawk.

The boys who spend much time in the fields are very well acquainted with me. Many a time, I dare say, they have seen me patiently sitting, for an hour or more, on a lofty branch waiting for "something to turn up."

Something does generally turn up, and that is a mouse. "Ah," says she, peeking out from her nest, "there is nobody around, so I will go out for a walk," and out she comes, not noticing me way up in the tree, of course.

Then I dive from my perch and fly directly over her. A mouse can't keep still, somehow, and from point to point she runs, zigzagging this way and that way, giving me lots of trouble, for I have to zigzag, too. After awhile she stands still for a minute, and so do I, up in the air, my fan-like tail spread out very wide, my head lowered and —well, pretty soon it is all over with Mrs. Mouse. But mice are nuisances anyway, don't you think? Just because people have seen me do that little trick they call me the Mouse Hawk. I catch Sparrows, and other small birds, so they call me the Sparrow Hawk, too.

I don't care what they call me, to tell you the truth, just so they let me alone. It's not pleasant to have a stone thrown at you, or a gun pointed your way——if it is loaded, and they generally are loaded, I notice with something that hurts.

My nest? Oh, I don't care for that sort of work, so I never build one. Any natural hole in a high tree, the deserted hole of a Woodpecker, or a Magpie's nest, is good enough for me. Just a few leaves in the bottom, and on them my mate lays five eggs, sometimes six, sometimes seven.

THE CACTUS.

PROF. W. K. HIGLEY.

BECAUSE the Greeks in olden times applied the word Cactus to a prickly plant, Linnæus, often called the Father of Botany, gave the same name to our wonderful American growth and since his time these strange and varied plants have borne this nomenclature.

We can hardly imagine any group of plants more interesting. There are over eight hundred varieties of curious and unexpected forms, bearing tubular or rotate flowers most varied in size and color—white, pink, purple, yellow, crimson, deep red—all beautiful and fascinating, and in our Northern country, protected in the conservatories. The Night-blooming Cereus is most renowned, most admired of all.

The Cacti are commonly found in the United States, in Mexico, and in South America, and some species are cultivated on the borders of the Mediterranean Sea, where the fruit is eaten.

They vary in size from an inch or two in height to enormous growths of fifty or sixty feet (*Cereus giganteus*) which stand like telegraph poles, sometimes nearly bare, sometimes with many vertical branches, reminding one of a huge candelabrum. Then again some forms are nearly spherical, while others are long, jointed, and square, one species (*Echinocactus visnaga*) grows about nine feet in height with a diameter of three feet or more and a single plant of this species will sometimes weigh a ton. One of our most common forms is flat and broad; This, the Prickly Pear or Indian Fig (*Opentia Vulgario*), is the only species found as far north as Wisconsin and New York.

As many of the Cacti require but little care, they are quite extensively cultivated, not only for the rare beauty of their flowers, but for economic purposes. However, nearly all are worthy of culture because of their peculiar forms.

In structure they are fitted for growth in the most arid regions; they abound in the deserts of New Mexico and southward, in many cases obtaining their food from a soil in which no other plant will grow, their thick coats enabling them to retain moisture and vitality for many weeks. Specimens of the Prickly Pear have been known to grow after lying on a dry floor, in a closed room, for six months and they have blossomed when left in this condition for some time.

These plants, which are more or less succulent, are usually protected from the ravages of animal life by a formidable array of spines and prickles. Those who have carelessly handled our common Prickly Pear can attest to the intensely irritating character of its defensive armor. Thus does nature provide for the care of its otherwise defenseless forms.

A form of the Prickly Pear (*Opuntia coccinellifera*) is cultivated in Mexico for the pupose of raising the Cochineal insect (*Coccus cacti*) which feeds upon it. Some of these plantations contain as many as 50,000 plants. The females are placed on the Cactus in August and in about four or five months the first gathering of the Cochineal takes place, being then ready for the market.

There are many other interesting uses to which these plants are put. When suffering from thirst animals will tear off the hard outer fibers and eagerly devour the moist, juicy interior of the stems. The Moki Indian basket makers use the fiber in their work. This they dye different colors and wind around the foundations, giving strength and beauty. The spines of one species (*Echinocactus visnaga*) are used by the Mexicans as toothpicks. It has been estimated that a single plant may bear upwards of 50,000 spines.

A unique and beautiful sight was a group of Cacti blooming in a Colorado garden, where the owner had spent much time and expense in gathering together many varieties, and one was made to realize how remarkable a thing Nature had lavished upon us: for, as Mr. Grant Allen has said: "The Cactuses are all true American citizens by birth and training, and none of them are found truly indigenous in any part of the Old World."

THE SQUIRREL'S ROAD.

It zigzags through the pastures brown,
And climbs old Pine Hill to its crown,
With many a broken stake and rail,
And gaps where beds of ivy trail.
In hollows of its mossy top
The pine-cone and the acorn drop;
While, here and there, aloft is seen
A timid, waving plume of green,
Where some shy seed has taken hold
With slender roots in moss and mold.

The squirrel, on his frequent trips
With corn and mast between his lips,
Glides in and out from rail to rail,
With ears erect and flashing tail.
Sometimes he stops, his spoil laid by,
To frisk and chatter merrily,
Or wash his little elfin face,
With many a flirt and queer grimace.
Anon he scolds a passing crow,
Jerking his pert tail to and fro,
Or scurries like a frightened thief
At shadow of a falling leaf.
All day along his fence-top road
He bears his harvest, load by load,
The acorn with its little hat;
The butternut, egg-shaped and fat;
The farmer's corn, from shock and wain;
Cheek-pouches-full of mealy grain;
Three-cornered beechnuts, thin of shell;
The chestnut, burred and armored well;
And walnuts, with their tight green coats
Close buttoned round their slender throats.

A busy little workman he,
Who loves his task, yet labors free,
Stops when he wills, to frisk and bark,
And never drudges after dark!
I love to hear his chirring cry,
When rosy sunrise stains the sky,
And see him flashing in his toil,
While frost like snow encrusts the soil.

With tail above his back, he sails
Along the angles of the rails,
Content to gain two rods in three,
And have sure highway from his tree.
Dear is the old-time squirrel way,
With mosses green and lichens gray,—
The straggling fence, that girds the hill,
And wanders through the pine woods still.
I loved it in my boyhood time,
I loved it in my manhood's prime,
Would in the corn-field I could lie,
And watch the squirrels zigzag by!

—JAMES BUCKHAM.

THE FLYING-SQUIRREL.

WITH the exception of Australia, Squirrels are found in all parts of the globe; they extend tolerably far north and are found in the hottest parts of the South. As a family they are lively, quick, and nimble in their movements, both in trees and upon the ground, Flying Squirrels alone being ill at ease when upon the surface of the earth. In compensation for this, however, they are possessed of a faculty which enables them to make exceedingly long leaps, which they take in an obliquely descending direction.

The nocturnal Flying Squirrels, says Brehm, differ from the diurnal Tree Squirrels mainly in having their fore and hind legs connected by a wide flying-membrane. This membrane acts as a parachute, and enables them to execute considerable leaps with ease, in an inclined plane from above downwards. This membrane consists of a stout skin, extending along both sides of the body, thickly grown with hair on the upper side, while the lower one shows but a scanty covering. A bony spur at the first joint of the fore-legs gives especial strength to the membrane. The tail serves as an effective rudder and is always vigorous, though it is not of the same conformation in the different species, one group having it simply bushy, while the other has the hair on it arranged in two lateral rows. There are also slight differences in the structure of the teeth.

The Flying Squirrel of North America, Assapan, is next to the smallest variety of the whole species, the Jaguan, or East Indian, being the largest, nearly equaling a cat in size.

The fur of the North American Flying Squirrels is exceedingly soft and delicate. In captivity they suffer themselves, by day, to be gently handled, making no effort to bite with their little sharp teeth as other Squirrels do. Overcome with sleep they lie curled up in their cage, as much hidden from view as possible, rarely bestirring themselves before nine o'clock at night. Then, "on the upper edge of the sleeping-box, which one must give them as a substitute for their nest, a round little head becomes visible; the body follows and soon one of the little creatures sits on the narrow edge of the box in a graceful Squirrel-like attitude, the flying membrane half folded against its body, half hanging down in a soft curve. The small, expanded ears move back and forth as does the bewhiskered muzzle, and the large, dark eyes inquisitively scan the cage and surroundings. If nothing suspicious is visible, the Assapan glides down like a shadow, always head first, whether the plane be inclined or vertical, without any noise, without a perceptible movement of the limbs, the greater part of which is covered with the membrane. It proceeds on the woven ceiling of the cage, back downward, as if it walked on level ground; it rope-dances over thin twigs with unsurpassed precision and agility at a uniform speed; spreading its membrane to the full, it darts through the whole space of the cage like an arrow, and the next instant seems glued to the perch, without having made an effort to regain its balance.

"During all this moving about it picks up a crumb, a nut, a grain of meat from its dish; drinks, sipping more than it laps, washes its head with saliva, combs its hair with the nails of its fore-feet, smooths it with the soles of its small paws, turning, stretching, stooping all the while, as if its skin were a bag in which its body sits quite loosely.

"After hunger and thirst are somewhat appeased, and the toilet over, a playful humor succeeds. Up and down, head upward or inverted, along the ceiling, or the floor, running, jumping, gliding, soaring, hanging, sitting, rushing ahead as if it could move a thousand joints at once, as if there were no such thing as gravity to be overcome."

THE MARSH WRENS.

A happier pair of birds than these little Wrens it would be hard to find.

They have just come up from taking their morning bath and are going to sing a while before going to work on their nests.

You see I say nests. That is a strange thing about the Wrens, they build several nests. I wonder if you can tell why they do this. If you can't, ask your teacher about it.

It is a little too early in the season or I would have one of the nests in the picture for you to look at.

I will try to describe it to you, so that you will know it when you see it. These little Wrens make their nests of coarse grasses, reed stalks, and such things, lined with fine grasses. It is round like a ball, or nearly so, and has the opening in the side. They fasten them to the reeds and bushes.

If you wish to get acquainted with these birds, you must visit the tall grasses and cat-tails along rivers and creeks and in marshes.

You won't have to let them know that you are coming; they will see you long before you see them, and from their little nests they will begin to scold you, for fear that you mean to do them harm.

When they see that you mean them no harm, they will begin to entertain you with their songs. Oh, how they do sing! It just seems as though they would burst with song.

You can see how happy the one is in the picture. The other little fellow will soon take his turn. See how straight he holds his tail up. Find out all you can about these Wrens. You notice they have long bills. We call them Long-billed Marsh Wrens. There are several other kinds. You surely must have seen their cousins, the House Wrens. I will show you their pictures some day.

SOME LOVERS OF NATURE.

Our Music's in the Hills.—EMERSON.

The groves were God's first temples.—BRYANT.

Nature, the vicar of the Almighty Lord.—CHAUCER.

The liquid notes that close the eye of day, (the Nightingale).—MILTON.

When spring unlocks the flowers to paint the laughing soil.—BISHOP HEBER.

O, for a seat in some poetic nook,
Just hid with trees and sparkling with a brook.—LEIGH HUNT.

By shallow rivers, to whose falls
Melodious birds sing madrigals.—CHRISTOPHER MARLOWE.

To me the meanest flower that blows can give
Thoughts that do often lie too deep for tears.—WORDSWORTH.

To him who in the love of nature holds
Communion with her visible forms, she speaks
A various language —BRYANT.

And this one life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.—SHAKESPEARE.

And now 'twas like all instruments,
Now like a lonely flute ;
And now it is an angel's song,
That makes the heavens be mute.—COLERIDGE.

There is a pleasure in the pathless woods,
There is a rapture in the lonely shore,
There is society, where none intrudes,
By the deep sea, and music in its roar ;
I love not Man the less, but Nature more.—BYRON.

In June 'tis good to be beneath a tree
While the blithe season comforts every sense;
Steeps all the brain in rest, and heals the heart,
Brimming it o'er with sweetness unawares,
Fragrant and silent as that rosy snow
Wherewith the pitying apple-tree fills up
And tenderly lines some last-year's Robin's nest—LOWELL.

THE CALIFORNIA VULTURE.

Among the crags, in caverns deep,
The Vulture rears his brood;
Far reaching is his vision's sweep
O'er valley, plain, and wood;
And wheresoe'er the quarry lies,
It cannot 'scape his peering eyes.
The traveler, from the plane below,
Sees first a speck upon the sky—
Then, poised on sweeping wings of woe,
A Vulture, Bat-like, passes by.

DOCTOR BREWER states that the single species composing this very distinct genus belongs to western North America, and, so far as known, has the most restricted distribution of all the large raptorial birds in the world. It is found on the coast ranges of southern California from Monterey Bay southward into Lower California. It has become very much reduced in numbers and extinct in localities where it was formerly abundant, which is doubtless due to the indiscriminate use of poison which is placed on carcasses for the purpose of killing Wolves, Bears, Lynxes, Cougars, and other animals which destroy Sheep, Calves, and other cattle of the stockmen. Davie says it is more common in the warm valleys of California, among the almost inaccessible cliffs of the rough mountain ranges running parallel with the Sierra Nevadas for a hundred miles south of Monterey. It associates with the Turkey Buzzard, and the habits of both species are alike, and they often feed together on the same carcass.

The Vulture's flight is easy, graceful, and majestic. A writer who watched one of these gigantic birds thus pictures it: "High in air an aeronaut had launched itself—the California Condor. Not a wing or feather moved, but resting on the wind, like a kite, the great bird, almost if not quite the equal of its Andean cousin, soared in great circles, ever lifted by the wind, and rising higher and higher into the empyrean. Not a motion of the wing could be seen with careful scrutiny through the glass, but every time the bird turned and faced the wind it seemed to bound upward as though lifted by some superhuman power, then bearing away before it, gathering the force or momentum which shot its air-laden frame higher and higher until it almost disappeared from sight —a living balloon."

The ordinary California Buzzard and the singular Ravens of Santa Catalina Island often give marvelous exhibitions of soaring or rising into the air without moving their wings, and when it is remembered that their bodies are reduced to a minimum of weight, and that even the bones are llled with air, it is almost scientifically and literally true that they are living balloons. And yet the weight of the Vulture is sometimes twenty-five pounds, requiring immense wings—eight and a half to eleven feet from tip to tip —to support it.

Mr. H. R. Taylor, of the late *Nidologist,* says there have probably but three or four eggs of the California Vulture been taken, of which he has one. The egg was taken in May, 1889, in the Santa Lucia Mountains, San Luis Obispo County, California, at an altitude of 3,480 feet. It was deposited in a large cave in the side of a perpendicular bluff, which the collector entered by means of a long rope from above. The bird was on the nest, which was in a low place in the rock, and which was, the collector says, lined with feathers plucked from her own body. This assertion, however, Mr. Taylor says, may be an unwarranted conclusion. From the facts at hand, it appears that the California Condor lays but a single egg.

The Condor is not an easy bird to capture, for it has a fierce temper and a powerful beak. An unusually large one, however, was recently taken in Monterey County, California. To catch the mighty creature William J. Barry made use of a lasso, such as ranchmen have with which to round up obstreperous cattle. The strength of one man was barely sufficient to imprison it. It is said that the appetite of the bird was not affected by its loss of liberty.

CALIFORNIA VULTURE.
$\frac{1}{5}$ Life-size.

FEATHERS OR FLOWERS?

WAS the question which confronted the fair sex this year when about to select their Easter hats or bonnets.

"Say flowers," pleaded the members of the Audubon Society, and from the many fair heads, innocent of feather adornment, which bowed before the lily-decked altars on Easter morning, one must believe that the plea was heeded.

Nearly every large house in Chicago, dealing wholly or in part in millinery goods, was visited by a member of the Audubon Society, says the *Tribune*. One man who sells nothing but millinery declared that the bird protective association was nothing but a fad, and that it would soon be dead. He further said he would sell anything for hat trimming, be it flesh, fish, or fowl, that a *woman would wear*.

Touching the question whether the beautiful Terns and Gulls, with their soft gray and white coloring, were to be popular, it was said that they would not be used as much as formerly. One salesman said that he would try, where a white bird was requested, to get the purchaser to accept a domestic Pigeon, which was just as beautiful as the sea and lake birds named.

The milliners all agree that the Snowy Egret is doomed to extermination within a short time, its plumes, so fairy-like in texture, rendering its use for trimming as desirable in summer as in winter.

As to the birds of prey, people interested in our feathered friends are as desirous of saving them from destruction as they are to shield the song birds. There are only a few of the Hawks and Owls which are injurious, most of them in fact being beneficial. Hundreds of thousands of these birds were killed for fashion's sake last fall, so that this coming season the farmer will note the absence of these birds by the increased number of rat, mouse, and rabbit pests with which he will have to deal.

It is a matter of congratulation, then, to the members of the Audubon Society to know that their efforts in Chicago have not been wholly fruitless, inasmuch as the majority of dealers in women's headgear are willing to confess that they have felt the effect of the bird protective crusade.

Dr. H. M. Wharton, pastor of Brantly Baptist Church, Baltimore, has always been a bitter opponent of those who slaughter birds for millinery purposes. "It is wholesale murder," said he, "and I am delighted that a bill is to be offered in the Maryland legislature for the protection of song birds. I have commented from the pulpit frequently upon the evil of women wearing birds' wings or bodies of birds on their hats, for I have long considered it a cruel custom."

"Birds are our brothers and sisters,' said the Rev. Hugh O. Pentecost before the Unity Congregation at Carnegie Music Hall, Pittsburg, a few weeks ago. "If we are children of God, so are they. The same intelligence, life, and love that is in us is in them. The difference between us is not in kind, but in degree."

"How is this murderous vanity of women to be overcome?" asks *Our Animal Friends*. "We confess we do not know; but this we do know, that good women can make such displays of vanity disreputable, and that good women *ought to do it*."

THE AMERICAN GOLDEN-EYE.

"We watch the hunters creeping near
Or crouching in the silvery grasses;
Their gleaming guns our greatest fear,
As high o'erhead our wild flock passes.

"But we are of the air, and speed
Like meteors dropping from the sky;
He's 'the man behind the gun' indeed
Who can fairly wing a Golden-eye."

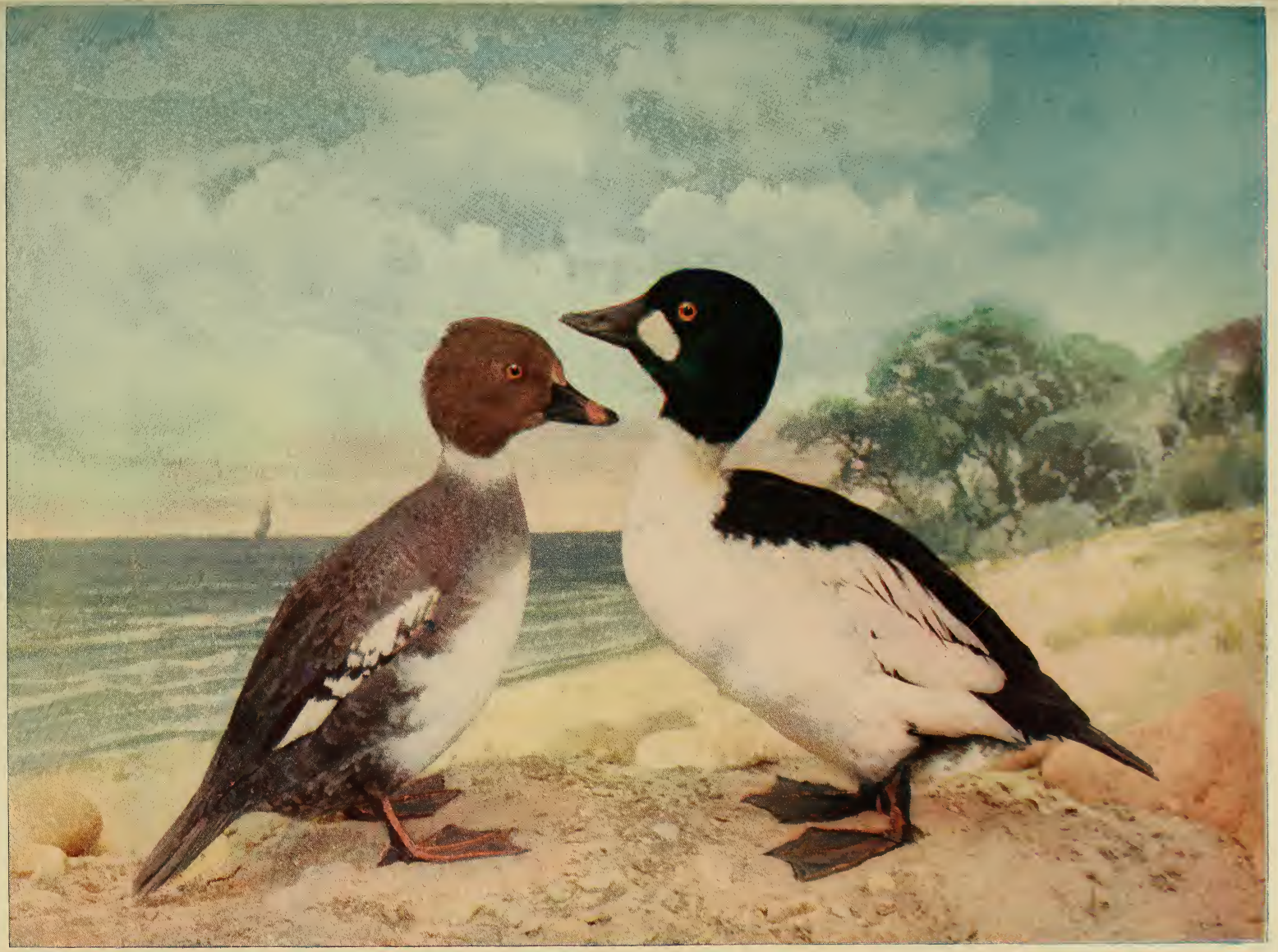
FOR beauty this bird will compare favorably with any of the family except the Wood Duck, whose colors are more various and brilliant. Whistler is the name by which it is more commonly known, from the peculiar noise of wings made while flying. In spite of its short, heavy body and small wings, it covers immense distances, ninety miles an hour being the speed credited to it by Audubon, who, however, was not always accurate in his calculations. It is an abundant species throughout the fur countries, where it frequents the rivers and fresh-water lakes in great numbers. It breeds as far north as Alaska, where, on the Yukon, it nests about the middle of June. Like the Wood Duck, it makes its nest in hollow trees and decayed trunks. This consists of grass, leaves, and moss, lined with down from the bird's breast. The eggs are from six to ten in number, and ashy green in color.

The Golden-eye is a winter visitant to Illinois. On Long Island it is better known among the hunters as the "Whistler," and by others it is also called the "Great-head," from its beautifully rich and thickly crested head. On that island it is said to be a not very abundant species, arriving there in company with other migratory Ducks. Mr. Girand met with it in the fall and spring on the Delaware and in Chesapeake Bay. Its food consists of small Shell and other Fish, which it procures by diving. In the fall the flesh of the Golden-eye is very palatable. It is very shy and is decoyed with great difficulty. In stormy weather it often takes shelter in the coves with the Scoup Duck, and there it may be more readily killed. Naturally the Golden-eye is chiefly seen in company with the Buffle-head, the Merganser, and other species that are expert divers like itself. When wounded, unless badly hurt, its power of diving and remaining under water is said to be so remarkable that it cannot be taken.

The Golden-eyes always have a sentinel on the watch to announce the approach of an enemy. They have been very little studied in their haunts. The word *Clangula* indicates in some degree the tone of their voices. They swim under water like fish, out of which they can bound upward and make off with prodigious speed.

GOLDEN ROD.

A lady who has lately been making a visit in the West was telling the other day about the forlorn aspect of the country out that way to her. "Even the Golden-rod," she said; "you can't imagine how scraggly and poor it looks, compared with our magnificent flowers along the road here. I wonder what makes the Western Golden-rod so inferior." The very next day there arrived at her house a relative whom she had been visiting when she was in the West. He sat on the veranda, and looked indulgently — even admiringly — at the landscape, and praised its elements of beauty. But as his eye ran along the roadside near by, he said: "But there is one thing that we are ahead of you in—you have no such splendid Golden-rod here as we have out West! The Golden-rod growing along that road, now, is tame and poor compared with ours." What a blessed thing it is that the gold of our own waysides is richer than the gold of all other waysides!



AMERICAN GOLDENEYE.
⅓ Life-size.

BIRDS IN THE SCHOOLS.

THE movement to protect the birds of America and prevent them from being transformed into millinery in such prodigious numbers, is having a marked revival in many parts of the country, especially in the state of New York. In New York City there was recently held a large public meeting, under the auspicies of the Audubon Society and the American Museum of Natural History, to protest against the wholesale and indiscriminate destruction of native birds for personal adornment. State Superintendent of Schools Skinner, of that state has established a "bird day" in the public schools in connection with Arbor Day, in which the pupils will be taught the great value of birds to mankind. Mr. Skinner also has in preparation a manual upon the subject, 100,000 copies of which he will have distributed among the New York state schools.

Public ignorance regarding the value of birds in the economy of nature and especially to human life is so great as to be almost incomprehensible. A number of estimates recently made by Morris K. Jesup, President of the American Museum of Natural History, show how important it is that a stronger safe-guard, in the shape of public sentiment, should be thrown about our feathered benefactors. In a late interview upon this subject, Mr. Jesup said:

"Among the birds most worn this winter are the Herons, which are killed for their aigrettes; the Terns, or Sea Swallows and Gulls; in short mostly marsh and maritime birds." It is known that the killing of a great number of these shore birds has been followed by an increase in human mortality among the inhabitants of the coast, the destroyed birds having formerly assisted in keeping the beaches and bayous free from decaying animal matter. New Orleans had a plague of bugs about the middle of September, just when the yellow fever began, and, strange as it may seem, the bugs proved far more troublesome than the disease, and certainly the annoyance was more immediate. The people called it a mystery, but the scientists said it was merely the result of man's improvidence in destroying the birds. The destruction has been going on in Louisiana, particularly on the Gulf coast, for years, and has been carried on by professional hunters, who kill the birds solely for millinery purposes. Nature revenged herself on New Orleans, as she will on every place where birds are destroyed for fashionable purposes.

Would it not be a good thing to increase the intelligence of the present and rising generation respecting the value of birds by introducing into the schools of every state in the Union the idea which has been adopted by State Superintendent Skinner? And we respectfully suggest that the use of this magazine by teachers, through the wise co-operation of school boards, everywhere, as a text book, would quickly supply the knowledge of bird life and utility so sadly needed by the community. We present some of the innocent creatures each month in accurate outline and color, and the dullest pupil cannot fail to be impressed by their beauty and the necessity for their protection. "Our schools, public and private, can hardly be criticised as instructors in the common branches of learning, but they could also teach the rising generation the equally important truths relating to the material world with which we are encircled." In Colorado and in some other states Boards of Education have supplied their teachers with BIRDS in sufficient quantities to enable their pupils to study the subjects in the most profitable manner.

THE AMERICAN SKUNK.

THIS little animal is distinctively American, the one figured being found only in North America. It has a beautiful jet-black fur, varied with a larger or smaller amount of white forming a stripe on each side of its body and head, and more or less of its tail. In some cases the white is reduced to a small "star" at the top of the head, and without doubt some specimens are entirely black, while occasionally a white specimen may be seen.

The fur of the Black Skunk is considered the best, and brings the highest price which decreases as the amount of white increases, the white ones being almost valueless. A slight unpleasant odor clings about the manufactured fur, which detracts much from its commercial value, although some dealers claim that this is never noticed when it is sold as "Alaska sable."

Another common name for the Skunk is Polecat. Though found in the woods, they prefer to inhabit grassy or bushy plains. During the day they lie sleeping in hollow trees or stumps, in clefts of rocks, or in caverns, which they dig for themselves; at night they rouse themselves and eagerly seek for prey. Worms, insects, birds, and small animals, roots and berries constitute their food.

The range of the Skunk is quite extensive, the animal being most plentiful near Hudson Bay, whence it is distributed southward.

It is slow in its movements, can neither jump nor climb, but only walk or hop. Knowing how formidable is its weapon of protection, it is neither shy nor cowardly.

The Skunk is a much respected animal, both man and beast preferring to go around him rather than over him, and many amusing anecdotes are related by hunters and naturalists, which lead us to believe that he does not always come out second best in an encounter. When in search of food he is so bold that he can be approached without difficulty, and he wears a look of innocence that effectually deceives the uninitiated, and brings about very unexpected results.

Hensel says that when it is pursued by dogs it lays its tail along its back like a sitting Squirrel, turns its hinder quarters towards the dogs and performs queer, angry, hopping antics, such as one sometimes sees in the cages of Bears. The attacked animal never wastes its secretion by unnecessary haste, but continues to threaten as long as the dogs are a few yards distant from it.

"Skunk Farming" cannot be said to be a growing industry, but there are a number of such "farms" in the northern and eastern states which are said to pay fairly well. A small plat of land is enclosed by a high board fence; stakes are driven into the ground close together under the fence so that the animals cannot burrow out. Small shelters are built in, some hay thrown in for nests, and the farm is ready for the skunks.

Skunks get very tame in captivity and tolerably well accustomed to their keeper, though great care is required not to irritate them. Hay is their favorite bed, on which they curl up like a ball. After eating, they wipe their snouts with their forepaws, being very cleanly, and they always keep their fur dainty and dressed. The fur is not very fine or soft, but it is valuable and in considerable demand.

SKUNK.
⅜ Life-size

FLYING SQUIRREL.
½ Life-size.

THE EVENING GROSBEAK.

In the far Northwest we find this beautiful bird the year around. During the winter he often comes farther south in company with his cousin, the Rose-breasted Grosbeak.

What a beautiful sight it must be to see a flock of these birds—Evening Grosbeaks and Rose-breasted in their pretty plumage.

Grosbeaks belong to a family called Finches. The Sparrows, Buntings, and Crossbills belong to the same family. It is the largest family among birds.

You will notice that they all have stout bills. Their food is mostly grains and their bills are well formed to crush the seeds.

Look at your back numbers of "BIRDS" and notice the pictures of the other Finches I have named. Don't you think Dame Nature is very generous with her colors sometimes?

Only a few days ago while strolling through the woods with my field glass, I saw a pretty sight. On one tree I saw a Red-headed Woodpecker, a Flicker, an Indigo Bunting, and a Rose-breasted Grosbeak. I thought then, if we could only have the Evening Grosbeak our group of colors would be complete.

Have you ever wondered at some birds being so prettily dressed while others have such dull colors?

Some people say that the birds who do not sing must have bright feathers to make them attractive. We cannot believe this. Some of our bright colored birds are sweet singers, and surely many of our dull colored birds cannot sing very well.

Next month you will see the pictures of several home birds. See if dull colors have anything to do with sweet song.

THE KENTUCKY WARBLER.

Although this bird is called the Kentucky Warbler, we must not think he visits that state alone.

We find him all over eastern North America. And a beautiful bird he is.

As his name tells you he is one of a family of Warblers.

I told you somewhere else that the Finches are the largest family of birds. Next to them come the Warblers.

Turn back now and see how many Warblers have been pictured so far.

See if you can tell what things group them as a family. Notice their bills and feet.

This bird is usually found in the dense woods, especially where there are streams of water.

He is a good singer, and his song is very different from that of any of the other Warblers.

I once watched one of these birds—olive-green above and yellow beneath. His mate was on a nest near by and he was entertaining her with his song.

He kept it up over two hours, stopping only a few seconds between his songs. When I reached the spot with my field-glass I was attracted by his peculiar song. I don't know how long he had been singing. I stayed and spent two hours with him and he showed no signs of stopping. He may be singing yet. I hope he is.

You see him here perched on a granite cliff. I suppose his nest is near by.

He makes it of twigs and rootlets, with several thicknesses of leaves. It is neatly lined with fine rootlets and you will always find it on or near the ground.

In the September and October number of "BIRDS" you will find several Warblers and Finches. Try to keep track of them and may be you can do as many others have done—tell the names of new birds that come along by their pictures which you have seen in "BIRDS."

HUMMINGBIRDS.
Life-size.

Life-size.

No. 1—Silkworm eggs. No. 2—Fourth-stage worm. No. 3—Pupa in Cocoon. No. 4—Cocoon. No. 5—Male Moth. No. 6—Female Moth. No. 7—Unspun Silk. No. 8—Raw Manufactured Silk. No. 9—Manufactured Silk.

HUMMING-BIRDS.

"Minutest of the feathered kind,
Possessing every charm combined,
Nature in forming thee, designed
That thou shouldst be

"A proof within how little space
She can comprise such perfect grace,
Rendering the lovely fairy race
Beauty's epitome."

IT has been said that what a beautiful sonnet is to the mind, one of these fairy-like creations is to the eyes. This is true even in the case of mounted specimens, which must necessarily have lost some of their iridescence. Few can hope to see many of them alive. The gorgeous little birds are largely tropical, the northern limit of their abundance as species being the Tropic of Cancer. They are partial to mountainous regions, where there is diversity of surface and soil sufficient to meet their needs within a small area. The highlands of the Andes in South America are the regions most favored by a large number of species. They are most abundant in Ecuador, the mountain heights affording a home for more than one hundred species. Columbia has about one hundred species; Bolivia and Peru claim about ninety-six; then follow, in consecutive order, Central America, Brazil, Venezuela, Mexico, Guiana, the West Indies, and the United States.

The eastern part of the United States has but one representative of the Humming-bird family, and only seventeen species have been found within the limits of the country. As ten of these really belong to the Mexican group, we can claim ownership of only seven, most of which, however, migrate far south in winter. Only one of these, the Anna, spends the winter in the warm valleys of California.

Most of the Hummers are honey-lovers, and they extract the sweetest juices of the flowers.

The "soft susurrations" of their wings, as they poise above the flowers, inserting their long beaks into tubes of nectar, announce their presence. Some of the Warblers and Kinglets will sometimes poise in this way before a leaf and peck an insect from its surface, but it is not a regular habit with them. The Hummer's ability to move backwards while on the wing is one of the most wonderful features of its flight, and this movement, Mr. Ridgway says, is greatly assisted by a forward flirt of the bird's expanded tail.

The nests of the Humming-birds are of cup-shape and turban-shape, are composed chiefly of plant-down, interwoven and bound together with Spider webs, and decorated with lichens and mosses. Usually the nest is saddled upon a horizontal or slanting branch or twig, but that of the Hermit Hummer is fastened to the sides of long, pointed leaves, where they are safe from Monkeys and other predaceous animals.

"Dwelling in the snowy regions of the Andes are the little gems called Hill-stars," says Leander S. Keyser, "which build a structure as large as a man's head, at the top of which there is a small, cup-shaped depression. In these dainty structures the eggs are laid, lying like gems in the bottom of the cups, and here the little ones are hatched. Some of them look more like bugs than birds when they first come from the shell. The method of feeding the young is mostly by regurgitation; at least such is the habit of the Ruby-throat, and no doubt many others of the family follow the fashions of the Humming-bird land. The process is as follows: The parent bird thrusts her long bill far down into the throat of her bantling, and then, by a series of forward plunges that are really terrible to witness, the honey food is pumped from the old bird's craw into that of the youngster. So far as is known the babies enjoy this vigorous exercise and suffer no serious consequences from it."

LIST OF COLORED PLATES VOLUME IV.