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and William Kerr Higley**

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

Vol. X.

JUNE, 1901.

No. 1



BIRDS and NATURE

IN NATURAL COLORS

A MONTHLY SERIAL
FORTY ILLUSTRATIONS BY COLOR PHOTOGRAPHY
A GUIDE IN THE STUDY OF NATURE

TWO VOLUMES EACH YEAR
VOLUME X
JUNE, 1901, TO DECEMBER, 1901

EDITED BY WILLIAM KERR HIGLEY

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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. X JUNE, 1901. No. 1

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JUNE.

No price is set on the lavish summer;
June may be had by the poorest comer.

And what is so rare as a day in June?

Then, if ever, come perfect days;
Then Heaven tries the earth if it be in tune,
And over it softly her warm ear lays:
Whether we look, or whether we listen,
We hear life murmur, or see it glisten;
Every clod feels a stir of might,
An instinct within it that reaches and towers,
And, groping blindly above it for light,
Climbs to a soul in grass and flowers;
The flush of life may well be seen
Thrilling back over hills and valleys;
The cowslip startles in meadows green,
The buttercup catches the sun in its chalice,
And there's never a leaf nor a blade too mean
To be some happy creature's palace;
The little bird sits at his door in the sun,
Atilt like a blossom among the leaves,
And lets his illumined being o'errun
With the deluge of summer it receives;
His mate feels the eggs beneath her wings,
And the heart in her dumb breast flutters and sings;
He sings to the wide world, and she to her nest,
In the nice ear of Nature which song is the best?

—James Russell Lowell, "The Vision of Sir Launfal."

2

BULLOCK'S ORIOLE.

(*Icterus bullocki*.)

Bullock's Oriole, a species as handsome and conspicuous as the Baltimore Oriole, replaces it in the western portions of the United States and is likewise widely distributed. Its breeding range within our borders corresponds to its distribution. It is only a summer resident with us, arriving usually from its winter haunts in Mexico during the last half of March and, moving slowly northward, reaches the more northern parts of its breeding range from a month to six weeks later. It appears to be much rarer in the immediate vicinity of the seacoast than in the Great Basin regions, where it is common nearly everywhere, especially if sufficient water is found to support a few stunted cottonwoods and willows. During my extensive wanderings through nearly all the states west of the Rocky Mountains and extending from the Mexican to the British borders, I have met with this species almost everywhere in the lowlands and in some localities have found it very abundant. Like the Baltimore Oriole, it avoids densely wooded regions and the higher mountains. It is especially abundant in the rolling prairie country traversed here and there by small streams having their sources in some of the many minor mountain ranges which are such prominent features of the landscape in portions of Idaho, Washington and Oregon. These streams are fringed with groves of cottonwood, mixed with birch, willow and alder bushes, which are the favorite resorts of this Oriole during the breeding season. The immediate vicinity of water is, however, not considered absolutely necessary, as I have found it nesting fully a mile or more away from it on hillsides, the edges of tablelands and in isolated trees, or even in bushes. In Colorado it is said to be found at altitudes of over eight thousand feet, but as a rule it prefers much lower elevations.

The call notes of Bullock's Oriole are very similar to those of the Baltimore, but its song is neither as pleasing to the ear nor as clear and melodious as that of the latter. Its food is similar and consists principally of insects and a few wild berries.

The nest resembles that of the Baltimore Oriole, but as a rule it is not quite as pensive and many are more or less securely fastened by the sides as well as by the rim to some of the adjoining twigs. The general make-up is similar. As many of the sections where Bullock's Oriole breeds are still rather sparsely settled, less twine and such other material as may be picked up about human habitations enter into its composition. Shreds of wild flax and other fiber-bearing plants and the inner bark of the juniper and willow are more extensively utilized; these with horsehair and the down of plants, wool and fine moss furnish the inner lining of the nests. According to my observations, the birch, alder, cottonwood, eucalyptus, willow, sycamore, oak, pine and juniper furnish the favorite nesting sites; and in Southern Arizona and Western Texas it builds frequently in bunches of mistletoe growing on cottonwood and mesquite trees.

The nests are usually placed in low situation, from six to fifteen feet from the ground, but occasionally one is found fully fifty feet up. A very handsome nest, now before me, is placed among six twigs of mistletoe, several of these being incorporated in the sides of the nest, which is woven entirely of horsehair and white cotton thread, making a very pretty combination. The bottom of the nest is lined with wool.



BULLOCK'S ORIOLE.
(*Icterus bullocki*).
 $\frac{2}{3}$ Life-size.
FROM COL. CHI. ACAD. SCIENCES.

The sexes are extremely devoted to each other and valiantly defend their eggs and young. I once saw a pair vigorously attack a Richardson's squirrel, which evidently was intent on mischief, and drive it out of the tree in which they had their nest. Both birds acted with the greatest courage and dashed at it repeatedly with fury, the squirrel beating a hasty retreat from the combined attack. The young are large enough to leave the nest in about two weeks and are diligently guarded and cared for by both parents until able to provide for themselves. 5

CHARLES BENDIRE.

From "Life Histories of North American Birds."

AN AFTERNOON IN THE CORNFIELD.

Uncle Philip was 16 years old, tall and strong, with merry dark eyes, red cheeks and thick, soft, wavy, brown hair. Every day except Saturday he was in school. Sometimes on Saturdays he went in the woods botanizing or he rowed his pretty boat, "The Lorelei," upon the lake. But, often he went to his sister's, Mamma Bryant's, to spend the day and work upon the farm. His little nephew, Leicester, was always glad when he came, for Uncle Philip took him with him to the field or barn, told him funny stories and taught him to take notice of all the things he saw or heard. One beautiful day in October, after the corn had been all cut and was standing in big yellow stooks, making long rows through the stubble, Uncle Philip arrived early in the morning at Leicester's home. Leicester was still in bed when Uncle Philip came, and Mamma Bryant said to herself, "I must go and see if he is awake." But just as she was about to open the door, out came Leicester in his white pajamas, rubbing his eyes and looking a little bit sleepy.

"Come, Leicester," said his mamma, "I will help you dress and then you can have your breakfast. Uncle Philip has been here and he has gone to the cornfield south of the meadow. He hitched up Blotter and Little Gray on the new wagon and will drive back to dinner. Come with me and get ready for breakfast. After breakfast I want you to take little sister Keren with you and hunt for the eggs. If you are a good, pleasant boy this morning you may go this afternoon with uncle, and I will make some cookies for you to take in your lunch basket."

Leicester, who was generally a very good boy, promised to do as his mother desired.

Before dinner time Aunt Dorothy came, and it was decided that she, too, should go to the cornfield and take Keren with her.

By one o'clock dinner was over. Mamma Bryant had decided that Leicester's lunch basket was too small, so she had taken a peach basket, into which she put, among other good things to eat, some large red apples and ever so many fresh baked cookies.

Uncle Philip had driven up the roadway and was standing in the new wagon waiting for his passengers. Corn huskers never take a seat on their wagons, but Uncle Philip had laid a board across the wagon-box and on that Aunt Dorothy seated herself.

It was a warm, bright day and the wagon ride to the cornfield was delightful. Blotter and Little Gray were not a very handsome team, but they were good gentle horses and the children loved them. Blotter was a white horse with black spots on him, which made him look as if he had been used for a pen-wiper.

On the way to the cornfield a little rabbit ran out of the bushes by the roadside, but quickly hid himself again. The chipmunks stood on their hind feet in the tall, withered grass and watched the new wagon coming down the road and popped into their holes when they thought it had come too near. The plummy pappus of the golden rod, with great bunches of scarlet rose seeds, bursting pods of the satin plant and clusters of large red and chocolate oak leaves growing on year-old sprouts which had sprung up from the stumps of trees cut down the fall before made huge bouquets in the fence corners. While driving through the meadow the horses, which were pastured there, came up to neigh a good-day to their friends in the harness and trotted along for some time on both sides of the wagon and behind it. At last the cornfield was reached and Uncle Philip drove up to a corn stook.

"Look at that bird sitting on the wire fence," said Aunt Dorothy. "Isn't that a butcher bird?"

"Yes," said Uncle Philip, "that is a shrike, or butcher bird. I should not wonder if it were the same bird that followed me around this morning. I won't tell you what he did, but if you will watch him maybe you'll see something very interesting yourself."

Uncle Philip put on his husking gloves and began his work, taking the ears of corn from the stalks in the stook without disturbing it any more than he could help.

Aunt Dorothy remained sitting on her board in the wagon.

Leicester and Keren went to play in the meadow through which they had just driven, and they frightened the butcher bird so that he flew away from the fence and perched near the top of a tall cornstalk in a neighboring stook. Keren found a dandelion blossom and Leicester a wild rose, a bit of pale, pink beauty that had blossomed late and alone on a bush whose leaves were dusty and faded. The children went to a hickory tree expecting to find some nuts on the ground, but the squirrels had been there already and nothing was left except some nut-shells. Yes, there were three or four nuts, but when, by the aid of two stones, the children had cracked them, they found the meat inside all dried up and unfit to eat. The squirrels must have known this without cracking the nuts, otherwise they would not have left them as they did.

Aunt Dorothy and Uncle Philip were talking about the butcher bird.

"The butcher bird is found all over the world," said Aunt Dorothy, "and has different names in different countries."

"And it has been written about by men who lived a long, long time ago," said Uncle Philip, and he told Aunt Dorothy some of those men's names. But they are so long and hard to say I will not tell them here.

"The shrike is a cousin to the crow. Nearly all the crows have black feathers, but the butcher bird wears a different dress in France from the one he wears in England, and in India he has still another garb," said Aunt Dorothy.

"Yes," said Uncle Philip, "but all the shrikes everywhere have toothed bills."

By this time two more shrikes or butcher birds had joined the first one and all three were flying about impatiently from place to place.

"Just as if they were waiting for something to happen," said Aunt Dorothy.

"So they are," said Uncle Philip, who had finished husking the corn in his stook. "Call the children now; or I will," he said, and whistled and beckoned till Leicester and Keren came running to where he was.

"Now," he said, "look at that stunted old tree over there, children. Do you see the three butcher birds in it?"

Yes, every one saw the birds.

"Well, then," he said, "get into the wagon and keep watch of them. I am going to drive to the next corn stook," and away they went. After Uncle Philip had stopped the horses he told Aunt Dorothy and the children to sit together on the board with their backs to the horses and keep very still.

"I am going behind the corn stook and will pull it away as best I can from where it now stands. Watch the birds and the ground near the stook."

As soon as he had pulled away the cornstalks he stooped down and walked away some distance as quickly and

quietly as he could. Then Aunt Dorothy and the children saw the butcher birds alight on the ground on which the cornstalks had been and catch young mice and moles. One of the birds took a mole to the wire fence near by and stuck it on a barb. Then he flew away, leaving it hanging there. He was going to catch some young mice to eat just then and save the mole for luncheon. 7

His claws were not strong enough to hold the mole while he could kill and eat it, but if he hung it on the wire fence he could use all his strength in tearing it to pieces with his strong toothed bill. Every one felt sorry for the poor mole, but all were glad to be able to see how the butcher bird gets his dinner.

Time went by and soon Uncle Philip was ready to move another bunch of cornstalks. Aunt Dorothy and the children prepared to watch again, for the butcher birds were still in the neighborhood and waiting anxiously for a chance to secure some more prey. This time there was a rat under the cornstalks and a bold butcher bird flew at him and tried to kill him. The rat, however, got away from his enemy in feathers. One of the butcher birds caught a mole and stuck it on a long thorn on a hawthorn tree.

"Let us have something to eat as well as the birds," said Uncle Philip. So he left Blotter and Little Gray standing in the field—they were never known to run away—and all went to a pleasant spot in the meadow and ate the luncheon which Mama Bryant had sent in the peach basket. Oh, how good those cookies tasted to Leicester and Keren!

Those were happy passengers who rode home that evening on the yellow ears of corn. Keren had found one red ear and she took it home and gave it a place by the side of her pet playthings.

At supper time Leicester told his papa what they had seen the butcher birds do, and Aunt Dorothy said: "You must tell about it in school, Leicester; it will make a good Monday morning story."

That evening after Uncle Philip and Aunt Dorothy had gone home and the children had said their little evening prayer Leicester kissed his mother and told her he would try to be a good boy every day for a whole week. "And I hope I will have as good a time next Saturday as I have had to-day," said he.

And all night long the little stars peeping through the windows saw two happy little faces asleep upon their pillows.

MARY GRANT O'SHERIDAN.

THE RETURN OF THE BIRDS.

I hear from many a little throat
A warble interrupted long;
I hear the robin's flute-like note,
The bluebird's slenderer song.

Brown meadows and the russet hill,
Not yet the haunt of grazing herds,
And thickets by the glimmering rill
Are all alive with birds.

—William Cullen Bryant.

8

HOUSE-HUNTING IN ORCHARD TOWN.

'Tis up and down
In Orchard town,
When airs with bloom are scented,
You'll hardly find
To suit your mind
A nook that is not rented.

The old sweet-bough,
They all allow,
The robin first selected.
"Our home is here,
Good cheer, good cheer,
All other claims rejected."

"Chick-a-dee-dee,
Don't come to me!"
The titmouse is refusing,
"We've leased this tree,
We'll friendly be,
But say you're late in choosing."

“Sweet, sweet, sweet, sweet,”
Across the street
The yellow-birds are moving.
“Chip-chip-a-chee;
So dear is she!”
He scarce can work for loving.

On lower floor,
Beside her door,
The wren is surely scolding.
If one but glance
She cries, “No chance
To rent the flat I’m holding.”

To hear her scold,
The sparrow bold
And jay, beside her dwelling,
Cry, “Tschip, tschip, chee!”
“Tease! tease! say we!”
The noise and chatter swelling.

On orchard wall,
To quip and call,
A stranger gay is listening;
His mate can hear
In meadow near,
Where daisy-birds are glistening.

Oh, Lady-link!
Ho, ho! just think!
To nest in trees what folly,
When they might be,
Like you and me,
In Daisy-land so jolly!

Down Pipin-way
Where branches sway,
An oriole hammock swings.
Mistress starling
And kingbird’s darling.
Rest near with brooding wings.

If you should go
Down Blossom-row,
Which runs right through the center,
At each day,
In morning gray,
You’d hear from every renter.

For handed down
In Orchard town,
’Tis quite an ancient notion,
To wake the earth
With song and mirth,
Such joy is their devotion.

—Isabel Goodhue.



SANDERLING.
(*Calidris arenaria*).
 $\frac{2}{3}$ Life-size.

FROM COL. CHI. ACAD. SCIENCES.

THE SANDERLING. (*Calidris arenaria*.)

By the beach border, where the breeze
Comes freighted from the briny seas,
By sandy bar and weedy rock
I frequent meet thy roving flock;
Now hovering o'er the bending sedge,
Nor gather'd at the ocean edge;
Probing the sand for shrimps and shells,
Or worms marine in hidden cells.

—Isaac McClellan.

This little shore or beach bird is sometimes called the White or Surf Snipe, and the Ruddy Plover. It breeds only in the colder portions of the northern hemisphere and migrates southward, even beyond the equator where it makes its home during the winter months. It frequents chiefly those regions near the surf-beaten shores of the oceans. It is also a common visitor to the beaches of larger inland waters. On these shores its beautiful form and habits are very noticeable. It walks and runs in a dignified and graceful manner as it chases the receding water searching for its food.

The pure white of the plumage of the under parts of the bird is a striking characteristic as they reflect the sunlight during flight. It is a silent bird and it sometimes appears alone, though it is usually seen in flocks and is frequently associated with other species of the snipe family. Regarding its habits, some one has said: "When feeding along the extreme verge of the ocean it is pleasant to watch its active movements when advancing or retreating with the influx of the sea. It is naturally very unwary and regards man with less suspicion than most of our snipes. When a flock is fired into, those which survive rise with a low whistling note, perform a few evolutions and presently resume their occupation with as much confidence as previously exhibited."

The feet of the Sanderling are unlike the other members of its family, being without a fourth toe, entirely divided and without a membrane. This indicates that it frequents firm surfaces and that it is fitted for running and walking upon the long, shelving beaches over which the tides and surf roll, leaving an abundance of its particular food.

The nest of the Sanderling, rudely constructed of dried grass and decayed leaves, is placed in a depression in the ground so situated as to be protected by the natural vegetation of the region. The eggs, usually three or four in number, have an ashy or greenish brown ground color and are finely spotted with different shades of brown.

The food of the Sanderling consists mainly of sea worms, small bivalve shells and crustaceans, though it will also eat buds and insects. It would seem as if its hunger was never satiated—always busy, always moving. These expressions describe its habits, as with its fellows and the other snipes with which it associates, it seeks its food in the wake of the retreating wave and turning, runs before the incoming water which seldom engulfs it.

For those who are so fortunate as to be located near the feeding grounds there can be no more interesting recreation than to sit on the beach and watch the peculiar antics of these delicate creatures. Frequently, without an apparent reason an entire flock will rise as if in answer to a signal and, after executing a few turns alight, again resume the occupation it had left.

PARTNERS.

No doubt every one knows the Lichens, the greenish gray growths, sometimes like rosettes or clusters of leaves or of fruit, on tree trunks or the gray rocks by the water, and even on the ground and old wood. Their forms are various and often graceful, and mingled with their greenish gray are many brighter colors, giving a rich tone to the rough surfaces they cover and adorn. But I dare say that most of us have thought of a Lichen as a single plant. It is not so, though it looks so exactly like one in its close union. It is a partnership, indeed; generally what looks like a single Lichen is a colony of partners keeping house together, or a manufacturing firm, if you like that expression of their business better. The partners are also kindred, or were so, in the past.

For there was a time long ago when there was only one big family of plants, the Algae; the brown Algae or seaweeds known as kelps often form the "wrack" or tangle of weeds like long leaves or branching stems, with berry or fruit-like bladders, thrown on the coast in great masses by a storm; and the red Algae, or the beautiful fern-like and coral-like seaweeds that grow far down in the deep sea. There are also the green Algae, found in fresh water, or even on damp tree trunks and rocks. They have many odd forms. One kind, called a pond scum, is a frothy, slippery mass of spirally wound bands, floating in ponds or still water; another, called "green felt," is found in water also, and has egg-like things from which spores or seed-like bodies escape to form new plants. They have filaments at the bottom, like roots, that are called "holdfasts." Lastly, there are blue-green Algae, jelly-like masses found on trees, rocks, damp earth or floating as green slimes in fresh water. Most water plants are active and independent. They are on the upward road, for though they have not distinct stems, roots, leaves or fruit, their different parts, as I have already said, show a decided likeness to these, especially their "holdfasts" to roots and their air-bladders to fruit. The exquisite red seaweeds are as graceful in form and vivid in color as many flowers.

There is a remarkable foreshadowing of the moral law even among these early growths. Some have shirked their work, which was to absorb waste substances, and manufacture these into organized plant food. They tried to live on other growths, to the injury of the latter, and even sank to feeding on dead substances. They lost the green chlorophyll, which is necessary for manufacturing, though the red and brown Algae do not show its presence because their other coloring is more vivid. But it is present all the same with every busy, self-respecting plant. The lazy, pauper growths deteriorated more and more and at last were no longer Algae at all, but Fungi. They could not live by themselves; their only chance was to get active or well-stocked partners. As the Alga developed more and more into a likeness of a perfect plant, so the Fungus grew less like one. The white furry "mould" on bread or preserved fruit, the "mildew" on grapes and lilac leaves, the "black knot" of cherry and plum, the "ergot" of rye, the "rust" of wheat, do not look like plants unless you study them through a magnifying glass. Nor do the "slime moulds" or the mushrooms, toadstools, puff-balls and truffles bear much resemblance to flowers. Some of these, however, are both pretty and useful.

In the case of a Lichen the partners really seem to be of use to each other. The Fungus is not a mere pauper living on his more active kinsman. If you examine a Lichen you will find a large number of transparent threads, and in their meshes lie the green Algae, giving the whole a greenish tint. The little cups or discs of the Fungus that appear on the surface are lined with vivid colors, and have delicate little bags or sacs, with seed-like spores inside. The Fungus supplies a shelter from extreme cold, and also holds water in which the Algae finds raw material. It is like a man and wife housekeeping, the man providing the house and the raw stuff—flour, eggs, sugar, etc.—and the wife makes these materials into food. Plants, by aid of their green stuff, work over the carbon and other materials they get from air and water and make sugar and starch, or organized food. This is their manufacture and they must have an abundance of light to do it well, so when the sea Algae grow to be immense kelps or seaweed, hundreds of feet long, they are kept afloat by their air bladders. Now, it is true the Fungus in our Lichen could not live at all without its busy Algae, which it holds in its transparent filaments, but it is not a useless partner, so we will not call it evil names. I think you will be surprised to hear, after all the warning given by these dependent and generally worthless idlers in the plant world, some of the beautiful and blooming flowers have fallen into their bad habits and are regular underground thieves.

For the *Gerardia* or false foxglove has established no partnership; it is plain stealing. It still works, so it has not lost its green of the leaf, or the purple and gold of its flower, but it steals the materials for its work. When it becomes utterly idle and useless it will lose all its color and be like the ghostly white Indian pipes that grow in the shadowy pine woods.

It is interesting to know how it steals. In the dark basement chambers underground the root servants of the plant move slowly in a certain circle that corresponds to the circle of light that the branches describe overhead. Within this space they gather chemicals from the soil and store up moisture, sending these by the sap up their elevators to the well-lighted leaves, where the manufacturing of starch and sugar goes busily on. Now, the *Gerardia*, being too trifling to collect its own stuff, sends suckers into the roots of other plants and greedily absorbs their contents. That is the reason it is so hard to transplant the *Gerardia*—its roots are enmeshed and entangled so in other roots below ground. A very odd thing sometimes happens to it. In the dark the roots occasionally blunder and tap other roots of the same *Gerardia*, just as if a pickpocket in the dark were by mistake to put his hand slyly into his own pocket and steal his own purse.

O violets tender,
 Your shy tribute render!
 Tie round your wet faces your soft hoods of blue;
 And carry your sweetness,
 Your dainty completeness,
 To some tired hand that is longing for you.

—May Riley Smith.

14

THE GREAT NORTHERN SHRIKE.

(*Lanius borealis.*)

Of the great family Laniidae, the shrikes, of the order Passeres, we have in America only two species, the Great Northern Shrike, *Lanius borealis*, and the loggerhead shrike, which has been dealt with in a previous article. The name of the Great Northern Shrike is much more than a mouthful, and is all out of proportion to the size and importance of the bird, though when I intimate it lacks in importance I by no means wish to say that it lacks in interest.

There are two hundred species of shrikes altogether, nearly all of them being confined to the Old World. When one comes to know fully the characteristics of the creatures he feels that the birds would not have been out of place if they had been classed in the order Raptores, because they possess the distinguishing traits of the bird of prey. The shrikes, however, do not have talons, and they are singers of no mean order, facts which perhaps disqualify them for association with their larger rapacious brethren.

The Great Northern Shrike, more commonly perhaps called Butcher Bird, comes from northern British-American territory to the latitude of Chicago in the fall and stays through the winter, when it leaves for the vicinity of Fort Anderson in the crown territories, to build its nest. This is placed in a low tree or bush and is composed of twigs and grasses. The eggs number four or five. During the winter the shrike's food consists almost entirely of small birds, with an occasional mouse to add variety. In the summer its diet is made up chiefly of the larger insects, though at times a small snake is caught and eaten with apparent relish.

The Great Northern Shrike has the habit of impaling the bodies of its victims upon thorns or of hanging them by the neck in the crotch of two small limbs. The bird has a peculiar flight, hard to describe, but which, when seen a few times, impresses itself so upon the memory vision that it can never afterward be mistaken, even though seen at a long distance. The Great Northern's favorite perch is the very tiptop of a tree, from which it can survey the surrounding country and mark out its victims with its keen eye. In taking its perch the shrike flies until one gets the impression that it is to light in the very heart of the tree. Then it suddenly changes direction and shoots upward almost perpendicularly to its favorite watch tower.

The Great Northern Shrike is larger and darker than its brother, the loggerhead. It is also a much better singer, its notes being varied and almost entirely musical, though occasionally it perpetrates a sort of a harsh half croak that ruins the performance. In general appearance at some little distance the shrike is not unlike a mocking bird. The description here given for the adult answers for both male and female: Upper parts gray; wings and tail black; primaries white at the base, secondaries tipped with white or grayish; outer, sometimes all the tail feathers, tipped with white, the outer feathers mostly white; forehead whitish; lores grayish black; ear coverts black; under parts white, generally finely barred with black; bill hooked and hawk-like. Immature bird similar, but entire plumage more or less heavily barred or washed with grayish brown.

One has to have something of the savage in him to enjoy thoroughly the study of the shrike. As a matter of fact, the close daily observance of the bird involves some little sacrifice for the person whose nature is tempered with mercy. The shrike is essentially cruel. It is a butcher pure and simple and a butcher that knows no merciful methods in plying its trade. More than this, the shrike is the most arrant hypocrite in the whole bird calendar. Its appearance as it sits apparently sunning itself, but in reality keeping sharp lookout for prey, is the perfect counterfeit of innocence. The Great Northern Shrike is no mean vocalist. Its notes are alluringly gentle, and, to paraphrase a somewhat famous quotation, "It sings and sings and is a villain still."



GREAT NORTHERN SHRIKE.
(*Lanius borealis*).
About $\frac{3}{4}$ Life size.
FROM COL. CHI. ACAD. SCIENCES.

There is one compensation beyond the general interest of the thing for the student who has to endure the sight of the sufferings of the shrike's victims in order to get an adequate idea of its conduct of life. The redeeming thing is found in the fact that in the winter time the great majority of the shrike's victims are the pestilential English sparrows, whom every bird lover would be willing to see sacrificed to make a shrike's supper, though he might regret the attending pain pangs. 17

My own observations of the shrike have been limited to the city of Chicago and to the fields immediately beyond its walls. For those unfamiliar with the subject it may be best to say that in the winter season the shrike is abundant in the parks of the great smoky city by the lake, and not infrequently it invades the pulsing business heart of the town. No one ever saw the placidity of the shrike disturbed in the least. It will perch on the top of a small tree and never move so much as a feather, barring its tail, which is in well nigh constant motion, when the clanging electric cars rush by or when the passing wagons shake its perch to the foundation.

The Great Northern Shrike reaches the city from its habitat beyond the Canada line about the first of November. For four years in succession I saw my first Northern Shrike of the season on November first, a day set down in the Church Calendar for the commemoration of "All Saints." It is eminently in keeping with the hypocritical character of Mr. Shrike, sinner that he is, to put in an appearance on so holy a day. From the time of his coming until late March and sometimes well into April, the shrike remains an urban resident and harries the sparrow tribe to its heart's content.

As far as my own observation goes the Great Northern Shrike in winter does not put very much food in cold storage. I have never seen many victims of the bird's rapacity impaled upon thorns. Perhaps I should qualify this statement a bit by saying that I have never seen many victims hanging up in one place. I have watched carefully something like a score of the birds, and while every one occasionally hung up one of its victims, there was nothing approaching the "general storehouse" of food, so often described. It is my belief that this habit of impaling its prey upon thorns or of hanging it by the neck in a crotch is one that is confined largely to the summer season, and especially to the nesting period.

The Great Northern Shrike has been said by some writers to be a bully as well as a butcher. I have never seen any evidence of this trait in his character. He does not seem to care for what some small human souls consider the delight of cowering weaker vessels. When the shrike gives chase to its feathered quarry it gives chase for the sole purpose of obtaining food. While the bird is not a bully in the sense in which I have written, it displays at times the cruelty of a fiend. It has apparently something of the cat in its nature. It delights to play with its prey after it has been seized, and by one swift stroke reduce it to a state of helplessness.

Every morning during the month of February, 1898, a shrike came to a tree directly in front of my window on Pearson street, in Chicago. The locality abounded in sparrows and it was for that reason the shrike was such a constant visitor. The bird paid no attention to the faces at the window, and made its excursions for victims in plain view. The shrike is not the most skilled hunter in the world. About three out of four of his quests are bootless, but as he makes many of them he never lacks for a meal. The Pearson street shrike one day rounded the corner of the building on its way to its favorite perch, and encountering a sparrow midway struck it down in full flight. The shrike carried its struggling victim to the usual tree. There it drilled a hole in the sparrow's skull and then allowed the suffering, quivering creature to fall toward the ground. The butcher followed with a swoop much like that of a hawk and, catching its prey once more, bore it aloft and then dropped it again as it seemed for the very enjoyment of witnessing suffering. Finally when the sparrow had fallen for the third time it reached the ground before the shrike could re seize it. The victim had strength enough to flutter into a small hole in a snow bank, where it was hidden from sight. The shrike made no attempt to recapture the sparrow. It seemingly was a pure case of "out of sight, out of mind." In a few moments it flew away in search of another victim. The sparrow was picked up from the snow bank and put out of its misery, for it was still living. There was a hole in its skull as round as though it had been punched with a conductor's ticket clip. 18

It has been my experience that the Great Northern Shrike hunts most successfully when he, so to speak, flies down his prey. If he gets a small bird well started out into the open and with cover at a long distance ahead, the shrike generally manages to overtake and overpower his victim. If the quarry, however, is sought in the underbrush or in the close twined branches of the treetop, it generally succeeds in eluding the butcher. One of the most interesting incidents of all my bird observations was that of the attempted capture by a Great Northern Shrike of a small brown creeper. The scene of the action was near the south end of the Lincoln Park lagoon in Chicago. The creeper was nimbly climbing a tree hole, industriously picking out insects, as is his custom, when a shrike dropped down after him from its high perch on a tree which stood close and overshadowed the one from whose bark the creeper was gleaning its breakfast. The shrike was seen coming. The creeper, for the fraction of a second, flattened itself and clung convulsively to the tree trunk. Then, recovering, it darted to the other side of the hole, while the shrike brought up abruptly and clumsily just at the spot where the creeper had been. The discomfited bird went back to its perch. The creeper rounded the tree once more and down went the shrike. The tactics of a moment before were repeated, the shrike going back to its perch chagrined and empty clawed. Five times it made the attempt to capture the creeper, and every time the little bird eluded its enemy by a quick retreat. It was a veritable game of hide and seek, amusing and interesting for the spectator, but to the birds a game of life and death. Life won. I ever have believed thoroughly that the creeper thought out the problem of escape for itself. The last time the shrike went back to its perch the creeper did not show round the trunk again, but instead flew away, keeping the hole of the tree between itself and its foe. It reached a place of safety unseen. The shrike watched for the quarry to reappear. In a few moments it grew impatient and flew down and completely circled the tree. Then, seemingly knowing that it had been fooled, it left the place in disgust.

Of the boldness of the Great Northern Shrike there can be no question. It allows man to approach within a few feet and looks him in the eye with a certain haughty defiance, showing no trace of nervousness, save the flirting of his tail, which is a characteristic of the bird and in no way attributable to fear or uneasiness. One morning early in March, when the migration had just started, I saw two shrikes on the grass in the very center of the ball ground at the south end of Lincoln Park. They were engaged in a pitched battle, and went for each other much after the manner of game cocks. The feathers literally flew. I looked at them through a powerful field glass and saw a small dark object on the grass at the very point of their fighting. Then I knew that the battle was being waged for the possession of an unfortunate bird victim. The birds kept up the fight for fully two minutes. Then, being anxious to find out just what the dead bird was which had given rise to the row, I walked rapidly toward the combatants. They paid no heed to me until I was within twenty feet of the scene of their encounter. Then they flew away. I kept my eyes on the much ruffled body of the little victim lying on the grass and, walking toward it, I stooped over to pick it up. At that instant, as quick as the passing of light, one of the shrikes darted under my hand, seized the quarry and made off with it. It was an exhibition of boldness that did not fail to win admiration. I did not have the chance to learn what bird it was that had fallen a victim to the shrikes' rapacity and had been the cause of that battle royal.

The Great Northern Shrike when it is attempting to capture a mouse, or a small bird that has taken refuge in a bush, hovers over the quarry almost precisely after the manner of the sparrow hawk. There are few more fascinating sights in nature than that of the bird with its body absolutely motionless, but with its wings moving with the rapidity of the blades of an electric fan. Sharply outlined against the sky, it fixes the attention and rouses an interest that leaves little room for sympathy with the intended victim that one knows is cowering below. A mouse in the open has little chance for escape from the clutches of the hovering shrike. Birds, however, which have wisdom enough to stay in the bush and trust to its shelter rather than to launch out into open flight, are more than apt to escape with their lives. In February last I saw two shrike-pursued English sparrows take to the cover of a vine-covered lilac shrub. They sought a place well near the roots. While flying they had shown every symptom of fear and were making a better pace than I had ever seen one of their tribe make before. The shrike brought itself up sharply in midair directly over the lilac, and there it hovered on light wing and looked longingly downward through the interlacing stems at the sparrows. It paid no heed to its human observer, who was standing within a few feet and who, to his amazement, saw an utter absence of any appearance of fear on the part of the sparrows. They apparently knew that; the shrike could not strike them down because of the intervening branches. They must have known also that owing to the comparative clumsiness of their pursuer when making its way on foot through and along twigs and limbs, that they could easily elude him if he made an attempt at capture after that manner. Finally the shrike forsook the tip of the lilac bush and began working its way downward along the outer edge of the shrub. When it had approached to a point as near as the sparrows thought was comfortable, they shifted their position in the bush. The shrike saw that the quest was useless unless he could start them to flight. He tried it, but they were too cunning for him, and he at last gave up the chase, the progress of which actually seemed to humiliate him. He flew afar off, where, perhaps, the prospects of dinner were better. 19

I once saw a goldfinch in winter plumage escape a Great Northern Shrike by taking a flight directly at the zenith. The shrike followed the dainty little tidbit far up, until the larger bird was only a speck and the little one had disappeared entirely. The shrike apparently could neither stand the pace nor the altitude, and the watchers, with whom the goldfinch was the favorite in the race, rejoiced with the winner.

EDWARD BRAYTON CLARK.

ORIOLE.

Hush! 'Tis he!

My oriole, my glance of summer fire,
Is come at last, and, ever on the watch,
Twitches the pack-thread I had lightly wound
About the bough to help his housekeeping—
Twitches and scouts by turns, blessing his luck,
Yet fearing me who laid it in his way,
Nor, more than wiser we in our affairs,
Divines the providence that hides and helps.

—James Russell Lowell, "Under the Willows."

20

THE FIRE-BIRD.

This Oriole is one of the most brilliantly colored of our common birds. The name oriole is from "aureolus," meaning, little bird in gold. Ruskin says that on the plumes of birds the gold of the cloud is put, that cannot be gathered of any covetousness.

There is a story to the effect that when, in 1628, Lord Baltimore was exploring the Chesapeake, worn out and discouraged, he was so much cheered by the sight and sound of the oriole that he adopted its colors as his own, hence the name, "Baltimore Oriole."

This bird, however, rejoices in several other cognomens, such as English Robin, Golden Robin, Hang-nest Bird, Fire-Finch, and Golden Oriole. He is both esthetic and utilitarian, being beautiful, musical, social and also useful in that he feeds upon insects most injurious to vegetation; especially the harmful small kinds passed over unnoticed by the birds of other species.

The Baltimore Oriole is fond of sweets. He has been seen to snip off the heads of white-headed or stingless bees and draw out the viscera through the ring-like opening, for the sake of the honey sack. How did he know it was there? How did he learn that he could get at it in this way? The poet naturalist, Thompson, well says of him:

"You whisk wild splendors through the trees,
And send keen fervors down the wind;
You singe the jackets of the bees,
And trail an opal mist behind.

"When flowery hints foresay the berry,
On spray of haw and tuft of briar,
Then wandering incendiary,
You set the maple swamps afire."

While the Oriole's song is not especially melodious to me, it is fresh and cheerful, with something of a human element in its child-like whistle. Young birds in the nest cry "cree-te-te-te-te-te."

This bird is fond of building near the habitations of men, selecting sites in door-yards, orchards, and lawns. He weaves an artistic habitation at airy heights, choosing strong, flexible material for the pendant, bag-like nest. In California, the Arizona hooded oriole weaves nests of the beautiful Spanish moss; but one occasionally uses the love-vine or yellow dodder to construct a gaudy, pocket-like nest. The Fire-bird would not do this, for it always selects for its nest grayish, bleached material in harmony with the limbs of the trees. An experiment was tried of placing a bunch of colored yarns near its nesting-place, in order to see what, if it used them, the choice of colors would be. It selected all the gray threads, and, when nearly done, a few blue and purple, but not a single red, or green or yellow strand. The strongest and best material is used for the part by which the whole is supported.

The Baltimore Oriole is sometimes on intimate terms with his relative, the Orchard Oriole. Last summer the latter had hung its pretty cup-shaped nest on a branch of weeping willow near my window. The tedium of her sitting was relieved several times by a morning call from Sir Baltimore. He would seat himself on a twig near her nest and utter a soft, clear note, which no doubt meant a greeting in bird language. When he went away a few moments later, his two notes sounded strangely like "A—dieu"—a translation for which Olive Thorn Miller is authority.

But his song and his speech were less heeded than the spectacle of his brilliant flight—

“For look! The flash of flaming wings
The fire plumed oriole.”

Belle Paxson Drury.



BRANDT'S CORMORANT.
(*Phalacrocorax penicillatus*).
About ¼ Life-size.
FROM COL. CHI. ACAD. SCIENCES.

23

BRANDT'S CORMORANT. **(*Phalacrocorax penicillatus*.)**

There are about thirty species of Cormorants which are distributed throughout the world. Ten of these are known to inhabit North America. They are ocean birds, yet they are also occasionally seen on the larger bodies of fresh water. The Pacific coast of North America and the shores of New Zealand are rich in species and their plumage is more beautiful than that of those found in other parts of the world.

The name Cormorant is derived from the Latin words *Corvus Marinus*, meaning marine crow or raven. This name may have been suggested by the fact that these birds are fond of sitting on an elevated perch, especially after a hearty meal. In this habit of seeking high perches, and because of their dark color, they resemble the raven or crow. The generic name *Phalacrocorax* is derived from the Greek words, meaning bald crow.

One of the species that frequents the coast of Europe is easily tamed and in early times was trained to fish for its master. There was even an appointment in the royal household known as the “Master of the Cormorants.” When used in fishing “a strap is fastened around the bird’s neck so as, without impeding its breath, to hinder it from swallowing its captures. Arrived at the waterside, it is cast off. It at once dives and darts along the bottom as swiftly as an arrow in quest of its prey, rapidly scanning every hole or pool. A fish is generally seized within a few seconds of its being sighted and as each is taken the bird rises to the surface with its capture in its bill. It does not take much longer to dispose of the prize in the dilatible skin of its throat so far as the strap will allow and the pursuit is recommenced until the bird’s gular pouch, capacious as it is, will hold no more. It then returns to its keeper, who has been anxiously watching and encouraging its movements, and a little manipulation of its neck effects the delivery of the booty.”

The Cormorants are voracious eaters. They catch the fish, which is their usual food, under water by rapid swimming and with the aid of their hooked bills. On account of this habit of the bird the word Cormorant has been used synonymously with the word glutton, rapacious or avaricious when applied to a person who exhibits these

traits.

Brandt's Cormorant, the bird of our illustration, is found on the Pacific coast from the state of Washington southward to Cape St. Lucas at the southern extremity of Lower California. In its habits it is gregarious and collects in great numbers wherever its natural food of fish is plentiful. These flocks present a very odd appearance and their long necks appear as numerous black sticks on the watery background.

Mr. Leverett M. Loomis well illustrates the habits of these birds in a report on the California Water birds. He says of a rookery "which is situated on a rock, or little islet, in the ocean at the extremity of Point Carmel, about fifteen yards from the mainland. This rock rises perpendicularly some forty or more feet above the water. At first sight it does not seem that it can be scaled, but closer inspection reveals that a foothold may be had in the seams and protuberances on its water-worn sides. Only on days when the sea is very calm can the rock be landed upon and then only from the sheltered channel separating it from the mainland. We first took a view of the rookery from the mainland. The Cormorants were very tame, remaining on their nests while we clambered down the sloping rocks and while we stood watching them on the same level, only a few yards away. They were equally tame when our boat drew nearer as we approached from the water. The clefts in the sides of the rock were occupied by Baird's Cormorant and the top by Brandt's. There were comparatively few of the former, but of the Brandt's 24 Cormorant there were upwards of two hundred pairs. Their nests covered the top of the rock, every available situation being occupied. Standing in one place I counted one hundred and eighteen."

He also states that the Cormorants remained on the nests till he fired his gun and they lingered on the edge of the rock while he walked among the nests a few yards away. On the rock were many piles of sardines, evidently placed near the nests for the use of the sitting bird.

The nests are nearly circular when placed on top of the rocks, and are usually constructed of eel grass. They are generally placed in the most inaccessible places and at various heights above the surface of the water. The Cormorants frequent the same locality from year to year and experience considerable difficulty in constructing their nests because of the gulls which frequently carry away the material as fast as it can be gathered. The young, when first hatched, are entirely devoid of plumage and their skin resembles a "greasy, black kid glove." It is said that the gulls feed upon these young birds.

Mr. Frank M. Woodruff relates the following observations, made during a recent trip to California. He says:

"The Brandt's Cormorant is the common species wintering in Southern California. Like the California brown pelican and the surf ducks, only the juvenile birds are found in the bay close to the city of San Diego. As one rows about the harbor close to the shipping docks and by the old deserted fishermen's huts along the slips, large numbers of Brandt's Cormorants and pelicans can be seen perched on and almost covering the sunny sides of the roof tops. They sit in rows like sentinels with the head well down upon the shoulders, undisturbed by the noise of traffic and only by continued rapping on the building with an oar can they be induced to take to flight. They will usually circle for a short time in a lazy manner and then return to their old position. The older birds are rather more wary and usually feed a mile or so from the shore, in flocks of from three to ten. The loose kelp floating in the bay attracts the smaller fish. Such places form their feeding grounds. After they become gorged with fish, they fly to the rocks along the jetties and to the cross bars of the buoys, which mark the deep water channels. The birds are perfect gluttons, and as I lifted it into the boat there dropped from the gular sack of one specimen that I shot, over twenty small fish. The beautiful iridescence of the dark copper-green plumage of the adult Cormorant can only be appreciated when the freshly killed bird is seen."

SETH MINDWELL.

MATE, OR PARAGUAY TEA.

It is a trite saying, but a very true one, that one-half the world does not know how the other half lives. This will apply to food and drink, as well as to other things, so widely do customs vary in different regions.

While tea, coffee and chocolate, all products of warm climates, have come into general use as table drinks over the greater portion of the globe, so as to be universally known, there is a beverage of similar use, the favorite of millions, which is practically unknown to the world at large.

Mate (two syllables) is the name of the prepared leaves of a shrub or tree belonging to the Rhamnes family, and has the scientific name of *Cassine gonhonha*, but is more generally known as *Ilex paraguayensis*, as it was first used by the Indians of Paraguay. It belongs to the natural order of the holly, to which it bears much resemblance. Its leaves are six to eight inches long, short stalked, oblong, wedge-shaped, and finely toothed at the margin. The small white flowers are borne in clusters at the axils of the leaves. It bears a four-seeded berry, but the leaves are used for decoction, except for a very fine quality, which is made from the dried flower buds. 25

It abounds in the forests of Paraguay and Brazil, where it is a tree of considerable size. It is cultivated to some extent, but in this state remains a shrub, and the quality is finer. It may be gathered at any season of the year, and the leaves must become dry enough to pulverize before they are fit for use.

Where it is cultivated it is dried in metal pans, after the manner of Chinese tea, but far greater quantities are gathered in the forests and dried in the primitive method adopted from the Indians.

A drying floor is prepared by clearing a space of ground and pounding it hard with a mallet. On this a fire is built,

and after the ground is well heated, it is swept off clean and branches from the neighboring forests spread upon it. Afterwards they are placed upon a rude arbor made of hurdles and a slow fire beneath completes the drying process.

When quite brittle the leaves are pounded in a mortar and reduced to small particles, but not to a powder. The preparation of it consists in placing a small quantity of it in a vessel, with sugar if desired, and adding a little cold water. After a little while boiling water is poured on and it is then ready for use. As the leaf particles do not settle well, it must be sipped through a tube. The natives for steeping it used a calabash gourd called mate, whence its common name, mate yerba, or calabash plant. These gourds are still often used, and are convenient, as they have a handle. Cocoa-nut shells, with handles of silver or other metal, are also popular. A reed or a metal tube, with a small perforated bowl at the bottom is used to sip it through. This is called a bombilla.

It is customary with the Spaniards and Portuguese to offer mate to visitors.

In the gardens of that sunny region vineclad arbors are furnished with seats, where the family with their visitors will sit in the cool of the evening, each one supplied with a bombilla and a cocoa-nut or calabash bowl of mate. Through a small opening in the top of the vessel the tube is inserted and the grateful infusion is enjoyed while matters of interest are discussed.

Great virtues are ascribed to this drink. Its properties appear to be chiefly due to theine and caffeine.

In Chili and Peru it is in universal use, and is considered more necessary than meat. On the plains of Argentina the gaucho or cowboy washes down his dried beef with copious draughts of mate and is content with his meal. To northerners the taste is not agreeable. It seems weedy and slightly bitter. For shipment the leaves, when dried, are packed in oblong cases or bags made of rawhide carefully sewed. These packages contain 120 pounds each. Since the beginning of the seventeenth century this drink has been used in Paraguay, and its use now extends all over South America. It is estimated that the amount used annually exceeds 60,000,000 pounds.

It is being introduced into other countries and the time may come when the bombilla and the bowl of mate may become a rival of five o'clock tea in English and American parlors.

ANNA ROSALIE HENDERSON.

Behind the cloud the starlight lurks,
Through showers the sunbeams fall;
For God, who loveth all his works,
Has left his Hope with all!

—John Greenleaf Whittier.

26

THE AMERICAN BUFFALO. (*Bison americanus*.)

The supremacy of man over the lower forms of animal life has no better illustration than that furnished by the rapid extermination of the American Buffalo (*Bison* or *Bos americanus*.)

Much less than a century ago, in immense herds, this animal swarmed over the prairies of the United States, unmolested except by the Indians who sought it for food and for the economic value of its hide. It was free to seek those localities which would furnish it the best and most abundant food supply. Even as late as the sixties of the last century the American Buffalo was represented by thousands upon thousands of individuals, whose numerous paths leading from the feeding grounds to a supply of fresh water were known to the frontiersman as "Buffalo trails." "In 1889 Mr. William T. Hornaday estimated the number of survivors to be eight hundred and thirty-five, inclusive of the two hundred then living in the Yellowstone Park under the protection of the government."

The passing from the face of the earth of this, the largest of the native animals of North America, has taken place within the last thirty years and this extermination may be laid at the door of the zealous hunter and trapper who systematically shot and destroyed them in order to obtain the small profit that their skins would bring. It is said that one of the railroads crossing the continent from the Mississippi river to the Pacific coast carried about two hundred thousand skins within a year after it was opened to traffic. One writer records the reception of over forty thousand pelts by a single firm in the year 1875. Many instances of the wanton butchery of this noble and useful animal might be mentioned, but it is much better illustrated by the absence of the Buffalo at the present time, from all localities, except where it is protected by the same hand which has brought about its destruction. In 1858, when a party was traversing the country by wagon train from the state of Missouri to Mexico, they were continually surrounded by large herds of Buffaloes. An eye witness said, "In bands, in masses, in hosts, the shaggy, black creatures thundered along in front of us, sometimes from north to south, sometimes from south to north; for forty consecutive hours we had them in sight, thousands upon thousands, tens of thousands upon tens of thousands, an innumerable mass of untamed animals, the flesh of which, as we believed, was sufficient to provide the wigwams of the Indians unto all eternity."

The American Buffalo belongs to the ox tribe of the family of horned animals (*Bovidæ*). Among its immediate relatives are the musk ox of the Arctic regions of America, the yak of the mountainous regions of Tibet, the zebu,

an East Indian species, the Cape buffalo, a ferocious animal of the central and southern portions of Africa, the Indian buffalo living in southern Asia and the European bison.

The European bison, like its American relative, has suffered from the hunter and the advance of civilization and is practically exterminated. It now exists only in a few forests on the Caucasus and in the famous forest and game preserve of the Czars of Russia called Lithuania. Here, protected by stringent laws through several centuries, the European bison has been saved from absolute extermination. "In former times this was different, for the bison ranged all over Europe and a large portion of Asia." In the time of Cæsar, according to his own record, they abounded in Germany and Belgium.

So it is with the American Buffalo. Were it not for government and private preserves this, one of the largest of living quadrupeds, would be unknown to future generations except by museum specimens. Correctly speaking, the American species should be called Bison. So universal, however, is the use of the term Buffalo that the word Bison would puzzle many people. Strictly speaking, the name buffalo should be applied only to designate the Cape and Indian species.



AMERICAN BISON OR BUFFALO.
(*Bison americanus*).

The original range of the American Buffalo extended from but little west of the Atlantic coast westward to the Rocky Mountains and from Mexico on the south northward to about the sixty-fifth degree of north latitude. By the trappers the Buffaloes were placed in two classes. Those that frequented the mountain ranges were called Bison. They were seldom seen on the plains, the home of the other class. Their limbs were shorter and stouter and better fitted for a rough country. There existed in former ages two other species entirely distinct from the animal with which we are familiar. They were much larger, possibly as large as an elephant, and were probably associates of the mastodon and the mammoth. 29

A fully adult male Buffalo will measure about nine or ten feet in length from the muzzle to the tail. Its height at the fore quarters is from five to six and one-half feet. The female is much smaller and weighs from seven to eight hundred pounds less than the male, the weight of which averages eighteen hundred pounds.

The Buffalo's massive head, with its short, curved horns which are set far apart on the broad forehead, is connected with the body by a short deep and narrow neck. From the neck the body rises, forming a large hump on the back over the forelegs, which gives the animal an odd and unwieldy appearance. This hump consists of fat and strong muscles which control the movements of the massive head. From the hump the body tapers downward so that the hind quarters are low and narrow. The anterior portion of the body, the forelegs and the head are covered with long hair. On the forehead and back the hair is curly and matted. In the early spring most of the long hair is shed, resulting in a modification of the color of the Buffalo. The new coat is a uniform grayish brown, deepening into black-brown in the mane, which covers the top part of the head, forehead, neck and under surface of the throat.

Captain Doyle in an article published in the American Naturalist says, "White Buffaloes have frequently been seen and killed. All the Indian tribes regard them as 'big medicine,' but they have different superstitions regarding them. For instance Catlin, the painter, while among the Mandans in 1832, saw a white buffalo robe erected on a pole in their village as a sacrifice to the Great Spirit. It had been purchased from the Blackfeet, who killed the Buffalo, for eight horses and a quantity of goods. On the other hand, the Comanches believe it very dangerous to see a white Buffalo. In 1869 I saw a young Comanche, who had seen a white Buffalo, return to his camp almost dead with fear. He was taken into his tent, the medicine man was sent for and they smoked him and kept up

incantations over him day and night for a week. When he came out he believed that he had had a very narrow escape from death. In 1859 a white Buffalo was killed by a white man on the north fork of the Red river. He desired to have it dressed to preserve it, but failed to get any Indian to undertake the task for a long time. At last he prevailed on a Comanche chief, named 'Horseback' to have the operation performed. 'Horseback' selected one of his squaws, had the medicine man of his band go through various ceremonies over her to preserve her life and then placed her in a tepee some distance from his camp, where the hide was taken to her by a soldier and brought away by him when dressed. No other Indian would look at the hide, much less touch it. Her food was left for her at some distance from the tepee and when the robe was dressed, medicine ceremonies were held over her before she was allowed to join the camp."

These gregarious animals, during the period of their supremacy, rarely remained for any great length of time in any given locality. Frequently, as if moved by a sudden and general impulse, the whole herd, made up of many smaller companies, each with its leader, would start, all the individuals moving in the same direction. No barriers seemed too great to overcome. Moving in a straight line they would swim or ford rivers, find some means of crossing chasms, but still move on as if led by some irresistible impulse.

These migrations, in many instances, may have been due to the necessity of seeking a more plentiful supply of food, especially when the pastures in the more northern regions became covered with snow. This caused them to move southward. The northern tribes of Indians did not believe that the same individuals returned, as the climatic conditions permitted, but that the Buffaloes were produced in immense numbers under ground and that in the spring they came forth from a great mountain far to the south, a herd of new individuals coming north each season. Since the Buffaloes have disappeared from the plains, some Indians claim that the holes in the southern mountains, in which the Buffaloes were formed, have been closed by some evil spirit.

Dr. Brehm tells us that "among the Buffalo's perceptive senses those of smell and hearing rank first. In its mental qualities it does not differ from its other relatives. It is little gifted, good-natured and timid, incapable of rapid excitement, but when it is irritated it is apt to forget all considerations which generally influence it and it will then oppose an enemy with courage."

It would seem that the Buffalo depends upon the sense of smell rather than that of sight, for when running from danger it holds the muzzle near the ground and rushes with incredible swiftness in the opposite direction. Obstinacy is one of the most marked characteristics of the Buffalo. When once moved to a certain action nothing seemed to sway a herd from its decision. Boats on rivers have been known to stop and wait for the passing of a herd that was swimming across the stream. Railroad trains have also been brought to a standstill by the herds crossing the tracks.

The American Buffalo was in reality an inoffensive beast and its ferocious appearance was due to its great bulk. "They are not intractable to domestication, readily entering into friendly relations with individuals who treat them kindly; at least they learn to recognize their keeper and to love him to a certain degree."

Years ago the Buffalo was the friend of the American Indian. It furnished him not only with food but its skin served him as a blanket and as a covering for his tepees. Its skin also provided the leather from which he made his clothing and footwear. At this time, as Moellhausen has said, "The Buffalo could, in a certain sense, be considered a domestic animal of the Indians, no diminution of the innumerable herds could be noticed; on the contrary, they thrived and multiplied on the rich pastures." Ever content if all their wants were satisfied, the American Indians killed only those that were required for their present needs. It was not till the white man visited them with his stock of glittering trinkets, so attractive to the red man, that he began to kill indiscriminately. He learned that the white man was pleased with their robes and that the flesh of the Buffalo delighted his taste; that he was willing to trade his trinkets for robes and flesh. It was then that the Indian's whole demeanor toward the Buffalo changed and he became the weak servant of the trader, bartering the lives of thousands of noble animals for valueless things which pleased his eye or caught his fancy.

The value of the Buffalo to the Indian's welfare can be shown in no better way than by quoting the words of Captain Butler. "What shall we do?" said a young Sioux warrior to an American officer on the Upper Missouri. 'What shall we do? The Buffalo is our only friend. When he goes, all is over with the red man. I speak thus to you because, like me, you are a brave.' It was little wonder that he called the Buffalo his only friend. Its skin gave him a house, its robe a blanket and a bed, its undressed hide a boat, its short, curved horn a powder-flask, its meat his daily food, its sinew a string for his bow, its leather a lariat for his horse, a saddle, bridle, rein and bit. Its tail formed an ornament for his tent, its inner skin a book on which to sketch the brave deeds of his life, the medicine robe of his history. House, boat, food, bed and covering, every want from infancy to age and after life had passed; wrapped in his Buffalo robe the red man waited for the dawn."

31

MR. CHAT, THE PUNCHINELLO. A TRUE STORY.

If Mr. Chat were an ordinary performer he would doubtless select a spot in the center of the village square; he would put up his little stage and his drop-curtain and would send small boys all through the village with his flaming posters:

ATTENTION, EVERY ONE!
This Afternoon—in the Village Square
AT TWO O'CLOCK,

Mr. Yellow-Breasted Chat will give one of his
REMARKABLE PERFORMANCES

Mr. Chat is acknowledged by all to be the best imitator, the most gifted singer, the finest elocutionist, the cleverest ventriloquist, the greatest athlete in all bird-dom.

MR. CHAT
ORATOR, SINGER, GYMNAST AND PUNCHINELLO!
Don't fail to see him!

and by two o'clock the village square would be alive with people, and after the show the dimes would rattle into the hat and no one would go away disappointed, as Mr. Chat's poster would be nearer the truth than most posters of its kind.

All this if Mr. Chat were an ordinary performer, but he is not. His performance is so far ahead of anything that was ever advertised on a poster, that there are not dimes enough in all the world to buy it. You may set a day for him and invite all your friends, or you may take your friends and go seek him in his own haunts; you may try to coax, hire, threaten; you may do everything in your power; but Mr. Chat is a happy creature of inspiration, and makes dates with nobody.

When he will, he will—
You may depend on't;
And when he won't, he won't—
And there's an end on't!

His only tent is the blue sky; his stage-setting a jungle of trees near a swamp; his stage a thick bough near the top of a tree; his curtain the leaves of a white birch, or willow, or butternut; his orchestra and curtain-raiser the wind, and his audience his wife sitting patiently on the eggs in her nest, and—you, if you belong to Nature's elect and happen to be near the swamp at that moment and have the kind of eyes that really see and the kind of ears that really hear. Mrs. Chat can command the performance with one little bird sigh. You could not buy it with the wealth of the world. After the entertainment is over, Mr. Chat drives his wife from the nest and takes her place on the eggs while she flies out over the tree-tops for a little outing. Not many bird husbands are so considerate.

Once upon a time (you see the story is just beginning now) I happened to find myself in a pasture; not a tame, every-day, green pasture tacked on one end of a nice smooth farm—not at all! but a pasture on top of a high hill, with beautiful fields stretching out below it, and all pink and white with laurel. The cows, who, they say, do not care either for laurel or scenery, may not have liked this pasture, but I did. So when I had climbed the bars and seated myself on the top one to view the country, I saw at the far edge of the pasture, a jungle of trees, and I liked it still more, and determined to explore it. On the way I flushed a brown thrasher in a laurel bush, and he flew into the jungle. There seemed to be but one bird singing in all the neighborhood, and this song which was a peculiar one, lured me into the thicket. On I went very cautiously till the sound seemed to be directly overhead. I paused and listened and peered into the tree tops.

"Caw-caw!" cried the bird harshly.

"Nothing but an old crow," said I in disgust.

I started to go, when from the same spot overhead came a loud, clear double note, and again I waited.

32

"Meow! meow!" remarked my new friend.

"How stupid of me!" said I. "I might have known it was Mr. Catbird." But immediately there came a glorious trill—first over my head, then almost under my feet, then at my right hand, then at my left; though there was no flutter of wings or other sound in all the jungle. At last the fallen branch upon which I had been sitting gave way and I went into the swamp with a splash of mud. "Look out, look out!" came a sarcastic voice from the tree top.

"It is an escaped Poll-parrot," said I, to reassure myself, but I took out my handkerchief and mopped my heated brow. The unknown then proceeded to bark like a dog, quack like a duck, and squeal like a pig, with occasionally a measure of song in between. At last in desperation I seized a young sapling near at hand and shook it with all my might, thinking to frighten him into showing himself.

"Haw-haw-haw!" rang out clearly from the top of the very sapling itself.

"That is no bird," I announced to the swamp; "it is an imp of the forest trying to lure me to destruction in the jungle," and I turned and fled.

I felt better when I met a cotton-tail rabbit, though he did not stop to be greeted; and still better when I reached the sunlight and the pink and white laurel pasture; and when I neared the bars and saw my horse grazing patiently on the other side, I was quite myself again. On an upright stake at the side of the bars sat a strange, yellowish bird. I did not know him, for I had not so many bird friends then as I have now. Suddenly he rose in the air with a shriek, his legs dangling helplessly. "Is this a magical pasture," I said to myself, "where birds are shot without the report of a gun?" and then with legs still dangling, he made a beautiful gyration in the air, and calling out: "That's it—that's it—tut—tut—tut!" disappeared in the direction of the thicket. This was my first attendance upon one of the remarkable performances of Mr. Yellow-Breasted Chat, and I can without hesitation pronounce it the most wonderful in all bird-dom.

The next day I invited some skeptical friends to prove the truth of my story. So at the same time of day we drove

up the long hills till we spied the pink and white of the laurel, and halted at the gray bars. The pasture which had been deserted the day before, was now spotted with cows, the laurel had begun to fade, and though we waited one long, weary hour, not a sight or sound of a bird of any description did we see. The towhee and the shore lark whom I had seen the day before, seemed to have dropped out of existence, and those disagreeable people hinted that even the brown thrasher was a myth. But as I ventured alone into the dark swamp, hoping still to stir up Mr. Chat, I came face to face with the beautiful purple-fringed orchis—the large, early variety—blooming alone in the damp thicket, so straight and stately, and of such a delicate, refined beauty, I fell on my knees beside it, and felt it to be ample compensation for any disappointments. So you see it is true that there is not wealth enough in all the world to force a bird-song at the moment when you want it, but at the same time and in the same swamp the purple orchis may be blooming for you.

NELL KIMBERLY McELHONE.



AGATES
FROM COL. CHI. ACAD. SCIENCES.

- Center Column
 - BANDED AGATE (Lake Superior).
 - MOSS AGATE.
- Bottom Row
 - BANDED AGATE (Brazil).
 - CLOUDED AGATE.

AGATE.

Agate is a form of the common mineral quartz. From other forms of that mineral it differs in being made up of minute layers and in being variegated in color. The colors may appear in the form of bands or clouds. The banded agates appear to be made up of parallel layers, sometimes straight, but more often wavy or curved in outline. These layers or bands differ in color from one another, exhibiting shades of white, gray, blue, yellow, red, brown or black. To the naked eye they appear to vary in width from the finest lines to a width of a quarter of an inch or more. In reality, all the bands visible to the naked eye are made up of finer ones, to be seen only with the microscope. Thus in a single inch of thickness of agate Sir David Brewster, using the microscope, counted seventeen thousand and fifty layers. Besides differing in color, the layers differ in transparency and porosity, and these properties add to the variegated appearance of the agate.

On account of their beauties of color and outline, agates have been known and prized from the earliest times. They are mentioned by many of the ancient Greek writers, and the name agate is a corruption of the name

Achates, a river in Sicily, whence the first stones of this kind used by the Greeks were obtained. This and neighboring localities continued to be the source of supply until the fifteenth century, when agates were found to occur in large quantities near Oberstein and Idar on the banks of the river Nahe, in the duchy of Oldenburg.

The industry of cutting and polishing the agates on a large scale was soon established there, and these places are to this day the center of the agate industry. The agates used most extensively at the present time are not, however, those found about Oberstein, but come from a region about one hundred miles in length extending from the Province of Rio Grande do Sul, of Southern Brazil, into Northern Uruguay.

The agates in this region, first discovered in 1827, so surpass in size and beauty those from any other known locality, that they form at the present time almost the only source of supply. They are shipped in large quantities as ballast to Oberstein and Idar, and here the work of cutting, polishing and coloring them is performed. The discovery that the attractiveness of agates could be enhanced by artificial coloring was made about the beginning of the nineteenth century. The natural colors are rarely of a high order, being often only variations of white and gray or dull yellows and reds. Through the difference of porosity of the different layers, however, and the consequent different absorption of coloring ingredients, methods of artificial coloring can be employed, which produce lasting and pleasing effects. Most agate used for ornamental purposes at the present time is therefore artificially colored.

Agates of considerable beauty, though not of great size, are found in many places in the United States. Those of Agate Bay, Lake Superior, have rich colors and make attractive charms and other ornaments. Agates are found in the beds of many streams in Colorado, Montana and other regions of the Rocky Mountains. They occur all along the Mississippi River, especially in Minnesota, also along the Fox River, Illinois, in the trap rocks along the Connecticut River, and on the coast of California. While many of these agates are of great beauty, their use and sale is not likely to be anything more than local, since the Brazilian agates can be supplied so cheaply from Germany. The moss agates of Colorado and other localities in the Rocky Mountains are, however, equal to anything in the world.

The layered structure of agates is due to successive depositions of silica by water flowing through cavities in rocks. Rising and falling alternately through the rocks the water leaves a mark of each advance or retreat in the form of an additional layer deposited upon the interior walls of the cavity. Agates, therefore, grow from the outside inward. The process may go on until the cavity is entirely filled or may cease at any time. If water remains in the cavity for some time crystals, such as are sometimes seen, will be formed. The nodule of silica or agate formed by the percolating waters is harder and more resistant than the surrounding rock. Hence it remains after the surrounding rock has been worn away. We can thus understand why agates should be found, as they usually are, on sea or lake beaches, or in the beds of streams.

The different colors seen in the natural agates are produced by traces of organic matter or of oxides of iron, manganese or titanium contained in the waters which formed them.

The beautiful moss-like inclusions seen in the moss agates are due to a partial crystallization of oxide of manganese or iron contained in the waters. The particles of oxide in these cases arrange themselves in arborescent forms, just as do the particles of frost crystallizing on a window pane.

Agates are not used as extensively as they once were for ornamental purposes. In the years of 1848-50 agate jewelry was very fashionable and was extensively worn. At the present time, however, the principal use of agate in jewelry is for breastpins and watch charms. For ornamental purposes it is used in pen-holders, knife handles, and vases. Its use for large marbles was once quite common, but glass marbles of the same size and still called "agate" are now generally substituted. In fine mechanical work, such as bearings for delicate instruments and in tools for polishing and grinding, agate is still extensively used.

OLIVER CUMMINGS FARRINGTON.

MARTYRS OF THE WOODS.

Would we miss them, you and I,
Would we care if soon should die
Every single singing bird
You and I have ever heard?
Would we miss them from the grass,
Through the tangled, deep morass;
From the bushes and the trees—
Robin, wren and chickadees—
Birds of blue and crimson wing;
Would we miss the notes they sing;
Would we miss the call and cry;
Chattering talk as we go by;
Nests amid the reeds and grass,
Nests swung high above the pass?
Do we care that birds must die,
Slaughtered daily as they fly?
Men will kill while people choose
Wings of birds to buy and use;

Soon the woods must quiet be;
Scarce a bird for minstrelsy.

—George Klinge.

37

A PANSY BED.

There is ever so much fun in a pansy bed. If you have never had one, ask your papa or mamma to let you have one this summer. A few dozen plants will give you much pleasure.

There are so many little faces to know among them, and so many little family groups. Some grin at you like monkeys, others scowl, some seem to wink, some smile shyly, while others are curious and open-eyed. There is a white family delicately blue-veined—Colonial Dames, I call them. There are negroes of the darkest hue, Indians, and those that the sun seems to have bronzed. There are groups of Chinamen with their little “yellow kids.” Some are tattooed, and some have striped skin. Many wear ruffled bonnets, and some have beards. The little clusters are so erect and alert on a morning after a heavy dew that they seem like families off for an outing or school children waiting for a snap shot. There are lovely grandmothers wearing purple caps with white frills, and with faces though crinkled and wrinkled yet full of smiles and wisdom. There are sweethearts too, their little heads close together, and they whisper, whisper when the wind goes by.

What do you think? One day from out of my bowl of pansies which I had placed on the lunch table skipped two frisky “yellow kids.” I discovered them hand in hand skipping away. Their little figures were reflected in the polished surface of the table, and they seemed partners out of a Virginia reel. As I put them back in the bowl among their elders, I felt that I had wantonly interrupted a runaway.

Watch how the pansies love the rain! As they seem praying for it with bent heads in dry weather, so they seem a-quiver with thanksgiving after a shower.

There are many things you can do with your pansies. First, though, you must love them. You must teach pussy and the dog not to tramp over them. Every day you must take off all the faded flowers. You must water them and weed them. You will enjoy gathering a bouquet daily for the house, and if anybody is ill, papa or mamma or some one else you love, by all means carry them a bunch of your pansies.

In midsummer, when the fairies have pitched their tents about the sweet-scented bed, the blossoms will have become so many that if grandpa or grandma has a birthday, you can gather seventy or eighty (possibly ninety if you need so many) for a birthday gift. You will not see the fairies about the bed, for they come at midnight, but the dew-sprinkled tents are there, and the cluster of toadstools that the brownies like so well.

Do not forget to give some flowers to the poor children who stand outside your gate, and who wish for some for their very own. The children who have no garden love to look at yours.

Perhaps you have an older sister or brother who paints. If so, they may like some of your pansies to sketch, and to keep in the house in the winter when your real ones are tucked under the earth and snow.

You will find several live things in your flower bed; the bees, the butterflies, and once in a while a humming-bird. Sir Bumble, the bee who looks so heavy and clumsy, touches lightly the pansies, and the pansies like to have him about, for he is so lively and cheery, so do not drive him away. The light yellow and the deep yellow butterflies seem like the pansies themselves, flying off from their stems for a journey about the country. Who knows what the butterflies and the bees tell the flowers, or what messages the flowers send by the flying creatures that pay them visits? When you have pansy beds of your own perhaps you will be able to write me some stories, and then perhaps you can tell me what the butterflies, bees and pansies talk about.

GRACE MARION BRYANT.

38

THE MULLEN.

Most of the familiar or useful plants have had their origin or characteristics accounted for by myths or legends, whereby the ignorant and superstitious have attempted to explain such features as attracted their attention. Some of these ideas were creditable to the plant, while others were quite the contrary. The Mullen appears to have led a dual existence, seeking an alliance with the spiritual world and at the same time aiding and abetting the witches in their nefarious undertakings.

A very pretty story concerning the Mullen is attributed to the American Indian, but in some regards it seems to be a variant of the Scandinavian Tree of Life myth. It appears that the Great Spirit of the red men lived at the top of a high tree whose branches reached to the heavens; as no mortal could attain to this high attitude, a spirit of the woods, in the guise of a beautiful maiden, took pity upon the people and so fashioning a ladder from the stems of the wild grape vine, she fastened it to a star. In order that the Great Father might not be disturbed, the fair sylvan carpeted the steps of the ladder with the velvet leaves of the Mullen, upon which she noiselessly ascended and descended, bearing the petitions of the red men or bringing to them advice or admonitions.

Of the one hundred and twenty-five species of Mullen that are native to the old world, five have become

naturalized in the United States. The Great Mullen (*Verbascum thapsus*), so familiar in dry, open fields, was originally christened by Pliny and has since received over forty English names of a less classical origin and significance. The name *Verbascum* is supposed to be derived from *Berbascum*, meaning a beard. Pliny doubtless selected this name, either because of the hairs on the stems of the plants or on account of the silky character of the leaves. The specific name, *thapsus*, is said to have been added, as the plants grew in considerable numbers in the vicinity of *Thapsus*.

One of the significant but impracticable common names of the Great Mullen is Hag-taper. The plant gained this unpleasant appellation by reason of the fact that if any one steps on a young Mullen plant after sundown, the witches will ride him as a horse until morning, lighting the way with Mullen stalks used for torches. These torches were also employed at the meetings of the hags and witches, when the leaves of the plant were an important element in the concoctions prepared in their cauldrons. Another name is Hare's Beard, illustrating a class of plants that have weird names because of some fancied likeness to animals. The name Cow's Lungwort, arose from the resemblance between the leaf and the dewlap of a cow, from which it was argued that the plant must be a specific for lung diseases. In England, where the Mullen is known as Blanket Leaf, the dried leaf is tied around the throat in cases of colds. It is believed that the leaf sets up a mild irritation which will be beneficial. The dried stalks of the plants were often used for torches at funerals which gave rise to the names High or Hedge Torch. The Great Mullen varies in height from two to seven feet. The stem is stout, very woolly, with branching hairs. The oblong, pale green, velvety leaves form a rosette on the ground or alternately clasp the stem. The flowers, which are about an inch in diameter, are clustered around a thick, dense spike, and have two long and three short stamens, so arranged as to materially assist the process of cross fertilization which is largely carried on by bees. It is interesting to note in connection with the thick woolly covering of the plant that many vegetable forms are so protected when exposed to intense heat or cold. This is true of most alpine and desert forms and the value of such a protection to the Mullen will be seen when it is remembered that the plants are always found in open, dry, stony fields exposed to the fierce heat of the sun, and afforded no protection for the rosettes of year-old plants which must survive the winter in order to send up the flower stalk the second spring.



GREAT MULLEN OR VELVET DOCK.
(*Verbascum thapsus*).



MOTH MULLEN.
(*Verbascum blattaria*).
FROM "NATURE'S GARDEN"

The Moth Mullen (*Verbascum blattaria*) is a far more attractive and graceful plant than the form previously described. The specific name was derived from the idea that the plant would kill the cockroach (*Blatta*). It was supposed that moths would not go near the plant, and it was quite a general custom in New England to pack these plants or flowers with clothing or furs in order to keep out moths. The stamens are similar to those of the Great Mullen, except the filaments are tufted with violet hairs. The flowers are yellow or white on long, loose racemes. The erect, slender stem is usually about two feet in height, and as a rule there are no leaves present at the flowering time. 41

CHARLES S. RADDIN.

THE CALL OF THE PARTRIDGE.

The fields are wet, the fields are green,
All things are glad and growing,
And fresh and cool across the pool
The gentle wind is blowing.
Tho' humid clouds yet fill the sky,
The rain has ceased its falling,
And from his rail across the swale,
I hear the partridge calling,
The spotted partridge calling.

Through the silence not a note
His listening ear is greeting.
But hear! O hear—how loud and clear
His call he is repeating,
What pleading lingers in his tone,

What tenderness revealing,
O, soft and sweet across the wheat,
A timid answer's stealing,
The timid answer's stealing.

—Belle Hitchcock.

42

JIM CROW AND HIS COUSINS.

While much can be said about the beauty and grace of birds of brilliant plumage and those of soul-stirring song, there is as much to be written concerning those noted for their sagacity and cunning. Some have selected the parrot as the model in this particular and the choice is not a mistake.

There is, however, a tribe which all may observe more or less, while a story relating to their habits or pranks will ever find willing listeners. The Crow is the best known of this genus, and grouped with him are the chough, the raven, the rook and the jackdaw. All of these may be tamed, and afterward may be taught to use the language of man.

The plumage of the Crow in the northern parts of the world is black, and we are so accustomed to that color that to speak of a white or of a spotted Crow might subject one to ridicule, yet in many parts of the world such Crows are found. Some are gray and black, and some species are larger than others. They are characterized by a comparatively short tail, long wings, and a strong, rather conical beak.

Crows are distinguished from ravens by their smaller size, and by the feathers of the neck blending with those of the body, while on the ravens, the neck feathers are pointed and distinct. The Crow family is widely distributed, but Crows, as properly understood, are mainly inhabitants of the north temperate zone. They are intelligent, wary birds (when persecuted), and are practically omnivorous, feeding upon fish, fowl, eggs, snakes, frogs, crabs, shell-fish, grubs, fruits, seeds and berries. The common Crow of North America is particularly abundant in the Eastern United States, and is looked upon as the inveterate foe of the farmer on account of the amount of injury he inflicts on growing crops, and especially upon corn. There is, however, a credit side to the account in the destruction of grubs; but as the Crow is by nature such a pilferer, he must be regarded as harmful in many ways.

In the fall and winter these glossy birds assemble by thousands in great roosts, or rookeries; one of these roosts on the Potomac above Washington has been estimated to harbor 40,000 Crows, while others are still larger. In the gray of the morning the birds leave in clamorous crowds for their feeding-grounds, often many miles away, and in the afternoon may be seen winging their way homeward in long lines, high above the earth in fair weather, low down in foul. The eastern fish crow, frequently found in company with the others, is a smaller bird, and can readily be distinguished by its hoarse caw.

The Carrion Crow of Europe and Asia closely resembles the North American Crow in form, size and habits, but is perhaps a little more destructive, attacking and killing lambs, or even weakly sheep. The Hooded Crow, found in northern and eastern Europe and in many parts of Asia, is gray, with black head, throat, wings and tail. The Gray-necked Crow of India is a small but bold and mischievous species, often stealing the very food from the table. On the other hand, it does much good as a scavenger, forming an able adjunct to the vultures in this respect.

An interesting story is told of a Crow of this species which had been tamed and petted until it behaved much as would a spoiled child. "Old Crusty," as he was called, would actually take the food away from the dog while he was eating, not by open encounter, for that would have deprived him of his fun. But he would tease the poor canine until he barked from vexation, then snatch up the prey and triumphantly bear it off to a neighboring tree, where he ate it at his leisure, while the dog stood looking at him and uselessly venting his rage in loud, threatening barks.

The annual "muster" of the Crows, like that of blackbirds, is a scene very amusing, as well as mysterious. It has been my privilege to witness a few such gatherings, but to me there seemed more noise than meaning. It is said by naturalists, however, that the most extraordinary meetings of the Crows occur in northern Scotland. There they collect in great numbers, as if they had all been summoned for the occasion; a few of the flock sit with drooping heads, and others seem grave as judges, while others again are exceedingly active and noisy. One authority says: "These meetings will sometimes continue for a day or so before the object, whatever it may be, is completed. Crows continue to arrive from all quarters during the session. As soon as all have arrived a very general noise ensues, and shortly after the whole fall upon one or two individuals and put them to death. When the execution has been performed they quietly disperse." 43

The Chough is a red-legged Crow and is one of the most mischievous birds of his genus. He carefully examines everything he finds, then carries it away if he can. And if there be a collection of anything to which he has access, he is sure to scatter it in all directions. Those which have been converted into pets have proven very affectionate, but they are easily offended and will often vent their spite in a most annoying yet very amusing manner.

The Raven is very much like the Crow in his habits, but is more given to fighting and to burglary than his shy cousin. He is a great tease, also, and will often attack children and even grown up people just for fun. By this it can be seen that the Raven is more susceptible to taming than the Crow, while no old Crow can steal so many articles or hide them as completely as the Raven. They are quick to make friends with dog or man, but, like the Chough, are very troublesome foes when once offended.

The Rook is a European bird, and though the farmer recognizes in him a destroyer of his young crops, he must

admit that without the Rook he would save little or none of his crop. Worms constitute the favorite food of this bird, wherefore many a husbandman has learned that it is best to endure the disadvantages of a rookery merely for the sake of his harvests. For one queer habit of Rooks is that they will frequent the same spot all their lives, and it is next to impossible to dislodge them from their abode.

The Jackdaws are the boldest of the genus, and have a very remarkable "don't care" look. They frequent high towers, hollow trees, and even appropriate to their own use the loftiest parts of the English castles. They choose their mates for life, and do not live in communities. They assemble in flocks, however, when cherries begin to ripen and will soon rob a tree if the owner is not on guard.

An amusing story is told of a tame Jackdaw. While pilfering one day he found a half-glass of whisky which had been left upon a table, and on tasting it, he liked it so much that he drank a quantity. In a few moments symptoms of intoxication began to appear; his wings dropped and his eyes were half-closed. He staggered towards the edge of the table, probably intending to fly to the floor, but he had either lost the power of his wings or he was afraid to trust them. He stood, seemingly meditating what he should do, all the while reeling like a drunken man about to lose his balance. Presently his eyes were shut and he fell over on his back with his legs in the air, exhibiting every sign of death.

An attempt was made to put some water down his throat, but he could not swallow it. He was then rolled in a piece of flannel, laid in a box and locked away in a closet. All the family, with whom he was a great pet, never expected to see him on his legs again. Next morning about six o'clock the door was opened, with the expectation of finding Jackie dead, but he had freed himself from the flannel and as soon as the door was open he flew out and hurried away to a basin-shaped stone, out of which the fowls drank, and copiously allayed his thirst. He repeated this several times that day and was none the worse for his exploit, but, with more forbearance than those who are endowed with reason, he never again would touch whisky.

CLAUDIA MAY FERRIN.

44

COCOA. (*Theobroma cacao*, L.)

The wretch shall feel
The giddy motion of the whirling mill,
In fumes of burning chocolate shall glow,
And tremble at the sea that froths below!

—Pope, "Rape of the Lock," ii, 135.

The cocoa-yielding plant is a tree varying from fifteen to forty feet in height. The main stem or trunk is much twisted and knotty, from which the branches stand out almost horizontally. The bark is thick, rough and of a cinnamon brown color. The leaves are alternate, large, smooth, entire, and of a deep green color. Flowers occur singly, more usually in clusters, from those parts of the branches and trunk formerly corresponding to the axils of leaves. Calyx deeply five-cleft, pale red. Petals pink. Fruit solitary or several together, pendulous, large, pear-shaped; each pericarp enclosing numerous brown seeds about the size of a hickory nut or almond, from which the chocolate and cocoa are made.

The chocolate tree is a native of Mexico, Central America, Brazil and other South American countries. It is now extensively cultivated in most tropical countries of both hemispheres. The West Indian islands have numerous large plantations. It is also found in botanic gardens and greenhouses. There are several cultivation varieties.

The cocoa or cacao yielding plant must not be confounded with the coco-nut palm or the coca-yielding plant which has already been described.

The natives of Mexico used cocoa before the discovery of America by Columbus. The Toltecs cultivated the plant centuries before they were finally conquered by the more powerful and more progressive Aztecs in 1325. Cortez and Fernandez in their letters to Charles V. of Spain referred to the cultivation of cocoa by the Mexicans who used the seeds not only as a food but also as a medium of barter and exchange. It was apparently the only medium accepted in the payment of provincial taxes. Humboldt states that cocoa was similarly employed in Costa Rica and other Central American countries.

In remote times cocoa was somewhat differently prepared from what it is at the present time. The roasted and hulled seeds were coarsely pulverized in a stone mortar, strongly spiced by means of vanilla and other spices, boiled in water and when cold stirred to a frothy semi-liquid in cold water and eaten cold. The word chocolate is said to be derived from the Aztec *chocolatl* (*choca*, frothy and *atl*, water). Through Cortez and others who lauded very highly the value of cocoa as a nourishing food for those going on long journeys, it soon became widely known. In 1520 considerable quantities of it, pressed into cakes, were shipped to Spain. Remarkable as it may seem, it is stated that the Brazilians learned the use of cocoa from the Spaniards. The noted Italian traveler Carletti (1597-1606) introduced the use and preparation of cocoa into his native city, Florence. Not all Europeans gave favorable reports concerning the use of cocoa. Clusius stated that it was more suited to hogs than human beings. Acosta stated that the drink had "a nauseous aspect and caused heart troubles." Cocoa was introduced into France about 1615, England about 1667, Germany about 1679. Somewhat later chocolate houses were established in various cities of Europe. William Homburg, a chemist, of Paris, extracted the fat from cocoa as early as 1695, and Quelus (1719) recommended its use as a salve and as an article of diet.



COCOA FRUIT.

Fruit and seeds.

FROM KÆHLER'S MEDICINAL-PFLANZEN.

The fruit of the wild growing plants is small and the seeds exceedingly bitter, hence the cultivated cocoa is preferred. The seeds are prepared in two ways, fermented and unfermented. In the former the seeds are placed in heaps in holes in the earth, in boxes or barrels, covered with leaves. In the course of four or five days they begin to "sweat" or undergo a mild form of fermentation. During this time the seeds must be stirred about occasionally. At the close of the sweating process most of the bitterness is gone and they have lost about one-half in weight. Afterwards the seeds are rapidly dried in the sun or in ovens. The fully dried seeds have a rich brown color. The following are the more important market varieties of fermented cocoa: 47

1. Mexican or Soconusco Cocoa.—Seeds rather small, delicate flavor and of a golden yellow color. Since Mexico does not produce sufficient cocoa for home consumption this variety is rarely exported. This and the following varieties are said to be derived from *Theobroma bicolor*, *Th. angustifolium* and *Th. ovalifolium*.

2. Esmeralda Cocoa.—Similar to the Mexican; somewhat darker in color.

3. Guatemala Cocoa.—Seeds large, with mild flavor.

4. Caracas Cocoa.—From Venezuela. Color pale brown, with a mild, agreeable flavor. Usually coated with a film of soil due to their being buried in the earth during the sweating process. A very highly priced variety.

5. Guayaquil Cocoa.—From Ecuador. Seeds flattened, somewhat wedge-shaped, wrinkled, reddish brown. An excellent variety.

6. Berbice Cocoa.—From British Guiana. Seeds small, externally gray, internally reddish brown.

7. Surinam and Essequibo Cocoa.—Seeds rather large and more firm; externally a loamy gray, internally deep reddish brown. Taste somewhat bitter.

The unfermented cocoa, also known as sun cocoa and island cocoa, is dried rapidly without fermenting. It is of a beautiful reddish brown color and a bitter astringent taste. The following are the principal varieties:

1. Brazilian (Para, Bahia) Cocoa.—Seeds smooth, wedge-shaped, flattened. One edge nearly straight, the other convex.

2. Cayenne Cocoa.—Quite hard, externally grayish brown, internally purplish red.

3. Antilles Cocoa (Island Cocoa).—Of this there are the following varieties: a, Trinidad cocoa, with large, flat, almost black brown seeds; b, Martinique cocoa, with elongated, flattened, reddish brown seeds; c, St. Domingo cocoa, with small, flattened, dark purplish brown seeds.

Cocoa requires considerable care in cultivation. A moist atmosphere and uniform temperature of about 24 to 28 degrees C., with considerable shade, is best suited. The tall variety of banana and the tree-like *Erythrina*

Corallodendron are the more common shade plants. The plants are grown from seeds which begin to germinate in eight days. The trees begin to bear fruit in about four years. More usually eight to ten years elapse before any considerable fruit is borne. Two crops are collected annually. It is stated that there is on an average only one fruit to every 3,000 flowers.

Chocolate and cocoa are prepared by roasting the seeds, removing the husks and crushing between hot rollers, which liquefies the solid fat and forms a paste. To make chocolate sugar is added and flavored with vanilla and cinnamon. Sometimes a coloring substance is added. The paste is finally moulded into cakes varying in size and form. Chocolate is frequently adulterated with lard, starches, rice flour and other substances. Cheap grades are usually flavored with sassafras nuts, cloves and other spices. In the manufacture of cocoa the husks are usually included and mixed with a variable quantity of sugar, starch, flavoring substances, etc. The roasted, hulled and coarsely broken seeds are known as cocoa nibs, and this is the purest kind of cocoa. The powder made from the seeds after the oil has been thoroughly expressed is known as broma.

The seeds contain about 50 per cent of fat. In the manufacture of broma and common cocoa most of this is removed and is placed upon the market as cocoa butter. The more or less broken hulls are sold as cocoa shells, from which a chocolate-like drink is made by boiling in water and sweetening with sugar. 48

There is perhaps no food substance which is more universally liked than chocolate. Mothers have no small amount of trouble in hiding the household chocolate from the children. With the omnipresent penny-in-the-slot machine more pennies are credited to it than to the chewing gum. The housewife and baker use it very extensively with chocolate cake. The confectioner uses it very freely, to the great delight of children.

The principal use to which cocoa is put is in the preparation of a beverage. For this purpose enormous quantities of chocolate, cocoa, broma and hulls are consumed annually. The word "Theobroma" is derived from the Greek, meaning drink for the gods. The drink is prepared by thoroughly tritulating the desired amount of chocolate, cocoa or broma with a small quantity of water, then stirring this into the necessary quantity of boiling milk or water and boiling for a few minutes with constant stirring. The oil present gives the drink great nutritive value. It is also slightly stimulating, owing to the presence of an alkaloid theobromine which is closely similar in its properties to theine and caffeine, the active constituents of tea and coffee. The drink does not agree with some individuals, because the large amount of oil present causes indigestion. It is also highly probable that the indigestion or dyspepsia is due to the minute fragments of roasted cell-walls of the seeds, which are not only indigestible, but irritate the secreting mucous cells lining the inner surface of the stomach.

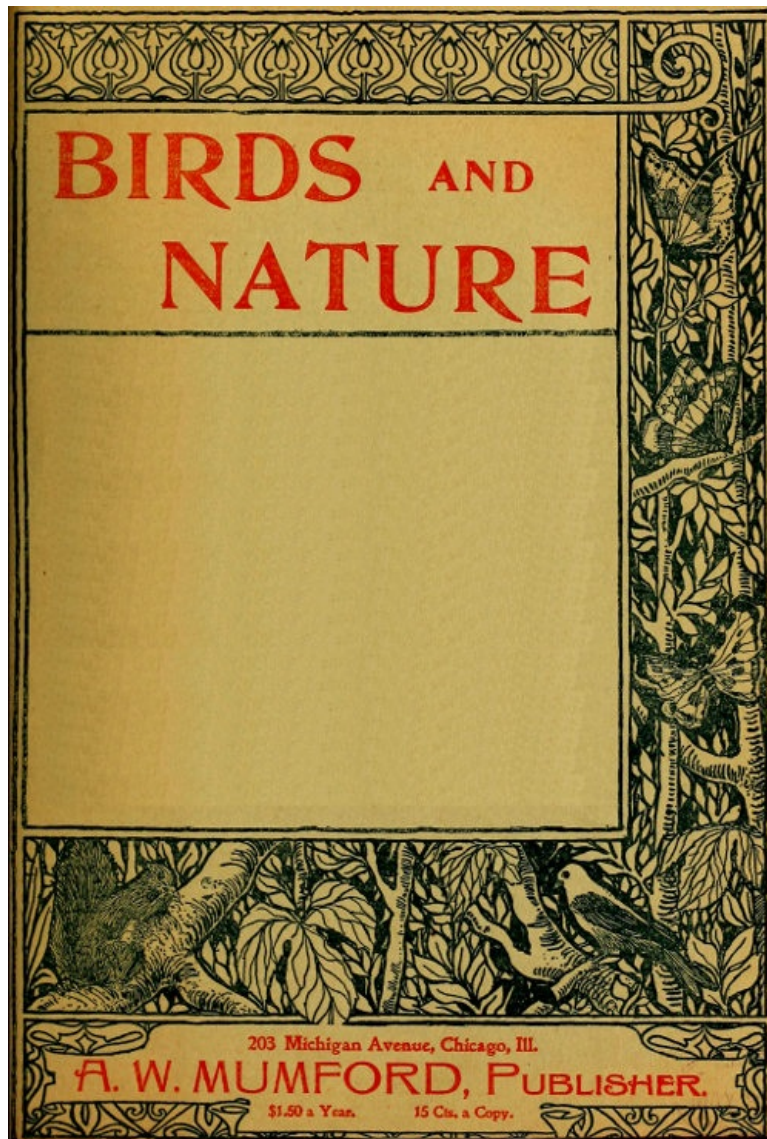
Cocoa butter, which resembles tallow in consistency and appearance, is used in medical and pharmaceutical practice as a salve, or pomade, for external application in eruptive diseases, as scarlet fever, etc., etc. Cocoa also finds extensive use in medical practice, though it has no marked curative properties. Cocoa from which the oil has been thoroughly expressed (broma) makes an excellent drink for convalescents. It is used to disguise the taste of disagreeable medicines, etc.

ALBERT SCHNEIDER.

THE CANOE-BIRCH.

Like polished marble their tall shafts gleam
Beside some beautiful inland stream,
And their heart-shaped leaves in autumn's prime
Wear the golden tints of a fairer clime.
As I touch the bark, white as driven snow,
I dream of the seasons long ago,
When the Red Man paddled his light canoe
Where the canopied birches pierced the blue!

—George Bancroft Griffith.



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