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# OCTOBER'S BRIGHT BLUE WEATHER.

O suns and skies and clouds of June,  
And flowers of June together,  
Ye cannot rival for one hour  
October's bright blue weather.

When loud the bumble-bee makes haste,  
Belated, thriftless vagrant,  
And golden-rod is dying fast,  
And lanes with grapes are fragrant;

When gentians roll their fringes tight  
To save them for the morning,  
And chestnuts fall from satin burrs  
Without a sound of warning;

When on the ground red apples lie  
In piles like jewels shining,  
And redder still on old stone walls  
Are leaves of woodbine twining;

When all the lovely wayside things  
Their white-winged seeds are sowing,  
And in the fields, still green and fair,  
Late aftermaths are growing;

When springs run low, and on the brooks,  
In idle golden freighting,  
Bright leaves sink noiseless in the hush  
Of woods, for winter waiting;

When comrades seek sweet country haunts,  
By twos and twos together,  
And count like misers hour by hour,  
October's bright blue weather.

O suns and skies and flowers of June,  
Count all your boasts together,  
Love loveth best of all the year  
October's bright blue weather.

Helen Hunt Jackson.

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## SONNET—OCTOBER.

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

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## SONNET—AUTUMN.

Thou comest, Autumn, heralded by the rain,  
With banners, by great gales incessant fanned,  
Brighter than brightest silks of Samarcand,  
And stately oxen harnessed to thy wain!  
Thou standest, like imperial Charlemagne,  
Upon thy bridge of gold; thy royal hand  
Outstretched with benedictions o'er the land,  
Blessing the farms through all thy vast domain.  
Thy shield is the red harvest moon, suspended  
So long beneath the heaven's o'erhanging eaves;  
Thy steps are by the farmer's prayers attended;  
Like flames upon an altar shine the sheaves;  
And following thee, in thy ovation splendid,  
Thine almoner, the wind, scatters the golden leaves!  
—Henry Wadsworth Longfellow.

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WILD COLUMBINE.  
(*Aquilegia Canadensis*).

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GARDEN."  
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## THE COLUMBINE.

Botanically the Columbine is called *Aquilegia*, from the Latin word *Aquila*, meaning an eagle, in reference to a fancied likeness of the spurs of its flowers to the talons of an eagle. It is one of the crowfoot family (*Ranunculaceae*).

This pretty and herbaceous perennial is distributed over most of the north temperate zone and, if not altogether a child of the mountains, it may be sought in rocky or stony localities. One is surprised to find the graceful Columbine, defying the storms, with its roots carefully fastened in the deep crevasses of the rocks of rugged mountains and protruding its nodding flowers above some steep ledge where human foot has never trod. To many a weary wayfarer this little hermit flower has brought joy and pleasure. Though attractive to the lover of flowers, it is not met with in folklore nearly as frequently as many other species of plants that are far less attractive.

The genus *Aquilegia* includes about twenty species and an endless number of varieties, produced by the skill and intelligence of the gardener. The United States can claim the prettiest of all the species of this widely distributed group. One species is the Wild Columbine (*Aquilegia Canadensis*) of our illustration. It is common everywhere. Here it is found covering rocky hills, softening the harsh gray of the rocks with its delicate foliage; there it enlivens the woodland borders with its nodding and pretty scarlet flowers, which are lined with bright yellow. In the woods it is frequently encountered, though not as robust in its growth, as if in this sheltered position less strength is required. Another species, and the most elegant of all the Columbines, is the blue Rocky Mountain form (*Aquilegia coerulea*). It is at home in the Grand Canon of the Colorado, where its wild grace and untrammelled native beauty is unsurpassed. Among the other species that should be mentioned are the Yellow Columbine (*Aquilegia crysantha*) of the Western States, and its sister, also yellow, the Pubescent Columbine (*Aquilegia pubescens*) of the Death Valley of California. The Rocky Mountain and Yellow Columbines furnish the finest garden forms and are the parents of several beautiful varieties. Europe has its common form (*Aquilegia vulgaris*) and also Alpine species, which, though outranked by our native species, are the originals of many of the single and double varieties of the garden.

Though it has been stated that the Columbines prefer the rocky hillsides, it must not be supposed that they will not tolerate a home in the border of a garden flower bed. Like many other plants of a similar nature, they thrive under cultivation, where a sunny and sheltered position is more suitable. One of the most beautiful of the garden varieties, or hybrids, is the double-flowered Skinner's Columbine.

The Columbines have been called "the flowers for the masses." Once started in the garden they will propagate for years and, although perennial, they increase rapidly by self-sown seed. The young plants will acquire sufficient size and strength, before the close of the growing season, to endure the trying winter weather.

James Jensen.

# THE RUFFED GROUSE.

Who knows the joy a bird knows,  
When it goes fleetly?  
Who knows the joy a flower knows,  
When it blows sweetly?  
Bird wing and flower stem,  
Break them who would?  
Bird wing and flower stem,  
Make them who could?

This world is very beautiful and the birds and flowers help to make it so. When we think what the world would be without the fluttering of wings and the carols of birds, without the color and perfume of the lilies and roses and the myriads of wild flowers that lift their pretty heads from banks of dainty moss or nod to their reflection in the clear waters of the brook, we begin to feel what beauty they possess and what a grace they give to our lives.

Birds have been named often from their appearance. The name grouse means gray hen, and this family of game birds as a whole is of this color.

I must now tell you of a wonderful thing that happened just a while ago. You all know about the Queen's Diamond Jubilee over in England? The papers every day gave interesting accounts of the Queen and her people, how they loved her, how they applauded her whenever she showed her good, kind face to them.

I had said to my brother that I wished I could see such a wonderful jubilee, when he replied: "Can you keep a secret?" "Of course you know that I can!" "Listen, then," he whispered softly, "if you wish to see some things as strange as the Queen's Jubilee be ready on your wheel at 11 tonight. Say not a word to any one." "But where are we going?" I asked. "That I shall not tell you; if you care to come, all right; if not, I shall go alone." Of course I was ready. Our wheels seemed to rise into the air, and, flying swiftly as the wind, we at last alighted in a nest of hills, a lovely spot. The moonlight was shining and strange winged figures were flitting about. One of them challenged us, but when the password, "Jubilee," was given he let us pass. The air was filled with the whirring of wings and the voices of the birds. They seemed to be very busy getting ready for some great event. Suddenly a drumming noise was heard and all the birds were still. Looking at the open space I saw a log and standing proudly there was a fine ruffed grouse. Soon he spoke: "Brothers of the grouse family, long have I waited for this day. It is the proudest moment of my life. To the broad prairies and lofty hills of America I bid you welcome, O, my brothers! I am glad so many of the ladies are present, too," and then Mr. Grouse spread his ruff so wide that we could hardly see his head, and made several low bows to the grouse hens who fluttered their sober gray wings. "In the name of all the grouse in America I welcome you. And now, brother and sister grouse, I have the honor of introducing the Cock-o'-the-woods, who will take the log."

The drumming and whirring of wings and cries of "Cock, cock!" that followed this speech of the ruffed grouse almost deafened us.

At last Mr. Capercaillie, called by his intimate friends Cock-o'-the-woods, advanced to the log. Ah, but he was a handsome bird! Very large, he weighed at least sixteen pounds, with brilliant plumage of black, brown and white, and dark green feathers in his chest. The scarlet patches of skin over his eyes were very bright in the moonlight. He looked slowly around, bowing to the applause, and said:

"I thank you for your welcome. In the name of all who have come from distant lands, from Asia and Europe, I thank you. We have come to hold a Grouse Jubilee. Surely we may well hold such a meeting and review our history and accomplishments, if the people who are really only new comers into our lands can hold a jubilee over a Queen whose family have been in England but a few hundred years. What are a hundred years in the history of our family who lived in England and northern Europe thousands of years ago?"

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"I will call upon the willow grouse to tell us the history of our famous family as he knows it."

Slowly Mr. Willow Grouse advanced to the log, chewing the bud of a birch tree as he came.

He bowed and said: "Mr. Chairman, you must excuse my slow speech, but you know I am the eldest brother of the grouse family and am not so strong as I used to be. Our history is certainly wonderful! Thousands of years ago we came southward with the ice and as the ice melted we flew north again. Today we live in many lands. I have traveled from Scandinavia with my wife and children, flying over Siberia and Alaska. My wife and I dress alike and our gray summer suits are good for traveling. In winter we prefer white coats, for then the hunter can not tell us from the snow." Just then a bird near us muttered: "That is nothing remarkable. I have three suits every year." "Hush," said a bird near him, "you must not interrupt."

But the willow grouse had finished, and after the young grouse had given him the front seat, for they are very kind to the old, the grouse who had boasted of his coats said: "Mr. President, I come from the high mountain peaks. Men call me ptarmigan or winged, because I have such thick plumage. As this is summer my legs and feet are quite bare and my coat is the color of the twigs, but you should see my winter suit! It is thick and soft and white as snow, and thick downy stockings cover my feet. They help me to make my way over the snow. In the autumn my coat changes to gray—the color of the rocks on the mountain side. It is hard work sometimes to find

enough to eat so high up in the mountains, but better a dish of leaves in freedom than to live on plenty in constant fear of the gun of the hunter." "Cock, cock!" said the grouse, and it sounded so much like our "hear, hear!" that I almost laughed aloud.

"The next number on our program will be a waltz," said the chairman. "A waltz," I thought; "grouse waltzing; whoever heard of such a thing?" Just then a handsome young capercaillie came to the log. It is not strange they are called the "cocks-of-the-wood," for they are certainly the handsomest of the grouse family. He puffed out his feathers, strutted back and forth on the log and began his waltz. It was a comical sight! While he was dancing he kept up the oddest singing—all on one note. Soon a black cock joined him and then they tried to show off. Some hens favored the capercaillie and some gathered around the black cock. At last all took sides, and it would have ended in a fight, only the dignified chairman stopped the dance and told them to remember that this was not a fight, but a jubilee. The cocks lowered their wings, but I believe they will fight it out sometime.

"Let us hear from the red grouse; let us hear from the red grouse!" cried several birds at once. A small bird with rich red-brown plumage came to the log.

"This is the first time I have ever been away from Great Britain," said the red grouse, "and I must be back for the 12th of August. That is an exciting day! All summer my wife and I keep with the children and live in peace, but on that day the hunters come. It is great fun to wait till they come very near and then whiz past so quickly that the shot does not reach you!" "Great fun, indeed!" muttered the ptarmigan; "fun for the hunter to slay his thousands every year." "Yes, that is true," replied the red grouse, "but we live in safety all the year except the hunting season. The keepers and the hunters keep the eagle and the fox and all our foes away, and our family of red grouse in Scotland is larger now than before the hunters came. It is because we are on the moors that all the wealthy people come to Scotland in August. Thousands of strangers fill the land, and they all come for us, the little red grouse who live only on British moors. We are proud of the fact that we are the only bird that belongs to Great Britain alone. We take care of our young together, my mate and I, and in October we join other families and fly to the uplands."

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Just here the hens of the capercaillie and the black cock began a noisy clatter. "I wish our husbands were like the red grouse," said one. "I think it is a perfect shame," said another; "my mate never stays near the nest. When I must leave the eggs to hunt for food he is never there to keep them warm." "I wish I were a willow grouse or a red grouse," said another demure little hen. The black cocks and the capercaillie looked rather ashamed; even the chairman hung his head, but he quickly called the hens to order, saying: "Now we will hear from our American friend, the ruffed grouse."

"Wake up! Wake up! You have been sleeping in the moonlight!" "Where is the ruffed grouse?" I sleepily ask, and then my brother laughs and asks what I have been dreaming. So it was all a dream, and the moonlight, the pines, the grouse and the jubilee have been but parts of a dream! "You awoke me and now you must tell me about the ruffed grouse," I say to my brother.

"Well, you must know that there are many varieties of grouse in our broad land, but the ruffed grouse is the gamiest and handsomest in plumage of all the grouse family. It is swifter on the wing and harder to shoot.

"This bird is called ruffed grouse because he can raise the numerous wide soft feathers on each side of the neck and make a ruff like those the ladies used to wear when Elizabeth was Queen of England.

"His favorite home is in the heavy bird forests or in the thickets of the scrub oak and he is seldom found in places open enough for good hunting with the dogs.

"When disturbed, the birds fly like an arrow for the thickest shelter. They dart behind the tree trunks or light upon its branches, and are so still and so exactly the color of the tree that they look like part of it.

"The ruffed grouse are found in all parts of the United States. They go in pairs or in small companies. The drumming noise made by the male when he is calling his mate is a very pleasant sound in the woods and may sometimes be heard a mile away.

"He selects a hollow log, struts back and forth upon it, and at last strikes his sides with his wings so rapidly that the noise resembles distant thunder. When his mate comes he raises his ruff until his head is almost hidden. He spreads his tail like a fan, and tries to make himself lovely in her eyes.

"They build their nest on the ground. It is made of grass, twigs and leaves. The mother-bird is very clever in protecting her young brood. If she hears someone near, she gives a cluck and they disappear, while she moves slowly along trying to lead the intruder away from the nest. When she can get behind a tree she flies swiftly away, coming back to the nest when she thinks all is safe.

"Go to sleep again and perhaps you will have another dream," laughed my brother. "That is all interesting, but I am sorry I did not hear the ruffed grouse tell his own story."

Florence Holbrook.





FRINGED GENTIAN.  
(*Gentiana crinita*).



CLOSED OR BLIND  
GENTIAN.  
(*Gentiana Andrewsii*).

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## THE BLUE GENTIAN.

During the reign of King Gentius, Illyria was devastated by the plague. So great was the mortality among his subjects, the pious king appointed a season of fasting, and prayed that if he shot an arrow into the air the Almighty would direct its descent, guiding it to some herb possessed of sufficient virtue to arrest the course of the disease. The king shot the arrow and in falling it cleft the root of a plant which, when tested, was found to possess the most astonishing curative powers, and did much to lessen the ravages of the plague. The plant from that time on became known as the Gentian, in honor of the good king, whose supplications brought about the divine manifestation of its medicinal properties.

The old herbalists called the Gentian Baldmoyne, or Feldwode. The first of these names is supposed to have been derived from the Latin *valde bona*, meaning very good. It was regarded as a specific for poisons and pestilence, and an excellent remedy for wounds caused by mad dogs. The term Feldwode carries the associations of the plant back to the time of Greek myths and fables. Tellus, the goddess of the earth, possessed the power to produce plants potent for enchantments. Hence, when Medea besought Tellus to evolve a plant which would give the element of renewed youth to the mixture in her caldron, the goddess produced the Gentian or Feldewode, which restored to the aged Aeson the freshness and vigor of youth.

The genus *Gentiana* includes nearly two hundred species distributed from boreal to tropical regions, although the majority are found in the north temperate zone. A large number of species are found in Europe, more than sixty having been reported from Russia, and there are nearly one hundred in North America. Several very beautiful forms come from the Swiss Alps, which rarely attain a height of more than three or four inches. The deep blue flowers of these diminutive specimens retain their color for years after being pressed for the herbarium, thus differing from many of the larger forms, whose corollas quickly fade.

One of the most attractive and familiar of the Gentians is the fringed or blue Gentian (*Gentiana crinita*). It is generally found in low grounds, along water courses or ditches, and while quite generally distributed, it is sparing of its favors, as the long peduncles that terminate the stems or simple branches, support but a single flower. The plant grows to a height of from one to two feet, and the leaves, placed opposite to each other, have rounded or heart-shaped bases attached directly to the stems, entire edges and tapering points. The sky-blue flower is bell-shaped, nearly two inches long and with the lobes strongly fringed. This is partially enclosed by a calyx, which is nearly as long as the corolla.

A much more common form, found growing in fields and woodlands, is the closed Gentian (*Gentiana Andrewsii*). The fanciful name, Cloistered Heart, has been given to the plant because of the story that once a fairy queen sought to elude pursuit by secreting herself in the flower of a fringed Gentian. In order that she might be more effectually shielded, the plant closed the lobes of its corolla and in gratitude the queen decorated the interior of the flower with brilliant stripes. It is in order to preserve this fairy painting that the flowers have remained closed ever since.

The closed Gentian has leaves with rough edges and a narrow base. The flowers are blue or occasionally white, closed at the mouth, forming an inflated, club-shaped corolla, with stripes on the inside. They are arranged in clusters on the ends of the peduncles or flower stems and are from an inch to an inch and a half in length. Both the fringed and the blue Gentian bloom during the autumn months and are among the most attractive forms that mark the close of the floral season.

The medicinal properties of the Gentian are obtained from the root, which, after being powdered, yields its remedial qualities to water and alcohol. As a tonic, it has been used from remote times and it is said that the Swiss macerate the plants in cold water, the sugar they contain causing fermentation which results in a spirituous liquor, bitter and unpleasant, but much used by them. The root is found as an ingredient in many of the ancient receipts transmitted from the Greeks and Romans, and is still employed in a great variety of complaints.

Charles S. Raddin.

# TO THE FRINGED GENTIAN.

Thou blossom bright with autumn dew,  
And colored with the heaven's own blue,  
That openest when the quiet light  
Succeeds the keen and frosty night.

Thou comest not when violets lean  
O'er wandering brooks and springs unseen,  
Or columbines in purple dressed,  
Nod o'er the ground-bird's hidden nest.

Thou waitest late, and com'st alone,  
When woods are bare and birds are flown,  
And frosts and shortening days portend  
The aged year is near his end.

Then doth thy sweet and quiet eye  
Look through its fringes to the sky,  
Blue—blue—as if that sky let fall  
A flower from its cerulean wall.

I would that thus when I shall see  
The hour of death draw near to me,  
Hope, blossoming within my heart,  
May look to heaven as I depart.  
William Cullen Bryant.

## THE BABY LIONS.

Girard, a great lion-hunter, once took home with him two baby lions which were a month old. The lioness was about as large as a cat and the lion a third larger.

The little lioness was very timid. If anyone tried to caress her she would repay him with a few blows from her little paws. Her brother, whom they named Hubert, was quite different. He would sit quiet, looking with some astonishment at all that passed, but was not cross. He was idolized by the children, who were ever fond of petting him. The lioness could not be induced to take sufficient food, and she finally died. Hubert got along nicely and was as healthy and strong as if he had been reared in the forest.

He was taken to a camp of soldiers, where he became the idol of the regiment. He was always present at parade and would play with the men during leisure hours.

As he grew older his capers became somewhat serious. He showed a liking for sheep and donkeys, which made it necessary for him to be chained. Finally, after he had killed a horse and dangerously wounded two men he had to be caged.

Girard still continued to pet him, however. Every night he would open the cage, and Hubert would spring out joyously, playing with him at hide-and-seek, embracing him with an ardor that was more affectionate than agreeable.

One night as they played Hubert came very near strangling his master, and probably would have succeeded if the soldiers had not beaten him away. That was the last time they played hide-and-seek together.

Hubert was afterward sent to Paris. Some time later Girard went to see him. Hubert was lying half asleep, not taking much notice of the visitors. Suddenly he raised his head, his eyes enlarged and there was a nervous twitching of the muscles of his face. He swung his tail from side to side, showing that the sight of the well-known uniform had aroused him. He knew the uniform, but had not yet recognized his old master. Girard approached and thrust his hand into the cage. It was a touching scene which followed. The lion, without taking his eyes from his master, put his nose to the outstretched hand and began to breathe deeply. With every breath his eyes became more affectionate, and when Girard said to him:

"Well, Hubert, my old soldier!" he made a terrible bound against the bars of his cage, which trembled beneath his weight. He stood up, pressed against the bars and tried to break through them. He licked his old master's hand with joy.

If anyone else came near the cage he became very angry. At last Girard went away, and when he was out of sight Hubert made the cage tremble with his cries and bounds.

# SUNFLOWERS AND DAISIES.

The dayesye or elles the eye of day,  
The emperice and flour of floures alle.  
—*Chaucer, Good Women, l. 184.*

The sunflowers are mostly large, erect, perennial herbs, with the flowers characteristic of the order Compositae. They are natives of tropical America, but have become widely distributed in cultivation, appreciated on account of their large yellow flowers. They not only thrive very luxuriantly under cultivation, but spread very quickly spontaneously. Every one is familiar with the sunflower as it appears in cultivation, hence no special description shall be given of it. It is kin to the iron weed, the dandelion, the golden rods, the asters and the daisies.

It would be impracticable to describe or mention all the species and varieties of sunflowers and their numerous relatives. We shall refer very briefly to a few of the more common kinds. *Helianthus annuus* is a commonly cultivated species. The seeds of this plant furnish a very useful oil; the flowers yield honey and a useful dye; the stalks a textile fabric and the leaves fodder. The seeds of this and other species are also used as food, and as a surrogate for coffee. The carefully dried and prepared leaves have been used as a substitute for tobacco in cigars. Poultry eat the seeds very greedily and thrive well upon them, due to the oil present. It is also maintained that a large number of sunflowers about a dwelling place will serve as a protection against malaria. An infusion of the stem is said to be anti-malarial.

*H. tuberosus*, known as the Jerusalem artichoke, has large tuberous roots which are sometimes eaten when cooked or pickled. Several species are said to have decided medicinal properties. *H. odora* is said to be carminative, diuretic, stimulant and antemetic. *H. rigida* is tonic and astringent. *H. virgaurea* of both continents is also astringent and tonic. In the eclectic school of medicine the infusion of seeds is used as a mild expectorant, and the expressed oil as a diuretic. The diuretic properties are said to be due to nitre, which occurs most plentifully in the central pith of the stalks.

The medicinal virtues of the sunflowers are very limited and uncertain. Their principal use is that of a showy garden plant. That they check or prevent malaria is quite probable, because of their draining effect upon the soil rather than any medicinal property residing in the plants themselves.

The daisies, of which the ox-eye daisy is a well-known example, are garden and field favorites. As already indicated, they are kin to the sunflowers. The word daisy is a contraction of the old English words "dayes eye," that is, the eye of day, meaning the sun, as indicated in the verse from Chaucer. There are a great many flowers known as daisies and again a given one has a number of popular names. For instance, *Rudbeckia hirta* (see illustration) is variously designated yellow daisy, black-eyed Susan, nigger head, golden Jerusalem and ox-eye daisy.

The two plates illustrate the tall or giant sunflower (*H. giganteus*) and the daisy just referred to.

Albert Schneider.



TALL OR GIANT  
SUNFLOWER.  
(*Helianthus giganteus*).



BLACK-EYED SUSAN OR  
OX-EYE DAISY.  
(*Rudbeckia hirta*).

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## A TRUE STORY OF A WAYWARD BOB WHITE.

Mother Bob White, with due maternal care, had selected a most appropriately concealed spot for her treasure. The roughly constructed nest was built upon high ground, and was artfully hidden at the base of a tuft of dried grass. That the necessary moisture, which adds vitality and strength to the young should not be lacking, she had deposited her eggs almost upon the bare earth, only a thin, but closely woven mat of dried grass intervening between the nine white eggs and the brown earth. The days of incubation were divided between the two old birds, the cock performing his share of the parent's duties. When the hen was collecting her food he would nestle down upon the eggs with a care equally as great as that bestowed by the mother.

After the chicks were hatched the cock shook himself free of any and all responsibility, and betook himself to the meadows to enjoy the more liberal forage. This desertion was most satisfactory to the mother, for no doubt she wished to have the entire training of the little ones left strictly to her care. She would not lead the chicks forth until sure of his departure. What fluffy little brown beauties they were as they dodged in and out among the weeds and grasses, learning their first lessons in the roughest school of life, the school of experience! They had many dangers to guard against, and they learned that much work was required of them before their insatiable little appetites were satisfied. They must brave attacks from foxes, skunks, weasels and minks upon the ground, and at the same time keep an alert eye upward for the sudden advent of some hungry hawk by day, or the relentless swoop of owls by night. Their nights were spent in anxiety, and, in fact, then they were most insecure, as owls, and foxes especially, appreciate a young quail and exert themselves to capture them. Their caution, however, could not interfere with their obtaining a supply of food and water, so they braved many dangers every hour of their lives, and not many days after their entrance into this world they had gained the assurance which comes from meeting and overcoming difficulties.

Mother Bob White had been carefully guarding her little brown family, leading them forth daily in quest of small bugs and scattered seeds, always upon the lookout for possible enemies, never failing to flutter away, feigning a crippled wing, should I chance to come upon her suddenly. And on such occasions look as quickly and intently as I might I seldom caught a glimpse of those brown bodies that so well obey the parting cry of warning, uttered by the mother as she fluttered just beyond my reach, leading me straight away from her trembling family. Should you wish to find one of the little chicks you may do so by carefully feeling among the tufts of grass and other decayed brown vegetation nearest the spot where one's eye lost them.

Upon one occasion I discovered several of this little brood in a most peculiar and interesting situation. I had startled the mother-bird while she was leading her young ones through a wood, the ground thickly covered with dried leaves, and, as she fluttered away from almost beneath my feet, I dared not move for fear of crushing one of the chicks. They scattered and seemed to have disappeared on all sides near me. Gazing intently upon the mass of brown leaves, I was thinking how I could extricate myself without harming the hidden brood, when my eye caught the slight motion of a leaf almost against my foot. I stooped and gently raised the leaf. It felt wonderfully heavy. This oddity of weight prepared me for the surprise yet in store. When the leaf had been lifted a sufficient distance to enable me to look beneath, I caught a glimpse of a tiny brown rascal clinging desperately. He was in the drollest of positions, clinging feet uppermost.

I soon learned to know about where Mrs. Bob White's brood could be found, and they were quite grateful for the crumbs scattered daily within their reach, usually along an old and dusty wagon road which passed but a short distance from the spot where the nest had been. The mother would lead her flock forth where for a few minutes would be enacted an amusing scene as she attempted their education in the art of dusting themselves. They would stand amazed, watching the cloud of fine dust raised by their teacher, until one by one, they seemed to understand her meaning and then squatting down in a circle, they made feeble imitations of her vigorous motions.

Wayward Bob was one of this family of nine, but as yet he had not been named, and, indeed, had he been, it would have taken a close critic to have distinguished him from his relatives.

Bob, together with his brothers and sisters, was seven days old and had learned quite rapidly to pick small bugs from the weeds and grasses, when a great misfortune befell him and I fear but for my timely assistance nine little homeless, motherless quails would have sadly longed for the sturdy care of their affectionate guardian. I had repaired to the old wagon road, to scatter a few crumbs upon the ground and watch the antics of my little friends. This time they were later than usual in coming to their dusting place. No doubt, the mother had given them a wider knowledge of their little world that day.

When they came, I caught sight of them some distance from the side of the road, wending their way through a tangle of weeds near a large pile of stones. As I looked a weasel darted from under those concealing rocks. I cried aloud, and rushed forward but my assistance came too late for the heroic little mother; and thus nine little orphans were thrust upon me for support. The young ones were so terrified by the suddenness of their affliction that they gathered in a helpless knot by the scene of the tragedy. I gently lifted eight of the fluffy chicks and deposited them in my hat. There was yet one more to be cared for. He looked up with an expression of trust and fear commingled. I reached forth my hand to take him, but, being a sturdy little fellow he decided to take his chances in the wide world, so he quickly darted from my hand and disappeared among the many weeds close by. I finally captured the willful son, and fearing lest he should again elude

me, I carried him in one hand apart from those in the hat. This is how a little quail came to live with me, and he received the sturdy name of Bob because of its aptness to his nature.

Bob's brothers and sisters were given to a bantam hen, who had made a failure with her own brood. She was happy to receive these new cares, and this time accomplished her maternal duties to her entire satisfaction, rearing all to their full growth. But Bob went with me. I placed a box in my room for him, and devoted many pleasant moments to feeding him, watching his growth, and training his belligerent ways.

My little friend became a great mischief as he grew older. He was allowed full freedom that summer and fall and his favorite pastime was annoying a brood of late hatched chickens. Down he would fly among those chicks, pecking at them spitefully, until the mother forced him to beat a hasty retreat.

One noon as the dining-room door stood ajar, Bob entered with a whirr, alighting upon the table when luncheon was being served. The visitor helped himself daintily from the contents of a platter. I reached my hand toward the pretty offender, but his fear of my touch caused him to fly quickly aside. In doing this he collided with a cup of tea, thus upsetting it, and causing the contents to fall upon my mother's gown. This act barred him from the dining-room, and he then contented himself by pursuing flies and grasshoppers upon the lawn.

One day a large grasshopper alighted upon my window. Bob's alert form came a moment later, and he made a dart for the coveted morsel. The grasshopper flew across the room, alighting behind a picture which was standing upon a table. Bob, nothing daunted by his late failure, flew rapidly across the room, and against the picture. He had the grasshopper this time, and it disappeared rapidly down his brown throat; but that was not the end, for the picture toppled forward and fell, breaking the delicate frame work and damaging a much prized portrait. This act brought Bob disgrace and punishment. He was not again allowed the full liberty of the house.

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My pet grew large and strong during the fall and winter and I spent many pleasant moments watching his mischievous pranks and quaint actions.

Spring came at last, and the summer songsters were arriving, treating us to many a happy anthem. The blue bird flitted by unnoticed. The robins were building their nests, and that gaudy summer visitor, the red-breasted grosbeak, had arrived in the gorgeous splendor of his spring plumage, when far away across the sweetly scented meadows echoed the bob white of my little pet's relatives. Bob would listen with head alert to this call, and then he would pace up and down his box just as you have seen wild animals do in a zoological garden. With all my kindness I had failed to deaden his love for the wild life of his kind. One day, when Bob was perched upon my window sill, there came from across the orchard a sharp and clear bob white! This was more than my little friend could withstand. He walked up and down, seeking vainly for a way to escape. In his sturdy body the varied emotions of a captive were contending. There was anxiety and hope, anger and fear, love and hate, commingled in his every motion.

Moved by my pet's desire for freedom, I threw open the sash. Out he flew, with a joyous whirr of his wings, and alighting upon the garden fence, with his characteristic energy, he uttered his first bob white! clear and strong.

He remained near home, giving me a good opportunity to watch his habits. He daily came to the house for food, and never was he disappointed, as I regularly placed a handful of wheat where he could reach it.

One day a great happiness entered the life of my little friend. He was uttering his call with the sweet tremulous notes of a love-sick life. Borne from the upper orchard there came an answering call from another lover in search of a bride. Bob's head went up higher and higher; he hurried along on an old rail fence, sending his challenge for combat across to his rival, for lurking near was a little brown form watching Bob's sturdy mien with piqued interest. He sped quickly to her side, she retreating farther and farther away across the orchard to the place where the other lover was watching and waiting for the rival who had gained favor in her eyes. Bob and his rival met face to face in the dusty wagon road near the spot where my pet's early life was spent. Then there was a duel for love, with the little modest brown lady-bird as umpire and prize.

The rivals chased each other up and down the dusty lane. At last Bob was victorious, and his rival quickly took wing, followed by the angry victor. Presently Bob returned alone, and approached his bride. She had laid a scheme to test his love, and was now ready to abide by the result of the conflict.

My little pet led his mate away through the wavy grasses, a victor and a king over the heart of his loved one. Several weeks later, after a nest had been built and a downy brood hatched, I came upon my old pet. It was a sunny day, and while strolling down an orchard path, Bob flew down in front of me, where he stood, trembling and terrified. Thinking to help my old friend in his distress, I put forth my hand to take him up. I should have known him better. In an instant he was changed. He eyed me with that old keen, distrustful glance, rose quickly from my feet, and flew rapidly away. Hardly had he gone fifty yards when a pigeon hawk that had been waiting and watching, darted forth, and swooped down upon poor Bob while in mid-air. A loud snap as the hawk struck, a sharp cry from the bonny victim, and a few feathers floating slowly down told too pathetically of Bob's awful fate. I gathered up the scattered plumage, a memorial of the little wayward quail I had fed and reared to maturity.

Bob seemed quite a patriot to me, as I reflected upon his decision when he eluded my hand that final time. "Liberty or death," he seemed to say, as he flew rapidly away. He exhibited that trait, in his bird-like way, by which great men have won fame and renown, so he, too, is worthy of having his story related and his life immortalized.

Charles Thompson.

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# THE OSWEGO TEA.

The Labiatae, or family of mints, consists of about one hundred and sixty genera, including the one to which the Oswego Tea of our illustration belongs. Under these genera are classed over three thousand distinct species. Many of these are well-known plants, such as the mints, pennyroyal, anise, bergamot, fennel, catnip, sage, thyme, lavender and rosemary. Representatives of this family are distributed throughout the world in the temperate and tropical regions. In fact, it is one of the most cosmopolitan of the plant families.

The characteristics of the family are very marked. The foliage abounds in volatile oils which generally give off an aromatic odor, especially when the leaves are bruised. The leaves are opposite and usually arise from a four-sided stem. The flowers, as a rule, are strongly two-lipped. This character gives to the family its scientific name, which is derived from a Latin word meaning lip. The stamens are attached to the corolla and are usually four in number, two of which are longer than the others. The ovary is four-lobed, and the resulting fruit consists of four nutlets, each containing one seed.

The Oswego Tea belongs to the genus *Monarda*, a group of plants named in honor of Nicolas Monardes, a Spanish physician and botanist of the sixteenth century. He wrote a number of valuable papers on the medicinal and other economic plants, especially treating of those from America. This genus includes about ten species, all natives of North America and Mexico.

The Oswego Tea (*Monarda didyma*) is frequently called Bee Balm, and locally it is often known as Fragrant Balm, Mountain Mint and Indian Plume. This plant prefers a moist soil near the wooded banks of streams and in the hilly and mountainous regions of Canada and the United States, east of the Mississippi River. In North Carolina it is found at an altitude of over five thousand feet.

The leaves are egg-shaped, elongated, taper-pointed and more or less saw-toothed on the margins. The floral leaves are tinged with red of nearly the same shade as that of the bright red and showy flowers. The flowers which appear in July, August and September and are about two inches in length, are massed in a dense, solitary and globular head, which is situated at the end of the flower stalk.

The flowers produce an abundant nectar, which attracts bumblebees, butterflies and humming birds; these by transferring the pollen from flower to flower assist in the fertilization of the developing seeds. The ordinary bees are barred from the sweets of this plant because of their short tongues, though some forms will cut a hole in the side of the corolla and obtain the nectar in this manner.

It is said that certain Indian tribes use this bark in preparing a tea that is nearly as palatable as that made from the ordinary tea of commerce.



OSWEGO TEA OR BEE  
BALM.  
(*Monarda didyma*).

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GARDEN."  
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# FLOWERS AND THEIR UNBIDDEN GUESTS.

In the [September number](#) we considered flowers and their invited guests, that is the insects useful in carrying pollen. The very things which attract useful insects to flowers are attractive also to useless insects. For example, nectar in a flower seems just as desirable to an ant as to a butterfly, but the ant is a creeping insect and would be likely to lose the pollen in passing from one plant to another. If useless insects found free access to flowers and carried off their food supplies, the useful insects would soon stop visiting them. It is of great advantage to flowers, therefore, to have some means of warding off the creeping insects. It must not be understood that all plants are equally successful in this matter, or that any plant is always successful, but there are certain things which seem to hinder or discourage the approach of creeping insects to flowers.

Perhaps ants may be taken as the best illustration of the insects whose visits are discouraged by flowers. They are very much attracted to the food supplies in the flower, especially the nectar, and are among the most intelligent of insects, often overcoming the most serious obstacles. They will be considered in this paper, therefore, as the insects which are seeking the nectar and pollen of flowers without invitation. A charming little book upon this subject has been written by Kerner, and translated into English, under the title which appears at the head of this paper. It is in this book that the chief obstacles to such unwelcome guests as ants are clearly stated.

Hairs.—One of the most common obstacles to ants is a barrier of hair. For some reason, ants dislike to cross such a barrier. Travellers in tropical countries, where ants abound, tell us that a hair rope laid around a tent is a very effective barrier against the invasion of armies of ants. Hair is very commonly found upon plants, and it may be noticed that it is apt to increase in amount and prominence towards or within the flower cluster. Sometimes the flowers themselves are hairy outside, and in the case of the trailing arbutus, whose flowers close to the ground are in special danger from creeping insects, the flowers are filled with a fluffy mass of hairs. In our illustrations, the wild columbine, the Oswego tea, the sunflower, and the ox-eye daisy are all hairy plants, and difficult for ants to climb. In the September number are illustrations of the mallow, the lady's slipper, and the New England aster, all of which are hairy and discouraging to ants.

An interesting fact in connection with the wild columbine may be noted. The nectar is deposited in the knob-like bottom of the long tubular spurs, and the entrance is so carefully guarded that only a long and slender proboscis, like that of a moth or a butterfly can reach the nectar. The bumblebees, however, have learned this fact, and bite through the tips of the spurs and steal the nectar. As a consequence, the wild columbine is said to be little visited by the proboscis-bearing insects, and its pollination is seriously interfered with.

Sticky excretions.—Some plants have the power of excreting upon their surface a sticky substance like mucilage. This mucilage may be produced by hairs, which are then called "glandular hairs," or it may appear directly on the surface of the plant. When ants or other insects try to cross such a barrier they are not merely stopped but caught. Upon "glandular" plants it is very common to see small insects stuck fast, and it is more than probable that the nourishing material of their bodies is digested and absorbed by the plant. In this way the plant not merely stops the insect, but catches and devours it.

A very common illustration of such a plant is the "catchfly," whose name suggests its power. The joints of its stem are long, and near the upper end of each joint is a band of mucilage. This series of sticky bands forms a very effective barrier to any insect trying to crawl up the stem.

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Isolation.—In some cases plants or their flowers are isolated from creeping insects by water, which forms a most efficient barrier. This has been demonstrated by housekeepers, who in the days of "safes" were accustomed to set the legs of the safe in cans of water to ward off the invasion of ants. Of course, plants standing in the water are well isolated, and usually show no further device for warding off creeping insects. There is an interesting fact connected with one of our water smartweeds, which has to do with our subject. Ordinarily it stands in shallow water, and is perfectly smooth; but when occasionally the water dries up the plant becomes hairy. That this has anything to do with the danger from creeping insects is unlikely, but the hairy covering certainly appears at a very opportune time.

The teasel was once extensively cultivated as a fuller's plant, and one or two species of it have become common as wild plants, their dense and prickly flowering spikes looking like swabs for cleaning lamp chimneys. The plant is tall and coarse, and is peculiar in that its large opposite leaves unite by their bases about the stem to form a cup. In this way a series of cups is developed on the stem, and in each cup there is water. When a creeping insect crawls over the edge of the cup he sees the stem rising from a pool of water which must be crossed. As there is a series of such pools it is very unlikely that any such insect reaches the showy cluster of flowers.

The so-called "travelers' tree" of the tropics is a teasel upon a larger scale. The enormous flower cluster is at the top of the plant, and between it and the ground is a series of very large water-containing cups formed by the leaves. The popular name has been given by travelers who have been represented as reaching a cup with a spear and piercing it, thus obtaining a supply of water. The story is very doubtful, and the water, usually full of the macerating bodies of insects, is still more doubtful.

Latex.—By this term is meant the milky juice which some plants possess. When such a plant is punctured or torn the latex flows out, and as soon as it is exposed to the air it becomes more and more sticky until it hardens. It is from the latex of certain trees that India rubber is obtained, but it may be observed in many plants, notably the milkweeds, which have received their popular name on account of it.

The milkweed may be used to illustrate how latex may be of service in warding off creeping insects. In many cases the plant is entirely smooth, and the stems of the flower cluster are even slippery. When an ant reaches these slippery surfaces it clutches for a hold and its sharp claws pierce the tender skin of the plant. Immediately a drop of latex oozes out and becomes sticky, and when the ant seeks to lift its feet there is resistance, and in the struggle the claws clutch deeper, more latex oozes out and becomes more and more sticky, until finally the insect is stuck fast. The flower clusters of certain milkweeds are often found plentifully covered with small captured insects.

Protective shapes.—Many flowers secrete their nectar so that a creeping insect cannot reach it, but the suitable insect can. Illustrations are numerous, but the following will suffice.

The wild columbine, represented in one of our illustrations, secretes its nectar at the bottom of long tubular spurs, which can be traversed by slender probosces, but are impassable to creeping insects. Spurs are developed in many flowers, notably the orchids, and they are always associated with nectar secretion and the visits of proboscis-bearing insects.

In the Pentstemon, a plant whose flowers have two lips, as in the Oswego Tea in our illustration, but not so prominent, the nectar is secreted in a little pit. Across the mouth of this pit one of the stamens, modified for this purpose, is placed like a drop-bar, leaving but a thin crevice leading to the nectar pit. Through this crevice a thread-like proboscis may be thrust, but a creeping insect cannot pass.

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In the snapdragon the two lips of the flower are tightly closed, the lower one decidedly projecting. Any small insect reaching this lower lip as a natural landing place finds no entrance. When the bumble-bee alights upon the lower lip, however, his weight depresses it and he forces his way in, and in passing to another flower effects pollination. It is interesting to note that after this first and important visit the lips remain open and other insects pass in freely, "being invited," as some one has said, "to eat at the second table."

In most of the orchids there is a very complete adaptation of the flower to its insect, by which almost every insect excepting one special kind obtains nothing for its visit. The nectar is usually in the end of a long spur, and to obtain it the head of the insect must just fit between two sticky buttons to which the pollen-masses are attached. The length of the spur is nicely adjusted to the length of the proboscis of the visiting insect, but his head must also be of a certain breadth. If an insect visits the flower with a proboscis too short or too long, or a head too broad or too narrow, its visit is unavailing. The danger of such narrow specialization is apparent in the case of the orchids, for each plant is so dependent upon a special insect that the disappearance of the latter seriously endangers the continued existence of the former.

Protective closure.—It has long been noticed that certain flowers open only in the evening, the evening primrose being a conspicuous example. These flowers are adapted to the visits of the night-fliers, the moths, and about clusters of evening primroses numerous large hawk-moths may be seen after sunset. During the day the flowers are closed and safe from the visits of any insect, but by opening in the evening they are not only ready for the visits of the night-fliers, but they avoid the visits of most creeping insects, notably the ants, who are not abroad after "the dew falls."

Protection against grazing animals.—Although we are considering the ways by which creeping insects are checked in their efforts to visit flowers, it seems pertinent to mention the more universal danger which comes from grazing animals. If flowers were as attractive to grazing animals as they are to insects they would be in danger of wholesale destruction. It can be observed, however, that these animals as a rule avoid the flowers of a plant, although they may strip off its leaves. It is believed that this avoidance is due to the fact that in or about the flower cluster there are usually secreted bitter, sour, or nauseous substances, which grazing animals have learned to avoid. It should not be imagined that these substances are there for that purpose, but being there the result is that the flowers are avoided. It is unknown how generally true this is, and the effectiveness of this method of protection may have been exaggerated. Those who can observe cattle, however, are in a position to test them with the flowers of the various plants they are known to eat, and determine how far they avoid them.

In conclusion, it may be of interest to call attention to the great complexity of relations existing among plants and animals by repeating Darwin's famous illustration known as "Cats and Clover." In a certain district in England he observed that the clover was pollinated by the bumblebees, which had their nests in the fields. It followed, therefore, that the more the bumblebees, the more the clover. He also observed that the field mice preyed upon the young broods of the bumblebees, and, therefore, the more the field mice, the fewer the bumblebees and the less the clover. When cats were plenty and preyed upon the field mice it followed that the more the cats, the fewer the mice, the more the bumblebees, and the more the clover. Therefore, the crop of clover depended upon the presence of cats in the neighborhood.

John Merle Coulter.





## HOW WE MAY BEST PAY THE DEBT.

In the [last number](#) of Birds and Nature we saw that the debt we owe the birds is by no means a small one, but is really greater than we can hope ever to fully repay. It is a debt of gratitude for the good work the birds do in keeping checked the increase of insect life which would surely become a great pest if very numerous; it is a debt of money value for the fruits and grains and other products of the earth which the birds make possible by eating the insects which eat the plants; it is a debt of love for the pleasure and inspiration which they bring with each returning springtide, for the courage which their cheerful endurance of all sorts of bad weather inspires. There is one best way to pay the debt, and that way is to take such a lively interest in the birds that we shall want to know all about their lives and as much as we can learn about the language they speak and the thoughts they have. When we have such an interest in them we shall not want to kill them, but we shall do what we can to make them love us and trust us so they will no longer want to fly away when we come near them.

We shall be paying the debt we owe to the birds when we try to make friends with them, for there is nothing greater or better than true friendship, nothing that counts for more where friends are so greatly needed. Our first effort at making friends with the birds is usually to give them something to eat, forgetting or not knowing that what is best for us may not be good for them. After we have watched them getting their own meals we shall know what each bird likes best, and then, instead of frightening them away with food that they cannot eat, we shall draw them to us by offering them what they like best.

We may think that we shall be able to learn all about the birds if we can get them into a cage and study them there. But birds are not free to do what they want to do when they are caged up, and there are many interesting things about them that we shall never know if we study only the caged ones. What we want to know is the bird just as he is as a free bird in the fields and woods. We shall not be paying much of the debt if we cage him up even to study his habits.

What we need the most is the most valuable to us. What the birds need most is a place where they can live and raise their young with the least danger. All birds are surrounded by their natural enemies, which are sure to kill a great many of them, but with the addition of cats, rats and human beings intent upon killing them they seem to have a poor chance of life. Then if we can provide a place or places where these enemies will be less sure to get them and their eggs or young, we shall be paying the debt we owe in the greatest measure possible. Can we provide any such safe retreats? I think we can. Your own door yard may be made such a retreat. Banish all cats and dogs who love bird flesh. See to it that stray cats and dogs are in danger of their lives on your lawn or in your yard. Let every boy know that the birds on your premises must not be disturbed in any way. Instead of carefully trimming out all the tangles of the vines and branches remember that such places are where the birds delight to build their nests. Put up bird boxes and houses for the martins, wrens, swallows and bluebirds and keep the English sparrows out of them. Make it easy for the birds while they are feeding their young. In short, give the birds which prefer your yard a little attention and you will soon be on friendly terms with them and they will many times repay any trouble you may put yourself to for their sakes. Any study of the birds is not wasted time, but time profitably spent.

Lynds Jones.

# A FEW OF THE BIRD FAMILY.

The old bob white, and chipbird;  
The flicker and chee-wink,  
And little hopty-skip bird  
Along the river brink.

The blackbird and snowbird,  
The chicken-hawk and crane;  
The glossy old black crow-bird,  
And buzzard, down the lane.

The yellowbird and redbird,  
The tom-tit and the cat;  
The thrush and that redhead bird  
The rest's all pickin' at!

The jay-bird and the bluebird,  
The sap-suck and the wren—  
The cockadoodle-doo bird,  
And our old settin' hen!  
James Whitcomb Riley.



PLYMOUTH ROCK FLOCK. CHICAGO:  
A. W. MUMFORD  
PUBLISHER.

## THE DOMESTIC FOWL.

The writers of antiquity used the term fowl to include all the members of the bird tribe and, in some cases, the young of other animals. Feathered creatures, no matter what their habits, were not called birds, neither were they separated into classes other than the "Fowls of the Air," "Fowls of the Sea," "Fowls of the Earth," and similar descriptive divisions.

In the seventeenth and the earlier part of the eighteenth century, the word fowl was applied to any large feathered animal and the term bird to those of less size. In early times the word bird was used in the sense of brood and included the young of all animals. In an early act of the Parliament of Scotland we find the expression "Wolf-birdis," referring to the very young wolf.

At the present time the term fowl in its wider sense is generally used to include all the forms of farm poultry, both when living and when prepared for food. More specifically it is applied to the domestic cock and hen, or, as they are more familiarly called, chickens (*Gallus domesticus*). The word chicken appropriately belongs to the common fowl when under one year of age, yet it is used to indicate those of any breed and of any age between birth and maturity. In this connection it is of interest to note that in the English language the common fowl has no distinctive name. The term hen, frequently used, should be applied only to the female of this and other domestic fowls.

The progenitor of the common fowl is generally conceded to be the Red Jungle Fowl (*Gallus ferrugineus* or *bankiva*), though there are three other wild species, all oriental. This species is a native of India, a part of China, the adjacent islands and the Philippines. Its habits are diversified, for we are told it may "be found in lofty forests and in the dense thickets, as well as in bamboo-jungles, and when cultivated land is near its haunts, it may be seen in the fields, after the crops are cut, in straggling parties of from ten to twenty."

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This wild species closely resembles the breed of poultry fanciers called the "Black-breasted Game," but the crow of the wild cock is not as loud or prolonged as that of the tame one.

All the evidence that we possess seems to indicate that this wild fowl was first domesticated in Burmah. The Chinese, as indicated by tradition, received their poultry from Burmah as early as 1400 B. C. Records show that about 1200 or 800 B. C., as some authorities hold, the eating of the tame fowl was forbidden, though the use of the wild fowl as food was permitted.

It seems evident that the fowl reached Europe, after domestication, about the sixth century before the time of Christ. It continued westward, for Julius Caesar found it in Britain at the time of his conquests. Both the wild and the tame fowls are mentioned by the early Latin and Greek writers. Homer writing about 900 B. C. does not refer to the fowl, but it is mentioned by Aristophanes at a date near 500 B. C. It is of interest to know that the domesticated form is not mentioned in the Old Testament.

It is said that some of the pagan tribes living at the present time on the east coast of Africa have a marked aversion to the domestic fowl. This may account for the absence of any representation of the fowl on the ancient Egyptian monuments, though it was represented on the Babylonian cylinders about the sixth or seventh century before Christ. In this connection it should be mentioned that many other people, notably the natives of the islands adjacent to the Australian continent and some of the Indian tribes of South America, show a strong dislike to this domestic bird as a food.

By selection, both natural and by man, many breeds have been produced. Dr. Charles Darwin says: "Sufficient materials do not exist for tracing the history of the separate breeds. About the commencement of the Christian era, Columella mentions a five-toed fighting breed, and provincial breeds; but we know nothing about them. He also alludes to dwarf fowls; but these cannot have been the same with our Bantams, which were imported from Japan into Bantam in Java. A dwarf fowl, probably the true Bantam, is referred to in an old Japanese Encyclopedia, as I am informed. In the Chinese Encyclopedia published in 1596, but compiled from various sources, some of high antiquity, seven breeds are mentioned."

The number of breeds is very indefinite. Darwin enumerates thirteen, including many sub-breeds. The American Poultry Association recognizes more than thirty, with several varieties of some of them. The game or fighting breed more closely resembles the wild form of India than do any of the others.

The Japanese, so noted for their wonderful development of dwarfed trees, are also the originators of the smallest fowls—the Bantams. Another interesting breed is called "Jumpers" or "Creepers." Their legs are so short that they are compelled to move by jumping.

The wild hen lays from eight to twelve white eggs in nests, seldom of better construction than a few dried leaves or grass scratched together in a secluded spot. It is said that "to every hen belongs an individual peculiarity in the form, color, and size of her egg, which never changes during her life-time, so long as she remains in health, and which is as well known to those who are in the habit of taking her produce, as the hand-writing of their nearest acquaintance." We are

told that the tame hen raises a brood of physically stronger offspring when allowed to select her own nesting place in some locality with natural surroundings.

The wild and the tame fowl alike eat a variety of foods, both animal and vegetable, but prefer the latter.

With reference to the habits and characteristics of this interesting domestic bird of our farm yards and orchards no words can describe them more aptly than those so delightfully written by Gail Hamilton, when she says:

"A chicken is beautiful and round and full of cunning ways, but he has no resources for an emergency. He will lose his reckoning and be quite out at sea, though only ten steps from home. He never knows enough to turn a corner. All his intelligence is like light, moving only in straight lines. He is impetuous and timid, and has not the smallest presence of mind or sagacity to discern between friend and foe. He has no confidence in any earthly power that does not reside in an old hen. Her cluck will be followed to the last ditch, and to nothing else will he give heed.

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I am afraid that the Interpreter was putting almost too fine a point upon it, when he had Christiana and her children into another room where was a hen and chickens, and bid them observe awhile. So one of the chickens went to a trough to drink, and every time she drank she lifted up her head and her eyes toward heaven. 'See,' said he, 'what this little chick doth, and learn of her to acknowledge whence your mercies come, by receiving them with looking up.'

Doubtless the chick lifts her eyes toward heaven, but a close acquaintance with the race would put anything but acknowledgment in the act. A gratitude that thanks heaven for favors received, and then runs into a hole to prevent any other person from sharing the benefit of these favors, is a very questionable kind of gratitude, and certainly should be confined to the bipeds that wear feathers.

Yet if you take away selfishness from a chicken's moral make-up, and fatuity from his intellectual, you have a very charming creature left. For, apart from their excessive greed, chickens seem to be affectionate. They have sweet, social ways.

They huddle together with fond, caressing chatter, and chirp soft lullabies. Their toilet performances are full of interest. They trim each other's bills with great thoroughness and dexterity, much better, indeed, than they dress their own heads, for their bungling, awkward little claws make sad work of it.

It is as much as they can do to stand on two feet, and they naturally make several revolutions when they attempt to stand on one. Nothing can be more ludicrous than their early efforts to walk. They do not really walk. They sight their object, waver, balance, decide, and then tumble forward, stopping all in a heap as soon as the original impetus is lost—generally some way ahead of the place to which they wished to go.

It is delightful to watch them as drowsiness films their round, bright, black eyes, and the dear old mother croons them under her ample wings, and they nestle in perfect harmony. How they manage to bestow themselves with such limited accommodations, or how they manage to breathe in a room so close, it is difficult to imagine. They certainly deal a staggering blow to our preconceived notions of the necessity of oxygen and ventilation, but they make it easy to see whence the Germans derived their fashion of sleeping under feather beds. But breathe and bestow themselves they do. The deep mother breast and the broad mother wings take them all in.

They penetrate her feathers, and open for themselves unseen little doors into the mysterious, brooding, beckoning darkness. But it is long before they can arrange themselves satisfactorily. They chirp, and stir, and snuggle, trying to find the softest and warmest nook. Now, an uneasy head is thrust out, and now a whole tiny body; but it soon re-enters in another quarter, and at length the stir and chirp grows still. You see only a collection of little legs, as if the hen were a banyan tree, and presently even they disappear. She settles down comfortably and all are wrapped in a slumberous silence.

And as I sit by the hour, watching their winning ways, and see all the steps of this sleepy subsidence, I can but remember that outburst of love and sorrow from the lips of Him who, though He came to earth from a dwelling place of ineffable glory, called nothing unclean because it was common, found no homely detail too homely or too trivial to illustrate the Father's love; but from the birds of the air, the fish of the sea, the lilies of the field, the stones in the street, the foxes in their holes, the patch on the coat, the oxen in the furrow, the sheep in the pit, the camel under his burden, drew lessons of divine pity and patience, of heavenly duty and delight."

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Who's whistling so cheerfully down in the clover,  
When the meadows are wet with the sweet morning dew?  
He's piping and calling, this ardent young lover,  
And telling his tale the whole morning through,  
What is it he says in the early sunlight?  
"Bob White! Bob White!  
Bob—Bob White!"

At noon, when the day god in wrath has descended,  
With his swift golden arrows, on grain-field and hill;  
And the birds of the morning their love songs have ended,  
Then deep in the wood, and down by the rill  
I hear a shrill whistle, so cheerful and bright:  
"Wheat ripe? Bob White!  
Not—not quite!"

When shadows of evening are lengthening slowly,  
Ere the night dews lie damp on the meadows again;  
As light breezes sweep o'er the soft grass so lowly,  
What is it he says? I hear the refrain,  
While in the thick verdure he's hid from my sight:  
"Good night! Bob White!  
Good—good night."

Effie L. Hallett.

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It might almost be said that the birds are all birds of the poets and of no one else, because it is only the poetical temperament that fully responds to them. So true is this, that all the great ornithologists—original namers and biographers of the birds—have been poets in deed if not in word. Audubon is a notable case in point, who, if he had not the tongue or pen of the poet, certainly had the eye and ear and heart and the singleness of purpose, the enthusiasm, the unworldliness, the love, that characterize the true and divine race of bards.

The very idea of a bird is a symbol and a suggestion to the poet. A bird seems to be at the top of the scale, so vehement and intense is his life—large-brained, large-lunged, hot, ecstatic, his frame charged with buoyancy and his heart with song. The beautiful vagabonds, endowed with every grace, masters of all chimes, and knowing no bounds—how many human aspirations are realized in their free, holiday lives, and how many suggestions to the poet in their flight and song!

John Burroughs  
in "Birds and Poets."



RAINBOW TROUT.  
(*Salmo irideus*.)

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CHICAGO.

# THE RAINBOW TROUT.

(*Salmo irideus*.)

The rainbow trout is a native of the mountain streams and lakes of the Pacific coast, ranging from the coast of Washington to San Diego, California. It was first made known to science in 1855 by Dr. Gibbons from specimens taken from Leander Creek, California. It is an extremely variable species, varying greatly in size, color, activity, etc. Those found near the sea spend much of their time in salt water, where living is easier and as a result they grow larger, lose their bright color and much of their activity. They usually return to fresh water with the salmon to feast upon their eggs.

The following are the most important varieties of the Rainbow Trout: The Brook Trout of Western Oregon, which is abundant in the streams of the Coast Range from Puget Sound to Southern California. Those taken in the headwaters of these streams seldom exceed a pound in weight, while those taken from brackish water, having spent considerable time in the sea, usually weigh from one to five pounds. The McCloud River Trout is abundant in streams of the Sierra Nevada Mountains from Mt. Shasta southward. It grows to a large size, reaching, in the larger and warmer bodies of water, a weight of ten to fourteen pounds. This variety is the Rainbow Trout of the fish culturists. It has been planted in many of our eastern streams, where it has become more or less abundant.

The Kern River Trout is known only from the Kern River in California. It often reaches a weight of eight pounds. The No-Shee Trout inhabits the Sacramento basin; it often reaches a weight of twelve pounds. The Golden Trout of Mount Whitney inhabits the streams on both sides of Mount Whitney, California.

The varieties mentioned here are usually recognized by students of fishes, but the angler sees many more varieties in different localities, and has given to them other names, as Red Sides, Mountain Trout, Brook Trout, etc. The Rainbow Trout, when taken from clear, cool water, is an extremely handsome fish. It is usually bluish in the upper part of the body; sides silvery; the body is everywhere covered with small, dark spots irregularly arranged, and extending on the fins. The side is usually provided with a red band which extends on the sides of the head. There is usually a dash of red under the chin. As soon as the fish is taken from the water its color changes. The red lateral band will pass through different shades of red, from a deep dark color to light crimson. The captured fish thus gives its captor a display of bright color superior to that possessed by any other fresh water fish.

The Rainbow Trout is quite as handsome as the Eastern Brook Trout and affords the angler an equal amount of sport. Those found in swift mountain streams are strong swimmers. To capture them with the rod the angler must display the highest skill possible. The same tactics which will catch a Rainbow Trout in one stream may fail in the next or even a second time in the same stream. It matters not in what mountain stream you fish the trout you catch are always superior to those you have previously taken in other streams.

The food of the Rainbow Trout is made up largely of worms, crustacea, insect larvae and the like. In the fall those in salmon streams feast on salmon eggs. During the spawning time of the salmon the trout in the ocean return to fresh water and accompany the salmon to their spawning beds. Many persons who catch them for table use do so with hooks baited with salmon eggs. Often salmon eggs are salted and dried and thus retained as bait for the entire year. No other bait seems so tempting to the Rainbow Trout. The sea run individuals are not so brightly colored as those which always remain in fresh water. On their return to fresh water they seem to have lost none of their game qualities. As a table fish they are not inferior to any fish taken in fresh water.

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The size of the Rainbow Trout depends upon its surroundings, the volume and temperature of the water and the amount of food it contains. They vary from the mere fingerlings found in small mountain brooks to those from ten to fourteen pounds, as found in Klamath and other similar lakes. The Rainbow Trout will live in warmer and more sluggish water than the Brook Trout, and for this reason it is being planted in many streams in the east, which are unsuitable for the Brook Trout. It is also being planted in many streams once inhabited by the Brook Trout, but because of the change due to civilization have become unsuitable for them. Rainbow Trout can now be found in many streams of the Allegheny region, in streams in Michigan, in the Ozark region and in many streams of the Western States. The Rainbow Trout is a superior game fish. It is a vigorous biter, and fights bravely for liberty. In no respects is it inferior to the Eastern Brook Trout.

The method of hatching Rainbow Trout is very interesting. At government hatching stations a large number of males and females are kept in ponds for breeding purposes. When ready to spawn the eggs are easily taken from the female by gently pressing on the ventral surface of the body. After fertilizing them with milt taken in a similar way from the male they are placed in wire trays in wooden troughs through which there is flowing a current of water. In water of 50 degrees F. the eggs will hatch in from forty-two to forty-five days. A female weighing one-half to one and one-half pounds will yield from five hundred to eight hundred eggs. One from two to four pounds, two thousand five hundred to three thousand eggs. When the eggs are partly hatched they may be carefully placed in trays and kept free from injury, and packed in ice and sent to any part of the country. In this way they are often sent across the continent, also to Europe, Brazil and Japan. The cool temperature stops the hatching, which will begin again as soon as placed in water of suitable temperature. The fact that so many eggs can be taken from one female and a

very large per cent (eighty-five per cent or more) hatched makes it possible to plant, in suitable streams, a large number of young fish each year. If the eggs were deposited in the stream by the fishes themselves the greater number would be eaten by young fishes, crustaceans, insects, etc. Here is a case where man is able to assist mother nature, and to preserve and widely distribute some of our most useful fishes. The Rainbow Trout is receiving much attention and yielding profitable returns. It will always give the angler an opportunity to display his highest skill, and afford a fair recompense for the toil of fishery.

Seth E. Meek.

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# DAY AND NIGHT.

Day is a snow-white dove of heaven,  
That from the east glad message brings:  
Night is a stealthy, evil raven,  
Wrapped to the eyes in his black wings.  
Thomas Bailey Aldrich.

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# THE GEOLOGICAL SUCCESSION OF FISHES.

In discussing this subject it will be necessary to say something about the geological history of the earth. Each geological age had its own peculiar fauna, and to write about any part of it means that we must know something about the particular geological age in which the animals under consideration flourished, and something of the earth's previous history.

The earth is supposed to be a small, condensed portion of the gaseous material which astronomers tell us at one time pervaded all space. The heat given off when the gas was condensing has been largely converted into mechanical energy which makes the earth revolve once in twenty-four hours and sends it flying through space. As soon as the earth decreased to about its present size and became cool enough for water to be condensed on its surface, it began to write its own history. Its entire surface may have at one time been covered to a uniform depth by water. If such was ever the case it did not remain so long. The interior of the earth was very hot and the crust cooled very irregularly and portions of it rose above the surface of the water. Since then there have been two antagonizing forces at work. The heat has caused the earth's surface to become irregular and the water has made a strong effort, which has been partially successful, to reduce all irregularities to the same level. We do not know how long these forces nearly balanced each other, but sooner or later dry land appeared in many places on the earth's surface. This was for a long period of time washed by heavy rains while the shores for some distance seaward were worn away by action of the tidal waves. Much of the land area then sank below sea level, and became covered with sand, gravel and the like. The portion which remained above the level is called the Archaean. Later a general elevation of the land area brought above sea level much of this land and gravel, forming around the Archaean an increased land era, which we call Silurian. The time when the sand and gravel was deposited forming this land is known as the Silurian age. Following this came the Devonian age. After this in the following order came the following geological ages: Carboniferous, Triassic, Jurassic, Cretaceous, Tertiary, Quaternary and then the present or Recent age, the one in which we now live. Each of these ages is characterized by the peculiar animals which then predominated, and these animals are known only from their remains imbedded in the rocks as fossils.

It may not be out of place here to mention that rocks are usually placed in two great classes, those which have been subject to great heat, melted, or partly so, at one time, then cooled and hardened are called metamorphic or igneous rocks. To these belong such rocks as our granites. Those which have not been changed by heat are called sedimentary rocks, such as sandstones, limestones, etc. In the former class we find no fossils. If fossils ever existed there, the fusing of the rocks has destroyed them. Sedimentary rocks contain many fossils. The Archaean area contains no sedimentary rocks, hence no fossils. Between the close of the Archaean and beginning of the Silurian is a long interval of which we know nothing. If any rocks were formed during this interval they are in no place exposed to the surface of the earth as are portions of all other formations. Life evidently existed then, for at the close of this interval or rather at the beginning of the Silurian we find a large number of Invertebrates. There were corals, crinoids, brachiopods, lamellibranches, gasteropods, cephalopods, worms and crustaceans. All of these animals flourished during the Silurian.

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It was during the latter part of the Silurian that fishes first made their appearance. If they lived earlier than this they were of low organization and possessed no hard parts, and when they died they would entirely decay, leaving nothing to be preserved as fossils. Of course, no one lived then to give fishes easy common names, and so we only know them by the long, hard scientific names given by scientific men. These we will use as little as possible in this article. In classifying fishes they fall into a few large groups, as follows: The lowest fish in point of structure is the lancelet, a small, semi-transparent animal, with no hard parts, as teeth, spines or bones. We would not expect it to be preserved as a fossil and so we find none. The next group contains our lampreys and hag fishes. These are parasites. They vary in length from a few inches to more than three feet. With a mouth nearly circular they attach themselves to other fishes and feast upon their blood. The hag fish eats its way into the fish and remains there until its host is a living hulk of skin and bones. Fishes known as Pteraspids, thought by some scientists to belong to this group, are found in the upper part of the Silurian. The lampreys of the present day have no very hard teeth and their backbone is simply very soft cartilage. These ancient lampreys, called Pteraspids, had the head and part of the body covered with a coat of mail. Of these there flourished in the last days of the Silurian quite a number of species. The next group of fishes are the sharks, the most blood-thirsty of all the inhabitants of the sea. Sharks flourished to some extent in the upper part of the Silurian. The shark has no true bones and its covering consists of shagreen tentacles. It is provided with hard teeth and the dorsal fins of the ancient shark were provided each with a hard, stout spine. The teeth were large, flat and fit for crushing. We know these ancient sharks only by the spines, shagreen tentacles and the teeth. These, however, furnished abundant evidence that the sharks in the upper Silurian were numerous as to individuals and species. The Chimera, a fish much resembling the sharks, was also abundant in the upper Silurian. A group of fishes usually known as ganoids and which comprise the lung fishes of the Nile, of Australia, the garpikes of North America and the sturgeons, were very abundant during the closing days of the Silurian. The fishes of this group are especially well preserved as fossils, their covering consisted of bony plates or bucklers or of scales covered with a coat of enamel. Their outer covering was well suited to become fossilized, and so we know this group much better than we do any other found in the Silurian.

The next and last group of fishes is known as Teleosts, or bony fishes. To this group belong our typical fishes, such as black bass, sun fishes, suckers, cat fishes and the like. None of this group lived during the Silurian.



HOME OF THE SEA  
BIRDS.

CHICAGO:  
A. W. MUMFORD  
PUBLISHER.

Following the Silurian came the Devonian, which is called the age of fishes. In no time in the world's history have fishes been so large and so abundant as during this age. They outclassed in every respect all other animals. The same general types flourished as those which existed in the latter part of the Silurian. There were more species and more individuals and some grew to an enormous size. Fishes ruled the Devonian seas. The crustaceans, such as trilobites which greatly predominated during the Silurian age, diminished greatly during the Devonian. In the struggle for existence they decreased in size and in numbers, and were obliged to seek safety in less favorable places. The Devonian fishes were largely sharks and ganoids, especially the latter. These were covered, with hard, enamel-coated scales or bony plates. Some were short and heavy and entirely encased in a covering of large bony plates. They were evidently anything but pretty and their movements in the water must have been extremely awkward. Others were formed much after our own ideas of fishes. These bore much resemblance to our garpikes, the lung fish of the Nile and the lung fish of Australia, and the worthless dog fish of our own fresh waters. Anglers and fishermen all despise these fishes now, yet in Devonian times the fishes most nearly like them were evidently the most handsome and graceful of all fishes then living. It appears as if fishes in those days did not fight each other. They found abundant sea room and plenty of food in the form of invertebrates. Of course it is quite probable that many fish-like animals existed at this time, but possessing no hard parts and were not preserved as fossils; these could not become at all important for the sea was too full of large animals of all classes which were so well protected with a coat of mail and so hostile that those less favorably situated could not exist in any great numbers. At the close of the Devonian many changes took place. The rocks of this formation, which now form a portion of the earth's surface, rose out of the water, the land area thus considerably increased, the seasons, such as they were then, became more marked; many inland seas were formed. These changes were more or less gradual, but not so much so that the fishes living then could not suit themselves to the new conditions. Those fishes which had flourished for generations had become accustomed to easy living and certain fixed ways, could not adapt themselves to changing conditions, and so became extinct. The Pteraspids, the earliest forms to appear; the Pterichthys, in fact, all forms which bear any resemblance to our present lampreys, or which may prove a close relative of the earlier ganoids, became extinct at close of the Devonian. The early Chimeras which flourished from close of Silurian also became extinct. Many ganoids became extinct, but other ganoids came into existence to take their places. The ganoids most nearly like our modern sturgeons increased during the last of the Devonian and retained their prominence to the close of the Carboniferous. The slow-moving, heavily plated ganoids passed away. They ruled during the Devonian age, but could not suit themselves to the new conditions at beginning of the Carboniferous. While fishes were numerous and large in the Devonian, throughout the Carboniferous they began to decline. By this time the land area had much increased, land plants became very abundant, there were immense forests of tropical vegetation, great swamps and peat bogs—all of which later sank below sea level—became covered up and changed into coal. Immense lizards lived in these forests and along the sea shores; these were the first land animals. At the close of the Carboniferous great changes took place; greater changes than at any time since the close of the Archaean. So marked were the changes at this time that it marks a new era in the geological history of the earth. All preceding the close of the Carboniferous is regarded as ancient geology; all since then as modern geology. It was at this time that plants and animals were represented by new forms more like those now living. The geological age following the Carboniferous is the Triassic. With this age began our modern sharks and fishes. They did not become abundant until the Jurassic and Cretaceous. All of the earlier sharks had strong spines in front of each dorsal fin and broad teeth made for crushing. One form of these known as Cestracionts were very abundant till the end of the Cretaceous. In the early Triassic they began to decline and the sharks, with pointed teeth, increased. These sharks, with pointed teeth, but rounded on the edges, commenced back in the Carboniferous. During the Triassic the sharks, with lancet-shaped teeth, such as are now possessed by nearly all our sharks, commenced in small numbers. One of the important differences between the ganoids and the teleosts or true fishes is in the tail vertebrae. In the

ganoids the tail vertebrae decrease gradually in size and curve upwards in the upper lobe of the tail. In the teleosts the tail vertebrae ends a short distance in front of ends of the middle fin rays of the tail fin. In the ganoids the upper lobe of the tail fin is the largest. In the teleosts both lobes are nearly the same size. The tail of the ganoid fish is called heterocercal, that of our modern or teleost fishes is homocercal. The tail of all early ganoids was strongly heterocercal. In the Triassic and Jurassic its lobes in many cases became nearly equal, approaching the homocercal tail. The tails of all sharks are heterocercal, of all modern fishes it is homocercal except in a few families, as the cod and related fishes, it is Isocercal; that is, the vertebrae decrease in size, but do not form an upward curve. So far as we know the Shad family is the first of our teleosts or true fishes to appear, and these were quite abundant in the early part of the Triassic.

The rays, fish-like animals much like Sharks, but with the body and fins flattened or spread out in a broad flat disc, appeared in the Jurassic. The Chimeras, so abundant in the Devonian and which died out apparently at the close of the Devonian, also reappeared at the beginning of the Jurassic. These did not belong to the same families as did the more ancient Chimeras. The Chimeras no doubt flourished in the Carboniferous and Triassic, but migrated to some portion of the sea where now perhaps their remains lie buried in rocks below the bottom of the sea. Their survivors, which were able to modify their structure and habits to become suited to new conditions, returned in modified forms in the Jurassic, where in time their remains come to the surface as fossils.

At the end of the Cretaceous or beginning of the Tertiary we find all of our modern types of sharks and all of the important orders of teleosts. The sturgeons and ganoids decreased throughout the Tertiary or Quaternary until at present we have but few living species. The sturgeons are the more abundant. Of the large group of Ganoids so abundant during all these geological ages but few forms are living to-day. These are the *Ceratodus*, lung fish of Australia; the *Polypterus* of the Nile, the *Protopterus* of Western Africa, the Dogfish and the three Garpike of North America. These few species are but the remnants of a once large and extensive group of fishes.

In the study of fishes we notice that some are highly specialized so far as their structures are concerned; the teeth of some become especially fitted for a peculiar kind of food, and as a result quite unfit for any other kind. Some, to be protected from their enemies, develop a heavy armor, which only retards their activity. Other fishes are more generalized; that is, are of medium size, omnivorous habits, are not hampered in their movements by a too heavy coat of mail, etc. When any change of conditions came to modify their habits of living the specialized were always the first to disappear. Being particularly fitted for one mode of life made them all the more unfitted for any other, and so when conditions changed they perished. All of our modern fishes except the few ganoids are more or less specialized. The trout lives in cool running water and some varieties can live in no other, while some fishes have become accustomed to warm, stagnant water and cannot live with the trout. What is true in this respect of fishes is true of land animals as well. The large, ponderous, slow-moving reptiles of the Triassic, Jurassic and the Cretaceous, and the large mammals of the Tertiary and Quaternary could not exist except under the peculiar conditions of that time, and sooner or later had to give way to the smaller, more active and more resourceful animals of their class.

In tracing the history of fishes from their earliest existence to the present one is struck with the myriad forms he finds. It would seem that all possible effort was made by them to modify their structure to suit their environment; when this changed all their efforts came to naught, and they were destined to give way to the more favored kinds.

# THE DEEP.

There's beauty in the deep—  
The wave is bluer than the sky;  
And, though the light shine bright on high,  
More softly do the sea-gems glow  
That sparkle in the depths below;  
The rainbow's tints are only made  
When on the waters they are laid,  
And sun and moon most sweetly shine  
Upon the ocean's level brine.

There's beauty in the deep.

There's music in the deep—  
It is not in the surf's rough roar,  
Nor in the whispering, shelly shore—  
They are but earthly sounds, that tell  
How little of the sea-nymph's shell,  
That sends its loud, clear note abroad,  
Or winds its softness through the flood,  
Echoes through groves with coral gay,  
And dies, on spongy banks, away.

There's music in the deep.

There's quiet in the deep—  
Above let tides and tempests rave,  
And earth-born whirlwinds wake the wave;  
Above let care and fear contend,  
With sin and sorrow to the end.  
Here, far beneath the tainted foam,  
That frets above our peaceful home,  
We dream in joy, and wake in love,  
Nor know the rage that yells above.

There's quiet in the deep.

John G. C. Brainard.



FROM COL. CHI. ACAD.  
SCIENCES.

AMERICAN REDSTART.  
(*Setophaga ruticilla*.)  
Life-size.

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CHICAGO.

# THE AMERICAN REDSTART.

(*Setophaga ruticilla*.)

Contemporaneous with the blossoming out of the wild plum, the early Richmond cherry and a rich and diversified profusion of woodland flowers, perhaps better exemplified on this occasion by such interesting types as the little Claytonia, or spring-beauty, the rue-anemone and the trilliums, both *T. erectum* and *grandiflorum*, with perhaps a few belated blossoms of the hepatica, is the advent of this interesting little bird among us, which here in Northeastern Illinois usually plans its arrival somewhere near the closing days of the first week in May.

Its generic name, *Setophaga*, interpreted into plainer English, means a devourer of insects, and, were we to select from among the large and varied assortment of birds comprising the bulk of our warbler hosts a form most elegant and expressive of gayety, sprightliness, and, in a measure, frivolity, we could not go far wrong in determining upon this species so easily outclassing all others as the most brilliantly colored member of that numerous large and interesting family, the *Mniotiltidae*.

At first a creeper and sharp-eyed inspector of hidden crannies, we afterwards discern no less in him, and upon the slightest provocation, a tyrant on the wing, thereby proving a general adaptability to and utility in his calling at all stages of the game—a constant warfare directed against the insect horde to which he devotes himself most assiduously at all times, and it is really astonishing the amount of the minute forms of insect life these little birds will consume. So then, what at first may appear to us as clever acts of trifling weight will, upon closer inspection, prove carefully executed movements planned and carried out with the greatest precision.

Among ornithologists we find it classed as an interesting member of the group of fly-catching warblers. Equally suggestive to the mind of the writer would be the name of the fan-tailed warbler, derived from its well-known habit of carrying the tail slightly elevated and partly spread.

To those who may be on the lookout for just such marked characteristics among our birds this one feature alone will serve as an excellent index in determining its proper identification.

The plainer and grayer markings of the female and immature birds may differ very considerably from the more pronounced black and white, orange-red and salmon-colored blotches of the adult male, but never so strikingly manifesting themselves in the markings of the tail which in either case may appear to the casual observer as quite similar.

Yet if we examine them more critically we will discover that they are distinctly different, the salmon-red and black-tipped feathers of the male bird being replaced by a paler reddish-yellow and grayer-tipped arrangement in the case of the female. Young males have the darker markings of the tail feathers very similar to those of the adult birds, which we are told do not take on the complete dress until the third year. But the habit of constantly flitting the tail in fan-like motions is peculiar alike to all phases of this bird's plumage and above all other characters serves as the greatest aid in naming it.

The very young, or nestling dress, of which little or nothing seems to have been written, bears a partial resemblance to that of the female bird, excepting that the wings are crossed by two yellowish bands, caused by the lighter tippings of the outer coverts. The yellow breast spots of the female are also wanting in this dress.

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For further particulars the reader is kindly referred to the colored plate accompanying this article.

Like the robin red-breasts, the name of the Redstart seems to have been brought to America by the earlier settlers who were ever on the watch for familiar objects to remind them of former days, and, as in the case of the example just cited, wrongfully ascribed by them to a far different bird. An analogy, however, exists in the coloration of the European and American birds justifying in a measure the reason for so naming it.

We are told, in Newton's Dictionary of Birds, that the Redstart, the *Ruticilla phoenicurus* of most ornithologists, is well known in Great Britain, where it is also called the Fire-tail, from the word "start" which in the original Anglo-Saxon "steort," means tail. But the English bird is very different from ours throughout, a marked distinction being its peculiarity of habit in seeking out for a nesting site a hole in a tree or ruined building.

Our bird, contrary to all this, more correctly builds its nest out of doors, usually selecting the upright forks of some tall shrub or small tree and placing therein a neat, compact structure, in which four or five light-colored eggs are deposited that in their spotted appearance and blotching of various shades of brown resemble very closely the eggs of the common yellow warbler (*Dendroica aestiva*).

But for all this, however, it repairs to the shadier depths of the woods while the yellow warbler on the other hand seeks out the more tangled thickets and willow copses.

The song of the Redstart, too, bears in a striking degree a very close resemblance to that of this same yellow warbler, though, as in the case of the nest, the localities frequented by it serve readily in making a distinction. "In general tone and quality," as Prof. Lynds Jones has remarked in No. 30 of the *Wilson Bulletin*, "Warbler Songs," "there is a strong resemblance to the Yellow,

but the range of variation is greater and the song distinctly belongs to the 'ringing aisles' of the woods." "The common utterance can be recalled by che, che, che, che—pa, the last syllable abruptly falling and weakening." "A soft song is like wee-see, wee-see-wee, with a suggestion at least of a lower pitch for the last syllable."

The range of the American Redstart is quite extended, including, as we may say, all of North America, though it is very rare and irregular in the States west of the Sierras. It is said to breed from Kansas northward.

Tabulated observations compiled by the writer at Glen Ellyn, Illinois, during the past seven years, show that the southward movement of the Redstart commences about the end of the first week in August; the first part of September finds them common, after which their numbers gradually wane, the last of the month, or the first few days in October, witnessing its final departure.

Benjamin True Gault.

## THE FLYING FISH.

All animals are provided with some means of protection from the attacks of their enemies and with ways of escaping from any object which they may fear. The means furnished to the Flying Fishes is one of the most unique and interesting.

To escape the larger fishes that prey upon them, or when frightened by a passing vessel, these fishes will rise from the surface of the water and with distended but quiet fins pass over a distance of several feet. They have been known to rise to a height of twelve or more feet and fly for one hundred or more yards, although the height and distance traveled is usually much less. This power of flight is due to the great development of the breast (pectoral) fins, situated on the sides of the body near the head.

Some writers have stated that these fishes left the water for the purpose of catching insect food and that they had the power of regulating their flight by the movement of their fins. The best authorities, however, claim that they do not possess the power of changing the direction, velocity, or altitude of their flight and the position of the fins is not voluntarily changed, and that their object in leaving the water is not for food.

They rise without reference to the direction of the wind or waves, and frequently, when their course is at an angle with the wind, the direction of their flight may be changed by the air currents or by contact with the waves. The direction is also modified, when passing close to the water, by immersing the tail fin and moving it with a rudder like motion.

There are two groups of Flying Fishes, both natives of tropical and sub-tropical seas. In one of the groups there are less than five species, while classed under the other there are fifty or more.

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### EDITOR'S NOTE.

On account of inaccuracies in the report of Mr. Chapman's lecture, which was quoted in the [June number](#) of this Magazine, it is only due to Mr. Chapman that we publish the following letter received from him:

TO THE EDITOR OF BIRDS AND NATURE:

*Dear Sir.*—In the June issue of your magazine there appeared an alleged abstract from a lecture by me on the "Structure and Habits of Birds," which so abounds in errors that I beg you will permit me to state that the matter published was a newspaper report, for which I am in no way responsible. Yours respectfully,

FRANK M. CHAPMAN.

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## Transcriber's Note:

- Minor typographical errors have been corrected without note.
- Punctuation and spelling were made consistent when a predominant form was found in this book; otherwise they were not changed.
- Ambiguous hyphens at the ends of lines were retained.
- The Contents table was added by the transcriber.

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OCTOBER 1900 \*\*\*

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