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BIRDS AND NATURE.

ILLUSTRATED BY COLOR PHOTOGRAPHY.

VOL. XII. JUNE, 1902. No. 1.

BIRDS and NATURE

IN NATURAL COLORS

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

TWO VOLUMES EACH YEAR
VOLUME XII
JUNE, 1902, TO DECEMBER, 1902

EDITED BY WILLIAM KERR HIGLEY

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VOL. XII. JUNE, 1902. NO. 1.

CONTENTS.

JUNE.

O month whose promise and fulfillment blend,
And burst in one! it seems the earth can store
In all her roomy house no treasure more;
Of all her wealth no farthing have to spend
On fruit, when once this stintless flowering end.
And yet no tiniest flower shall fall before
It hath made ready at its hidden core
Its tithe of seed, which we may count and tend
Till harvest. Joy of blossomed love, for thee
Seems it no fairer thing can yet have birth?
No room is left for deeper ecstasy?
Watch well if seeds grow strong, to scatter free
Germs for thy future summers on the earth.
A joy which is but joy soon comes to dearth.

—Helen Hunt Jackson.

WAY OF JUNE.

Dark-red roses in a honeyed wind swinging,
Silk-soft hollyhock, colored like the moon;
Larks high overhead lost in light, and singing—
That’s the way of June.
Dark red roses in the warm wind falling
Velvet leaf by velvet leaf, all the breathless noon;
Far off sea waves calling, calling, calling—
That’s the way of June.
Sweet as scarlet strawberry under wet leaves hidden,
Honeyed as the damask rose, lavish as the moon,
Shedding lovely light on things forgotten, hopes forbidden—
That’s the way of June.

—Pall Mall Gazette.

THE SWALLOW-TAILED KITE.

(*Elanoides forficatus.*)

Hawks in highest heaven hover,
Soar in sight of all their victims:
None can charge them with deception,
All their crimes are deeds of daring.

—Frank Bolles, “The Blue Jay.”

The late Dr. Coues enthusiastically writes of the beauty of the Swallow-tailed Kite in the following words:

“Marked among its kind by no ordinary beauty of form and brilliancy of color, the Kite courses through the air with a grace and buoyancy it would be vain to rival. By a stroke of the thin-bladed wings and a lashing of the cleft tail, its flight is swayed to this or that side in a moment, or instantly arrested. Now it swoops with incredible swiftness, seizes without a pause, and bears its struggling captive aloft, feeding from its talons as it flies. Now it mounts in airy circles till it is a speck in the blue ether and disappears. All its actions, in wantonness or in severity of the chase, display the dash of the athletic bird, which, if lacking the brute strength and brutal ferocity of some, becomes their peer in prowess—like the trained gymnast, whose tight-strung thews, supple joints, and swelling muscles, under marvelous control, enable him to execute feats that to the more massive or not so well conditioned frame would be impossible. One cannot watch the flight of the Kite without comparing it with the thorough-bred racer.”

The Swallow-tailed Kite inhabits the southern United States as far north as the Carolinas. In the interior, it frequents the Mississippi valley, commonly as far north as Minnesota and westward to the Great Plains. As a casual visitor, it is found in New York, New England and Canada. Though some may winter within the United States, the majority make their winter home in Central and South America.

Swallow-like, this Kite never seems contented unless coursing through the air. There is its home and it seems to frequent trees but little except during the breeding season, when “flocks consisting of from two or three to ten or twelve birds, but oftener of three, may be seen following one another around, frequently uttering their calls and circling in and out among the tree tops so fast as to make one dizzy to look at them.” It captures its food, eats and drinks while on the wing, and some one has said that he often wondered if it did not, at times, even sleep while flying. Its wonderful endurance and power of flight have more than once taken it across the ocean, where it has happily surprised the ornithologists of Europe.

The legs of the Swallow-tailed Kite are so short that they are practically useless for locomotion and it seldom lights on the ground. Like the marsh hawks, it obtains its food while flying close to the ground; or, if its prey be an

insect, it pursues it in the air. Dragon flies are dainty morsels for this graceful bird. At no time is the Kite's alertness and control of every muscle in its body more clearly shown than when it is pursuing these insects. The peculiar zigzag and vacillating flight of the dragon fly must puzzle the keenest vision, yet this bird will instantly change the direction of its flight, swooping downward, upward or to the side, without a moment's hesitation, and sometimes in order to secure the fly "it is necessary for it to turn completely over in its evolutions." It also feeds extensively on snakes and other reptiles, insect larvæ and grasshoppers. It is very useful in cotton fields, which it frequents, feeding on the cotton worm and other injurious insects. The smaller snakes, however, form a large part of the Kite's diet and they are so frequently seen with these reptiles in their talons that in the south they are sometimes called Snake Hawks. So far as known, they do not capture the smaller birds or mammals.

SWALLOW-TAILED KITE.
(Elanoides forficatus.)
⅓ Life-size.
FROM COL. CHI. ACAD. SCIENCES.

The Swallow-tailed Kite usually builds its nest in the tallest trees of wild localities, where it is quite concealed by the foliage of the smaller branches. The nest is often constructed with sticks and twigs, but when obtainable, Spanish moss or the fibrous inner bark of the cottonwood is used to make a thick and substantial lining. Some observers state that the material is collected by the female, but that the male assists in the construction of the nest. He is certainly a faithful mate, for during the period of incubation she seldom leaves the nest and he brings food to her. Both birds assist in feeding the young. During this time, both sexes are vicious and will attack any intruder, be it bird, beast or even man.

An interesting habit of this Kite is its method of leaving its nest. It does not fly from the side, but seems to rise directly upward, "as if it were pushed up with a spring." On alighting, it hovers over the nest and with an almost imperceptible motion of its wings gently lowers itself until the nest is reached.

The antics of the Swallow-tailed Kite during the mating season are particularly interesting. An observer of bird life says: "Of all aerial performances I have ever witnessed, the mating of the Swallow-tailed Kite excels. Ever charming and elegant, they outdo themselves at this season. In Becker County, Minnesota, in the spring of 1886, they chose as their mating ground an open space over the mouth of an ice-cold brook that made its way out from a dark, tangled larch swamp. From my boat on the lake I had an excellent view of them. All the afternoon seven of these matchless objects sported, chasing each other here and there, far and near, sailing along in easy curves, floating, falling and rising, then darting with meteor-like swiftness, commingling and separating with an abandon

and airy ease that is difficult to imagine. The next day three pairs were selecting nesting sites."

TO THE BIRDS.

Dear birds, an easy life was yours
  E'er man, the slayer, trod
Your earth from all its seas and shores
  Went up your praise to God.

What though to weasel, stoat and fox
  Your toll of lives you paid,
And hungry hawks might tithe your flocks
  That through the woodland play'd?

Short fears were yours and sudden death,
  Long life and boundless room;
No cities choked you with their breath,
  Or scared you with their gloom.

Pure streams and quiet vales you had;
  No snare nor line nor gun
Made war against your legions glad
  That wanton'd in the sun.

Hope on, and some day you shall see,
  When these ill days have end,
That man the slayer—who but he?—
  Is changed to man, the friend.

—Henry Johnstone.

OLD-FASHIONED OUTINGS.

PART I.

The western shore of Gloucester harbor rises in a succession of wooded ridges from the sea-rocks, which redden westward to a degree fully bearing out the sketching-books in the statement that rocks are among the most highly colored of objects.—A sketch is brought home.—"Your rocks are too red." "Too red!" exclaims the aggrieved sketcher, "they aren't half red enough. They fairly blazed!" These rocks abound in chasms where trap-dikes have worn away; and when some trap is left, the contrast in color is very striking, but the main charm of this shore is the intimate association of woods with rocks and water. Next the rocks, as a rule, on high knolls and hedges thinly veiled with a dry, light soil stand the pitch pines, those gnarled and fragrant dwarfs with their stout prickly needles and prevailing shape of a double umbrella. Under favorable circumstances these grow quite tall. The Lone Pine, standing in a low, moist place near the mouth of a creek, attained a height of thirty or forty feet, and its characteristic, interesting shape was long a landmark on that shore. Great was the sorrow when it fell. Fortunately a portrait of it still exists.

The white pines stand back from the water on their great purple trunks, and rain their rust-red needles down among the purple bowlders of exactly the same shade, which encumber lowland and hillside, while trunks and bowlders are alike besprinkled with lichens of palest green. Some giants used to shade the new road where it passes the Red Brook; and the perfect level, deep shadow and general dampness somehow recalled the Wood at the Hague, although that is beech forest. Oaks clothe the more easterly ridges or stand alone in open pastures near the shore, but the present tendency of fields which have lain open since our infancy to grow up to woodland in the last half-dozen years is deplored if not resented.

A ruined stone wall with a hedge-row running down toward the water divides two dear familiar fields bounded by woodland on either hand, and in the row once stood alone a delightful white pine with double crown. Through these fields we pass on our way to certain parts of the shore, and we always had a view of rocky headland, white sails and dancing water, over a sloping foreground dotted with fern and yellow St. John's wort or golden-rod and asters, according to season, while we paused to pick blue curls and Nuttall's polygala or spiranthus and little purple gerardia. At present that stylish pine is all mixed up with dowdy maples and poplars, the water view is completely blocked, and we wedge our way with difficulty where we once stepped freely along a tiny track beaten hard in the thin sunburnt pasture grass, running diagonally to a breach in the wall flanked by barberries, and out into the big field which, dipping suddenly to the level of the beach, becomes a grassy swamp. Half way down stands a magnificent pitch pine of most luxuriant growth and very peculiar shape, quite tall, yet stretching one broad curving arm down the slope close to the ground, like a great delicious tufted green mattress. The path, bearing a little to the right, comes out on the beach, while beyond the swamp the land rises in quite a high "hog-backed" hill, of which, after a very considerable dip on the outside, enough is left to form a very bold shore.

Ah, what a view! two views, in fact, from that outpost, the inland slope of that hill eastward, up the harbor, over a bold headland clothed all but the crown in oak woods, beautiful background to a pretty cove beyond the

sloping pasture; and westward past the Rock, along the wooded shore of Norman's Woe to the cliffs at Rafe's Chasm and the sunset. One fairy sunset there was never matched anywhere in my experience, the sky one dome of soft luminous pink, the sea another sky, the earth translucent floating between, like the firmament that divided the waters.

A little way back from that shore ran in our day over hill, dale and brook an old grass-grown road, by each brook a ruined cellar, reputed trace of Acadian dwelling. The hills are among the sharpest little pitches ever seen. Driving at our ease about New England nowadays, we are fain to exclaim: Of a truth our forefathers would seem to have climbed hills by preference (and laid stone walls for exercise). But swamps were their horror, and the poor creatures had to thread their way through mazes of them. There can be no doubt that these wet areas are much restricted now, leaving us but a faint idea of ancestral difficulties in this regard; but even up to our time grandmothers told awe-struck children fragments of half-forgotten stories of the horrors of the swamps. Ours told of an already nameless young soldier, perhaps in the Great Swamp Fight, who, sinking slowly before the eyes of his comrades, pushed his watch to them over the bog, bidding them take it back to his mother. How it was they could do nothing to help him, did not appear.

The Magnolia Swamp lies north of the ridges, and some magnolia trees grow in an arm of it more accessible than the rest. Long before you reach a tree the dead swamp air is redeemed by their fresh fragrance if any flowers are in bloom; and redeemed is well said; for the swamp-air of the dog days is rendered doubly oppressive by millions of stiff white spikes borne by the obnoxious clethra in odor "overbearin' and upsettin',"—as Aunt Semantha said widders were in temper. You enter over turf wherein remain divers small deep swamp-holes surrounded by crimson calopogon, yellow-eyed grass, white cotton-grass and the pretty little yellow-horned bladder root. Further in, the path becomes miry, and you have to put aside the long swaying wands of the swamp loosestrife with its whorls of magenta bloom, and catch at the shrubs to keep you out of the mud. (At this point the poison sumach officiously tenders aid), but the path to your goal, the magnolia tree, leads aside into the bush where the footing is perfectly hard and peculiarly flat; and it doesn't exactly quake and doesn't exactly sound hollow, yet something tells you the bog is beneath, and you are walking on a crust.

To return to the old road: it forded two brooks, the Red Brook which runs into the sea behind Norman's Woe Rock, and the White Brook which runs out (amid much ivy) over the rocky beach by the Dry Chasm. The Red Brook must have been much bigger formerly, for it turned a saw-mill before 1700, and the ruined dam is still to be seen a little way below the ford, where it serves as a bridge. This brook is charged with coloring-matter from the swamps, so that it lines your tin cup with gold (if you chance to have "escaped from the Bastille of civilization"), and it furnishes the most unsatisfying draught ever swallowed. Not a drop ever seems to go lower than your collar-button. It makes one thirsty to think of it. But it was lovely to look at! It ran out of a great bed of cardinal, jewel-weed and raspberry-bushes (which bore monstrous berries because they stood with their feet in the water) and spread out in a big red pool at the foot of a gentle dip in the grassy road; and from the upper level you looked over the brook at a preternaturally steep little pitch beyond, where the road climbed a pine-clad hill, bowing out to the very verge of the dark descent to a ferny swamp, cradle of the brook. The dark background was faced with bright growth, and all in the light of sweet summer mornings with water sparkling in the bay and in the brook! Above, the road turned sharply, broadening into a level glade set round with barberry-bushes, door-yard of a vanished dwelling, and then turned another corner round the cellar and away. This was a cherished haunt. A little sidelong, slippery path, parallel with the brook led down a rugged slope of pine and cedar to a little bluff behind Norman's Woe Rock.

Here we camped out before that way of life became general, except for Uncle Sam. He had just been camping out on a large scale, and so it chanced that two large round tents and sundry new rubber blankets came our way and did not go a-begging. The Red Brook filled our kettles in a shady little glen with sides so steep we had to lower and raise ourselves by the trees, and then it ran away and spread out over the sea-rocks in a series of big, shallow basins—a famous dressing-room—but the way to it was of the roughest, for the red rock scaled off, and literally cut the soles from our boots.

The summer of 1865 was very dry, and so was the brook in many places. Therefore we slept in peace in our tents; but the next year the mosquitoes fairly drove us out, and we were fain to betake ourselves and our bed-sacks down that jagged path to the rocks just above high-water mark where the mosquitoes left us alone until four o'clock. Then they descended in force, and we had to get up. The crows wanted us to get up at three, at which unseemly hour they used to be discussing mussels at the other end of the rough bar between us and the Rock. We, on the other hand, held that meals attended with clamor, especially at such an hour, were "tolerable and not to be endured," and so arose one of those painful differences not uncommon between neighbors who cannot sympathize with each other's needs. Remonstrance growing vain, one of the family employed a rifle; a convincing argument apparently, for the sitting dissolved instantly, and gathered no more.

Having learned the constellations at school, we had been poking our heads out of window at all hours to see things that were not up when we went to bed; and we thought it would now be very convenient to observe these matters from our beds without stirring, but we never did. Dear Robert Louis in the course of his donkey-drive averred, on the authority of shepherds and old folk, that "to the man who sleeps afield—there is one stirring hour—when a wakeful influence goes abroad over the sleeping hemisphere, and all the outdoor world are on their feet." But we knew nothing of it, perhaps because we never went to bed with the fowls, and had no cows or sheep to browse around us. At all events—and we were really disappointed—that starry show was thrown away on us. Nobody ever woke.

But we woke one morning in a thick fog, with the Boston boat shouting its way out past us, and water standing in the dimples in our blankets enough to wash our faces very passably if we had had no better chance. When the sun broke through, some one faced it and struck up:

"When the sun gloriously—"

and the rest, like so many troop-horses, bounded and stood in choir-order and went on:

—“comes forth from the ocean,
Making earth glorious, chasing shadows away,
Then do we offer Thee our prayer of devotion:
God of the fatherless, guide us, guard us today.”

The other verse we sometimes sang at sunset, undaunted in our heyday by its melancholy tone, and then we piled a big fire of the fragrant red cedar to light our supper table and our evening. Pretty silver-mounted trinkets cut from the rich heart of this thenceforth precious wood, and polished on the spot, are still in being, ready, as our camp-laureate had it,

“To sing in praise
Of summer days
In camp at Norman’s Woe.”

—Helen Mansfield.

ALICE’S THRUSH.
(Turdus aliciae).
FROM COL. CHI. ACAD. SCIENCES.

THE ALICE’S THRUSH.

(*Turdus aliciae.*)

Alice’s Thrush, or the Gray-cheeked Thrush, has an extensive range covering the whole of North America from the Atlantic coast westward to the Plains and northward to the regions beyond the Arctic Circle and is abundant along the Arctic Coast. Mr. Ridgway says: “This bird and the robin are the only species of our thrushes that cross the Arctic Circle to any distance, or reach the shores of the Arctic Ocean. It occurs from Labrador all around the American Coast to the Aleutian Islands.” It also frequents Siberia. From its breeding grounds in northern North America, on the approach of winter, it migrates southward to Central America, and finally reaches Costa Rica.

Alice’s Thrush closely resembles the olive-backed thrush with which it is frequently associated during its migrations. When thus associated, only the trained eye of an expert can discriminate between them. The two may be distinguished, however, by the much stronger buff coloring on the throat and breast, and on the sides of the head around the eyes, of the olive-backed species.

Alice’s Thrush is a shy bird during the nesting period and remains within the friendly shelter of thickets and though unseen “their low sweet song is frequently heard.” Mr. Ridgway says: “The notes are said to be quite distinctive, the song being most like that of the hermit thrush, ‘but differs in being its exact inverse,’ beginning with its highest and concluding with its lowest notes, instead of the reverse.” However, when their family cares are over, their retiring nature disappears to a great extent and they seem to seek a closer association with the habitation of man and frequent more open places in the vicinity of villages. In his report on “The Birds of Alaska,” Mr. E. W. Nelson says that during the period following the breeding season and before the migration begins,

“many are killed by the native boys, armed with their bows and arrows. Their skins are removed and hung in rows or bunches to dry in the smoky huts and are preserved as trophies of the young hunter’s prowess. In the winter festivals, when the older hunters bring out the trophies of their skill, the boys proudly display the skins of these thrushes and hang them alongside.”

So closely does this bird resemble some of its sister thrushes that it was not until the year 1858 that its distinctive characteristics were recognized and it was given a name of its own. In that year it was described from specimens collected in southern Illinois by the eminent naturalist Robert Kennicott and his sister Alice.

For many years it was considered a rare bird, for in its typical form it is only a migrant in the United States, silently winging its way through the forests to and from its summer home.

Its nests are usually placed in shrubs or low branching trees at a height of but two to seven feet from the ground and in a few instances it has been known to nest on the ground. The nest is usually compact and “composed of an elaborate interweaving of fine sedges, leaves, stems, dry grasses, strips of fine bark and lined with fine grass. Occasionally nests are constructed with mud, like those of the common robin.” It is said that this thrush will easily modify its nesting habits to suit the requirements of its environment. In the land of the deer, nests have been found that were wholly constructed of hair and lined with the hair of deer, feathers and some moss.

In our illustration is shown its habit of scratching away the dead leaves that accumulate under the trees, in its search for grubs and worms.

A BIT OF FICTION FROM BIRDLAND.

It was a radiant May day, so invitingly fresh and sunshiny that I found it impossible to stay indoors with any degree of resignation. Far up the hillside sloping southward was a favorite nook, and thither I turned my springing steps, so full of life and gladness that I could hardly contain it all.

Robins and bluebirds along my path saluted me, sparrows caroled from shrub and tree top their sweet, glad-spirited chorus, swallows were skimming the meadow with graceful wing, and bobolinks sang everywhere, jubilant, hilarious, in their “rollicking holiday spirit,” evidently intensely amused over some episode of recent date in the blithe bobolink world.

An old orchard of gnarled and tangled trees—a veritable “antique”—ended my ramble; here I threw myself down upon a mossy bank, turning to face the direction whence I had come. Down the valley, with its willow and alder fringed brook threading the meadow flats, I could look far away and over to the distant hills, woods and tilled lands on the other side.

The old orchard stands like the leafy porch to the sylvan halls behind it. Upon either side is a wild unbroken tangle of small growth—saplings of birch, poplar and maple; in front is a stubbly slope cut off by a picturesque brook from the meadows beyond; upon the farther side a deep forest of many years’ standing.

Ah, the restfulness of a retreat like this, shut in from the rustle, bustle and petty cares of the world and the everyday scramble for the bread and butter of mere existence! And the witchery of an hour like this—the whole earth steeped in sunshine, the air exhilarant and inspiring with freshness and fragrance, the woodsy odors of the tender new life but just awakened from the torpidity of frost-bound inanition, and the honeyed fragrance of the abundant apple blossoms inviting bird and bee and human flower lovers.

Evidently the birds were in sympathy with my mood, for there were literally flocks of them all about me; and the air was freighted with the enchanting melody of their rejoicing voices, Robert O’Lincoln as usual making himself delightfully prominent. I threw myself back upon the lap of Mother Earth and mentally rehearsed that characteristic bobolink poem:

> “A flock of merry singing birds were sporting in the grove,
> Some were warbling cheerily and some were making love.
> There were Bobolincon, Wadolincon, Winterseble, Conquedle,—
> A livelier set were never led by taber, pipe or fiddle.”

Presently the soporific influence of the atmosphere and surroundings began to take effect; and, soothed by Nature’s lullaby, I fell asleep with Wadolincon, Bobolincon, Conquedle, Winterseble, all in a confused jumble in my brain.

Immediately my companions began a lively discussion about house-building. At first I could not make out even the subject of the conversation, for all were talking together in such determined I-will-have-my-say accents that they out-babeled Babel with the confusion of tongues and senseless racket.

Soon, however, came a diversion, a hawk flew screaming across the arena, and, in the lull that followed, Mrs. Crow seized the opportunity to mount the platform of a tall spruce and call the meeting to order, suggesting that as the subject under consideration was of common interest and importance, it would be more profitably discussed if each were allowed to speak separately.

I was grateful indeed for this timely suggestion of the sable intruder, for, being myself especially interested in the subject under debate, I was anxious for information, and knew that among so divers opinions one might expect new light upon it.

Mrs. Robin Redbreast came forward just then and opened the discussion by expressing her own choice of "use before beauty" and a dry and airy situation.

Mrs. Bluebird liked privacy and retirement from the public gaze, and declared that no place more conspicuous than a hollow post or stump is a fitting home for the bringing up of baby bluebirds.

Mrs. Sparrow, in modest apparel, showed her quiet taste in the matter of home-making as in dress, choosing a lowly nook in the pasture or upon the edge of some grass-fringed bank.

An equally secluded and unsuspected site, with the meadow grasses waving above and daisies and buttercups nodding in the breeze but telling no tales, is the select location of Mrs. O'Lincoln, and rarely indeed does Madam betray the secrets of her home.

"No position is so favorable for nesting purposes as a big knot upon a bridge sleeper," tersely remarked Mrs. Pewee. "My sisters and I make a point of utilizing every bridge in our neighborhood, though we like nearly as well the eaves of a barn if only the Swallows would give us permission to build on their territory."

"Dear me," exclaimed Mrs. Vireo in a distressed tone. "Under a bridge. How plebeian to be sure! Why, how can the precious nestlings sleep in so much noise? I think a swinging cradle indispensable for my babies."

"I, too," chimed in Mrs. Oriole. "I have often watched Mrs. Pewee from our beautiful Elm Lodge and wondered how she could be happy with her home in such a constant jar."

"Come, come," interrupted Mrs. Crow at this point. "I hope no sarcasm is intended. Our taste is for a branch high up in some dark hemlocks, out of the reach of gunners and harum-scarum boys. We care more for quantity than quality, too, plenty of room but not too much luxury to make our children lazy in getting their own living."

"That would never do us," persisted Mrs. Vireo. "We hold that nothing is too good for the little ones, and early surroundings and influences are everything in cultivating a refined taste, a love for the beautiful, and the art of fanciful designing. You cannot find anyone who takes more pains than we in this respect."

"O, we all know that the Vireos have plenty of time and means," tartly responded Mrs. Catbird, in an unmistakably sarcastic tone. She, well aware of her own carelessness both in selection of site and manner of building, had not an advanced idea to offer; and, like certain humans, she therefore indulged in scoffing at her betters. "For my part," she continued after a pause intended to be impressive, "I think that those who trust to luck a little more come out just as well in the end and have just as respectable and more independent children."

"Yes, yes," laughed Mrs. O'Lincoln, "if by 'independent' you mean lawless; and fine examples you could furnish us, too. No one will dispute you."

"I like to see materials correspond with surroundings," modestly suggested Mrs. Sparrow, and Mrs. Bluebird added: "If you have proper regard for privacy and modesty in the choice of a site you need give less attention to either materials or the style of your structure."

Madam Cowbird now descended from a perch in the big birch balcony and summarily dismissed the assembly with this rough injunction: "Better be in better business, all of you! Work is better than talk and accomplishes more for the benefit of your neighbors. Theories are well enough, but let me see a practical demonstration of your various ideas. Finish your building and I will come around as critic and inspect your work. I'll warrant that I shall find little to choose among you for all your fine talk."

This characteristic speech filled me with such indignation that I resolved at once to expose the duplicity of the speaker, thus thwarting Madam's wily plans for shirking her own duties.

Springing to my feet and gathering my forces for an energetic and scathing rebuke, I suddenly discovered that the whole company had dispersed, leaving me alone with the beauty and sweetness and quiet gladness of the old orchard.

SARA ELIZABETH GRAVES.

THE CAROLINA CHICKADEE.

(*Parus carolinensis.*)

As one walks through the forest, either in winter when the snow is deep, or in summer when the sun is highest, the stillness will be broken from time to time by the merry "Chicka-dee-dee," "day, day," or "hey-de, hey-de," coming from a little throat only a few feet away.

The Carolina Chickadee is very similar to the blackcapped chickadee with the exception that it has a decidedly shorter tail. Its range is also different, being seldom found north of a line extending from New Jersey, through central Indiana, west to Texas and Indian Territory. The blackcapped is seldom found south of this line.

The nest of this bird is a very cozy affair sheltered in a hollow snag or post. It often takes advantage of the deserted home of a downy woodpecker to make its nest. It also frequently excavates a cavity in some rotten snag or tree trunk. As soft wood is preferred one generally finds the nest in a willow snag. I found a nest of this interesting little bird in a rotten willow snag only a few feet from a small stream. The stump was so decayed that I

could easily have pushed it over. The excavation had been recently done, because fresh bits of wood were scattered about the ground. Looking in at the hole, which was about four feet from the ground, I could easily see the nest and eggs in the cavity some ten inches below. Desiring to study it more closely and to obtain a photograph, I carefully pushed my knife through the soft trunk and pried off a large slab. This exposed the cavity and the nest. The nest was a beautiful soft affair, composed of hair, feathers, down, etc., and contained seven small, pinkish white eggs, spotted with reddish brown most profusely at the larger end.

I then carefully replaced the slab and tied it on securely, trusting I had not disturbed the home too much to prevent further nesting.

When I again passed the nest an hour later and looked in I met the gaze of a pair of small bead-like eyes. The parent bird had returned and had resumed her task, apparently in no way disturbed by the rude attack on her domicile.

Whenever I desired to examine the progress of development of this small family I had but to remove the door and look in. This was easily done, for the latchstring was always out. About eight days after hatching the young left the nest.

The Chickadee is one of the farmer’s best friends. During the egg-laying season of the canker-worm moth it destroys a great many eggs. Examination of the stomach contents shows between 200 and 300 canker-worm eggs in each. It has been estimated that each of these birds destroys 14,000 of these eggs during the month of egg laying. The Chickadee has been accused of destroying the buds of fruit trees, but this is not substantiated. It has been found that whenever it attacks a bud it does so to secure the worm which has burrowed into the center.

These birds are doubly useful because they remain with us the entire year and continue their destruction of eggs and larvæ. The amount of work done by a pair of these birds in destroying eggs and larvæ of injurious insects is more than could be accomplished by any man. They should therefore receive the greatest protection possible.

J. Rollin Slonaker.

CAROLINA CHICKADEE.

(Parus carolinensis.)
Life-size.
FROM COL. CHI. ACAD. SCIENCES.

DICK.
(THE STORY OF A DOG.)

My first remembrance is when I was about two weeks old and lived with my mother, brother and sister in a fancy basket that stood in the corner of a pleasant room in a house in the city of Apokeepsing.

My mistress came into the room followed by another lady, and taking me up she said: “This is the one I am going to give to the little boy.”

The other lady took me in her hands and smoothed my curls as she said: “Well, he is a dear little fellow—but what a darkey he is!”

My father was an imported Russian poodle. He was pure white with pink eyes and nose, but he was cross, for the only time I remember seeing him, he growled at me and I hid in my mistress’ skirts while she scolded him.

My mother was a Skye terrier, silver gray in color and very intelligent and affectionate.

Our mistress loved us dearly and used to wash us and comb our hair until we were as clean as children.

She was a pretty woman and we all loved her as much as she did us and would run to meet her and kiss her hands and jump in her lap as soon as she sat down.

I used to wonder who the little boy was to whom I was to be given, and when he would come for me; but time went on and I was still with my mother and had nearly forgotten about being given away. One day when I was about five months old, my mistress came into the room and said to her daughter: “Emma, where is Sandy?” I pricked up my ears, for that was my name. She then called me and I ran to her. She took me in her arms and carried me to the street. There was a wagon standing by the sidewalk and in it were a gentleman and a dear brown-eyed little boy who gave a pleased laugh and caught me in his arms, as my mistress held me up to him, and he hugged me so hard that it almost hurt.

Then the gentleman thanked my mistress and she said: “Good bye, Sandy,” and I tried to get back to her, but the horses started off and I had to go too.

First we went up a long hill where trolley cars ran and where wagons, horses and people were coming and going all the time.

Then we drove on over a softer road, with less noise and so few houses that sometimes I had to look all around before I could see any, but at last the horses turned in through a gateway and stopped at a large white house.

The little boy called, “Mamma, come and see the new dog!” and out on the stoop came a young lady with a baby in her arms, and she said: “Well! well! what a funny little black fellow!” but she said it with a laugh in her eyes so I knew she liked my looks and when the gentleman put me out on the stoop, I ran to her and she took me up and let the baby pull my curls.

I was so glad to be liked, that I kissed them both ever so many times, until the lady laughed and said: “Here, my son, take this little kisser in and give him some dinner.” I was glad to hear that for I was very hungry.

The next day the little boy said he meant to call me Dick, so his mother took my head between her hands and said: “Dear little doggie, your name is Dick now, so don’t forget that we mean you when you hear us say it.”

I wagged my tail as hard as I could to tell her I would remember and I did so well that it wasn’t long before I forgot to expect to be called Sandy and grew to like Dick much better.

I found I had come to live on a farm with cool green grass to run through, cats to chase, chickens to hunt and horses and cows to look out for.

One day I was barking at a cow to make her go into the barn and she turned quickly and kicked me against the fence.

It hurt me pretty badly and I was sick for several days. My new mistress gave me medicine, rubbed my sides and kept me in the house by her until I felt better.

There was another dog at this house. He was a great St. Bernard called Brian and he used to play with me and scare me almost to death.

His paws were so large that when he struck me in play he nearly knocked my breath away.

There were seven people in this home, the little boy’s mother and father, baby sister, their grandfather and a little woman and a young man who did most of the work.

My mistress used to talk to me and teach me how to do things. I soon learned to jump and speak and shake hands, to sit up, lie down, roll over and do other little similar tricks.

When she went out with her horse, I would go too and sometimes when we were alone I would sit on the seat by her side.

One day all were going for a drive and I was to stay at home, but after they were gone, I became so lonesome that I ran off after them and tried my best to catch them.

After I had run a long way, I saw the wagon ahead of me and so I hurried on until I was close to them. I went on for some time without any one seeing me, but at last my mistress turned her head and saw me trotting along through the dust. She looked surprised and shook her head at me, but did not tell the others.

By and by the horse stopped at a house and I was so tired I ran up to the wheel and cried to be taken in.

Then the little boy cried out, “Why, here is Dick, how did he get here?” and his papa said, “Dick, you rascal, what did you follow us for?” I hung my head for I thought I might get a whipping for coming without permission, but the gentleman only laughed and taking me up, put me in under the seat. Wasn’t I glad to lie down and rest!

When the baby began to creep she and I used to have great fun on the floor. I would stand still and let her catch me and then jump away and back at her, and she would laugh and crow with delight.

The little boy was in school part of the day, but we always had a good run after he came home.

My mistress used to say to me, “Dick, it is half past three and time for brother to come from school,” and then I would run down to the gate and watch for him, and when I saw him coming we would run to meet each other, and such a hugging as I would get!

But for that great dog I would have had a happy life on the farm, but Brian used to bat me around so roughly that I was afraid to go near him, and at last, one day, he struck me with his paw and rolled me over. He then stepped on me, and I was hurt so badly that I could not get up.

My mistress ran out and picked me up in her arms and scolded Brian until he hung his head and tried to lick her hand. Then she said, “Well, I suppose you didn’t intend to hurt Dick, and, after all, you are only a dog, and people do more thoughtless things than this.”

I stayed in the house nearly all the time until my sides were well, and every day Brian came to the door to ask how I felt and to tell me how sorry he was for having hurt me.

He was an affectionate dog, but very thoughtless, and I often heard our mistress say that he was very different from the majority of St. Bernard dogs, for they were generally very intelligent and trustworthy.

Perhaps Brian had not been well treated during his puppyhood, for that is the time to form a dog’s character. By talking to us when we are little we soon learn to understand what is required of us, and, then if people are kind, we always will try to do as they wish.

My mistress used to say that the worst thing a person could do was to abuse a dog or a horse, for both were too good friends to be ill-treated.

There were four horses on the farm, a black mare named Dot, a black horse, Billy, a large bay, Milo, and a young chestnut horse called Archie.

When my mistress and the children went for a drive Milo generally took them, and then I used to go, too. Sometimes I ran ahead to see if the roads were all clear, and one day I saw a snake going across the road. I ran back as fast as I could to tell Milo to hurry so the children could see it. They were taught not to be afraid of everything, as some children are, but to be interested in all living things, so I always told them when I found snakes or turtles or any odd things out of doors.

One day, soon after I had recovered from Brian’s playfulness, I heard the little boy’s father say to my mistress: “We will have to send Dick away.” She said, “Why so; on account of Brian?” and he replied, “Yes, I think it will be better for Dick to have a more gentle playmate.” “Well,” said my mistress, “I can send Dick down home.”

I was lying on the floor beside her chair, listening as hard as I could and wondering where “down home” was and whether I would be treated well and if the people would like me and a hundred other things. But under all ran the thought that I was to leave my dear little master, the baby and my mistress, and it made me feel so badly that I gave a howl of sorrow before I knew it.

My mistress looked surprised and exclaimed, “Why, Dickie, what is the matter?”

I climbed up in her lap and licked her face and hands and tried to beg her to keep me with her. I must have succeeded, for she hugged me close and said, “Did you hear what I said, my doggie?

“Well, never mind, Dickie, you will be happier there than you are here.”

But I didn’t believe that, for it didn’t seem as though I could be happy away from these three.

After that I followed her wherever she went, and she used to laugh at me and call me her shadow, but I wanted to be with her all I could before she sent me away.

About a week after this my mistress said, “Dickie, I am going to take you to town this morning.” I was delighted, but when a little after the little boy, before he went to school, kissed me ever so many times and said, “Goodbye, my dear doggie,” it set me to wondering what was going to happen.

The next thing that occurred was very unpleasant, for the little boy’s father put me in a box and nailed slats across the top so that I couldn’t get out.

I did not like to be a prisoner and tried to scratch the slats off, but it was of no use, so at last I sat down and waited to see what would happen next.

As soon as Milo was harnessed the young man put me into the wagon and led Milo to the house.

My mistress and the baby came out, and off we went.

As soon as we were on our way my mistress leaned over and said, “Dear doggie, I am afraid you are not very comfortable in there, but you will soon come out;” and she gave me her hand to lick. Then I felt better and sat looking out as we drove along to the city.

Pretty soon we stopped in front of a store and a young man came out. My mistress said to him, “I want to send this dog to New York by express.”

Going out, she procured some meat and put it in the box for me, and then she said, “Good-bye, my dear old Dick, you are going where I would like to be myself. Be good and love everyone for me.”

After a while a man came for me and put the box in a wagon. He took me a long way through the city to a place where there were cars and locomotives. I was put in a car with a queer little brass check tied to the box, and soon the car began to go very fast indeed.

The next thing I knew a man was hauling my box out of the car, and he put it on a sort of wheelbarrow and took me off across a street or two and to a boat.

After I had been taken off the boat my box stood for a long while in a corner, and I was just about ready to cry myself to sleep when I heard a gentle voice say, “Here he is and it is Dick, sure enough.”

It was too dark to see plainly, but I could see a lady, a gentleman and a young girl. The lady continued talking to me while the gentleman broke open the box so I could get out.

At last the slats were off and out I bounced, and the lady said, “Dick, I am your little master’s grandma,” and then I was very glad, for I knew I was home at last.

Pretty soon we all four started to walk up a road. The lady led me by a cord around my neck, as she was afraid I would run away, but if she had known how glad I was to find friends she would not have worried about that.

The house we reached was a large one, with beautiful lawns and gardens, and I soon found out that I was to be known as “Brother’s dog,” and to be petted because I belonged to him.

All through the winter and spring I lived an easy, happy life, with but one break in the quiet days, and that was when my dear little master, mistress and the baby came for a visit.

I was so glad to see them that I jumped and barked until I was all tired out.

How I did miss them when they went away again!

Along toward spring one night we heard bells ringing and men shouting, and I ran out in the yard to see a great glare of fire along the river just a short distance above our home.

A large building was all ablaze, and it burned to the ground.

The next morning a poor little cat came to the place. She had been in the fire and was horribly burned.

Brother’s grandpa brought her into the barn and gave her some milk, and after a while she crept into my house to rest.

This poor thing was in such a terrible condition that I felt sorry for her and began to talk to her to find out what I could do to help lessen her pain.

I made her welcome to my bed, and we lived together after awhile, for she said my thick curls made a warm bed for her poor burned sides to rest on, so I tried to help her get well.

By and by the people began to call her “Bob” and say she was “Dick’s cat,” and that pleased me so much that I began to be quite fond of her, and many a cosy nap we had together.

Her burns healed nicely, but half her ears and nearly all her tail was gone. She looked very queer, but she was a gentle little cat.

I licked her ears for her and kept them clean, so they healed nicely, too.

When she had lived with us a month or two I came around to my house one afternoon and there were three tiny gray kittens.

I was surprised, and asked Bob what they were doing there, and she replied that they were her babies.

Then I was glad and kept them warm for her many times while she was off hunting.

When they grew large enough they used to play tag over my back while Bob and I lay talking together, and after a while I found they liked to have me play with them, and for some reason I enjoyed a good romp as much as they did.

One day when they were all climbing over me one put his paw on my nose so I couldn't breathe, and I took him in my mouth and carried him off on the lawn and gave him a good shaking, but dear me! he knew I wasn't angry and didn't mind it a bit.

Now the long, sunny summer days are coming, and I am waiting eagerly, for when the warm weather comes my dear little master and his mother and baby sister are coming for a long visit. Then I'll be the happiest dog in town, for I'll have to go walking with two playmates and my mistress.

It is strange how few people understand dogs, or any other animal for that matter.

The majority seem to think that all we are good for is to be kicked and abused.

The people at both my homes are as kind to their animals as to their children, and love and care for us just as we need.

I suppose that my history is not a very important one, but it will show how a dog can love and appreciate and tell what a truly happy life I have had so far, because I have been with good-hearted people.

I am not a very old dog yet, but I hope to live many years with my kind friends in the beautiful home I now have, and wish all animals were as well off as,

Yours truly,

DICK.

KATHARINE WATKINS LAWSON.

VIOLET-GREEN SWALLOW.
(Tachycineta thalassina).
⅘ Life-size.
FROM COL. CHI. ACAD. SCIENCES.

THE VIOLET-GREEN SWALLOW.

(*Tachycineta thalassina.*)

The Violet-green Swallow is one of the most beautiful of the Hirundinidæ, or family of swallows. There are about eighty species of the family and they are world-wide in their distribution. These tireless birds seem to pass almost the entire day on the wing in pursuit of insects upon which they feed almost exclusively. They can outfly the birds of prey, and the fact that they obtain their food while flying enables them to pursue their migrations by day and to rest at night.

The Violet-green Swallow frequents the Pacific coast from British Columbia on the north, southward in the winter to Guatemala and Costa Rica. Its range extends eastward to the eastern base of the Rocky Mountains.

Its nest, which is made of dry grass and copiously lined with a mass of feathers, is variously placed. Sometimes the knot-holes of oaks and other deciduous trees are selected. They have also been known to use the deserted homes of the cliff swallow. Mr. Allen states that they “nest in abandoned woodpeckers’ holes, but at the Garden of the Gods and on the divide between Denver and Colorado City, we found them building in holes in the rocks.” This Swallow is quite common in Western Colorado, where they have been observed on the mountain sides at an altitude of eight to over ten thousand feet. In “The Birds of Colorado” Mr. W. W. Cooke says: “A few breed on the plains, but more commonly from six to ten thousand five hundred feet” above the level of the sea. He also adds that they begin laying late in June or early in July and desert the higher regions in August and the lower early in September.

The notes of this exquisite bird are described by an observer who says that they “consist of a rather faint warbling twitter, uttered as they sit on some low twig, their favorite perch; when flying about they seem to be rather silent.”

The Violet-green Swallows, like their sister species, usually nest and migrate in colonies.

Isn’t it wonderful, when you think,
  How the wild bird sings his song,
Weaving melodies, link by link,
  The whole sweet summer long?
Commonplace is a bird alway,
  Everywhere seen and heard,—
But all the engines of earth, I say,
Working on till Judgment Day,
  Never could make a bird.

—J. S. Cutler.

A PRETTY HOUSE-FINCH.

My first meeting with the blithesome house-finch of the west occurred in the city of Denver, Colo. It could not properly be called a formal introduction, but was none the less welcome on that account. I had scarcely stepped out upon the busy street before I was accosted with a kind of half twitter and half song that was new to my eastern ears. “Surely that is not the racket of the English sparrow, it is too musical,” I remarked to the friend walking by my side.

Peering among the trees and houses, caring little for the people who stopped to stare at me, I presently focused my field-glass upon a small, finch-like bird, whose body was striped with gray and brown, and whose crown, face, breast and rump were beautifully tinged or washed with crimson. What could this chipper little city chap be, with his trim form and pretty manners, in such marked contrast with those of the alien English sparrow? Afterward he was identified as the house-finch, which rejoices in the high-sounding Latin name of Carpodacus mexicanus frontalis. He is rather an exclusive little bird, his range being only from the eastern border of the Rocky Mountains to the Pacific coast, chiefly south of the fortieth degree of north latitude in the interior regions.

He is certainly an attractive little fellow, and I wish we could offer sufficient inducements to bring him east. A bird like him is a boon and an ornament to the streets and parks of any city that he graces with his presence. No selfish recluse is he—no, indeed! In no dark gulch or arid wilderness, “far from human neighborhood,” does he take up his abode. He prefers the companionship of man to the solitudes of nature. In this respect he bears likeness to the English sparrow, but be it remembered that there the resemblance stops. Even his chirruping is musical as he flies overhead or protests from a tree or a telegraph wire against your ill-bred espionage. He and his more plainly clad mate build a neat cottage for their bairns about the houses, but do not clog up the spouting and make themselves a nuisance otherwise, as is the manner of their English cousins.

This finch is a minstrel, not one of the first class perhaps, but one that merits a high place among the minor songsters. I am tempted to call him an urban Arion, for there is real melody in his swinging, galloping little aria, running up and down the chromatic scale in a remarkable way. Many times did his matin voluntaries mingle with my half-waking morning dreams, as he is an early riser. His song is quite a complicated performance, considerably prolonged, and delivered with great rapidity, as if the busy minstrel were in a hurry to have done so that he could get at something else.

In my rambles he was found, not only in the cities of the plains, including Denver, Colorado Springs and Pueblo, but also in nearly all the mountain towns visited, Leadville, over ten thousand feet skyward, being, I believe, an exception. In the villages of Red Cliff and Glenwood, both beyond the continental divide, he was the same sprightly citizen, making himself very much at home. My observation is that these finches are more plentiful on the plains than in the higher altitudes and that they seldom venture farther up into the mountains than 8,000 or 9,000 feet. To give an example, in a recent rambling trip among the Rockies a few were seen at Georgetown, which is 8,476 feet above sea level; but my notes contain no record of this species having been seen in any of the higher localities visited.

Much as this finch cherishes the society of man, he is quite wary, and does not fancy being watched. As long as you go on your way without seeming to notice him, he also goes on his way, coming into plain sight and chirping and singing; but just stop to ogle him with your glass and see how quickly he will dart away or esconce himself behind a clump of foliage, uttering a protest which seems to say, "Why doesn't that old fellow go about his own business!"

If in some way the American house-finch could be induced to come east, and the English sparrow could be given papers of extradition, the exchange would be a relief and benefit to the whole country.

LEANDER S. KEYSER.

THE THRUSH'S SOLO.

There's a robin's invitation
And a bluebird's message sweet,
Bidding us to Forest City
With its crooked moss-grown street;

Feathered folks and folks in ermine
Own the city with its trees,
Own the brooks and own the berries,
Own the dewdrops and the breeze.

There, to-day, there was a concert
In a snowy elder bush,
Opened with a thrilling solo
By a prima-donna thrush.

When the sweet brown-breasted singer
Hushed the wonder of her song,
From her listeners rose an encore
Echoing the hills along;

Tambourines the brooks were shaking,
Clapped the palms on every oak
And from old and trained musicians
Warbled rounds of music broke.

Winds that held their breath to listen
Swept adown the vine-clad rooms,
Crowned the little prima-donna
With soft-shaken elder blooms.

—Mrs. A. S. Hardy.

SPRINGS, GEYSERS AND ARTESIAN WELLS.

If the earth were transparent as the atmosphere we should see many things of wonderful interest and beauty beneath its surface. If we could see the mineral gems that lie beneath the earth's surface they would rival in beauty the jeweled firmament above us. We should also see rivers and rivulets of crystal clearness and lakes of broad expanse. I can almost hear my young readers saying, "I wish we could look beneath the surface of the earth and see the wonderful and beautiful things it contains, just as we look up to the stars, or out of the window upon a landscape." But let me remind them that nature has been very generous in furnishing rare and wonderful things for them to study and admire to which they can have easy access almost every day. The longest life is too short to study and admire more than a few of the things we may see upon the surface of the earth. Nature has opened a few doors so that we may walk in, study and admire the work she is carrying on in the darkness where the light of the sun never penetrates. Nature makes a free use of sunlight to perfect her most beautiful work upon the surface of the earth, but her most delicate and beautiful work beneath the surface of the earth is wrought by other agencies. Caves have been entered and explored by natural openings, and springs and rivers gush out at the surface of the earth, telling us plainly that they are fed by subterranean fountains and lakes.

Following the order of our topic, let us see what we can find out about underground streams and lakes, and why we know they exist when we seldom see them. We know that large rivers after flowing miles upon the surface of the earth suddenly drop into subterranean channels and reappear after running miles underground. Springs which are always flowing must be constantly fed from some source beneath the surface of the earth. In boring wells the augers, after going down to various depths, suddenly drop several feet, showing that they have reached a cavity in the earth or a fountain of water; if the water gushes up it is evident a fountain has been struck.

Where does the water come from to fill the underground lakes and reservoirs and keep the rivers constantly flowing? Geologists tell us that all the land surface of the earth was for vast ages under water; that the great oceans that now roll between the continents once covered them entirely, but after long ages mighty internal forces of the earth raised them above the ocean's level. For a long time after the hills and mountains were raised above the surface of the ocean, where the valleys and prairies now are there were lakes and inland seas. The water in these lakes and seas did not all evaporate or find its way to the ocean by the rivers that flowed from them. Deep down into the earth much of it found its way, along the fissures and porous strata, until it reached some impervious stratum, as clay or granite. But as this first underground supply would in time become exhausted, by flowing into the ocean through the rivers they fed, nature has made further provision for keeping up the supply. Everywhere upon the surface of the earth where there is water or moisture evaporation is going on. The sun raises enormous quantities of water in the form of vapor, which forms clouds and descends in rain. A part of this water is soon restored to the sea by the rivers, but by far the largest portion penetrates the earth's surface, as water would penetrate cloth or a sponge when poured upon it. Rain penetrating the earth goes down until it comes to some substance that it cannot penetrate. Then, in trying to find its level, it will distribute itself just as it does upon the surface of the earth. It will find its way into cavities, large and small, or following some underground channel or stratum, it may burst forth a clear and sparkling spring, or it may flow on a rivulet, or river, and perhaps enter into a great subterranean lake. The underground fountain or lake that keeps an artesian well spouting from year to year may be fed by a stream or lake in the heart of some distant mountain. Some artesian wells cease to flow after a while, showing that the fountain that supplies them is at least partially exhausted. We do not know to what depth water penetrates the earth. Artesian wells have been bored in recent years to the depth of four thousand feet. The temperature of springs and artesian wells is regulated by the temperature of the strata through which the water percolates. The geysers of Iceland send up enormous jets of hot water in the midst of Arctic cold.

OLD FAITHFUL GEYSER.
(Yellowstone National Park).
PHOTOGRAPH BY F. J. HAYNES, ST. PAUL.

The earth is nature's great filter, cleansing and purifying the water from the impurities of the soil. As it passes through strata of gravel or clay, it becomes pure and wholesome to drink. Sometimes water passes through a stratum containing sulphur, iron or magnesia, and so we have mineral wells and springs. There is in Brown County, Illinois, an iron, a sulphur, and a magnesia spring within a few feet of each other. 29

Having considered underground streams and lakes, artesian wells, and geysers in a general way, we will now proceed to notice some of the most remarkable of each. Of underground lakes we know but little. We cannot enter them as we do a cave, and if we could now and then find an entrance to them, we should find little room between their surface and the strata above it for navigation. We infer their existence, because they are necessary to supply many underground rivers and smaller streams that come to the surface and discharge their waters into the ocean. Another proof of their existence is found in the large areas of country where deep water is struck at a uniform depth measuring from the ocean level. The bogs of Ireland are floating upon underground lakes.

Springs are gems of the first water, as the dealer in precious stones would say of a perfect diamond. They do not impress us with their size so much as the way they minister to our comfort. But few wells equal them in the variety and purity of their waters. I remember a spring back in New England, which burst forth from a bed of gravel at the side of a hill with such force that it seemed to fairly boil, though icy cold and clear as crystal. So violent was the ebullition that the gravel and pebbles were continually thrown to the surface. Then it ran leaping, gurgling and sparkling down a steep declivity, and was joined on the way by rivulets from three smaller springs, so that when it reached the level of the valley it became a quiet, well-behaved brook, the home of the speckled trout. In places where it spread out over a gravelly bed the birds would light upon the stones and sip the water, and fly away singing joyous notes for so exquisite a luxury. A half mile from its source this brook became quite broad and deep. It ran through a pasture, and cattle came and slaked their thirst.

Hot springs are numerous in all parts of the world. The water of most hot springs has decided mineral properties, for the reason that hot water passing through mineral strata will dissolve more of the mineral substance than cold water. Many hot springs are great resorts for invalids because of their curative properties. The famous Silver Spring in Florida has the dimensions of a small lake, and boats sail over it, and a small river continually flows from it. The inhabitants of Chaudes Aigues, France, use the water of the hot springs to cook their food, to wash their clothes, and warm their houses. The heat from these springs is worth about $30 per day, as it is equal to the heat produced by five tons of coal.

Few things in nature are more beautiful and impressive than a river bursting from the hillside, its clear water sparkling in the sunlight, seeming joyous at being free from its captivity. Among the most celebrated and beautiful of subterranean rivers is the Sorgues of Dauclûse, in France. It flows for miles through a cave, and discharges thirty cubic yards per second. Soon after it issues from the cave it divides into numerous irrigating channels, and spreads fertility over an area of more than eighty square miles. Echo River in Mammoth Cave is navigated by boats for nearly a mile, and in some places is two hundred feet wide. The Poik River in Austria flows through the famous cave of Planina. The cave can only be explored by a boat. Professor Schmidt, with three companions, navigated the river for more than a mile. Along the continental shores many outlets of subterranean rivers may be seen. In 1857 all that part of the sea adjacent to the southern point of Florida received an immense eruption of fresh water. Intelligent observers estimated that for more than a month this remarkable inundation of a subterranean river discharged as much water as the Mississippi, and spread all over the strait, thirty-one miles wide, that separates Key West from the mainland of Florida. 30

Among the wonders of Yellowstone Park the geysers are the most noted. One of them is called Old Faithful, because he always spouts on time. He gives a grand exhibition every hour, whether he has an audience or not. He spouts, and sputters, and hisses and throws a huge column of hot water into the air, and then quiets down and gets ready for another performance. Another geyser in Yellowstone Park is called the Beehive, being cone-shaped like the old-fashioned beehive. It throws up a column of water more than two hundred feet. Castle Geyser is another that throws up a larger column of hot water than either of the above. The falling water has built up a huge crater that resembles a castle, hence its name. But the largest geyser in Yellowstone Park is called the Giantess. The well or orifice through which it sends up its column of water is more than twenty feet in diameter. The steam arises after the water has been ejected. A body of water more than twenty feet in diameter ascends in one gigantic column to the height of ninety feet. Then from the apex of this column five jets shoot up, radiating slightly from each other to the height of two hundred and fifty feet from the ground. The earth trembles under the descending deluge of this vast column of water, a thousand hissing sounds are heard in the air, rainbows encircle the summits of the jets with a halo of celestial glory. The falling water plows up and bears away the shelly strata, and a seething flood pours down the slope into the river. It is the grandest and most terrible fountain in the world. Visitors have to wait hours and sometimes days before the geyser will entertain them with an exhibition of its power and beauty.

Commander Ford, of the British Navy, says that one of the geysers of Iceland, called the Stroker, can be excited to action by throwing stones and turf down into the pit, and that the geyser resents the insult by throwing them up. He found that it usually took about forty minutes after throwing in the stones before they were thrown up. It occurred to him that he might send his dinner down and have it sent back to him well cooked. So he wrapped a leg of mutton and a fowl in a cloth and threw them into the boiling caldron, where he would never see them again unless they were thrown up. After waiting the usual forty minutes he began to regret his venture, but the geyser was only seven minutes behind time, and up came his leg of mutton and fowl done to a turn. Aside from the beauty of the columns of water, vapor and steam geysers send up, the waters are all the time depositing carbonate of lime and silica, and building up craters of many interesting forms.

The principle on which artesian wells act is very simple and can be understood by any schoolboy. Though this principle is very simple, there are so many varying conditions that many expensive failures result. Millions of dollars have been spent to get pure wells of flowing water, with nothing to show but holes in the ground or a flow of useless mineral water, but sometimes a good quality of mineral water is obtained. At Henry, Illinois, a flowing well of sulphur water is highly valued by the people, who come many miles to obtain it, while a few miles north of Henry, at Bureau Junction, there is a well of soda water which is very palatable.

Some of the best authorities say that only flowing wells should be called artesian. I will refer to a few of the many flowing wells. The hot springs in many parts of the world are natural artesian wells, the water being forced up from great depths. It is estimated that there are more than fifty thousand wells east of the Mississippi River from one to two thousand feet in depth, drilled to obtain petroleum oil or the inflammable gas which accompanies it. These are as strictly artesian wells as those that send up water. 31

Among the most noted artesian wells is the one at Grenelle, in Paris. In boring this well, after going down one thousand seven hundred and ninety-seven feet and passing through a stratum of rock over a subterranean fountain, the drill suddenly fell fourteen feet and the water soon rose above the surface. The temperature of the water coming from this well is eighty-two degrees, Fahrenheit. It is conducted by pipes to the hospital in the town, for heating purposes. The bore in most artesian wells is from three to six inches in diameter, but the one at Passy, near Paris, is twenty-eight inches in diameter and one thousand nine hundred and twenty-five feet deep.

In town and country a pure water supply is of the utmost importance to the health of the people and in many countries it can only be obtained by deep and expensive boring. Various uses are made of water flowing from artesian wells. In many places it is used to propel machinery. In the desert of Sahara artesian wells have become of great value in making the country near them habitable, as the flow is sufficient to irrigate large areas of land. Two new villages have been built in the desert and two hundred thousand palm trees have been planted about these wells. In the Western part of the United States, where the rainfall is limited, many artesian wells have been bored, the water being largely used for irrigation. In California more than forty thousand acres are irrigated from flowing wells. The average depth of these wells is about two hundred and fifty feet and the average discharge eighty thousand gallons per day.

M. S. Hall.

WHERE WE FOUND THE LADY-BIRDS.

(A TRUE INCIDENT.)

One spring we were cleaning away the leaves and ice from about the roots of a little thicket of white Scotch roses, as we have always called the low-growing, small-blossomed white rose so popular in many country places.

The sunshine had not warmed the air enough to melt the snow and ice which had been formed in early winter about the roots and which held together a mass of oak leaves driven by the wind to this hiding-place or else put there by the farmer in the fall. One lump of ice about the size of a man’s fist had been very hard to dislodge from the rose bushes and as it was brought out by the teeth of our iron rake we picked it up to show to some interested bystanders and to our surprise, and theirs also, we found a number of the small orange-colored beetles usually called lady-birds closely imbedded in this icy prison.

Breaking off a part of the lump which held a half dozen or more of the tiny beetles, we carried it into the house and allowing it to melt in our hands we were surprised to find the lady-birds slowly begin to come back to life and its pleasures. They seemed at first as stupid and drowsy as any other mortals when just aroused from a heavy sleep, but in an hour’s time they were flying about the room and finally all gathered on the window where the sunshine was streaming in with greatest light and warmth. 32

The children who had at first mourned over the supposed death of these special insect pets of children were never tired of telling the story afterward of how “the lady-birds could freeze to death all winter and then wake up and fly in the springtime.”

Mary Catherine Judd.

CHERRY AND I.

No one knows where the alder boughs lean,
And the willow dips its head,
And the whitest pebbles sleep and dream
In their sandy, wave-washed bed.
Where the mosses creep o’er fallen trees,
As softly asleep they lie,
Lulled by the drowsy hum of bees—
No one but Cherry and I.

No one knows how the cardinal flower,

Velvety, gorgeous and tall,
Was ’prisoned fast in a virgin bower
Of golden thread for a thrall,
That the dodder spun one summer day,
When only we two were nigh;
No one else saw—so no one can say—
No one but Cherry and I.

No one knows where the blue-berries hide,
In the fern beds, thick and green,
Where the mossy floor is soft and wide,
And the sunlight sifts between
Layers of leaves, in the roof o’erhead,
With never a glimpse of sky;
Where the trillium’s cup is the wild bee’s bed—
No one but Cherry and I.

No one knows where the oriole’s nest
Swings by a silvery thread,
Backward and forth by the wild grape pressed,
That drops from the boughs o’erhead.
Where we find the first wild strawberry,
No one could tell, should they try:
For a chestnut heifer is Cherry,
And a country milkmaid, I.

—Elizabeth Walling.

STARFISHES.
FROM COL. CHI. ACAD. SCIENCES.

First row:
Asterias ochracea (California.)
Asterias vulgaris (Massachusetts.)
Second row:
Asterias forbesii (Rhode Island.)
Asterias forbesii (Massachusetts.)
Third row:
Nidorella armata (Panama.)
Asterina miniata (California.)

STARFISHES.

One of the most unique and interesting branches of the animal kingdom is that division called by scientists Echinodermata, comprising animals familiarly known as starfishes, sea urchins, sand dollars and sea cucumbers. So far as is known no member of this group of animals has ever ventured on land or into fresh water. All are inhabitants of the ocean and are found from the tide-washed shore to the abysses of the sea.

The present article deals with the true starfishes (Asteroidea) and a good idea of the general structure may be gained by a careful examination of a specimen of the common five-finger (Asterias vulgaris) so common on the New England coast. It is made up of a central disk or body, from which extend five rays or arms, whence the name starfish. The animal is protected by a hard framework or skeleton, composed of many limestone plates, attached by a tough membrane and covered with a skin. Between these plates there are many small openings through which the water enters the body cavity. The plates are armed with numerous spines, attached by a ball and socket joint. Some of these spines bear little pincer-like organs called pedicellariæ, which are capable of considerable movement. Many of these little organs are arranged in groups about the spines, which swell at the point of attachment to the surface of the starfish, thus forming a shelf or base, around which these organs arrange themselves in the form of a wreath, the spine projecting high above the center. The exact function of these little organs is not known, although they have been seen to catch small animals, such as crustacea, and this is probably one of their duties.

The lower or actinal surface of each arm is deeply channeled and perforated by many holes or pores, through which the little ambulacra or water-feet are thrust. These serve as organs of locomotion, of respiration and of perception. These water-feet form a part of the wonderful water-vascular system, which consists of a madreporic body, or sieve-like organ, opening on the dorsal or actinal surface and situated between two rays. It opens into a tube called the stone canal, which enters a circular vessel called the circum oral water tube, surrounding the mouth, and a long radial canal, to which the water-feet are attached, opens from this tube and extends along the inner surface of each ray. The water enters the madreporic body, circulates through the stone canal, the circular and radial tubes, and finds its exit through the ambulacra. The water system is directed and controlled by a set of nerves, extending from a ring of nerve matter surrounding the mouth.

The true vascular or blood system consists of a heart or hæmal canal, which runs parallel with the stone canal from the madreporic body to the oral water tube. A set of circular and radial vessels supplies every part of the animal with the vital fluid.

The digestive system is simple and consists of a mouth, a stomach, which is large and sends a lobe into the base of each arm, and an intestine of greater or lesser length, ending in a small anal opening on the dorsal surface. The cœca or liver consists of two long, tree-like masses, nearly filling each ray and connecting with the stomach by a short duct.

Starfishes are very destructive to the oyster beds along the Atlantic coast of the United States, thousands of bushels of oysters being destroyed in a few days by them. The little starfishes attack the young oysters and as the former increase in size they move about in vast numbers, resembling in this respect the grasshoppers and locusts of the west and being fully as destructive. In a paper in a Bulletin of the United States Fish Commission, by

Henry C. Rowe, it is stated that in 1882 $90,000 worth of oysters were destroyed in six months and $9,000 were spent in the same period in catching the starfishes. The method of catching these animals is interesting. Devices called “tangles” and “mops” are used. These consist of a heavy iron frame, to which about twenty small ropes, ending in a large bunch of cotton waste, are fastened. These “mops” are drawn over the oyster beds and the starfishes become entangled in the waste and are then drawn on board the vessel. As many as 1,500 starfish have been taken from a single “mop.”

The following account, published in the Evening Register, of New Haven, Conn., April 3, 1884, will serve as an example of the destructive habits of these animals: “It was reported yesterday that between November 1, 1883, and the close of navigation in December, there were caught on oyster beds adjoining the Bridgeport public beds about 15,000 bushels of starfish. Since October 1 they have destroyed over 900 acres. From six to ten steamers have been catching starfish during the past six months, at an expense of $5,000.”

When oystermen first knew of the destruction caused by the starfishes, they spent much time and labor in collecting the injurious animals, cutting off an arm or two and then throwing the mutilated body and dismembered arms back into the water, not knowing that the arms would grow out again. The animals are now collected and used as a fertilizer. The interesting power of reproducing lost arms is well illustrated on the plate, the individual figured having one perfect arm and four new ones just starting to grow.

The method of eating among some of the common starfishes is curious. When the shell of an oyster is too large to be swallowed, the starfish actually projects its stomach from its mouth, surrounds the shell with this everted organ, and digests its prey in this position. The sight presented in an aquarium by a number of these animals in this attitude is truly wonderful and odd. Another interesting performance of a member of this group is that of righting itself when placed on its back. This is performed in the following manner: One or more of the rays is twisted about until the sucking feet get a firm hold on the ground or the object upon which it is resting; this is followed by a succession of similar movements farther back in the row of ambulacra, so that the whole ray is finally twisted around and lies flat on the ground. The other arms then turn in a similar manner and the starfish is soon “right side up.”

Though hidden away in dark corners of the sea, the starfish is able to see, being quite well supplied with visual organs. The end of each ray is slightly turned up and at its summit is situated a little red eye. A long nerve

extends from this eye-spot to the ring of nerve matter which surrounds the mouth.

The Atlantic and Pacific coasts abound in several species of interesting starfishes, several of which are illustrated on the plate. The most numerous of these is the common five-finger (Asterias forbesii), found abundantly on the shores of the New England states. This animal loves to hide among the rocks and seaweed, and a search at low tide will always reveal a host of them. Along the sandy shores of Narragansett Bay they may be collected at low water among the seaweed, where they feed upon bivalve mollusks, such as cockles, arks and clams.

One of the largest and handsomest of the starfishes is the Giant Mountain Starfish (Oreaster reticulatus), so common in the waters of the Bahama Islands. This species attains a diameter of fifteen or sixteen inches and is very high in the center. Its upper surface is reticulated by the crossing of the hard parts of the skeleton, and beautiful ornaments may be made by removing the softer parts and leaving only the skeleton, which forms a peculiarly latticed framework. This species is found on both sides of the Atlantic ocean; it is a common starfish in the West Indies, inhabits the coast of the United States from Florida to South Carolina and is abundant on the shores of the Cape Verde Islands.

The most common starfish of the Pacific coast is the Ochre-colored Starfish (Asterias ochracea), which ranges from Sitka, Alaska, to San Diego, California, the last mentioned locality being one of the best. It is a large species, frequently attaining a diameter from tip to tip of the arms of sixteen inches. When alive it is of a rich ochre color or brown, and the surface is beautifully reticulated by numerous club-shaped spines arranged in rows. This species is as much an enemy to the oysters of the Pacific coast as is the common five-finger to those of the Atlantic coast.

Another common starfish of the coast of California is the Vermilion Starfish, which may be collected by thousands at San Diego and Monterey. The body is very broad and the rays short and wide. It is in shape quite suggestive of the foot of a pelican or duck. The upper surface is beset with small, heavy spines, which are arranged in little festoons on the five rays. Its name is very appropriate, for it is of a rich vermilion color, varying from this to rose, yellowish or purple.

A starfish of peculiar design and startling aspect is the Armed Starfish (Nidorella armata), which is an inhabitant of the warm waters of the Isthmus of Panama. It is like a star in form, the rays being short and wide. The edge is bordered by large, squarish plates and the upper surface is marked by many little holes, giving it the aspect of a fine sieve. But the most peculiar ornamentation and the character from which the species derives its name is the row of long, cornucopia-shaped spines which extend along the center of each ray from the tip to the center of each disk. Besides this regular row of spines there are several projecting from the surface of the starfish between the rays. Taken as a whole, the dorsal surface is not unlike a miniature African shield.

During the past twenty years many interesting and curious forms of starfishes have been dredged by the United States Fish Commission Steamer Albatross, in deep water, off the eastern coast of America. Some of the species were the common forms found along the shore, such as the common five-finger (Asterias vulgaris), which ranges from low water to two hundred eight fathoms. But the majority were species new to science, which were brought up from a maximum depth of two thousand three hundred sixty-nine fathoms, a depth of about three miles.

One can hardly realize the difficulties attending the gathering of these animals from such a depth. Let us imagine that a dredge is dropped from the top of the Masonic Temple, in Chicago, a height of about two hundred and seventy feet, and drawn along the street to catch such insects, mollusks and other life as might be there. It is manifest that only a small percentage of the fauna would be represented by such a method. The depth mentioned is only forty-five fathoms, and if there is difficulty in securing a representative collection for this moderate distance, what must be the almost insurmountable obstacles when that distance is multiplied fifty times. With all these difficulties, however, the animals of the abysses of the ocean are being collected and classified.

Frank Collins Baker.

THE FIRE-WEED OR GREAT WILLOW-HERB.

(*Chamaenerion angustifolium.*)

Scattered throughout the world, but more abundant in the temperate regions of America, there are three hundred and fifty species of plants that are closely related and grouped by the botanist as the evening primrose family. By him this family is called the Onagraceæ, possibly derived from two Greek words, meaning wine and a hunt or eager pursuit. The Greek name is supposed, by some authorities, to have been applied to a plant a portion of which when eaten would develop a taste for wine. Even now the roots of some species are used in scenting wine. The word may also be derived from the Greek word meaning the ass, and used here because many of the species bear elongated, erect and pointed leaves resembling the ears of that animal.

This family includes a number of interesting plants. Here are classed the fuchsias or ladies' eardrops, of which there are many brilliant varieties under cultivation as house plants. These are natives of the mountain regions from Mexico southward. Another cultivated plant is the Clarkia, a native of Oregon and California.

Among the more common wild species are the evening primroses, the willow-herbs and the enchanter's night-shade, named Circaea in honor of Circe, the enchantress. Why Linnæus should have chosen this plant with which to honor Circe is difficult to understand, for the Circaea is an insignificant plant of the woods.

The Fire-weed is one of the most interesting of the wild members of the family. It is abundant in dry fields and

along roadsides throughout that portion of North America lying north of North Carolina, Kansas, Arizona and California. With its spike-like racemes of rather broad purple or sometimes white flowers, it beautifies many waste places from the Atlantic to the Pacific coast. A plant of the Fire-weed is a continuous bouquet, for it blossoms from June to October. The flowers are followed by attractive fruits which are long and slender and when ripe split into four sections, thus releasing the numerous seeds which have a tuft of long cottony hairs by means of which they are wafted by the wind to long distances. Many of these seeds fall where the conditions are not favorable for growth, but they retain their vitality for a long time.

The Fire-weed is a plant of the open country and not of the forest. It must have a great deal of sunshine. When its seeds fall in the deep shade of a dense forest, where the rays of the sun penetrate but a short distance if at all, they cannot grow. But let the woodman or a fire lay low or destroy the noble growth of trees, then there is soon a transformation—the landscape is enlivened by the bright flowers of the Fire-weed. Where the northern coniferous forests have been burned, it is not an uncommon sight to see a Fire-weed plant, from six to ten feet tall, with its broad top of flowers closely contrasted with the blackened remains of a forest monarch. The Fire-weed is an excellent illustration of the perfect provision that is found in Nature for the perpetuation of the species. Its seeds are distributed by both animate and inanimate forces. They are dropped on both favorable and unfavorable soil. If on the latter, their structure is such that the little embryo plant within the seed can lie dormant for a long time. The deep forest is an unfavorable soil for the seed of the Fire-weed, but remove the trees and it can find no better home.

SEA OR MARSH PINK.
(Sabbatia stellaris).
FIRE-WEED.
(Chamaenerion angustifolium).
FROM "NATURE'S GARDEN"

THE SEA OR MARSH PINK.

(*Sabbatia stellaris.*)

The Sea or Marsh Pink, or the Rose of Plymouth, as it is frequently called, is a member of the beautiful gentian family. The genus Sabbatia, a name adopted in honor of an Italian botanist, includes about fourteen species, all natives of eastern North America and Mexico.

Our illustration is taken from "Nature's Garden" and Neltje Blanchan, its author, writes as follows regarding those species of the marsh pinks that are confined to the vicinity of the Atlantic ocean: "Three exquisite members of the Sabbatia tribe keep close to the Atlantic coast in salt meadows and marshes, along the borders of brackish rivers, and very rarely in the sand at the edges of fresh-water ponds a little way inland. From Maine to Florida they range, and less frequently are met along the shores of the Gulf of Mexico so far as Louisiana. How bright and dainty they are! Whole meadows are radiant with their blushing loveliness. Probably if they consented to live far away from the sea, they would lose some of the deep, clear pink from out their lovely petals, since all flowers show a tendency to brighten their colors as they approach the coast.

"The Sea or Marsh Pink, whose graceful alternate branching stem attains a height of two feet only under most

favorable conditions, from July to September opens a succession of pink flowers that often fade to white. The yellow eye is bordered with carmine. They measure about one inch across, and are usually solitary at the ends of branches, or else sway on slender peduncles from the axils."

This plant is frequently called the American Centaury, but it is not the plant of which Pliny wrote these words: "Centaury, it is said, effected a cure for Chiron (the Centaur), on the occasion when, while handling the arms of Hercules, his guest, he let one of his arrows fall upon his foot: hence it is said that by some it is called 'Chironion.'" Botanists are practically agreed that the plant mentioned by Pliny was a species of the genus Centaurea, so well represented in this country by the bachelor's-button of our gardens.

THE WORLD.

Great, wide, beautiful, wonderful World,
With the wonderful water around you curled,
And the wonderful grass upon your breast—
World, you are beautifully drest!

The wonderful air is over me,
And the wonderful wind is shaking the tree;
It walks on the water, and whirls the mills,
And talks to itself on the top of the hills.

—John Greenleaf Whittier.

THE WATER OUSEL.

Washington state can boast of possessing many beautiful birds. Their beauty consists not only in bright and brilliant plumage, but also in sweetness of song. The old favorites are here; those whose liquid notes are so familiar and so dear to every American ear. There are the yellow-vested meadow lark, robin red breast, the blue bird, black bird, linnet, cat-bird, and a great many little warblers whose names I cannot mention. Ah! there is Miss Jennie Wren, for whose sake Sir Cruel Sparrow "with his bow and arrow," slew Mr. Cock Robin. Then we have Mr. Wee Tomtit. Of course we have the-ever-to-be admired humming bird.

Of other birds whose plumage is not noted for its brilliancy, and whose notes are not melodious, we might mention the ebony-hued crow, the noisy yellow-hammer (or flicker), the impudent magpie, the harsh-voiced blue jay, the intrusive kingfisher and the loud-whirring night jar. But the list would be too long should we attempt to enumerate all the birds, great and small, whose home is in Washington.

However, I must not omit from the list the lively little Water Ousel. This bird is not numerous in this state. In fact, the Ousel is quite scarce. It is found nowhere else but along small water courses. Along only a few of the streams is the Ousel met. One of the favorite streams along which this little creature lives is Kettle river, which flows through Stevens county, and empties into the great Columbia. A few may be seen along Colville river at certain times, generally during the summer and early fall months. This bird is not noted for its power of song, nor yet for its beauty of plumage. But withal, the Water Ousel is an interesting and attractive bird.

The Water Ousel of eastern Washington is nearly as large as the ordinary field robin. Its body is short and plump. The tail is short and broad. Though much larger, the Ousel reminds one of the little wren. Of course the color is not the same; but an Ousel looks like an "enlarged wren." Their bodies are similar and also their actions.

As to color, the Ousel is a brownish-black, dark snuff hue. The plumage of the male is much brighter and more pronounced than that of the female. In some of the males, the color is of a darkish-blue and almost as glossy as that of the male blackbird.

Grace and sprightly action characterize the Water Ousel. It is as quick as a flash. The bird never deserts the stream. No difference how attractive may be the wooded banks, it does not lose itself in the sylvan depths.

Along the pebbly and sandy margin it makes its home. If disturbed, or suddenly frightened, the Ousel will flit up or down the stream. Sometimes the bird will wing its way to the opposite bank. It delights in the water, and spends hours in wading about and seeking its food among the pebbles and sand. The cute little fellow bathes almost constantly. Every few minutes it will dip its plump little body under the water, and then shake its feathers.

The bird is always cheerful and full of action. Never for an instant is the Ousel at rest. It is always on the move, uttering its short, plaintive chirp. The Ousel is not wild, nor even timid. Occasionally one can approach within a few yards and the little chap will eye you sharply in a half saucy way, very much like a starling. If you come nearer, he is off in a twinkle. Whenever the bird alights it invariably takes a dip in the water, chirping gaily to itself.

These birds are rarely seen in pairs except during the mating period. I have never yet been able to discover an Ousel's nest, but those who have made a close study of the habits of this interesting bird claim that they build their nests in the banks, burrowing for that purpose a small hole.

TOBACCO.

(*Nicotiana tabacum* L.)

Pernicious weed! whose scent the fair annoys,
Unfriendly to society's chief joys.
The worst effect is banishing for hours
The sex whose presence civilizes ours.
Thou art indeed the drug a gardener wants
To poison vermin that infest his plants.

—Cowper: Conversation, line 251.

The tobacco plant is a tall herbaceous annual with large simple leaves and terminal inflorescence, belonging to the nightshade family (Solanaceæ), the members of which resemble each other in that they are more or less poisonous and in that they have a disagreeable, nauseous, heavy odor.

There are several species of tobacco, of which the above is the most highly valued, and they are all natives of warm countries, as southern Asia, India, South America and the West Indies. Tobacco is very extensively cultivated in nearly all warm countries, especially in the southern United States and the West Indies.

The history of the cultivation and use of tobacco is shrouded in uncertainty. Some authorities affirm that it was extensively used for smoking and as snuff and cultivated on a large scale in China, many centuries before the discovery of America. Meyen, the botanist, in studying ancient Chinese sculptures noticed the same form of pipe in use at the present time. Even if this be true, and the statement is questioned by other authorities, the fact nevertheless remains that tobacco was unknown to Europeans until after the discovery of America. Columbus found that the natives of the West Indies smoked cylindrical rolls of tobacco leaves wrapped in maize leaf, to which the name "Tobako" was applied. This name was also given to the tobacco tubes used by the ancient Mexicans. That tobacco was employed since the remotest antiquity by the natives of the western continent, from South America to Canada, has been satisfactorily proven from the examination of burial mounds. In 1492 the natives of Cuba used tobacco for smoking, both as a narcotic stimulant and to drive away mosquitos, as snuff and as a medicine.

The monk Romano Pane, a companion of Columbus, gave the first description of the plant. Gonzalo Hernandez de Oviedo was the first to bring seeds to Spain, where tobacco was cultivated as an ornamental plant until Nicolo Menardes began to extol its medicinal virtues. Soon thereafter it began to be used for smoking and as snuff. Shakespeare makes no reference to the use of tobacco, though it was well known in England during his time. The price was very high and it was used in small quantities by the rich only. The pipes used for smoking tobacco were very small and are known to antiquaries as "elfin pipes." The smoke was expelled through the nostrils and not the mouth, as this produced the most pronounced narcotic effect.

It seems that from the very first strong efforts were made to prevent the use of tobacco, excepting as a medicine. Popes Urban VIII and Innocent XI issued bans without effect. Priests and the sultans of Turkey declared smoking a crime; Sultan Amuret IV decreeing its punishment by the most horrible death. In Russia during the earlier part of the seventeenth century the noses of smokers were cut off. King James I of England issued a "Counterblaste to Tobacco" in which he described its use as "a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black, stinking fume thereof nearly resembling the horrible Stygian smoke of the pit that is bottomless," to which all users of the weed are condemned. All opposition was of no avail and the use of tobacco has increased steadily up to the present time, and is still on the increase in spite of all boasted civilized progress. Turks and Persians are the greatest smokers in the world. In India all classes and both sexes smoke; likewise in China and Japan. When it was found that even the most cruel death penalty did not prohibit, efforts were made to check its use, and to this effect some ridiculous laws were made. For example, according to a Puritan Blue Law it was a criminal offense to smoke within ten miles of any habitation. Yet it will be recalled that tobacco was extensively cultivated in the colonies, and history informs us that England sent shiploads of "fair maidens" to America to be bartered for with tobacco leaves. Each eligible Puritan planter had the privilege of choosing a maiden who became his property in exchange for from forty to as much as ninety pounds of good tobacco. This barter is referred to in the opening chapters of that interesting novel "To Have and to Hold," by Mary Johnston.

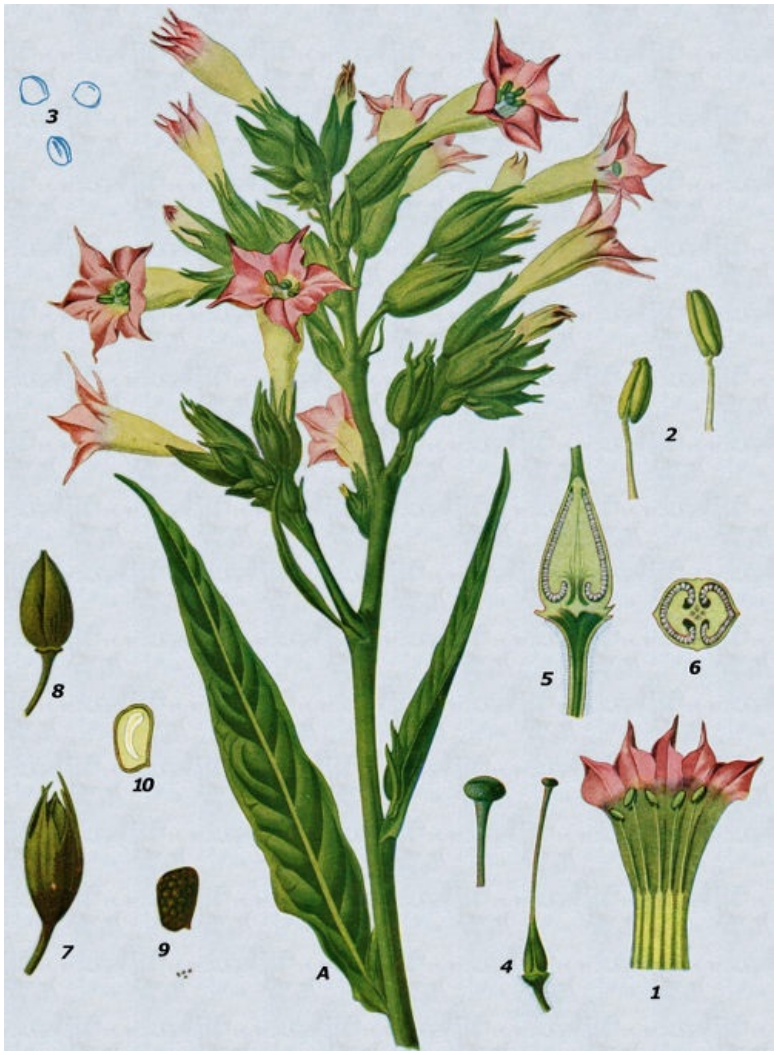
Historically it is stated that Francis Drake, and Sir Walter Raleigh the gallant favorite of Queen Bess, introduced the custom of smoking into England. One day a servant on entering the study in which Sir Walter was quietly smoking, believing his master on fire, rushed forward and dashed a bowl of water over him. It is also stated that Sir Raleigh made a wager that he could give the weight of the smoke made from a pipe full of tobacco. He carefully weighed the tobacco before putting it into the pipe, smoked it, and then weighed the ash; the difference he said was the weight of the escaped smoke. The wager was, however, not justly won, as Raleigh did not take into consideration the oxygen of the air which entered into chemical union during smoke formation.

Tobacco requires rich soil and careful cultivation. The seed is sown in a hotbed or in a sheltered place in the open. The plants are set from April to June. The ground is carefully tilled, freed from weeds and the plants watched for cut worm and the big green tobacco worm, which are very destructive. Worms and eggs must be removed and destroyed. To increase the size of the leaves and hasten maturity, the flowering tops are broken off. When the leaves are matured, which is indicated by a yellowish mottling, the plants are cut off close to the ground, fastened

in groups of six to eight and dried. Drying must be done carefully, as upon this depends the aroma of the tobacco. The leaves are also taken from the stalks and dried. In either case they undergo a “sweating process,” which must be carefully regulated. According to recent observation the sweating process, which develops the aroma, is initiated by microbes and that the special aroma of each brand or culture variety of tobacco is the result of the action of a certain species of microbe. German scientists have succeeded in developing the flavor or aroma of Havana tobacco in tobacco raised in Germany by adding the sweating microbe of Havana tobacco. Further experiments in this line are in progress.

At the present time tobacco is cultivated on an enormous scale, the United States producing more than all European countries put together. Southern England is well suited for tobacco growing, but since 1660 it has been unlawful to grow tobacco for use, because of a statute then passed in favor of the American colonies, which law, remarkably enough, has not been repealed. The West Indies produce enormous quantities of highly prized tobacco, the Havana tobacco and cigars having a worldwide fame for delicacy of aroma.

Tobacco is prepared for use in various ways. The leaves are more or less finely cut for smoking, powdered for snuff, pressed into various forms for chewing and rolled into cylinders for smoking. The leaves may be used pure or flavored with different substances, as licorice, syrup and molasses. Tobacco is also extensively adulterated with other leaves, as cabbage, cherry, peach, carrot, beet, etc. The very poor employ various substitutes, as red clover heads, dried corn silk, various leaves, even finely cut hay. Enterprising boys may be seen smoking dried cornstalk pith, twigs of the grape vine and other porous plant branches.



TOBACCO.
(Nicotiana tabacum).
FROM KŒHLER’S MEDICINAL-PFLANZEN.

Description of Plate: *A*, flowering stem; 1, floral parts; 2, stamen; 3, pollen; 4-8, ovary and pistil; 9, 10, seed.

The price of crude tobacco and prepared tobacco varies greatly, depending upon the quality, judged by the delicacy of the aroma, the quality of the leaf and the manner of preparation. Some flavors are not the result of the sweating or curing processes, nor yet due to the quality or variety of the tobacco, but to foreign substances added or to the modification of the curing method. The peculiar flavor of the so-called “Latakia tobacco” is due to the smoke made of the wood of a pine (Pinus halopensis), to which it is exposed for several months. This tobacco is said to consist largely or wholly of the flowering tops and even the seed bearing capsules. In the manufacture of cigars and better grades of smoking and chewing tobacco the mid-ribs are removed, but are not thrown away, but generally added to the cheaper grades of smoking tobacco and snuff tobacco. Crude as well as prepared tobacco is subject to deterioration after curing. For example, Havana cigars pronounced of excellent quality on leaving the factory will deteriorate in flavor and aroma after having been stored for some time. This is supposed to be due to

the development of a microbe producing a different aroma.

No substance, whether animal, vegetable or mineral has been the cause of so much discussion and variation of opinion as to its utility as tobacco. As one extreme may be mentioned an eminent older botanist who questioned the desirability of the discovery of America by Columbus because as a result was introduced into the civilized world this poisonous weed. Others again cannot find words suitable to laud its virtues, considering it a plant especially created for the benefit and pleasure of man, without which life would be dull and profitless. Similar differences of opinion exist today. To get a reliable opinion on the value of tobacco one must not take the fanatical rantings of those who believe every crime is to be laid to the use of tobacco, nor yet the addle-brained vaporings of those whose systems have been for years steeped in nicotine and the oil of tobacco. As an example of the latter may be cited Kipling's poem, "To My Lady Nicotine."

The use of tobacco may be summarized as follows: Tobacco contains a very powerful poison, nicotine, named after Jean Nicot, the French ambassador to Spain, who was instrumental in introducing the plant in Spain and France. Further, it contains oil and odoriferous volatile substances. To one not accustomed to the use of tobacco even very minute doses of nicotine (1-7 gr.) produces severe symptoms of poisoning, accompanied by very depressing nausea, vomiting, feeble pulse, muscular weakness, extreme pallor and cold sweat; in brief, there is an "all gone" feeling. As a rule the system recovers quite rapidly from the awful depression. A tolerance to the effects of tobacco is readily established, as all who are addicted to its use can testify. I have seen a tobacco chewer swallow the entire quid without any noticeable ill effects.

All unprejudiced authorities are agreed that the habitual use of tobacco acts injuriously upon the system, no matter in what form or manner it is used. It is stated that there is no nicotine in tobacco smoke, that is during the combustion the nicotine is changed chemically, but it is nevertheless true that there are more or less poisonous gaseous compounds in the smoke. Not only is the tobacco habit injurious to the system, but it is also nasty and filthy. The tobacco stench not only permeates the clothing, but also the entire system, the breath and the atmosphere about the users of tobacco. While all tobacco habits are filthy, there are degrees of filthiness. "Snuff dipping," which is extensively practiced by men and women of the poorer classes of the south, is unquestionably the most filthy habit. A stick moistened with saliva is dipped into snuff tobacco and rubbed on gums, teeth and tongue. Next in filthiness is the old fashion of putting snuff into the nostrils; a habit which we are pleased to note is rapidly dying out. Next follows the chewing habit, which is very extensively practiced by laborers, with whom smoking is inconvenient or forbidden; as sailors. I remember an inveterate user of tobacco who smoked and chewed at the same time; he kept a quid in his mouth during his meals and took a big mouthful just before retiring. The breath of tobacco chewers is sickening, and the discolored teeth and tobacco stained mustache and beard is disgusting to behold, to say nothing of the filthy expectoration. Of the various forms of smoking the cigarette habit is the most disgusting and the most injurious. Cigarettes are extensively smoked by young boys, and those who continue on a large scale become physical and mental weaklings and criminals. Pipe smoking, as already indicated, dates back to remotest antiquity. Pipes with short stems are more injurious because more poisonous volatile substances are inhaled. The long stemmed pipes of German students are less injurious. In a short time the bowl of the pipe becomes saturated with tobacco oil and emits a horrible stench. Cigar smoking is usually considered less vulgar and less disgusting than smoking a pipe, but there is certainly nothing more disagreeable to the nostrils than the conglomerate stench from a poor cigar. The well diluted aroma from a good cigar is very pleasant at a distance.

The injurious effects resulting from the continued habitual use of tobacco may be summarized as follows: If the habit is begun very early in life (five to ten years) the mental, moral and physical development is checked or stunted. At all times the habit is apt to produce chronic dyspepsia; the heart's action is weakened; there will be palpitation, irregularity of beat and sooner or later there is fatty degeneration; that is, there are a series of changes in the heart designated as "tobacco heart." Those with tobacco heart cannot undergo the usual hardships and they are more apt to succumb to disease. The optic nerve and retina are acted upon, producing weakness and dimness of vision known as "tobacco amblyopia," which may result in total blindness. The mental powers are lessened; there will develop various neuroses, twitchings, tremblings of hands, etc. One of the most common results is "smokers' sore throat," which cannot be cured unless the use of tobacco is discontinued.

Medicinally tobacco is but rarely used now. With non-smokers it is useful to relieve asthma. Formerly it was quite extensively employed in spasmodic affections and in parasitic skin diseases. Tobacco will be excluded from the next issue of the United States Pharmacopœia.

A few words in regard to anti-tobacco and anti-cigarette crusades. They are too generally conducted by those who in their efforts approach the fanatical and who are greatly lacking in scientific learning and who therefore cannot present the subject in a rational and effective manner. If parents will set a good example and teach the true injurious effects of tobacco and tobacco habits to their sons and daughters, they will in all probability not be tempted to use tobacco. All children need careful watching by intelligent parents in order to keep them from acquiring bad habits. This does not apply more nor less to a possible acquisition of the tobacco habit than to any other habit. An illy fed, neglected boy, who is allowed to roam the streets and gutters, who chooses his own companions and who never receives any good advice or kind words from any one, will very likely learn to smoke, besides acquiring other bad habits.

ALBERT SCHNEIDER.

Among the beautiful pictures
  That hang on memory's wall,
Is one of a dim old forest,

That seemeth best of all.

—Alice Carey

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