VARIOUS

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THE OLD YEAR

Ring out, wild bells, to the wild sky,
The flying cloud, the frosty light:
The year is dying in the night;
Ring out, wild bells, and let him die.

Ring out the old, ring in the new,
Ring, happy bells, across the snow:
The year is going, let him go;
Ring out the false, ring in the true.

Ring out the grief that saps the mind,
For those that here we see no more;
Ring out the feud of rich and poor,
Ring in redress to all mankind.

Ring out false pride in place and blood,
The civic slander and the spite;
Ring in the love of truth and right,
Ring in the common love of good.

Ring out old shapes of foul disease,
Ring out the narrowing lust of gold;
Ring out the thousand wars of old,
Ring in the thousand years of peace.

Ring in the valiant man and free,
The larger heart, the kindlier hand;
Ring out the darkness of the land,
Ring in the Christ that is to be.

– Alfred Tennyson.

THE WHITE-WINGED CROSSBILL
(*Loxia leucoptera.*)

The Crossbills, together with the finches, the sparrows, the grosbeaks, the redpolls, the goldfinches, the towhees, the cardinals, the longspurs, and the buntings, belong to that large family of perching birds called the Fringillidae, from the Latin word Fringilla, meaning a finch.

Mr. Chapman tells us, in his "Birds of Eastern North America," that "this, the largest family of birds, contains some five hundred and fifty species, which are represented in all parts of the world, except the Australian region. Its members present a wide diversity of form and habit, but generally agree in possessing stout, conical bills, which are admirably adapted to crush seeds. They are thus chief among seed-eaters, and for this reason are not so migratory as insect-eating species." Many of the birds most highly prized for the cage and as songsters are representatives of this family and many of the species are greatly admired for their beautiful coloring. The White-Winged Crossbill is a native of the northern part of North America, migrating southward into the United States during the winter months. Its technical name, Loxia leucoptera, is most appropriate and descriptive. The generic name Loxia is derived from the Greek loxos, meaning crosswise or slanting, and the specific name leucoptera is from two Greek works, meaning white and wing, and has reference to the white tips of the feathers of the wings. The common name, Crossbill, or, as the bird is sometimes called, Crossbeak, describes the peculiar structure of the bill which marks them as perhaps the most peculiar of our song birds. The bill is quite deeply cut at the base and compressed near the tips of the two parts, which are quite abruptly bent, one upward and the other downward, so that the points cross at an angle of about forty-five degrees. This characteristic gives this bird a parrot-like appearance. The similarity is heightened by the fact that these hook-like bills are used by the birds to assist in climbing from branch to branch.

The Crossbills are even parrot-like in captivity. Dr. Ridgway, in the "Ornithology of Illinois," writes as follows regarding the habits of a pair: "They were very tame, and were exceedingly interesting little pets. Their movements in the cage were like those of caged parrots in every respect, except that they were far more easy and rapid. They clung to the sides and upper wires of the cage with their feet, hung down from them, and seemed to enjoy the practice of walking with their head downward. They were in full song, and both the male and female were quite good singers. Their songs were irregular and varied, but sweet and musical. They ate almost every kind of food, but were especially eager for slices of raw apple. Although while they lived they were continually bickering over their food, yet when the female was accidentally choked by a bit of egg shell her mate was inconsolable, ceased to sing, refused his food, and died of grief in a very few days."

Their peculiar bills are especially fitted for obtaining their food, which consists to a great extent of the seeds of cone-bearing trees, such as the pine, the hemlock and the spruce. The ornithologist Wilson says: "On first glancing at the bill of this extraordinary bird one is apt to pronounce it deformed and monstrous; but, on attentively observing the use to which it is applied by the owner and the dexterity with which he detaches the seeds of the pine-tree from the cone and from the husks that inclose them, we are obliged to confess on this, as on many other occasions where we have judged too hastily of the operations of nature, that no other conformation could have been so excellently adapted to the purpose; and that its deviation from the common form, instead of being a defect or monstrosity as the celebrated French naturalist insinuates, is a striking proof of the wisdom of the great Creator."

As an accidental malformation this structure of the bill has been noted among other birds, and, it is said, with some frequency among the crows. A mediaeval legend gives as the cause for this conformation of the bill and the red color of the plumage that it was acquired "in recognition of the pity it bestowed on the suffering Savior at the Crucifixion."

Probably due to the nature of their food, which can usually be procured in any season, these birds are apparently not under the control of the usual laws that govern migration, but wander about in a seemingly aimless manner and are not influenced to any great extent by the changing seasons. They do not seem to be a constant inhabitant of any given locality for any length of time, but appear and disappear as if constantly dissatisfied with their surroundings.

The two sexes vary in color, the body of the male being a dull carmine-red, which is brighter on the rump, and that of the female is brownish, tinged with olive-green and with brownish yellow on the rump. The young males are similar in color to the females, but pass through a changeable plumage while maturing.

The Crossbill usually builds its nest in a cone-bearing tree and does not always choose the most inconspicuous locality. The nest is generally constructed of rather coarse twigs and strips of birch or cedar bark and lichens. This is lined with hair, the softer fibers of bark, fine rootlets, grass and feathers. The whole nest is saucer-shaped and about four inches in diameter, outside measurement, by one and one-half in depth. Authorities tell us that the eggs are usually three in number. In color they are a pale blue, nearly spotless at the smaller end, but at the larger end marked with irregular streaks or dots of lavender or reddish-brown. The eggs are small, about eight-tenths of an inch long by nearly six-tenths in diameter.

On account of their vagrant habits, Dr. Brehm was wont to call them the “Gypsies” among birds. While seeking food or flying from place to place, they continually utter a plaintive note and their song is soft and sweet.

THE LEGEND OF THE CROSSBILL

On the cross the dying Saviour
Heavenward lifts his eyelids calm.
Feels, but scarcely feels, a trembling
In his pierced and bleeding palm.

And by all the world forsaken,
Sees he how with zealous care
At the ruthless nail of iron
A little bird is striving there.

Stained with blood and never tiring,
With its beak it doth not cease,
From the cross 'twould free the Saviour,
Its Creator's Son release.

And the Saviour speaks in mildness:
"Blest be thou of all the good!
Bear, as token of this moment,
Marks of blood and holy rood!"

And that bird is called the Crossbill;
Covered all with blood so clear,
In the groves of pine it singeth
Songs, like legends, strange to hear.

– From the German of Julius Mosen, Henry Wadsworth Longfellow.

THE STUDY OF BACTERIA

The bacteriologist is working in a wonderland fully as remote to the average mind as that ever occupied by the astronomer or psychologist; and yet it is as real to him as though he were walking through a forest and noting the different kinds of trees. Such popular doubts as have been held regarding bacteriology and even the existence of bacteria are no longer justified. The evidence is too overwhelming not to be accepted by anyone who has sufficient interest to investigate. The methods used in bacteriologic studies are to-day giving us information fully as concise as that obtained by the general botanist in the study of higher plants. Indeed, the phenomena of bacterial activities and the chemistry of the products of growth of many species of bacteria have already received attention not equaled in the study of some of our most useful plants.

Bacteria are plants; not because of any absolute characteristic that separates them from animals, but because comparative study shows that they are more like plants than animals. They are single-celled organisms and each individual has the prime factors of life, assimilation, growth and reproduction. Each bacterium is an independent cell and although the cells in some species remain attached to one another, giving rise to characteristic groupings, they are mostly detached and free individuals. Bacteria can increase in numbers to a remarkable extent when favorable conditions exist. The mother-cell simply splits into two daughter-cells and these form a generation of four cells, while later generations, consisting of perhaps one million cells, can in fifteen or twenty minutes produce two million bacteria. But conditions must be favorable for this active growth, ample food stuffs, free from other bacteria, together with moisture and reasonable warmth are most essential. There are many circumstances constantly at work to prevent an overgrowth of bacteria; exhaustion of food supply, antagonism of species and fresh air with sunshine, are the most important. Bacteria are present everywhere in greater or less numbers, except within the bodies of healthy, growing plants and animals. It is for this reason that bacteria become so active and multiply with great rapidity when once established in the tissue fluids of larger organisms, either before or after they have died. Vital activities during health prevent the entrance of bacteria into our bodies. There are, however, times when the association of different species of bacteria and also the association of bacteria with higher plants is of mutual advantage. The association of decomposition and pathogenic bacteria frequently makes it possible for the latter to infect an animal, when alone it perhaps would not take place. Again, the growth of certain bacteria within the root-structure of plants greatly improves their functional activity. The leguminous plants are enabled to assimilate much larger quantities of nitrogen when associated with bacteria than when growing alone. No such mutually advantageous relationships are known to exist between bacteria and animals; the tendencies are rather destructive, leading to the infectious diseases. The general biologic function of the bacteria is very important and in a general way the need of their existence can be much better appreciated than that of many living beings. Decomposition may be stated as being their chief functional activity. Decomposition stands before life; without it the progress of the generations would terminate. The gradual and ever rapid disappearance of the substance of vegetable and animal bodies after death makes room for growing life. With an absence of decomposition the bodies of plants and animals would collect on the earth and cover it so deeply with organic matter that plants in particular would be entirely unable to obtain requisite nourishment. Higher plants having chlorophyll are able to feed on inorganic material, while bacteria require organic matter to sustain life. Bacterial food is then derived from the higher forms of life, while these higher forms feed on the end products of bacterial decomposition, with the addition of salts from the earth. An evolutionary query might then arise as to the early conditions in the history of organic life on the earth. It is certainly a fertile field for the theorist. Accepting the general rule that simplicity of structure indicates priority, what then was the food supply of the primordial bacterium before the advent of higher plants to supply requisite organic matter? We can hardly believe that there was

already in existence sufficient ammonia-bearing compounds of suitable quality to sustain these lowest organisms until evolutionary conditions added organisms having the capacity of collecting nitrogen and carbon from purely inorganic sources. These general facts, as we now see them, would apparently strengthen the thought that different kinds of organisms became extant at the same time.

The methods used in bacteriologic study are based on a few very distinct principles. Successful cultivation of bacteria depends upon a knowledge of sterilization, preparation of culture media and isolation of species. It is in fact miniature gardening. A rod of platinum wire is the trowel and this is kept clean and free from undesirable organisms by heating it red hot in the gas flame. With it bacteria are lifted from tube or plate. The culture media required are mostly beef-tea and gelatine mixtures and are prepared with extreme care as to their composition and reaction. The decomposition of the culture medium is prevented by keeping it in test tubes or flasks plugged with cotton and sterilized by boiling. By means of the cotton plug the air passing in and out of the tube is filtered and the bacteria floating in the air are caught in the cotton and cannot get into the tube. It also prevents bacteria from the culture getting out of the tube and spreading infectious material. Each test tube represents a little greenhouse, but one that is free from all life; it is sterile when ready for use. To the media or culture soils in the tubes the bacteria are transplanted with the platinum rod, and active growth is obtained by placing the tubes in a suitable temperature. Such a growth of bacteria in a test tube can contain many millions of bacteria, while the resulting appearance of growth is due to the heaping up of the individuals. To the naked eye the cells are invisible, but the mass is recognized in the same way that one would know a field of wheat in the distance without being able to see each separate plant. Species of bacteria are separated by distributing a few organisms throughout a fluid and then planting upon solid media. The individual cells then grow in place and produce colonies. These are separate and distinct to the eye and each contains bacteria, all of the same kind. From colonies transplantations to tube cultures are made, and the species is propagated on different media. The observations from such growths, together with the microscopical study and sometimes inoculation experiments on animals are the data by which the species is recognized. Microscopic methods, although somewhat complicated have been so far developed that some species of bacteria can be as promptly recognized under the microscope as an acquaintance met upon the street.

Bacteriology is now being studied and investigated as a field of research in hundreds of laboratories, and in every university in Europe and America. Bacteriology has added as much to man's wealth and happiness as any of the applied sciences. All the methods of preservation of food depend upon bacteriological principles, while modern sanitary science is based on the recognition of the cause of infectious diseases. The presence of specific bacteria in the secretions or tissues of man and animals is now such a certainty for many diseases that the work of making bacteriologic diagnoses is in itself an extensive vocation. Within the next few years every city in America will have a diagnosis laboratory for infectious diseases. We can safely predict that the trained bacteriologist will be called upon to stand between each sick person or animal and the community to direct measures that will prevent infection of others. Hygienists are learning more every day as to the exact way in which disease bacteria pass from person to person, and the reasons for the occurrence of diseases. They have learned that the accidental and unusual circumstance is least important, but that there is a regular train of cause and effect, and in the knowledge of how to break this chain is the key to the proper control of an epidemic. Veterinary medicine has been able to obtain benefits from bacteriology much beyond those already so important to human medicine. This is so because of the persistent prejudice opposed to bacteriology in medicine, while the veterinarian has been allowed to treat his patients practically as the experiment animals are treated in the laboratory.

Bacteriologists are frequently meeting demands made of their science that are beyond its present stage of progress. It is frequently forgotten that this is biology whose deductions are always subject to the variation of growing things, and not chemistry or mathematics, with their definite determinations and strict limitations. Bacteriology is now an established science, and it is as competent

to render service in due proportion to its development and with the same integrity as any biological subject. There are now many known facts in bacteriology that cannot be made useful because intermediate steps in their study have not been learned. It will require long series of experiments in some cases, but when added to the present usefulness of bacteriology the results may be expected to satisfy the most severe critics.

Adolph Gehrmann.

THE YELLOW-BREASTED FLYCATCHER

"Come here! come here! come here!
My Philip dear, come here! come here!
Philip, my dear! Philip, Philip, my dear!"

Poor mournful Mrs. Flycatcher,
With ample breast of dainty buff,
Now don't you think you've called your mate, —
To say the very least – enough?

I'm sorry for you, plaintive one;
I would be glad to make him fly
From his long tarrying place to you,
If that would stop your weary cry.

Can't you decide to give him up?
All over town you've called his name;
I heard you calling this week, last,
The week before you called the same.

Perhaps some boy with "twenty-two"
Has shot him for his sister's hat.
Go! search the churches through and through;
If he's not there, accuse the cat.

– Carrie B. Sanborn.

THE TOWNSEND'S WARBLER
(*Dendroica townsendi.*)

Dr. Robert Ridgway, in the Ornithology of Illinois, uses the following words in speaking of that family of birds called the American Warblers (Mniotilidae), "No group of birds more deserves the epithet of pretty than the Warblers; Tanagers are splendid; Humming-birds are refulgent; other kinds are brilliant, gaudy or magnificent, but Warblers alone are pretty in the proper and full sense of that term."

As they are full of nervous activity, and are "eminently migratory birds," they seem to flit rather than fly through the United States as they pass northward in the spring to their breeding places, and southward in the fall to their winter homes among the luxuriant forests and plantations of the tropics. All the species are purely American, and as they fly from one extreme to the other of their migratory range they remain but a few days in any intermediate locality. Time seems to be an important matter with them. It would seem as if every moment of daylight was used in the gathering of food and the night hours in continuing their journey.

The American Warblers include more than one hundred species grouped in about twenty genera. Of these species nearly three-fourths are represented in North America at least as summer visitants, the remaining species frequenting only the tropics. Though woodland birds they exhibit many and widely separated modes of life, some of the species preferring only aquatic regions, while others seek drier soils. Some make their homes in shrubby places, while others are seldom found except in forests. As their food is practically confined to insects, they frequent our lawns and orchards during their migrations, when they fly in companies which may include several species. Mr. Chapman, in his Handbook of Birds of Eastern North America, says, "Some species flit actively from branch to branch, taking their prey from the more exposed parts of the twigs and leaves; others are gleaners, and carefully explore the under surfaces of leaves or crevices in the bark; while several, like Flycatchers, capture a large part of their food on the wing."

The Townsend's Warbler is a native of Western North America, especially near the Pacific coast. Its range extends from Sitka on the north to Central America on the south, where it appears during the winter. In its migration it wanders as far east as Colorado. It breeds from the southern border of the United States northward, nesting in regions of cone-bearing trees. It is said that the nest of this Warbler is usually placed at a considerable height, though at times as low as from five to fifteen feet from the ground. The nest is built of strips of fibrous bark, twigs, long grasses and wool, compactly woven together. This is lined with hair, vegetable down and feathers.

The eggs are described as buffy white, speckled and spotted with reddish brown and lilac-gray, about three-fifths of an inch in length by about one-half of an inch in diameter.

THE STORY OF SOME BLACK BUGS

We were going to visit Aunt Bessie, and John and I like few things better than that. To begin with, she lives in the country, and there is always so much to do in the way of fun that the days never seem half long enough.

Then, besides, Aunt Bessie knows everything, and can tell such famous stories. So when she asked us one morning to go to the pond with her and see something interesting, you may be sure we were not slow in following her.

The rushes grew thickly along the sides, but the water was clear, and we could plainly see the black bugs she pointed out to us crawling, slowly and clumsily, over the muddy bottom.

"Those things!" said John, not a little disgusted. "I don't think they are much. Are they tadpoles?"

"Tadpoles!" I echoed. "Why, whoever saw tadpoles with six legs and no tail?"

"The absence of a tail is very convincing," laughed Aunt Bessie. "They are certainly not tadpoles. Now watch them closely, please, and tell me all about them."

"They are abominably ugly. That is one thing," broke in John. "They look black, and have six legs. But how funny their skin is. More like a crust, or lots of crusts laid one on the other. They are about the stupidest things I ever saw. They seem to do nothing but crawl over that mud and – Hello! they aren't so stupid, after all. Did you see that fellow snatch a poor fly and gobble him up quicker than you could say Jack Robinson? And there's another taken a mosquito just as quick. I'll take back what I said about the slow business. But really, Auntie, do you think them very interesting?"

"I'll ask you that question when you have learned something more about them," was her answer. "Tell me now what you think of that Dragon-fly darting over the water?"

"Oh, he is a beauty," we answered in a breath. "But please let us hear something about those things down there."

"Not to-day, boys. I wish you to see something for yourselves first. Watch here for a few days and your patience will be rewarded, I promise you. Then I will have a story to tell you."

I knew that Auntie never spoke without reason, so John and I kept a close watch on those bugs. For two days nothing happened. The old things just crawled over the mud or ate flies and mosquitoes, as usual.

But the third day one big fellow decided to try something new. It was nothing less than to creep up the stem of one of the rushes. I suppose it was hard work, for he took a long time to get to the surface of the water. Here he stopped a while and then seemed to make up his mind to go further. Soon he was quite out of the water and could breathe all the air and sunshine he wished. I believe he did not like it very well. He seemed so restless and uneasy. I was expecting to see him go back, when I heard John cry out:

"Look! oh, do look!"

I did look, and could scarcely believe my eyes.

His skin (the bug's, I mean), was actually cracking right down the back, just as though the air and sunshine had dried it too much.

Poor fellow, he seemed in great trouble about it. Then, to make matters worse, a part of his coat broke off at the top and slipped down over his eyes, so that he could not see. After a moment, however, it dropped further, quite under the place where his chin would have been, had he had a chin.

"Oh! he is getting a new face. A prettier one, too, I am glad to say."

It seemed as if John was always first to notice things, for it was just as he said; as the old face slipped away a new one came in its place.

I guess that by this time that old bug was as much astonished as we were. He was wriggling about in a very strange fashion, and at last quite wriggled himself out of his old shell. Then we saw

two pairs of wings, which must have been folded away in little cases by his side, begin to open like fans. Next, he stretched his legs, and it was easy to see that they were longer and more beautiful than those he had had before.

Then, before we could admire his slender, graceful body, or fully realize the wonderful change that had occurred in him, he darted away before our astonished eyes, not a black bug, but a beautiful Dragon-fly.

Конец ознакомительного фрагмента.