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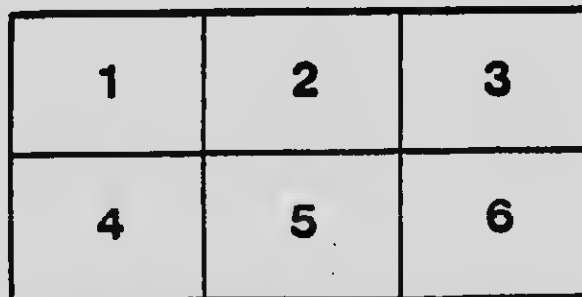
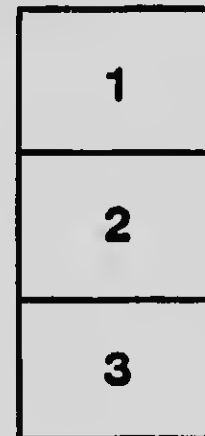
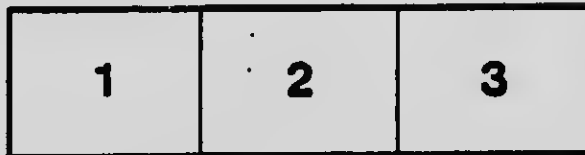
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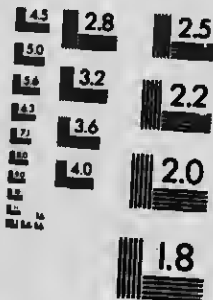
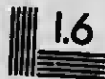
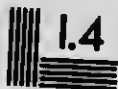
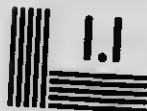
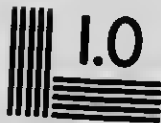
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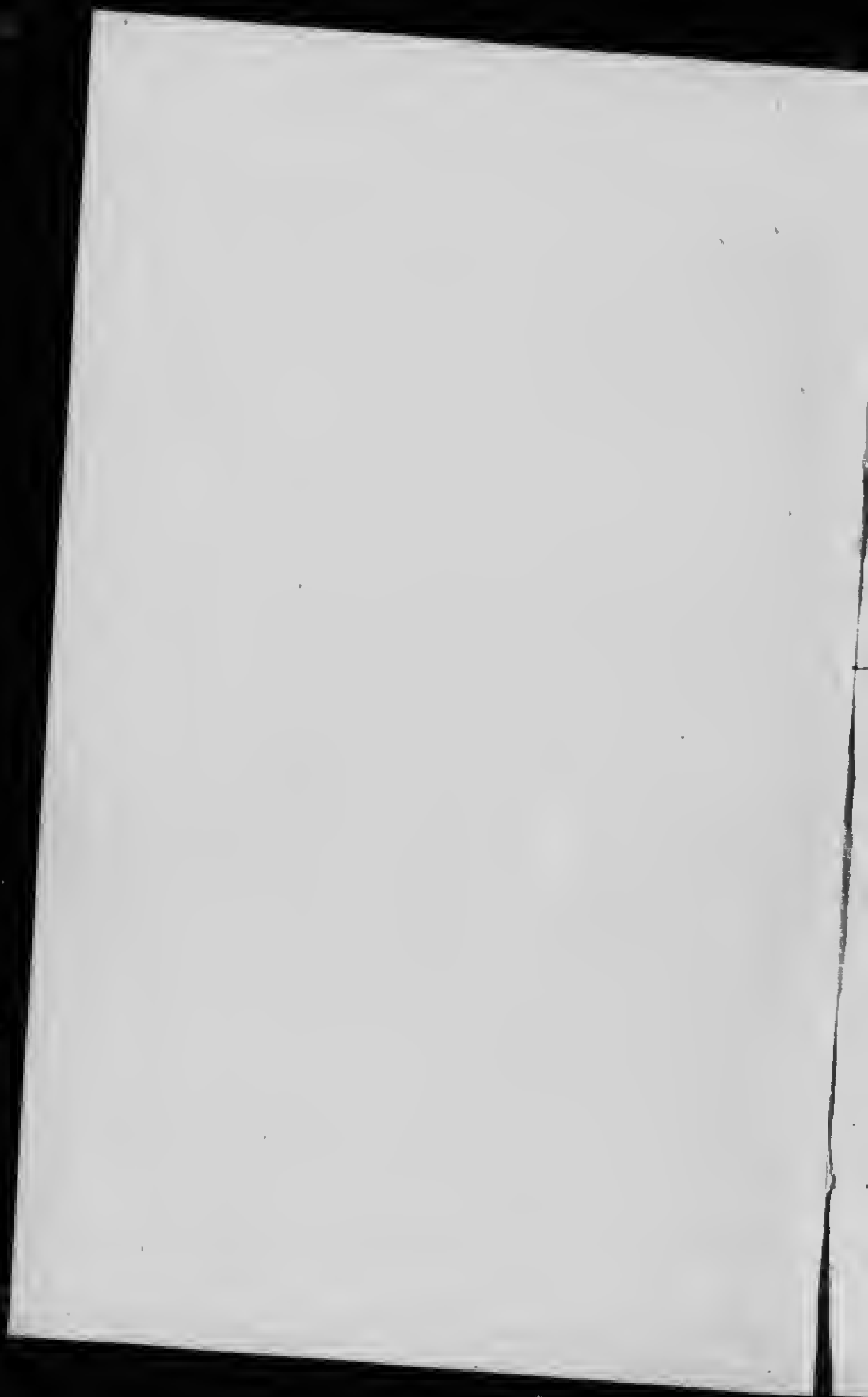
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Further Studies in Nature

BY

ROBERT R. MCLEOD

*Author of "Nature Studies in the Acadian Land,"
"Markland," Etc.*

A POSTHUMOUS PUBLICATION

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*"Shall I not have intelligence with the earth ? Am
I not partly leaves and vegetable mould myself ?"*
—THOREAU.

THOREAU, HENRY
ADAMS, W. W.

880188

Preface.

This little book contains a series of chapters which were not finally arranged or edited by the author, when the Great Power who is practically revealed in the making of "My River" with his mighty glacial gravers, took him away from his happy task in the midst of the opening paragraphs of a new chapter—another example of His ways too high for us to understand. However, the editor undertaking to collect and arrange the MSS appears to have been successful in catching the author's idea, for they follow each other in harmonious succession.

Altho the author studied in the greatest American university of his day and had much converse with many of its distinguished seniors, his most useful education was developed with the aid of a wide range of literature by close observation and contemplation in the temple of Nature, overarched by the canopy of cloud or blue sky through which came peeps from the infinite Universe beyond, pillared by the graceful lichen-flecked trees of the Nova Scotian forests, and floored by story pictured rocks, the eloquent sands, and gravels and clays, and the ever-running, ever-babbling romancers like his Medway river. As a powerful and popular writer he ranked high in the public forum; but in no department did he appeal more effectively to the cultured imagination of his fellow citizens than when discussing the wonderful ways of Nature in man's environment.

In the opening chapter, "My River," we are gradually led from viewing the picturesque around us to the contemplation of its significance. Then the origins appear in kinetoscopic recession, until finally we are found speculating on the genesis of our present land sculpture and the processions of vegetable and animal life fighting for its successive possessions. He ever and anon bursts forth with his philosophy of the evolution of it all, and cannot refrain occasionally from gently returning some old theological compliment, which originally had often been violently hurled at the scientific iconoclasts. It is done, however, in a pleasant mood which only serves to bring into relief the changing views of things.

In "Beauty and the Beast," the rescue of the "sand-peep" from the jaws of the "water turtle" is an introduction to the philosophy of the "struggle for existence," the "survival of the fittest," and the evolution of the altruistic sentiment in man.

The chapters on animals are not only interesting but of permanent value. They are not compilations of what others have observed, or the imaginings of a "fiction" naturalist. They are original contributions to human knowledge, the observations of animal intelligence, showing that in their own world they are wiser than we, and in our world they are just as foolish as we are in theirs. The very much greater power of reflective reasoning in man gives him an advantage under new conditions.

These stories vividly recall the preaching of the first Isaiah, "The ox knoweth his owner, and the ass his master's crib; but Israel doth not know, my people doth not consider"; and of Jeremiah: "Yea, the stork in the heaven knoweth her appointed times; and the turtle, and the crane, and the swallow, observe the time of their coming: but my people know not the judgment of the Lord."

On the whole this book will prove to be popular science, for it is picturesque in its objects, and in its literary expression. It will not only be invaluable to teachers to whom it points out an easy entree to the romantic mysteries of Nature around them for the benefit of their pupils, but to the general reader who loves sport or is intelligently interested in his surroundings.

"**Further Nature Studies**" forms a very effective second volume of the series "In the Acadian Land"—the two making a very creditable collection of scientific observations and reflections on the Natural History of the Province. The author's "Markland" is an elaborate cyclopaedia of Nova Scotia, in 600 quarto pages, showing a great range of interests, a wealth of illustration and statistics, and a masterful understanding of the character and resources of the country. It is valuable but severe prose, altho everywhere lighted up by his brilliant imagination; while this little volume is virtually poetry and is set to some of the rhythms of the music of the spheres.

Halifax, 6th June, 1910.

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MY RIVER.

"Beneath low hills, in the broad interval
Through which at will our Indian rivulet
Winds mindful still of sannup and of squaw."

"He goes to the river-side,—
Not hook nor line hath he."

—Emerson.

I find that a section of diversified country, unspoiled by human hands, is a source of inexhaustible interest, provided that we furnish a fair share of curiosity and intelligent enthusiasm. No aspect of nature has greater attraction for me than a river. My RIVER is an old acquaintance of nearly three score years. It is no Utopian stream in the Land of Nowhere, but a real body of water on its course down the Atlantic watershed of Nova Scotia. It is no great rushing tide hundreds of yards in width, neither is it a mere brook threading its slender way to become the tributary of a larger stream. As a matter of course, there is no exact line where a brook becomes a river, or a river dwindles into a brook, no more than there is when a boy becomes a man, but there is a general understanding in such matters. In proportion to other

natural features, in this province, there are real rivers, and this of MINE is one of them, and everything considered is superior to all the others in spite of the fact that neither shallop nor schooner has ever, or can ever push its prow between its borders, and no cities will ever be built on its banks.

It has values that can never be transmuted into coin of the realm, and would be forever safe were it not for the destructiveness of mankind. Before going further, I must take the reader into my confidence and locate this "thing of beauty and joy forever." Sometimes I am full of regrets that a white man ever discovered it, and wish that only the Indian's canoe had ever invaded its peaceful and pictured waters. For the sake of securing a few bits of pulpwood, I have seen on this river, heaps of unsightly brush where a few months before was a secluded gem, a burnished pool, a wondrous mirror reflecting the close bordering hemlocks and clumps of maples in all their glory of scarlet and green. Centuries had wrought to create this bower of beauty, and in one short hour the hand of man had reduced it to hopeless ruin.

The main sources of this river are along the ridge of the watershed of the province, in the county of Annapolis. Some forty miles from its entrance, far from human habitation, are the

most distant fountains from which run two rivulets that hasten to join each other and form a real river deserving the name.

This river is not mine by virtue of any written instrument, but my title is without a flaw, and I shall never be called before judge or jury to defend it. I have no desire to divert its course from the natural bed, nor in the least disturb a feature of its belongings. With my eyes I take ample tribute of its scenic beauties, and could do no more did the stream belong to me by inheritance or conveyance. For me, the lilies whiten with lustrous beauty the quiet shelters of friendly islands and coves, the wild roses garnish the bosky margins, and the pontederias, radiant in purple and gold, splash the shallows with floral splendour that scarcely wins a glance from the casual passer. For me, sings the hermit thrush from his hidden retreat, as if the heart of the secluded woodlands had found a voice to match their charms. For me the bittern booms in the meadows, the partridge drums on his log, and "the boding owls, that to the moon complain of such as wandering near their sacred bower molest their ancient, solitary reign."

Emerson, with his usual penetration, remarks that "a river is a perpetual gala, and boasts each day a new ornament." This is not true of all rivers, for they are sometimes but muddy

channels of wearisome sameness; but this river of Minc, from mouth to sources, is never lacking in the gala garniture of Emerson's description. Whether the chill of winter has sealed the surface with ice and draped the woodlands along the banks with snow, or midsummer reigns in verdant beauty, there is, to the responsive soul, a perpetual charm in the changing aspects of nature. Meeting me as I rambled beside this river an Indian woman remarked: "River great company." She had been reared beside this stream, and was no stranger to the companionship it afforded. It seemed like a living thing coming from somewhere and moving on to a fixed destination. It had a personality of moods, and characteristics of frowns and smiles; one hour a mirror of azure skies, and then shadowed and darkened by overhanging clouds; at one time calm and beautiful, with reflections of all its surroundings, at another fretted and flurried by vagrant winds that "blow where they list." It was a never failing source of food for the Indians, a beautiful and convenient highway for their birch canoes, and afforded ample opportunities for healthy and pleasing recreations. While the red men were not heedless of the beauty of this stream, they did not know a word of the wonderful story of its birth that I will now relate—a story that has not been written in books,

nor handed down by word of mouth from distant generations. It is the testimony of the rocks writ large in the majestic scrip of natural features. It is graven on the ledges and boulders, and wrought into the structure of the hills that hem it about. The lakes and bogs and brooks are eloquent with this old, old story of My River.

This earth was not made at one cast and fresh-rolled from the hands of a Creator. Since the primitive fire-mist cohered into a globe, scores of millions of years have passed away, and during all this unimaginable stretch of time no two days found this earth alike in structure. All the mountains were not brought forth in the same day. Ages separate the times of their appearance. In briefest outline this is the story.

Several million years after the principal coal seams of Nova Scotia were formed, when our familiar species of animal and vegetable life abounded, and rude savage men maintained a squalid existence—about a hundred thousand years ago—the unexpected came to pass.

Owing to causes not yet completely understood, because they do not lie on the surface of things and events, the climate of the northern hemisphere very gradually became colder and colder. Probably the change was scarcely perceptible in a century, but it was the dawn of the

Great Ice Age that was to bind the land in fetters of frost during thousands of years. The summers became shorter, till the sun was powerless to thaw the snow of the preceding winter. This condition extended southward ever more, and more. Higher piled the snow from century to century. All living things, generation after generation, were forced from their old haunts and homes a little further southward from the invading terror, leaving almost the entire temperate zone a desert of ice several thousand feet in thickness. From at least three sources flowed these American glaciers. I say flowed, because under their condition they crawled slowly towards the coast, and pushing far out into the sea broke away into icebergs. The southward extension over the land was melted in the latitude of the lower Mississippi.

After many thousand years, the climate became milder, and the ice slowly disappeared from the land that was deluged in a series of freshets that were real floods. It is the belief of men who are particularly well qualified to make an estimate, that the ice disappeared about twenty thousand years ago from the latitude of Nova Scotia. In many aspects a new Canada came to view. The glaciers left lakes and streams where there had been none, and made an end of all of them that previously existed. When the Nova

Scotian peninsula was free from the grip of the glacier it lay bare and naked to the sun. Every trace of vegetation had long ago perished. From the melting ice in the summers there were floods that swept the country and overtopped the highest hills where one finds gravel and sand and stranded boulders. From the ridge of the watershed or divide the great sheets of water flowed northward and southward to the sea. What are now the hills gradually became islands in this turbulent stream. The deeper valleys and depressions become lakes or basins of water. Along lines of least resistance the freshet selected a course that finally narrowed into a river channel; the old glacial lakes are bogs and swamps that were long ago drained; thus it was that My River was formed. At first, during centuries, it ran through a desert of naked rocks and stretches of sand and gravel; but slowly crept the vegetation from the southward that had previously been released from the glacial ice. Favorable winds brought the spores of lichens, and mosses, and fungus and ferns, and from these lowly germs sprang the first signs of vegetable life after the reign of the glaciers. Birds from the southward fed on berries containing seeds after their kind, and by chance, or determination, they flew northward, occasionally, and dropped on the waiting land the undigested seeds that took ready

root and made the beginning of the higher forms of vegetation. It may be objected that the seeds would not thus be carried by the birds; but it is well known that in the migrating seasons, birds in the far north of New England have been killed and found to have in them the whole seeds of plants that were not to be found short of the remoter Southern States. It would doubtless require several centuries to clothe the land in forests and grasses and shrubs. Animal life in various forms flew, and walked, and crept, and crawled northward as the case may be. Birds were the first to arrive, unless winged insects would be in advance of them. Generations of the slower moving creatures must have lived and died, each one reaching a little further northward, till at length even the slow turtles and land snails and angle-worms reached this Promised Land.

At last this River of Mine that once was the turbulent roily overflow of the great glacial freshets rushing through naked channels of rock and gravel, or sauntering through shallow lakes, became shadowed by evergreen forests, or glided through verdant meadows and dallied among grassy islands where the black ducks nested, and the muskrats made their home. We shall never know how long it remained a beautiful highway from the sea to the far-off forests, before a hu-

man footstep invaded its banks. It may have been ten thousand years, the undisturbed haunt and home of wild birds and beasts, before the coming of this relentless hungry lord of the animal world who carried death and destruction into their ranks. At any rate, when the white men first reached this region they found the land sparsely inhabited by a race of hunters and fishers who knew by name all the lakes, harbors and rivers, and were evidently dwelling in a country long known to their ancestors. They were a tribe of the North American aboriginals, mis-called Indians, but they had been so long on this continent that all tradition of their coming had been lost. Very likely they are of Asiatic origin, but after all they may be descendants of the Glacial men whose flint weapons and implements and bones have been found in the glacial drift of sand and gravel. These men of the Stone Age, destitute of metals and cloths of all kinds, their hands embroiled in fierce tribal wars, still managed to find life worth living. They came upon My River as refugees, or explorers, or by chance, and seeing that it was a goodly stream abounding in fish, and surrounded by forests in which roam caribou, moose, and bear, and other creatures desirable for food or clothing, they built wigwams and canoes, and gathered their families about them, and there, during many centuries,

lived, and loved, and died, before a white man had invaded their secluded retreats. Their old camping places and burial grounds tell the story of their long occupancy.

To them the river was known as the Ugle-dook, probably referring to the abundance of the mushroom tribe in the vicinity. It is known to us as the Port Medway River, and very likely seems to be a commonplace affair to many who have been born and bred within a bowshot of the stream. So much the more is it to be regretted that they should lie daily at the "Gate Beautiful" and yet remain insensible of the subtle charms of the situation, and almost unconscious of the various resources, so near, and so adapted to reach all the senses with happy suggestions and delightful ministrations, enriching the mind at first hand from Nature's inexhaustible wealth.

Emerson has well said, that—

"Whoso walketh in solitude,
And inhabiteth the wood,
Choosing light, wave, rock, and bird
Before the money-loving herd,
Into that Forester shall pass
From these companions power and grace,
The mounting sap, the shells, the sea,
All spheres, all stones his helpers be."

It is surely a high privilege to be "in league with the stones" and "sermons in them," to listen to the high requiem of the secluded thrushes, and the murmuring winds as they take the green summits of the lichen-kirtled hemlocks. There is no stint of good things for those who have ears to hear and eyes to see. How true it is, that

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

I am no judge of such music as human ingenuity has produced with instruments, but Aeolus of the winds has moved me in deep places.

"When the countless leaves of the pine are
strings

Tuned to the lay the wood-god sings."

I am not out of tune with the liquid note of the leaf-hidden brook that goes on forever, and the multitudinous sounds of living things that vary from day to day, from year's end to year's end. One must not always expect to hear "melodious birds sing madrigals." The devotee of Nature discovers that all her moods and phases are charged with a significance that lies not on the surface, but must needs be entertained and discussed and interpreted by human faculties. I am pleased with the synchronous chirping of

crickets that remind me of the approach of autumn and seem to demand of me an explanation of their performance. The noise is produced by scraping their rough legs on their wings. But why is it that they all scrape at the same time? The peeping frogs of the early spring, as they awake from their long sleep, make a perfect medley of noises; each one seeming to be heedless of all others. Despite their clamor, I am glad to hear them announce the event of spring after their own fashion. In the dead of winter the woods are rarely destitute of all sounds of interest. It may be the hammering of a woodpecker in search of a morsel to stay his stomach; and one wonders how long before a grub will reward him for his labor. It may be the clamor of hungry crows, or the raucous call of shy ravens, or the cheerful notes of a flock of chickadees as they search the branches of evergreen trees for morsels of insect life tucked away in silken cocoons for the winter. On these moths and butterflies "scarce half made up" and yet in the making, with a seasoning of torpid spiders, they are dependent for their daily rations. But for this overplus of insects, there would be no place for these hardy midgets that never budge from their northern home to seek a warmer clime. They seem as well content among the frozen boughs as they are in midsummer days.

"Here is this atom in full breath,
Hurling defiance at vast death,
This scrap of valor just for play
Fronts the north wind in waistcoat gray.
What fire burns in that little chest
So frolic, stout and self-possesst?
Henceforth I wear no stripe but thine;
Ashes and black all hues outshine."

To catch all the sounds of our winter woods about My River when the winds are asleep in their caves, one must lapse into such silence himself that breathing is inaudible, and not unlikely he may hear the faint nibbling of a pine squirrel very near him, as he bites the scales one by one to uncover the seeds which he hid away in the early autumn. I am not thinking that he foresaw the coming winter when as yet there was no hint of it on all the face of nature. I believe his instinctive prompting to do the right thing was an inherited habit that was the outcome of the struggle for existence maintained by thousands of generations of his ancestors, in which only those survived that had hit upon this hoarding of food so common to many species of beasts and birds.

It depends upon the make-up and mood of the listener whether the sights and sounds of outdoor life are invested with instructive charms. Some-

times the camper-out in the forests, when all is dark and still, hears the crash where some venerable "senator of the mighty woods" has yielded to the insidious attacks of internal enemies and lies prostrate on the breast of Mother Earth from which it sprang. This occurrence to most men would cause neither comment nor surprise, but coming within the experience of a poet it is reported in this manner:

"I heard when in the wood at intervals
With sudden roar the aged pine tree falls.—
One crash, the death hymn of the perfect tree
Declares the close of its green century,
Low lies the plant to whose creation went,
Sweet influences from every element,
Whose living towers the years conspired to build,
Whose giddy top the morning loved to guild."

An incident like this properly becomes a subject for poetical treatment; it offers opportunities for sentiment to deal with it, but if the same tree had gone down in a gale during broad daylight no poet would find it deserving the notice of his Muse. Once a tree is down, it is pounced upon by an army of organisms of one kind and another that will oxidize it, or burn it after their own methods and in their own good time, and out of its ashes other trees will grow and die and decay. Nature is always working over her ma-

terial into other forms, not an atom is ever destroyed; it is all indestructible, endowed with immortality, and thus partakes of the nature of God himself. It may be locked up in the chemical structure of granite ledges on which millions of years have recorded their passage; but once set free in the crucible of the chemist it is instantly ready to fiercely manifest all its primitive activities. We are not sufficiently observant of what in a word we call matter. The structures that men proudly build crumble at last into indistinguishable ruin, but the tooth of time never mars the elemental matter of which they are made. All organic forms are destined to perish. The relentless years reduce all alike to imperceptible atoms and molecules that are in demand for other purposes that may detain them for a day or for a million years. There is no stint of time, and no danger of destruction.

Among my belongings is a crystal quartz some two inches in length and transparent as glass, and therein is a drop of water with room enough and to spare, in its tiny cell. It was imprisoned when the crystal was formed. The specimen came from the depths of a Mexican mine, and this drop of water has doubtless been a captive ever since the vein was made from which it was taken, and that must have been millions of years ago. Had it been free during this time, it might have gone

a marvellous round and served in a multitude of capacities. It could have been in the sea, and the mist, and the morning cloud, and in the rainbow's radiant arch. It could have gleamed in a dewdrop, blushed in a rose, and glowed in the cheek of beauty. It might have crystalized in a snowflake, flowed in a glacier, drifted in an iceberg, and rushed in a torrent. It could have escaped from a volcano's throat, served as steam in an engine, been sap for grain, juice for fruit, and grateful drink for fevered lips. So varied are its offices, so vast are its ranges that to enumerate them all would require a great hook for that purpose alone.

Writing in this vein recalls a beautiful poem from Hindoo literature that deserves to find a place at this point.

“The snowflake that glances
At morn on Kailassa,
Dissolved by the sunbeams,
Descends to the plain;
There, mingling with Ganges,
It flows to the ocean,
And lost in its waters
Returns not again—
It comes not, it goes not,
It comes not again.

On the roseleaf at sunrise,
Bright glistens the dew-drop
That, in vapor exhaling,
Falls in nourishing rain.
Then in rills back to Ganges,
Through green fields meanders,
Till onward it glides to the ocean.
It glides to the ocean again.

A snowflake still whitens
The peak of Kailassa,
But the snowflake of yesterday
Flows to the main;
At morning a dew-drop
Still hangs on the rose-leaf,
But the dew-drop of yesterday,—
It comes not, it goes not,
It comes not again.

The soul that is freed from
The bondage of Nature
Escapes from illusions
Of joy and of pain,
And pure as the flame
That is lost in the sunbeams
Ascends unto God
And returns not again,—
It comes not, it goes not,
It comes not again."

Let us get back from this excursion to the

old dead tree, for while we are about it there is something more to be said from that text. Shakespeare tells us that we may "find tongues in trees." This is true, not only when the "morning gilds their giddy tops" but when they are no longer numbered with the living. When this tree of ours was in all the glory of leaf and blossom it was a veritable hive of teeming activities. The sap was coursing up the trunk in myriad channels defiant of gravitation, the leaves were taking into their structure the molecules of carbonic dioxide, and breaking them up to secure the carbon for building purposes, and sending it by some subtle means of transportation, all her own, to the topmast twig and the farthest rootlet. The sunbeams were acting on the chlorophyll in the leaves, and were the real master-builders of this "living tower." The bark was yielding and cracking from the strain of inward growth; and with ears sufficiently acute, one should have heard the hum of all these rapid, and ceaseless performances. Now that it has ceased to live, one might be pardoned for believing that all activities are at an end, but the fact is that this "tower that the years conspired to build" must not be allowed to cumber the ground that is demanded for living things. The material must be set free for other purposes, and to this end decomposition at once begins. Chem-

ical changes are set up for this purpose, and millions of fungus spores, with which the air is always abounding, find ready lodgement and operate in the fibre itself. Mosses and lichens lay hold of the outside, and great bracket-fungi flourish along the sides and the larval grubs of beetles tunnel it in all directions. Thus the work goes on till not a vestige remains of this "senator of the mighty woods" to tell that it ever existed. Surely the crash of this falling tree was not its last word. It was still left with a tongue to rebuke all human vanities and teach us lessons too deep for utterance.

It is often remarked that Science in its matter of fact manner has divested the study of Nature of human charms and made it less attractive to people in general and poets in particular.

For example, in one of his sonnets Edgar Allen Poe says of science:

"Hast thou not dragged Diana from her car?
And driven the Hamadryads from the wood
To seek a shelter in some happier star?
Hast thou not torn the Naiads from the flood
The Elfin from the green grass and from me
The summer dream beneath the tamarind tree?"

In the same regretful vein is Wordsworth's famous sonnet that reads like a lament to the

gods of Greece by this great poet, who was so much in love with Nature that one might have expected to see mosses, and lichens growing on his wrinkled face. Here it is; a glorious performance from a literary point of view:

"The world is too much with us; late and soon,
 Getting and spending, we lay waste our powers:
 Little we see in Nature that is ours;
 We have given our hearts away, a sordid boon!
 This Sea that bares her bosom to the moon;
 The winds that will be howling at all hours
 And are up-gathered now like sleeping flowers
 For this, for everything, we are out of tune;
 It moves us not. Great God! I'd rather be
 A Pagan suckled in a creed outworn;
 So might I, standing on this pleasant lea,
 Have glimpses that would make me less forlorn;
 Have sight of Proteus rising from the sea;
 Or hear old Triton blow his wreathed horn."

Schiller, the great German poet, lamented the departure of the Greek gods in a poem that called down upon him the censure of Christian moralists. Here are a few lines in translation:

"What time the happy world was guided,
 Ye Gods, by your indulgent hand,
 When over happy men presided
 Fair beings born of Fable-land.

All sceptic gloom and dullness vanished
Where your inspiring cult was known,
Untuneful souls were rightly banished
And glad contentment ruled alone.

These buds have all untimely perished
Before the scathing Northern blast,
Farewell ye Gods, so dearly cherished,
Ye pass away that One may last."

Tears and vain regrets are wasted on this theme. We live in a world of continuous change, where everything is on the move. Not only "every dog has his day," but every god has his day. Dead deities flit everywhere through the deserted corridors of history. Isis and Osiris, Zeus and Pan, Baal and Astaroth, Jupiter and Juno, Odin and Thor: all these, and hundreds more of enthroned divinities, have deserted their shrines. Their votaries have perished. Mighty priesthoods, stately rituals, and temples vast have vanished like the mists of the morning. This order of Nature is no good reason for mourning, but rather a cause for rejoicing.

"Not in vain the distance beacons, Forward, forward let us range.
Let the great world spin forever down the
ringing grooves of change.

Through the shadow of the globe we sweep into
the younger day;
Better fifty years of Europe than a cycle of
Cathay."

It is quite true that men of science and culture in this age, enraptured with the great book of Nature, no longer live in the mythical atmosphere of the Ancient Greeks. For them there are no gods to be seen of men. We all know now that the Nymphs, and Naiads, and Elfs and "light-winged Dryads of the trees," with all their kith and kin, vanished with the men who created them. Creatures of the imagination they were. They grew as grows the grass in response to the demands of curiosity concerning the nature of things. Christianity, with its dominating dogma of one God the Father and Maker of all, dismissed these Pagan products from the realm of realities. Science found no place for these subtle products of former generations, but she has substituted for these ancient divinities such knowledge of the laws of Nature, such explanations of natural phenomena, that a new world of wondrous beauty, order, and contrivance, lies open to all who have eyes to see, and ears to hear, and intelligence to understand. As a result, where there was but one attentive observer in the wide field of Natural Science in the days of Poe, and

Wordsworth, and Schiller, less than a century ago, now there are thousands of eager investigators ransacking all departments of the known universe, from the farthest reach of telescopes and cameras to the abysmal depths of the deepest oceans, and all that lies between. Where there was but one book on Natural Science fifty years ago, they are now to be counted by hundreds, treating every phase and feature of Nature with precision and a "fanaticism for veracity" hitherto unknown.

To Charles Darwin belongs the undying fame of having lighted the torch of enthusiasm for these studies that has passed from hand to hand among an army of workers in this generation. He suggested that organic things, as we find them at present, are the descendants of ancestors that very long ago did not greatly resemble them. He substituted Evolution for fiat Creation. He called attention to the struggle for existence wherever life exists. He pointed out in the animal world that there were always more mouths than morsels, and that this shortage of good involved a struggle, driving to utter extermination all individuals that failed to hold their own in this "warfare from which there is no discharge."

With this view of Nature in mind Tennyson wrote the famous lines:

"Are God and Nature then at strife,
That Nature lends such evil dreams?
So careful of the type she seems,
So careless of the single life.

That I, considering everywhere
Her secret meaning in her deeds,
And finding that of fifty seeds
She often brings but one to bear.

So careful of the type! But no!
From scarped cliff and quarried stone
She cries: A thousand types have gone,
I care for nothing—all shall go.

Man her last work, who seemed so fair,
Such splendid purpose in his eyes,
Who rolled the psalms to wintry skies,
Who built him fanes of fruitless prayer.

Who trusted God was love indeed,
And love creation's final law,—
Tho' Nature, red in tooth and claw,
With ravine, shrieked against his creed."

Said Newton: "Never a great discovery without a great guess." Darwin did not make a great guess until he had long looked for some rational explanation of the world of living things. He was not the

"First who ever burst
Into that silent sea,"

where Ignorance and Faith had never ventured. But he WAS the first to return from such a quest with bloodless trophies of the brain that were destined to generate a new mental atmosphere in the civilized world, and revolutionize the sciences, the philosophies, and theologies of all Christendom.

"He brushed the cobwebs of caprice and chance
from Nature's dome
And showed that order reigned."

The origin of species was called the "mystery of mysteries" until Darwin came with his orderly mind, his untiring industry, and enthusiastic love of biological facts, and then Nature could hide her secret no longer. She had at last brought forth the consummate genius who was destined to stampede the old errors, and lay bare the methods of creation and become the leader of a great company of explorers, and investigators who would seek no mystic Holy Grail nor fabled Eldorado, but rest content with only the rewards that Truth confers on those who seek her with unselfish aims and laudable interests. After twenty years of incessant labor on the problem of the origin of species, carried on with incredible patience, he gave to the world one of the great books, "Origin of Species by means of Natural Selection," that became epoch-making. The time

was ripe for it, and instantly the scientific world was resounding with discussion of his theme. In fact he had foreseen nearly every objection that has ever been raised, and with admirable fairness had offered his explanations. He was the sworn interpreter of Nature in the high court of Reason. This doctrine of Darwin antagonized the accepted views of Christendom on the creation of the world, and as a result Christian theologians by the hundreds pushed forward in the press and pulpit to disprove the conclusions of this monarch-minded man who had ventured to suggest a rational hypothesis of the origin of species in place of a venerable absurdity that rested on no support that Science was able to respect, or defend. No proper argument was ever brought forward by one of these "sons of thunder" who were so ready to call down fire from the skies that refused to heed their frantic protests. They appealed to prejudice and superstition. They raised a false alarm, for religion was not in the least danger, and was in no way dependent on the interpretation of the Book of Genesis.

Darwinism has prevailed, for
"Facts are chieftains that winna ding,
An dinna be disputed."

Today there is not a naturalist of any note who is not an evolutionist, and all the leading

theologians have fallen into line, as has everybody else who has any curiosity about this wonderful world, and thinks about how it became as we now see it. In the hands, or more properly in the heads of all naturalists, Darwin placed the master-key for solving old problems, and explaining old difficulties that confronted them from the organic world. He set all the known creation in a new perspective of overwhelming grandeur. Under the guidance and suggestions of the theory of evolution the naturalist, the mineralogist, the geologist the astronomer and the chemist find everywhere inducements for thought, subject for reflection and reasons for admiration and wonder. This theory of Creation supplies us with clews that lead in all directions into labyrinths of unexplored mysteries, and realms of unsuspected existences. In the light of this doctrine the humblest plant, the tiniest insect, the microscopic germ of life are all invested with an interest hitherto unknown. Every form and feature of organic life becomes of eager interest to the student of Nature. They are invested with a new significance; they have all come forth out of "great tribulation;" they are but survivors of a mighty host they have "overcome" and therefore their names are writ in the "great book of life."

I set this much down at present because I shall discuss all my subjects from the standpoint

of an Evolutionist; in fact, but for the light and leading afforded me by this theory there would be very little that would seem to me worth mentioning in the field of Natural history.

A working naturalist today is not content to make collections of plants and insects and label them with Latin, or Greek names, but he pushes his studies into the whys and wherefores of these things as he has found them. In the light of what has been already learned, he can no longer regard the world as a creation of a few thousand years ago, and all the living things as unchanged descendants of the first of their kind. Before the incoming of this new epoch, curiosity along these lines of investigation was expected to be satisfied with the assurance "that it was so created." But now we are able to discover rational causes for the varied features and structures of Nature and Life. Heretofore this world was looked upon as a finished product which we might examine if we pleased, but could not comprehend. Now it has become a blossoming flower, still unfolding before our eyes. It is a proclamation that God is not dead, nor has He retired to some remote abode above the skies, but he "worketh up to this time" as the Gospels have it. To "consider the lilies how they grow" demands more than a passing glance of admiration. It is an imperative direction to pause, and think, and weigh, and com-

pare until you feel that the opulent beauty of the flowers exceeds the splendor of Solomon in all the glory of his regalia. One should consider not only the flowers on the hills of Palestine, but study and admire the wonders and beauties of Nature in all parts of the world. During millions of years the flowers bloomed before there was an eye to witness their beauty; they were visited by bees and butterflies for the honey they contained, but their loveliness of color, and daintiness of form, and deliciousness of odor failed to awaken a thrill of admiration in all the world. "Beauty is its own excuse for being" is a famous line that has won an immortality of quotation, but I hold that there was no beauty in the "Rhodora," to which this line was addressed, nor in any other flower, or feature of Nature on this earth until there was a being who was conscious of such a quality. All authorities are agreed that if there were no creatures that could hear upon the earth, there would be no such sensation as sound. The lilies of Galilee had bloomed and faded during thousands of years in the presence of mankind; but one may fairly question if ever before they had seemed so royally beautiful as they did to him who compared them to the adornments of the kingliest of Judah's kings. The explanation is that never before was there an observer of these lilies who

had in himself the quality of soul to respond to these humble instances of the overflowing beauty and munificence of the Maker and Sustainer of all things. As all colors are not in the objects that display them, but in the brain that sees them, so in like manner, the deepest significance of Nature's most wonderful aspects is not in the visible or audible manifestation, but is to be perceived in some subtle manner only by those who are constitutionally qualified or intentionally prepared for this delicate business.

The profoundest mystery that confronts the curiosity of mankind is often secreted in some commonplace object or ordinary phenomena. It is a saying that "An undevout astronomer must be mad," as if the myriad million star-suns proclaimed the power and nature of God in a greater degree than the humble flower by the wayside. With this view in mind Tennyson wrote:—

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

The ordinary man plucks the flower from the crannied wall and casts it aside as something undeserving a moment's consideration, but the

poet with a deeper insight sees far enough to report that it is a maze of mysteries and wonders. It has been truly said that the poet "is a true landlord, sea lord, air lord. Wherever snow falls or water flows or birds fly, wherever day and night meet at twilight, wherever the blue heaven is hung by clouds, or sown with stars, wherever are forms with transparent boundaries, wherever are outlets into celestial space, wherever is danger, and awe and love, there is Beauty, plenteous as rain shed for thee, and tho thou shouldst walk the world over thou shalt not find a condition inopportune or ignoble."

BEAUTY AND THE BEAST.

"Beauty is of all things what least calls for explanation."

—Santayana.

"But ask now the beasts, and they shall teach thee;
And the fowls of the air, and they shall tell thee!"

—Job.

While I was standing within a few feet of the shallow margin of the river beneath the shade of a clump of hemlocks enjoying the delightful air of a summer's morning, my attention was called to a sudden and violent splashing, and turning quickly I discovered that a tortoise or turtle had seized a beautiful bird by the tail and remained almost hidden beneath mud and water. I lost no time in going to the rescue of the bird. The ugly reptile was reluctant to release his victim, and waited for me to take him by the tail before relaxing his hold. The bird was not hurt, but greatly alarmed, as she might well be in such a plight. She was the least Sandpiper or Peep, *Tringa minutilla*, an elegant creature frequenting the shores of our lakes and rivers, walking or running along the margins with a peculiar tip-up at each step, or flying over the water as she

calls "peep peep" in a soft and complaining voice. All summer they stay with us, and nest on the ground near the water, their speckled eggs looking very much like pebbles that are generally all about the nest. Snakes and squirrels and hawks and other animals are fond of eggs and this mimicry of the pebbles would be of service in deceiving the thievish enemies. This resemblance would come about in a natural manner since the birds that laid eggs most nearly like the pebbles would oftener bring out their broods, that run as soon as they get clear from their shells.

I was somewhat puzzled to imagine some probable way that this slow clumsy reptile was able to seize this nimble creature before taking to her wings. I am thinking that the bird mistook the creature for a stone and alighted upon his back and got her tail within reach of his mouth. At any rate she stood close enough to be caught by the quick thrust of the neck and head from the shell. There was no prospect of release from that relentless hold that does not quickly slacken even when the head is severed from the body. Had I not come upon the scene there would have been a missing mate at the nest. The turtles feed for the most part on leaves, and insects, and tadpoles and frogs, and it was not often that such a bit of luck came in their

way as befell this one from which I snatched his breakfast, leaving him to reflect that there is "many a slip 'twixt the cup and the lip." His act in my eyes was cruel, for in fact, he was blameless, and his performance as natural and orderly as the swing of the planets in their orbits. Had I killed the bird instead of releasing her, and opened her up, there would have been scores of insects, some of them still alive, and all of them as fearfully and wonderfully made as herself, but not as high in the scale of organic life. Neither the bird nor the tortoise had the least notion of pity, nor is there any indication of this sentiment in the world apart from what may be seen in mankind. There is neither pity, nor mercy nor sympathy in Nature. So long as the main occupation of every creature was to get something to eat or keep some other thing from eating them, there was no demand for these fine virtues that are now so becoming to mankind, and just why or how they came to appear in human nature is one of the deeply hidden secrets from which the veil has never been lifted. At any rate the progress of the human race is not properly to be reckoned by the advancements in the arts and sciences, but by the evolution of these unselfish sentiments that distinctly declare the dignity of our race. "God is Love" is the dictum of holy writ, and by some subtle means

dawn from infinite resources this human nature responded to the throbbing of that "Immortal sea which brought us hither" in which we live and move and have our being. Delving deeply into the make-up of the human body, chemists have discovered that it is fashioned from the elements of sea water, or in other words contains all the metals and minerals held in solution in the oceans and all the gases mingled or combined chemically therein. This discovery is the more interesting when we consider that life first appeared in the sea, and from that beginning have come all the varied organisms that live or ever did exist on this globe, mankind included.

While the weary millions of years through the stress and strain of evolution were bringing to birth this body with its dome of thought, in the same time there was interwoven in this material structure "one accent of the Holy Ghost the heedless world has never lost." How this was done will ever remain an insoluble mystery. It is the "path that no fowler knoweth, and which the vulture's eye hath not seen; the lion's whelps have not trodden it, nor the fierce lion passed by."

If my readers were intent upon having me say something further of the bird-and-turtle incident they may complain that I was drawn aside by a suggestion from the thread of my story. The fact is that my story ended when the crea-

tures were separated, and unless the affair was allowed to become a starting point for a bit of discussion there was no more to be said. I released the bird in response to something higher in me than all brutedom can boast. Had I passed by the struggling creature with no inclination to set it free that would have been proof of my lack of qualities that are the highest endowments of humanity. The savage undeveloped nature of any person could be tested by an opportunity of that kind. Australian black fellows or cannibals from Africa or New Guinea would be curious enough to wait and see the bird disappear in the throat of its captor, but such persons are either instances of arrested development in a primitive stage of evolution, or degradations from higher ancestors. One regrets to know that such dispositions are not confined to remote peoples, but many men living in the style of civilized life are almost destitute of pity and sympathy for suffering animals.

The Roman theatre shook with Pagan applause at the recitation of the famous line of Terence, "NOTHING THAT IS HUMAN IS FOREIGN TO ME," but better still is the sentiment of Coleridge when he says:

"He prayeth well who loveth well
All things both great and small."

It has been said that "Sympathy is the Gulf Stream of love that runs through the waters of the world's misunderstanding," and we do well to turn as often as we can some tiny tributary of tenderness into this heart-current that sorely needs the smallest contributions. It is helpful to believe that the "best portions of a good man's life are his little nameless unremembered acts of kindness and of love," they are the "living flowers that skirt the eternal frost" of human heartlessness. "The instinctive fine brotherhood of the soul" does not hesitate and boggle over the matter of the question of color or of kind, when a suffering creature bids for our sympathy and assistance. Robert Burns ran his plowshare unawares through the winter nest of a mouse that was then snugly sleeping, deep-hidden beneath the November blast, and the poet immortalized the incident, before the set of sun, in verses that will remain among the best efforts of his genius.

"Lest we forget" here are two or three stanzas:
'I'm truly sorry man's dominion
Has broken nature's social union,
An' justifies that ill opinion,
Which makes thee startle
At me, thy poor earth-born companion,
An' fellow-mortal.

FURTHER STUDIES IN NATURE

Thy wee bit housie, too, in ruin
 It's silly wa's the wins are strewin
 An' naething now to big a new ane
 O' foggage green
 An' bleak December's winds ensuin
 Baith snell an' keen.

Thou saw the fields laid bare an waste
 An' weary winter comin fast,
 An' cozie here beneath the blast,
 Thou thought to dwell
 'Till crash the cruel coulter past
 Out thro' thy cell."

Of the Buddhist Faith there are almost as many millions as there are Christians, and it is their belief that certain men at rare intervals have lived so pure and good that they have become incarnations of the Divine love.

The late Edwin Arnold in his poem entitled "The Light of Asia" has admirably told a story well-known among the Buddhists, of the self-sacrifice of one of the holy men to satisfy the hungry pangs of a famished tigress and her starving whelps. It is especially worth reading in this connection.

"For aye so piteous was the Master's heart
 For all that breathe this breath of fleeting life
 Yoked in one fellowship of joys and pains.

That it is written in the holy books
How in an ancient time, when Buddah wore
A Brahman's form, dwelling upon the rock
Named Mnuda, by the village of Dalidd,
Drouth withered all the land; the young rice died
Ere it could hide a quail in forest glades;
A fierce sun sucked the pools; grasses and herbs
Sickened; and all the woodland creatures fled,
Scattering for sustenance. At such a time,
Between the hot walls of a mullah stretched
On naked stones, Our Lord spied, as he passed,
A starving tigress; hunger in her orbs
Glared with green flame, her dry tongue lolled a
span
Beyond the gaping jaws and shrivelled jowl;
Her painted hide hung wrinkled on her ribs,
As when between the rafters sinks a thatch
Rotted with rains, and at the poor lean dug
Two cubs whining with famine tugged and sucked
Mumbling those milkless teats which rendered
nought,
While she their gaunt dam licked full motherly
The clamorous twins, yielding her flank to them
With moaning throat, and love stronger than want
Softening the first of that wild cry wherewith
She laid her famished muzzle to the sand
And roared a savage thunder-peal of woe.
Seeing with bitter strait, and heeding nought
Save the immense compassion of a BUDDH

Our Lord bethought, there is no other way
To help the murderess of the woods but one.
By sunset these will die having no meat.
There is no living heart will pity her.
Lo! if I feed her, who shall lose but I,
And how can love lose doing of its kind
Even to the uttermost? So saying, Buddh
Silently laid aside sandal and staff,
His sacred thread, turban and cloth, and came
forth
From behind the milkbush on the sand,
Saying, Ho! mother here is meat for thee!"
Whereat the perishing beast yelped hoarse and
shrill,
Sprang from her cubs, and hurling to the earth
That willing victim had her feast of him;
With all the crooked daggers of her claws
Rending his flesh, and all her yellow fangs
Bathed in his blood; the great cat's burning
breath
Mixes with the last sigh of such fearless love."

The ugly reptile that I threw over the bank
away from the river is well worth looking after
all, I would like to know what he has thought
of his unusual experience within the last ten
minutes. Very likely he could think while he
had the bird, and while I was taking it from him,

but that he was capable of turning it over in his mind in a reflective way is hardly credible. In the matter of comeliness his "looks are agin him," but beauty may be only skin deep, or feather deep, and may serve to disguise unsightly deformities or despicable qualities. I cannot pretend to introduce this particular individual in any formal fashion, but presume that his humble existence of a few years has been diversified with its good times and hard times through which he kept the even tenor of his way, and neither looked backward with regret, nor forwards with fear, and his rudest awakening happened this morning when we two "earth-born and fellows mortals" collided on life's pilgrimage. In the nature of things neither explanations nor apologies can pass between us. Something more formidable than his shell forbids all communications of that kind, but his shell is largely responsible for his inert stupidity. This creature has a long pedigree, it is a lineal descendant of great formidable reptiles that dominated the world during scores of thousands of years before a flower had bloomed, bird existed, or a creature had suckled her young. They were lords of land and sea, and from them have been evolved the birds and milk-giving beasts, and also the tortises; but the tortises appeared long before the advent of the higher beasts, and all the birds.

Their shells are strewn through the cretaceous formations of millions of years ago when they flourished in great numbers and were of huge dimensions. Out of them was evolved nothing higher; the shell was not only a serviceable life-preserver, but an effectual barrier to structural progress. It limited experience to very restricted localities, and to but few activities. Long after their appearance in the world certain species of reptiles that had fought life's battles in the open, and neither gave nor asked for quarters when matched with fierce antagonists, when each was bent on making a meal of the other, became modified in structure, in response to changing environment, and from them were evolved a race of dinosaurs that were of great dimensions but not altogether reptilian in make-up. They were getting away from the old type and advancing towards higher forms that were yet to come, including Man himself. The oldest known fossil birds are feathered lizards, and the wings of all birds are but reptilian fore-legs equipped with quills which are merely developments of the reptilean scale covering and feathers. During all this vast stretch of years, beyond human conception, the tortises were merely "marking time," and making no advancement. Their shells forbade the evolution of wings or swiftness of limbs. There was no opportunity for evolutionary agencies to conduct

them to higher forms of structure, and greater brain capacity. They branched off into many genera, and species and varieties, but the hall mark of their lowly Order remained. The shell was an insurmountable barrier to further progress. They took to the sea and lost their toes in exchange for paddles; they swarmed in the rivers, and lakes, and became at home on land and in the water, and got them webs on their feet, but still kept their toes and their nails; they wandered away on the dry land out of reach of rivers and developed a hinge in the lower shell, or PLASTRON, that enabled them to shut themselves closely inside a box. These variations and many more have come about within their Order, but Mother Nature with all her ingenuity has never yet brought forth a higher creature from this reptilian offspring that she so considerably withdrew from the fighting-line of creation, and for safe-keeping housed him in a castle from which there has been no escape. Their shells are eloquent records of the warfare of life, and so are all shells full of the same story, and in every instance the occupants of such shelters are either brainless mollusks and crustaceans, or stupid tortises and armadillos. When men make a creed-shell for religious purposes, the result is as disastrous to the individuals who are trained to believe its assertions. But this is a bit of private opinion thrown in for the sake of variety.

To make some amends for lack of teeth and shortage of brains, Nature has endowed the tortises with unusual vitality. They even insist upon walking about after being deprived of their heads; and to live beyond the century mark even in confinement is no very uncommon occurrence. Their ribs are grown together, and pieced out with marginal plates to form the upper shell or CARAPACE, but this solidifying of the ribs makes respiration in the usual way impossible, so the breath is taken by the mouthful and swallowed instead of being drawn into a vacuum. However, a small quantity of air goes a long way in meeting their wants, for they can remain beneath the water for hours in the summer time, but in winter they crawl away like the frogs beneath mud and water, or often enough without the mud.

Upon turning my turtle over, I discovered a dozen bloodsuckers or leeches fastened on the skin of the thighs, the groins, the armpits and lower neck; not one of them could be reached by the toes or mouth of their host, but I seemed to feel that he must want to scratch them away, and for the same reason that I released the bird, the leeches were taken off and left to look for another victim on the dry land. I am not sure but the turtle had become indifferent to their ravages, but am inclined to believe that they served a purpose by keeping him from thinking

about being a turtle as David Harum said about the fleas on a dog.

These leeches are a species of flat worms that are parasites on fishes and whatever else they can lay hold of and remain without disturbance. Like all other parasites, they are very degraded, and far from being fair representatives of their group. Without legs or eyes or sense of hearing, they are wholly dependent upon their sucking capacity for a food supply. They have been pressed into the service of mankind. The demand for them in France alone by the medical profession is almost beyond belief, for a hundred millions are sold there annually. An examination of these on the turtle would have shown that they were also preyed upon by parasites, and thus it goes on all the world over, jus'fying the bit of rhyme that declares:

“Big fleas have little fleas upon their backs
to bite 'em,
And these again have other fleas and so ad
infinitum.”

A MORNING WALK IN THE WOODS.

'At the gates of the forest, the surprized man of the world is forced to leave his city estimates, of great and small, wise and foolish. The knapsack of custom falls off his back with the first step he makes into these precincts.'

It was a morning in June, and I took my walk abroad to "sniff the caller air," and to see and hear what might come within range of eye and ear, over a bit of woods and roadside and pasture and river-bank where I had been hundreds of times before. One might think the prospect not very alluring for anything new to turn up over this well-beaten route, but we must bear in mind that every step of this familiar ground, at this season, is alive with moving, growing things. Earth, Air and Water are separate domains where objects and incidents that were not to be seen yesterday may be ready to invite our attention to-day.

As an instance of Nature's ever-shifting panorama, here at my feet is a great sturdy toadstool large as a saucer, that was not here in the afternoon of yesterday, when I passed this way.

It had pushed its way upwards with such force through leaf-mould and decayed wood that its glistening dome is loaded with this material. Neither the trunks nor roots of our great forest trees will move aside a slender branch or a small stone, but tenderly wrap it in tissues as if it had rights to be respected. But this audacious toadstool, this soft assemblage of fungus cells, huddling together in the darkness, thrusts and pushes as if it owned the world and room for it must be made at all hazards.

Surely this object, common-place tho it be, deserves more than a passing glance or a contemptuous kick. What our bodily eyes cannot see in this object, it is the privilege of the mind's eye to bring within range, and thus we may, with the aid of the imagination, observe the atoms and molecules, that no microscope can detect, growing into cells and ranging into lines of order and symmetry, forming stem, and cap, and gills and spores, and all this with the greatest activity, as if fearful lest the dawning day might fall upon their operations. They have been set in motion by the underlying mycelium of white threads and knobs that have lain for months in the frozen leaf-mould endowed with a latent life, and waiting for the night in which it would become the directing centre of great operations, commanding atoms and molecules by the millions to take their appointed

places in the fast growing structure. Not one of them was ever before part and parcel of such an object. Without eyes they seem to see, without ears they seem to obey orders; without brains they appear to think. There are no blunders and no collisions, and, with the ear of the mind, one seems to hear the soft muffled marshalling of this vast army of builders that have scarcely completed their work. It is now pulsing with life in the full flower of its existence. From beneath its mould-laden cap the gild-clefts are shedding on the listless breeze their myriads of seed-spores that one of a thousand may find a friendly lodgement and bring forth after its kind.

By to-morrow's set of sun it will be a dead and fetid thing, inviting with its putrid breath the visits of carrion beetles and blowflies. All its invisible host of atoms and molecules will be discharged to find other fields for their services in the great schemes of nature and life.

One who pauses long enough to think soberly about this lowly object is almost sure to wonder why such a thing is brought into existence, and to ask himself what purpose it can serve in the economy of Nature, and why it should begin to die by the time that the last atom has responded to the builders roll-call?

One might with equal propriety seek to know why this globe was called into existence to whirl

about the sun for a little season, and then to return to it a lifeless cinder. It really matters but little whether the duration of existence is millions of years, or thousands of seconds, since both alike have growth, and decay, and death.

The heavens are studded with numberless array of suns, many of them much larger than our own. These stars for multitude exceed the mushrooms of all the world, and these we discover in all stages of growth and decay. In the eyes of the great telescopes some are but luminous wisps of world-stuff, some are revolving in vast nebulous spirals, others are advanced to the dignity of youthful suns, others again are red and lusty with the vigor of maturity, others are yellow with declining light, while over others is drawn the ashen veil of dying twilight; and when the last glimmer has disappeared these dead, dark suns are detected as they exert their gravitating power on companion suns, that have outlived them, or they thrust themselves across the line of human vision, and partially eclipse their living neighbor. In comparison with all this array of worlds, our own little globe is but a mote in the sunbeam, an ephemeron of a day, as transient as the glow of dawn or the gloom of a passing cloud. No man knows why it came into existence; and when the last throb of life has left it cold and barren, who can tell us what

purpose it has served, or what has been gained by all the pain and sorrow, and dumb suffering of the voiceless world, where the "whole creation groaneth and travaileth in pain together." Human life, so far as this world is concerned suggests the mushrooms of a day. Poets and philosophers have dwelt on the transientness and uselessness of our lives.

"As for man, his days are as grass; as a flower of the field so he flourisheth, for the wind passeth over it and is gone; and the place thereof shall know it no more," exclaims the Psalmist. My days are swifter than a weavers shuttle" is the cry of Job.

Said the Preacher of Ecclesiastes, "Behold all is vanity and vexation of spirit."

While there is a large measure of truth in these estimates, and a moderate degree of reflection thereon is far from a waste of time, still, since this is a depressing view of life, there is more need for us to be nerved by incessant affirmation of the good, the true, the beautiful. Despondency is not the mother of noblest thoughts, nor of most heroic deeds. It is a mood of mind that rarely leaves desirable results. Even now while the fungus is ready to fester at my feet, blackbirds are whistling in the alders, and from the thicket of the very summit of yonder

fir is flung upon the morning air a far-reaching melody from the Golden-crowned Kinglet, that marvellous midget of the woodlands. Invitations are to be seen and heard on every hand to move on and seize the passing opportunities for delightful and instructive experience.

On every hand I am beckoned to look there and called to listen here, till one might well wish he were all eyes and ears in order to make ready response to these varied invitations. In these June days in our woodlands, Nature is fast arraying herself in all the glory of leaf and blossom. The birds of song are wooing their mates with their sweetest performances, and those that have no musical gifts are contributing their medley of voices to the general jubilee of the feathered community. Small wonder it is that Wordsworth wrote:—

“Come forth into the light of things.
Let Nature be your teacher.”

“The light of things” well describes the subtle influences and varied suggestions to be gained from a close and inquisitive companionship with natural scenes, and the wild world of living things. In comparison with an association of this kind, the sordid and paltry squabbles for power and pelf, among human creatures, seem contemptible beyond description. Nature is

healthy and stable; our discordant reveries are not to be classed with her fadeless beauty. She is self-sustaining and self-developing; she is too great and grand for our grasp; but we can study and contemplate her, mute and bareheaded, and invigorate our frail beings in contact with her immortality. In the highest, and therefore, the truest sense, the material creation is a poem. Hence, St. Paul said, there was no excuse for men being ignorant of some proper knowledge of God, for the invisible things of Him from the creation of the world are clearly seen, being understood by his "POEMA", a word that is translated for us "the things that are made." To the Greeks who coined the word, the poet was one who created. He poured forth the inner treasures of his soul in metre and melody, under the inspiring influence of some unseen divinity. With that view in mind, St. Paul would have it understood that this material universe is God's Poem, in which is revealed somewhat of His unsearchable riches.

I had but taken a few steps from this interesting innshroom, when almost within reach of my hand was a pretty cup-shaped nest hung in the slender fork of a long low hemlock limb. We have only three species of birds that build these hanging nests, and they are all of one Family, the Vireos, or Greenlets. So far as outward

appearances go, this might be a new cradle containing eggs, or young. But, without looking inside I know it is an affair of last year. It is almost white with fine tatters of birch-bark that are woven and plaited on the outside, and by this sign it was surely built by the Solitary Vireos, for the other kindred species do not make use of this material. If this were a new nest, the male bird would be chattering and scolding in violent protest, altho unable to match himself against an enemy that might care to seize eggs or young. I have invariably found this rare nest, when new, by the vigorous outcry of the father of the family, who had better held his peace on such occasions. The habits of birds differ very greatly in the matter of giving alarm at the approach of an enemy to their nests, but I do not recall an instance where a very small bird so clearly gives away the whereabouts of his family secret. The result must be to keep down the numbers of the species from what it otherwise would be. But what is more detrimental to their multiplication is the use of the white bark on the nest. That makes it an easy mark for vigilant eyes. This bird is the rarest of the Vireos, and the reason for their scarcity may well be found in these peculiarities.

THE AMERICAN WOODCOCK.

"Cock of the heath, so wildly shy."

—Joanna Baillie

Sportsmen, with dogs and guns, take keen delight in hunting and killing woodcock, and epicures consider their flesh a dainty morsel for the palate, but, since I am neither sportsman nor epicure, my interest in this bird is for other, and I believe, better reasons. One need take only a passing glance to see that this bit of fat and feathers is no commonplace in structure, but a creature highly specialized for certain purposes. He catches the eye at once with his peculiarities. His long slender bill almost underneath his conspicuously large black eyes set close to the top of the head, his short tail hidden completely under the upper coverts, his plump brown body the color of faded grasses and ferns; these are the most striking structural characteristics that appear on the outside. The peculiar bill loudly proclaims some special means of securing a food supply.

I have been greatly favored in my observations of this bird at the close range of a

few feet, while he, with no suspicion of my presence, proceeded to get a square meal after his own fashion. This he did by thrusting his bill into the fairly soft mud up to his eyes, feeling with the soft sensitive tip for bugs and worms and larval life, and eating whatever he found to suit his taste, without removing his bill to see what had come his way. Feeling, and taste, have told him all he cares to know before either swallowing or rejecting the morsel. He does not poke his bill perpendicularly into the ground with his neck muscles, but thrusts it a little slanting, so that he can brace himself effectually and secure a purchase from his legs, and get the weight of his body to bear on the operation. When he has well prospected one boring, he makes another very near; and one may see by his occasional swallowing that there is something doing to satisfy his appetite. While he is thus engaged, up to his eyes in business, it becomes him to be very watchful lest an enemy on the wing, or on foot, taking advantage of his awkward predicament, may seize him before he can get his bill out of the mud, and make use of his wings for escape. Now we may understand the meaning of the large eyes set so near the top of the head that all directions are brought into view. The color of the woodcock is admirably suited to the localities he selects for feeding; making it difficult to de-

fect him among the brown leaves, and faded grasses of bogs, and meadow margins. This bird that came often under my observation was operating on a patch of ground from which a pile of stable manure had been removed; and it was more or less strewn with bits of hay, among which were blackish portions of softer naked ground. While the bare places seemed the most tempting localities, he kept closely to the brown hay-littered parts and probed their margins of darker material, and not once could I find him venturing fully out in the danger zone, where his color would be in contrast with a dark background.

According to the older orthodox methods of teaching Natural History, this species of bird was suddenly created as we see them to-day, with all the instincts that are now a part of their nature, and set to the task of probing the bogs and swamps for their daily bread. This explanation is contradicted by the well-known fact that birds of all kinds are of reptilian ancestry. The earliest fossil birds of several million years ago were clawed and toothed and tailed like lizards. The growing chicks in their shells repeat structurally this lowly ancestry.

Our woodcock has a pedigree that extends far beyond the time when, tho a bird, he bore no close resemblance of what he is today. He is the

structural outcome of the never-ending struggle for existence that has made and moulded him during many million years. Every crack and cranny where food could be secured has long ago been exploited and pre-empted by one organism or another, and the bird or beast or insect best calculated by bodily make-up to get it has managed to live, and leave a like progeny to carry on the structural line. The bill of the woodcock could be no longer without being an awkward encumbrance when not in use. For probing purposes alone, it might well enough be longer, but in the nature of things any overgrowth in that direction is checked by disadvantages that would prove fatal to the unfortunate individuals that might be thus hampered in the contest of life. The great Glyptodons of South America, that are now found as fossils, were of the sloth family, and were incased in shells of great thickness, weighing a ton, and therefore proof against the attacks of all enemies from without; but their evident clumsiness, and inability to get on their feet when once overturned, proved a fatal handicap and doubtless resulted in their extinction. The nice balance, where a proper protection of shell does not run into the extreme of deadly clumsiness, was not duly observed. The building forces failed to observe the structural proprieties demanded by the owner of the shell. There was too

munch of a good thing, with the result that the Glyptodon was struck from the roll of Creation. The bills of our woodcock are now just what they should be, but how many perished long ago because they were too long or too short is a matter for speculation. We may be confident, however, that this bird has come forth out of "great tribulation." His table has ever been set in the presence of his enemies. His species is a survival from a vast multitude of individuals that were not so happily adapted to their environment as the present species now are.

This was an old world when the coal mines were formed. Millions of years, to be reckoned by the score, had passed away since it was born of the nebulous world-stuff; but in all the tropical verdure of the long Carboniferous Age there were no birds, and no beasts on the land except reptiles. Millions of years more passed away before there was a feather in the world, and millions more before there were birds of song, and jewelled hummers, and birds of paradise. Our woodcock belongs to the Snipe Family, a group that includes many species of snipe, also Sandpipers, Tattlers, Curlews and Godwits; all of them are frequenters of wet localities, such as ocean beaches, shores of lakes and rivers, and swamps and bogs and marshes, where they feed upon insects and worms.

The nest of our woodcock is but a shallow, hollow scratched away among the dead leaves and old grass, and the eggs are usually four in number, colored brownish blotched with lilac. The young birds are able to run away like chickens as soon as they are out of the shell, and the mother has the singular habit of seizing one of them in her feet and flying away with it, when alarmed; the others are left to shift for themselves, which they can do so well that it seems an undue caution to carry any of them away.

GULLS AND TERNS.

"—A sheltering breast
Tonight shall haunt in vain thy far-off nest,
A call unanswered search the rocky ground."
—Hawker.

One mid-summer I became the owner all in one day of two gulls and three terns. They were in the down, being too young for feathers. The gulls were of the species known as the American Herring Gull, *Larus argentatus*, and the others were of the species called Wilson's Tern, or Common Tern, *Sterna hirundo*. These terns are in reality but a variation of the gulls, and only to be separated from them by such minor differences as specialists alone would notice.

I made a little yard for their accommodation, provided it with a tank of water, and then looked about for a supply of fish to suit their taste. I knew where the yellow perch and chub congregated, and they were drawn upon for food, especially during the babyhood of my birds, for later they would eat the liver of cattle and other meat. The gulls stood about eight inches in height when

they got into an attitude as straight as a stake. They were awkwardness personified, but everything they did was comical and amusing. One would stand erect for an hour at a time, as if in the midst of deep reflection, and then abruptly walk up to one of the little terns not half his size, lift it by the neck from the ground and replace it, and resume his attitude, as if he had been wound up like an alarm clock and set for this operation. The victims were never hurt, but they always objected as best they could.

They would swallow a fish as far as it would go down, and then stand straight as an adjutant, with the tail protruding from the bill, and wait the action of the digestive forces to make room for it. It would be followed by another without a moment of needless delay; it was only a question of room for them.

Even then they were not satisfied, but picked up another out of the dish and regretfully eyed it as if it was a struggle to wait till the other disappeared. When eating was out of the question with them any longer, they would roll over and over with mouths wide open, and disport themselves in many curious ways. When they were hungry they would come to me with open mouths and distended throats, as if to show me their capacity for food, and, if not promptly served, they would set up a doleful peeping, and go

through a complete pantomime of swallowing fish, and then wait a little for results.

The little terns grew rapidly, as did also the gulls. In a fortnight the terns were feathered. They were very tame. I shifted their quarters to a large room in a stable, and when I entered the terns flew to meet me, screaming as if in competition, and believing that the one which made the most noise would be served first.

The gulls were very particular about cleaning their bills after eating, going to a tank of water and swashing them vigorously for a long time. They had a curious fashion of resting on their ankle joints and making a third leg, or tripod, out of the tail. As they grew to gull-hood this attitude was given up, as if it were a mere freak of youth, and not in keeping with adult life. They were very playful, seizing sticks and pebbles and tossing them over their heads. An old rubber shoe was a source of much enjoyment. They carried it to the tank, dropped it in, and then had a task to get it again. They lived in a friendly way all the time, with the exception of the occasional diversion that the larger species found in picking up the little fellows, and that was doubtless mere sport, a sort of a practical joke.*

Perhaps this harmless foolery was originally the meaning of the verb "gull".—Ed.

OWLS.

"O, when the night falls, and roosts the fowl,
Then, then, is the reign of the Horned Owl."

—Barry Cornwall.

These are birds of prey, that, as a rule, take the night time for seeking their meat. When all other feathered people are asleep, and the hares and mice are awake looking for something to eat, then the owls are abroad for a meal.

The more you think about it, and the more you observe, the plainer will it appear that the principal business of all creatures is to get something to eat, and that their next concern is to prevent something from eating them, and the next to reproduce their kind by egg or by birth.

Hunger must be satisfied, or there soon will be nothing to satisfy. The way matters are arranged in this world, a very large proportion of creatures are obliged to subsist on the bodies of one another. A lion must have an antelope or some other large animal every few days, or he will die of starvation. A spider must have flies or other insects, or all will soon be over with it. Between these extremes, thousands of dif-

ferent species are daily and nightly feasting on the bodies of luckless victims.

It may seem hard to realize that all our lovely little birds that build their interesting nests, and tenderly rear their helpless broods, are doing a large part of this work for the benefit of hawks and owls. In fact, more than half their young are intended by nature for that very purpose. It is because the demands of our robber birds are so great that our small birds lay so many eggs and attempt to rear so many young. About six or seven to every pair of them, in many instances two broods in a season, is the rule. Birds of prey do not lay half so many eggs, and in some peculiar instances where great safety is secured in the nesting place, even one egg in a season is enough. We have an instance in the lone rocky islands, where there are no enemies. There, one egg is almost sure to hatch, and the young bird reach maturity.

Now we will take a look at the make-up of the owls, and see how surely they are intended and calculated to capture their prey. The law of all civilized nations inflicts a far greater penalty for the crime of breaking and entering a dwelling at night than by day; because it is so necessary for people to sleep, and trust to the honesty of everybody. I cannot but entertain a feeling of aversion toward these feathered mur-

derers which operate under the cover of darkness. Let us first of all examine their plumage. In the matter of color, we find they are never decked out in gaudy colors that vie with the rainbow, like many other families, but that, with the exception of the Snowy Owl of the Arctic regions, they are of various shades of brown and black. These shades are suited to the night; they may be regarded as the natural colors of the oldest stock of the bird class. The Snowy Owl lives almost always amid the snow and somewhat in the daylight, and his white plumage is a great advantage to him in a country where the snow lies upon the ground nearly all the year.

It may be inquired why owls are not sometimes blue or red or green or some brilliant hue, as these colors are all dark at night. We may as well understand that these high colors in other birds are the result of special agencies operating through millions of years. Very likely the females have in many instances selected the prettiest birds for mates, and thus by this long-continued choice the males have obtained the bright colors they display. As a rule, the females are duller of plumage than the males, and this is a valuable protection during the period of hatching, as they are not so readily seen by birds of prey. All this will do to think about, and we will go on with the owls.

It is desirable that the owls shall make no whirring sound with their wings in their search for their prey. The slightest sound might alarm the sleeping creatures. To prevent such mishaps, their plumage is covered with a fine down, and thus their flight is as noiseless as a falling leaf. Now one may readily see that this downy condition of the feathers would be brought about in a very natural way, since the individuals that flew with the least noise would fare the best, just as a man with moccasins on his feet could more successfully still-hunt a moose than a person shod with cow-hide boots. Little by little this noise-deadening growth was secured and transmitted to the offspring.

A bird that hunts by night must be provided with eyes that can see fairly well under such conditions. In the absolute darkness no eye can see; but in the night there is always some light from moon or stars or both, and the eyes of owls are constructed in a way to take advantage of what there is. They are set in long horn-like tubes after the fashion of telescopes and spy glasses, and the iris can open wide till almost the whole opening is pupil, thus admitting the faintest gleam through the lens and upon the retina, which is but the optic nerve spread out at the back of the socket. It will be readily perceived that the owls which see best in the night will be

surest to live, and that their advantages of structure will reappear in their offspring. At any time now, an owl with eyes that did not see well at night would be likely to starve, and thus end the unfortunate defect.

The claws of the owl are just what they should be, crooked, long and sharp, with ample leg muscle to drive them deep into the vitals of the struggling prey. The beak is hooked and sharp, the mouth wide, and there are large accommodations below for hearty meals.

In one way and another, I have made quite an extensive acquaintance with these night-birds, from the great horned owl of our Nova Scotian woods to a pygmy, not larger than a sparrow, which I discovered in Mexico.

It may be of interest to relate some of my experiences with these creatures.

In the state of Maine, there came one night to my house two boys returning from an afternoon's shooting. They had bagged a specimen of the barred owl, a bird about as large as a hen, destitute of horns, or the tufts of long feathers about the ear openings that go by this name. The eyes of the barred owl are not yellow, and altogether this species is not at all of a formidable appearance. This particular individual had met with hard experience from the boys. They had no fine feelings for owls. His right wing was

broken near the body, and one eye was hopelessly destroyed. I was not anxious to take the poor creature on my hands, but, as a matter of mercy, a trade was made and the bird was mine. It was after dark, and I made the best shift I could for him, after having amputated his wing. He was placed on a bit of old manger in a lintel that had no other occupants than a Guinea fowl and three or four hens. I thought the creature so completely knocked out that he would die during the night. Imagine my surprise in the morning to find him very comfortable—after having pecked the brains out of every living thing in the room. Loss of blood and loss of an eye and of a wing had not in the least prevented him from making havoc in this wholesale fashion. By a performance of that kind we may learn that these creatures are not as sensitive to pain as people are. Where is the man who would get around in that way within a few hours of the time when he had lost an arm and an eye, and also had his body peppered with shot? There was no indication that my owl intended to die, neither did he seem to be wasting any regrets over his misfortunes, but his motto evidently was, "let us live while we live, and get brain food while we can." As he was no heauty, and had fully proved his ferocity and ingratitude, there was but little left for me to do but even up the score by removing him from further temptations.

Not long afterwards, I came into possession of a fine specimen of the Great Horned Owl, or Virginia Owl. He had been caught by his toe in a steel trap, and the hoy who made the capture brought him alive and well to me. I gave him the run of a loft in an old shop, and there he remained all winter. I also tried to convince him that wo might and ought to be friends, hut all in vain. No blandishments nor persuasions in the least overcame his instinctive feeling, that in the nature of things we were enemies. Perhaps he was of the opinion that I had something to do with the trap, as he had heen promptly brought to me, and if so that would be good cause for keeping me at a distance. I soon learned that he had not lost his appetite on account of his confinement, hut was ready to eat as much as a small boy. When I entered his quarters. if he happened to be on the floor, then, in one hound, he leaped and flew aloft on his perch, and so savagely that he seemed more defiant than dangerous. When I practiced on him the hygiene of fasting for a day or two, and then made an appearance with a dead rabbit in my hand, he did not stand on any ceremony, hut pounced upon it with a fearful display of claws and gleaming eyes that warned me not to meddle with his meat.

After several months of confinement he escaped into the lower part of the building and

quickly fell in with a hen, proceeding at once to appropriate her to his own use, while she protested in the most violent manner, cackling and screaming as she dodged hither and thither behind boxes and barrels. Such an alarm brought the mistress of the household, who had a belief that hens were more profitable than owls. Seizing a broomstick, she began active hostilities against the offender, with the result that he soon received a blow on the skull that put him asleep. He seemed to be a very limp affair; in fact he looked very much like a dead owl, and a tub was turned over him to make very sure of his whereabouts. Later, by a couple of hours, I returned and learned of the battle, and went out to see the results. The tub was raised, and there sat the owl cracking his beak in the old defiant fashion, as if nothing had happened worth mentioning. But I had seen enough of him, and concluded that he might go where he would. The door was opened. He made a dash for liberty, and laid his course direct for the edge of the forest, where he was well acquainted, and that ended my experience with him. While I had him he was as savage as a tiger, sleeping and nodding all day, but when the sun went down he got up, and although there was nothing to hunt in his loft, still he put in the time dashing here and there all the night long.

This species of owl is the most common in Nova Scotia, and one of the largest of the family. He can carry away a rabbit with ease, and he can also eat one at a meal, as I have witnessed more than once. Except in the breeding season, these owls are solitary creatures, preferring the gloomy cone-bearing forests, where they perch among the thicker branches, as the light is doubtless not agreeable to their eyes. They nest in hollow trees and manage to hide very well their treasures of eggs and young.

We have also in Nova Scotia the small Acadian owl, not as large as a robin. It is generally called a Saw-whet, because its call in the breeding season suggests the sound of filing a saw, but it is really a pretty cooing call at regular intervals of a few seconds between, and very well becomes the shy little hermit of the swamps. I have had them, alive, in barns during the winter season, when hunger and cold had driven them to hunt for mice in such retreats. They are as defiant as the largest of the family, and crack their bills in true owl fashion. At sight of a living mouse, they are very wide awake in an instant and pounce upon it with great flourish of claws and beak, and all the savage grimaces of their kin. In fact, they have more savageness in their disposition than their habits demand. In this they testify to the existence of an ancestry

that grappled with prey more difficult to overcome than mice and small birds. They are surely a pigmy breed from a larger stock. There are several species of these very small owls in America, some of them not larger than sparrows. A species of more northern range generally than the Saw-whet, and a trifle larger, is Richardson's owl. This species overlaps the Saw-whet's territory, and is sometimes found in Nova Scotia.

CROWS.

"To shoot at crows is powder flung away." —Gay.

Crows are common, and conspicuous, and therefore generally known by name if no more. There is a large family connection, including ravens, jays, blackbirds, and magpies. The raven is often mistaken for a crow by untrained eyes, but he is about a quarter larger than the crow, his wings are longer than the tail and overlap it, and the bill is thatched with stiff bristles that hide the nostrils. There are also many other differences between the Common American Crow and the Raven of the eastern portions of North America. Their habits are very dissimilar. The raven is a solitary bird, choosing the deepest forests and the lone sea-shore, away from the haunts of men. They have long been considered birds of ill omen, and our literature abounds with references to this reputation. However, they are readily tamed, if taken from the nest when young, and may even be taught to speak a few words—as every reader of "Barnaby Rudge" must have learned, where a specimen of this kind is an important character. Emboldened by hunger, they will pick

up a chicken. Crows are never alone. In the breeding season they are paired during a few weeks, and then the young are urged out of the nest to a friendly limb near at hand, fed and tended a few days, and apparently instructed in early lessons of crow talk, for there is no end to the cawing and croaking, at that time. Very soon this brood of crows gets on the wing and finds another brood, and by the early fall, in some localities, they congregate by hundreds in a favorite grove, where they pass the nights.

Our crow is an all-round bird. He can walk in elegant fashion. He can run well, and hop in fine style. These three modes of locomotion are seldom found in the same species. If we could get upon the line of evolution that produced the crow, we would find that it took distinct departure from other birds by reason of a grain more of gumption than his fellows. The separate strain began with an individual of superior wits, at a period in their history when they did not look much like crows. This gleam of higher intelligence was valuable in the way of maintaining an existence in a world of continual struggle, and was therefore passed along to descendants by laws of heredity, and thus the crow family got set off as a separate branch. Or if brains are the true measure of the birds as well as men, then they are the tip of the main stem, and our common American Crow merits highest rank in

the family to which he belongs, wherein there are several species. He is not equipped with hooked claws and beak, like birds of prey, nor has he any very special feature in his structure. In scientific terms he is not specialized, with long legs like the waders, with webbed feet like the swimmers, with sharp long bills like the woodpeckers, or wide stretching wings like the hawks and gulls. He is a generalized bird, with structure suited fairly well to many purposes. He can fly straight ahead in a respectable fashion, but he is not calculated for any giddy gymnastics on the wing like swallows and gulls and goatsuckers. He has length of leg enough to answer all his purposes, and thus throughout his body one sees the evidence of the habits of the creature. He is not calculated to fit into some one calling for a livelihood like a woodpecker or a snipe or a loon, but he is adapted to take advantage of many situations where his superior wits indicate an opening for a meal. The wide variety of his food is just what we should expect from such a make-up of body. Meat, and fish, and eggs, and berries, and fruits, and grains, and insects, and reptiles, and worms, and clams, are all eaten in their season. His universal appetite for what can be had has tided him over hard places in the struggle for existence, and he has escaped with his life when other birds of narrower ranges of food supply have perished. His search for something to eat, like that

of all other creatures, man included, has been his principal employment, and it gave him an experience as varied as his bill of fare. It is a modest estimate that the human race has been here one hundred thousand years, and thousands of years before that this bird was a crow, very much as we see him. He got his high grading for intelligence in the bird world before there was anyone to pelt him with stones, or pierce him with arrows, or riddle him with shot, or catch him in a trap. He has been long enough acquainted with people to know they are not to be trusted—long enough for the young crows to have inherited a wholesome fear of all our kind, and know a gun at sight as quick as a chicken knows and fears the very shadow of a hawk that it never yet saw. Crows invade a cornfield with a distinct understanding that they are to be treated as enemies, and no quarter given. They know the range of a shot gun, and calculate closely how far away will be a safe distance. The cleverest scarecrow does not long deceive them. Some of their number are always on the lookout and ready to give the alarm.

His black plumage has been against him, so far as making him conspicuous, but his size and strength was a notice to let him alone, and predaceous birds heeded the notice. On the ground where he obtained most of his food, the foxes and other flesh-eaters would be on the watch for him at

a pinch, but the vigilance of the crow was sleepless. His intelligent prudence, made the more effectual by his gregarious or flocking habits, did not peculiarly encourage any protective color of plumage, as it was not needed in a creature so well adapted to take care of himself by other means.

One never gets near enough to a crow to make an intimate acquaintance unless he takes a nestling and tames it. This is a very easy matter. The creature at once becomes friendly. It is too early for the instinctive fear of mankind to get into operation. Like an alarm clock, it was set to go off at a later stage, but will never be heard from if the mechanism is disturbed by removing the creature from its natural environment. These instincts are arranged with nice precision. A chicken hatched in an incubator will follow a hen any time within a couple of days after hatching, but after that will not need a hen at all. The instinct reached out like the tendril of a plant and found nothing to seize upon, and shrivelled up and disappeared. The tame crow soon prefers human company to that of his kind. He will join a flock for a few hours, but return to his quarters where he is acquainted. He may be trusted out of doors, with no fears that he will stray away altogether, but one should have some misgivings about the mischief he makes when left to amuse himself. It is crow nature to be always

busy; his brain is active, and his body responds. When wild in the woods and fields and on the shore, they are never long in one locality, but flying hither and thither with caw and hurry, now to raid a cornfield, now to rob a bird's nest, now to hunt for clams, now to sample a dead fish on the shore, a ripe apple on the trees, or a frozen potato in the furrows. The same uneasiness of temperament is marked in the tame individual—he must have something to do. Crows take evident interest in securing bits of bright metals and getting them together in a pile, and they make the locality a favorite resort where they turn over their treasures as a connoisseur does his art collection. Jewelry is preferred by them. The Bower birds of Australia are of this crow connection and exhibit this characteristic in a marked degree, for they work together and construct a roofed bower in the long grass, and decorate it with bits of beautiful shells and corals, often brought miles from the sea shore to the dainty bower.

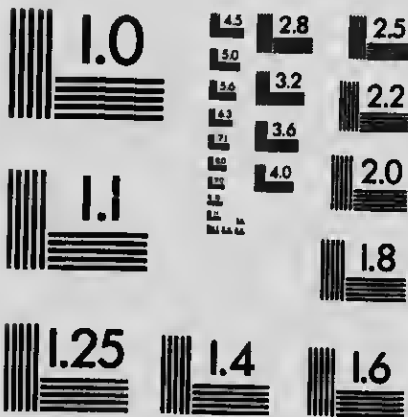
The tame crow will very adroitly hide any bit of food that is more than he needs. In this he follows the habit of his kind. He seems to understand, or in some way know that the morsel must be out of sight, but takes no pains to prevent it being found by the sense of smell. In this, crows differ from dogs and foxes, which bury bones and bits of meat and evidently have in mind the nose

as well as the eyes of other hungry brutes. The crow will fetch a chip and carefully cover the provision with it, and then step away a few feet and inspect the work, and if it does not look right will go back more than once to adjust it to his liking. He must surely be thinking that other eyes will find it, if not better concealed, for he always made it better in that respect. Such a habit as this is a great advantage in the struggle for existence, and it is worthy of inquiry as to how it came into existence. We may be confident that a crow was not made to crow at one cast, by a mere fiat, for the Bird Class is found in fossils through the rocks that were formed millions of years ago. During the vast lapse of time when our coal mines were forming there were no birds and no creatures that suckled their young. The first feathered creatures that the rocks (that were once beds of shallow seas) preserve are very lizard-like in their structure, and ages passed away after their time, before such a bird as a crow had an existence. If we could trace his pedigree it would take us through many strange bird-forms to the world of reptiles. By these considerations we may learn that his instincts have been slowly formed from actions that became habits, back to the same place to feed from what had been left, and accidentally covering it, so that he and that these, being of great importance to the



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individuals, were inherited and preserved. In this instance it may have begun in an individual going was obliged to uncover it at another visit, and out of some such small beginning the habit might have had its origin. I think, however, that the habit more likely arose from contention over food, when various individuals secured what they could out of the scuffle and flew away from others less fortunate, and had sense enough to put it out of sight.

Perhaps we shall never know the origin of the instinct, but the performance being of much advantage to the individual would readily become a habit, for we all know how easily habits are formed. Such a peculiarity could very well be inherited, and get itself bred into the descendants as an instinct, and these descendants, having such an advantage over other individuals of their species, would eventually outlast all the others.

If one doubts that a habit would be readily inherited, he has only to look into the instances of the common eave swallows, and the chimney swift, miscalled swallows. Before the coming of white men to America these swallows built under the niches of cliffs, and still build them in such places, in the wilder portions of the Rocky Mountain regions. The swifts nested in hollow trees before there were chimneys, and still continue the habit in localities remote from houses. In

both cases, the act of a few, or perhaps but one pair of each, was inherited by the young that had been hatched in these strange places. The individuals that took advantage of the asylum afforded by man multiplied faster than those which contended with more enemies in the outside wilds, and long ago all eastern North America witnessed these swallows and swifts in the asylums offered by barns and chimneys. Thus we see that not in all instances is instinct such a hard-and-fast arrangement that a bird cannot get away from its operations and take a new departure.

Farmers are rather rough on crows, because they do not know their friends when they see them; for this bird destroys a vast horde of objectionable insects in a season, far more than enough to even up the score against him as a thief.

OAKS.

"The monarch oak, the patriarch of the trees,
Shoots rising up, and spreads by slow degrees."
—Dryden.

The Oak Family contains more than three hundred species, among which the leaves are of various patterns; the nuts take many shapes, and the trees are of dimensions varying from shrubs to giants fifty feet in circumference.

There are oaks in England, and elsewhere, that were growing a thousand years ago or more. The wood was always held in high esteem in Britain, for purposes of ship-building, houses, and furniture. The Celtic druids of that island, from prehistoric times had associated many of their dark rites with groves of oak.

It is the bark of a member of this family that furnishes the cork supply of the world. In some few species the acorns are sweet. Our species beside my camp is the red oak (*Quercus rubra*) of the botanist. The nuts of all our northern species are bitter, and that fact is worth halting at for a little consideration. Let us see if we can hit upon the explanation of this distasteful

quality. In the first place oaks are especially pestered with insect enemies that attack them, roots, branches, leaves, and fruits. Most of them are gall flies that cause tumors by poisoning the cells with their egg-depositors. The shell of the nut is a protection against insects, birds, and squirrels. The cup that holds the acorn is but an adapted involucre of the flower blossom that guards the soft end of the nut till it is ready to drop from ripeness, and then they part company. Inside the shell is a vital germ or seed imbedded in a mass of nutritious pulp intended to supply the infant tree with food till it is provided with leaves and roots. One bunch of bull thistles has more seeds than a giant oak, but they are entrusted to the winds to carry them every-whither, and, since the number is so great, most of them may be lost, and still enough left to keep up the species. With the oak it is quite otherwise. There are no thousands for waste, and special provisions have arisen to provide for the infant tree in case it has the opportunity to germinate. Only a very small proportion of these little trees will get beyond a year or two. For the most part, they fall under the parent limbs and perish in the shade. Many oaks grow upon hillsides, and the nuts fall from the boughs, and heavy rains wash them further down and help to cover them with earth, thus leaving them favorably located

for sprouting. If the provision made to nourish the seedling oak results in having it devoured by hungry creatures, then some way may be found to defeat them more or less in this work. If the meat of the nut can be kept nutritious and have added to it a dash of bitterness, the situation will be improved, because so many of the nuts will not be eaten. Nature has often had recourse to that plan for the preservation of her vegetable products. It is quite true that acorns, with us, are still eaten by squirrels and birds, but to no great extent. I have but rarely seen a squirrel feeding on acorns, but they carry them away and bury them here and there, one in a place. This is the Red or Pine Squirrel, *Sciurus Hudsonicus*. The nuts are intended for winter use in case of shortage of pine seeds. Never have I observed one of these squirrels eating an acorn in the winter, nor have I seen where they had been doing the like, as the shells would easily mark the place. To find them digging up their cones and removing the scales from the seeds is a common occurrence. The fact that they place only one acorn in the same spot, and one readily finds the young oaks starting up hundreds of yards from an oak tree, leads me to believe that but few, if any, of these stored acorns are eaten.

At any rate these squirrels are distinctly helpful to the oaks in thus planting their seeds

where they could never get, without outside aid.

These trees are also befriended by the Blue Jays, which have a strong preference for acorns. This species of Jay is an intelligent bird. He takes the nut in his toes with the soft end upwards, resting the other end on a limb and vigorously thrusts his bill through the thin shell far enough at one stroke to make it stick there, and then he is master of the situation. He proceeds to use this arrangement as a hammer, and pounds away on the limb till the shell splits open and the prize is his. The vigilance of these jays is a marked characteristic. They readily become alarmed by men and hawks while in the midst of an acorn party, and fly away as fast as their wings can carry them. One often sees them flying from the oaks with an acorn on the tip of the bill, that may or may not hold fast till some distant tree is reached. Every one thus dropped stands a chance to germinate and grow to full maturity. I have often seen oak trees so far removed from other trees of that kind, that they must have been carried there by jays, as squirrels would not take them so far.

ABOUT BEARS

"The fur that warms a monarch, warm'd a bear."
—Pope.

The following chapter on Bears was a letter written to a ten year old boy in Boston :

Dear Ralph,—

I promised to write down a few stories about beasts and birds and other living things and send them to you. Here is the beginning at any rate. It is much easier to write for grown-up people than it is for a boy ten years of age, but we will see if I can succeed.

I believe you seemed the most desirous of knowing something about bears when last we were together, so we will begin here with them. Very likely you know there are several kinds or species of bears, but all I have to say here will be about the common black bear of North America. A Boston boy of your age must have seen these animals alive in the menageries where they do not show off very well, but seem quite stupid, poor things. They are prisoners behind bars and often show plainly enough that they are weary of that kind of life. You will remember that they are much larger than the St. Bernard dogs, or even the great mastiffs. Before I can

tell you any stories about them we must have a good understanding about their habits and dispositions. One of the first things to notice about the bear is the fact that he walks on the soles of his feet, like we do, and not on his toes like dogs and cats and lions, cattle and horses. His track in the mud or snow looks quite mannish, and is nearly as largo in many cases. He can stand up on his hinder feet as straight as a soldier, and even walk very well in that position. He is a great hugger, and sometimes he gets into trouble with men; to get his enemy in his big strong arms as he stands up is what he wants to do, and will do unless killed or crippled. His fore feet are used very much like hands.

The bear climbs large trees by a good use of strong limbs and long claws and a large share of good sense. No doubt he could get along almost as well if he never went up a tree, and so could a boy, but somehow there is a lot of fun in that kind of exercise.

Bears remind us very much of people. They are intelligent, and think and plan very much as we do. If they could talk, they would doubtless surprize us by what we might overhear them say about human animals that set traps for them and shoot at them and generally get themselves disliked by all the bear brotherhood.

If you stop to inquire about it you will find

that men, and monkeys, and apes eat many kinds of food, but horses and cattle and deers and numerous other species feed only on some form of vegetation. Lions, tigers, wolves, foxes, and a great many other animale eat no food but meat. Now the bear is like one of us, when it comes to satisfying his hunger. He could eat at our second table, and take his share of what the others had, and do well all the time. He would think himself lucky to get the scraps of any respectable table.

Both for men and bears, it is a very good thing to be able to eat a variety of food, because there are times, and seasons, when certain supplies are not to be had, and then other materials will serve for food.

Our Nova Scotian bears, through all the summer months, take life rather easy. In its due time something that suits their tastes may always be had by looking or smelling or listening, and going hither and thither over the country. A lazy bear will starve, and a sick one will go the same way unless it gets well very soon, for there are none to wait upon them. In the early spring, before the berries grow, it is rather a pinching period for them. But still there are fern roots to be had and ant hills to be dug open, where they may lick up the tiny inhabitants which rush out in alarm to see what all this uproar of falling

roofs and walls may mean; but before they can see the cause of ruin, a long red tongue has carried them by hundreds into the mouth of the great black brute. There cannot be much nourishment for such a large creature in a few thousand of these insects, yet he will not in the least mind spending an hour in digging and searching, for even that much food. The ants are sour to the taste of men, and I suppose the bear finds them a little acid, and relishes them as we do mustard and pepper.

Time is of but little account to a bear. He loiters around the country, like a big boy turned loose to do about as he pleases. He can eat a great deal, or he can make out very well on a little odds and ends. In the early spring, when his allowances are short, he can eat a bunch of ash sprouts like an ox. His nose is of great service, and tells him a good deal that he would not be likely either to see or hear. He has a sweet tooth, as they say, and a bee's nest has no terrors for him, if the honey is to be had. A few stings on the nose don't count for much, when such a prize is within reach. In the Nova Scotia woods, there are no wild-hive bees to make stores of honey and hide them away in hollow trees, as in many other parts of America, but there are humble bees, or humble bees, just as you chooses to call them. They are much

larger than the other kind, and their habits are very different. They do not make a honeycomb, but instead of that they put the honey in little paper bags. I have always found that the bumble bees have discovered an old mouse nest made of grass, hidden away under a rock or root, and in it have stowed their sweets.

Now this would do very well if a bear did not dig up every old or new mouse nest that his nose tells him where to find. He will spend hours in tearing up old stumps and logs and stones in order to get hold of one little frightened mouse. Even after all his work, the little fellow may escape by some secret passage, or dodge past his clumsy paws. Very likely there is some fun for the bear in this mouse hunt that he pursues so eagerly, and thus he thinks his time well spent if he gets no more out of it. All good hunters know that it is the chase for the game, and not the killing that is the best sport.

Now you must know that an old mouse nest will smell mousey to keen noses ever after, and that fact is important to the bear, and unfortunate for the bumble bees. The bear now and then has better luck than he expected, for while he was digging out a mouse as he supposed, there turned out to be some honey pots stowed away in the bunch of dried grass, that had once

served for a nest in which a mother mouse had reared her little family.

Bears have a great liking for berries, and help themselves all summer long to each kind in its season. Blueberries are the most plentiful in Nova Scotia, and they grow in large bunches, or clusters, thus making it easy for these hungry pickers to fill themselves to their satisfaction. There are also choke-cherries and wild-pears, or service-berries, and raspberries, and blackberries, and the bears know where to look for all these good things, and also when to look for them. Later on, in the fall, when the berries drop, there are in some localities beach-nuts and acorns, and bears contrive to make their homes where such fine food can be had. On these they grow fat, but on berries, that is hardly possible. There is a good reason why a bear, in a country like Canada, where there is a long winter, must get a thick coat of fat on him in the autumn, but of this I will tell a little later on in the story. We have more to say about the bear's bill of fare. He is far from sticking close to berries, and roots and mice and ants. He snaps up a nest full of young birds, creeps on a sleeping partridge, goes fishing in the shallows for perches and suckers, and flips them out on the bank with his paw. All this kind of a life is rather a tame affair for a great brute with his strong claws and tearing

teeth, that were surely intended for bigger business than picking berries and scratching open ant-hills. In the woods of Nova Scotia there are moose, caribon, and a few common deer. It is a very difficult feat for a bear to get any of these creatures when they are somewhat grown-up. They have very keen scent, and know a bear by the odor of him a long way off. Even though he should creep upon one of them, he would be beaten in a race for life. However, there are the young of these animals and sometimes they are seized and eaten by a bear. Then again an old moose could be run down, or driven into the miry bogs and there killed and devoured.

Our bears are frightened of men, and keep out of sight all they can. It is only a she-bear with her young that is dangerous to meddle with. Although they are fearful of guns and traps, still, they will very often linger about a farm all summer and kill sheep and cattle, and manage to get clear alive. In spite of all efforts to kill them they come to know a farmer's fields and pastures and fences and buildings almost as well as the owner. They have their hiding places, and keep a good run of the stock, and know when to make the attacks and when to lie low. They can run down an ox, and break his back with a blow from a paw. They also creep upon

sleeping sheep, and young cattle, and seize them before they can attempt to escape. You can see now why the farmers are sworn enemies to bears, for it is no small matter to be robbed of a large part of what a poor man owns, and for which he has worked hard to get together. It is looked upon by the farmers as a kind of war in which any means are fair means. They have no pity, no excuses for the brute that has only done what seemed a proper thing to do when he was hungry. He knew nothing about the cattle being owned by any man, and simply took what he needed. To outwit the bear is what the farmers and trappers set about to do, and this is not an easy matter after all the bragging men do about their brains. Bears have brains also, and they are fashioned on the same plan as our own; they do not weigh as much, but they are made to do some thinking like our own; and if they could talk we would be very much surprised at their good sense.

In the attempt to get a troublesome bear, either dead or alive, there are various plans carried out. A common thing to do is to set a steel trap; that is contrived to catch the creature by the foot or ankle. It is a cruel instrument, so heavy that it is a back-load for a man. There are a pair of jaws armed with long teeth, and these jaws are set wide open, but, easily forced to-

gether with a spring, if the bear places his foot between them on a bit of iron called a pan. A large stick of wood is chained to the trap, but that is only to keep them from going very far away with the dreadful implement on their foot. An Indian who by accident was caught in one of these traps in the woods, while he was alone, had to stay there four days. He told me about his terrible sufferings, and his narrow escape from death. A bear does not suffer so much, but his pain must be very great, and his fright is near to madness. Sometimes a bear is able to draw a hinder foot out of the jaws in spite of the teeth that go through and through it. I have known one to climb a tree, and drag after him the trap and log of wood until he reached a large limb, and there he jumped some fifteen feet to the ground, while the log was on the other side of the limb and could not be drawn over. The weight of his body falling so far jerked the foot from the trap that was left hanging to the branch, and the poor fellow limped away with a broken ankle and a badly wounded foot. No person has seen him since, but very likely he soon recovered, and is a wiser bear for that experience. I will not say that he planned to get his liberty in this way, but it looks as if he did that very thing.

A neighbor of mine hung up a piece of meat

on a tree for bait, where he had seen bear tracks, and under it he carefully set a steel trap. When he came the next day to see what luck there was for him, he found the trap torn up from its bed of leaves and thrown to one side, and the meat gone. The bear understood something about traps or he would have been caught. How he learned I cannot tell. His nose had told him of the buried danger. Then he must have been on his guard, or the thing would have been sprung with his foot between the terrible jaws. He did trip the pan that holds them down, but he did it from beneath, as if he knew where it could be safely done.

The trapper was not discouraged, but rather liked to outwit the brute if he could. So he set two traps within a few feet of each other, thinking that the animal would not expect more than one, and not be on the lookout for the other. What the bear did was this: he sprung one of them and threw it aside, and smelled around, at the meat, as his manner is, and, coming to the other trap, pushed his nose well down into the leaves to satisfy himself what might be there, never mistrusting that two of these dangerous things could be there, when instantly the spiked jaws closed about his snout. Do what he could with his strong paws and hinder feet, there was no getting away from the horrid instrument of tor-

ture. The pain must have been almost enough to drive him crazy. He knew that there was a man at the bottom of this sore trouble; he had smelt his tracks, and, besides this proof, he was sure that steel traps did not grow of themselves. It was bad enough to be in agony with this cruel instrument, weighing a hundred pounds, fastened to his face, but what of the man who was sure to come, later on, and find him in this helpless condition. At any rate, his paws were free, and he could walk on his hinder legs, but he could not drag the clog of wood; so he picked it up in his arms and walked away into the woods till he came to a large hemlock tree with branches from near the ground upward. Into this he painfully climbed, taking the piece of wood under one arm, while he bled and choked, and got himself hidden in the thick branches forty feet from the roots. Not likely that he thought any further, than to get out of the way of the hunter, who came the next day and discovered the poor brute and shot him; and afterwards remarked in a joking way that the bear looked comical with that ornament on his nose. He had not the least pity for the suffering creature that had no notion of right or wrong; and this man was like most other people when it comes to wild creatures.

The trappers have another kind of contrivance for catching bears that they call a "dead fall."

It is a small pen made of logs, with an opening at one end, and inside is a piece of meat fastened to a stick. Over the entrance is a great log connected with the pole that carries the bait. A bear is not without his fears of these things, and often will let the tempting morsels hang there, and go about his business in pursuit of food in safer places. There are foolish or stupid bears, just as there are the same kind of people. There are gluttonous bears also, as there are men who live to eat, and when one of these brutes, who is both stupid and unable to master his appetite, finds a dead fall supplied with good meat to be had for the taking, he enters cautiously stretching out his neck to get it without going altogether into the pen, for that was not the intention of the trapper who made it too small for that purpose. The plan was to have him stand with his back or his neck under the log that is hanging over the doorway. The animal is well aware that an enemy in the shape of a man has built the contrivance and placed the meat within reach, but he concludes to take the chances whatever they are. At any rate, that is what he seems to do; by hesitating and examining with nose and eyes, for the silliest bear that ever was, would not walk up to a dead fall and go in at once, as if he had no notion of danger.

One strong tug at the meat trips up the pole.

and instantly the great weight has fallen across him, and, turn and twist as he may, it is almost sure to be the end of him. If he has been caught across the neck, then death will soon put an end to his pain; but, if the log has fallen upon his hinder parts, he may live for days in great suffering, for the trappers do not go every day to their traps. On one occasion, a trapper, whom I know, found a bear standing upright with this great weight on his back, but he could not move a step without heing horn to the ground, and this he knew without trying. When he saw his enemy coming up, his fears drove him to make an effort to escape, and so was crushed beneath the burden he had upheld for hours.

When the hunters find a bear in a steel trap, the brute seems to be very much ashamed and will not look up, but holds his head down like a sulky child and makes no fuss about the matter. In spite of his appearance, it would be very dangerous to get within reach of his paws, for he would not lose a chance to settle up the account for causing him all the pain he suffered.

I once knew a man who was nearly killed in that way by a bear that he was teasing, and thought himself at a safe distance. No one could fairly blame the brute that was tortured with pain, and saw well enough that the creature before him had been the means of getting him into all this painful trouble.

In the fall, when the berries are all gone, and the cattle and sheep are housed, and there is neither fish, nor flesh to be had, the bears are then in hard straits. Wild cats, and foxes are more nimble and quicker scented, and manage to catch bares and partridges enough to satisfy their hunger all the year round, but the bears are unable to provide for themselves in that way. The fact is they must either starve, or live without eating all winter and early spring. The wonderful thing is that they do live without food during four or five months. Now, if they walked about, their strength would be used up, and their flesh would fail, and death be the end in a short time. What they must do if they are to live, is to keep warm and go to sleep. By these means, if there is a good coat of fat over their bodies, they may do very well; but they must sleep; for it takes strength to think. The fat will keep them warm, and also serves as a sort of coal bin to draw upon for fuel to keep up the needed heat. All summer long, the bears have no dens, and roam here and there, sleeping out in the open; but when the provisions fail they know it is time to get into a suitable shelter for winter. It is not an easy task to find what is needed, for every hole under the rocks will not answer for a bedroom. The floor must be dry, and the roof water tight. More than this, it is necessary to

look ahead and think of a wet spell that might flood many places that seem to be fine quarters during the time they are looking them up. No doubt all the older bears are acquainted with snitable places wheer they have passed previous winters, but it sometimes happens that another bear has gotten ahead, and refuses to give up his place. In a case of that kind, there is nothing to do but hastily look around and find a place to sleep, and sometimes they have to put up with very poor accommodations. I knew where a bear was obliged to take shelter for the winter's sleep under the cover of a large tree that had been blown over and left propped up by the roots at one end and by some branches at the other. In this way, the trunk was raised from the ground some three or four feet, and formed rather a poor roof, but it was better than no protection. Under this crept the bear, and made it a little larger by digging away from the floor a portion of the ground. She carried into this place dry leaves and dry ferns, a large armful for men, but many mouthfulls for herself, and in this way made a good bed. Do what she would, the den was open all around and the roof would surely leak some in a long rain storm. However, into it she crawled and curled herself up into a kind of ball, and soon fell asleep. During three months and over, all went very well, better than she could

have expected, but early in the month of March she was awakened by rain that had trickled around the log roof and wet her and her bed. It took her an hour or so to get fully awake and able to know what to do. She was very uncomfortable, but to stay there any longer would be all the worse for her. It was hard luck, but out she must go and move around. Very soon the sun came out from behind the clouds, and, as at that time of year it is quite warm, the poor brute, acting like a sensible creature, brought out her bed and scattered it over the snow to dry. Before night it was all in good order again and she carried it back, and having got her own coat dry through the day she went to bed none the worse for the trouble. All night she slept well, and doubtless dreamed over some of the disagreeable matters of the day before. It would take a day or two before settling into a slumber that might last a month longer. In the morning while nestling around she heard human voices and knew well enough that men were no friends of hers. When she was satisfied of the direction they were taking, it seemed best to get up and away to the hillside, not far from her den, but, as she hoped, out of sight of her enemies. The men were moose-hunters, who quickly saw the broken bits of bedding on the snow and followed them to the log where they got the track of the

bear. A very little looking and searching was needed to find her, as she sat watching them from her hiding place. I am sorry to say that she was shot at once, for such an intelligent animal deserved a better fate. Her skin was probably worth fifteen dollars, and that amount of money is not to be had so easily by most people.

When a den is large enough, sometimes two full-grown bears will use it for the winter's sleep. Mothers with a pair of cubs some seven months old remain together in the same den, and there must be some planning in order to get stowed away all right, but somehow they know enough to look after their own affairs pretty well.

Very likely that you know something about other animals taking the long sleep through cold weather. Our common striped squirrel or chipmunk makes a long burrow, and at the end of it out of reach of the frost builds a warm nest of leaves, and there passes the winter without food. The woodchuck, or groundhog, has the same habit. Frogs, toads, snakes and many insects, and some kinds of mice are winter sleepers. But this is not all, for the trees and plants of cold countries also get ready for a long nap, and if this was the proper place I would tell you how carefully and tenderly they are protected from the frost and snow, and made ready for a spring awakening.

In the Spring, soon as the snow has gone, the bears leave their dens, and you might think that after the long fast they are poor in flesh, but the truth is that they are almost as fat as they were in the fall. Their hearts beat very slowly, and as they breathed lightly and seldom, there was but little waste of fat or flesh for fuel. And here my bear stories must end. Spring has come, and I must get out into the fields.

GLIMPSE OF THE DARK SIDE OF NATURE.

"It is surely no small part of education to put us in intelligent possession of the most important and most universally interesting facts of the universe." — John Stuart Mill.

"To give a hospitable reception to all that presents itself as true knowledge. This is to be Hellenic. The growing mind in youth is keen after realities."

Last summer an acquaintance of mine, while mowing on a meadow, came upon a specimen of the Jumping Mouse (*Arvicola riparius*), and, picking it up by its very long tail, noticed between the shoulders the head of a grub that was imbedded under the skin. Once before he had observed on a living mouse of this species a grub in about the same position, inaccessible to feet or teeth of the little victim. Following a suggestion of my own he placed this recent capture in a box containing a little earth, and fed it during a few days, till the grub came out and soon covered itself with mud and then became snugly housed in a hard jointed pupa-case. In this condition it fell into my hands, and passed the entire winter and spring in a bottle in an unheated room. I had long thought it dead, but in the

middle of July the case was broken apart by a very lively fly that for ten days refused to die, and very much resented the imprisonment that kept him from roaming the wide world. As I expected, he was a species of the gad-fly, or hot-fly. Like "Dick Deadeye," "his looks were agin him." He was about the size of a small bumble bee, with hulging eyes on a large head covered with yellowish-white hairs, plastered flat over his face and mouth; two wings, black as coal, and a pair of winglets, no longer operative, telling the tale in brief of the strenuous struggle for existence wherein it had cast aside every weight and hindrance.

The Ox Bot-fly (*Hypoderma Bovis*) places her egg beneath the skin, where the larvae remain s'll fall and winter, hut early in the spring leaves its host, and, reaching the ground, finds shelter, and remains in the pupa case about one month, when it escapes and takes wing. My specimen was fully eight months in the pupa case. I have no doubt it is the Skin Bot-fly (*Cutererra Buccata*) that is known to infest the smaller mammals, rats, mice, and rahhits.

It appears that the larval grub does not eat while under the skin, hut, like the tape worm, absorbs sufficient nourishment from its surroundings. It is another fly of that group that is responsible for hots in horses, and still another that

infests the nostrils of sheep in a fatal fashion. With an unailing instinct, each of these creatures proceed to the business of perpetuating their species, with an utter disregard of the discomfort and actual pain inflicted on highly sensitive creatures.

Parasitism is the darkest aspect of nature. The moral disorder of it is appalling. Nothing escapes invasion; not only visible but invisible organisms and worms make themselves at home in our bodily premises, as if they were the right-owners of that varied domain. Not even our brain is free from their audacious intrusions, whilst armies of invisible germs throng our veins and nestle in our lungs, causing disorders that carry away large portions of the human race.

Says Professor Henry Drummond: "If Nature is the Garment of God, it is woven without seam throughout." I do not set this down in order to refute, or confound it, but to call attention to its sweeping confidence that Nature in all her aspects presents no phases that shock our finest sensibilities, or traverses our deepest convictions of right and goodness. The hagfish fastens itself to the throat of a much larger fish, and, by means of its specially contrived tongue, rasps a hole through the skin, and then at leisure makes its way into the muscular tissue of its victim, taking care not to injure the vital organs. When

its host at last dies, it is a mere bulk of skin, bones and viscera.

Says Babbage in a Bridgewater treatise : "The truths of natural religion are impressed in indelible characters on every fragment of the material world." It surely requires a special insight to detect religion of any kind in such moral disorder as the hagfish exhibits.

It is far from my intention to declare that even the atrocities of parasitism may not be reconciled with Eternal Goodness. It may be an unavoidable by-product of the evolutionary plan of creation. At any rate, it is good to come in close contact with such aspects and incidents of nature that compel us to think, and reflect; for the life which asks no questions of itself, which traces back no events to their causes, attempts no solution of the enigmas of life, is but a little better than a mere animal existence. Nature studies, that do not provoke curiosity and stimulate thinking, are falling far short of the opportunities in this wide and varied field. "When I consider the heavens, the work of thy fingers, the moon and the stars which thou hast ordained, what is man that thou are mindful of him, and the son of man that thou visitest him." This is a good instance of reflection of a high order induced by the observation of one of the commonest features of nature, but the grandest and most stupendous in the ken of mortal man.

WAY-SIDE WOODS IN WINTER.

"February bears the bier."

—Shelley.

"Stern winter loves a dirge-like sound."

—Wordsworth.

A February day, with clear skies and keen air, and under foot six inches of snow. I went about a hundred rods from my door across the main road, by the church, into a bunch of pines and hemlocks of ancient growth, where I am almost sure to see or hear some living creature that is not human. It is a kind of halting-place between the lower reaches of the river where there are no clearings, and the upper, and western side, of the road among the pastures and fields and fence-corners. On this afternoon there was neither sight nor sound of wild life. Coming to the lower margin of the wood where there was a bit of overflowed meadow, I noticed, frozen in the snow, here and there a feather of the ruffed grouse or commonly called hereabouts, "birch partridge." Further across the ice, was almost a handful of feathers in a bunch, and stuck fast to the snow into which they had thawed and afterward frozen: this item is important to my story. I

soon followed the feathers back into the edge of the woods to a nest-like cavity in the snow beneath a small yellow birch tree. On that spot had been enacted a woodland tragedy, one of the common-places of nature. Reading the signs, the affair runs in this way. Early in the afternoon of yesterday a partridge was feeding on the buds of the yellow birch, to which these birds are very partial. Having satisfied her hunger, she came to the ground and scratched away the snow from the turf that covered a half sunken boulder, where she found a checker-berry leaf or two, and then sat down to take her ease in the shadows of the old evergreens, as if there were no enemies in the world. In fact she had but little to fear, for the owls were not out in the broad daylight, and the wild-cats for the most part were in hiding. Birds of prey were speeding southward—but one species remained, and he was not a common bird by any means. From foxes and weasels there was danger in sleeping there, or even nodding. The unexpected happened, as it so often does. Our winter falcon, the fierce goshawk that had been slashing through the keen air with his strong wings, dashed through the pinery unperceived by the drowsy grouse and grappled her in his sharp crooked talons almost without stopping his flight, for there was no sign of resistance beyond a wing

mark on the snow. Away he bore her struggling and parting with her feathers, but all in vain; from those claws no bird had ever escaped. Let us consider the signs that tell the story. Had it been at night, the partridge would have been roosting on a limb, and not sitting in a cavity in the snow. It happened when there was no wind, otherwise the feathers would have been blown far and wide, also the feathers would not have been thawed down into cavities without the bright sun at this winter temperature. The afternoon of the day before I came exactly answers the conditions; the day before that was cloudy and squally.

If the hawk had not made a prize of her, there is evidence that a weasel might have feasted on her. for his tracks betrayed his presence the same afternoon on the very spot, where he smelled of almost every feather; as if he could hardly believe the evidence of his eyes, that so fresh a scent did not lead to a square meal for him thereabouts. Had he found the drowsy bird, he would have crept unperceived upon her, greatly favored by his white coat. Once within reach, by a single bound he would have her in his jaws, of immense strength for so small an animal, and while the scuffle would have been vigorous even to the bird flying away with him, still there could be but one ending to the contest, and that was

death to the grouse. Any person may see that the stupid partridge would be the one to fall a victim to the enemy; and thus the more clever individuals are continually preserved. It is equally true that the prizes will fall to the swiftest and most intelligent hawks and owls, provided that their eyes and ears are of the best. Only the choicest weasels will be able to secure meat enough to answer their purposes. The loss of an eye to a weasel, or the slightest deafness to an owl would shorten his days.

In spite of all alarms, and occasional hardships, and continuous bloodshed, one is warranted in the belief that the beasts and birds find life fairly enjoyable. They do not know that it is ever to have an ending. No thought of death has ever disturbed them. The evils to come are not considered. Their fears are soon quieted, and with a fair share of food, life is doubtless worth living.

To go on with my walk: I followed the river, now closed with ice a foot in thickness, a half mile to the hardwood hill, where I took the shelter of a fringe of ancient hemlocks that had appropriated a narrow strip of ground at the junction of the hill and swamp that forms the margin of the river. I have taken my readers over this favorite bit of woods when the flowers were in bloom and the mating birds were full of song.

But now all is changed. There is no sound but the muffled roar of the wind as it shakes the tree-tops, and the harsh crunching of the crust under-foot that is hidden beneath the lighter snow. This is a locality where owls find congenial quarters amid the sheltering branches of the hemlocks, and many times have I disturbed them as they dozed away the daylight in these dim retreats. Hidden by the tree-tops, and high in the air a raven is wrestling with the keen, stiff north wind, and reports his presence by now and again crying "ou-u", with a long drawn accent on the second syllable, and varying it with a hoarse croak that has never been taken to mean any good to mortal man. Hunger is driving this black speck across the sky in a search of food; perhaps he knows where it can be found and has it in view from his lofty lookout. Among the farmers there are occasional deaths among their cattle, sheep, and horses, and the carcasses are dragged away to the woods or pastures, where they become bonanzas for the ravens, especially in the cold season, when there is but little more to be had. In the warm weather there are young birds, and reptiles, and frogs, and a chicken here and there; but the taint of decay is no objection in the raven's estimation.

At this point, I turned homewards, as I had no disposition to go faster than needful to keep myself warm; indeed, it may be truly said, that he who

runs on these occasions will never read much of what can be gained by a very slow pace. There are always interesting objects to be seen, if we care to look after them. Hollow trees are attractive to me. They are the natural houses and nesting-places of many beasts and birds. In the winter, they shelter families of flying squirrels; and there the red squirrels often make their warm nests of moss and dry leaves; in them the owls find an opportunity for nests; and some species of butterflies hide away there for the winter. Sometimes there are openings near the ground, and with a few blows of my hatchet such a place may be readily enlarged. Before I got out of this woods, an ancient beech invited me to overhaul its cavity within my reach, and I was repaid by discovering a living butterfly clinging in a torpid condition to the dry and sheltered interior. It was the species known as the "Mourning Cloak", or *Antiopa Vanessa*, that may be seen common enough in the very early spring before even the *Arbutus* is in bloom. It has wintered in safety, and takes the first opportunity to get abroad again. As offspring will not appear till later, and they may be known by their brighter and newer aspect, and their unbroken wings. This species need not be confused with any other, as its dark velvety wings about two and a half inches across, bordered with whitish buff, make it conspicuous both in

size and color. The little creature had crawled into this dark shelter and taken a grip of the decayed wood and there it was motionless and insensible to all its surroundings. A slight warmth would have set in motion the torpid machinery, but it would be a perilous awakening on such a day, so I left it undisturbed: later on, some day after the summer has come, a little bird will strip it of wings and legs and feed her infant brood with the wonderful body that defied the rigors of winter to so small a purpose.

As a rule the butterflies perish through the summer and fall, but two or three species at any rate withstand the cold season.

Enough of this. My shadow stretched out rods in length across the snow as I faced the setting sun, and so there was no more sight-seeing for me that day. But I hardly dare look to the right or left lest some other object detain me while the twilight crept over the land.

THE END.

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