

NATURAL HISTORY OF MASSACHUSETTS¹

BOOKS of natural history make the most cheerful winter reading. I read in Audubon with a thrill of delight, when the snow covers the ground, of the magnolia, and the Florida keys, and their warm sea-breezes; of the fence-rail, and the cotton-tree, and the migrations of the rice-bird; of the breaking up of winter in Labrador, and the melting of the snow on the forks of the Missouri; and owe an accession of health to these reminiscences of luxuriant nature.

Within the circuit of this plodding life,
There enter moments of an azure hue,
Untarnished fair as is the violet
Or anemone, when the spring strews them
By some meandering rivulet, which make
The best philosophy untrue that aims
But to console man for his grievances.
I have remembered, when the winter came,
High in my chamber in the frosty nights,
When in the still light of the cheerful moon,
On every twig and rail and jutting spout,
The icy spears were adding to their length
Against the arrows of the coming sun,
How in the shimmering noon of summer past
Some unrecorded beam slanted across
The upland pastures where the Johnswort grew;
Or heard, amid the verdure of my mind,

¹ Reports — on the Fishes, Reptiles, and Birds; the Herbaceous Plants and Quadrupeds; the Insects Injurious to Vegetation; and the Invertebrate Animals of Massachusetts. Published agreeably to an Order of the Legislature, by the Commissioners on the Zoölogical and Botanical Survey of the State.

The bee's long smothered hum, on the blue flag
 Loitering amidst the mead; or busy rill,
 Which now through all its course stands still and dumb,
 Its own memorial, — purling at its play
 Along the slopes, and through the meadows next,
 Until its youthful sound was hushed at last
 In the staid current of the lowland stream;
 Or seen the furrows shine but late upturned,
 And where the fieldfare followed in the rear,
 When all the fields around lay bound and hoar
 Beneath a thick integument of snow.
 So by God's cheap economy made rich
 To go upon my winter's task again.

I am singularly refreshed in winter when I hear of service-berries, poke-weed, juniper. Is not heaven made up of these cheap summer glories? There is a singular health in those words, Labrador and East Main, which no desponding creed recognizes. How much more than Federal are these States! If there were no other vicissitudes than the seasons, our interest would never tire. Much more is adoin'g than Congress wots of. What journal do the persimmon and the buckeye keep, and the sharp-shinned hawk? What is transpiring from summer to winter in the Carolinas, and the Great Pine Forest, and the Valley of the Mohawk? The merely political aspect of the land is never very cheering; men are degraded when considered as the members of a political organization. On this side all lands present only the symptoms of decay. I see but Bunker Hill and Sing-Sing, the District of Columbia and Sullivan's Island, with a few avenues connecting them. But paltry are they all beside one blast of the east or the south wind which blows over them.

In society you will not find health, but in nature. Unless our feet at least stood in the midst of nature, all our faces would be pale and livid. Society is always diseased, and the best is the most so. There is no scent in it so wholesome as that of the pines, nor any fragrance so penetrating and restorative as the life-everlasting in high pastures. I would keep some book of natural history always by me as a sort of elixir, the reading of which should restore the tone of the system. To the sick, indeed, nature is sick, but to the well, a fountain of health. To him who contemplates a trait of natural beauty no harm nor disappointment can come. The doctrines of despair, of spiritual or political tyranny or servitude, were never taught by such as shared the serenity of nature. Surely good courage will not flag here on the Atlantic border, as long as we are flanked by the Fur Countries. There is enough in that sound to cheer one under any circumstances. The spruce, the hemlock, and the pine will not countenance despair. Methinks some creeds in vestries and churches do forget the hunter wrapped in furs by the Great Slave Lake, and that the Esquimaux sledges are drawn by dogs, and in the twilight of the northern night the hunter does not give over to follow the seal and walrus on the ice. They are of sick and diseased imaginations who would toll the world's knell so soon. Cannot these sedentary sects do better than prepare the shrouds and write the epitaphs of those other busy living men? The practical faith of all men belies the preacher's consolation. What is any man's discourse to me, if I am not sensible of something in it as steady and cheery as the creak of crickets? In it

the woods must be relieved against the sky. Men tire me when I am not constantly greeted and refreshed as by the flux of sparkling streams. Surely joy is the condition of life. Think of the young fry that leap in ponds, the myriads of insects ushered into being on a summer evening, the incessant note of the hyla with which the woods ring in the spring, the nonchalance of the butterfly carrying accident and change painted in a thousand hues upon its wings, or the brook minnow stoutly stemming the current, the lustre of whose scales, worn bright by the attrition, is reflected upon the bank!

We fancy that this din of religion, literature, and philosophy, which is heard in pulpits, lyceums, and parlors, vibrates through the universe, and is as catholic a sound as the creaking of the earth's axle; but if a man sleep soundly, he will forget it all between sunset and dawn. It is the three-inch swing of a pendulum in a cupboard, which the great pulse of nature vibrates by and through each instant. When we lift our eyelids and open our ears, it disappears with smoke and rattle like the cars on a railroad. When I detect a beauty in any of the recesses of nature, I am reminded, by the serene and retired spirit in which it requires to be contemplated, of the inexpressible privacy of a life, — how silent and unambitious it is. The beauty there is in mosses must be considered from the holiest, quietest nook. What an admirable training is science for the more active warfare of life! Indeed, the unchallenged bravery which these studies imply, is far more impressive than the trumpeted valor of the warrior. I am pleased to learn that Thales was up and stirring by night

not unfrequently, as his astronomical discoveries prove. Linnæus, setting out for Lapland, surveys his "comb" and "spare shirt," "leathern breeches" and "gauze cap to keep off gnats," with as much complacency as Bonaparte a park of artillery for the Russian campaign. The quiet bravery of the man is admirable. His eye is to take in fish, flower, and bird, quadruped and biped. Science is always brave; for to know is to know good; doubt and danger quail before her eye. What the coward overlooks in his hurry, she calmly scrutinizes, breaking ground like a pioneer for the array of arts that follow in her train. But cowardice is unscientific; for there cannot be a science of ignorance. There may be a science of bravery, for that advances; but a retreat is rarely well conducted; if it is, then is it an orderly advance in the face of circumstances.

But to draw a little nearer to our promised topics. Entomology extends the limits of being in a new direction, so that I walk in nature with a sense of greater space and freedom. It suggests besides, that the universe is not rough-hewn, but perfect in its details. Nature will bear the closest inspection; she invites us to lay our eye level with the smallest leaf, and take an insect view of its plain. She has no interstices; every part is full of life. I explore, too, with pleasure, the sources of the myriad sounds which crowd the summer noon, and which seem the very grain and stuff of which eternity is made. Who does not remember the shrill roll-call of the harvest-fly? There were ears for these sounds in Greece long ago, as Anacreon's ode will show.

"We pronounce thee happy, Cicada,
 For on the tops of the trees,
 Drinking a little dew,
 Like any king thou singest,
 For thine are they all,
 Whatever thou seest in the fields,
 And whatever the woods bear.
 Thou art the friend of the husbandmen,
 In no respect injuring any one;
 And thou art honored among men,
 Sweet prophet of summer.
 The Muses love thee,
 And Phœbus himself loves thee,
 And has given thee a shrill song;
 Age does not wrack thee,
 Thou skillful, earthborn, song-loving,
 Unsuffering, bloodless one;
 Almost thou art like the gods."

In the autumn days, the creaking of crickets is heard at noon over all the land, and as in summer they are heard chiefly at nightfall, so then by their incessant chirp they usher in the evening of the year. Nor can all the vanities that vex the world alter one whit the measure that night has chosen. Every pulse-beat is in exact time with the cricket's chant and the tickings of the death-watch in the wall. Alternate with these if you can.

About two hundred and eighty birds either reside permanently in the State, or spend the summer only, or make us a passing visit. Those which spend the winter with us have obtained our warmest sympathy. The nut-hatch and chickadee flitting in company through the dells of the wood, the one harshly scolding at the intruder, the other with a faint lisping note enticing him on; the jay screaming in the orchard; the crow cawing

in unison with the storm; the partridge, like a russet link extended over from autumn to spring, preserving unbroken the chain of summers; the hawk with warrior-like firmness abiding the blasts of winter; the robin¹ and lark lurking by warm springs in the woods; the familiar snowbird culling a few seeds in the garden or a few crumbs in the yard; and occasionally the shrike, with heedless and unfrozen melody bringing back summer again: —

His steady sails he never furls
 At any time o' year,
 And perching now on Winter's curls,
 He whistles in his ear.

As the spring advances, and the ice is melting in the river, our earliest and straggling visitors make their appearance. Again does the old Teian poet sing as well for New England as for Greece, in the

RETURN OF SPRING

Behold, how, Spring appearing,
 The Graces send forth roses;
 Behold, how the wave of the sea
 Is made smooth by the calm;
 Behold, how the duck dives;
 Behold, how the crane travels;

¹ A white robin and a white quail have occasionally been seen. It is mentioned in Audubon as remarkable that the nest of a robin should be found on the ground; but this bird seems to be less particular than most in the choice of a building-spot. I have seen its nest placed under the thatched roof of a deserted barn, and in one instance, where the adjacent country was nearly destitute of trees, together with two of the phœbe, upon the end of a board in the loft of a sawmill, but a few feet from the saw, which vibrated several inches with the motion of the machinery.

And Titan shines constantly bright.
 The shadows of the clouds are moving;
 The works of man shine;
 The earth puts forth fruits;
 The fruit of the olive puts forth.
 The cup of Bacchus is crowned,
 Along the leaves, along the branches,
 The fruit, bending them down, flourishes.

The ducks alight at this season in the still water, in company with the gulls, which do not fail to improve an east wind to visit our meadows, and swim about by twos and threes, pluming themselves, and diving to peck at the root of the lily, and the cranberries which the frost has not loosened. The first flock of geese is seen beating to north, in long harrows and waving lines; the jingle of the song sparrow salutes us from the shrubs and fences; the plaintive note of the lark comes clear and sweet from the meadow; and the bluebird, like an azure ray, glances past us in our walk. The fish hawk, too, is occasionally seen at this season sailing majestically over the water, and he who has once observed it will not soon forget the majesty of its flight. It sails the air like a ship of the line, worthy to struggle with the elements, falling back from time to time like a ship on its beam ends, and holding its talons up as if ready for the arrows, in the attitude of the national bird. It is a great presence, as of the master of river and forest. Its eye would not quail before the owner of the soil, but make him feel like an intruder on its domains. And then its retreat, sailing so steadily away, is a kind of advance. I have by me one of a pair of ospreys, which have for some years fished in this vicinity, shot by a neighboring pond,

measuring more than two feet in length, and six in the stretch of its wings. Nuttall mentions that "the ancients, particularly Aristotle, pretended that the ospreys taught their young to gaze at the sun, and those who were unable to do so were destroyed. Linnæus even believed, on ancient authority, that one of the feet of this bird had all the toes divided, while the other was partly webbed, so that it could swim with one foot, and grasp a fish with the other." But that educated eye is now dim, and those talons are nerveless. Its shrill scream seems yet to linger in its throat, and the roar of the sea in its wings. There is the tyranny of Jove in its claws, and his wrath in the erectile feathers of the head and neck. It reminds me of the Argonautic expedition, and would inspire the dullest to take flight over Parnassus.

The booming of the bittern, described by Goldsmith and Nuttall, is frequently heard in our fens, in the morning and evening, sounding like a pump, or the chopping of wood in a frosty morning in some distant farm-yard. The manner in which this sound is produced I have not seen anywhere described. On one occasion, the bird has been seen by one of my neighbors to thrust its bill into the water, and suck up as much as it could hold, then, raising its head, it pumped it out again with four or five heaves of the neck, throwing it two or three feet, and making the sound each time.

At length the summer's eternity is ushered in by the cackle of the flicker among the oaks on the hillside, and a new dynasty begins with calm security.

In May and June the woodland quire is in full tune, and, given the immense spaces of hollow air, and this

curious human ear, one does not see how the void could be better filled.

Each summer sound
Is a summer round.

As the season advances, and those birds which make us but a passing visit depart, the woods become silent again, and but few feathers ruffle the drowsy air. But the solitary rambler may still find a response and expression for every mood in the depths of the wood.

Sometimes I hear the veery's¹ clarion,
Or brazen trump of the impatient jay,
And in secluded woods the chickadee
Doles out her scanty notes, which sing the praise
Of heroes, and set forth the loveliness
Of virtue evermore.

The phœbe still sings in harmony with the sultry weather by the brink of the pond, nor are the desultory hours of noon in the midst of the village without their minstrel.

Upon the lofty elm-tree sprays
The vireo rings the changes sweet,
During the trivial summer days,
Striving to lift our thoughts above the street.

With the autumn begins in some measure a new spring. The plover is heard whistling high in the air over the dry pastures, the finches flit from tree to tree,

¹ This bird, which is so well described by Nuttall, but is apparently unknown by the author of the Report, is one of the most common in the woods in this vicinity, and in Cambridge I have heard the college yard ring with its trill. The boys call it "yorrick," from the sound of its querulous and chiding note, as it flits near the traveler through the underwood. The cowbird's egg is occasionally found in its nest, as mentioned by Audubon.

the bobolinks and flickers fly in flocks, and the goldfinch rides on the earliest blast, like a winged hyla peeping amid the rustle of the leaves. The crows, too, begin now to congregate; you may stand and count them as they fly low and straggling over the landscape, singly or by twos and threes, at intervals of half a mile, until a hundred have passed.

I have seen it suggested somewhere that the crow was brought to this country by the white man; but I shall as soon believe that the white man planted these pines and hemlocks. He is no spaniel to follow our steps; but rather flits about the clearings like the dusky spirit of the Indian, reminding me oftener of Philip and Powhatan than of Winthrop and Smith. He is a relic of the dark ages. By just so slight, by just so lasting a tenure does superstition hold the world ever; there is the rook in England, and the crow in New England.

Thou dusky spirit of the wood,
Bird of an ancient brood,
Flitting thy lonely way,
A meteor in the summer's day,
From wood to wood, from hill to hill,
Low over forest, field, and rill,
What wouldst thou say?
Why shouldst thou haunt the day?
What makes thy melancholy float?
What bravery inspires thy throat,
And bears thee up above the clouds,
Over desponding human crowds,
Which far below
Lay thy haunts low?

The late walker or sailor, in the October evenings, may hear the murmurings of the snipe, circling over

the meadows, the most spirit-like sound in nature; and still later in the autumn, when the frosts have tinged the leaves, a solitary loon pays a visit to our retired ponds, where he may lurk undisturbed till the season of moulting is passed, making the woods ring with his wild laughter. This bird, the Great Northern Diver, well deserves its name; for when pursued with a boat, it will dive, and swim like a fish under water, for sixty rods or more, as fast as a boat can be paddled, and its pursuer, if he would discover his game again, must put his ear to the surface to hear where it comes up. When it comes to the surface, it throws the water off with one shake of its wings, and calmly swims about until again disturbed.

These are the sights and sounds which reach our senses oftenest during the year. But sometimes one hears a quite new note, which has for background other Carolinas and Mexicos than the books describe, and learns that his ornithology has done him no service.

It appears from the Report that there are about forty quadrupeds belonging to the State, and among these one is glad to hear of a few bears, wolves, lynxes, and wildcats.

When our river overflows its banks in the spring, the wind from the meadows is laden with a strong scent of musk, and by its freshness advertises me of an unexplored wildness. Those backwoods are not far off then. I am affected by the sight of the cabins of the muskrat, made of mud and grass, and raised three or four feet along the river, as when I read of the barrows of Asia. The muskrat is the beaver of the settled States. Their

number has even increased within a few years in this vicinity. Among the rivers which empty into the Merrimack, the Concord is known to the boatmen as a dead stream. The Indians are said to have called it Musketaquid, or Prairie River. Its current being much more sluggish and its water more muddy than the rest, it abounds more in fish and game of every kind. According to the History of the town, "The fur-trade was here once very important. As early as 1641, a company was formed in the colony, of which Major Willard of Concord was superintendent, and had the exclusive right to trade with the Indians in furs and other articles; and for this right they were obliged to pay into the public treasury one twentieth of all the furs they obtained." There are trappers in our midst still, as well as on the streams of the far West, who night and morning go the round of their traps, without fear of the Indian. One of these takes from one hundred and fifty to two hundred muskrats in a year, and even thirty-six have been shot by one man in a day. Their fur, which is not nearly as valuable as formerly, is in good condition in the winter and spring only; and upon the breaking up of the ice, when they are driven out of their holes by the water, the greatest number is shot from boats, either swimming or resting on their stools, or slight supports of grass and reeds, by the side of the stream. Though they exhibit considerable cunning at other times, they are easily taken in a trap, which has only to be placed in their holes, or wherever they frequent, without any bait being used, though it is sometimes rubbed with their musk. In the winter the hunter cuts holes in the ice,

and shoots them when they come to the surface. Their burrows are usually in the high banks of the river, with the entrance under water, and rising within to above the level of high water. Sometimes their nests, composed of dried meadow-grass and flags, may be discovered where the bank is low and spongy, by the yielding of the ground under the feet. They have from three to seven or eight young in the spring.

Frequently, in the morning or evening, a long ripple is seen in the still water, where a muskrat is crossing the stream, with only its nose above the surface, and sometimes a green bough in its mouth to build its house with. When it finds itself observed, it will dive and swim five or six rods under water, and at length conceal itself in its hole, or the weeds. It will remain under water for ten minutes at a time, and on one occasion has been seen, when undisturbed, to form an air-bubble under the ice, which contracted and expanded as it breathed at leisure. When it suspects danger on shore, it will stand erect like a squirrel, and survey its neighborhood for several minutes, without moving.

In the fall, if a meadow intervene between their burrows and the stream, they erect cabins of mud and grass, three or four feet high, near its edge. These are not their breeding-places, though young are sometimes found in them in late freshets, but rather their hunting-lodges, to which they resort in the winter with their food, and for shelter. Their food consists chiefly of flags and fresh-water mussels, the shells of the latter being left in large quantities around their lodges in the spring.

The Penobscot Indian wears the entire skin of a musk-

rat, with the legs and tail dangling, and the head caught under his girdle, for a pouch, into which he puts his fishing-tackle, and essences to scent his traps with.

The bear, wolf, lynx, wildcat, deer, beaver, and marten have disappeared; the otter is rarely if ever seen here at present; and the mink is less common than formerly.

Perhaps of all our untamed quadrupeds, the fox has obtained the widest and most familiar reputation, from the time of Pilpay and Æsop to the present day. His recent tracks still give variety to a winter's walk. I tread in the steps of the fox that has gone before me by some hours, or which perhaps I have started, with such a tip-toe of expectation as if I were on the trail of the Spirit itself which resides in the wood, and expected soon to catch it in its lair. I am curious to know what has determined its graceful curvatures, and how surely they were coincident with the fluctuations of some mind. I know which way a mind wended, what horizon it faced, by the setting of these tracks, and whether it moved slowly or rapidly, by their greater or less intervals and distinctness; for the swiftest step leaves yet a lasting trace. Sometimes you will see the trails of many together, and where they have gamboled and gone through a hundred evolutions, which testify to a singular listlessness and leisure in nature.

When I see a fox run across the pond on the snow, with the carelessness of freedom, or at intervals trace his course in the sunshine along the ridge of a hill, I give up to him sun and earth as to their true proprietor. He does not go in the sun, but it seems to follow him, and there is a visible sympathy between him and it.

Sometimes, when the snow lies light and but five or six inches deep, you may give chase and come up with one on foot. In such a case he will show a remarkable presence of mind, choosing only the safest direction, though he may lose ground by it. Notwithstanding his fright, he will take no step which is not beautiful. His pace is a sort of leopard canter, as if he were in no wise impeded by the snow, but were husbanding his strength all the while. When the ground is uneven, the course is a series of graceful curves, conforming to the shape of the surface. He runs as though there were not a bone in his back. Occasionally dropping his muzzle to the ground for a rod or two, and then tossing his head aloft, when satisfied of his course. When he comes to a declivity, he will put his fore feet together, and slide swiftly down it, shoving the snow before him. He treads so softly that you would hardly hear it from any nearness, and yet with such expression that it would not be quite inaudible at any distance.

Of fishes, seventy-five genera and one hundred and seven species are described in the Report. The fisherman will be startled to learn that there are but about a dozen kinds in the ponds and streams of any inland town; and almost nothing is known of their habits. Only their names and residence make one love fishes. I would know even the number of their fin-rays, and how many scales compose the lateral line. I am the wiser in respect to all knowledges, and the better qualified for all fortunes, for knowing that there is a minnow in the brook. Methinks I have need even of his sympathy, and to be his fellow in a degree.

I have experienced such simple delight in the trivial matters of fishing and sporting, formerly, as might have inspired the muse of Homer or Shakespeare; and now, when I turn the pages and ponder the plates of the Angler's Souvenir, I am fain to exclaim, —

“Can such things be,
And overcome us like a summer's cloud?”

Next to nature, it seems as if man's actions were the most natural, they so gently accord with her. The small seines of flax stretched across the shallow and transparent parts of our river are no more intrusion than the cobweb in the sun. I stay my boat in mid-current, and look down in the sunny water to see the civil meshes of his nets, and wonder how the blustering people of the town could have done this elvish work. The twine looks like a new river-weed, and is to the river as a beautiful memento of man's presence in nature, discovered as silently and delicately as a footprint in the sand.

When the ice is covered with snow, I do not suspect the wealth under my feet; that there is as good as a mine under me wherever I go. How many pickerel are poised on easy fin fathoms below the loaded wain! The revolution of the seasons must be a curious phenomenon to them. At length the sun and wind brush aside their curtain, and they see the heavens again.

Early in the spring, after the ice has melted, is the time for spearing fish. Suddenly the wind shifts from north-east and east to west and south, and every icicle, which has tinkled on the meadow grass so long, trickles down its stem, and seeks its level unerringly with a million comrades. The steam curls up from every roof and fence.

I see the civil sun drying earth's tears,
Her tears of joy, which only faster flow.

In the brooks is heard the slight grating sound of small cakes of ice, floating with various speed, full of content and promise, and where the water gurgles under a natural bridge, you may hear these hasty rafts hold conversation in an undertone. Every rill is a channel for the juices of the meadow. In the ponds the ice cracks with a merry and inspiring din, and down the larger streams is whirled grating hoarsely, and crashing its way along, which was so lately a highway for the woodman's team and the fox, sometimes with the tracks of the skaters still fresh upon it, and the holes cut for pickerel. Town committees anxiously inspect the bridges and causeways, as if by mere eye-force to intercede with the ice and save the treasury.

The river swelleth more and more,
Like some sweet influence stealing o'er
The passive town; and for a while
Each tussock makes a tiny isle,
Where, on some friendly Ararat,
Resteth the weary water-rat.

No ripple shows Musketaquid,
Her very current e'en is hid,
As deepest souls do calmest rest
When thoughts are swelling in the breast,
And she that in the summer's drought
Doth make a rippling and a rout,
Sleeps from Nahshawtuck to the Cliff,
Unruffled by a single skiff.
But by a thousand distant hills
The louder roar a thousand rills,

And many a spring which now is dumb,
And many a stream with smothered hum,
Doth swifter well and faster glide,
Though buried deep beneath the tide.
Our village shows a rural Venice,
Its broad lagoons where yonder fen is;
As lovely as the Bay of Naples
Yon placid cove amid the maples;
And in my neighbor's field of corn
I recognize the Golden Horn.

Here Nature taught from year to year,
When only red men came to hear, —
Methinks 't was in this school of art
Venice and Naples learned their part;
But still their mistress, to my mind,
Her young disciples leaves behind.

The fisherman now repairs and launches his boat. The best time for spearing is at this season, before the weeds have begun to grow, and while the fishes lie in the shallow water, for in summer they prefer the cool depths, and in the autumn they are still more or less concealed by the grass. The first requisite is fuel for your crate; and for this purpose the roots of the pitch pine are commonly used, found under decayed stumps, where the trees have been felled eight or ten years.

With a crate, or jack, made of iron hoops, to contain your fire, and attached to the bow of your boat about three feet from the water, a fish-spear with seven tines and fourteen feet long, a large basket or barrow to carry your fuel and bring back your fish, and a thick outer garment, you are equipped for a cruise. It should be a warm and still evening; and then, with a fire crackling merrily at the prow, you may launch forth like a cucullo

into the night. The dullest soul cannot go upon such an expedition without some of the spirit of adventure; as if he had stolen the boat of Charon and gone down the Styx on a midnight expedition into the realms of Pluto. And much speculation does this wandering star afford to the musing night-walker, leading him on and on, jack-o'-lantern-like, over the meadows; or, if he is wiser, he amuses himself with imagining what of human life, far in the silent night, is flitting moth-like round its candle. The silent navigator shoves his craft gently over the water, with a smothered pride and sense of benefaction, as if he were the phosphor, or light-bringer, to these dusky realms, or some sister moon, blessing the spaces with her light. The waters, for a rod or two on either hand and several feet in depth, are lit up with more than noonday distinctness, and he enjoys the opportunity which so many have desired, for the roofs of a city are indeed raised, and he surveys the midnight economy of the fishes. There they lie in every variety of posture; some on their backs, with their white bellies uppermost, some suspended in mid-water, some sculling gently along with a dreamy motion of the fins, and others quite active and wide awake, — a scene not unlike what the human city would present. Occasionally he will encounter a turtle selecting the choicest morsels, or a muskrat resting on a tussock. He may exercise his dexterity, if he sees fit, on the more distant and active fish, or fork the nearer into his boat, as potatoes out of a pot, or even take the sound sleepers with his hands. But these last accomplishments he will soon learn to dispense with, distinguishing the real object of his pursuit, and find

compensation in the beauty and never-ending novelty of his position. The pines growing down to the water's edge will show newly as in the glare of a conflagration; and as he floats under the willows with his light, the song sparrow will often wake on her perch, and sing that strain at midnight which she had meditated for the morning. And when he has done, he may have to steer his way home through the dark by the north star, and he will feel himself some degrees nearer to it for having lost his way on the earth.

The fishes commonly taken in this way are pickerel, suckers, perch, eels, pouts, breams, and shiners, — from thirty to sixty weight in a night. Some are hard to be recognized in the unnatural light, especially the perch, which, his dark bands being exaggerated, acquires a ferocious aspect. The number of these transverse bands, which the Report states to be seven, is, however, very variable, for in some of our ponds they have nine and ten even.

It appears that we have eight kinds of tortoises, twelve snakes, — but one of which is venomous, — nine frogs and toads, nine salamanders, and one lizard, for our neighbors.

I am particularly attracted by the motions of the serpent tribe. They make our hands and feet, the wings of the bird, and the fins of the fish seem very superfluous, as if Nature had only indulged her fancy in making them. The black snake will dart into a bush when pursued, and circle round and round with an easy and graceful motion, amid the thin and bare twigs, five or six feet from the ground, as a bird flits from bough to bough,

or hang in festoons between the forks. Elasticity and flexibility in the simpler forms of animal life are equivalent to a complex system of limbs in the higher; and we have only to be as wise and wily as the serpent, to perform as difficult feats without the vulgar assistance of hands and feet.

In May, the snapping turtle (*Emysaurus serpentina*) is frequently taken on the meadows and in the river. The fisherman, taking sight over the calm surface, discovers its snout projecting above the water, at the distance of many rods, and easily secures his prey through its unwillingness to disturb the water by swimming hastily away, for, gradually drawing its head under, it remains resting on some limb or clump of grass. Its eggs, which are buried at a distance from the water, in some soft place, as a pigeon-bed, are frequently devoured by the skunk. It will catch fish by daylight, as a toad catches flies, and is said to emit a transparent fluid from its mouth to attract them.

Nature has taken more care than the fondest parent for the education and refinement of her children. Consider the silent influence which flowers exert, no less upon the ditcher in the meadow than the lady in the bower. When I walk in the woods, I am reminded that a wise purveyor has been there before me; my most delicate experience is typified there. I am struck with the pleasing friendships and unanimities of nature, as when the lichen on the trees takes the form of their leaves. In the most stupendous scenes you will see delicate and fragile features, as slight wreaths of vapor, dew-lines, feathery sprays, which suggest a high refine-

ment, a noble blood and breeding, as it were. It is not hard to account for elves and fairies; they represent this light grace, this ethereal gentility. Bring a spray from the wood, or a crystal from the brook, and place it on your mantel, and your household ornaments will seem plebeian beside its nobler fashion and bearing. It will wave superior there, as if used to a more refined and polished circle. It has a salute and a response to all your enthusiasm and heroism.

In the winter, I stop short in the path to admire how the trees grow up without forethought, regardless of the time and circumstances. They do not wait as man does, but now is the golden age of the sapling. Earth, air, sun, and rain are occasion enough; they were no better in primeval centuries. The "winter of *their* discontent" never comes. Witness the buds of the native poplar standing gayly out to the frost on the sides of its bare switches. They express a naked confidence. With cheerful heart one could be a sojourner in the wilderness, if he were sure to find there the catkins of the willow or the alder. When I read of them in the accounts of northern adventurers, by Baffin's Bay or Mackenzie's River, I see how even there, too, I could dwell. They are our little vegetable redeemers. Methinks our virtue will hold out till they come again. They are worthy to have had a greater than Minerva or Ceres for their inventor. Who was the benignant goddess that bestowed them on mankind?

Nature is mythical and mystical always, and works with the license and extravagance of genius. She has her luxurious and florid style as well as art. Having a pil-

grim's cup to make, she gives to the whole — stem, bowl, handle, and nose — some fantastic shape, as if it were to be the ear of some fabulous marine deity, a Nereus or Triton.

In the winter, the botanist need not confine himself to his books and herbarium, and give over his outdoor pursuits, but may study a new department of vegetable physiology, what may be called crystalline botany, then. The winter of 1837 was unusually favorable for this. In December of that year, the Genius of vegetation seemed to hover by night over its summer haunts with unusual persistency. Such a hoar-frost as is very uncommon here or anywhere, and whose full effects can never be witnessed after sunrise, occurred several times. As I went forth early on a still and frosty morning, the trees looked like airy creatures of darkness caught napping; on this side huddled together, with their gray hairs streaming, in a secluded valley which the sun had not penetrated; on that, hurrying off in Indian file along some watercourse, while the shrubs and grasses, like elves and fairies of the night, sought to hide their diminished heads in the snow. The river, viewed from the high bank, appeared of a yellowish-green color, though all the landscape was white. Every tree, shrub, and spire of grass, that could raise its head above the snow, was covered with a dense ice-foliage, answering, as it were, leaf for leaf to its summer dress. Even the fences had put forth leaves in the night. The centre, diverging, and more minute fibres were perfectly distinct, and the edges regularly indented. These leaves were on the side of the twig or stubble opposite to the sun, meeting it for the

most part at right angles, and there were others standing out at all possible angles upon these and upon one another, with no twig or stubble supporting them. When the first rays of the sun slanted over the scene, the grasses seemed hung with innumerable jewels, which jingled merrily as they were brushed by the foot of the traveler, and reflected all the hues of the rainbow, as he moved from side to side. It struck me that these ghost leaves, and the green ones whose forms they assume, were the creatures of but one law; that in obedience to the same law the vegetable juices swell gradually into the perfect leaf, on the one hand, and the crystalline particles troop to their standard in the same order, on the other. As if the material were indifferent, but the law one and invariable, and every plant in the spring but pushed up into and filled a permanent and eternal mould, which, summer and winter forever, is waiting to be filled.

This foliate structure is common to the coral and the plumage of birds, and to how large a part of animate and inanimate nature. The same independence of law on matter is observable in many other instances, as in the natural rhymes, when some animal form, color, or odor has its counterpart in some vegetable. As, indeed, all rhymes imply an eternal melody, independent of any particular sense.

As confirmation of the fact that vegetation is but a kind of crystallization, every one may observe how, upon the edge of the melting frost on the window, the needle-shaped particles are bundled together so as to resemble fields waving with grain, or shocks rising here and there from the stubble: on one side the vegetation

of the torrid zone, high-towering palms and wide-spread banyans, such as are seen in pictures of oriental scenery; on the other, arctic pines stiff frozen, with downcast branches.

Vegetation has been made the type of all growth; but as in crystals the law is more obvious, their material being more simple, and for the most part more transient and fleeting, would it not be as philosophical as convenient to consider all growth, all filling up within the limits of nature, but a crystallization more or less rapid?

On this occasion, in the side of the high bank of the river, wherever the water or other cause had formed a cavity, its throat and outer edge, like the entrance to a citadel, bristled with a glistening ice-armor. In one place you might see minute ostrich-feathers, which seemed the waving plumes of the warriors filing into the fortress; in another, the glancing, fan-shaped banners of the Lilliputian host; and in another, the needle-shaped particles collected into bundles, resembling the plumes of the pine, might pass for a phalanx of spears. From the under side of the ice in the brooks, where there was a thicker ice below, depended a mass of crystallization, four or five inches deep, in the form of prisms, with their lower ends open, which, when the ice was laid on its smooth side, resembled the roofs and steeples of a Gothic city, or the vessels of a crowded haven under a press of canvas. The very mud in the road, where the ice had melted, was crystallized with deep rectilinear fissures, and the crystalline masses in the sides of the ruts resembled exactly asbestos in the disposition of their needles. Around the roots of the stubble and flower-stalks, the

frost was gathered into the form of irregular conical shells, or fairy rings. In some places the ice-crystals were lying upon granite rocks, directly over crystals of quartz, the frostwork of a longer night, crystals of a longer period, but, to some eye unprejudiced by the short term of human life, melting as fast as the former.

In the Report on the Invertebrate Animals, this singular fact is recorded, which teaches us to put a new value on time and space: "The distribution of the marine shells is well worthy of notice as a geological fact. Cape Cod, the right arm of the Commonwealth, reaches out into the ocean, some fifty or sixty miles. It is nowhere many miles wide; but this narrow point of land has hitherto proved a barrier to the migrations of many species of Mollusca. Several genera and numerous species, which are separated by the intervention of only a few miles of land, are effectually prevented from mingling by the Cape, and do not pass from one side to the other. . . . Of the one hundred and ninety-seven marine species, eighty-three do not pass to the south shore, and fifty are not found on the north shore of the Cape."

That common mussel, the *Unio complanatus*, or more properly *fluviatilis*, left in the spring by the muskrat upon rocks and stumps, appears to have been an important article of food with the Indians. In one place, where they are said to have feasted, they are found in large quantities, at an elevation of thirty feet above the river, filling the soil to the depth of a foot, and mingled with ashes and Indian remains.

The works we have placed at the head of our chapter, with as much license as the preacher selects his text, are

such as imply more labor than enthusiasm. The State wanted complete catalogues of its natural riches, with such additional facts merely as would be directly useful.

The reports on Fishes, Reptiles, Insects, and Invertebrate Animals, however, indicate labor and research, and have a value independent of the object of the legislature.

Those on Herbaceous Plants and Birds cannot be of much value, as long as Bigelow and Nuttall are accessible. They serve but to indicate, with more or less exactness, what species are found in the State. We detect several errors ourselves, and a more practiced eye would no doubt expand the list.

The Quadrupeds deserved a more final and instructive report than they have obtained.

These volumes deal much in measurements and minute descriptions, not interesting to the general reader, with only here and there a colored sentence to allure him, like those plants growing in dark forests, which bear only leaves without blossoms. But the ground was comparatively unbroken, and we will not complain of the pioneer, if he raises no flowers with his first crop. Let us not underrate the value of a fact; it will one day flower in a truth. It is astonishing how few facts of importance are added in a century to the natural history of any animal. The natural history of man himself is still being gradually written. Men are knowing enough after their fashion. Every countryman and dairy-maid knows that the coats of the fourth stomach of the calf will curdle milk, and what particular mushroom is a safe and nutritious diet. You cannot go into any

field or wood, but it will seem as if every stone had been turned, and the bark on every tree ripped up. But, after all, it is much easier to discover than to see when the cover is off. It has been well said that "the attitude of inspection is prone." Wisdom does not inspect, but behold. We must look a long time before we can see. Slow are the beginnings of philosophy. He has something demoniacal in him, who can discern a law or couple two facts. We can imagine a time when "Water runs down hill" may have been taught in the schools. The true man of science will know nature better by his finer organization; he will smell, taste, see, hear, feel, better than other men. His will be a deeper and finer experience. We do not learn by inference and deduction and the application of mathematics to philosophy, but by direct intercourse and sympathy. It is with science as with ethics, — we cannot know truth by contrivance and method; the Baconian is as false as any other, and with all the helps of machinery and the arts, the most scientific will still be the healthiest and friendliest man, and possess a more perfect Indian wisdom.