

IX

APRIL, 1858

(ÆT. 40)

April 1. White-bellied swallows.

P. M. — Paddle up Assabet.

The river is at summer level; has not been up this spring, and has fallen to this. The lowermost willow at my boat is bare. The white maples are abundantly out to-day. Probably the very first bloomed on the 29th. We hold the boat beneath one, surprised to hear the resounding hum of honey-bees, which are busy about them. It reminds me of the bass and its bees. The trees are conspicuous with dense clusters of light-colored stamens. The alders above the Hemlocks do not yet shed pollen. What I called yellow wasps, which built over my window last year, have come, and are about the old nest; numbers have settled on it.¹

I observed night before last, as often before, when geese were passing over in the twilight quite near, though the whole heavens were still light and I knew which way to look by the honking, I could not distinguish them. It takes but a little obscurity to hide a bird in the air. How difficult, even in broadest daylight, to discover again a hawk at a distance in the sky when you have once turned your eyes away!

Pleasant it is to see again the red bark of the *Cornus*

¹ Were they not the common kind looking at it?

sericea shining in the warm sun at the hill swamp, above the spring. Walking through the maple [*sic*] there, I see a squirrel's nest twenty-three or twenty-four feet high in a large maple, and, climbing to it, — for it was so peculiar, having a basketwork of twigs about it, that I did not know but it was a hawk's nest, — I found that it was a very perfect (probably) red squirrel's nest, made entirely of the now very dark or blackish green moss such as grows on the button-bush and on the swampy ground, — a dense mass of it about one foot through, matted together, — with an inobvious hole on the east side and a tuft of loose moss blowing up above it, which seemed to answer for a door or porch covering. The cavity within was quite small, but very snug and warm, where one or two squirrels might lie warmly in the severest storm, the dense moss walls being about three inches thick or more. But what was most peculiar was that this nest, though placed over the centre of the tree, where it divided into four or five branches, was regularly and elaborately hedged about and supported by a basketwork of strong twigs stretched across from bough to bough, which twigs I perceived had been gnawed green from the maple itself, the stub ends remaining visible all around.

Near by I saw another much smaller and less perfect nest of the same kind, which had fallen to the ground. This had been made in a birch, and the birch twigs had been gnawed off, but in this case I noticed a little fine broken grass within it, mixed with the moss.

I notice large water-bugs.

It is remarkable that the river seems rarely to rise

or fall gradually, but rather by fits and starts, and hence the water-lines, as indicated now by the sawdust, are very distinct parallel lines four or five or more inches apart. It is true the wind has something to do with it, and might waft to a certain place much more dust than was left on another where the water stood much longer at the same level. Surely the saw-miller's is a trade which cannot be carried on in secret. Not only this sawdust betrays him, but at night, especially, when the water is high, I hear the tearing sound of his saw a mile or more off, borne down the stream.

I see six *Sternotherus odoratus* in the river thus early. Two are fairly out sunning. One has crawled up a willow. It is evident, then, that they may be earlier in other places or towns than I had supposed, where they are not concealed by such freshets as we have. I took up and smelt of five of these, and they emitted none of their peculiar scent! It would seem, then, that this may be connected with their breeding, or at least with their period of greatest activity. They are quite sluggish now.

At Hemlock Brook, a dozen or more rods from the river, I see on the wet mud a little snapping turtle evidently hatched last year. It does not open its eyes nor mouth while I hold it. Its eyes appear as if sealed up by its long sleep. In our ability to contend with the elements what feeble infants we are to this one. Talk of great heads, look at this one! Talk of Hercules' feats in the cradle, what sort of cradle and nursing has this infant had? It totters forth confident and victorious when it can hardly carry its shield. It looked

so much like the mud or a wet muddy leaf, it was a wonder I saw it.

I start, under the hemlocks there, a butterfly (call it the tawny-orange single-white-spotted) about the size of *Vanessa Antiopa*, tawny-orange, with black spots or eyes, and pale-brown about them, a white spot near the corner of each front wing, a dark line near the edge behind, a small sharp projecting angle to the hind wings, a green-yellow back to body.¹

See wood turtles coupled on their edges at the bottom, where the stream has turned them up.

Far up in still shallows, disturb pickerel and perch, etc. They apparently touch the muddy bottom as they dart out, muddying the water here and there.

A *Rana halcina* on the bank.

When I started to walk that suddenly pleasant afternoon, the 28th of March, I crossed the path of the two brothers R., who were walking direct to the depot as if they had special business there that Sunday, the queer short-legged dog running ahead. I talked with them an hour there in the hope that the one who is not a stranger to me would let something escape from his wise head. But he was very moderate; all I got out of him to be remembered was that in some town up-country where he lived when young, they called the woodchuck "squash-belly,"—with reference to his form I suggested, but so far he had not advanced. This he communicated very seriously, as an important piece of information with which he labored. The other told me

¹ [*Vanessa j-album*, to judge by the date and the general description.]

how to raise a dog's dander, — any the gentlest dog's, — by looking sternly in his face and making a peculiar sound with your mouth. I then broke short the conference, continued my walk, while these gentlemen wheeled directly about and walked straight back again.

It is evident that the date of the first general revival of the turtles, excepting such as are generally seen in ditches, *i. e.* the yellow-spotted, depends on the state of the river, whether it is high or low in the spring.

April 2. P. M. — To yew and R. W. E.'s Cliff.

At Hubbard's Grove I see a woodchuck. He waddles to his hole and then puts out his gray nose within thirty feet to reconnoitre. It is too windy, and the surface of the croaker pool is too much ruffled, for any of the croakers to be lying out, but I notice a large mass of their spawn there well advanced. At the first little sluiceway just beyond, I catch a large *Rana halecina*, which puffs itself up considerably, as if it might be full of spawn. I must look there for its spawn. It is rather sluggish; cannot jump much yet. It allows me to stroke it and at length take it up in my hand, squatting still in it.

Who would believe that out of these dry and withered banks will come violets, lupines, etc., in profusion? At the spring on the west side of Fair Haven Hill, I startle a striped snake. It is a large one with a white stripe down the dorsal ridge between two broad black ones, and on each side the last a buff one, and then blotchy brown sides, darker toward tail; beneath,

greenish-yellow. This snake generally has a pinkish cast. There is another, evidently the same species but not half so large, with its neck lying affectionately across the first, — I may have separated them by my approach, — which, seen by itself, you might have thought a distinct species. The dorsal line in this one is bright-yellow, though not so bright as the lateral ones, and the yellow about the head; also the black is more glossy, and this snake has no pink cast. No doubt on almost every such warm bank now you will find a snake lying out. The first notice I had of them was a slight rustling in the leaves, as if made by a squirrel, though I did not see them for five minutes after. The biggest at length dropped straight down into a hole, within a foot of where he lay. They allowed me to lift their heads with a stick four or five inches without stirring, nor did they mind the flies that alighted on them, looking steadily at me without the slightest motion of head, body, or eyes, as if they were of marble; and as you looked hard at them, you continually forgot that they were real and not imaginary.

The hazel has just begun to shed pollen here, perhaps yesterday in some other places. This loosening and elongating of its catkins is a sufficiently pleasing sight, in dry and warm hollows on the hillsides. It is an unexpected evidence of life in so dry a shrub.

On the side of Fair Haven Hill I go looking for bay-wings, turning my glass to each sparrow on a rock or tree. At last I see one, which flies right up straight from a rock eighty [or] one hundred feet and warbles a peculiar long and pleasant strain, after the manner

of the skylark, methinks, and close by I see another, apparently a bay-wing, though I do not see its white in tail, and it utters while sitting the same subdued, rather peculiar strain.

See how those black ducks, swimming in pairs far off on the river, are disturbed by our appearance, swimming away in alarm, and now, when we advance again, they rise and fly up-stream and about, uttering regularly a *crack cr-r-rack* of alarm, even for five or ten minutes, as they circle about, long after we have lost sight of them. Now we hear it on this side, now on that.

The yew shows its bundles of anthers plainly, as if it might open in four or five days.

Just as I get home, I think I see crow blackbirds about a willow by the river.¹

It is not important that the poet should say some particular thing, but should speak in harmony with nature. The tone and pitch of his voice is the main thing.

It appears to me that the wisest philosophers that I know are as foolish as Sancho Panza dreaming of his Island. Considering the ends they propose and the obstructions in their path, they are even. One philosopher is feeble enough alone, but observe how each multiplies his difficulties, — by how many unnecessary links he allies himself to the existing state of things. He girds himself for his enterprise with fasting and prayer, and then, instead of pressing forward like a light-armed soldier, with the fewest possible hindrances,

¹ Yes.

he at once hooks himself on to some immovable institution, as a family, the very rottenest of them all, and begins to sing and scratch gravel *towards* his objects. Why, it is as much as the strongest man can do decently to bury his friends and relations without making a new world of it. But if the philosopher is as foolish as Sancho Panza, he is also as wise, and nothing so truly makes a thing so or so as thinking it so.

Approaching the side of a wood on which were some pines, this afternoon, I heard the note of the pine warbler, calling the pines to life, though I did not see it. It has probably been here as long as I said before. Returning, I saw a sparrow-like bird flit by in an orchard, and, turning my glass upon it, was surprised by its burning yellow. This higher color in birds surprises us like an increase of warmth in the day.

April 3. Going down-town this morning, I am surprised by the rich strain of the purple finch from the elms. Three or four have arrived and lodged against the elms of our street, which runs east and west across their course, and they are now mingling their loud and rich strains with that of the tree sparrows, robins, bluebirds, etc. The hearing of this note implies some improvement in the acoustics of the air. It reminds me of that genial state of the air when the elms are in bloom. They sit still over the street and make a business of warbling. They advertise me surely of some additional warmth and serenity. How their note rings over the roofs of the village! You wonder that even the sleepers are not awakened by it to inquire who is there,

and yet probably not another than myself in all the town observes their coming, and not half a dozen ever distinguished them in their lives. And yet the very mob of the town know the hard names of Germanians or Swiss families which once sang here or elsewhere.

About 9 A. M., C. and I paddle down the river. It is a remarkably warm and pleasant day. The shore is alive with tree sparrows sweetly warbling, also blackbirds, etc. The crow blackbirds which I saw last night are hoarsely clucking from time to time. Approaching the island, we hear the air full of the hum of bees, which at first we refer to the near trees. It comes from the white maples across the North Branch, fifteen rods off. We hear it from time to time, as we paddle along all day, down to the Bedford line. There is no pause to the hum of the bees all this warm day. It is a very simple but pleasing and soothing sound, this susurrus, thus early in the spring.

When off the mouth of the Mill Brook, we hear the stertorous *tut tut tut* of frogs from the meadow, with an occasional faint bullfrog-like *er er er* intermingled. I land there to reconnoitre. The river is remarkably low, quite down to summer level, and there is but very little water anywhere on the meadows. I see some shallow lagoons (west of the brook), whence the sound comes. There, too, are countless painted turtles out, around on the banks and hummocks left by the ice. Their black and muddy backs shine afar in the sun, and though now fifteen to twenty rods off, I see through my glass that they are already alarmed, have their necks stretched out and are beginning to slip into the

water, where many heads are seen. Resolved to identify this frog, one or two of whose heads I could already see above the surface with my glass, I picked my way to the nearest pool. Close where I landed, an *R. halecina* lay out on some sedge. In went all the turtles immediately, and soon after the frogs sank to the bottom, and their note was heard only from more distant pools. I stood perfectly still, and ere long they began to reappear one by one, and spread themselves out on the surface. They were the *R. halecina*. I could see very plainly the two very prominent yellow lines along the sides of the head and the large dark ocellated marks, even under water, on the thighs, etc. Gradually they begin to recover their voices, but it is hard to say at first which one of the dozen within twenty feet is speaking. They begin to swim and hop along the surface toward each other. Their note is a hard dry *tut tut tut tut*, not at all ringing like the toad's, and produced with very little *swelling* or motion of the throat, but as much trembling of the whole body; and from time to time one makes that faint somewhat bullfrog-like *er er er*. Both these sounds, then, are made by one frog, and what I have formerly thought an early bullfrog note was this. This, I think, is the first frog sound I have heard from the river meadows or anywhere, except the croaking leaf-pool frogs and the hylodes. They are evidently breeding now like toads, and probably are about the water as exclusively as the toads will soon be.

This sound we continue to hear all day long, especially from the broad meadows in Bedford. Close at hand a single one does not sound loud, yet it is

surprising how far a hundred or thousand croaking (?) at once can be heard. It comes borne on the breeze from north over the Bedford meadows a quarter of a mile off, filling the air. It is like the rattling of a wagon along some highway, or more like a distant train on a railroad, or else of many rills emptying in, or more yet like the sound of a factory, and it comes with an echo which makes it seem yet more distant and universal. At this distance it is a soft and almost purring sound, yet with the above-named bullfrog-like variation in it. Sometimes the meadow will be almost still; then they will begin in earnest, and plainly excite one another into a general snoring or eructation over a quarter of a mile of meadow. It is unusually early to hear them so numerous, and by day, but the water, being so very low and shallow on the meadows, is unusually warm this pleasant day. This might be called the Day of the Snoring Frogs, or the Awakening of the Meadows. Probably the frost is out of the meadows very early this year. It is a remarkable spring for reptile life. It remains now to detect the note of the *palustris*, wood frog, and *fontinalis*. I am not sure but I heard one kind of bullfrog's note along the river once or twice. I saw several middle-sized frogs with green noses and dark bodies, small, bullfrog-like (??), sitting along the shore.

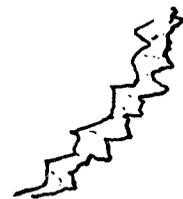
At what perhaps is called the Holt just below N. Barrett's, many grackles and red-wings together flit along the willows by our side, or a little ahead, keeping up a great chattering, while countless painted turtles are as steadily rustling and dropping into the water from the willows, etc., just ahead.

We land at Ball's Hill and eat our dinners. It is so warm we would fain bathe. We seek some shade and cannot easily find it. You wonder that all birds and insects are not out at once in such a heat. We find it delicious to take off our shoes and stockings and wade far through the shallows on the meadow to the Bedford shore, to let our legs drink air.

How pretty the white fibrous roots of the criocaulon, floating in tufts on the meadow, like beaded chains!

In the hazy atmosphere yesterday we could hardly see Garfield's old unpainted farmhouse. It was only betrayed by its elms. This would be the right color for painters to imitate. When the sun went into a cloud we detected the outlines of the windows only.

When returning, we discovered, on the south side of the river, just at the old crossing-place from the Great Meadows, north of the ludwigia pool, a curious kind of spawn. It was white, each ovum about as big as a robin-shot or larger, with mostly a very minute white core, no black core, and these were agglutinated together in the form of zigzag hollow cylinders, two or three inches in diameter and one or two feet long, looking like a lady's ruff or other muslin work, on the bottom or on roots and twigs of willow and button-bush, where the water was two or three feet deep.



The greater part lay on the bottom, looking like a film, these cylinders being somewhat coiled about there. When you took it up, the two sides fell together, and it was flat in your hand like the leg of a stocking. In one

place there were a dozen very large red-bellied and brown-backed leeches in it, evidently battenng on it. This must be frog or fish spawn. If frog-spawn, I think it must be that of the *Rana halecina*,¹ the only ones fairly awake along the river; but how are leeches propagated? There was a great abundance of it, many bushels, for at least a dozen rods along the shore, and it must afford food to many creatures. The consistency of a jelly we eat. We saw one perch there. Some on the ruts was quite up to the surface, but most lower. When you had taken up a handful and broken it, on dropping it into the water it recovered its form for the most part. I noticed that the fine willow root-fibres and weeds, potamogeton, etc., there were thickly covered with a whitish film or fuzz, an eighth to a quarter of an inch deep, or long, apparently connected with this spawn, which made them look like plants covered with frost in a winter morning, though it was a duller white; but out of water you did not perceive anything. Probably this was the milt.

When I have been out thus the whole day and spend the whole afternoon returning, it seems to me pitiful and ineffectual to be out as usual only in the afternoon, — as if you had come late to a feast, after your betters had done. The afternoon seems coarse and reversed, or at best a long twilight, after the fresh and bright forenoon.

The gregariousness of men is their most contemptible and discouraging aspect. See how they follow each other like sheep, not knowing why. Day & Martin's

¹ No. *Vide* April 5th. Is it not fish-spawn?

blackng was preferred by the last generation, and also is by this. They have not so good a reason for preferring this or that religion as in this case even. Apparently in ancient times several parties were nearly equally matched. They appointed a committee and made a compromise, agreeing to vote or believe so and so, and they still helplessly abide by that. Men are the inveterate foes of all improvement. Generally speaking, they think more of their hen-houses than of any desirable heaven. If you aspire to anything better than politics, expect no coöperation from men. They will not further anything good. You must prevail of your own force, as a plant springs and grows by its own vitality.

Hear the *Rana halecina* in the evening also, from my window.

April 4. P. M. — Go to the cold pond-hole south of J. P. Brown's, to hear the croaking frogs. They are in full blast on the southwest side, where there have been some birches, etc., cut the past winter, and there is much brush fallen in the water, whose shelter they evidently like, and there they have dropped their spawn on the twigs. I stand for nearly an hour within ten feet on the bank overlooking them. You see them lying spread out, or swimming toward one another, sometimes getting on to the brush above the water, or hopping on to the shore a few feet. I see one or two pairs coupled, now sinking, now rising to the surface. The upper one, a male, quite dark brown and considerably smaller than the female, which is reddish —

such part of her as I can see — and has quite distinct dark bars on its posterior extremities, while I cannot discern any on the male. But the greatest commotion comes from a mass of them, five or six inches in diameter, where there are at least a dozen or fifteen clinging to one another and making a queer croaking. From time to time a newcomer adds himself to the mass, turning them over and over.¹ The water is all alive with them for a couple of rods, and from time to time they croak much more generally than at others, evidently exciting one another to it, as do the *R. halecina*. Before I caught any of them I was only struck with the fact that the males were much smaller and very much darker, though I could see only one female partially. At length, when all the rest had been scared to the bottom by nearer approach, I got near to the struggling mass. They were continually dropping off from it, and when at length I reached out to seize it, there were left but two. Lifting the female, the male still clung to her with his arms about her body, and I caught them both, and they were perfectly passive while I carried them off in my hand. To my surprise the female was the ordinary light-reddish-brown *wood frog* (*R. sylvatica*), with legs distinctly barred with dark, while the male, whose note alone I have heard, methinks, was not only much smaller, but of a totally different color, a dark brown above with dark-slate-colored sides, and the yet darker bars on its posterior extremities and the dark line from its snout only to be

¹ It was an incessantly struggling mass. You could have *taken up a dozen* or fifteen in your two hands.

distinguished [on] a close inspection. Throat and beneath, a cream white, like but clearer than the female. In color, a small bullfrog¹ which I had caught, and any other frog that I know, was more like the female than these males were. I have caught the female in previous years, as last spring in New Bedford, but could find no description of him and suspected it to be an undescribed frog. It seems they were all (of this mass) about one female, and I saw only one other in the pool, but apparently only one had possession of her. There was a good deal of spawn firmly attached to the brush close to the surface, and, as usual, in some lights you could not see the jelly, only the core. I brought these frogs home and put them in a pan of water.²

Sophia has brought home the early large-catkinned willow, well out; probably some yesterday at least.

April 5. What I call the young bullfrog, about two and a half inches long, — though it has no yellow on throat. It has a bright-golden ring outside of the iris as far as I can see round it. Is this the case with the bullfrog? May it not be a young *Rana fontinalis*? No yellow to throat. I found it on the shore of the Clamshell Hill ditch. Can jump much better than the others, and easily gets out of the deep pan.³

Those to whom I showed the two *R. sylvatica* could not believe that they were one species, but this morn-

¹ Probably *R. fontinalis*.

² *Vide* below.

³ *Vide* three pages forward. *Vide* also June 8, 1858. Probably a *Rana fontinalis*.

ing, on taking them out of the water to examine minutely, they changed so rapidly, chameleon-like, that I could only describe their first appearance from memory. The male grew a lighter brown and the female darker, till in ten minutes there was but a slight shade of difference, and their whole aspect, but especially that of the male, *seemed* altered also, so that it was not easy to distinguish them. Yet they would readily be recognized for rather dark-colored wood frogs, the posterior extremities of both having distinct dark bars. The female was two and one tenth inches long, the male one and four fifths inches long. The female was (apparently involuntarily) dropping a little spawn in the pan this morning, and the black core was as big as the head of a pin when it issued from the body. The only difference in color that I now noticed, except that the male was a shade the darkest (both a pale brown), was that there was a very distinct dark mark on the front side at the base of the anterior extremities of the female, while there was but the slightest trace of it in the male. Also the female was more green on the flanks and abdomen; also she had some dusky spots beneath. What is described as a yellow line along the lower edge of the dark one through the eyes, *i. e.* along the upper jaw, and which I observed to be such last spring, was in both these at all times a broad silvery or bright cream-colored line. Putting them into the water, after an hour they again acquired distinct colors, but not quite so distinct at first. It is singular that at the breeding-season, at least, though both are immersed in water, they are of a totally different color, --

the male a very dark brown for a frog, darker than the ordinary color of any Massachusetts frog, without distinct bars to his posterior extremities or a distinct dark line along the snout, while the female is a light reddish brown or lively dead-leaf color, — and that, taken out of water, they rapidly approximate each other till there is only a shade of difference if any. At their breeding-season, then, the colors of the male are not livelier, as in the case of birds, but darker and more sombre.

Considering how few of these or of the *R. halecina* you meet with in the summer, it is surprising how many are now collected in the pools and meadows. The woods resound with the one, and the meadows day and night with the other, so that it amounts to a general awakening of the pools and meadows.

I hear this morning the seringo sparrow.

In the proceedings of the Natural History Society for December, 1856, there were presented by Dr. H. R. Storer, “a globular concretion of grass said to have been formed by the action of waves upon the seashore.” Were not these some obtained by the Hoars or Emersons from Flint’s Pond?

P. M. — I go to the meadow at the mouth of the Mill Brook to find the spawn of the *R. halecina*. They are croaking and coupling there by thousands, as before, though there is a raw east wind to-day. I see them coupled merely, in a few instances, but no such balls or masses of them about one female as in the case of the *R. sylvatica*, though this may occur. You can easily

get close to them and catch them by wading. The first lagoon within the meadow was not a foot deep anywhere, and I found the spawn where it was about eight inches deep, with a grassy and mossy bottom. It was principally in two collections, which were near together and each about a yard in diameter. The separate masses of this were from two to six, or commonly three or four, inches in diameter, and generally looked quite black and dense or fine-egged in the water. But it really on a closer inspection presented quite an interesting variety of appearances. The black core is about the size of a pin-head, and one half of it is white. It commonly lies with the black side up, and when you look directly down on it, has a rich, very dark blue-purple appearance. When with the white or wrong side up, it looks like a mass of small silvery points or bubbles, and you do not notice the jelly. But it lies also at all intermediate angles, and so presents a variety of appearances. It is attached pretty firmly to the grass and rises just to the surface. There are very fine froth-like bubbles more or less mingled with it. I am not sure that I can distinguish it from that of the *R. sylvatica*.

I caught several of the first. The dark blotches on the back were generally more or less roundish with a crenate edge. There were distinct, raised, light bronze-colored ridges from the snout along the side-head and body, which were conspicuous at a distance. They were, all that I caught, distinctly yellow-white beneath, and some had green buttocks.¹ And now, standing over them, I saw that there were considerable lateral

¹ Were they not males?

bubbles formed when they croaked, *i. e.*, the throat was puffed out *on each side* quite far behind the snout. The tympanum was very convex and prominent.

At evening I find that the male *R. sylvatica* couples with or fastens himself to the back of the young bull-frog (?), or whatever it is,¹ and the latter meanwhile croaks, in short croaks four or five times repeated, much like the *R. sylvatica*, methinks.

I hear the hylodes peeping now at evening, being at home, though I have not chanced to hear any during the day. They prefer the evening.

April 6. A moist, foggy, and very slightly drizzly morning. It has been pretty foggy for several mornings. This makes the banks look suddenly greener, apparently making the green blades more prominent and more vividly green than before, prevailing over the withered ones.

P. M. — Ride to Lee's Cliff and to Second Division Brook.

It begins to grow cold about noon, after a week or more of generally warm and pleasant weather. They with whom I talk do not remember when the river was so low at this season. The top of the bathing-rock, above the island in the Main Branch, was more than a foot out of water on the 3d, and the river has been falling since. On examining the buds of the elm at Helianthus Bank, I find it is not the slippery elm, and therefore I know but one.

At Lee's Cliff I find no saxifrage in bloom above

¹ *R. fontinalis*.

the rock, on account of the ground having been so exposed the past exceedingly mild winter, and no *Ranunculus fascicularis* anywhere there, but on a few small warm shelves under the rocks the saxifrage makes already a pretty white edging along the edge of the grass sod [?] on the rocks; has got up three or four inches, and may have been out four or five days. I also notice one columbine, which may bloom in a week if it is pleasant weather.

The *Ulmus Americana* is apparently just out here, or possibly yesterday. The *U. fulva* not yet, of course. The large rusty blossom-buds of the last have been extensively eaten and mutilated, probably by birds, leaving on the branches which I examine mostly mere shells.

I see, in [one] or two places in low ground, elder started half an inch, before any other shrub or tree. The *Turritis stricta* is four to six inches high. No mouse-ear there yet.

I hear hylas in full blast 2.30 P. M.

It is remarkable how much herbaceous and shrubby plants, some which are decidedly evergreen, have suffered the past very mild but open winter on account of the ground being bare. Accordingly the saxifrage and crow-foot are so backward, notwithstanding the warmth of the last ten days. Perhaps they want more moisture, too. The asplenium ferns of both species are very generally perfectly withered and shrivelled, and in exposed places on hills the checkerberry has not proved an evergreen, but is completely withered and a dead-leaf color. I do not remember when it has suffered so much.

Such plants require to be covered with snow to protect them.

At Second Division, the *Caltha palustris*, half a dozen well out. The earliest may have been a day or two.

The frost is but just coming out in cold wood-paths on the north sides of hills, which makes it very muddy, there only.

Returned by the Dugan Desert and stopped at the mill there to get the aspen flowers. The very earliest aspens, such as grow in warm exposures on the south sides of hills or woods, have begun to be effete. Others are not yet out.

Talked a moment with two little Irish (?) boys, eight or ten years old, that were playing in the brook by the mill. Saw one catch a minnow. I asked him if he used a hook. He said no, it was a "dully-chunk," or some such word. "Dully what?" [I] asked. "Yes, dully," said he, and he would not venture to repeat the whole word again. It was a small horsehair slip-noose at the end of a willow stick four feet long. The horsehair was twisted two or three together. He passed this over the fish slowly and then jerked him out, the noose slipping and holding him. It seems they are sometimes made with wire to catch trout. I asked him to let me see the fish he had caught. It was a little pickerel five inches long, and appeared to me strange, being *transversely* barred, and reminded me of the Wrentham pond pickerel; but I could not remember surely whether this was the rule or the exception; but when I got home I found that this was the

one which Storer does not name nor describe, but only had heard of. Is it not the brook pickerel? Asking what other fish he had caught, he said a pike. "That," said I, "is a large pickerel." He said it had "a long, long neb like a duck's bill."

It rapidly grows cold and blustering.

April 7. A cold and gusty, blustering day. We put on greatcoats again.

P. M. — Down the Great Meadows.

The river is low, even for summer. The ground about the outmost willow at my boat's place is high and dry. I cross the meadows and step across the Mill Brook near Mrs. Ripley's. You hear no stertorous sounds of the *Rana halecina* this cold and blustering day, unless a few when you go close to their breeding-places and listen attentively. Scarcely one has his head out of water, though I see many at the bottom. I wear india-rubber boots and wade through the shallow water where they were found. In a shallow sheet of water on the meadow, with a grassy bottom, the spawn will commonly all be collected in one or two parcels in the deepest part, if it is generally less than eight or ten inches deep, to be prepared for a further fall. You will also find a little here and there in weedy ditches in the meadow. One of the first-named parcels will consist of even a hundred separate deposits about three or four inches in diameter crowded together. The frogs are most numerous to-day about and beneath the spawn. Each little mass of ova is pretty firmly attached to the stubble, — not accidentally,

but designedly and effectually, — and when you pull it off, leaves some of the jelly adhering to the stubble. If the mass is large it will run out of your hand this side or that, like a liquid, or as if it had life, — like "sun-squall." It is not injured by any ordinary agitation of the water, but the mass adheres well together. It bears being carried any distance in a pail. When dropped into the water again, it falls wrong side up, showing the white sides of the cores or yolks (?). On the Great Meadows, I stand close by two coupled. The male is very much the smallest, an inch, *at least*, the shortest, and much brighter-colored. The line, or "halo" (?), or margin about its blotches is a distinct yellow or greenish yellow. The female has a distended paunch full of spawn.

Snipes rise two or three times as I go over the meadow.

The remarkable spawn of the 3d, just below the Holt (?), does not show its cylindrical form so well as before; appears to have been broken up considerably, perhaps by creatures feeding on it.

I see the remains of a duck which has died on this meadow, and the southeast edge of the meadow is strewn with the feathers of the water-fowl that plumed themselves here before the water went down. There is no water anywhere on these meadows now — except the one or two permanent pools — which I cannot walk through in my boots.

Where they have been digging mud the past winter in Beck Stow's Swamp, I perceive that the crust, for one foot deep at least, consists chiefly, or perhaps

half of it, — the rest mainly sphagnum, — of the dead and fallen stems of water andromeda which have accumulated in course of time.

I brought home the above two kinds of spawn in a pail. Putting some of the *Rana halcina* spawn in a tumbler of water, I cannot see the gelatinous part, but only the dark or white cores, which are kept asunder by it at regular intervals.

The other (probably fish) spawn is seen to be arranged in perfect hexagons; *i. e.*, the ova so impinge on each other; but where there is a vent or free side, it is a regular arc of a circle. Is not this the form that spheres pressing on each other equally on all sides assume? I see the embryo, already fish-like (?), curved round the yolk, with a microscope.¹

April 8. Surveying Kettell farm.

Could I have heard *Fringilla socialis* along the street this morning?² Or may it have been the *hymnalis*?

Polly Houghton comes along and says, half believing it, of my compass, "This is what regulates the moon and stars."

April 9. April rain at last, but not much; clears up at night.

At 4.30 P. M. to Well Meadow Field.

¹ The greater part of the fish-spawn, being left out in a firkin, was apparently killed by the cold, the water freezing half an inch thick April 7th.

² Possibly, for I hear it the 14th, and perhaps the 12th. *Vide* 12th.

The yew looks as if it would bloom in a day or two, and the staminate *Salix humilis* in the path in three or four days.¹ Possibly it is already out elsewhere, if, perchance, that was not it just beginning on the 6th on the Marlborough road. The pistillate appear more forward. It must follow pretty close to the earliest willows.

I hear the booming of snipe this evening, and Sophia says she heard them on the 6th. The meadows having been bare so long, they may have begun yet earlier. Persons walking up or down our village street in still evenings at this season hear this singular *winnowing* sound in the sky over the meadows and know not what it is. This "booming" of the snipe is our regular village serenade. I heard it this evening for the first time, as I sat in the house, through the window. Yet common and annual and remarkable as it is, not one in a hundred of the villagers hears it, and hardly so many know what it is. Yet the majority know of the Germanians who have only been here once. Mr. Hoar was almost the only inhabitant of this street whom I had heard speak of this note, which he used annually to hear and listen for in his sundown or evening walks.

R. Rice tells me that he has seen the pickerel-spawn hung about in strings on the brush, especially where a tree had fallen in. He thinks it was the pickerel's because he has seen them about at the time. This seems to correspond with mine of April 3d, though he did [not] recognize the peculiar form of it.

I doubt if men do ever simply and naturally glorify

¹ *Vide* 13th.

God in the ordinary sense, but it is remarkable how sincerely in all ages they glorify nature. The praising of Aurora, for instance, under some form in all ages is obedience to as irresistible an instinct as that which impels the frogs to peep.

April 11. P. M. — To Lee's Cliff.

The black spheres (rather dark brown) in the *Rana sylvatica* spawn by Hubbard's Grove have now opened and flatted out into a rude broad pollywog form. (This was an early specimen.)

Yesterday saw moles working in a meadow, throwing up heaps.

I notice at the Conantum house, of which only the chimney and frame now stand, a triangular mass of rubbish, more than half a bushel, resting on the great mantel-tree against an angle in the chimney. It being mixed with clay, I at first thought it a mass of clay and straw mortar, to fill up with, but, looking further, I found it composed of corn-cobs, etc., and the excrement probably of rats,  of this form and size, and of pure clay, looking like the cells of an insect. Either  the wharf rat or this country rat. They had anciently chosen this warm place for their nest and carried a great store of eatables thither, and the clay of the chimney, washing down, had incrustated the whole mass over. So this was an old rats' nest as well as human nest, and so it is with every old house. The rats' nest may have been a hundred and fifty years old. Wherever you see an old house, there look for an old rats' nest. In hard times they had, ap-

parently, been compelled to eat the clay, or it may be that they love it. It is a wonder they had not set the house on fire with their nest. Conant says this house was built by Rufus Hosmer's great-grandfather.

Slippery elm. Crowfoot (*Ranunculus fascicularis*) at Lee's since the 6th, apparently a day or two before this. Mouse-ear, not yet. What that large frog, bullfrog-like but with brown spots on a dirty-white throat, in a pool on Conantum? See thimble-berry and rose bush leafing under the rocks.

April 12. A. M. — Surveying part of William P. Brown's wood-lot in Acton, west of factory.

Hear the huckleberry-bird and, I think, the *Fringilla socialis*.¹ The handsomest pails at the factory are of oak, white and some "gray" (perhaps scarlet), but these are chiefly for stables. The woods are all alive with pine warblers now. Their note is the music to which I survey. Now the early willows are in their prime, methinks. At angle H of the lot, on a hillside, I find the mayflower, but not in bloom. It appears to be common thereabouts.

Returning on the railroad, the noon train down passed us opposite the old maid Hosmer's house. In the woods just this side, we came upon a partridge standing on the track, between the rails over which the cars had just passed. She had evidently been run down, but, though a few small feathers were scattered along for a dozen rods beyond her, and she looked a little ruffled, she was apparently more disturbed in mind than body.

¹ Probably, for I hear it the 14th.

I took her up and carried her one side to a safer place. At first she made no resistance, but at length fluttered out of my hands and ran two or three feet. I had to take her up again and carry and drive her further off, and left her standing with head erect as at first, as if beside herself. She was not lame, and I suspect no wing was broken. I did not suspect that this swift wild bird was ever run down by the cars. We have an account in the newspapers of every cow and calf that is run over, but not of the various wild creatures who meet with that accident. It may be many generations before the partridges learn to give the cars a sufficiently wide berth.

April 13. Began to rain last evening, and still rains.

The tree sparrows sing sweetly, canary-like, still. Hear the first toad in the rather cool rain, 10 A. M.

See through the dark rain the first flash of lightning, in the west horizon, doubting if it was not a flash of my eye at first, but after a very long interval I hear the low rumbling of the first thunder, and now the summer is baptized and inaugurated in due form. Is not the first lightning the forerunner or warranty of summer heat? The air now contains such an amount of heat that it emits a flash.

Speaking to J. B. Moore about the partridges being run down, he says that he was told by Lexington people some years ago that they found a duck lying dead under the spire of their old meeting-house (since burned) which stood on the Battle-Ground. The weathercock — and it was a cock in this case — was

considerably bent, and the inference was that the duck had flown against it in the night.

P. M. — To the yew.

Shepherd's-purse already going to seed; in bloom there some time. Also chickweed; how long? I had thought these would be later, on account of the ground having been so bare, and indeed they did suffer much, but early warm weather forwarded them. That unquestionable staminate *Salix humilis* beyond yew will not be out for three or four days. Its old leaves on the ground are turned cinder-color, as are those under larger and doubtful forms. *Epigæa* abundantly out, *maybe* four or five days. It was apparently in its winter state March 28th.

April 14. Rains still, with one or two flashes of lightning, but soon over.

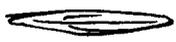
The yew plucked yesterday blossoms in house today.

P. M. — Up Assabet.

The river is a little higher on account of rain. I see much sweet flag six or eight inches long, floating, it having been cut up apparently by musquash. (The 17th I see much of the sparganium cut up close to the bottom along a musquash-path at the bottom of a meadow where there was one foot of water.)

My *Rana halecina* spawn in tumbler is now flatted out and begins to betray the pollywog form. I had already noticed a little motion in it from time to time, but nothing like the incessant activity of the embryo fishes.

I find no suckers' ¹ nests yet. There has been no rise of the river of any consequence.

At Ed. Hoar's in the evening. I look at one of his slides through a microscope, at the infusorial skeletons of the navicula  and dumb-bell  etc. With his microscope I see the heart beating in the embryo fish and the circulations distinctly along the body.

April 15. P. M. — To sedge-path *Salix humilis*.

I see many planting now.

See a pair of woodpeckers on a rail and on the ground a-courting. One keeps hopping near the other, and the latter hops away a few feet, and so they accompany one another a long distance, uttering sometimes a faint or short *a-week*.

I go to find hylodes spawn. I hear some now peeping at mid-afternoon in Potter's meadow, just north of his swamp. It is hard to tell how far off they are. At a distance they often appear to be nearer than they are; when I get nearer I think them further off than they are; and not till I get their parallax with my eyes by going to one side do I discover their locality. From time to time one utters that peculiar quavering sound, I suspect of alarm, like that which a hen makes when she sees a hawk. They peep but thinly at this hour of a bright day. Wading about in the meadow there, barelegged, I find the water from time to time, though no deeper than before, exceedingly cold,

¹ [A pencilled interrogation-point in parentheses here.]

evidently because there is ice in the meadow there still.

Having stood quite still on the edge of the ditch close to the north edge of the maple swamp some time, and heard a slight rustling near me from time to time, I looked round and saw a mink under the bushes within a few feet. It was pure reddish-brown above, with a blackish and somewhat bushy tail, a blunt nose, and somewhat innocent-looking head. It crept along toward me and around me, *within two feet*, in a semi-circle, snuffing the air, and pausing to look at me several times. Part of its course when nearest me was in the water of the ditch. It then crawled slowly away, and I saw by the ripple where it had taken to the ditch again. Perhaps it was after a frog, like myself. It may have been attracted by the peeping. But how much blacker was the creature I saw April 28th, 1857! A very different color, though the tail the same form.

The naturalist accomplishes a great deal by patience, more perhaps than by activity. He must take his position, and then wait and watch. It is equally true of quadrupeds and reptiles. Sit still in the midst of their haunts.

Saw fitting silently through the wood, near the yew, two or three thrushes, much like, at least, the *Turdus Wilsonii*; a light ring about eyes, and whitish side of throat (?); rather fox-colored or cinnamon tail, with ashy reflections from edges of primaries; flesh-colored legs. Did not see the breast. Could it have been what I have called *T. solitarius*? Soon after *methought* I heard one faint wood thrush note (??).¹

¹ *Vide* 21st.

Catch a peeper at Hayden's Pool. I suspect it may have been a female, for, though I kept it a day at home, it did not peep. It was a pale fawn-color out of water, nine tenths of an inch long, marked with dusky like this, though not so distinctly. It could easily climb up the side of a tumbler, and jumped eighteen inches at once.



Equisetum arvense out by railroad, and probably I saw it out on the 12th, near the factory.

April 16. My fish ova in a tumbler has [*sic*] gradually expanded till it is some three sixteenths of an inch in diameter, and for more than a week the embryos have been conspicuously active, hardly still enough to be observed with a microscope. Their tails, eyes, pectoral fins, etc., were early developed and conspicuous. They keep up a regular jerking motion as they lie curved in the egg, and so develop themselves. This morning I set them in the sun, and, looking again soon after, found that they were suddenly hatched, and more than half of them were free of the egg. They were nearly a quarter of an inch long, or longer than the diameter of a perfect egg. The substance of the egg-shell seemed to have expanded and softened, and the embryo by its incessant quirking elongated it so that it was able to extend itself at full length. It then almost incessantly kept up a vibratory motion of its tail and its pectoral fins, and every few moments it bunted against the side of the egg, wearing it away and extending it, till it broke through. Sometimes it got its head

out first and then struggled many minutes before it escaped completely. It was a pretty sight to see them all rising immediately to the surface by means of the tail and pectoral fins, the first vibrating from one twentieth to one thirtieth of an inch, at an angle of about forty-five degrees, and then, ceasing their motions, they steadily settled down again. Think of the myriads of these minnows set free of a warm morning, and rising and falling in this wise in their native element!! (Some are still in the egg on the 18th.)

The incessant activity of these minnows, and apparent vigor, are surprising. Already they dart swiftly an inch one side like little pickerel, tender as they are, carrying the yolk with them, which gradually diminishes, as I notice, in a day or two after. They have no snouts yet, or only blunt and rounded ones. I have not detected any general resting even at night, though they often rest on the bottom day or night. They are remarkably aroused when placed in the morning sun. This sets them all in motion. Looking at them through a jar between you and the sun, a hundred at once, they reflect the colors of the rainbow,—some purple, others violet, green, etc., etc. It is a wonder how they survive the accidents of their condition. By what instinct do they keep together in a school?

I think that the spawn could not have been laid long when I found it April 3d, it was so perfect and the embryo so slightly, if at all, developed. That was a sudden very warm day. In that case, they may be hatched in a fortnight. That appeared to have been a general breeding-place for this species of fish. I

looked a good while on the 14th, but could find none near home.

My hylodes in the tumbler will always hop to the side toward the window as fast as I turn it.

We may think these days of the myriads of fishes just hatched which come rising to the surface. The water swarms with them as with the mosquito.

P. M. — To Conantum.

The *Rana sylvatica* spawn at Hubbard's Grove begins to kick free. This is early. I put some in a bottle, which being shaken in my walk, I find the embryos all separated from the ova when I get home. These are now regular little pollywogs and wiggle about in a lively manner when the water is shaken. They are chiefly tail and head. They look like the samara of the ash, and in both cases this winged or feather-like tail it is that transports them. I can already see their little feet or fins.

The bodkin-like bulb, considerably grown, in my tumbler and elsewhere, is probably the water-purslane. I see it floating free and sending out many rootlets, on pools and ditches. In this way it spreads itself.

The earliest red maple I can see in this walk is well out, on the Hubbard Bridge causeway. Probably some was yesterday.

I sat a long time by the little pool behind Lee's, to see the hylodes. Not one was heard there; only the skater insects were slightly rippling the surface, pursuing one another and breeding amid the grass. The bottom is covered with pretty proserpinaca. At length

I see one hylodes with heels up, burying itself at the bottom. How wary they are! After nearly half an hour I see one sitting out on a blade of the floating purple grass, but down he goes again. They see or hear you three or four rods off. They are more active toward night.

April 17. P. M. — Via Assabet to Coral Rock.

See several kingfishers. Red-wings still in flocks, and crow blackbirds feeding amid leaves by Assabet-side, half a dozen together. The female flowers of the alder are now very pretty when seen against the sun, bright-crimson. I take up a wood turtle on the shore, whose sternum is covered with small ants. The sedge is shooting up in the meadows, erect, rigid, and sharp, a glaucous green unlike that of the grass on banks. The linnæa-like plant turns out to be golden saxifrage. Its leaf is the same form, but smooth and not shrubby.

The *Rana halecina* spawn in tumbler begins to struggle free of the ova, but it is not so much developed as the *R. sylvatica*. Some of the first may be a little more forward in the meadows. I see some to-day, probably this kind, flatted out, though I do not see the frog. It made the same sound, however. The *R. sylvatica* is probably generally the earliest.

April 18. P. M. — To Hubbard's Grove.

A dandelion open; will shed pollen to-morrow.

The *Rana sylvatica* tadpoles have mostly wiggled away from the ova. Put some *R. halecina* spawn which has flatted out in a ditch on Hubbard's land. I saw in those ditches many small pickerel, landlocked, which

appeared to be transversely barred! They bury themselves in the mud at my approach.

Examined the pools and ditches in that neighborhood, *i. e.* of Skull-Cap Ditch, for frogs. All that I saw distinctly, except two *R. fontinalis*, were what I have considered young bullfrogs, middling-sized frogs with a greenish-brown back and a throat commonly white or whitish. I saw in a deep and cold pool some spawn placed just like that of the *R. sylvatica* and the *R. halecina*, — it was in the open field, — and the only frog I could distinguish near it was a middling-sized one, or larger, with a yellow throat, not distinctly green, but brown or greenish-brown above, but green along each upper jaw. A small portion of bright-golden ring about the eye was to be seen in front.

In the spring near by, I see two unquestionable *R. fontinalis*, one much the largest and with brighter mottlings, probably on account of the season. The upper and forward part of their bodies distinct green, but their throats, white or whitish, not yellow. There were also two small and dark-colored frogs, yet with a little green tinge about the snouts, in the same spring.

I suspect that all these frogs may be the *R. fontinalis*, and none of them bullfrogs. Certainly those two unquestionable *R. fontinalis* had no yellow to throats, and probably they vary very much in the greenness of the back. Those two were not so much barred on the legs as mottled, and in one the mottlings had quite bright halos. They had the yellow segment in front part of eye, as also had the two smallest. Have the bullfrogs this? I doubt if I have seen a bullfrog yet.

I should say, with regard to that spawn, that I heard in the neighboring pool the stertorous *tut tut tut* like the *R. halecina*, and also one dump sound.

Frogs are strange creatures. One would describe them as peculiarly wary and timid, another as equally bold and imperturbable. All that is required in studying them is patience. You will sometimes walk a long way along a ditch and hear twenty or more leap in one after another before you, and see where they rippled the water, without getting sight of one of them. Sometimes, as this afternoon the two *R. fontinalis*, when you approach a pool or spring a frog hops in and buries itself at the bottom. You sit down on the brink and wait patiently for his reappearance. After a quarter of an hour or more he is sure to rise to the surface and put out his nose quietly without making a ripple, eying you steadily. At length he becomes as curious about you as you can be about him. He suddenly hops straight toward [you], pausing within a foot, and takes a near and leisurely view of you. Perchance you may now scratch its nose with your finger and examine it to your heart's content, for it is become as imperturbable as it was shy before. You conquer them by superior patience and immovableness; not by quickness, but by slowness; not by heat, but by coldness. You see only a pair of heels disappearing in the weedy bottom, and, saving a few insects, the pool becomes as smooth as a mirror and apparently as uninhabited. At length, after half an hour, you detect a frog's snout and a pair of eyes above the green slime, turned toward you, — etc.

It is evident that the frog spawn is not accidentally

placed, simply adhering to the stubble that may be nearest, but the frog chooses a convenient place to deposit it; for in the above-named pool there was no stout stubble rising above the surface except at one side, and there the spawn was placed.

It is remarkable how much the musquash cuts up the weeds at the bottom of pools and ditches, — bur-reed, sweet flags, pontederia, yellow lily, fine, grass-like rushes, and now you see it floating on the surface, sometimes apparently where it has merely burrowed along the bottom.

I see where a ditch was cut a few years ago in a winding course, and now a young hedge of alders is springing up from the bottom on one side, winding with the ditch. The seed has evidently been caught in it, as in a trap.

April 19. Spend the day hunting for my boat, which was stolen. As I go up the riverside, I see a male marsh hawk hunting. He skims along exactly over the edge of the water, on the meadowy side, not more than three or four feet from the ground and winding with the shore, looking for frogs, for in such a tortuous line do the frogs sit. They probably know about what time to expect his visits, being regularly decimated. Particular hawks farm particular meadows. It must be easy for him to get a breakfast. Far as I can see with a glass, he is still tilting this way and that over the water-line.

At Fair Haven Pond I see, half a mile off, eight large water-fowl, which I thought at first were large ducks, though their necks appeared long. Studying them

patiently with a glass, I found that they had gray backs, black heads and necks with perhaps green reflections, white breasts, dark tips to tails, and a white spot about eyes on each side of bill. At first the whole bird had looked much darker, like black ducks. I did not know but they might be brant or some very large ducks, but at length inclined to the opinion that they were geese. At 5.30, being on the Common, I saw a small flock of geese going over northeast. Being reminded of the birds of the morning and their number, I looked again and found that there were eight of them, and probably they were the same I had seen.

Viola ovata on bank above Lee's Cliff. Edith Emerson found them there yesterday; also columbines and the early potentilla April 13th!!!

I hear the pine warblers there, and also what I thought a variation of its note, quite different, yet I thought not unfamiliar to me. Afterwards, along the wall under the Middle Conantum Cliff, I saw many goldfinches, male and female, the males singing in a very sprightly and varied manner, sitting still on bare trees. Also uttered their watery twitter and their peculiar mewling. In the meanwhile I heard a faint thrasher's note, as if faintly but perfectly imitated by some bird twenty or thirty rods off. This surprised me very much. It was equally rich and varied, and yet I did not believe it to be a thrasher. Determined to find out the singer, I sat still with my glass in hand, and at length detected the singer, a goldfinch sitting within gunshot all the while. This was the most varied and sprightly performer of any bird I have heard this

year, and it is strange that I never heard the strain before. It may be this note which is taken for the thrasher's before the latter comes.

P. M. — Down river.

I find that my *Rana halecina* spawn in the house is considerably further advanced than that left in the meadows. The latter is not only deeper beneath the surface now, on account of the rain, but has gathered dirt from the water, so that the jelly itself is now plainly seen; and some of it has been killed, probably by frost, being exposed at the surface. I hear the same *tut tut tut*, probably of the *halecina*, still there, though not so generally as before.

See two or three yellow lilies nearly open, showing most of their yellow, beneath the water; say in two or three days.

Rice tells me of winging a sheldrake once just below Fair Haven Pond, and pursuing it in a boat as it swam down the stream, till it went ashore at Hubbard's Wood and crawled into a woodchuck's hole about a rod from the water on a wooded bank. He could see its tail and pulled it out. He tells of seeing cartloads of lamprey eels in the spawning season clinging to the stones at a dam in Saco, and that if you spat on a stone and cast it into the swift water above them they would directly let go and wiggle down the stream and you could hear their tails snap like whips on the surface, as if the spittle was poison to them; but if you did not spit on the stone, they would not let go. He thinks that a flock of geese will sometimes stop for a wounded one to get well.

Hear of bluets found on Saturday, the 17th; how long?

Hear a toad ring at 9 P. M. Perhaps I first hear them at night, though cooler, because it is still. R. W. E. saw an anemone on the 18th.

April 20. P. M. — Rain-storm begins, with hail.

April 21. George Melvin says that Joshua Haynes once saw a perch depositing her spawn and the male following behind and devouring it! (?) Garlick in his book on pisciculture says that the perch spawn in May. Melvin says that those short-nosed brook pickerel are caught in the river also, but rarely weigh more than two pounds.

The puddles have dried off along the road and left thick deposits or water-lines of the dark-purple anthers of the elm, coloring the ground like sawdust. You could collect great quantities of them.

The arbor-vitæ is apparently effete already. Ed. Hoar says he heard a wood thrush the 18th.

P. M. — To Easterbrooks's and Bateman's Pond.

The benzoin yesterday and possibly the 19th, so much being killed. It might otherwise have been earlier yet. *Populus grandidentata* some days at least. The *Cornus florida* flower-buds are killed.

The rocks on the east side of Bateman's Pond are a very good place for ferns. I see some very large leather-apron umbilicaria there. They are flaccid and unrolled now, showing most of the olivaceous-fuscous upper side. This side feels cold and damp, while the other,

the black, is dry and warm, notwithstanding the warm air. This side, evidently, is not expanded by moisture. It is a little exciting even to meet with a rock covered with these *livid* (?) green aprons, betraying so much life. Some of them are three quarters of a foot in diameter. What a growth for a bare rock!

April 22. Hear martins about a box.

P. M. — To Hubbard's Great Meadow.

The spawn of April 18th is gone! It was fresh there and apparently some creature has eaten it. I see spawn (*R. halecina*-like) in the large pool southeast of this and catch one apparently common-sized (!) *R. halecina* near it. The general aspect dark-brown, with bronze-colored stripes along sides of back one tenth of an inch wide; spots, roundish with a dull-green halo; a roundish spot on each orbit; no bright spots. I catch apparently another in the Great Meadow, and I think some *R. halecina* are still spawning, for I see some fresh spawn there.

Andromeda, apparently a day or two, — at least at edge of Island Wood, which I have not seen.

I walk along several brooks and ditches, and see a great many yellow-spotted turtles; several couples copulating. The uppermost invariably has a depressed sternum while the other's is full. The *Emys picta* are evidently breeding also. See two apparently coupled on the shore. You see both kinds now in little brooks not more than a foot wide, slowly and awkwardly moving about one another. They can hardly make their way against the swift stream. I see one *E. picta* hold-

ing on to a weed with one of its fore feet. Meanwhile a yellow-spotted turtle shoots swiftly down the stream, carried along by the current, and is soon out of sight. The *E. picta* are also quite common in the shallows on the river meadows. I see many masses of empty or half-empty *R. halecina* spawn.

April 23. I receive to-day *Sanguinaria Canadensis* from Brattleboro, well in bloom, — how long? — in a large box full of mayflowers.

The toads ring now by day, but not very loud nor generally.

I see the large head apparently of a bullfrog, by the riverside. Many middle-sized frogs, apparently bullfrogs, green above and more or less dark-spotted, with either yellow or white throats, sitting along the water's edge now.

Catch two *Rana palustris* coupled.¹ They jump together into the river. The male is two and a quarter inches long. This I find to be about an average-sized one of four or five that I distinguish. Above, pale-brown or fawn-brown (another, which I think is a male from the size and the equally bright yellow of the abdomen and inside of limbs, is *dusky*-brown, and next day both the males are of this color; so you must notice the change of color of frogs), with two rows of very oblong, two or three or more times as long as broad, squarish-ended dark-brown spots with a light-brown edge, the rear ones becoming smaller and roundish; also a similar row along each side, and, beneath it, a

¹ *Vide* May 1st and 2d.

row of smaller roundish spots; as Storer says, a large roundish spot on the upper and inner side of each orbit and one on the top of the head before it; the throat and forward part of the belly, cream-colored; abdomen and inside of the limbs bright ochreous-yellow, part of which is seen in looking at the back of the frog. Tympanum slightly convex in middle. The female is about an eighth of an inch longer (another one is three quarters of an inch longer), beside being now fuller (probably of spawn). The pale brown, or fawn-brown, is more brassy or bronze-like and does not become darker next day. She has no very oblong squarish spots on back, but smaller and roundish ones and many fine dusky spots interspersed; is thickly dark-spotted on sides. Throat and belly, white or pale cream-color; sides of abdomen only and inside of limbs, much paler yellow than the male; has no dark spots on orbits or on head in front (another specimen has).

Saw a *Viola blanda* in a girl's hand.

April 24. A cold northwest wind. I go at 8 A. M. to catch frogs to compare with the *R. palustris* and bull-frog which I have, but I find it too cold for them. Though I walk more than a mile along the river, I do not get sight of one, and only of one or two turtles. Neither do I find any more frogs (though many *Emys picta*) at 4 P. M., it being still cold. Yet the frogs were quite numerous yesterday. This shows how sensitive they are to changes of temperature. Hardly one puts its head out of the water, if ever he creeps out the grassy

or muddy bottom this cold day. That *proserpinaca* deserves to be named after the frog, — *ranunculus*, or what-not, — it is so common and pretty at the bottom [of] the shallow grassy pools where I go looking for spawn. It is remarkable that I see many *E. picta* dead along the shore, dead within a few weeks apparently, also a *sternotherus*. One of the last, alive, emitted no odor to-day.

I find washed up by the riverside part of a pale-greenish egg-shell bigger than a hen's egg, which was probably the egg of a duck laid on the meadow last year or lately.

There is an abundance of the *R. halerina* spawn near the elm at the hill shore north of Dodd's. It is now semiopaque, greenish, and flatted down and run together, mostly hatched; and a good deal has been killed, apparently by the cold. The water thereabouts is swarming with the young pollywogs for a rod about, but where have all the frogs hidden themselves?

E. Hoar saw the myrtle-bird to-day.

The pollywogs must be a long time growing, for I see those of last year not more than two inches long, also some much larger.

The hatched frog-spawn is quite soft and apparently dissolving at last in the water. Yet possibly that mass of jelly once brought me on a stake was this jelly consolidated.

I find that my fish ova were not all killed some weeks ago in the firkin, as I supposed, for many that were accidentally left in it have hatched, and they bore the cold of last night better than those hatched earlier

and kept in the larger vessel (tub), which froze but thinly, while the firkin froze a quarter of an inch thick last night.

April 25. P. M. — To Assabet.

Approaching the Island, I hear the *phe phe, phe phe, phe phe, phe phe, phe*, the sharp whistling note, of a fish hawk, and, looking round, see him just afterward launching away from one of the swamp white oaks southwest of the Island. There is about half a second between each note, and he utters them either while perched or while flying. He shows a great proportion of wing and some white on back. The wings are much curved. He sails along some eighty feet above the water's edge, looking for fish, and alights again quite near. I see him an hour afterward about the same spot.

See a barn swallow. Also see one myrtle-bird, and Goodwin says he heard a stake-driver several days ago.

April 26. A little snow in the night, which is seen against the fences this morning. See a chewink (male) in the Kettell place woods.

April 27. It has been so cold since the 23d that I have not been able to catch a single frog, have hardly seen where one jumped, as I walked through the meadows looking for them, though in some warmer places I heard a low stertorous *R. halccina*-like note from a few. The tortoises are stirring much more. Frogs appear to love warm and moist weather, rainy or

cloudy. They will sit thickly along the shore, apparently small bullfrogs, etc., *R. palustris*.

My young fishes had the pectoral fins and tail very early developing, but not yet can I detect any other fins with my glass. They had mouths, which I saw them open as soon as hatched, and more and more a perch-like head. I think that with Hoar's microscope I detected two dorsal fins such as the perch have. When I put them suddenly in the sun they sink and rest on the bottom a moment.

In the French work for schools of Edwards and Comte, it is said that the perch spawns not till the age of three years, and in the spring. "The ova are joined together by some glutinous matter in long strings (*cordons*) intertwined with the reeds." (Page 36.)

I noticed yesterday that again the newly laid spawn at the cold pool on Hubbard's land was all gone, and that in the larger pool south of it was much diminished. What creature devours it?

Snows hard in afternoon and evening. Quite wintry. About an inch on ground the next morning.

April 28. Blustering northwest wind and wintry aspect.

A. M. — Down river to look at willows.

The common *S. cordata* apparently not yet within two days at least. This salix is not *always* conspicuously double-scaled, nor is the scale carried up on the catkin. It is not always even on that of the *S. Torreyana*.

I see the fish hawk again [two or three indecipherable words] Island. As it flies low, directly over my head,

I see that its body is white beneath, and the white on the forward side of the wings beneath, if extended across the breast, would form a regular crescent. Its wings do not



form a regular curve in front, but an abrupt angle. They are loose and broad at tips.

 This bird goes fishing slowly down one side

of the river and up again on the other, forty to sixty feet high, continually poising itself almost or quite stationary, with its head to the northwest wind and looking down, flapping its wings enough to keep its place, sometimes stationary for about a minute. It is not shy. This boisterous weather is the time to see it.

I see the myrtle-bird in the same sunny place, south of the Island woods, as formerly. Thus are the earliest seen each spring in some warm and calm place by the waterside, when it is cool and blustering elsewhere. The barn swallows and a martin are already skimming low over that small area of smooth water within a few feet of me, never leaving that spot, and I do not observe them thus playing elsewhere. Incessantly stooping back and forth there.

P. M. — To Ledum Swamp.

At Clamshell Ditch, one *Equisetum sylvaticum* will apparently open to-morrow. Strawberries are abundantly out there; how long?

Some *Salix tristis*, bank near *bræomyces*. Did I not put it too early in last year's list of willows? Probably earlier elsewhere?

The snow was generally gone about 10 A. M., except in circular patches in the shadow of the still leafless trees.

April 29. Storror Higginson plucked the uva-ursi fully out the 25th; perhaps two or three days, for it was nearly out, he says, the 18th!!! By his account it was on Pine Hill.

I heard yesterday at Ledum Swamp the lively, sweet, yet somewhat whimsical note of the ruby-crowned wren, and had sight of him a moment. Did I not hear it there the 10th?

Noticed a man killing, on the sidewalk by Minott's, a little brown snake with blackish marks along each side of back and a pink belly. Was it not the *Coluber amœnus*?

April 30. P. M. — I carry the rest of my little fishes, fifteen or twenty, to the cold pool in Hubbard's ground. They are about a quarter-inch long still, and have scarcely increased in length.

I learn that one farmer, seeing me standing a long time still in the midst of a pool (I was watching for hylodes), said that it was his father, who had been drinking some of Pat Haggerty's rum, and had lost his way home. So, setting out to lead him home, he discovered that it was I.

I find a *Fringilla melodia* nest with five eggs. Part, at least, must have been laid before the snow of the 27th, but it is perfectly sheltered under the shelving turf and grass on the brink of a ditch. The snow would not even have touched the bird sitting on them.

It is much warmer, and now for the first time since April 23d I find frogs out. (Perhaps I could have found some yesterday.)

I noticed one of the large scroll ferns, with its rusty wool, up eight inches on the 28th. See a white-throated sparrow by Cheney's wall, the stout, chubby bird.

After sundown. By riverside. — The frogs and toads are now fairly awake. Both are most musical now at evening. I hear now on various sides, along the river and its meadows, that low, stertorous sound, — like that of the *Rana halecina*, — which I have heard occasionally for a few days. (I also hear it in Stow's field by railroad, with toads' ringing.) It is exceedingly like the note of the *R. halecina*, yet I fancy it is somewhat more softly purring, with frequently a low quivering, chuckling, or inquisitive croak, which last takes the place of the bullfrog-like *er er er* of the *halecina*. This is the only difference between it and the *halecina* that I am sure of. The short quivering croak reminds me of the alarm (?) note of the hylodes. I suspect it is the *R. palustris*, now breeding.¹ I hear no snipe.

Frogs, etc., are perfect thermometers. Some that I had in a firkin were chilled to stiffness, while their fellows buried themselves again in the mud of the meadows; *i. e.*, in a cold night at this season they are stiffened in a tub of water, the small *R. palustris*, not being able to bury themselves in mud. They appear to lose their limbs or portions of them, which slough off in consequence.

¹ *Vide* May 1st.