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Vermont Botanical and Bird Clubs

APRIL, 1917

Published Annually by the Clubs

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One copy of this bulletin is sent to each member. Extra copies of bulletins 1 to 8 of the Vermont Bird Club and 1 to 9 of the Vermont Botanical Club and Joint Bulletin 1-2 may be obtained of the librarian at Burlington at 10 cents each, postpaid, to club members and 25 cents to outsiders.

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EDITORIAL

The club is glad to receive so many contributions for the bulletin from botanists living outside of the state. Many of these people come to Vermont on vacations and because they have a great deal more time at their disposal than the average Vermont botanist, whose excursions afield are largely confined to one-day trips, they are able to cover a great deal of ground which might otherwise go unexplored. The visiting plant lovers thus add to our knowledge of local floras.

Some wonder is expressed by botanists from neighboring states who visit Vermont that the flora published in 1915 does not show a wider distribution for certain plants. This is due to the fact that the committee on publication desired to limit the number of stations with a view to keeping the flora from reaching a size which would make the cost exceed the sum set aside for it by the state.

FIELDS OPEN TO VERMONT NATURALISTS

The study of the distribution of plants, especially the higher forms, has been carried on to such a degree that many people are thoroughly conversant with the botany of Vermont. The time is ripe for systematic investigation of some single group of plants or other work that will add to our knowledge of the natural history of the state. Mr. Flint has opened the door to the study of algae in an article in this issue of the bulletin. In bulletin 2 "The Mammals of Vermont" was published. The reptiles offer opportunity for a contribution to the fauna of the state. Who has the time and the interest to gather material for a paper on the fishes or the mollusks? Who will be the first to collect data as to the more common insects to be found in Vermont, particularly the lepidoptera?

THE SUMMER MEETING AT WALLINGFORD

Nellie F. Flynn

The summer meeting of the clubs was held at Wallingford, July 11 and 12, 1916. The headquarters were at Hotel Wallingford and the attendance, which was larger than usual, about 35, taxed the resources of the house to the utmost.

The members were mostly on hand for the Tuesday morning ride on a hayrack to the "White Rocks." It was a pleasant trip and a fine time was had, but it was rather a disappointment botanically as

the rocks are too dry for vegetation. At the foot is a small ice cave from which issues a stream of very refreshing cold water. Wednesday a trip was made to some swamps in Tinmouth. The swamps proved rather barren of anything except a few swamp grasses and sedges, but the woods at their edge had some of the rarer rock ferns and some good violets. The showy lady's slipper *Cypripedium hirsutum* and one-flowered pyrola, *Moneses uniflora* grew at one swamp.

Side trips were made by some of the members who brought back the orchids, *Pogonia ophioglossoides* and *Calopogon pulchellus* and the horned bladderwort *Utricularia cornuta* from Elfin Lake bog, Goldie's fern, *Aspidium Goldianum* and narrow-leaved spleenwort, *Asplenium angustifolium* from rich woods on the river road, and the purple loosestrife *Lythrum Salicaria*, which grows abundantly along the banks of the Otter Creek.

TREASURER'S REPORT

VERMONT BOTANICAL CLUB

RECEIPTS

Cash on hand Jan. 19, 1916	$ 54.60
Received from dues	111.00
Sale of club pins	1.30
One-half balance transportation fund	.62
	$ 167.52

EXPENDITURES

One-half bill printing joint bulletin No. 2	$ 32.50
Postage	14.16
One-half bill printing notices, dues cards and receipts	11.72
Stationery	1.42
One-half bill typewriting for bulletin	1.00
One-half telephone bill	.76
	$ 61.56
Balance Jan. 26, 1917	105.96
	$ 167.52
Life membership fund	$ 140.00
Accrued interest on same	11.52

VERMONT BIRD CLUB

RECEIPTS

Cash on hand Jan. 19, 1916	$	12.76
Received from dues		75.60
One-half balance of transportation fund		.63
	$	88.99

EXPENDITURES

One-half printing bulletin No. 2	$	32.50
Postage		15.41
One-half printing notices, dues cards and receipts		11.71
Dues to Audobon Society		5.00
Stationery		1.42
One-half bill typewriting for bulletin		1.00
One-half telephone bill		.76
	$	67.80
Balance Jan. 26, 1917		21.19
	$	88.99
Life membership fund	$	30.00
Accrued interest on same		4.83

TWENTY-SECOND WINTER MEETING

George P. Burns

The 22nd annual winter meeting of the Vermont Botanical club and the 15th annual winter meeting of the Vermont Bird club was held at the University of Vermont January 26 and 27, 1917. The meeting was not as largely attended as some of the previous meetings. The club members were especially sorry to learn that the president of the clubs, Dr. Ezra Brainerd, could not attend because he had an important business engagement in New York. Some of the most valuable members of the club were detained but those who came enjoyed a profitable time and the program was carried out in full.

The business meetings were presided over by the secretary.

The club decided to hold the annual summer meeting on Mt. Mansfield the week following July 4.

The officers elected were: President, Ezra Brainerd, Middlebury; vice-president, Harry T. Perkins, Burlington; secretary, George P. Burns, Burlington; treasurer, Mrs. Nellie F. Flynn, Burlington; librarian, Miss Phoebe Towle, Burlington; editors of bulletin, George L. Kirk, Rutland, and A. E. Lambert, Middlebury.

Miss Towle will not be in Vermont next year and L. H. Flint, of Burlington, was elected assistant librarian to take charge of the work during her absence.

The report of the treasurer was received and placed on file. The local members of the two clubs gave a complimentary dinner to visiting members at the Commons hall but the usual roll call was omitted to allow some members to attend a concert.

The meeting adjourned Saturday morning at 10:30.

REPORT ON THE VERMONT HEPATICAE FOR 1916

Annie Lorenz

The season of 1916 was a banner one for the Vermont hepatic list with no less than five additions, including one new to New England, bringing the total up to 127.

First of the acquisitions was *Cephalozia macrostachya* Kaal, from the summer meeting at Wallingford. It was abundant in the sphagnum bog at Elfin Lake.

On the adjournment of that meeting, the writer went to make a visit in Ascutneyville. During an evening stroll near the village, *Ricciella crystallina* (L.) Warnst., appeared on the sandy-clayey edge of the road, a similar station to several in eastern Connecticut. The plants, either of this, or of the following species, were not very large, as it was only the middle of July, which is early for good material of the largely annual *Ricciaceae.*

Next morning the writer explored the clayey bank of the Connecticut River, and located, first, *Riccia arvensis* Aust., then more *R. Crystallina* (L.) Warnst., and finally, an extremely attractive unfamiliar *Riccia.* On being submitted to Dr. Howe, he reported it to be *R. Frostii* Aust., not previously reported east of New York state. As this species was named by Austin for his Brattleboro colleague, it seems only appropriate that it should make its first New England appearance within this state.

As pickings were so good on this side of the river, the writer then tried the banks at the Claremont end of the bridge, and gathered in

Riccia arvensis Aust., which was No. 139 for New Hampshire, just for good measure!

Later, while motoring through Granville Notch, Mr. C. A. Weatherby collected *Radula tenax* Lindb., a species whose appearance the writer had been expecting for quite a while. There are still over 30 species on the New England list which it would not be unreasonable to expect in Vermont.

COLONY OF VIRGINIA AND SORA RAILS

Duane E. Kent

I have often read of colonies of Virginia and sora rails, but it was never my good fortune to visit one, until May 31, 1916.

My work often takes me to Bridport, Vt., and during the spring of 1916, I overheard Mr. R. B. Myrick telling about a cat-tail bog in a meadow nearby, which he said, was inhabited by some strange birds that made runways in the cat-tails and rank water sedges. I took it for granted at once that the birds were rails, and through the kindness of Mr. Myrick, I made plans to visit this bog the coming nesting season and May 31, 1916, was the eventful day.

This bog is about one and one-half miles southwest from Bridport village, on Mr. J. Swinton's farm. As the soil is very fertile, a luxuriant growth of cat-tails, water-grasses, and sedges form a jungle, some of the cat-tails reaching above my head. The bog is in a little meadow, commencing near a barn, and ranging from about four to 40 or 50 rods wide. It is nearly a half mile in length, emptying into Dead creek, north of the barn.

In May there was only a short growth of new shoots showing above the dead grasses, which in some places were matted lightly together, making a mass two feet in depth. Of course most of the fruiting cat-tails were still erect, and this, with a considerable depth of mud, made it a very difficult place to locate nests.

When Mr. Myrick and I arrived at the bog, bobolinks, meadowlarks and vesper, song and Savannah sparrows were singing in the meadow close by, and numerous red-winged blackbirds, and long-billed marsh-wrens were very active in the cat-tails, but not a sound came from the rails. After entering the cat-tails, my delight was unbounded upon hearing the Virginia rail's note, and from this on, we could hear them continually in different parts of the bog.

We had been searching for nests only a short time, when Mr. Myrick located a Virginia rail's nest just completed, about two feet from the water in a mass of dead grasses; then a short distance from this I found one containing two eggs. This nest was also placed up in the grasses.

I have forgotten now just how many nests we located in the short time we spent in the bog, but I would say probably eight or 10. Some were placed on the ground at the foot of cat-tails, built up from the water with dead grasses and cat-tails as supports. Others were arched over and placed in thick masses of dead cat-tails. A few were just completed. Others containing from one to five eggs were seen. As we failed to locate a full set, (which is from eight to 12 eggs), I decided to visit this location again in two weeks.

Just as we were leaving on the occasion of the first visit I heard Mr. Myrick call, saying that he had found something different. I hurried over to him, and there among a luxuriant growth of cat-tails, and placed on the ground, was a sora rail's nest containing 13 eggs, in two layers; about the finest sight I ever saw. At once the parent birds commenced their cackling call, "cut-cut-cut-cut"; the first sora I had ever heard. The birds were very tame, and as they were so near, (only six or eight feet distant), and making such a disturbance, it seemed as though we were about stepping on them; especially as the grasses were so dense, it was impossible to see them. The nest was made of a mass of dead cat-tail flags, and was about six inches deep, and eight inches wide. The eggs ranged in incubation from about three to 10 days. I now have the nest and eggs in my collection. Mr. L. F. Brehmer, photographer of Rutland, has a colored lantern slide and stereoscope of this nest and eggs.

Two weeks later, I again visited the place and found that most of the Virginia rails' nests found on the earlier date had been destroyed by mice and muskrats, and in one of the nests I found a litter of young field mice. (*Microtus pennsylvanicus*). As we found these nests destroyed, I decided to try a different part of the swamp and then went north of the meadow, just in the edge of the pasture. As soon as we entered the cat-tails a number of Virginia rails commenced to sound their alarm notes, and in a few minutes I had located three nests, one containing seven eggs, the other two containing eight eggs each.

Most of the eggs in each nest were pipped. All of these nests were placed on the ground, and not concealed in the least. One I could easily see when 20 feet away.

It was very interesting to note how tame the parent birds were, this of course being caused by the eggs being nearly ready to hatch and the mother bird being anxious to resume her incubating.

During our visits to this locality, we found a number of red-winged blackbirds' and 25 long-billed marsh-wrens' nests.

It would be interesting to take a census of the rails and wrens that were nesting in a certain area of this bog, and then estimate the number of nesting rails in the entire swamp. Of course, it would be impossible to make a very accurate estimate, unless this was done. I won't make the attempt at this time, as I am afraid it might sound exaggerated to readers.

The coming season I hope to spend more time at this interesting place, and I can assure all bird lovers that their time will be well invested if they could visit a colony of rails.

WHITE PINE BLISTER RUST

George P. Burns

Vermont has no finer tree than the white pine but it is today in danger of elimination from the Vermont forests if we are to judge by the experiences of some of the European countries, such as Holland and Russia, where the growing of white pine has been made impossible by the white pine blister rust. In certain regions in Maine, about 85 per cent. of the trees are affected and over a third of them are dead from the same trouble. This parasite, introduced into this country in 1909, on imported white pine seedlings, attacks the young plants producing yellow blisters full of powder-like spores. The disease finally kills the tree after a few years although it may remain alive for a long time. Old trees are not as often affected by this rust as are the younger ones.

The same parasite which causes the blister rust lives part of its life-cycle on the leaves of the currant and gooseberry. Rust spots appear on these plants in May and from them, the disease spreads to the pines. The essential point in blister rust control, therefore, is the eradication of currant and gooseberry bushes in the neighborhood of pines.

The Vermont department of forestry has tried to control this dangerous pest by watching all the white pine plantations where imported seedlings were set out in 1909, and by inspecting all currant

and gooseberry bushes in the vicinity of pines. A law giving the state forester authority to root out all currants and gooseberries is necessary and probably will be passed by the present legislature. Every member of the Vermont Botanical club can help in this work of control by immediately reporting rusts on currants or gooseberries to the state forester.

NESTING OF THE CONNECTICUT WARBLER

Inez Addie Howe

Among the rare birds that I have found in St. Johnsbury during the past two years perhaps the Connecticut warbler is more interesting than any of the others, owing to it having nested here the past two seasons. My first observations on this species were made in June and July, 1915. On the morning of June 10 I was attracted to a small piece of damp woodland about 10 rods from my buildings, by an unusual bird-song. I carefully searched out the singer and found it to be a male Connecticut warbler. Hiding myself in the underbrush I watched it for a while, when to my surprise I discerned the female hopping along the ground in a thrush-like fashion with her mouth full of fine fibers suitable for nest-building. She almost disappeared in some deep moss on a rocky bank, left her load and flew out to the open field where no doubt she collected her nesting material. The next day I spent a few minutes in watching the pair and the female evidently did all of the work of building the nest while her mate sang at his best.

During the next four days I found time to visit the spot occasionally and on the morning of June 15 the female was on the nest so I went away without disturbing her. On June 20 I found four pinky-white eggs with brownish spots on them in the nest. On July 4 I again visited my noted tenants and found four little ones in the nest.

Then came a week of summer meetings of the Vermont Botanical club, much rain, and other interests than warbler babies. However, on July 15 I paid them another call when I found the adults and two young fairly well fledged in some low fir trees near the nesting site. Although I visited the spot many times afterwards I did not see them again in 1915.

On July 13, 1916, while botanizing in a famous old orchid swamp in the northwest part of St. Johnsbury, I discovered a singing male in

some low pine trees, on the border of the swamp and knowing how much singing and how little work the male who lived in my woods the previous summer had done, I immediately crouched to the ground and scanned closely the moss under the pines where, to my delight, I spied the plucky little mother sitting in her moss-hidden nest. I immediately withdrew lest I frighten her, so I do not know whether she was brooding eggs or young.

On September 3 an adult male appeared in my garden searching for food. He spent about an hour there, gave me a broken, half-hearted autumn song and departed. I shall eagerly watch to see if they return to us in 1917.

These are my only personal records or experiences with this rare species. In addition to mine the Fairbanks' museum records show the following list of dates for this species: 1901, June 9; 1902, May 18; 1903, May 16; 1905, May 18; 1906, May 23; 1908, September 1; 1914, May 21. The specimen of 1908 was picked up dead in the grounds at Elmwoode, St. Johnsbury. The specimens in the museum collection were taken by Mr. W. E. Balch at Lunenburg September 14, 1905. Mr. Balch also reports one as observed by him there on July 9, 1916.

He also sends me notes regarding his experiences with this species in Lunenburg in previous years. He says he has taken one adult specimen in late May but hasn't the exact date. He further states: "I have taken a number of immature specimens or young of the year from the first part of July until the last of August and I have always expected to find the nest as I am sure they nest here from the young birds I have seen and taken at different times."

I honestly believe that this species is far more common than most observers think, because of its habits of keeping to cool, swampy woods, flying rather low, in and out among the thick bushes and hiding quickly when disturbed. Unless one were thoroughly familiar with the song of this species it might easily be mistaken for a poor rendering of that of the Maryland yellow-throat or confused with some of the higher notes of the mourning warbler. In both places where I have found the Connecticut warbler I have also found the mourning warbler.

THE ALGAE OF VERMONT

L. H. Flint

Vermont is one of the smallest of the states, but no botanist need ever pine for other worlds to conquer. Allow 10 years for an ac-

quaintance with the flowering plants—and then there will be the club-mosses and ferns and their allies. Allow five years for those—and then there will be the fungi and lichens. Allow 10 years for those, and then there are the mosses and liverworts. Allow 10 years more, and then there are the algae. If anyone thinks to know all the algae of Vermont he will die of exasperation if not of old age.

In climbing down the family tree of the plant kingdom, furthermore, the farther down we get, the smaller are the plants. We can manage fairly well with a hand lens until we get to the algae perhaps, but there we must have a compound microscope—that's one reason why many of us have never climbed down among these interesting plants. Not alone this, but the base of the tree stands in water. The mosses and liverworts lead us to the water's edge, and when we go down farther we get into water—I might say into deep water.

The algae, then, comprise the plants at the lower confines of the vegetable kingdom. They are for the most part, so far as fresh water forms are concerned, plants of microscopic size living in water or in moist situations, of various colors and simple structure. They may be separated into six groups, namely, the *Myxophyceae* or blue green algae, the *Chlorophyceae*, or simple green algae, the *Zygophyceae*, or conjugate algae, the *Siphonophyceae*, or tube algae, the *Phaeophyceae*, or brown algae, and the *Rhodophyceae*, or red algae.

The lowest and simplest of the algae make up the blue-green group. These plants are of one cell, in which there is no definite nucleus or chloroplast, the contents being nearly homogeneous. The cell-wall of these plants is not composed of true cellulose, but of a sort of gelatinous substance similar to animal cell-wall in composition. On account of the nature of the cell-wall and the simple fission method of propagation, the plants give rise to colonies of plants, which appear as blue-green masses, often in chains or filaments. As a representative of one of the first subdivisions of this group we may consider the genus *Chroococcus*, the plants of which are spherical, and whose species are of various colors. The gray, blue, brown, red, yellow, orange and violet colorings seen on our moist cliffs are often due to microscope algae of this group. What at first appears as a stain upon a rock may often prove a colony of these simple plants, and in this group the gelatinous sheath is not noticeable to the unaided eye. This group bears perhaps the closest resemblance to bacteria, and were not bacteriology elevated to the position of a separate science we should have to include bacteria in a study of the algae.

A second subdivision of the blue-green algae which invites especial attention is represented by spherical or flattened colonies of plants. These develop from single microscopic resting cells 1/2500 of an inch or so in diameter, and form colonies as much as an inch in diameter in some species. These are species of the genus *Nostoc*, and abound in almost every habitat affording quiet fresh water, though many species do not form colonies of a noticeable size. They will be found growing with moss on dripping cliffs, or in quiet pools, and it is in the latter habitat that they obtain their greatest size. The *Nostocs* vary to some extent in color, but are mostly a rich olive green. Some species require a continuous water habitat while others may be found in moss or mud at the water's edge.

It will be observed that the dividing plants of the *Nostoc* remain for a time adjacent to each other in the gelatinous mass of their partly soluble cell-walls, so that the microscope reveals them to us as countless little chains of a dozen or more cells each, with occasional thicker-walled resting cells. The next subdivision leads us to plants which form individual filaments each having a gelatinous sheath but not united in any definite mass with other filaments. These plants are best represented in the genus *Scytonema*, and are found on moist cliffs, where they often entwine with moss and form the basis of lime incrustations. Some of the rocks at the Winooski gorge are covered with a red scab-like growth which consists almost entirely of these plants.

We have in the *Scytonemas* a growth which is a filament. In the next subdivision we find a differentiation of the filament into a base and apex, and the plants are attached to rocks under water, usually in quiet pools or streams. The filaments divide and subdivide, and we find strands radiating upward from a central point to form little cushions up to a half inch in diameter. These are most frequently represented in the genus *Rivularia*.

Another interesting subdivision of the blue-green algae is found to be characterized by an unbranched filament without a noticeable gelatinous sheath, the common genus of which is *Oscillatoria*. These plants move about clockwise and sidewise. They are perhaps the most common of the blue-green group—no pond or stream or swamp is without them, and they occur frequently as brownish or greenish "slime" on moist earth.

The *Chlorophyceae*, or simple green algae, are not so simple as we might wish. In the blue-greens we traced a structural development which began with a single free-floating sphere and ended in a plant which had a filamentous form and a base and apex. But the struc-

tural changes were external, and all the cells were for the most part similar. The simple algae usher in some changes within the cells. The central portion of the cell becomes a more pronounced center of activity and is called a nucleus, while the green coloring matter is invested within a special body called the chloroplast.

The group of simple algae appears as a promiscuous gathering of plants in which a number of experiments were tried. Chlorophyll is the authorized coloring matter and nutritive agent it would seem, but there is no agreement as to the shape into which it shall be incorporated. We find green flasks, green blankets, green cylinders, green plates, green crescents and green footballs all striving to get the most energy out of the sun: it seems that the idea of experimenting is very old. Within this group also we find a variety of plant forms which seem for the most part to lead nowhere in particular. The modes of reproduction are likewise diverse. Within the group we find certain plant cells giving rise to motile bodies called gametes, which in turn lead varied existences, some of them fusing to form spores, others developing directly into new plants.

The most common genera of this group will be considered very briefly, with no attempt to enumerate their specific characters. The *Ulothrix* is an unbranched filament having a blanket-shaped chloroplast. It is frequent on the wave-washed rocks at the lake here, and was occasionally noted in mountain brooks. The *Hydrodictyon* or water net is one of the most unique of all the algae, the colony being made up of long cells arranged end to end in a curious manner forming a net which sometimes measures several inches across. There is but one species known, and this is abundant in quiet inlets along the Lake Champlain front and in still pools. I have never found it except at Burlington, but expect it will be reported from some of our smaller lakes. *Scenedesmus* is a genus in which the colony of four crescent-shaped cells is microscopic, and is occasional in still pools with other algae. *Oedogonium* is a filamentous form of frequent occurrence. It has cylindrical chloroplasts, and the cell-wall is peculiarly ridged. *Stigeoclonium* species are frequent throughout the state, typically in running water. These plants may attain a length of several inches, and are delicately branched. Four species are commonly noted. *Chaetophora* resembles *Stigeoclonium* in structure, but grows radially, forming a rounded mass on submerged sticks and stones. In *Draparnaldia* we have an interesting genus in which the main filament is surrounded by delicate whorls of branches, the whole being contained within a gelatinous sheath. I have never found it except in

mountain brooks, where it occurs occasionally, and seems more or less confined to shaded pools, where it is attached to rocks in under water. *Drapernaldia* is one of the most beautiful of our algae, and like some of our orchids, seems to seclude itself in the heart of the wildest woods.

The phylum *Zygophyceae*, the yellow-green or conjugate algae, includes some of our commonest algae. The group as a whole is characterized by unbranched filaments consisting of a single series of cylindrical cells. The plants are sluggish, typical of still waters, free-floating, and for the most part yellow-green in color. The reproduction is by the fusion of two cells in adjacent filaments following the formation of a connecting tube, and this fusion gives rise to a zygospore, from which the group takes its name.

Spirogyra is the most noticeable of the genera in this group, and about a dozen species are reported from Vermont. The green scums on still pools and the large green masses resting on submerged rocks are often made up chiefly of species of *Spirogyra*. The name of the genus is suggested by the one or more spiral chloroplasts which wind about within each cell. *Spirogyra* is one of the innocent recipients of that non-botanical term "frogspit."

In *Zygnema* we have a genus of filamentous plants similar in habit to *Spirogyra*, and differing chiefly in having two star-shaped chloroplasts within each cell instead of the spiral bands. While *Zygnema* is not so widely represented in Vermont, there are several species, and it is not at all uncommon.

The desmids comprise a subdivision of this group in which the individual cells are organized into symmetrical halves, each containing a chloroplast. The filaments usually break up into single cells, and some are motile. The desmids exhibit a wonderful variety of form, and are often very beautiful. They are found free-floating in quiet pools or entangled with other algae.

The diatoms comprise a group of plants characterized by rigid silicate walls and a box-like structure, typically isolated but sometimes as a filament, for the most part yellow-brown in color and moving about through the water by means of pseudopodia. The silicate walls of the diatoms are marked by minute transverse lines. The desmids and diatoms are such varied groups of plants, and comprise so many species—some 10,000—that in the study of the writer they have been passed by without comment. They abound in all waters and moist soils.

The *Siphonophyceae* or tube algae are typically aquatic green plants, filamentous and branching, and composed either of segments or

of continuous tubes. Reproduction is more commonly by special cells constituting antheridia and oogonia, or by asexual spores.

Of the green algae of this group five genera are of frequent representation. Species of *Cladophora*, or water flannel, occur in tangled masses of stout-branched filaments in streams and ponds. *Vaucheria*, or green felt, forms dense felted masses in shallow water or on moist earth. *Potrydium*, a balloon-shaped green algae, occasional on moist ground, is often found along with *Vaucheria*. *Nitella* and *Chara* are genera characterized by whorls of free branches, and are found in the still waters of streams and ponds. They may attain a height of several inches, and grow in upright attached masses.

The phylum *phaeophyceae* or brown algae consists mainly of marine plants, and no representatives are reported from Vermont.

The phylum *Rhodophyceae*, or red algae, although comprising marine forms mostly, has two freshwater forms within the state, representatives of the genera *Chantransia* and *Batrachospermum*.

Chantransia violacea forms a purplish mat on wet rocks, the individual plants being about a quarter of an inch long. They are delicately branched plants, not having a gelatinous sheath, and reproducing sexually by a carpogonium and antheridium. From my own limited collecting this plant would seem rare in Vermont, being found at a single station in a mountain brook.

The genus *Batrachospermum* is represented by the species *gelatinosum*, and consists of a main cylinder of elongated cells surrounded by a cortex of smaller cells containing the chloroplasts and a reddish coloring matter, the whole being invested within a gelatinous sheath. At more or less regular intervals this rudimentary stem is beset with clusters of delicate branches. This plant is attached, as is *Chantransia*, and branches freely, sometimes attaining a height of several inches. It is confined to cold streams of the mountains, where it is not infrequent, being noted in about a dozen stations. These two red algae are both plants of the mountains, and, it seems to me, are the most beautiful of all.

This group completes the enumeration of our most common algae. Within this brief survey we have traced an evolution from a plant consisting of a single spherical cell to one having a rudimentary stem of several cells thickness, from a plant of microscopic size to one of several inches in height, from a plant reproducing by simple cell fission to one having special cells set aside for reproduction. The algae reveal to us the early struggles of nature in building up the plant world, and are witnesses of some of her most fantastic experiments. To study

the algae is to gain a greater insight into the beauties and wonders of our earth, as well as to add much to our understanding of the present world flora of flowering plants.

A considerable number of preserved specimens of algae have been placed on file in the Pringle herbarium at the University of Vermont and will be gladly shown at any time to those who may be interested.

GOSHAWKS UNUSUALLY NUMEROUS

Evalyn Darling Morgan

During the month of November, 1916, an unusual number of goshawks visited Woodstock and vicinity so that instead of being rare, they were for a time actually common.

On November 2 a nearby poultryman shot one as it was killing a hen, and sent the specimen to me. It proved a splendid one, measuring 26 inches in length. This was a female and its mate was seen for several days in the poultry yards where it manifested great boldness, but escaped with its life, as well as with its prey.

A few days after that, one visited "The Highlands" in Hartland and I had the experience of watching it catch a field mouse. It perched on a conspicuous branch of a butternut tree on the edge of the field, remaining motionless for a long time, and then of a sudden, swooping down with cruel swiftness on its prey. As it sailed up from the ground the blue-gray of its back was strikingly attractive. Another day it attempted to secure a chicken near the barn, but was greeted by such an uproar from the flock that it retreated and was not seen again.

The following week another specimen, also a female, was sent me by a farmer in Hartland, and during that week I obtained four additional records.

An exhibition of hawk skins at the "Old Home Day" (Hartland) celebration awakened considerable interest. It included a specimen of Swainson's hawk taken May 23, 1915, in Hartland village. For sometime it was observed perching in perfect unconcern in nearby trees, seeming friendly and unafraid, and finally proved a tempting target to a man with a gun. It is a striking blackish-brown bird—this one, a male, measuring 20 inches. In the west where it is common it is considered a great friend of the farmer as it destroys so many rodents.

It would be interesting to know how many of these birds have been taken in this state. Vermont's preliminary list says: "This

is a rare species in the state. Lunenburg, Balch." Do the club members have additional records?

GOOD "FINDS" IN VERMONT

E. H. Eames.

During 1915 and 1916 Mr. C. C. Godfrey and the writer spent some time in Vermont and some very good plants were collected. Several of these appear to be without record in the state, judging by the recent Flora. Others appear to be known from few stations and a few are of interest because of extension of range from the small areas stated in the catalogue. The following notes summarize the data:

Polypodium vulgare L. var. *attenuatum* Milde. Plentiful on certain ledges at Hubbardton.

Crytogramma Stelleri (Gmel) Prantl. More or less calcareous ledges at Mt. Willoughby, etc.

Potamogeton angustifolius. Berchtold and Presl. Keeler and Huff ponds and Lake Hortonia, Sudbury.

Potamogeton foliosus Raf. Lake Bomoseen, also Silver Lake, Leicester.

Carex granularis Muhl. var. *Haleana* (Olney) Porter. Brandon.

Carex foenea Willd. var. *perplexa* Bailey. Hubbardton.

Carex Pseudo-Cyperus L. Castleton, Hubbardton, Orwell, Sudbury; local not rare.

Fimbristylis Frankii Steud. Muddy shore of Burr pond, Sudbury, with the next.

Eleocharis olivacea Torr. As above.

**Agrostis alba* L. Teratological form mentioned in Gray manual ed. 7. (A. sylvatica L.) Lake Willoughby.

Zizania palustris L. Abundant in Lake Bomoseen marshes.

Scirpus occidentalis (Wats) Chase. Common, often abundant, in ponds and lakes of western Vermont, north to Sudbury, at least.

Lemna trisulca L. Silver lake, Leicester.

Juncus bufonius L. var. *congestus* Wahl. Pawlet.

Salix candida Flugge. Castleton, Hubbardton, Sudbury, Brandon; local, not rare in suitable places.

Alnus crispa (Ait) Pursh. var. *mollis* Fern. Cliffs, Mt. Willoughby.

Lychnis chalcedonica L. Sudbury.

Gypophila paniculata L. Westmore.

Clematis verticillaris. D. C. Mt. Willoughby, plentiful about tops of cliffs.

Potentilla Anserina L. var. *sericea* Hayne. Shore of Lake Champlain at Orwell.

**Acalypha gracilens*, Gray. Sudbury where abundant over small area of dry pasture.

Ilex verticillata (L.) Gray. var. *tenuifolia* (Torr) Wats. Sudbury.

Pyrola secunda L. var. *obtusata.* Turcz. Sudbury, Brandon; apparently in almost any arbor vitae-larch swamp.

Pterospora andromedea Nutt. Hemlock woods, Sudbury.

Stachys palustris L. Marsh bordering on Lake Bomoseen.

**Utricularia minor* L. Shallow water of pools at Lake Bomoseen,, Hubbardton; also Marl pond, Westmore.

Solidago rugosa Mill. var. *villosa* (Pursh) Fernald. Plentiful along a woodland road east of Mt. Willoughby, Westmore; altitude about 1,800 feet.

Hieracium florentinum All. Sudbury.

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*New to Vermont.

EXPLORATIONS IN EDEN

Clarence H. Knowlton

A party of eight botanists spent four days of last July camping at Eden Pond. The most interesting place visited was the Garden of Eden, a peat-bog at high elevation. In the swampy wooded margin were *Listera cordata*, L. *convallarioides*, and *Habenaria obtusata.* Beside the usual ericaceous plants of the open bog we found *Rhamnus alnifolia* and *Salix pedicillaris* var. *hypoglauca.* Herbaceous plants included *Cypripedium hirsutum, C. parviflorum, Thalictrum polygamum* var. *hebecarpum, Saxifraga pennsylvanica,* and one solitary plant of *Pyrola asarifolia* var. *incarnata.* In wet evergreen woods beyond the bog were *Epipactis repens* var. *ophioides, Oxalis Acetosella* var. *subpurpurascens* and *Carex paupercula* var. *pallens.*

Other interesting species of the town were *Polystichum Braunii, Danthonia compressa, Eriophorum gracile, Habenaria orbiculata, H. dilatata,* and *Mimulus moschatus,* the last in full bloom.

NEW STATIONS FOR VERMONT PLANTS

Ella Munsell

The following list of plants which the Flora of Vermont lists as not generally common were collected in Newbury and Ryegate by Frederic W. Grigg of Newtonville, Mass., and the writer, all doubtful or critical specimens having been determined by Prof. M. L. Fernald or other experts:

Equisetum scirpoides, Ryegate, Newbury.
Andropogon furcatus, Ryegate, Wells River.
Panicum strictum (*P. depauperatum*), Newbury.
Panicum tennesseense, Newbury.
Trisetum spicatum var. *molle*, Ryegate.
Poa debilis, Newbury.
Eleocharis ovata, Wells River.
Scirpus atrovirens, Newbury.
Carex tincta, Ryegate.
Carex aenea, Newbury.
Carex stellulata var. *augustata*, Wells River.
Carex albicans, Newbury.
Carex umbellata var. *brevirostris*, Ryegate.
Arisaema triphyllum, form with very narrow leafleats and spathe, Newbury; form with lateral leaflets two-parted, Ryegate.
Allium Schoenoprasum var. *sibiricum*, Ryegate.
Oakesia sessifolia, leaves variegated with yellow, Newbury.
Ornithogalum umbellatum, Newbury.
Sisyrinchium angustifolium, with 3-parted perianth, Newbury.
Cypripedium acaule, white form, Newbury.
Cypripedium hirsutum, Newbury.
Cypripedium paviflorum var. *pubescens*, Newbury.
Habenaria Hookeri, Newbury.
Habenaria orbiculata, Newbury.
Corallorrhiza maculata, Newbury.
Microstylis unifolia, Newbury.
Alnus crispa var. *mollis*, Wells River.
Urtica Lyallii, Ryegate, Wells River.
Humulus japonicus, Wells River.
Sagina procumbens, Newbury.
Stellaria borealis, Newbury.
Clematis verticillaris, Newbury.

Lepidium virginicum, Wells River.
Raphanus Raphanistrum, Wells River.
Cardamine parviflora, Newbury.
Arabis Drummondi, Newbury.
Parnassia caroliniana, Newbury.
Amelanchier sanguinea, Ryegate.
Potentilla pumila, Wells River.
Rubus procumbens (*R. villosus*), Newbury.
Agrimonia striata, Newbury.
Prunus pumila, Wells River.
Astragalus alpinus var. *Brunetianus*, Ryegate.
Amphicarpa Pitcheri, Wells River.
Geranium Bicknellii, Newbury.
Acer Negundo, Ryegate.
Hypericum majus, Newbury.
Viola rotundifolia, Ryegate, Newbury.
Viola renifolia, Newbury.
Viola renifolia var. *Brainerdii*, Newbury.
Oenthera cruciata, Wells River.
Panax quinquefolium, Newbury.
Conioselinum chinense, Ryegate.
Moneses uniflora, Newbury.
Rhododendron maximum, Newbury.
Epigaea repens, Newbury.
Gaylussacia baccata, Newbury.
Vaccinium Vitis Idaea var. *minus*, Ryegate.
Lysimachia Nummularia, Wells River.
Gentiana quinquefolia, Newbury.
Apocynum cannabinum, Wells River.
Asclepias phytolaccoides, Newbury.
Cynanchum nigrum, Wells River.
Myosotis arvensis, Wells River.
Lappula echinata, Wells River.
Physalis heterophylla var. *ambigua*, Wells River.
Veronica arvensis, Newbury.
Scrophularia marilandica, Newbury.
Solidago squarrosa, Newbury.
Solidago racemosa, Ryegate.
Aster linariifolius, Ryegate, Newbury.
Cirsium discolor, Wells River.
Senecio Robbinsii, Newbury.

THE MALE FERN, *Aspidium Filix-mas,* AND ITS DISTRIBUTION

E. S. Shaw

The male fern is a very common fern in Europe where as many as 14 varieties are listed. In this country the fern is considered very rare, northern Michigan and Vermont being the only state east of the Mississippi River where it is listed.

Thus far only six stations have been reported for Vermont, four of them being in Windsor county, one in Brandon, and the other in Northfield. At the last named station it is found in the same profusion as the more common species, hundreds of the strong clusters being visible at once.

At this station there is also found an abundance of what is apparently *Aspidium Filix-mas marginalis.*

This station offers an interesting field for further study.

It may be of interest to add that the male fern in Europe is the one fern having recognized medicinal properties.

NEW PLANTS FOR ST. JOHNSBURY

Inez Addie Howe

The following additions were made to the flora of St. Johnsbury during the summer of 1916: *Vaccinium Oxycoccos, Iris pseudacorus, Spiranthes lucida, Spiranthes cernua* var. *ochroleuca, Habenaria dilatata* var. *media, Habenaria clavallata, Habenaria Andrewsii, Spergula, arvensis, Smilacina trifolia, Viola fimbriatula, Salix lucida, Salix fragilis, Chamaedaphne calyculata, Euphorbia hirsuta, Bromus inermis, Carex trisperma, Carex Deweyana, Cyperus strigosus, Cyperus rivularis, Dulichium arundinaceum, Muhlenbergia foliosa, Eleocharis obtusa, Juncus brachycephalus,* and *Juncus canadensis.*

In Danville, stations for *Geum macrophyllum, Stellaria borealis, Habenaria macrophylla, Habenaria leucophaea, Corallorrhiza maculata,* and *Scirpus validus* were found.

On a day's trip to West Barnet the first week of July and another to East Barnet in August these species were noted: *Microstylis monophyllos, Cornus circinata, Monotropa hypopytis, Ludvigia palustris, Acalypha virginica.* A fine specimen of *Galium verum* was sent me from Barnet for identification.

Habenaria fimbriata was found growing abundantly in Lunenburg in July.

NOTES ON WEST RIVER FLORA

(Abstract)

Leston A. Wheeler

Although other matters have made an unusual demand on my time the past season what time I have been able to give to botanical pursuits has yielded some good results. Among new stations for plants previously reported may be mentioned several for *Polysticum acrostichoides* var. *Schweinitzii;* two for *Botrychium obliquum* var. *dissectum* and one each for *Amelanchier sanguinea, Monotropa Hypopitys* and *Juncus marginatus* in Townshend. *Hesperis matronalis* was found in Newfane and *Lillium philadelphicum* in Dummerston.

Plants collected for the first time were: *Osmunda cinnamomea* with fertile frond like the type and one like the variety *frondosa,* in Townshend; *potentilla canadensis* and its variety in Townshend; *Veronica Tournefortii, Anthemis arvensis* var. *agrestis, Oxalis stricta, Galium Mollugo, Juncus effusus* var. *solutus* and *Juncus secundus,* all in Townshend; *Juncus tenuis* var. *Williamsii,* Newfane, Townshend, Jamaica and Stratton; *Antennaria fallax* and *Carex laxiculmis* var. *copulata* in Newfane; *Mellilotus officinalis* in Dummerston; *Lychnis dioica, Galinsoga parviflora* var. *hispida* and *Xanthium commune* in Brattleboro (two last not from West River territory). At the Newfane meeting of the American Fern society *Aspidium Goldianum, Asplenium angustifolium, Polystichum Braunii, Potentilla tridentata, Habenaria macrophylla, Senecio aureus, Carex retroflexa, C. Stellulata* var. *excelsis* and *Lychnis chalcedonica* were found.

QUERCUS AMBIGUA MICHX

George P. Burns

When I first visited Ethan Allen park to study the oaks, I was puzzled by the appearance, bark, leaves and fruit of some of the trees found there. An examination of the literature at hand seemed to show that these trees were *Quercus ambigua Michx.,* which the last Gray Manual gives as a variety of *Quercus rubra* L. This seemed to

me an impossible classification and when, last year, Professor Trelease of the University of Illinois wrote me, asking for a specimen of *Quercus ambigua*, I sent him leaves and fruit from some of the park trees. He replied "that seeing is believing" and recognizes this tree. This appears to me to be the more logical position but as long as our systematic work rests on the present dogmatic basis, we will be unable to determine such matters with certainty.

It is hoped to publish a more extended account of the matter later.

SHORT NOTES OF INTEREST

EFFECT OF WET SEASON

During 1916, a season of luxuriant growth, because of wet weather, Leston A. Wheeler of Townshend, found a number of plants of special interest as follows: A plant of *Oxalis corniculata* (among raspberries) which measured three feet and six inches in height; plant of *Asplenium Trichomanes* with over 70 fronds; *Lillium philadelphicum* with three and four flowers.

ACADIAN CHICKADEES ABUNDANT

During the fall of 1916 Vermont was visited by a large number of Acadian chickadees which passed through all New England and migrated farther south than ever before so far as ornithological records show, reaching New Jersey. The birds began to appear in central Vermont October 22 and during the week thereafter were abundant in mixed woods at all altitudes. They were seen in good numbers until mid-November and a few stragglers were about the first week in December. Specimens taken in Massachusetts and Rhode Island show that the birds which made the unusual southward movement were of the form known as *Penthestes hudsonicus nigricans*, the Labrador chickadee, and it is supposed that the Vermont birds were of this same dark form.

UNUSUAL DATE FOR WHITE-THROATED SPARROW

Richard M. Marble of Woodstock reports in Birdlore, Vol. XIX; 1:13, that a white-throated sparrow remained at Woodstock until Christmas day in 1916.

SPECIMENS FOR EXCHANGE

F. G. Floyd of 325 Park street, West Roxbury, Mass., wishes to exchange duplicate botanical books and local floras of New England

with the club members. Leston A. Wheeler, Townshend, Vt., has Vermont plants for exchange. E. H. Eames, 540 State street, Bridgeport, Conn., also wishes to exchange botanical specimens.

ATTRACTIVE WILD ORCHID PHOTOGRAPHS

W. E. Balch of Lunenburg has secured an unusually fine collection of photographs of Vermont orchids, taken by him in their native habitats. The collection includes pictures of growing plants of 37 of 53 species known to the state.

HUMMINGBIRD FED FROM HAND

Leston A. Wheeler of Townshend reports a case where a ruby-throated hummingbird suddenly appeared and thrust his bill into the blossoms of a bouquet of nasturtiums which a lady in Townshend was picking. The act of familiarity was repeated on other occasions.

STROKED A BROWN CREEPER

Miss Ella Munsell of Wells River had the unusual experience of stroking the back of a brown creeper as it crept up the trunk of a tree in its characteristic manner.

HARVEY'S POND BECKONS TO THE BOTANIST

Miss Mabel A. Shields of St. Johnsbury expresses the wish that the Vermont Botanical and Bird clubs will meet at Harvey's pond in the near future and in this connection she writes: "Harvey's pond at West Barnet is an ideal place for a summer meeting. Rhododendron bushes are found there and just to the south a half mile is a swamp where calypso and the ramshead ladyslipper are found. There are other orchids, too. Roy and Harvey mountains, between which the pond lies, have botanical possibilities that have not been explored as has a swamp at the outlet of the pond. There is a little hotel that would accommodate most of the club and farm houses of the better class would extend their hospitality."

NELSON'S SPARROW IN VERMONT

While collecting in Otter Creek valley on October 8, 1916, Mr. G. H. Ross and G. L. Kirk of Rutland secured two specimens of Nelson's sparrow, (*Passerherbulus nelsoni* Allen), one in Rutland and the other in Clarendon. This is the first known record in Vermont for this middle-western form of the sharp-tail sparrow. The birds were seen balancing on grasses, wren fashion, their habits being noticeably different from that of any native sparrow.

JUNCOES IN JANUARY

Mr. Duane E. Kent of Rutland observed a flock of six slate-colored juncoes at East Middlebury on January 26, 1916. This bird is very uncommon in mid-winter in Vermont.

HEATHER IN VERMONT

Miss Elizabeth Billings of Woodstock writes: "I would like to report that I found heather growing on our place in Woodstock last summer (1916). It was near a plantation of white pines. There is a second small station nearby."

VERMONT PLANTS FAR FROM HOME

W. W. Eggleston of Washington, D. C., writes: "Tell the club that in the Colville Mountains in the state of Washington, on the base of Mount Bonaparte, I found *Viola Selkirkii* and *Viola Brainerdi*, new to the state of Washington, *Viola canadensis*, *Moneses grandiflora*, *Pyrola secunda*, *Pyrola minor*, *Chimaphila corymbosa* and quite a few other Vermont plants.

INTERESTING WOODPECKER

On December 26, 1916, George L. Kirk secured in Mendon a downy woodpecker which is of considerable interest. The bird is slightly larger as to wing and total length than the average specimen of *Dryobates pubescens medianus*, (the New England form), has slightly large white spots on the back and wings and is almost without the usual black bars on the outer feathers of the tail. In this respect the bird resembles somewhat Nelson's downy woodpecker (*D. p. nelsoni*), a northern form, but experts say that it is intermediate between Nelson's downy and the common bird of Vermont orchards. Birds like the Mendon specimen have been secured in Massachusetts and elsewhere in New England. It is interesting to note that these have been all winter specimens, indicating that the birds are probably migrants from some territory in the north which is intermediate between the ranges of *medianus* and *nelsoni*.

PLANT FREAKS

Miss Ella Munsell of Wells River reports finding the following abnormal plant forms during botanical excursions: Buttercup with two blossoms, back to back; buttercup blossom one and a quarter inches in diameter; star flower with 10 leaves and some of them with three flowers on one plant, some of them with nine petals; bunchberry with

"flower" one and three-quarter inches in diameter and in some cases two leaves on stem in place of flowers; wild sarsaparilla in blossom October 26, 1916.

OXYBAPHUS HIRSUTUS IN VERMONT

Mrs. Mary C. Munson of Manchester found *Oxybaphus hirsutus* (Pursh) Sweet in her yard, growing as a weed.

MIGRATION LISTS

The attaches of the Fairbanks museum kept the usual complete bird migration list at St. Johnsbury during the season of 1916. The list numbers 114 species including a number of unusual records which are mentioned elsewhere in this bulletin. The Rutland list kept by D. E. Kent, G. H. Ross and G. L. Kirk for 1916 numbers 145 species.

NEW MINT FOR VERMONT

A new mint has been added to the Vermont flora *Dracocephalum parviflorum* Nutt having been discovered in the west part of the town of Clarendon by L. H. Potter of Clarendon.

MISSTATEMENT CORRECTED

In the paper "Mammals of Vermont," published in Vermont Botanical and Bird Club Joint Bulletin No. 2, April, 1916, it was stated by the author, G. L. Kirk, that the records for the smoky shrew, *Sorex fumeus* Miller, referred to in the article, were the first for Vermont. Mr. A. H. Howell of the United States biological survey calls attention to the fact that he collected the little animal on Mount Mansfield some years previous to the trapping of the specimens cited in the bulletin and the first records were published in the Auk. Mr. Howell's mammal article had not come to the attention of the writer of the Vermont paper at the time the 1916 bullein appeared. Mr. Howell states that he also secured the northern form of the red squirrel, *Sciurus hudsonicus gymnicus* Bangs on Mount Mansfield. All Vermont specimens secured by Mr. Kirk (including collections made from Berkshire to the Massachusetts line) have been the more southern *S. h. loquax* Bangs.

UNUSUAL FLIGHT OF PIPITS

Pipits were unusually abundant in the Otter Creek valley about Rutland in the fall of 1916. While these birds are regular migrants on Lake Champlain they are uncommon or irregular in the interior. They began to appear on September 28, were about in great numbers October 8-10 and stragglers were seen until November 5.

PROTHONOTARY WARBLERS IN VERMONT

"Evening grosbeaks from January 20 to May 9, 1916, and returning on December 13, 1916, were St. Johnsbury's most famous bird guests during the past year," writes Miss Inez Addie Howe. "Now they are quite at home in the village for the winter (January). Rusty blackbirds nested in St. Johnsbury during the season of 1916. Prothonotary warblers were seen in and near St. Johnsbury from May 14 to July 22, 1916. I have every reason to believe that they nested at Stiles' pond, although I could not find the nest. Two, evidently a pair, were seen there at intervals from June 20 to July 22. On May 16, I saw a least sandpiper on Sleepers river above Emerson Falls. A pair of towhees were noted June 10. A water thrush nested at Lime pond in Danville last season, the nesting site being very near to the home of a large colony of muskrats."

WOODSTOCK HAS BIRD CLUB

Following a lecture by Ernest Harold Baynes before the Lucy Mackenzie Humane society, (Woodstock), in November, 1916, a bird club was organized to be conducted under its auspices. Mrs. W. H. Moore was chosen president and Mr. Richard Marble, secretary. Fifty dollars was voted for the immediate use of the club, and plans are under way for the establishment of feed stations in various parts of the village, as well as for an organized campaign against the encroachment of the English-sparrow.

DOINGS OF HARTLAND CLUB

"The Hartland Nature club continued its study of the song and chipping sparrow in 1916, devoting one meeting to the subject, and adding some interesting nests of both birds to their collection," writes Mrs. A. B. Morgan.