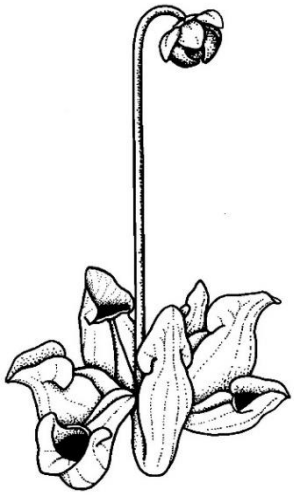

Sarracenia

Newsletter of the Wildflower Society of Newfoundland and Labrador

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Small Lousewort (*Pedicularis sylvatica*). Blast Hole Ponds Road, Portugal Cove. June 23, 2022. Photo: John Maunder.

Editor's Column

I now have two issues of the Sarracenia under my belt, and am looking forward to beginning a third. My sincere thanks to those "trusty folk" who have contributed to this volume so far.

Down the road, I'm really hoping to convince a wider portion of the membership to "help spread the load" by contributing, materially, to the growth and diversification of our publication.

Some new directions?

The production of a newsletter like the Sarracenia requires a continuous flow of good quality "content" which is both varied and interesting to its readers.

While many past Sarracenia contributions have tended a little toward "the scientific side" — probably discouraging the submission of more "popular" pieces by some "general members" — there doesn't seem to be any good reason why a healthy portion of future contributions can't be a wee bit more easy-going and "grass-roots", in the interests of satisfying the full range of interests and aesthetic sensibilities of our greater membership. Ideally, of course, there should be some sort of balance between the two.

Suggested contributions might include, at least in part, a number of *shorter* (maybe "half-page") pieces on:

- general news and information/notes/comments
- special botanical places/secret spots
- field trip reports — both new and historical
- new discoveries/new distributions
- associated flora and fauna (eg., pollinators)
- philosophical musings
- recipes? (when I edited The Osprey, years ago, I fondly remember publishing the recipe for Charlie Horwood's magnificent blueberry wine!)

Simple contributions of interesting photographs, with explanatory captions, will also be welcomed.

The possibilities are endless. Don't be shy! It's *your* newsletter! "Everybody has skills"!

John Maunder: Editor
Please send all contributions to the newsletter to:
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Featured Links

Nova Scotia Wild Flora Society http://nswildflora.ca/ Our sister group "next door". Of particular interest is their archive of PowerPoint and Zoom presentations available at: http://nswildflora.ca/programme/videos-of-presentations/ and also at: http://nswildflora.ca/programme/videos-of-presentations/powerpoints-of-presentations/ [click the *titles* to launch]. [Note that a number of our members are also members of the NSWFS, and vice-versa.]

The Digital Flora of Newfoundland and Labrador https://www.digitalnaturalhistory.com/flora.htm (This website is presently undergoing a complete upgrade!)

Flora of Newfoundland and Labrador by Susan and Bill Meades https://newfoundland-labradorflora.ca/. Includes the most authoritative checklist of the Province's vascular plants https://newfoundland-labradorflora.ca/checklist/

"Limestone Barrens ... Ours to Protect" https://limestonebarrens.ca/ A Newfoundland website that is a multi-layered goldmine of information. Includes many excellent links, particularly on the pages https://limestonebarrens.ca/Resources.htm and https://limestonebarrens.ca/EarlyStudies.htm

Small Lousewort (*Pedicularis sylvatica*) in Newfoundland, and Nova Scotia

John Maunder

Fig. 1: A "new patch" of Small Lousewort (*Pedicularis sylvatica*) discovered by the author, on the side of the gravel road leading up to the Blast Hole Ponds, Portugal Cove, NL. Photographed on June 23, 2022. [See, also, the cover photo.]

This beautiful little plant is not native to North America. On this continent, it is found only at a few scattered localities on the northeastern part of the Avalon Peninsula of the Island of Newfoundland, and at ONE tiny spot on the western part of Cape Breton Island, Nova Scotia (*if* that population still exists – see below).

When, and how, the plant arrived in North America is unknown. However, quite clearly, it has been in Newfoundland for at least 111 years.

The great Harvard University botanist, Merritt Lyndon Fernald collected the species at St. John's, Newfoundland ("Damp mossy or turfy hollows on hills south of St. John's [ie., the Southside Hills]. July 31, 1911. G 6181") and ("pastured sphagnous openings in woods" along the Waterford River between St. John's and Donovans. Aug. 4, 1911". G 6182), as well as at Carbonear, Newfoundland ("Damp hollows in spruce woods". August 6-7, 1911. G 6183).

Fernald (1926) recorded finding the plant again, in St. John's, on another trip to Newfoundland, in 1924: "The train for Trepassey would not leave until Friday noon, so, after a rainy morning, we spent Thursday afternoon [August 14] climbing the slopes of [the]

South[side] Hill. I had been there with [Karl] Wiegand in 1911, but [my 1924 travelling companions] [Bayard] Long and [Boyd] Dunbar had not [been] …".
In the same essay, Fernald "gushed": "*Pedicularis sylvatica* L., with small fern-like foliage and little racemes of exquisite shell-pink large corollas … abounded in the peat and rock along the hillside rills."

[**Reference**: Fernald, M. L. 1926. Two summers of botanizing in Newfoundland [in part]. Rhodora 28(328): (specifically pp. 80-81).]

The plant was soon-after recorded again, for the northeast Avalon Peninsula, by two amateur (but very knowledgeable) local botanists - Mary Southcott (no data. NFLD 2323, NFLD 2325), and Agnes Marion Ayre (Murray's Pond, Portugal Cove. "June-October, 1928". Wet rocks. NFLD 2324. G)

For the record, more recent collections are listed below, in chronological order [this list may not be exhaustive]:

[1] Eli Lear. St. John's. Path through woods to Virginia Waters. July 29, 1932. ACAD
[2] A.C. Smith, E.C. Smith. Logy Bay. Wet places. July 14, 1945.
[3] Hubert J. Squires. St. Phillips. Meadow. August 11, 1945. NFLD 2321
[4] John E. Maunder. Logy Bay. Damp mossy places in coastal heath. June 22, 1968. NFM 7365
[5] John E. Maunder. Middle Cove. West side of cove. Wet grassy area overlooking beach. June 22, 1968. NFM 7365.
[6] Peter Scott. Outer Cove, above cove on east side. Wet boggy area. Sept 29, 1972. NFLD 2315
[7] David P. Weber. Near Long Pond, St. John's. On grassy slope off footpath along wooded hillside. June 24, 1974. NFLD 2318
[8] Peter Scott. Kenmount Road, St. John's. Moist sunny slope. July 14, 1974. NFLD 2320
[9] Hilda E. Smith, Marine Drive [near St. John's]. Open poor pasture. September 13, 1975. NFLD 2319
[10] Alexander W. Robertson. Cape Spear. Exposed sites around parking zone. July 21, 1977. NFLD 2314
[11] Paul Barclay. Signal Hill, St. John's. July 4- 7, 1977. DAO. [See: Sarracenia 5(2): 7-8. Winter-Spring 1995]
[12] Laura Park. In front of Queen's College, Prince Phillip Parkway, St. John's. Lawn. Sept. 14, 1978. NFLD 2316 [17957]
[13] John E. Maunder. Nagle's Hill, St. John's. Pole line below and E of, the golf course. Disturbed ground in drainage ditch. July 29, 1997. NFM 7353
[14] John E. Maunder. Blast Hole Ponds Road, Portugal Cove. Small patch on open, weedy roadside. June 23, 2022. NFM (pending).

Numerous sight records exist for Memorial University's St. John's campus, primarily from the area north of the Prince Phillip Parkway, between the autism centre and Queen's College, and numerous photos have been taken in the general area by WFS members, and others.

It appears that not all of the populations enumerated above still survive. Urban spread, and general human disturbance appears to be the main culprit. However, the problem may just be a lack of recent "search effort"? It might be an interesting exercise to try to re-locate as many of the old records as possible, and perhaps even find some new populations – like my recent find on the Blast Hole Ponds Road (Fig. 1).

All Newfoundland records, known to date, are plotted on the Google Earth map presented below (Fig. 3).

The elusive Nova Scotia site.

On June 17, 1987, a single collection of *Pedicularis sylvatica* was made by Nova Scotia amateur botanist Sandra Ferguson, at the tiny Estmere Cemetery, S of Little Narrows, off Route 223, on western Cape Breton Island. The plants occurred primarily within the cemetery, but were also seen to be spreading out into the surrounding area. A collection was placed in the herbarium of the University College of Cape Breton [now Cape Breton University]. Apparently, as well, a duplicate collection was deposited in the Nova Scotia Museum.

In August of 2009, at the urging of myself and the legendary [in NS] Pixie Williams, WFS member Carl Munden relocated the site, and reported that there were still about 10-15 plants there, despite the fact that the cemetery had apparently been "improved" significantly (ref. Pixie Williams), since 1987 (Fig. 2).

Fig. 2: Estmere Cemetery, NS. 2009.

Fig. 3: All known records of Small Lousewort (*Pedicularis sylvatica*) for Newfoundland, historical and recent.

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Recovery Plan. Limestone Barrens Species at Risk.
Just Released!

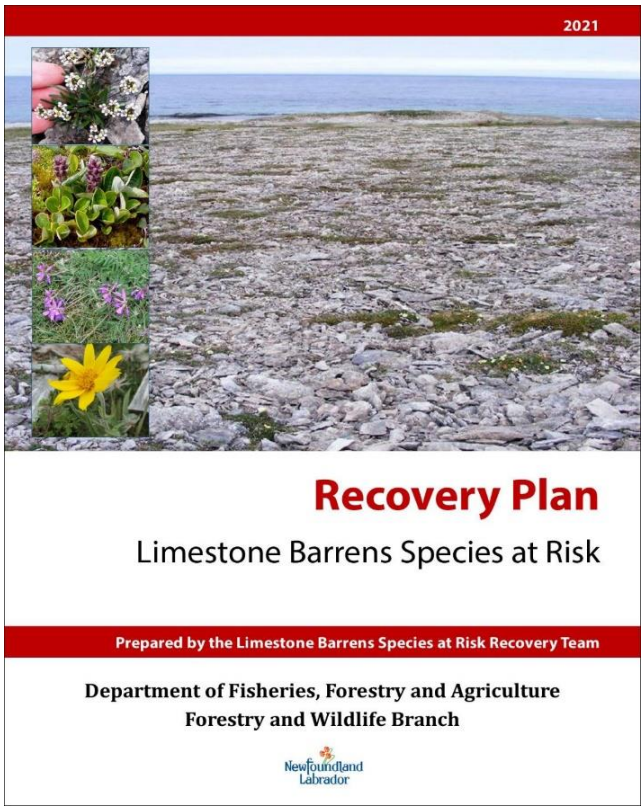
For many of our members, the Limestone Barrens of Newfoundland are an incredibly special place!

Sadly, particularly since the beginning of upgrading on the Great Northern Peninsula Highway in the early 1970s, the barrens, themselves, and many of the equally special species that live there, have come under increasingly threat, and have suffered great damage.

In response to this problem, in recent years, an impressive amount of scientific research has been carried out on these barrens, much has been learned, and many strategies to help preserve the habitat and its species-at-risk have been developed.

On July 7, 2022, the Provincial Government released a comprehensive document entitled “Recovery Plan. Limestone Barrens Species at Risk.”

The full document — a real “goldmine” — is available here: https://www.gov.nl.ca/ffa/files/Limestone-Barrens-Species-at-Risk-Recovery-Plan.pdf It’s really worth a read! You’ll learn stuff!



Eastern Dwarf Mistletoe—the sequel

Andrus Voitk, Maria Voitk

Fig. 1: Witches' broom on black spruce, all around the property, with several dead trees still standing. The characteristic proliferation of the branches feeding the witches' brooms can be seen. One characteristic of witches' broom caused by mistletoe, as opposed to rust fungi, is that the needles stay on and the broom remains green to the bitter end.

In the last edition of this newsletter, we two, together with our young neighbour, Nico, reported on sightings of Eastern Dwarf Mistletoe near Humber Village. The effort earned us the trust of our neighbour, who a week later asked us to look after his chickens during his [and his parent's] absence in the Dominican Republic. When we arrived at his house for our Chicken Watch training, we were awed by an unexpected skyline view: nothing but spruce with witches' brooms all around (Fig. 1).

This warranted a closer look. There was a clump of somewhat deformed-looking small spruce behind the chicken coop, holding two bird feeders, under which the chickens liked to peck (Fig. 2A). The trees were so full of mistletoe, it was easy to understand how the tiny shrubs can kill big trees with sheer numbers. The spruce were expending a lot of energy in aid of their visitor's flower and seed production.

Because the trees were small, we could examine them fully. As a result, we discovered that we had erred in our previous report, saying that male and female mistletoe grew on different trees. Several instances could be found, where both sexes grew on the same tree - although maintaining some propriety by at least occupying different branches.

The irony of life! We took Nico into the forest to show him a plant growing in profusion by his front door. If anybody is interested in seeing these plants, we are certain that after his return Nico can organize guided tours for a very reasonable fee.

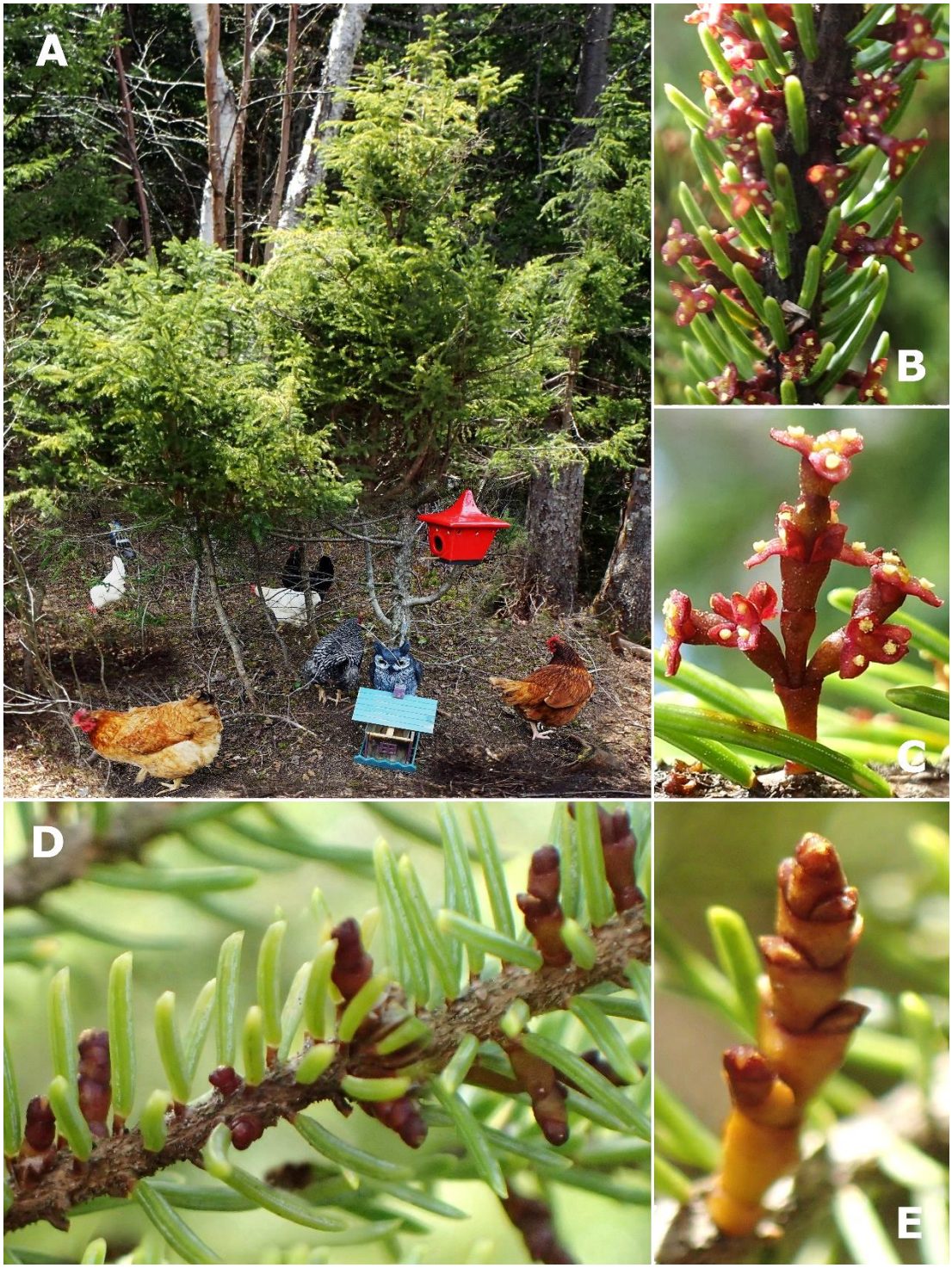


Fig. 2: **A.** A clump of small black spruce, all with a somewhat disorganized growth pattern. Denser proliferation of small branch clusters can be seen, sitting on disproportionately thick branches. **B.** Branches were literally covered by flowering mistletoe. Most male flowers have three petals, but four-petalled flowers are not uncommon. **C.** In areas with a great profusion of shrubs, male plants took on very florid arrangements with several branches and multiple petals. It is not common to find mistletoe plants taller than the surrounding spruce needles. **D.** Most female plants seemed to be a little behind the males in flowering, but were equally profuse and multi-petalled. **E.** Closer view of a more mature flowering female mistletoe. These were on a different branch of the same tree.

From Wild Violas to Garden Pansies – A Newfoundland Connection

John Maunder

In 2015, Canada Post issued a set of postage stamps featuring the Garden Pansy[1].

Fig. 1: The flowers illustrated are "Delta Premium Pure Light Blue Pansy" and "Midnight Glow Icicle Pansy"

Noting that the wording on the stamp booklets mentioned a specific "Newfoundland connection", the late Larry Dohey, an archivist at The Rooms Provincial Archives at the time, contacted me for more information. The present article is a very brief summary of some of what I sent him.

The Garden Pansy (*Viola ×wittrockiana*) is a much-loved, and commonly planted, horticultural species, known to most.

However, the details of its origins, from wild violas, are not very widely known. Nor is the "Newfoundland connection" alluded to.

In Europe, violas, of various species, have been planted in garden settings for a very long time. As early as 1542, Leonhart Fuchs recorded that "Heartsease" (*Viola tricolor*) was not only found in the wild, but was also cultivated in gardens in Germany (Wittrock 1896).

Sinclair and Freeman (1885: 427) wrote that: "… some manuscript papers … relating to the management and contents of Sayes Court Garden in Surry [England], by the celebrated [John] Evelyn, written in 1687, [record that] … pansies are enumerated in the list of 'coronary flowers for the parterre and borders'[2] [of the garden]."

Additionally, the 1764 edition of Miller's "Gardeners' Dictionary" (ref. Dean 1893) stated that: "Heartsease or Pansies grow naturally in some parts of the northern counties of England, but are generally cultivated in gardens about London."

Photo: John Maunder

Fig. 2: "Heartsease" or "Johnny Jump Up" (*Viola tricolor*) [both of these names, along with the identifications of individual specimens, have long been applied "a bit loosely"]. Urban garden, Pouch Cove, Newfoundland.

Nonetheless, Veit Brecher Wittrock (the Garden Pansy's namesake) was of the opinion (in 1896) that: "All the Pansies of the sixteenth, seventeenth, and eighteenth centuries may be called wild Pansies, as in all essential points they resembled those growing wild …"

However, beginning in the early years of the nineteenth century, this picture changed quite rapidly.

Lady Mary Elizabeth Bennet (later, Lady Monck), daughter of Charles Bennet, 4th Earl of Tankerville, (Walton-on-Thames, Surry, England), along with the earl's estate gardener William Richardson, are often credited with the first serious attempts at the selective breeding of violas, with a view to producing "improved" horticultural varieties.

Lady Bennet, did, in fact, have "a little flower garden in the grounds of her father … who was a zealous cultivator of plants. In this … garden was a figure of a heart, into which this amiable lady used to plant the varieties of pansies, which she accidentally discovered growing [on the estate] … [and, indeed] several pretty varieties were raised or discovered, and transplanted to this little parterre[2] " (Sinclair and Freeman 1835). According to Cuthbertson (1910: 4-7): "By giving them good cultivation and selecting seeds from the best kinds every year, this lady obtained varieties possessing remarkably fine flowers." According to Darwin (1868: 391-393): "in the course of a few years twenty [of these] varieties could be purchased".

However, ultimately, the *modern* Garden Pansy owes its origins almost entirely to Lord James Gambier of Iver (Buckinghamshire, England) (Fig. 4) and his estate gardener William Thompson, who, together, in 1813 or 1814, embarked upon an endeavor almost parallel to the above.

This very same Lord Gambier — a Vice-admiral in the British Navy (later Admiral of the Fleet, and a 1st baron) who served as **Governor of Newfoundland** between the Spring of 1802 and May of 1804 — was the "**Newfoundland connection**" alluded to above.

Luckily, a first-hand account exists that describes, in some detail, Lord Gambier's pansy-related enterprises. In 1841, eight years after Gambier's death, his "partner in crime", William Thompson, wrote a short article on the "History of the Heartsease".

It would seem to be a grave disservice to attempt to rewrite, or summarize, Thompson's marvelously circuitous prose, so, below is the article as it was written (with minor deletions to shorten the piece, a bit of paragraph break-up to increase readability, and a couple of useful [I hope] insertions and clarifications):

"About seven or eight and twenty years ago, Lord Gambier brought me a few roots of the common yellow and white Heartsease [apparently *Viola lutea*], which he had gathered in the grounds at Iver, and requested that I would cultivate them. Always eager to please my worthy and ever-to-be-lamented master, I did so, saved the seed, and found that they improved far beyond my most sanguine expectation.

In consequence thereof I collected all the varieties that could be obtained. From [Mr.] Brown, of Slough, I had the blue; and from some other person, whose name I do not now recollect, a darker sort, said then to have been imported from Russia [apparently *Viola altaica,* which is cobalt-blue]. These additions wonderfully improved my breeders. But still, though the varieties I soon obtained were multitudinous, their size was almost as diminutive as the originals.

Public Domain

Fig. 3: Lord James Gambier

Nevertheless his lordship was pleased, and thus I was amply rewarded. Up to this period, which was about four years after my commencement [i.e., 1817 or 1818], I began imperceptibly to grow pleased with the pursuit [myself], for all who saw my collection declared themselves delighted therewith.

I then began to think that some of my sorts were worthy of propagation; and this circumstance led me to give one, which took his lordship's fancy, a name. This was entitled Lady Gambier, and as I struck cuttings of it, they were given as presents by my worthy employers to their numerous friends and acquaintances …

Lady Gambier was the beauty of her tribe, and won golden opinions from every beholder. It was, indeed, in shape little more symmetrical than a child's windmill,

but looked in size among the sisterhood like a giant surrounded by dwarfs. But the giant of those days would be a pigmy now, as Lady Gambier herself appeared in comparison with another flower, which I soon after raised, and which, on account of what I then considered its monstrous proportions, I christened Ajax. This I then thought never could be surpassed, and yet in shape it was as lengthy as a horse's head.

Still I had worked wonders, and I resolved to persevere. I did so, and was at length rewarded by producing rich colouring, large size, and fine shape. The first large and good shaped flower that I raised was named Thompson's King."

Public Domain

Fig. 4: "Iver Grove" — Lord Gambier's English Estate

Thompson continued:

"… up to this period, a dark eye, which is now considered one of the chief requisites in a first-rate flower, had never been seen. Indeed such a feature had never entered my imagination - nor can I take any merit to myself for originating this peculiar property - for it was entirely the offspring of chance.

In looking one morning over a collection of heaths, which had been some time neglected, I was struck, to use a vulgar expression, all of a heap, by seeing what appeared to me a miniature impression of a cat's face steadfastly gazing at me. It was the flower of a Heartsease, self-sown, and hitherto left 'to waste its beauty far from mortal's eye.' I immediately took it up, and gave it a local habitation and a name[3].

This first child of the tribe I called Madora, and from her bosom came the seed, which after various generations produced Victoria, who in her turn has become the mother of many even more beautiful than herself. Hitherto, in the way of colour, nothing new had been introduced; white, yellow and blue, in their numerous shades, seemed to be the only colours which the Heartsease was capable of throwing out, till about four years since, when I discovered in my seedling bed a dark bronze flower, which I immediately marked and baptized Flamium; - from this have sprung Tartan, Vivid, and the King of Beauties, which has only bloomed this spring, and is, decidedly, the best flower of its kind that has ever been submitted to public inspection …"

So. There you have it — for all intents and purposes, the modern "Garden Pansy".

The rest, they say, "is history".

"From 1841 onwards it became the ambition of the florists to develop in the Pansy the following qualities: a perfect outline, well-defined blotches and margins, greater substance, [and] cleaner and yet deeper colours. By 1880, the heyday of the Show Pansy, these qualities were well-neigh obtained" (Cuthbertson 1910: 7).

A fitting testament to the exceptional industry and perseverance of William Thompson was a personal comment by James Simkins (1889: 14-15) who wrote: "Mr. Thompson raised so many varieties [of pansies] that he was often obliged to go to Shakespeare – so he told me – to find names for them."

Footnotes:

[1] The word "pansy" is derived from the French "pensée" (= "thought"). Cleverly, in "Hamlet, Act 4, Scene 5, Lines 199-201", Shakespeare had Ophelia say, in her "mad scene": "There's rosemary, that's for remembrance; pray, love, remember: and *there is pansies, that's for thoughts*."

[2] https://en.wikipedia.org/wiki/Parterre

[3] Charles Darwin (1875: 392) emphasized the importance of this event: "The first great change was the conversion of the dark lines in the centre of the flower into a dark eye or centre, which at that period had never been seen …"

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Grassy Arrowhead (*Sagittaria graminea*)

This little plant belongs to the same family (Alismataceae: Water-Plantains) as the Lesser Water-plantain (*Baldellia ranunculoides* subsp. *repens* which grows, uniquely in North America, at Bristol's Hope, Newfoundland. See: https://www.digitalnaturalhistory.com/flora_alismataceae_index.htm#baldelliaranunculoides

The Grassy Arrowhead is not a very common plant on our Island, especially in the east, although there is a tight little knot of records for the central Avalon.

At Collin's Pond, just west of Colinet, it occurs, uncommonly, in close association with Floatinghearts (*Nymphoides cordata*), at, or just slightly above, the water line. Notably, the flowers are MUCH larger than those of the floating hearts, so can be separated from them very easily. As in *Baldellia*, the individual flowers are relatively fragile, and don't last very long.

Photo: John Maunder

Sagittaria graminea, Collin's Pond, just west of Colinet. July 17, 2022. A rather short, stunted, example. More slender plants, up to 10-15 cm tall, occur there.

“Stone – Whats ?”

[From the Botanical Ramblings of Henry Mann -
a profound follow-up to the book review on the same subject,
presented in the previous edition of this newsletter]

Fig. 1: The stonewort (= charophyte) *Chara virgata*:

I love **flowers**! I love to grow them, to watch them, to smell them, to photograph them, to read about them, to talk about them, to write about them, to give them to my wife (very occasionally!), and to collect them (dead or alive).

There is almost nothing more beautiful on earth than flowers! Surely, they are near the pinnacle of creation. And they *would be* at that pinnacle if it were not for … **Stoneworts**!

I see the blank stares and the curious twitches when I speak thus to an audience, and I feel them now as you read this. But don’t skip the rest of the essay just yet. Hear me out!

Stoneworts [= charophytes] do exist, and they are beautiful, intricate, interesting, and weird. Yet 99.99%+ of the earth's population wouldn't recognize a stonewort if one got caught between their toes while they were wading at the beach.

I was one of those poor souls at one time. For the first thirty years of my life, I had never even seen a stonewort … at least I have no recollection of such. Oh, I do remember the *name*. It came up, I believe, in a dingy lecture theater just off College Avenue in Regina back in Biology 101 class. But I had never actually *seen* a living example. To me it was just another botanical tale like man-eating plants in the Amazon or the apple account in Eden.

Then, I came to Newfoundland - a place known for rocks, bogs, forests, fish and … Stoneworts! Everywhere I looked there were Stoneworts! The streams and the rivers, the ponds and the pools, the barachois, the freshets, the flashets, and the side channels, were all loaded with them.

Fig. 2: The author merrily collecting stoneworts somewhere in the wilds of Newfoundland.

Yet virtually no one, even here in Newfoundland, knows what a stonewort is! Here's the secret, see … stoneworts are normally invisible. But not because they are too small to be seen, or because they are some ethereal mental construct. No. It's because, like bats, belugas and blewit mushrooms, they live where humans seldom look.

So, what are Stoneworts?

They are, in fact, little green marvels growing on the bottoms of lakes, ponds and streams – indeed, on the bottoms of almost any fresh or brackish clean water body around the world. However, none are truly marine. Their entire world is underwater.

They are best observed in their natural habitats by snorkelling or scuba, or – as a poor substitute - by dredging them up from the bottom, into a pan of water.

When they are in "full bloom", exhibiting their reproductive structures, they can be quite colourful.

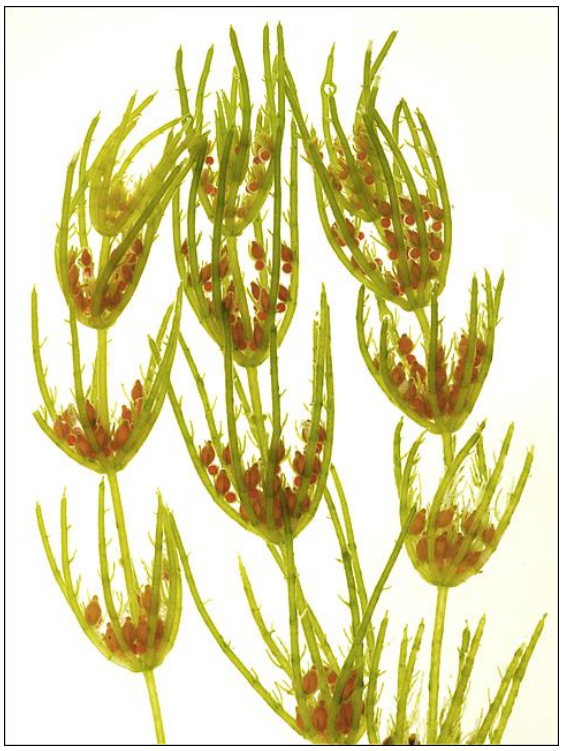

Fig. 3: According to their place in the plant world (they are actually a very unique group of "green algae"), they should not have stems, branches or branchlets, like the "higher" plants, but they *do*.

They also have the weirdest sex organs - unlike anything else found in plants.

Fig. 4: Male (round) and female (vase-shaped) sex organs.

Their history goes back well before dinosaurs roamed the earth. They are “plants” that seem to have both land and aquatic adaptations. A stonewort aficionado once quipped that they “appear to be aquatic plants that once tried to move onto dry land, didn’t like it, and decided to return to a more comfortable life under water.” Who knows?

The second most frequently asked question, after “What are stoneworts”, is “What *good* are stoneworts?”

That question would seem to assume that the listener had thought deeply about how the living world functions and about his/her place in it. Sadly, though, if this were the case, the question would not have been asked in the first place.

The correct reply is, of course, “What good is anything?” However, I’ve learned to save my breath on that one because it’s just “whistling into the wind”, or some other such activity done “into the wind”!

The unstated, subtle, point that the questioner may really be trying to make is likely “Why are you wasting your time looking at worthless stoneworts when we desperately have other more pressing needs?”

Allow me a brief digression into human nature. The basic human being (and I include myself here) values material needs in four fundamental categories: food, sex, drugs and money (wealth). I include drugs (e.g., alcohol, etc.) just for effect, as “three” seems to be too confining a number.

The query “What good are stoneworts?” is thus really a combination of “Can stoneworts be eaten?”, “Can stoneworts help my reproductive prowess?”, “Can stoneworts help me get high?”, and “Can stoneworts be sold for a profit?”

A cow is of obvious value because it fits two categories, food and profit. Wheat, barley, rye and sugarcane fit at least three categories, and so are even more highly valued. On the other hand, stoneworts appear to fit into none of the above categories, and so would seem to be completely worthless.

Continuing this theme, grass obviously has value, as does hamburger, beefsteak and Kentucky Fried Chicken. Almost everyone beyond the age of three is capable of this leap to understanding. We preach this concept throughout our school system; food chains, food webs, primary producers, primary consumers, secondary consumers, trophic levels, energy pyramids, etc., etc.

Yet, transferring value to wildflowers, alders and stoneworts presents a chasm of understanding that is apparently too wide to jump across. Maybe at each grade level, every year, an essay should be required of each student on “What good are…….? (pick any green organism), culminating in grade twelve with, “What good are Stoneworts?”. Ah, but I dream!

On the other hand, if you ask “What good are ducks?” or “What good are trout?”, there’s no problem here, for anyone. Eyes light up, stories gush forth of that special hunting or fishing trip and the big one that got away. This is the time to pop a different question - “Did you know that without stoneworts there would be no ducks to hunt or trout to catch?” Now you’ve grabbed their minds in a place they can’t ignore. Offer them a beer and you have a captive audience. It’s a dirty trick, but it works. It also works in a class with students (minus the beer of course) providing that you throw in a few stonewort-oriented cartoons of Garfield.

Whether stoneworts will ever have value in any of the four physical categories mentioned above is unknown because no one has yet taken the time to analyse their physical and chemical potential. Maybe someday there will be a stonewort extract aphrodisiac elixir. Wouldn’t that be something!

Getting back to ducks (and other water birds) for a moment ... To waterfowl, stoneworts are as important as mixed green salads are in our diets (when richly amended with cheeses, shrimp, bacon bits, croutons, and so on).

The brittle calcareous coatings and the ridged hard spores of stoneworts add roughage to the plant food that the ducks grind in their crops (along with the worms, bugs, snails, leeches and minnows which provide a necessary source of protein). Obviously, a diet well-balanced with stonewort spores provides the green salad component.

Interestingly the birds and the stoneworts have struck up a symbiotic relationship going way back hundreds of millions of years. Many tough, hard-coated, stonewort spores are able to pass through duck and geese digestive tracts, remaining viable as the birds fly from water body to water body, and are thus readily dispersed.

Below are microscopic views of the hard ridged spores of two different genera of stoneworts.

[The actual size of each spore is about the size of a period at the end of a sentence on a normal 8.5 x 11 page in 12-point font.]

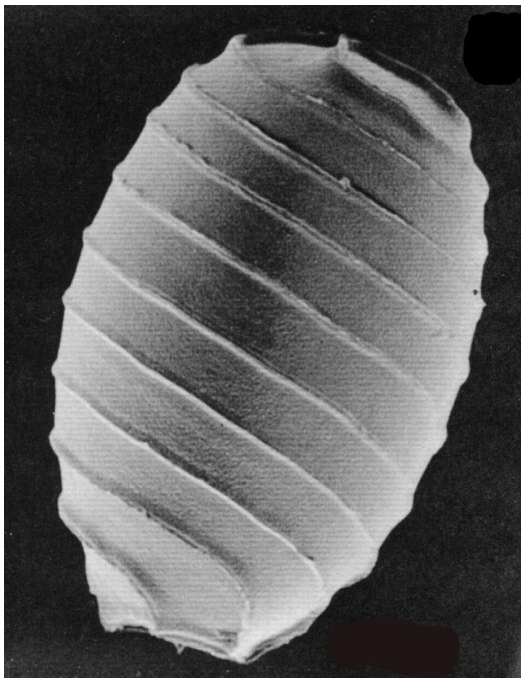

Fig. 5: Spore of a *Chara* species.

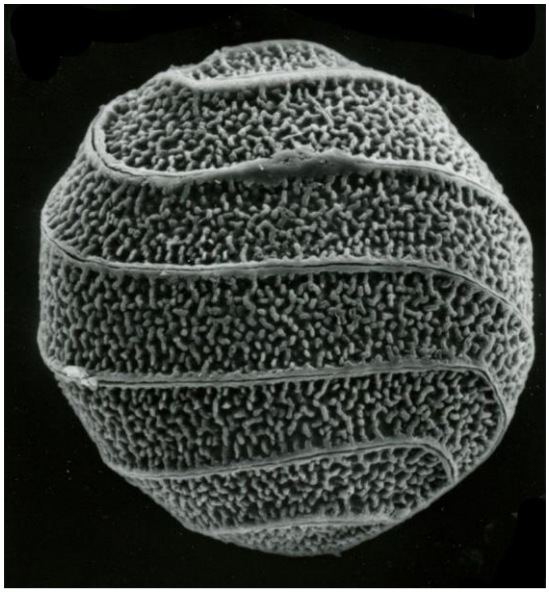

Fig 6: Spore of a *Nitella* species. Some neat, eh?

Spore-containing mud and/or bulbils adhering to feet and feathers of both waterfowl and shorebirds likewise help in dispersal. Stoneworts are one of the first pioneer species appearing in newly formed water bodies whether natural or man-made around the globe. One might say that stoneworts have enlisted waterfowl as their own personal airline, certainly much more efficient than Air Canada.

Critics often conclude that biologists are infatuated with sex and reproduction. We gush on about organs, sperm, egg, fertilization and endless discourse about life cycles sometimes even with a twinkle in our eyes. True, guilty, but yes, it must be so. Reproduction is essential to the existence of life as we know it on this planet. Not only essential, but even paramount for every species we know or don't know about. We should really try to better understand how it works and what its far-ranging implications are for all of the billions of organisms that we share this tiny blue orb with.

I am not just speaking of flesh and cellulose here. More importantly, I am referring to beliefs, ideas, values and attitudes, and how they interrelate to the well-being and future survival of the total complex biosphere.

Stoneworts have gotten it right and have fit nicely into the life of the planet for hundreds of millions of years, still today carrying out their essential aquatic services and providing survival avenues for all of the organisms in their watery realm.

Compare this to another species – humans - who consider reproduction to be a pleasurable pastime, not only for spawning offspring, but also for a whole host of synergistic attitudinal and ethical spin-offs and values that are wreaking havoc on ecosystems and even on their own long-term survival. To achieve hundreds of millions of tenure years on the planet, like the stoneworts, perhaps we need to do an in-depth rethink of how physical reproduction and mental values promote species survival.

Stoneworts have made the choices long ago, but we have yet to do so.

[Above, you have seen just a tiny selection of the ideas floating around in the back of a biologist's mind when considering the subjects of sex and reproduction, even when discussing lowly, poorly known, organisms such as stoneworts.]

Should you ever find yourself at a freshwater beach, out fishing in a canoe, or simply wading in the shallows on a pleasant warm sunny day, keep an eye out for stoneworts.

They're everywhere!

References:

For an *exhaustive* account of stoneworts, in particular those of Newfoundland and Labrador, download Henry's e-book from here: https://www2.grenfell.mun.ca/herbarium/download/Stoneworts%20of%20Newfoundland%20and%20Labrador%20-%20Henry%20Mann%20-%202021.pdf

[287 Mb high resolution version - maybe a seven minute download. Worth the wait though! You may, or may not, have to cut and paste the above link to your browser's URL address line (don't know why).]

[See the book review of that excellent document in the previous edition of this newsletter.]

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Our traditional, annual, "Chuckly Pear" (i.e., *Amelanchier*) walk. On the GEO Centre trails, Signal Hill, St. John's. June 9, 2022.