

# Sarracenia

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Newsletter of the Wildflower Society of Newfoundland and Labrador.

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*Daucus carota*: Holland Nurseries August 2010 (see p.29)

Howard Clase

## Miscellaneous Notices.

### 2010 Annual General Meeting.

The AGM was held at our November meeting. All the existing members of the executive were willing to continue and all were re-elected.

### Botany on the web.

Apologies to Gene for omitting our own website from my list in the last Sarracenia. If you haven't yet discovered it, it's at:-

<http://www.wildflowersociety.nl.ca/>

This will carry updates on our events sooner than they will appear in Sarracenia.

(The provisional old website on the editor's former MUN chemistry pages is now totally defunct.)

### Message from the editor.

You will notice that this issue combines Vol. 18#3 & Vol. 18#4. I haven't received much new material lately, and haven't had the time to write anything myself, which is how past editors have managed to solve the problem. I have reprinted a couple of articles from the first few issue of Sarracenia that I think still have interest. But rather than extend Volume 18 far into 2011, I've decided to end it here and start afresh with Volume 19 in the winter 2011 issue.

### Next Issue: Vol 19 #1

I am hoping the next issue will be largely a 2010 field trip issue. I have already started writing my memories of the Haricot trip while waiting for my car to be fixed. But I should like some help! Please send me anything you have (within reason!), your best pictures (preferably no larger than 3 MB), favourite discoveries, moments, etc. Even short comments would be appreciated, they can be incorporated into longer articles. Please send to : [sarracenia@nl.rogers.com](mailto:sarracenia@nl.rogers.com) before 15<sup>th</sup> of February if possible.

### Upcoming indoor meetings.

(First Wednesday of the month (Feb - May) at 7.30 p.m. in the MUN Botanical Garden Conference Room.)

**February 3<sup>rd</sup> - Glen Ryan**, will be giving a talk on native trees and shrubs.

Glen is the author of 'Native Trees and Shrubs of Newfoundland and Labrador' 1978. If there is a tree or shrub in your yard that you cannot identify, feel free to

bring along a sample.

**March 3<sup>rd</sup> - Todd Boland** will be talking on "The Flora and Fauna of Cape Province, South Africa."

**TBA. Henry Mann** will be in town in early spring and will give a talk "Nature in Winter" if it can be arranged at short notice.

The 2010-11 Executive		
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### Honorary Memberships.

At a meeting last Fall the executive elected two new honorary members:-

**Wilf Nichols** for his support during the time he was Director of the MUN Botanical Garden. Wilf is now Director of the State Botanical Garden of Georgia in Athens, Georgia, U.S.A.

**Bill Hay** who has enlivened several of our recent summer field trips with his Scots humour and expertise with the narrow green things that most of us find so confusing – grasses, sedges and rushes. Bill is now in his mid 80s and has more or less given up overseas travel – although he has asked for details of this summer's trip, so you never know!

### After the Hurricane Field Trip – 2011.

This year's summer field trip will take place as follows:-

July 31<sup>st</sup> – August 3<sup>th</sup> – Terra Nova National Park.

August 4<sup>th</sup> – 5<sup>th</sup>. Bonavista Peninsula.

Members have been informed of the preliminary details, including a list of accommodations – contact the society for more information if you didn't receive it.

**Since this is a popular holiday area you should book as soon as possible if you have not already done so.**



## Wild Chervil (*Anthriscus sylvestris* (L.) Hoffm.) in Western Newfoundland.

by Henry Mann

I have always associated Wild Chervil (Cow Parsley) with the St. John's area. Therefore in early June 2010 I was surprised to see a profusion of white-topped umbellifers (*Apiaceae, Umbelliferae*) intermediate in size between Cow Parsnip (*Heracleum maximum*) and Wild Caraway (*Carum carvi*) growing in Hammond Farm's hayfield at Little Rapids. Since I have driven the TCH to Corner Brook for many years almost on a daily basis and have not observed such a massive growth of an umbellifer in this location before, a screeching halt and dash into the hayfield ensued to photograph and collect some specimens. The plants grew throughout the hayfield, but were more thickly spaced along its inside margins, however, strangely they were confined within the exact boundaries of the hayfield (Figure 1). Not a single plant seemed to have yet strayed beyond the fence-line or

into the adjacent highway ditch. It almost appeared as if they were seeded in the field. Since it is doubtful that anyone would seed Wild Chervil into a hayfield on purpose, it is speculated that the seeds must have contaminated manure or organic materials spread on the field. I learned in a subsequent discussion with a resident of Little Rapids that the chervil was first seen in bloom in that hayfield last summer (2009) during a time when I was out of the province (Lois Bateman, personal communication).

Having been alerted by the Little Rapids "infestation" I began inquiring of other local naturalists whether they had previously noticed this species elsewhere in western Newfoundland. Only three unconfirmed reports surfaced; possibly a few plants in the Gillams area, a few plants in a Hammond Farm location different

from the current hayfield area, and a few plants at a residence in Little Rapids village. In our travels throughout the Humber Valley, Cormack, Port au Port Peninsula, and elsewhere during the blooming period (early June to early July) we searched along roadsides and fields and one other location was found by the sharp eyes of wife Phyllis. Four large dense patches of chervil were observed on the east banks of the TCH/Hwy 430 overpass at Deer Lake. From the size of the patches it appears that chervil has been present here for many years, possibly since the overpass was constructed or restructured. Because of the four distinctly separate patches, it may be assumed that seeds were probably contaminants of the hydro-seeding grass mixture.

Wild Chervil is a biennial or short-lived perennial growing to a height of 1.5 meters, sometimes more in good



Figure 1: Wild Chervil in hayfield.



Figure 2: A chervil leaf.



sites. It has much divided leaves (Figure 2) and white flat-topped inflorescences in a compound umbel (Figure 3).



**Figure 3: Flat-topped chervil umbel.**

There are no bracts at the base of the primary umbel, but it has broad reflexed bractlets at the base of the small secondary umbellets (Figure 4).



**Figure 4: Bractlets at base of umbellets.**

Characteristic of this species are white tooth-like hairs where the pedicel of each flower and the ovary meet (Figure 5), best seen with a

hand lens. None of our other umbellifers exhibit this feature.



**Figure 5: Stout hairs at base of ovary.**

Fruits are elongate, 6 – 9 mm in length and glabrous (Figure 6).



**Figure 6: Chervil fruits.**

At a distance the white flat-topped inflorescence of Wild Chervil might be mistaken for Caraway, Queen Anne's Lace or Wild Carrot (*Daucus carota*), or Goutweed (*Aegopodium podagraria*), but a close examination would show that leaves and fruits are quite different. It is the earliest of the white flat-topped bloomers, beginning in early June.

A recent comprehensive review of Wild Chervil (Darbyshire et al. 1999) indicates that this species can become an aggressive invasive especially of cultivated farm fields, pastures, hay meadows and disturbed sites. Mowing, especially prior to seed set, encourages the production of buds from the root crown promoting vegetative reproduction and spread. Rapid and dense growth of broad leaves in spring tends to crowd out other vegetation. The species is highly

resistant to some herbicides. Nova Scotia has it listed as a legislated noxious weed, as well as Ontario and B.C. The MUN Botanical Garden also has it listed as a Newfoundland invasive. Whether in Newfoundland it will primarily remain an agricultural, horticultural and anthropogenic weed or whether it will spread into the natural vegetation and begin crowding out native species is unknown. It appears to be most aggressive in good nutrient rich soils so the potential for invasion into the natural riparian vegetation of rich alluvial soils in the warmer sheltered valleys seems a possibility.

Two questions come to mind; "What, if anything, should be done about this species in Newfoundland?", and "Is there a provincial mechanism for effectively evaluating and dealing with potentially aggressive species?". From reading my articles and emails, many naturalists know that I tend to welcome newly introduced "wildflowers" for adding beauty and diversity to our somewhat impoverished flora. All species have both beneficial traits and potentially harmful ones depending on a host of environmental factors. Wild Chervil is no different in this regard, having been grown in herb gardens for its medicinal values and as a pot-herb for human consumption. It can be used as a forage species for livestock who will readily consume it although it is of poorer nutrient quality than normal forage. Do we need to be concerned about its potential invasive tendencies in terms of our natural vegetation? Do we need to be concerned with its potential problem as an agricultural weed? I don't know.

With regard to the second question, who is in charge concerning these matters in this province, and what, if any, legislation

exists? It seems that potentially invasive introduced species should be both the shared concern and responsibility of the provincial Agrifoods and the Wildlife Division. One should be primarily concerned with the economic effect and spread of agricultural weeds and the other the ecological and biodiversity effects on the native vegetation. Does the required legislation exist and are there actually individuals “on the

ground” in these two government units who have the time, expertise, and resources to regularly monitor the province for introduced “weeds”, to evaluate the species designated, and to enact the appropriate measures when warranted? Or is all the hype about “invasive aliens” just that, all academic and political rhetoric with no real functioning mechanisms for monitoring and remedial action?

Again, I don't know. This would make an informative and interesting article for Sarracenia if some representative of the provincial departments/divisions could enlighten us on these matters. Or perhaps a presentation to one of our natural history or wildflower groups would be in order. I look forward to such!

Happy Botanizing!

### Cited Literature

**Darbyshire, S.J., R. Hoeg, and J. Haverkort. 1999.** The Biology of Canadian Weeds. 111. *Anthriscus sylvestris* (L.) Hoffm. Canadian Journal of Plant Science 79: 671 – 682.

## Alien Umbellifers in the St. John's Area.

by Howard Clase

As Henry says, Wild Chervil or Cow Parsley, *Anthriscus sylvestris*, is one of the most common early flowering road and waterside weeds around St John's. The Waterford Valley is full of it. To most people it's the first “Queen Anne's Lace” to flower here. (North American botanists seem to have appropriated this name for one species, the Wild Carrot, *Daucus carota*, but to English botanists and the general wild-flower noticing public on this side of the Atlantic this is a general name for any similar flowers, even Yarrow, *Achillea millefolium*.) Later, in mid summer, it is followed by the Burnet Saxifrage, *Pimpinella saxifraga*, (which is neither a burnet, a saxifrage nor a pimpernel!) This is bit shorter than the Cow Parsley and has pinnate basal leaves resembling burnet – hence its common name. This is a little less widespread in the city, but is abundant in places (e.g. our lawn!). The smaller Wild Caraway, *Carum carvi*, has recently started to appear on roadside verges around the city too, but is not as

common as it is on the Northern Peninsula. Like many of our “new” aliens it has probably been introduced by hydroseeding. Another source of introduction for aliens is the potted perennials, trees and shrubs brought in from the mainland by chain stores and nurseries. For the past couple of years Wild Carrot has been flowering around the green-houses of Holland Nurseries. This plant is already established locally in the West of the Island and on the Burin (Mann 2005) and may well survive here. This stands up to 1.5 m (4 ft) and has much tighter umbels of small creamy white flowers than the other species and which are characterised by having a coloured central floret in each umbel. (See cover illustration.) It may be anything from pink through red to deep purple, and one of the ones behind Holland Nurseries was the rare forma *alba* with a white centre!

The giant of the local alien umbellifers is of course the Giant Hogweed, *Heracleum mantegazzianum* Sommier & Levier, which

caused a stir in the media during the summer when there was nothing much else to get excited about. The alarmist information distributed by the media, made people reluctant to take a walk along the trails lest they be set upon by these ferocious plants. In fact as long as you leave them alone they won't harm you – unlike the Poison Ivy, *Toxicodendron radicans* (L.) Kuntze, on the mainland, which can cause problems to susceptible people when they merely pass near by it. (True Poison Ivy does not occur in Newfoundland.)

The sap of many plants of this family will cause nasty blisters if it comes in contact with the skin in bright sunlight, and, being large, the Hogweed produces more sap than most, but in my experience, Newfoundlanders have better things to do on our rare sunny days than to rub the sap of wild plants onto themselves. In the 1950's when cheap Chinese plastic toys weren't yet available there was a rash of hospital cases in the UK of children who had been cutting the hollow

stems to use as “telescopes” and this has given rise to the plant's reputation for causing eye damage – but you have to do a lot more than look at it! Giant Hogweed has been here in St John's for some time – in the early days of the Botanic Garden it was even deliberately planted at

the head of the pond. It was reported in this journal as growing in 2003 (Clase, 2004) in the fen bisected by the Outer Ring-road between Portugal Cove and Torbay Roads. As it has become an invasive alien in parts of Scotland, choking river valleys, Leila and I have been

keeping an eye on this area, but so far it has shown no sign of becoming seriously invasive. There have been some 6 – 12 flower heads visible each summer. I understand the city did go in and cut them down after the Hogweed hysteria last summer, it will be interesting to see if they return.

### References.

**Clase, H.J. 2004.** Aliens large and small: *Heracleum mantegazzianum*, *Veronica peregrina* and *V. arvensis* in St John's. Sarracenia 12(1): 6-8.

**Mann, H. 2005.** Dispersal of Queen Anne's Lace (*Daucus carota* L.) in Newfoundland. Sarracenia 13: 38-41.

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## Notes to contributors.

Sarracenia is prepared using OpenOffice.org – a free office suite that offers capabilities far beyond the needs of the ordinary user, and is largely compatible with MSOffice. (A new version OOo3.3 is just out. As a fan of OOo I would be happy to help anyone who is interested in trying it out,. It includes several other programs as well as the word processor such as the equivalents of excel and powerpoint.) It would help me as editor if contributors would take note of the following guidelines when submitting articles, I will be happy to discuss the details, and I will send proof copies to authors whenever possible.

### General.

The editor will be responsible for the overall format and layout of the magazine. Contributors should keep to default formatting as far as possible. Please avoid excessive use of the space bar and block capitals. Leave the the fancy formatting to me!

### Text.

Text should be supplied **without** embedded pictures or tables, but type styles like italics, underlining, etc. should be included. The “native” format for OOo is Open Document Text (.odt) but I can also handle files in .rtf, .doc, .docx, and .wpd formats. All word processors give the option of saving in rich text format (.rtf), this preserves italics etc. Please do not use simple text (.txt) as all these styles will be lost. Typos will be corrected, but changes of substance will only be made after consultation with the author.

### Pictures and Tables.

These should be submitted as **separate files**. Pictures preferably as .jpeg files, raw formats like tiff are very bulky and will have to be compressed. Please do not resize to very small sizes, such as are usually used in e-mails, these may not contain enough detail when printed, even though they look fine on the screen, but very large files can be resized, I'd prefer 3 MB maximum if possible. Pictures will likely be cropped – but leave that to me, it depends upon the space available. You should indicate in the text where you would like them to be placed if it isn't obvious. Captions may be included at the end of the text or separately as convenient.

### Hard copy.

Material which is already printed will have to be scanned into electronic form, (I can do this). Illustrations will be kept as is, but text will either be re-typed or converted via an optical character reader. The format may be changed, but I shall only do this in consultation with the author.

### Scientific Names.

Scientific names will be *italicised*, they need not include authorities if they follow those in the latest (2000) edition of the “*Annotated Checklist of the Vascular Plants of Newfoundland and Labrador*” by Susan J. Meades, et al. All articles should include both the scientific name and the common name of each plant, normally at first mention. Only scientific names will be indexed.



## The Ties That Bind Us.

*A terse and exciting drama in one three-scene act, where Moose, Vixen and Crow make some observations on mycorrhizal restrictions placed on orchids and other flowers.*

by Andrus Voitk

### Scene 1: Late summer, somewhere in Western Newfoundland.

**CROW** (in the distance): Caw, caw, caw.

**MOOSE:** Hear that, Vixen? That's Crow cawing. Let's invite him along for a little morning walk.

**VIXEN:** I thought you, Moose, had poor eyesight, but good hearing. Sounds like your hearing is also bad. Listen again to Crow. There is no "k" (or "c") sound at the beginning of his vocalization and no "w" sound at the end.

**MOOSE:** Indeed, I do have genetically acquired acute hearing, but it's tempered by my English upbringing, which causes me to say "caw" when I hear Crow say "a". Funny, eh? How many times, as a bullock, did I swear to be different from my elders? How many times, now as an old bull, do I catch myself being exactly like my parents? Uncanny! The ties that bind us are much stronger than I appreciated and in many ways I seem to have remained stuck in the same mold, whether it be a mannerism, an expression, a certain smile, or the way I organize my life and the tenets I hold dear. I am the product of both my

genes and my upbringing, and often the distinction between nature and nurture becomes moot.

**VIXEN:** Hang on there, Moose! Don't go all philosophical or introspective on me so early in the morning. But keep that thought, for you may be onto something. Let's invite Crow along and see if we can explore the concept of the ties that bind us, as you so poetically, albeit not entirely originally, put it. Crow knows a lot and may explain these things to us.

**MOOSE:** Yes, let's. Here he is. Good morning, Crow. We heard you cawing, which set off a discussion of the ties that bind us. Would you care to join us to look for examples of this phenomenon?

**CROW:** Why, thank you, lady and gentleman, for inviting me. Your subject is enthralling. I suggest we begin our exploration over in yonder fen.

Stomp, stomp, stomp; pad, pad, pad; flap, flap, flap.  
*Curtain.*

### Scene 2: A nearby fen surrounded by various trees.

**CROW** (a little later): Here we are, here's the fen. As we enter the fen from the forest, what do you notice?

**VIXEN:** Why, there's a whole bunch of showy lady's slippers (*Cypripedium reginae*) right here at the forest-fen border. Is that what you mean?



**CROW:** Yes. Although they have finished blooming, they are big and easy to recognize. Why do you think they are at the border and not everywhere?

**MOOSE:** Guess because they don't like full sun.

**CROW:** Many books state exactly that, based on the very same observation. However, while the observation is correct, the conclusion is not. What other reason could there be?

**VIXEN:** Let's see... if the conclusion is wrong, it means that they like sun. But we do not see them alone in the middle of the fen. Since we are speaking of the ties that bind us, could it be that they are tied to the edge of the forest in some way?

**CROW:** Very good, Vixen, very good. Let me explain. Orchids are among a group of plants with very, very tiny seeds—essentially only a microscopic capsule of genetic material borne aloft on thin wings. Unlike peas and beans, the seeds contain no nutrition to provide succor for the germinating plant. Thus, in order to grow, orchid seeds need an external source of energy in a usable form. For orchids, this is provided by fungi in the soil:

specific fungi form a relationship with specific orchid seeds, providing them the energy required to germinate, grow and develop. The process to produce a flowering plant may take as long as 15 years or more and most of this time the orchid is dependent on its fungal partner for its energy needs.

**MOOSE:** So, what are you saying? That the fungus ties the orchids to the forest edge? Why should it do that?

**VIXEN:** I have heard that some fungi are mycorrhizal, which means that they have a physical relationship with the roots of plants. They give the plants water and minerals from the ground in exchange for sugars. Could it be that the fungi that help the orchid seed grow are also connected to the trees?

**CROW:** Right again, Vixen! These fungi do not extend much beyond the roots of the trees with which they are associated. Therefore, only those orchid seeds get fed that land where the fungi are—at the forest border.

**MOOSE:** If that's true, why are there no showy lady's slippers in the forest? It is full of trees with their fungus partnership.

**VIXEN:** Ahaa, that's where we began: these orchids need sun to thrive. That's why we seldom see them in the forest, even if the required fungus is there, but rather on the clearing side of the forest edge, near trees. When we do encounter them in the forest, it is in places the forest is somewhat thinner, letting some sunlight in.

**CROW:** Good show, Vixen! Once they are grown, of course, they have leaves of their own with which they can photosynthesize food of their own, and no longer need to be fed by the fungus. But they stay where the seed grew, tied by the ties that bind them.

**MOOSE:** But what's to stop them seeking out more sun then, if that's what they like, now that they are free?

**CROW:** Ha-ha, but aren't you forgetting something? They are not mobile like you. So even if they no longer need the fungus, they are stuck where they grew up, unable to move away, even when they no longer need those ties.

**MOOSE:** How do you know that that's true, that they are free to leave and no longer need those ties?

**VIXEN:** Guess you haven't been trampling too many people's gardens lately, Moose. If you had, you'd notice clumps of showy lady's slippers all over the place. They seem to do well in full sun. Guess that shows that they stick to the forest edge because they are tied to it, not because they do not like full sun.

**CROW:** Yes, its "freedom" is working against the orchid's interests in human-orchid interactions. If orchids invariably died after transplantation, humans would learn to leave them be. But, because many of the prettier orchids lose the dependence on their fungal ties at maturity, they become prey for transplanters. Many eventually succumb due to lack of other requirements or change of human plans, but enough survive to encourage the practice.

**MOOSE:** OK, so that's why showy lady's slippers grow at the edge of the fen. But from where I stand, even with my poor eyesight I can see groups of them throughout the fen as well. How do we explain that?

**VIXEN:** If you look at those clumps carefully, you will note that each one is associated with a tree or shrub, even if small. If the tree grows and finds the required fungal partner, then orchid seeds can germinate beside it. Therefore, we see orchids growing all around that solitary spruce (*Picea sp.*), for example, in the middle of the fen.



They seem to be particularly fond of black ash (*Fraxinus nigra*), because it is rare to see even the smallest ash in an orchid fen without several orchid plants around it.





**CROW:** Spot on, Vixen! Perhaps it would be more correct to say that the orchid seed's obligatory fungal partner seems to be fond of ash, not the orchid. Along these lines, look at that maple shrub (*Acer sp.*) over there in the fen. What do you see?



**MOOSE:** Unlike other trees and shrubs, it has no orchids around it. Why not?

**VIXEN:** From the previous discussion, one might guess that the orchid-feeding fungus does not like maple.

**CROW:** Right again, Vixen. In fact, the maple is one of the few trees that does not form mycorrhizal relationships with any fungi. No fungi, no lady's slippers.

**MOOSE:** Wow! So these ties that bind us are a very complicated affair. To grow, the orchid seed needs to meet the right fungus. But it also needs sun, so fungus alone is not enough. And for the fungus to thrive, it needs a specific tree. So the orchid, who doesn't care about the tree, is still dependent on it, invisibly bound to it, even fed by it through the fungus. No wonder wild things don't transplant well. And by the time they gain independence, they are tied down where they grew up, unable to move.

**VIXEN:** Yes, and when they are moved by others, they may actually become worse off or die. Freedom is a dangerous and risky condition.

**CROW:** They also need moisture, calcium-containing bedrock and many other things. If these are not provided, they will not thrive, even when they no longer need their fungal partner. Well, it seems we are gaining some insight into these ties that bind us. Look at the pretty flowers around these young spruce (*Picea sp.*). More of what we were talking about.



**MOOSE:** What kind of orchids are they?

**CROW:** If I told you that they are not orchids, but winter-green (*Pyrola americana*), what would that tell you about them?

**MOOSE:** That they behave just like lady's slippers?

**CROW:** OK, but why? What similarity must they share with lady's slippers?

**VIXEN:** If they are bound to a tree by a fungus, either they are unable to make their own food or they have seeds with no food stored in them, like the orchid. And since they have nice green leaves with lots of chlorophyll, the matter must rest with their seeds.



**CROW:** Good deduction! That's exactly the situation. The seed of wintergreen is also almost microscopic, with no food, just some wings for flight. Therefore, to germinate, it also must meet a succoring fungus willing to feed it. And this fungus must, in turn, be tied to a tree partner. And the tree to some different fungi, that need different plant partners, and so on. The more dependent we are,

the more difficult to break the ties supplying that dependency. Let's see if we can find some examples of that in yonder birch forest.

Stomp, stomp, stomp; pad, pad, pad; flap, flap, flap.

*Curtain.*

### Scene 3: A darker part of a mixed forest.

**VIXEN** (a little later): What is that pretty white plant-like thing, growing all over the place here? It looks like a flower, but has no leaves and no green colouring.



**CROW:** Full marks for both parts! It is indeed a flower, Indian pipe (*Monotropa uniflora*), which begins to bloom after the showy lady's slipper has finished. Indian pipe has no chlorophyll. Since chlorophyll is primarily stored in the leaves, it has no need of leaves. All you can see are rudimentary stubs, called bracts, of what would have been leaves.

**MOOSE:** Since it has no chlorophyll, it can't make its own sugars, so it needs to get them from elsewhere. Is this one fed by a fungus as well?

**CROW:** Good guess, Moose, you're catching on. Yes, a fungus is the mediator, but indirectly it is fed by the birches all around. The fungus has a normal mycorrhizal relationship with birch roots, giving the birch water and minerals in exchange for some of its sugars. Indian pipe makes a relationship with the fungus as well, and drains off sugars for its needs.

**VIXEN:** I bet that its seeds are also unable to support germination on their own.

**CROW:** Exactly. The seeds of Indian pipe are exceedingly small, with no innate nutrition to aid germination. Thus, the seed will only grow where a suitable feeding fungus can be found. And, as we said, this fungus needs a birch association, so Indian pipe is found under birches.

**MOOSE:** What do you mean, when you say the seeds are exceedingly small? How small are they?

**CROW:** They are like dust, each only a few cells borne on the currents by thin wings. Even my good vision needs the help of a microscope to actually see them. Maybe we can look at them in Mr Mann's lab.

**VIXEN:** Indian pipe differs from the orchid or wintergreen in that when the latter become mature plants, they can supply their own needs, whereas Indian pipe must remain dependent on its feeding fungus forever.

**CROW:** Yes, that is the situation. Once orchids mature, they can give sugars to the fungus, which now collects on its earlier investment. The way Indian pipe is made, its ties bind it in a one-way relationship, just take, take, take. No give.

**MOOSE:** What a sweet deal! Free lunch all the way. Must be nice.

**CROW:** Well, it is and it's not. This makes Indian pipe much more dependent on its partners. It has very little leeway. It will not survive transplantation and if someone chops down the birch, the plant dies.

**VIXEN:** You wonder how it ever got into such a relationship, why it developed to be this way. Looks to me like



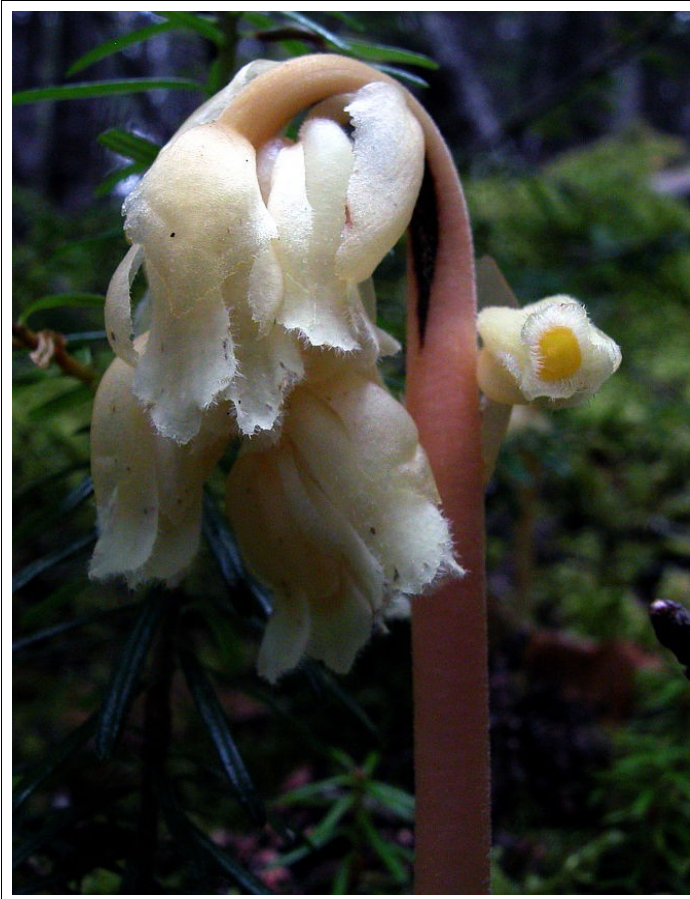
it's painted itself into a corner with very few options left. If anything alters the ecosystem, its days could be numbered.

**CROW:** Indeed. Most organisms that depend on each other evolve together. However, it would indeed seem that in the case of Indian pipe, with no resources of its own for survival, fully dependent on very specific relationships with very specific organisms, organisms that have very specific relationships of their own, any small change anywhere in the system might make it unworkable. Indian pipe is probably at the end of the line of its evolutionary path. This is not a plant that should tinker with the ties that bind it.

**MOOSE:** Oh, look, there is some more in that dark balsam fir tuckamore.

**VIXEN:** No, it looks very similar, but not quite the same. This one is yellowish, has a good smell and has many flowers per stalk.

**CROW:** Yes, that's pinesap (*Hypopitys monotropa*), another closely related flower. It behaves exactly like



Indian pipe, except that the fungus that feeds its seeds forms associations with the roots of balsam fir. Again, the ties that bind it determine where it grows—under balsam fir. And because it has no chlorophyll, it can grow quite happily on the near-dark floor of a tuckamore forest, a place devoid of any green plants.

**VIXEN:** Just as in our life, most of the ties we have discussed are not visible. What is this mysterious fungus that we have been referring to all along?

**CROW:** Well, it's not just one single fungus. Different species are at play in different situations, but as our walk has suggested, each plant seems to pair up with a very specific fungus. For lady's slippers, these come from the genus *Tulasnella*, a thin skin-like mushroom found on moist vegetative matter. Wintergreens are associated with *Cortinarius*, *Hebeloma*, *Russula* and *Tomentella*. Indian pipe is usually associated with *Russula* and pine sap with *Tricholoma*. Some of the recent work on the orchid-fungus association has been done by a Canadian, Randy Currah in Alberta.

**MOOSE:** Wow, that's a lot of information to assimilate! Thank you very much, Crow, for the informative walk. Much food for thought about the ties that bind us. Quite clearly, what we do and how we act are not only limited by our genes, but also by our environment, to such an extent that the lines between the two become blurred. It seems that we are all linked and, to coin a phrase, no moose is an island. Freedom seems to be inversely related to the ties that bind us, but directly related to danger. What we in our rebellious years may perceive as shackles to be cast off, might in some way be the very lifelines that feed us. Funny, though. We spend a lot of energy at rebelling to be different from our parents and view being like them as a negative. Yet, when our kids act and behave like us, we view this as a positive. Guess it's alpine to be inconsistent.

**VIXEN:** Not alpine alone - vulpine too, and perhaps even avian. Guess all us animals are the same. Only man with his great intellect has risen above that and is consistently logical. To be unerringly and logically consistent is human, to coin another phrase. Yes, thank you, Crow, for giving us stuff to ponder.

**CROW:** Caw, caw.

*Curtain.*

*During a stage performance the photographs - all by Maria Voitek except the wintergreen and pinesap (A, Voitek) and the seeds (H. Mann) - should be projected onto a screen behind the actors.*

## Epilogue: In the laboratory of Mr Henry Mann.

**CROW:** Here is a composite photo taken through a microscope by Mr Henry Mann, showing the seeds of all three flowers we have talked about. The showy lady's slipper has the largest seed, 1.25 mm long on the average; wintergreen has the smallest at one-half mm long.



*Final Curtain.*

## A Very Curious Plant.

by Aaron Thomas.

*(In 1794, Aaron Thomas, a "gentleman able seaman" attached to the Royal Navy ship HMS Boston spent some time in St John's. During this time he explored and described the outports and countryside around the city, travelling as far as Portugal Cove, Torbay, and Ferryland. His manuscript journal of this journey passed into the hands of the Murray family in St John's and was published in 1968. It's a good read! Here is a short passage describing a plant that I'm sure all our readers will be able to identify!)*

I am but a sorry Botanist. I was one day ambulating the bank of a Ravine where I met with a very curious Plant. It was bulbous and had a Stalke about fifteen inches high, at the top of which was a Fruit about the size of a Walnutt, which was defended in a most extraordinary manner, for the side to which the Fruit adhered formed a Canopy over it exactly resembling an Indian umbrella No mortal existence, I am confident, could execute a piece of Art so curious and masterly but a principal part of its singularitys are

yet to come, for the Leaves, four or five of which ascend from the Root and which are formed alike the fingers of a human body, is open at the top and perfectly hollow. It grows erect and it is green The Stamens of the plant are very numerous and fine. When I stoop'd down to look at them I found each of the fingers full of water, some contain'd a Gill at least, which appear'd to have been there for a long time. The more I survey'd this Plant the more it struck me with surprize. I was confident that those fingers were tubes given by

Providence to supply its Roots with regular moisture when the heavens had ceased from raining on earth for some weeks, but I was surpriz'd to find it on the border of a Ravine or indeed in Newfoundland, where the air is commonly moist. I was sure it was a native of a dry Soil and a Hott Climate. I broke off one of the Stalkes (which are very slender) and, on minutely looking at it, I saw that its Canopy formed a perfect and complete umbrella - its fibres as fine as the finest Silk.

### Reference.

**Murray, Jean M.** (Ed.) 1968 The Newfoundland Journal of Aaron Thomas 1794. p. 142. Longmans Canada Ltd.



## Medical Notes on Newfoundland Flowering Plants.

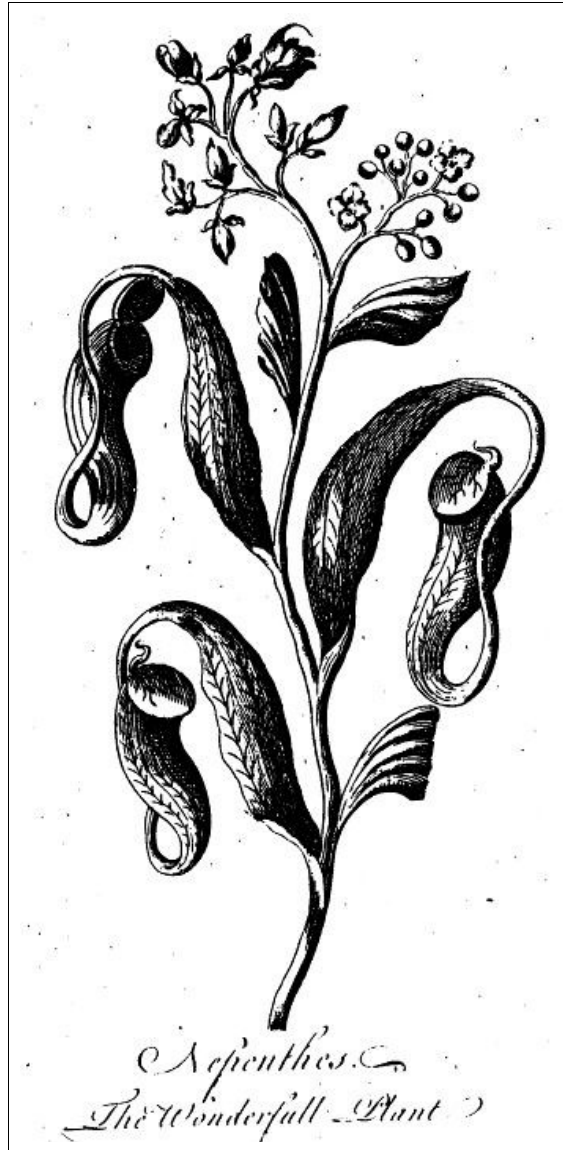
by John Crellin

*Reprinted, with permission, from Sarracenia Winter 1991/2*

### Pitcher plant.

Newfoundland's provincial flower, *Sarracenia purpurea*, the "northern" pitcher plant, attracted limited professional and lay medical interest in the 1800s. In the first half of the century when Newfoundland, traveller, W.E. Cormack, indicated that the root was known to Indians for treating spitting of blood and pulmonary conditions, professional medical interest had already been expressed in a growing reputation for relieving stomach ailments. More intense interest, however emerged - at least for a while - in whether or not the root was of value in treating smallpox. C. Millspaugh, in his influential *American Medicinal Plants* (1892), referred to American Indian use of an infusion of the root for the disease (as had P. Tocque when writing on Newfoundland in 1878). Millspaugh, however, reminded readers that an 1861 meeting of the Medical Society of Nova Scotia had felt that there was no "reliable data upon which to ground any opinion in favour of its value as a remedial agent" against smallpox.

Medical opinions commonly differ over therapy. Standard medical texts of the 1890s still mentioned the plant, although one stated that it is "now but little used in medicine" as a diaphoretic, diuretic and stomachic and for atonic dyspepsia. Employment for venereal disease by



the "Indians of Nova Scotia" was also noted as was usage of an alcoholic rather than aqueous extract of the root. Further, an account of Newfoundland in 1888 promoted the plant, particularly as an excellent remedy against the "gout."

It is unclear whether or not twentieth century references to Micmac and other Indian usage for

treating smallpox, "consumption" (tuberculosis) and blood-spitting, also noted in the recently recorded Newfoundland oral tradition.

The astringency of the pitcher plant root probably contributed to the belief that it could stop bleeding from the lungs or the upper gastrointestinal tract, although there is presently no scientific basis for this action. The frequent association of spitting of blood with tuberculosis possibly explains suggestions that the pitcher plant may be helpful in treating the disease. Astringency also rationalized usage for stomach complaints, and perhaps, too, it was linked to relieving fevers and hence smallpox.

Modern chemical and pharmacological studies might offer alternative explanations for past usages — including the reputation as a diuretic and strong laxative — but the historical record hardly suggests that the pitcher plant is a wonder drug waiting to be discovered.

Any information on twentieth-century Newfoundland usage would be welcome.

*The illustration, which accompanied John's article in the 1991/2 issue, is clearly not of our own Sarracenia, but one of its relatives from Thomas' "Hott climate" - the genus occurs from Southern China to Northern Australia. Ed.*

## Growing wildflowers from seed.

by Ron Payne

*This article appeared in the very first issue of our newsletter, 20 years ago. Thanks, Ron, for permission to reprint.*

Every serious wildflower gardener is faced eventually with the problem of growing plants from seed for it is no longer acceptable to remove specimens from the wild except in very special circumstances and growing from seed becomes the only way to acquire many interesting species. Some wildflowers, particularly the species purchased in commercial wildflower seed mixtures, do germinate as readily as weeds; probably because they are weeds, or "ruderals" to be polite, but many are far less accommodating. The secret to germinating these more difficult species is to look at life from their point of view and then attempt to provide conditions that are as close as possible to what they would experience in the wild. Some understanding of plant physiology and ecology is essential for success.

Unlike vegetables and typical flower border plants, which have been selected by countless generations of garden cultivation to germinate quickly and consistently as soon as moisture and warmth are provided, the seeds of many wild species are programmed to germinate only at a specific season, usually spring. Also, a generation of wild flower seeds may germinate unevenly over a period of several years. This strategy ensures that a whole generation of seedlings is unlikely to be destroyed by a sudden deterioration in the weather. A late frost may kill the majority of young plants but there will always be some seeds that will remain ungerminated until at least the following year. The longevity of many seeds is remarkable, particularly those of

ruderals which can commonly survive in cool, moist soil for tens or even hundreds of years. The record for longevity is held by *Lupinus arcticus*. seeds of which were successfully germinated after 10,000 years' burial in permafrost, but 500 years is probably more typical for ruderals under optimum conditions. Therefore, the wildflower gardener has two basic problems to contend with: inactivating the mechanisms which space seed germination over several seasons and setting their internal biological clocks to spring.

Delayed dormancy is usually due to either a water-impermeable seed coat or a specific requirement for light. Mechanical impermeability is common among members of the pea family. Most seeds in this category are large and can easily be handled. My personal strategy is to hold such seeds individually in a pair of eyebrow tweezers and gently rub the surface with a nail file until sufficient of the seed coat has been braided to expose a small area of the tissue below. It is important not to file close to the embryo lest it be damaged. A tiny scratch on the seed coat is all that is needed. Alternatively, one can put the seed in a glass bottle along with some dry sand and shake the contents vigorously for several minutes. The need for light to trigger germination, which incidentally is the reason why a new crop of weeds always appear soon after we dig our vegetable gardens, is easily satisfied by ensuring that seeds are just covered with compost in the seed pan and by exposing the seed pans to daylight.

Providing conditions to convince

the embryonic plant that spring has indeed sprung is a more complex problem. Most spring-germinators require a definite period of low temperatures under moist conditions before germination can be triggered by subsequent warmth. During this cold, moist period a seed may seem quite inactive but in reality it is busy preparing the embryo for germination by mobilizing energy reserves and also probably breaking down various hormonal germination inhibitors that were incorporated into the seed while it was maturing in the seed pod. At the end of this cold, moist period the seed is fully activated and will respond to rising temperatures and light by germinating. Usually 30 days at 4° C are adequate but a few species require as long as 3 months. I provide these conditions by placing seeds evenly on damp (not wet) tissue paper in a clean screw cap jar in the fridge but it is equally satisfactory to mix the seed with moist (not wet) sand, peat or horticultural vermiculite. Each jar should be carefully labelled with the name of the plant and the date. It is important to keep the seeds cool but not frozen as the biochemical changes that take place during seed maturation cannot happen if the seed is frozen. If you start this process in March the seeds should be ready for sowing in late May in pots of suitable compost outdoors under cover from rain and strong sun. These dates apply to eastern Newfoundland where the weather is unpredictable through April and early May and may be adapted to suit local climatic conditions.

Many species will begin to



germinate in the fridge, in which case they should be sown without delay. Most wildflower seeds do not require warm temperatures for germination, indeed many prefer quite cool conditions (10° C or less) or they will assume it is summer and promptly go into dormancy again. Permitting the seed pans to dry out often has the same effect. This secondary dormancy is difficult to overcome and the seeds may refuse to germinate unless the complete cold treatment is repeated. A few species, such as some lilies, paeonies, and viburnums, take two full seasons to germinate. Following the first cold treatment they need about 12 weeks at 20° C in order to mature the embryo or develop a root depending on the species, and then a second cold treatment before they make any aerial growth. with careful planning one can start these seeds in the fridge in October, expose them to gentle warmth over January to March, and have the second cold treatment complete by early June when they can finally be sown . Seeds of these species with double dormancy are best kept in damp peat. In general, the need for one or more cold treatments is characteristic for seeds of species from temperate latitudes. Species from arctic, alpine or desert climates usually germinate without prior chilling but many of them require a period of cool, dry storage for a month or more after collection before they are capable of germination. It is believed that these seeds may contain volatile germination inhibitors. Finally, most seeds can be stored in a cool, dry place until you are ready to sow them but some primulas, anemones, aquilegias and buttercups must be sown as soon as the seed pods are ripe. Often they will germinate

immediately if sown in the warmth in which case they can be difficult to overwinter but most can be kept safely until spring in the fridge provided they are never permitted to dry out. Even if they do germinate in the fridge, growth is slow so there is no need for panic seed sowing in mid-winter.

Much has been written about seed-sowing composts but in reality plants are far from fussy. For wildflowers, the rules are simple: the compost should have an open texture so it drains well after watering, the degree of acidity should be appropriate, and fertility should not be excessive. Unless I have a very good reason to decide otherwise I use a 1:1:1 mixture of sieved garden loam, horticultural peat, and sand. For heath plants the mixture is about 1:2:1 and for dry-land plants 1:1:2. The sand used on building sites is quite unsuitable as it is too fine to provide adequate drainage properties. A medium grit with particle diameters of 1-2 mm is about right. Heath plants insist on an acid soil but species growing naturally on calcareous soils are less fussy in cultivation so a slightly acid reaction (about pH 5.5) seems to suit almost everything. There has been much debate on the merits of using sterilized loam. Seedlings growing on sterilized .composts are less likely to succumb to fungal infections but if such infections do happen the effects are often severe. With unsterilized composts, fungus infections are more common but less devastating. The reason for this would appear to be that unsterilized soils contain a balance of beneficial and deleterious fungal species but sterile soils permit uncontrolled growth of any fungal spores that happen to arrive. If the first arrival happens to be a

deleterious species the consequences can be devastating for the seedlings, my preference is to use unsterilized composts but I like to spread the ingredients out thinly in the hot sun for some hours to kill any earthworms and insect larvae that may be present. With this approach one is forced to learn to recognise the local weed seedlings so they can be snipped out with pair of fine-point scissors. There is a slight complication in the case of heaths because these species can only grow vigorously if they can form root associations with specific fungi. For these plants I inoculate each seed pan of compost with a tablespoonful of fresh soil in which heaths are already growing. This approach might also be successful with terrestrial orchids which have very demanding requirements for specific fungal associations but I have never tried it.

I use plastic pots which I crock with a 2 cm layer of coarse gravel, fill to within 2 cm of the rim with compost, and then gently firm with my fingers. Very small seeds may be mixed with a spoonful of sand which is then scattered over the surface of the compost and larger seeds are individually spaced as far apart as possible. Where possible, I sow seeds individually in small pots as this prevents transplant shock later. Seeds should only just be covered with compost. The pots are then watered from below, covered with a sheet of glass, and placed in a cool, shady spot (but not in the dark) to germinate. As soon as the first true leaves have appeared the glass covers can be removed for gradually increasing periods each day. One can then slowly accustom the young plants to the sun as appropriate to their final location in the garden.

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(Scientific names without authorities follow: "Annotated Checklist of the Vascular Plants of Newfoundland and Labrador" by Susan J. Meades, Stuart G. Hay, and Luc Brouillet, 2000. <http://www.digitalnaturalhistory.com/meades.htm>) (including synonyms.)