



BSS News

The Newsletter of the
Botanical Society of Scotland

No. 111

September 2018







The Botanical Society of Scotland is a Scottish Charitable Incorporated Organisation (SCIO) (No. SC016283)

Front cover pictures

Outside

Spirodela polyrhiza (Greater Duckweed) and *Lemna minuta* (Least Duckweed) in a pond at Strathpeffer, exceptionally far north for both species. See article on p. 15. Photograph © Chris Jeffree.

Inside

Top row: Plants at Coul Links. See article by Brian Ballinger on p. 10. Photographs © Chris Jeffree:

left to right: *Astragalus danicus* (Purple Milk-vetch); *Helianthemum nummularium* (Common rock-rose); *Juncus balticus* (Baltic rush).

Middle row, left: *Pyrola minor* (Common Wintergreen) at Strathpeffer; **centre:** Small Blue butterfly on its foodplant *Anthyllis vulneraria* (Kidney vetch) at Coul Links. See the articles on p. 10 and p. 11. Photographs © Chris Jeffree.

Middle row, right, top: A hoverfly (*Chrysogaster* sp.) within a *Saxifraga hirculus* flower at Munsary Peatlands, Caithness. Yellow pollen is notable on its thorax. See article by Charles Hawkins on p. 36. Photograph © C. Hawkins

Middle row, right, bottom: A fly (Muscidae sp.) within a *Saxifraga hirculus* flower at Munsary Peatlands, Caithness. See article by Charles Hawkins on p. 36. Photograph © C. Hawkins.

Bottom row: Rusts on their angiosperm hosts. **Left**, *Uromyces geranii* on *Geranium pyrenaicum* (Hedgerow Crane's-bill); **middle**, *Melampsorella symphyti* on *Symphytum* sp.; **right**, *Puccinia punctiformis* on *Cirsium arvense* (Creeping Thistle). See article by Cameron Diekonigin on p. 21. All photographs on bottom row © Cameron Diekonigin.

BOTANICAL SOCIETY OF SCOTLAND

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Website: <http://www.botanical-society-scotland.org.uk>

Founded in 1836 as the Botanical Society of Edinburgh, the Society became the Botanical Society of Scotland in 1991. Meetings are held in Edinburgh, Glasgow, Aberdeen, Dundee, St. Andrews and Inverness. The Society encourages the study of flowering and non-flowering plants. Activities of the Society include lectures, field meetings, symposia, surveys, and an annual joint meeting with the BSBI for the exchange of information on all aspects of Scottish botany. All botanical enthusiasts are welcome to be members of the Society, including gardeners, professional plant scientists, amateur field botanists and students. All members receive information about the events of the Society, including programmes of lectures and field meetings, as well as a twice-yearly newsletter, *BSS News*. Standard membership also includes the scientific journal: *Plant Ecology & Diversity*, published by Taylor & Francis on behalf of the Botanical Society of Scotland. Standard members can also go online and download all the Society's journals, from papers which have just been accepted for publication in *Plant Ecology & Diversity*, all the way back to the first issue of *Transactions of the Botanical Society of Edinburgh* published in 1844 (instructions can be found on our website).

Applications for membership of the Botanical Society of Scotland should be made to the Membership Secretary at the address at the top of this page. Subscriptions can be paid by cash, cheque (payable to the Botanical Society of Scotland), or Banker's Order. Please ask for a Banker's Order form if required. Or you can join online and pay by PayPal via the BSS website at <http://www.botanical-society-scotland.org.uk/content/bss-membership>

Subscriptions fall due on 1st October each year:

Standard rate (with the Journal <i>Plant Ecology & Diversity</i>)	£40.00
Standard rate for undergraduate students (with the journal)	£30.00
Basic rate (without the journal)	£20.00
Basic undergraduate student rate (without the journal)	£5.00

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EDITORIAL

Since our last issue, the Coul Links golf development saga has progressed slowly. Highland Council's Planning Officer recommended refusal, but their Planning Committee recommended acceptance. In this situation, Scottish Ministers must be informed and they have just announced that they will 'call the proposal in' for their consideration. Of course, they may still grant permission for the development. We will keep you informed in future issues. Meanwhile, the BSS, and our friends in other organisations, have not been idle. MSPs and Ministers have been written to, and few of them can now be unaware that conservationists are very strongly opposed to the development. The BSS owes a debt of gratitude particularly to Drs Julia Wilson and Brian Ballinger for their sterling work on our behalf. Please read their articles on pages 10 and 11.

'Sterling' leads us to Stirling, one of several places to which there have been field excursions over the Summer. These are reported on pages 12 to 18. Most of these field trips were organised jointly by us and other botanical/natural history groups. There has been some concentration on built-up areas, inspired by our own Urban Flora Project. We hope that these joint activities will encourage other natural historians to pay more attention to the urban areas of Scotland, which have arguably been under-studied in the past. There is an update on the UFP on page 19.

We hold a joint meeting with the BSBI every November. Previously called the 'Scottish Annual Meeting', it is being renamed as the 'Scottish Botanists' Conference'. It is hoped that it will appeal to all botanists in Scotland and beyond, whether members or not. There will be a mixture of lectures, poster sessions and mini-workshops, and it is a great way to meet fellow botanists, so please sign up.

Our lecture during the Science Festival, arranged jointly with the RBGE, attracted a number of people new to our meetings. Prof. Langdale's lecture on C4 Rice was a revelation as to current progress in molecular genetics, and left us breathless with admiration! As you will see from our new lecture programme, Professor Bill Davies of Lancaster University will present our lecture at next year's Science Festival on 'Sourcing healthy food as climate and politics change'.

Our AGM was held in May 2018 and our elected Council members for 2018-19 are listed on p. 51. We have some vacancies, please contact

us if you are interested in helping to run the BSS. Our draft accounts for 2017-18 are presented on page 52.

We were sad to learn of the recent death of Prof. Charles Henry Gimingham, an outstanding ecologist and former President of the Botanical Society of Edinburgh. His obituary is on p.7.

Roger West and Jill Thompson

MEMBERSHIP MATTERS

Subscriptions and Gift Aid

Thank you for your continued support of the BSS. Payment of annual membership subscriptions is due on 1st October for all members except those who have joined us since 1st April 2018, whose membership will run until October 2019.

If you already pay by Banker's Order, membership should renew automatically (but please check that you are paying at the correct rate). If you pay by PayPal, please renew your membership online at <http://www.botanical-society-scotland.org.uk/content/bss-membership>. If you prefer to pay by cheque, please make the cheque payable to the Botanical Society of Scotland. Banker's Order and cheque payment forms are enclosed with this News.

Membership rates remain unchanged, please see p. 2 for details.

If you pay UK tax, it helps the BSS if you 'Gift Aid' your subscription. This enables us to reclaim 25p tax for each £1 of your subscription. If you have completed a gift aid form in the past, you do not need to do so again, but if you have never done so, please complete the one enclosed with this News, and send it to the Treasurer.

Some subscriptions are paid from Bank Accounts which do not match the names of any of our members. We have to play detective to work out who they are. If this applies to you, please inform the Treasurer.

Finally, if you decide not to renew your membership, please tell us – it helps us to keep our records straight. However, if we do not receive your subscription by Feb 1st 2019, your membership will lapse.

GDPR and Your Contact Details

Please check that your postal and email addresses are up to date. An email address allows us to communicate quickly with you (e.g. to tell you about the next lecture, a cancelled event or an additional field meeting, or in connection with AGM elections). We share your postal address securely with our printers, in order to send our BSS News and Plant Ecology & Diversity, but apart from that we NEVER pass your details on to others.

In order to be compliant with new data protection regulations (GDPR), we emailed our members asking them to confirm that they wish to continue receiving monthly emails from us about upcoming events. We try not to overload your in-boxes and restrict these emails to one per month unless there are special circumstances. If you are no longer receiving our monthly emails and wish to resume receiving them, please either click the link in the original email (which was sent on May 14th) or send a message to the membership secretary. While emails about monthly events require your consent, we will continue to email all our members about issues relating to the management of the BSS, such as the AGM and membership renewals. We have updated our Privacy Policy which can be found at <http://www.botanical-society-scotland.org.uk/content/privacy-policy>. If you wish to receive a printed copy of it please contact us.

You can edit your contact details online, by logging into our website, otherwise please contact the membership secretary who can make the changes for you.

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CHARLES HENRY GIMINGHAM, OBE FRSE FRSB

Professor Charles Gimingham has died, aged 95. He was one of Britain's leading ecologists, undoubtedly the foremost expert on heather and moorlands. He died at Milltimber, near Aberdeen, on 19th June 2018. He is survived by his wife Caroline, daughters Alison, Anne and Clare, and his grandchildren.



His father, Conrad Theodore Gimingham was an entomologist and Director of Plant Pathology at the Ministry of Agriculture's laboratory in Harpenden. Charles was educated at Gresham's School, and then Emmanuel College Cambridge. He gained a First in Natural Science in 1944. His first appointment was as a research assistant at Imperial College from whence he moved north to Aberdeen University. He was fascinated by the wild and heather-clad landscape of north-east Scotland, and began asking questions about the growth of heather and the way the vegetation was being managed as grouse-moor. Many of the old gamekeepers had been lost in the war, and 'muir-burn' was then a haphazard process. He made careful observations and devised clever experiments to devise 'best practice'. He was promoted to a Personal Chair in 1969 and soon became a widely respected authority on heather. He became Regius Professor of Botany in 1981, an important and influential post that dates back to the reign of James IV in 1497. His academic career was highly successful. He was elected a Fellow of the Royal Society of Edinburgh (1961), the Royal Society of Biology (1967), received the Order of the British Empire (1990), served as President of both the Botanical Society of Edinburgh (1982-1984) and the British Ecological Society (1986), and he inspired a generation of students to

study ecology. Many became professional ecologists and now occupy influential positions here and throughout the world.

He remained active after retiral, becoming Patron of the Institute of Ecology and Environmental Management (from 2000) and President of the Heather Trust (2004). He was made an Honorary Member of both the Botanical Society of Scotland and the British Ecological Society, the highest honour of these two societies.

His published work includes *The Ecology of Heathlands*, 1972; *An Introduction to Heathland Ecology*, 1975; and *The Lowland Heathland Management Handbook*, 1992, as well as numerous papers in scientific journals and numerous articles in books and conference proceedings. His committee work was equally important. He served as a member of many government and agency committees including the Countryside Commission for Scotland, SNH, and the James Hutton Institute. Through chairing expert groups from 1955 onwards, he developed science-based guidance on heather moors which became enshrined in legislation governing heather burning, now known in Scotland as *The Muirburn Code*.

Although best known for his work on heather, and especially the effect of fire on its regeneration, his research covers ecological topics relevant to landscape and conservation in Britain and beyond: grasslands, woodlands, pastures, dunes and bryophytes. He visited and worked in diverse geographic areas including Antarctica.

The broadcaster Magnus Magnusson, founder Chairman of Scottish Natural Heritage (SNH), hailed Charles as ‘a living legend’ in his foreword to *Heaths and Moorland: Cultural Landscapes*, published in 1995 in honour of Charles’ work. Charles wrote in that book: “During the progress of nearly 50 years of heathland ecology there has been one very major change in perception. At the beginning of this period it seemed that there was little threat to heaths and moors because they were widespread in Britain, but it is now realized they are fast disappearing throughout the west European heath region, including south England.”

When I began my own PhD on modelling the physiology and growth of heather in 1967 at the University of Sheffield, I wrote to him for advice. He replied warmly, with words of encouragement. Although by no means a physiologist, he could see the merit in what I was attempting. Without that encouragement, I might not have continued. Later, when I was a new and very young lecturer in Edinburgh, he invited me to his periodic

meetings of Scottish ecologists. In that way, I was introduced to, and inspired by, the leading ecologists of the day. Thus, my career was launched. Still later, I worked with him on committees of the British Ecological Society, and came to appreciate him as a friend.

He was a quiet and gentle man, always prepared to listen and lend a guiding hand. For that reason, he was always in demand on committees and as an External Examiner, particularly for degree courses where management of natural resources was considered to go hand-in-hand with basic science. His nature is summed up beautifully by these words from the obituary in the Guardian newspaper: *erudite, dignified, and the embodiment of academic humility*. Elsewhere, an obituary for the Botanical Society of the British Isles describes him thus: *...he was a neat, slender, and dignified figure with spectacles, short brown hair and a matching beard, and a thoughtful, precise, slightly hesitant way of speaking. He was modest, rather shy, and, for an ecologist, surprisingly practical-minded. You sensed that he was, in every way, a **good** man.*

Moving words written by his children are recorded in the Obituary from the Aberdeen newspaper *The Press and Journal*: “We consider ourselves very fortunate that while growing up we were lucky to see a lot of our father. He was always there at mealtimes, he helped with homework, was a willing model for our first aid practices, took us swimming in the university pool every Saturday, helped us develop our own little patches of garden, and of course we all accompanied him a number of times on student field trips. We learnt from being with him, whether at home, on holiday or in church”. He was evidently a good father as well as an eminent scientist.

John Grace

(With help from Des Thompson and Sarah Woodin)

COUL LINKS IN SUMMER

Coul Links in Sutherland is an area of coastal dunes with extensive dune slacks which are flooded in winter. As previously highlighted, in the March 2018 edition of the News, when I wrote about a winter visit, the Links are protected by several environmental designations. Here I describe a very contrasting account of the Links in summer.

A small group of us visited the Links on June 22nd this year. The formerly flooded dune slacks were now mostly dry and covered by a mass of colourful flowers. Our walk took us along the coast and the dunes backing the sea, returning along the disused railway line. At the northern end, long tongues of saltmarsh enter behind the line of dunes. Here were typical salt-loving plants such as *Glaux maritima* (Sea-milkwort), *Armeria maritima* (Thrift) and *Carex extensa* (Long-bracted Sedge).

From the saltmarsh we walked among the complex interlinked areas of dune slacks divided by raised areas of vegetation and surrounded by high dunes. *Filipendula ulmaria* (Meadowsweet) was abundant here and the roses were beginning to come into bloom. *Helianthemum nummularium* (Rockrose) was very common, creating a vast yellow floral sheet. An occasional Juniper grew on hummocks and there were areas of willow and birch scrub. In the dune slacks a very interesting find was *Juncus balticus* (Baltic Rush), nationally scarce and only recently recorded here.

When we settled down for lunch on the high fore-dunes we were visited by several Small Blue butterflies near their foodplant *Anthyllis vulneraria* (Kidney vetch). *Astragalus danicus* (Purple Milk-vetch) was in full bloom and abundant. We had wonderful views over the almost-deserted long sandy beach.

In places there is obvious dune erosion on the steep slopes facing the sea, and at the southern end of the dunes the sea is penetrating up a burn to behind the dune line.

While walking within the dune system it is difficult to envisage the layout of the proposed golf course, which will zig-zag across much of the site. White posts mark the locations of the proposed golf greens and highlight how intrusive this development will be.

This is a very fine and important site and it is very sad to know that it is under such threat.

Brian Ballinger

COUL LINKS DEVELOPMENT UPDATE

Regular readers of the BSS News will remember that our March 2018 edition contained an article about a planning application to Highland Council (application no. 17/04601/FUL) to construct a golf course at Coul Links, near Embo, Sutherland, which is protected by national (Site of Special Scientific Interest), European (Special Protection Area) and International (Ramsar) environmental designations.

Along with many other organisations, the BSS submitted an objection to the planning application (probably for the first time in the society's history). After the closing date for receipt of comments on the application, the proposers submitted further documents, which led to a new deadline being set. We examined the new documents and submitted a further objection. At the meeting of the Planning Committee in June, Highland Council's Area Planning Manager recommended refusal primarily on the basis of the objections by Scottish Natural Heritage (a statutory body) and damage to wildlife, but the Planning Committee recommended acceptance. In this situation, Scottish Ministers must be informed, and they are expected to call in the proposal for a final decision.

Ramsar sites, like Natura 2000 sites, require a particular process of 'appropriate assessment' to be gone through, which does not seem to have been followed. This process is based on environmental objectives and completely excludes consideration of economic issues.

The BSS sent to a letter to the Scottish Minister for Local Government, Housing and Planning, requesting that the proposal be called in. We have heard today (24th August) that the proposal will be 'called in' for the reasons given below

'Having considered the proposal, the Scottish Ministers have decided, in terms of Section 46 of the Town and Country Planning (Scotland) Act 1997, to require the application to be referred to them for determination. The Scottish Ministers have given this Direction as the proposal raises issues of national importance in relation to natural heritage issues and its compliance with SPP (Scottish Planning Policy) which require further scrutiny at a national level.'

This is very welcome news, and a step in the right direction, but there is still a long way to go.

Julia Wilson

FIELD EXCURSIONS, MAY to JULY 2018

1: MENSTRIE

BSS, BSBI and PSNS, 15th May 2018

This was an exploration of the urban flora of the small town of Menstrie in Clackmannanshire for the Botanical Society of Scotland's urban flora project, for the Botanical Society of Britain and Ireland's Atlas 2020, and for the records of the Perthshire Natural History Society.

Nine of us came from different directions to gather at the Dumyat Centre car park in the bright sunshine. We set off on what turned out to be a fairly short walk which took us through two monads (1km squares). In the car park we were shadowed by a man spreading weedkiller on the wild flowers, so we hastened across the road to the small park to the north of the main road. Apart from a mass of Daisy flowers (*Bellis perennis*) we were pleased to find 3 species of *Veronica* (Speedwell) in the lawn (*V. arvensis*, *serpyllifolia* and *filiformis*) and two more were to follow later in the morning (*Veronica chamaedrys* and *hederifolia*).

The bank of the stream that runs through the town was very flowery including *Allium ursinum* (Ramsons), *Chrysosplenium oppositifolium* (Opposite-leaved Golden Saxifrage) and *Luzula sylvatica* (Great Wood-rush). We were escorted by a dipper for part of the way.

Beyond the park the town walk runs along a woodland edge and here we saw *Hyacinthoides non-scripta* (Bluebells), *Silene dioica* (Red Campion) and *Arum maculatum* (Lords and Ladies). There were also some neophytes such as *Polygonatum × hybridum* (Garden Solomon's-seal).

We enjoyed our lunch on the line of seat provided in the park and proceeded to the streamside path to the south of Menstrie. Along here we saw patches of *Stellaria holostea* (Greater Stitchwort), *Circaea × intermedia* (Upland or Intermediate Enchanter's Nightshade) and *Moehringia trinerva* (Three-nerved Sandwort). Some keen-eyed members of the party noted *Cardamine amara* (Large Bittercress) on the opposite bank.

At 3pm gentle rain began to fall and a teashop proved inviting. We had recorded 79 species in the first monad and 68 in the second, so we had a successful and enjoyable day.

Liz Lavery and Brian Ballinger

2: NINEWELLS HOSPITAL, DUNDEE

**Dundee Naturalists Society, Botanical Society of Scotland and
Friends of the Community Garden. 22nd May 2018**

Ninewells Hospital is remarkable in having a large arboretum in its grounds providing a pleasant network of paths, much appreciated by the local community. There is also a community garden which lies alongside the arboretum and is maintained by a team of volunteers. Dundee Naturalists and the Botanical Society of Scotland (BSS) were invited by the Friends to visit and review the wildlife to be found there. We were recording plants for the BSS urban flora project (which will also feed into the botanical atlas 2020) and also noting birds, invertebrates and other wildlife. The arboretum stretches across two tetrads (2 x 2km squares), so two lists were made. The dividing line runs up the main path of the community garden. In the eastern square 43 different plant species were noted and in the western 37. The plants were a mixture of natives and aliens, but planted specimens were excluded. Pignut (*Conopodium majus*) was widespread as was Meadow Foxtail (*Alopecurus pratensis*). Five species of Speedwell (*Veronica*) were spotted (*V. chamaedrys*, *filiformis*, *officinalis*, *serpyllifolia* and *hederifolia*) and a sixth had been seen a couple of days earlier (*V. persica*). An unexpected find was Common Fiddleneck (*Amsinckia micrantha*) in the path by the garden. Birdlife was plentiful and 19 species noted included Great Spotted Woodpecker, Goldfinch and Swift. A Tawny Owl was heard. A common Carpet moth was recorded and an egg of Orange Tip butterfly was detected on its food plant (Cuckoo flower or *Cardamine pratensis*). Rabbits were seen in several places and a vole scuttled away under a plant pot in the garden. There were some interesting looking fungi which mainly remained unidentified.

This was an enjoyable evening which yielded some useful records.

Brian Ballinger

3: STIRLING CASTLE MOUND

BSS and Scottish Wildlife Trust Stirling group, 26th May 2018

This was a joint field meeting devoted to the Botanical Society of Scotland's urban flora project and the local Scottish Wildlife Trust members centre survey. The Stirling group led by Roy Sexton have been studying the history and trends of the plant populations on the castle rock for 10 years.

A group of nine assembled in bright sunshine at the Gowan Hill entrance to the site and set off in two groups to explore the network of paths surrounding the castle. We met up again for lunch sitting on a wall by the church and adjourned to the cafe there for a cup of coffee or tea.

The hill is well wooded in many places and typical woodland plants were there including *Mercurialis perennis* (Dog's mercury), *Oxalis acetosella* (Wood Sorrel) and *Circaea lutetiana* (Enchanter's Nightshade). The bluebells were mainly of the escaped hybrid variety, but some appeared to be very close to the native *Hyacinthoides non-scripta*.

On the cliff walls under the castle there was a good show of *Erysimum cheiri* (Wallflower). On walls further down a variety of ferns was seen including *Asplenium trichomanes* (Maidenhair Spleenwort), *Asplenium ruta-muraria* (Wall-rue) and *Phyllitis scolopendrium* (Hart's-tongue). Also here was *Erinus alpinus* (Fairy Foxglove). An interesting find along the paths was *Conium maculatum* (Hemlock), in several places. In the meadow area Comfrees were present (*Symphytum tuberosum*, × *uplandicum* and *officinale*). Orange tip butterflies fluttered around us. Neophyte aliens on the site included *Polygonatum* × *hybridum* (Garden Solomon's-seal) and *Ornithogalum angustifolium* (Star of Bethlehem).

We recorded 171 species in the four monads (1km squares). Repeated visits to this area would no doubt increase the lists and the SWT group will continue to study this location.

We were blessed with a beautiful day for a rewarding visit.

Brian Ballinger

4: STRATHPEFFER

BSS and BSBI, 23rd June 2018

This meeting was held to update the records for 3 tetrads for the BSBI and also to contribute to the Botanical Society of Scotland's urban flora project.

Our party consisted of members of both societies and also some members of the Inverness Botany Group. We gathered at the Blackmuir Wood Forestry Commission car park which is poorly signed but well situated.

We started by looking at a vegetated lochan virtually adjacent to the car park, which was remarkably dry following the recent weather. There were plenty of wetland plants including *Hydrocotyle vulgaris* (Marsh Pennywort), *Potentilla palustris* (Marsh Cinquefoil), *Carex rostrata* (Bottle Sedge) and *Pedicularis palustris* (Marsh Lousewort). Nearby were the sedges *Carex binervis*, *C. canescens* (= *C. curta*) and *C. pilulifera*.

We then moved on to some wet broadleaved woodland on the edge of the forestry plantation in search of *Corallorrhiza trifida* (Coralroot Orchid), previously recorded here.

An intensive hunt only discovered 4 spikes, perhaps related to the dry season and increased cover by other vegetation. Also here were flowering examples of *Pyrola minor* (Common Wintergreen), which is present in many places in this wood. However, there was no sign of the long-lost *Moneses uniflora* (One-flowered Wintergreen) which used to grow in here before forestry development 40 years ago.

Along the path at the edge of the woodland above Strathpeffer we found a table for a lunch stop, with views of the hills and a dried-up pond featuring *Veronica scutellata* (Marsh Speedwell).

We split into two groups for the afternoon, one group taking the steep descent into the urban area proper where we found a mixture of natives and neophytes. An unexpected find was a *Euonymus* species (Spindle tree or ally). *Tellima grandiflora* (Fringecups) is a common garden escape in Strathpeffer, although unusual elsewhere in the area. Other neophytes included *Aruncus dioicus* (Goatsbeard Spiraea) and *Lilium pyrenaicum* (Pyrenean Lily).

The other group concentrated on other parts of urban Strathpeffer, including the old station and railway line. They added a good number of records to the day's totals, including a range from the tall, such as

Chamaecyparis lawsoniana (Lawson's Cypress), *Betula papyrifera* agg. (Paper-bark Birch); through medium height, including bindweeds *Calystegia sepium* (Hedge Bindweed) and *C. silvatica* (Large Bindweed), *Rumex longifolius* (Northern Dock), *Sinapis arvensis* (Charlock); to small *Montia fontana* (Blinks).

The pavilion has a small semi-wild park and in we were surprised to see in its pond *Spirodela polyrhiza* (Greater Duckweed), well away from its usual southern distribution and probably introduced, and also *Lemna minuta* (Least Duckweed) which has not previously been recorded this far north in Scotland.

A footpath by the school led us to a damp area, surrounded by houses, which supported a very large and beautiful display of *Dacylorhiza purpurella* (Northern Marsh-orchid).

We then managed to find time for a cup of coffee sitting outside the village cafe.

In all we recorded 101, 72 and 101 vascular plant species respectively in the three tetrads we passed through. Bruce Ing also recorded 49 species of fungi in the urban area, including mildews, leaf spots rusts and smuts (see next article).

Brian Ballinger and Mary Dean

5: FUNGI RECORDED IN STRATHPEFFER SURVEY

23rd June 2018

Species and Species group	Plants on which fungal species were found, and other notes
Myxomycetes – slime moulds	
<i>Fuligo septic</i>	on buried wood
<i>Lycogala terrestre</i>	on stump
Peronosporomycetes – downy mildews	
<i>Albugo candida</i>	white rust, on <i>Alliaria</i>
<i>Peronospora neesleana</i>	<i>Alliaria</i>
<i>Peronospora ranunculi</i>	<i>Ranunculus repens</i>
Ascomycetes – leaf spot fungi	
<i>Ascochyta amelanchieris</i>	<i>Amelanchier</i> new to Ross
<i>Ascochyta metulisporea</i>	<i>Fraxinus</i> - new to VC106

<i>Ascochyta trifolii</i>	<i>Trifolium pratense</i>
<i>Mycosphaerella hedericola</i>	<i>Hedera helix</i>
<i>Mycosphaerella podagrariae</i>	<i>Aegopodium</i>
<i>Phoma tussilaginis</i>	<i>Tussilago</i>
<i>Phyllosticta mahoniae</i>	<i>Mahonia</i>
<i>Ramularia didyma</i>	<i>Ranunculus repens</i>
<i>Ramularia heraclei</i>	<i>Heracleum</i> - new to VC106
<i>Ramularia montana</i>	<i>Chamerion</i>
<i>Ramularia pratensis</i>	<i>Rumex acetosa</i>
<i>Ramularia primulae</i>	<i>Primula</i> - new to VC106
<i>Ramularia rubella</i>	<i>Rumex obtusifolius</i>
<i>Ramularia taraxaci</i>	<i>Taraxacum</i>
<i>Ramularia variabilis</i>	<i>Digitalis</i>
<i>Septoria epilobii</i>	<i>Epilobium montanum</i>
<i>Septoria rhinanthi</i>	<i>Rhinanthus minor</i> . New to Ross; rare
<i>Septoria urticae</i>	<i>Urtica dioica</i>
<i>Sphaerulina rubi</i>	<i>Rubus</i> (fruticosus agg.)
<i>Venturia rumicis</i>	<i>Rumex obtusifolius</i>

Ascomycetes – powdery mildews

<i>Blumeria graminis</i>	on grasses
<i>Erysiphe aquilegiae</i> var. <i>ranunculi</i>	<i>Ranunculus repens</i>
<i>Erysiphe azaleae</i>	<i>Rhododendron</i>
<i>Erysiphe cruciferarum</i>	<i>Alliaria</i>
<i>Erysiphe euonymi</i>	<i>Euonymus</i> new to VC106, second Scottish record!
<i>Erysiphe heraclei</i>	<i>Heracleum</i>
<i>Erysiphe lonicerae</i>	<i>Lonicera</i>
<i>Erysiphe trifoliorum</i>	<i>Trifolium pratense</i>
<i>Golovinomyces cynoglossi</i>	<i>Symphytum</i>
<i>Golovinomyces sordidus</i>	<i>Plantago major</i>
<i>Podosphaera amelanchieris</i>	<i>Amelanchier</i>
<i>Podosphaera erigerontis-canadensis</i>	<i>Taraxacum</i>
<i>Podosphaera filipendulae</i>	<i>Filipendula ulmaria</i>
<i>Sawadaea bicornis</i>	<i>Acer pseudoplatanus</i>

Ascomycetes – others

<i>Botrytis cinerea</i>	<i>Bergenia</i>
<i>Protomyces macrospores</i>	<i>Aegopodium</i>
<i>Rhytisma acerinum</i>	<i>Acer pseudoplatanus</i>

Basidiomycetes – rusts

Puccinia chaerophylli

Anthriscus and *Myrrhis*

Puccinia lagenophorae

Senecio vulgaris

Puccinia maculosa

Mycelisrare

Puccinia urticata

Urtica dioica

Uromyces dactylidis

Ranunculus repens

Basidiomycetes – smuts

Entyloma microsporum

Ranunculus repens

Basidiomycetes – brackets

Bjerkandera adusta

on fallen *Fagus* trunk

Bruce Ing

6: LOCH GLASCARNOCH

BSS and Inverness Botany Group, 5th July 2018

This joint field meeting at the east end of Loch Glascarnoch aimed to increase the number of records in two tetrads (2km squares) and also seek some “lost” species not recorded for some time.

A group of 10 met at the car park by the dam, much frequented by tourists on the way to Ullapool. The base-rich material used in the construction of the dam and its access tracks has had a considerable influence on the local flora.

We started by heading down the slope beside the dam and the area was a mass of colour produced by, among others, *Lotus corniculatus* (Bird’s-foot trefoil), *Thymus polytrichus* (Thyme) and *Erica tetralix* (Cross-leaved Heath). By the car park *Gentianella campestris* (Field Gentian) was just coming into flower and *Botrychium lunaria* (Moonwort) was frequent.

Down the slope *Dactylorhiza maculata* (Heath Spotted-orchid) was plentiful and *Platanthera bifolia* (Lesser butterfly-orchid), although present, was less frequent than in the past at this site. *Dactylorhiza purpurella* (Northern marsh-orchid), so often seen further east, was a new record for this 10km square (hectad). *Diphasiastrum alpinum* (Alpine Clubmoss) was an unexpected find at this relatively low altitude.

A scramble over the rocky area below the dam was undertaken by some of the party where *Drosera anglica* (Great Sundew) was seen. *Nitella flexilis* (smooth stonewort, Charales), new for this square, was also found.

A lunch on a convenient rocky ledge by the dam in the warm sunshine was followed by a walk along the track above the loch. Once more there was a floral display along the trackside, whereas the surrounding area supported a more acid-loving flora, although a mass of *Eriophorum angustifolium* (Common Cottongrass) provided a spectacle.

Gymnadenia conopsea ssp. *borealis* (Fragrant Orchid) was particularly abundant on the trackside and we were slightly surprised to see *Asplenium trichomanes* (Maidenhair Spleenwort) and *Asplenium adiantum-nigrum* (Black Spleenwort) in the trackside rubble.

In all we recorded 120 species of vascular plants in the first tetrad and 80 in the second, including some new hectad records and refinds.

Bruce Ing identified 26 species of fungi, 3 new to Ross-shire and 17 new to this hectad.

We followed a good day with tea and cakes, sitting outside a local stall, where a water shortage caused by the dry weather was causing problems. We did not have time to go to the other end of the Loch and this must wait for another occasion.

Brian Ballinger

URBAN FLORA PROJECT

Midsummer Update

The Urban Flora project is progressing well and the 2018 field programme is running according to plan. May and June have been very busy months, with field meetings in the major urban locations Stirling and Glasgow as well as some smaller towns such as Melrose, Carnoustie and North Berwick. Many of us have also been doing our own botanical explorations. I have data from Girvan and Stranraer, and several streets near where I live in Edinburgh. Some of these Edinburgh streets have not been treated with herbicide this year, at least so far. In Comiston Drive alone, I found 47 species, some of them unexpected, like *Briza maxima*, *Claytonia perfoliata* and *Oxalis corniculata*. I think they have escaped from gardens but here they are growing and flowering in the cracks and dust of roadsides, parked cars and pavements. Personally, I like looking in cemeteries, but most are too well-tended to harbour many species. There is a good one in Dalry, and of course Warriston. If you know any good ones, anywhere in Scotland, please let us know.

Cemeteries are one of several urban environments that we need to explore thoroughly. Another is the environment of embankments, especially trunk roads. Edinburgh is bounded by a ring-road, the A720, which is currently looking extremely floriferous. Partly this is due to planting, I'm sure. There are also embankments on railway lines, and in Edinburgh the tram line offers novel opportunities.

Some people like to work in groups whereas others prefer lone recording. The latter can be very productive as one can fit the effort into the odd hour or so in the evening – very little planning is involved. Yes, we get strange looks from passers-by as we stare intently at walls and cracks in pavements. A hand lens around the neck attracts curiosity and a notebook may elicit suspicion. Bird watchers are so often seen that their binoculars do not provoke a similar reaction from the public. Sensitive people may feel self-conscious as lone botanists. In groups, this doesn't occur. There is strength in numbers. And in groups we have more eyes to find more species.

A feature of our recording has been co-operation with other groups, including Natural History Societies and of course the Botanical Society of Britain and Ireland, BSBI. Links with Natural History groups have enabled Brian Ballinger to lead highly successful visits to Carnoustie, Strathpeffer, Menstrie, Ninewells Hospital grounds and Stirling (and more to come). Reports of most of these visits are available on our web site and some are printed in this issue of the News.

Have we found anything rare this summer? It's early to say, and some specimens are still being examined. The unusual ones for me have been Wall Whitlowgrass *Draba muralis* (found by David Chamberlain in Melrose – a very small white-flowered crucifer found on limestone and associated with lime mortar), Pirri-pirri-bur *Acaena novae-zelandiae* (found by Maria Chamberlain, also in Melrose, evidently a garden escape but one which may become invasive according to some authorities), Betony *Stachys officinalis* in Morningside and Portland Spurge *Euphorbia portlandica* found by the shore in Girvan. The last two of these are southern species which may be creeping north as a result of warming.

We still need more people to be involved as recorders. It's never too late to join in. Keep an eye on the web site for news of visits, or do some lone recording.

John Grace

RUST FUNGI. A BEGINNER'S WORKSHOP

Led by Cameron Diekonigin

During June, I ran a beginner's workshop on rust fungi at Bridgend Farmhouse. It was the second of 3 workshops and this one was attended by several members of the Botanical Society of Scotland. The aim of the workshop was to provide the attendees with the skills to record those rust fungi that could be identified without any specialist equipment (e.g. no requirement for microscopes). This would cover about 70% of the species found in the UK.

Rust fungi belong to the Basidiomycota, and are related to the more familiar gilled fungi. Rust fungi are obligate parasites, growing within plants and becoming noticeable when the spores break through the plant epidermis. Although some rust fungi can have complicated life cycles and many species having several stages, their host specificity lends to easy identification. The name of these fungi comes from the most familiar stage, uredinia, which produces the distinctive rust coloured 'spots' usually on the underside of leaves.

Many rust fungi species are common and a visit to most gardens or a local park can usually lead to the collection of at least one species. Yet rust fungi remain relatively unrecorded, even by those with good knowledge of fungi, due to lack of experience or knowledge. Once a basic understanding of rust fungi is achieved, identification becomes straightforward for the majority of rust fungi, the main requirement being the ability to identify the host plant. More importantly, there are some rust fungi that are associated only with some of our rarer plants, therefore, making the rust themselves as rare or even rarer, making records important.

The workshop was specifically aimed at those who had no knowledge of rust fungi and the venue was chosen due to its close proximity to Craigmillar Park, with its variety of plants but also the location of known rust fungi species suitable for the workshop.

The main focus for learning was the book *The Rust Fungi of the British Isles*; a 30-page publication that lists which rust fungi can be found with a particular plant species. Another key element of the workshop was the 5-stage rust lifecycle; a small number of plant species can have more than one rust fungus and these species can be separated out once the rust fungi lifecycle is understood.

Each workshop was limited to 10 attendees with everyone working in small groups to support each other. As well as getting to grips with the book and the lifecycle, there were several practicals and a walk into Craigmillar Park to give everyone the opportunity to collect and identify rust fungi for themselves. By the end of the day, each attendee was able to identify at least 20 rust fungi.

A highlight of the workshop was the finding of 5 rust fungi species within 10 minutes of leaving the 'classroom'. Particularly impressive was the heavy infection of *Melampsorella symphyti* on *Symphytum*, with the uredinia producing a vivid orange underside to the infected leaves. In close proximity were extensive patches of *Uromyces geranii* on *Geranium pyrenaicum* and also the fragrant *Puccinia punctiformis* on *Cirsium arvense*.

Cameron Diekonigin

REFERENCE:

Henderson, D.M. (2004). *The Rust Fungi of the British Isles. A Guide to their Identification by Host Plants*. British Mycological Society

Bridgend Farmhouse. Visit the website www.bridgendfarmhouse.org.uk

REVIEWS OF PLANT WORKSHOPS

Grasses Workshop Holyrood Park, Edinburgh

Led by Dr Faith Anstey 2nd June 2018

Faith Anstey's workshop was a triumph. With the help of her excellent little book "*Start To Identify Grasses*", Faith introduced simple steps to identify 20 common grasses without the use of keys, microscopes or PowerPoint. She is an excellent teacher and the few necessary botanical terms were clearly illustrated in beautifully drawn handouts. The tutors (Jay Mackinnon, Barbara Sumner and David Chamberlain) each brought with them small quantities of the 20 species, and then looked after a group of 4 or 5 students to explain what the terms in the handouts look like in fresh material. Then a flowchart was used (not a key) to match names to specimens and specimens to names. After a packed lunch we all went out to the grasslands of Holyrood Park to hone our skills and tie in each species with its ecology.

Many of the 14 attendees were engaged professionally in some kind of survey or recording work, paid or unpaid, or on related student courses. All left the day's workshop happy to be able to identify the 20 grass

species which are most likely to be encountered in common habitats, and even to spot those which were *different* from one of the top 20.

We extend warm thanks to Faith and the staff of the Holyrood Education Centre.

Maria Chamberlain

**Plant ID Evening Crash Course for Beginners
Ashworth Building, King's Buildings, Edinburgh
Led by Dr Richard Milne 30th May 2018**

Richard's Introductions to plant ID are legendary, and this one was no exception. About 60 fresh flowering plant species were exhibited on lab benches, and the 17 attendees were given the challenge to identify as many of them as was possible in the time available. Richard started the session by explaining his genius short-cut method. Plant identification can be a daunting task for a beginner, but with Richard's method you can cut out the tortuous procedures demanded by commonly used Floras, such as *The Wild Flower Key* by Francis Rose, or Streeter's *Collins Wild Flower Guide*. Both of these books were in fact used, but first a scheme laid out on a laminated sheet is consulted. This asks a few simple questions about each plant, leading to a list of most likely plant families. Then you simply look at pictures each family contains (page numbers are provided), and try to match one up. This may not sound very scientific, but the more you do this, the more familiar with each family you become, until you start being able to recognize them immediately. Keys were in fact used to discriminate between some critical species, but only once the genus was identified using a picture book.

"This laminated sheet is pure genius", said one of the attendees. Indeed, instead of naming maybe three plants in two hours, most people successfully identified about 25. The process was quick, painless and effective. What is more, by the end of the evening people were able to spot a specimen of the Brassicaceae, Caryophyllaceae, Asteraceae, Fabaceae or Lamiaceae right across the room. As Richard says, once you can identify 10 families, you are half-way to being able to tackle the British flora, as about half of our plants belong to just 10 common families.

We thank Richard and the staff of Ashworth, particularly the irreplaceable Mike Dye.

Maria Chamberlain

TWO POEMS

In March and April, we were treated to two talks, by Prof. Susan Gurr and Prof. Jane Langdale. Both talks were about the contribution plant science can make to global food security, Prof. Gurr describing her team's battle against plant pathogens, and Prof. Langdale her team's project to improve the photosynthetic efficiency in rice. The scope, ambition and quality of both projects was mind-boggling. These verses are an inadequate tribute to two great ladies of plant science.

PHYTOPHTHERA

*Phytophthora's a nasty beast,
You cannot love it in the least.
According to the best reports
There are more than one hundred sorts,
Each striking with most deadly thrust
Some plant whose use we know and trust.
One causes a most dread disease
Of oaks and other sorts of trees.
Some blight potatoes, leeks and kale,
Some, raspberries. It makes us quail
To contemplate the fell attack
Of oomycetes that turn green plants black.
They can disperse by wind and rain;
To spread from plant to plant's no strain
To these, who, like the Mongol horde,
Rampage through garden, field and sward.
In every forest, every farm
They cause our cultivated crops great harm.
They also travel, out of doors,
In mud on tyres of four-by-fours.
If there's a place they want to enter
They will seek out a garden centre,
Which will convey them, all for free,
To the place they want to be.
Custom posts they pass with ease:
Visas aren't for such as these!
Human vectors, don't be silly.
Don't spread *Phytophthora* willy-nilly.*

C4 BIRYANI

“Waiter! I’d like the menu, please.
Let me just see which of these
delicious Indian recipes
will tempt my palate.
Egg biryani! That looks nice;
Oh, it’s made from C4 rice?
Waiter, what’s that?”

“Madam, it once used to be
That planted rice was all C3.
But lately, as I hope you’ll see,
We’ve had a C-four-for-three
basmati rice offer.
There are now much bigger yields
In all of Asia’s paddy fields,
And rice is much cheaper.
Harvests now are much, much more
than they were in days of yore,
allowing the world’s rural poor
to thwart the Grim Reaper.”

“But does it really taste as nice
as good old-fashioned C3 rice,
or must you add more herbs and spice
for a dining party?”

“Madam, I can truly claim
that it tastes just the same
as any other rice of name
Indian basmati.”

“Good! That all sounds very grand,
but, pray help me understand.
By what magic sleight of hand
or changes to the farmers’ land
was this achieved?”

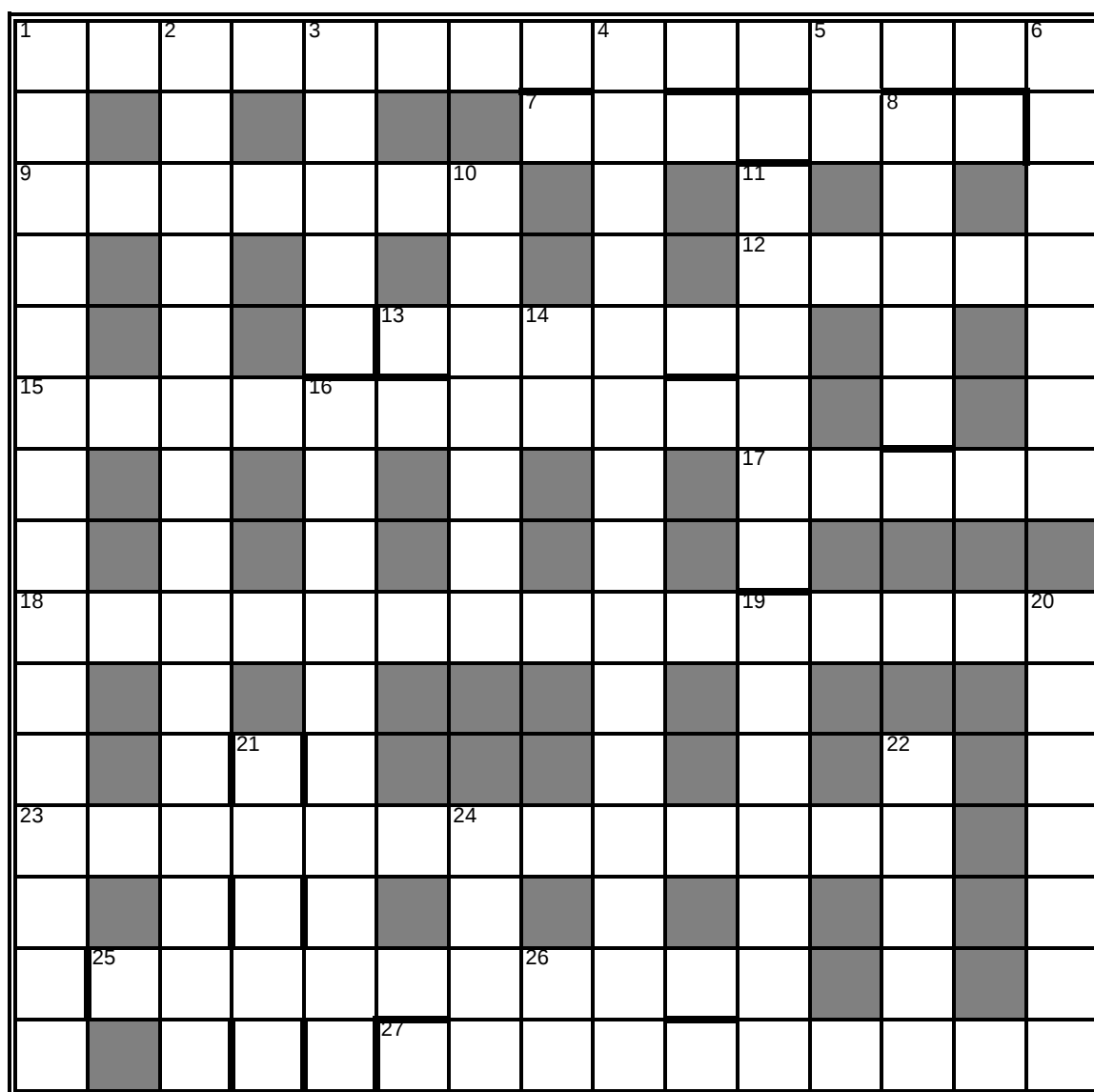
“Well ma’am, so I’ve heard say,
researchers took some DNA
from plants that grew far, far away,
that were C4 already.
Then, more than once or twice or thrice,

made a bespoke genetic splice
in genes of some good C3 rice
while they held it steady.
Then they took this transformed cell –
that at least's what I've heard tell –
and grew it in a little well
of nutrient agar.
They took this tiny little callus –
smaller than *Lemna minor*'s thallus –
and grew it – doubt it I can't –
into a sturdy little plant.
That was their first objective.
When at year's end it set its grain,
grew it, once, twice and again,
by breeding that's selective.
Their final plan they then unfurled:
to grow enough to feed the world.
Ma'am, I've tried hard to explain,
and hope that I have made things plain,
but if that's been of no avail
or has left you feeling pale,
just ask Professor Jane Langdale."

Roger West

Phytolexicon cruciformis B.S.Scot ex Word

XWord 13. The solutions to clues are mostly botanical names of families, genera or species and including some cryptogams. There are also words from botanical glossaries and some non-botanical English words, marked (English). Two-letter chemical elements are given as clues where they happen to occur. Solutions do not enter grey squares or cross thick lines. Further helpful hints may be found on the Members Page of the BSS website: click **Help for BSS News puzzles**.



ACROSS

- 1 Clair has tat plus marsh marigold (Ranunculaceae). (6,9)
- 7 See 11d
- 9 Rain ore, perhaps a genus that is medicinal and decontaminates soil (Violaceae). (7)
- 12 Generic currant in beer I bespoke. (5)
- 13 See 23a.
- 15 Fern growing from mild bench and Uranium. Illegal synonym (sorry!) for *Blechnum* (Hard Ferns), a small genus which has dimorphic fertile & sterile fronds (Blechnaceae). (11)
- 17 Genus included in caucis? Yes, but it has no uses (Agavaceae). (5)
- 18 O my! Say such reign kills poultry (Solanaceae). (10,5)
- 23 and 13a. Source of Siberian ginseng Henry I endorsed (Araliaceae) (12,6)
- 25 Mid-lunar unit National Trust abandons for little nest fungus (10)
- 27 In *Anacyclus*, I, ace aeronaut, conceal St. John's family. (10)

DOWN

- 1 Silver-spiked sedge named after Scots botanist? (5,9)
- 2 Linnaeus' twin? Flower of the north (Caprifoliaceae) (7,8)
- 3 Frost resistant poet and novelist. (5)
- 4 Iris, vulgar liana, conceals amphibian's fibre (Scrophulariaceae) (7,8)
- 5 Element 52 which Uri found in the rostellum of orchids (2)
- 6 Loss, alas! (with loss of sulphur) yields saltwort (Chenopodiaceae) (7)
- 8 Genus held back in suburban environment (Rosaceae) (5)
- 10 I having anaemia, lose a genus in Schizaeaceae, related to *Lygodium*. Terrestrial or epilithic, small to medium size, with creeping to suberect solenostelic or dictyostelic stems, 1-pinnate or 2-pinnate + pinnatifid leaves bearing sori on skeletonised basal pinnae and hairy with red or yellow hairs. Mostly warmer, drier places from Texas to Argentina. (7)
- 11 I'm dry. Is winter hiding anti-scorbutic winter bark? (Winteraceae). (6,7)
- 14 Element 60, found in *Andromeda* growing in rare earth. (2)
- 16 I shun yacht in favour of garden flower (Liliaceae) (10)
- 19 Rare gas before emanation starts to grow filamentous alga with thick-walled cells. The filaments are uninervate and surrounded by mucilage. The cells are thick-walled, globular to cuboidal to cylindrical and usually separated from each other; they each have a small number of parietal plastids. Reproduction is by cell division and

zoospores. It is epiphytic on plants in the littoral zones of brown-water lakes of various nutrient status (Neonemataceae) (7)

20 Arrangement of leaves found in small *Rosa*? No! (7)

21 Genus sprouting from a node with a lack of energy (Malvaceae) (5)

22 Feature of pollen of *Ilex*, inert to decomposition (5)

24 Leaf shape of zero value? (4)

26 The unique Z number (almost) is 44 if bezique is not played. (2)

NON-NATIVE INVADERS (8): BUDDLEJA DAVIDII FRANCHET (BUDDLEJACEAE, LOGANACEAE or SCROPHULARIACEAE)

The scientific name of the Butterfly Bush, *Buddleja davidii* Franchet, is also often spelled *Buddleia davidii*. Linné (aka Linnaeus) named the genus *Buddleja* in 1737 in honour of an English amateur botanist, Rev. Adam Buddle, the author in 1708 of an unpublished English Flora. Being Swedish, Linné would have pronounced the 'j' as a 'y'. This might explain why the genus has since been frequently written as '*Buddleia*', among several other spellings. The International Rules of Nomenclature require that the original spelling is retained but no doubt in Britain at least it will continue to be pronounced as if spelled '*Buddleya*'. The genus was originally placed in the Scrophulariaceae. Since then, and even since the year 2000, it has been variously assigned to Scrophulariaceae, Buddlejaceae and Loganaceae. Stace's New Flora of the British Isles, and the Flora Europaea (2010), assign it to the Buddlejaceae. The genus *Buddleja* is found in Asia, Africa, and the Americas and contains about 140 species. *B. davidii* is native to mountain slopes at 800m to 3000m in central and south-western China where it is an opportunist coloniser of disturbed habitats. It was named in 1887 by Adrien René Franchet, at the Natural History Museum in Paris, in honour of Père Armand David (1826-1900), who collected the plant in China and sent specimens to Franchet in 1869. David was a missionary and notable naturalist in China, after whom Père David's deer (*Elaphurus davidianus*) is named.

Early collections did not establish successfully in cultivation but in 1907-1910, Wilson collected the seed in the wild in China from which the garden *B. davidii* is descended. The first record of it as a naturalised plant growing in the wild in Britain is at Harlech in 1922 and it was first recorded as naturalised in London in 1927. It has become abundant along railway

lines since about 1980. It is now common throughout most of Great Britain, especially in the southern half.

In Britain it became popular as a garden plant particularly during and after the 1950s. It had previously colonised bombed sites and building rubble in considerable numbers during World War 2. It was subsequently frequently planted in parks and gardens and has become readily available from garden nurseries. Cultivated plants release large numbers of widely dispersed seeds, which rapidly grow through a brief juvenile period in a range of environmental conditions, allowing it to establish in the wild. Stems and roots in carelessly discarded garden rubbish can also give rise to new plants in the wild. Thus, gardening throughout Britain contributes significantly to the spread of naturalised plants. It is now established in a variety of sunny free-draining habitats with nutrient-poor soils usually with a pH in the range 6.0 to 8.9, particularly disturbed waste ground, railway tracks and embankments, limestone quarries and rock faces, and deteriorating buildings with blocked gutters and crumbling mortar. It is the most common and widely distributed naturalised non-native plant in England but decreases in abundance northwards to Central Scotland. It is also naturalised in many other parts of the world with a mild moist climate: in Europe from Spain to Bulgaria (and as far north as Bergen in Norway) as well as in parts of North, South and Central America and south Africa, much of Australia and throughout New Zealand. There it is reported along sea coasts, river corridors, forest edges and abandoned cultivated land. It is absent from colder drier areas.

B. davidii is a morphologically variable semi-deciduous shrub or small multi-stemmed tree up to 30ft in height. There are reports that it is mycorrhizal (AM, arbuscular mycorrhizal). It is fast growing but short-lived, usually dying before it is 20 years old. It is a tetraploid, $2n=4x=76$. The four-angled stems bear ovate leaves which are opposite, 5-20cm long and 1-7cm wide, with short petioles and small stipules. Their upper surface is glabrous and dark green and the lower surface is whitish-green with stellate and glanduliferous hairs; the margins are finely toothed. The leaves are palatable to several invertebrate herbivores from slugs to weevils and *B. davidii* plants are occasionally defoliated by them. Flowering is initiated by long days, and in July to September panicles of flowers up to 30cm long appear at the end of branches. Flowers open in sequence from the base to the top of the panicle; each flower lasts up to 3 days, each panicle for up to 2 weeks. The hermaphrodite flowers are usually red-purple to violet-blue, occasionally white, in colour in native

plants in China but usually lilac in naturalised plants in Britain while the flowers of selected named cultivars vary from white and yellow through red to dark purple. The 3mm long bell-shaped calyx is usually four-lobed. The zygomorphic flowers consist of four petals which are fused for three-quarters of their length to form a narrow tube 5-8mm long. The interior of the tube is orange, with yellow nectar guides leading to the base of the tube. The four stamens are fused to the petals and the anthers are located about half-way along the tube. Hairs in the tube may serve the purpose of preventing small insects from reaching the nectar at the base of the tube without making contact with the anthers or stigma. The single ovary has two locules.

The flowers of *B. davidii* are pollinated by butterflies and perhaps other visitors, which include day-flying and night-flying moths, bees, wasps, hornets, lacewings, beetles and hoverflies, although only those with long tongues would be successful in reaching the nectar. Insects are attracted by the sweet scent; 33 components have been detected in the scent, especially 4-oxoisophorone, E- α -farnesene and 1-octen-3-ol. The other *Buddleja* species that are regularly pollinated by humming-birds are scentless. Insects visiting *B. davidii* are rewarded with substantial quantities (up to 0.64 μ l per flower) of nectar rich in sugar (up to 33.5%, more concentrated than in most garden plants). Research has confirmed that butterflies visit more frequently those *Buddleja* flowers that produce most nectar and those that produce nectar with the highest sugar concentration. An additional benefit for insects visiting *Buddleja* is that they are able to feed from several flowers close together in the same inflorescence. It has been reported that *B. davidii* does not self-pollinate. This might mean that no pollen reaches the stigma of the same flower but it is almost certain that pollen will be carried from stamens of one flower to the stigma of another flower on the same plant as insects forage over the inflorescences. This too is self-pollination with the same genetic consequences as pollination within a single flower. Apparently, it is not known whether there is an underlying self-incompatibility mechanism to prevent self-fertilisation after self-pollination. After pollination followed by fertilisation, the ovary becomes a cylindrical brown capsule up to 9mm long. When ripe, these open in dry weather and close again when wet. Each contains up to 1000 tightly-packed brown thread-like seeds, about 4mm long, with a thickened centre and long wings at each end. These seeds are wind-dispersed in early Spring and the results of one study showed that 95% of the seeds travel more than 10m. When the seeds land, they form a short-lived seed bank; their viability falls rapidly after 2-

5 years. There is no innate dormancy to delay germination when conditions are suitable, that is in the light at temperatures above 6°C. Seedlings can flower when 2 years old.

In cultivation, selection and hybridisation with other *Buddleja* species since the 1920s has produced a range of cultivars with different colours, with more compact growth, greater cold tolerance and reduced seed production. In 1941, *B. davidii* was awarded the RHS Award of Garden Merit (AGM). By 2008, seven subspecies and 90 cultivars of *B. davidii* had been described; named cultivars can be propagated clonally by stem or root cuttings. They are deer- and rabbit-proof and can be planted as a hedge. Young wood produces flowers more prolifically than old stems, so garden plants are pruned hard every Spring. Because of their ability to attract butterflies, they are a commercially important plant in the British horticultural trade, but their national economic value has not been assessed. A variety of butterflies has been recorded visiting *B. davidii* cultivars, including Red Admirals, Comma, Peacock, Large, Small and Green-veined Whites, Painted Lady and Meadow Brown. Native plants in China must be pollinated by a completely different lepidopteran fauna, so it is interesting that *B. davidii* is equally attractive to a different butterfly population in Britain. Clearly, the ability of the nectar and scent to attract butterflies is not species specific. It is not known whether all the other insect visitors, notably moths, bees and hoverflies, are equally effective in achieving pollination, but it has been observed that white- and pale-flowered cultivars receive fewer butterfly visits than those with red, pink and lavender flowers (Butterflies can 'see' red wavelengths). The Plant Heritage collection of *Buddleja* cultivars is held at Longstack Park Nursery, Stockbridge, Hampshire.

In Britain, naturalised plants have been referred to as 'invasive non-natives' by DEFRA, who recommend removing developing seed heads from plants in cultivation to reduce spread, but it is not listed under Schedule 9 of Section 14 of the Wildlife and Countryside Act 1981. Perhaps its most widespread and obvious impact occurs when it invades railway tracks and if unchecked can disturb the ballast track bed or form thickets which obstruct, for example, cables or even engines and rolling stock. It can damage buildings by colonising decaying mortar; expanding root systems can destroy brick walls. There has been little systematic study of its impact on the native flora but in Folkestone, Kent, it is invading and replacing rare chalk grassland habitats. In most other countries, including especially USA and New Zealand, where it is naturalised it is

also recognised to be invasive. It can displace native colonisers of riverside gravel banks in flood plains in New Zealand and the USA and it out-competes *Pinus radiata* in New Zealand and *Salix* and *Populus* species in north western USA. A less obvious interference with the native flora occurs when some butterflies visit naturalised *Buddleja* in preference to local indigenous species, creating the possibility of reduced pollination success in the latter, a phenomenon also observed with another invasive alien, *Impatiens glandulifera* (see No.2 in this series). Despite its attractive features, in New Zealand the Ministry of Agriculture and Forestry has deemed it to be 'noxious' and prohibited its propagation, release and sale. Control measures are largely limited to cutting down before seeding or, because it regenerates readily from the stumps the following year, complete removal. However, biological control involving a defoliating weevil, *Cleopus japonicus*, collected from the native range of *B. davidii* in China has been under trial in quarantine containment in New Zealand. A stem weevil, *Mecysolobuserro*, that eats stem tips has also been under consideration.

Meanwhile, in Britain, further increases in its abundance as a naturalised alien seems inevitable as long as it remains so popular as a garden plant free from any restrictions. The price of enjoying its flowers and the visitors that they attract in gardens is the cost of eliminating naturalised plants from localities where they are having a damaging effect on urban structures or natural vegetation.

Adrian Dyer

THE BURNING LANDS

Ecology, Evolution and Biogeography in Tropical High Rainfall Savannas

I recently had the pleasure of attending a temperate grass identification skills workshop in Holyrood Park led by Faith Anstey (see review by Maria Chamberlain on page 22). This workshop equipped me with all the knowledge I needed to identify the twenty grasses I was most likely to see, living in Edinburgh. I also met a lot of lovely grass enthusiasts, one of whom (Jill) encouraged me to write about my research for this newsletter.

My PhD research is on tropical savannas, a far cry from the verdant slopes of Arthur's Seat. I specifically work on high rainfall savannas,

where annual precipitation exceeds around 700mm and the climate is highly seasonal. These are systems which regularly experience fire. The rain helps the grass grow – in some cases several metres high - and then as the plants die their standing dead biomass is a perfect fuel for fires in the dry season. The biome is an interesting one, not least because less is known about it than more obviously charismatic habitats such as rainforest. In general, although low rainfall sites such as the Serengeti National Park have been fairly systematically studied, higher rainfall sites have often been overlooked. This is probably at least partly because the exciting large herbivores and grazers and their associated predators tend to be found on the lower rainfall savannas. But it is also because high rainfall savannas support more trees, and have tended to be misidentified as degraded forests (Ratnam et al. 2011, Ratnam et al. 2016). This puts them at risk from misguided afforestation schemes, and conversion to agriculture. In fact, savannas in general have been highlighted as an ideal habitat to convert to intensive agriculture (Boval et al. 2017). For some high rainfall savannas, we do not even know exactly what we would be losing if this happened.

My research focuses on trying to understand the ecology, evolution and biogeography of high rainfall savannas. From the evolution side of things, I have been doing some phylogenetic analyses of the widespread shrub/tree *Ziziphus* (Rhamnaceae). I am hoping to use *Ziziphus* to answer questions around evolutions into and out of the savanna biome, and whether the savanna displays similar patterns of geographic phylogenetic structure to other tropical biomes. *Ziziphus* has some well dispersed and some range restricted species as well as some confined to savanna. It is also often as spiny as hell, and no fun to collect. To answer questions on ecology and biogeography, I have two field sites, one in Cambodia and one in Mozambique. I am hoping to characterize the understory – not just grasses but also forbs – and see how shade from savanna trees affects species turnover. Grasses which use the C4 pathway are optimized for low CO₂ levels, but may lose a competitive advantage with rising atmospheric CO₂. Studies in the USA have shown that C4 grass diversity reduces with increased shade levels (Veldman, Mattingly and Brudvig, 2013), but that N-fixing forbs have the opposite response (Peterson, Reich, and Wrage, 2007). My work will see if patterns seen in the New World are replicated in the Old World, and will hopefully enable future work looking into resilience to woody encroachment and rising atmospheric CO₂.

Savannas cover 20% of global land surface, and support around 1 billion people's livelihoods, and yet we still know so little about this fragile and fiery biome. I am hoping that my research will help answer some of our questions, and perhaps reveal some new ones to be asked.

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WHAT DETERMINES THE DISTRIBUTION OF A RARE PLANT SPECIES AT THE LOCAL SCALE?

Assessing the Autecology of Marsh Saxifrage (*Saxifraga hirculus*) at Munsary Peatlands, Caithness.

Marsh Saxifrage (*Saxifraga hirculus*) has seen significant decline throughout Europe's agricultural intensification of the 20th and 21st centuries. It is now consequently listed on Annexes II and IV of the EU's Habitats Directive, being one of Central and Western Europe's rarest plants (Venterink & Vittoz 2008). It is now extirpated from many European countries where it once grew, including, Austria, Germany, The Netherlands, and Czech Republic (Muldoon et al 2015; Venterink & Vittoz 2008). Because of this range restriction it is now thought of as an upland species, despite its previous populations stretching down to the lowlands (Hallam et al 2005; Muldoon et al 2015).

In a European context, the UK represents an important harbour for *S. hirculus*. There are around 25 recorded sites, with around 70% of these within the Pennines (Muldoon et al 2015), whilst Scotland has populations in the Grampians, Pentlands, and Caithness (Hallam et al. 2005). It has been noted that many of the populations are located near areas with apparently similar vegetation, yet lack *S. hirculus* for no outwardly obvious reason (Welch 1996). These empty flushes raise questions on potential reintroduction efforts, which have been attempted successfully before (Welch 2002).

There have been several cases of UK populations that have had the grazing pressures on them relaxed or removed. When a Pennine population was enclosed it initially did well, showing high flowering rates. However, as more competitive vegetative flourished, the *S. hirculus* suffered, with its cover reducing by 75% (Roberts 2009). Another population was inadvertently fenced off, with only nine flowering shoots visible through the denser vegetation within a decade, later reducing to only one shoot (Roberts 2009). This highlights the need for further studies and better communication of the requirements of *S. hirculus*, and to ensure that stakeholders do not overlook an inconspicuous but rare plant.

Munsary Peatlands is an area of blanket bog within the Flow Country of Caithness, North-West Scotland. A former shooting estate, the current owners, the conservation charity Plantlife, purchased it 1999. In 2002 a large population of *S. hirculus* was found; with over 1000 flowering shoots

recorded (Lindsay and Freeman 2006); it is both nationally and internationally important to European conservation of the species. Two further *S. hirculus* sites were discovered in 2009; although smaller with 20 and 5 flowering stems recorded. A fourth site was discovered in 2008, although at less than 2m², it is by far the smallest.

A study was undertaken over the summer of 2017 to assess why marsh saxifrage is limited to its current range of four sites at Munsary and quantify what determines its success. This was done through examining the differences in vegetation and water chemistry between the population sites and control sites where it is absent (Tables 1 and 2). The control sites were made up of two groups: sites that appear potentially suitable in structure and vegetation community for *S. hirculus*, and sites that appear unsuitable by visible differences in their structure and community. The population and suitable control sites could generally be classified as mesotrophic grassland, whereas the unsuitable sites were mire communities typical of blanket bogs. Grazing and pollinator influences were also considered.

It was established that the water at the population sites is base-rich. Specifically, the water has low levels of organic carbon and high levels of calcium in comparison to the control sites where the species is not found, and the pH is near neutral (Table 1).

Table 1- The average Calcium (Ca), Magnesium (Mg), Strontium (Sr), Iron (Fe), Potassium (K), Sodium (Na), Zinc (Zn), Aluminium (Al), Manganese (Mn) and pH for each group of sites studied at Munsary Peatlands. Pop.= *Saxifraga hirculus* populations, Suit. = Sites deemed potentially suitable for *S. hirculus* where it is absent, Inh. = sites that appear inhospitable for *S. hirculus*.

Site Group	mg/l								pH
	Ca	Mg	Sr	Fe	K	Na	Zn	Al	
Pop. Average	49.11	5.86	0.50	1.95	5.31	3.29	0.156	0.003	6.74
Suit. Average	9.02	2.02	0.17	4.48	0.90	6.65	0.269	0.016	6.08
Inh. Average	0.89	0.75	0.01	0.35	2.75	8.62	0.307	0.027	5.24

These results indicate that the water is of a provenance that upwells past/through the underlying limestone rock strata, contributing to its high mineral content. Although the apparently suitable control sites also had higher levels of calcium than the unsuitable controls, they only averaged approximately 20% of that where populations of *S. hirculus* were found. The unsuitable control sites were also found to have high amounts of

organic carbon, very low amounts of calcium, and a low, more acidic pH. Because of this, the water of these sites was determined to be of surface percolation origin, being rainwater that has travelled through the peat layer. The results from the sites with populations were similar to those seen in remaining *S. hirculus* populations of Europe (Vittoz et al. 2006).

Table 2- The average Total Organic Carbon (TOC), Inorganic Carbon (IC), Total Carbon (TC), Total Nitrogen (TN), and the proportion of TOC and IC (T prop and I prop) making up the TC for each group of sites studied at Munsary Peatlands. Pop. = *Saxifraga hirculus* populations, Suit. = Sites deemed potentially suitable for *S. hirculus* where it is absent, Inh. = sites that appear inhospitable for *S. hirculus*.

		mg/l					
Site group		TOC	IC	TC	TN	T prop.	I prop.
Pop.	Average	11.22	31.1	42.4	1.11	0.26	0.73
Contr.	Average	26.63	7.41	34	0.98	0.78	0.21
Inh.	Average	27.16	0.8	28	0.79	0.97	0.02

The difference in vegetation communities was also assessed. Due to their selection for similarities to the population sites, the suitable control sites clearly were not substantially different in community composition to the population sites; both were mixed sward areas that stood out from the surrounding blanket bog in their greenness, being predominately made up of Yorkshire fog (*Holcus lanatus*) and red fescue (*Festuca rubra*). When the results were statistically analysed through ordination techniques there appeared to be separation between the potentially suitable sites and sites with *S. hirculus* populations. The environmental factors behind the separation in the ordination were determined to be water inundation, and indicated that the suitable control sites were dryer than the population sites. The vegetation survey results also recorded a thicker, taller sward in the absent sites. When this is considered with the established view that *S. hirculus* requires a stable high-water table and a sparse-medium sward for establishment and survival (Vittoz et al. 2006), it seems that this could prevent *S. hirculus* from spreading beyond its current populations to the suitable control sites at Munsary, rather than the subtle differences in species composition.

Three groups of potential pollinating insects were identified at the population sites, all being sighted multiple times within *S. hirculus* flowers. These were: hoverflies (*Chrysogaster* sp.), two fly species of Muscidae,

and wasps of Ichneumonidae. Pollen was evident on the thorax of the hoverflies, with *Chrysogaster* sp. being recorded as a key pollinator to *S. hirculus* in European populations (Warncke et al. 1993; Warncke and Olesen 1990).

There appeared to be significant deer herbivory and disturbance to the population sites, to a lesser extent to the absent but potentially suitable sites and very little damage to the absent unsuitable sites. Specifically, 29% of relevés within the populations recorded some kind of deer influence (browsed stem, hoof prints, or dung), compared to 9% of those from the absent suitable sites. Deer paths that appeared to lead to the populations were evident at all sites. Increased grazing could be a key factor behind keeping the sward density low enough for *S. hirculus* to thrive, with soil disturbance required for seedling establishment (Ohlson 1988; Hallam et al. 2005). Deer attraction to the populations could itself be caused by the water chemistry of the populations. Specifically, grasses of base-rich flushes are more palatable than the surrounding blanket bog vegetation (Roberts 2010).

Two broom both caterpillars (*Ceramica pisi*) were seen in separate *S. hirculus* flowers one population site, one of which was defoliated with visible damage to the carpel. There appeared to be many defoliated flowers at the population sites. As far as it seems, *C. pisi* has not been recorded interacting with *S. hirculus* before, and as many flowers appeared to be defoliated its potential impact on *S. hirculus* could be further studied.

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THE ROSES of ROBERT BURNS

A Discussion of the Roses in the Poems and Songs of Robert Burns

My Luve is like a Red, Red Rose 1794

*O my Luve's like a red, red rose,
That's newly sprung in June;
O my Luve's like the melodie
That's sweetly play'd in tune.-*

*As fair art thou, my bonie lass,
So deep in luve am I;
And I will love thee still, my Dear,
Till a' the seas gang dry.-*

*Till a' the seas gang dry, my Dear,
And the rocks melt wi' the sun:
And I will love thee still, my Dear,
While the sands o' life shall run.-*

*And fare thee weel, my only Luve!
And fare thee weel, a while!
And I will come again, my Luve,
Tho' it were ten thousand mile!-¹*

Toward the end of his brief life, Robert Burns penned what is generally believed to be the most pure and poignant love song ever written, "My Luve is like a Red, Red Rose." During the last ten years of his life, Burns set out to collect and preserve songs for Johnson's "The Scots Musical Museum" and for George Thomson's "Select Scottish (sic) Airs" His contribution amounted to more than three hundred songs for these volumes of collected works.

In creating "A Red, Red Rose," Burns edited and combined lines he had gathered from several sources including "The True Lover's Farewell" and "The Wanton Wife of Castle Gate."² "A Red, Red Rose," was first published in 1796 in "A Selection of Scots Songs," edited by Peter Urbani, due to Burns' concern that the editor of the "The Scots Musical Museum," James Johnson, would look upon the poem as "the ludicrous & the absurd,' instead of "the simple & the wild"³.

Burns began the poem with several similes such as, "My luve is like a red, red, rose," and "My luve is like a melody that's sweetly played in

tune,” and gradually progressed to the use of more complex and hyperbolic metaphors such as “And I will love thee still my dear, while the sands o life shall run” taking the reader on a journey from the ephemeral blooming of a young and perfect rose “newly sprung in June,” to a love that will last “til the rocks melt with the sun.”

Living in the countryside and being an acute observer of nature, Burns often wove references to plants and animals into his poems, with roses being mentioned in dozens of poems⁴. At times a rose was included in a description of a pastoral scene – “The rose upon the brier by the waters running clear” (The Winter it is Past). In several poems the rose stood as a symbol of purity – “Wi' lightsome heart I pu'd a rose... And my fause luvver staw my rose,” (Ye Flowery Banks). Burns often described his current infatuation as having lips like a rosebud, “I'll pu' the budding rose when Phoebus peeps in view, For it's like a baumy kiss o' her sweet, bonie mou.” (The Posie). Roses were also used to mark the passing of time, “While peaches and cherries, and roses and lilies, They fade and they wither awa, man.” (The Ronalds of the Bennals).

Although Burns included many references to roses in his poems and revised Scots songs, the question remains, to which roses was he referring? Specifically to which rose was he referring in “My Luve is Like a Red, Red Rose?”

Only in a small number of poems did Burns mention the color of a rose:

*“And here's the flower that I loe best –
The rose that's like the snaw!”*
(O, Kenmure's On And Awa, Willie)

*“O, gin my love were yon red rose,
That grows upon the castle wa'’;”*
(O, Were My Love Yon Lilac Fair)

*“The blude-red rose at Yule may blaw,
The simmer lilies bloom in snaw,”*
(To Dauntoun Me)

And of course:
*“O my Luve's like a red, red rose,
That's newly sprung in June:”*
(A Red, Red Rose)

During Burns' lifetime in the second half of the 18th Century, at least five species of wild rose (excluding natural sports and hybrids) would likely have been found in the countrysides of Ayr, Mauchline, Irvine and Dumfries. The Botanical Society of Britain & Ireland's "Distribution Database Maps" (pre-1930 to 2010)⁵ show that the most abundant species are the following five: the Dog-rose, the Glaucous Dog-rose, the Soft Downy-rose, Sherard's Downy-rose, and the Scots or Burnet Rose.

***Rosa canina*:** Found throughout Britain Dog-rose is a deciduous shrub growing over 16 feet in height. Its flowers are white to deep pink each with five petals. Stems have sharp hooked prickles and hips are red-orange in colour.

***Rosa caesia* ssp. *glauca*:** Glaucous Dog-rose differs from Dog-rose in having more pronounced wine-red colouring on the stems. Its flowers are pink and its styles completely cover the hip's disk in a woolly mass.

***Rosa mollis*:** Soft Downy-rose's name is derived from its soft hairy leaves. Flowers are pink to deep rose. The shrub is deciduous and forms dense thickets in multiple habitats.

***Rosa sherardii*:** Sherard's⁶ Downy-rose has white to deep pink flowers and is called "downy" because of the soft tangles of hair on the undersides of its leaves and major veins.

Rosa spinosissima - Scots or Burnet rose is most often found on sand dunes and sea-cliffs, but also can be found inland on less acidic soils. Its flowers are white and its stems covered with a multitude of prickles and bristles.

Non-native wild roses such as *Rosa rugosa* (Japanese rose) and *Rosa virginiana* (Virginian rose) that did not arrive in Britain until after Burns' lifetime are not included on the list; nor are wild species that are less commonly found in Ayrshire such as *Rosa arvensis* (Field rose) and *Rosa rubiginosa* (Eglantine or Sweet-briar, illustrated here).

To those who have pondered which rose(s) Burns had in mind, the Dog-rose, *Rosa canina*, is usually the candidate of choice. In his book, "Robert Burns, 'A Man for All Seasons,'" author John Young writes, " ... Burns listed the 'wild brier-rose' as one of his favourite flowers and with over sixty references he made that obvious."⁷ Indeed in his letter to Mrs. Dunlop on January 1, 1789, Burns wrote, "I have some favourite flowers

in spring, among which are the mountain-daisy, the hare-bell, the fox-glove, the wild brier-rose, the budding birch, and the hoary hawthorn, that I view and hang over with particular delight.”⁸



Ironically the only wild rose that Robert Burns referred to by its species name is the Eglantine (or sweet briar) rose, *Rosa rubiginosa*, in his first draft of the poem, “The Posie,” “I’ll join the scented birk, to the breathing eglantine;” yet the Eglantine rose is not found as commonly in Ayr as the five roses considered earlier.⁹

Burns’ “red” rose could also refer to the cultivated Old Garden Roses of his day instead of the wild species. Again John Young, “Garden or cultivated roses were first brought to Scotland in 1596 ... Thus present potentially in gardens during the Burns era, some of his non specific

references 'my love is like a red, red rose' for example, could equally have referred to a cultivated variety."¹⁰

Old Garden Roses that Burns may have encountered in gardens of his day include:

***Rosa x alba*:** Also known as the White Rose of York, *Rosa x alba* is one of the oldest garden roses. Its white or pale pink blossoms flower only once in mid-summer.

***Rosa gallica*:** *Rosa gallica* and its cultivars ranging in colour from pink to deep purple are arguably the oldest of garden roses originating in southern and central Europe and western Asia. *Rosa gallica varietas officinalis*, the Apothecary's Rose AKA the Red Rose of Lancaster, was the most popular rose of Burns' day.

***Rosa x damascena*:** The Damask rose with its light pink to light red flowers is a complex hybrid that was brought to Europe from the Middle East sometime between 1254 and 1276; although ancient Roman frescoes hint that the damask rose may have existed in Europe for millennia.

***Rosa centifolia*:** Predominantly pink Centifolia, Provence, or Cabbage roses are derived from the 17th century Dutch hybrid, *Rosa x centifolia*. The name, "Centifolia," comes from the rose's 100 petals and the name "Cabbage" comes from the flower's globular shape.

***Rosa x centifolia 'Muscosa'*:** Popular in Victorian times, moss roses were derived from an early sport of *Rosa x centifolia* in which a moss-like growth appeared on the flower's sepals.

Old Garden Roses range in colour from white to deep rose pink. None exhibit the bright crimson red color that we associate with the term "red" today. Their colours and those of the wild species roses give us pause to wonder exactly what colour Burns had in mind when he used the term, "red." Perhaps he was referring to the color of the unopened buds of the Dog-rose as maintained by Colin Will, former librarian and senior manager at the Royal Botanic Garden Edinburgh, "An Ayrshire farmer would be more likely to have come across *Rosa canina*, the Dog Rose, in the hedgerows. But that's a pink rose, you say. And so it is. 'My love is like a pink, pink rose' doesn't sound right. Then I recalled that when the Dog Rose is 'newly sprung' its buds are red."¹¹

Or was Burns simply using the term "red" for the rosy red usually associated with the colour pink in his day? The colour pink itself was not

used commonly until one hundred years before Burns' time at the end of the 17th century. Additionally in many languages the colour pink is still called rose or rosa, after the rose flower. Originally named after the "pink" flower in the genus *Dianthus*, the term "pink" comes from the flower's frilled edges (as if they were trimmed by pinking shears). Until this time flowers and animals coloured in shades from pink through orange were given "red" epithets such as red campion, red bartsia, red clover, red fox, red squirrel, red deer and robin redbreast to name a few.

According to Alice Bucknell in her article "A Brief History of the Color Pink," "It wasn't until the 1700s, however, that the color was popularized through the fashion and interior design worlds. Pastel pink was favored by both the men and women of the European bourgeoisie, from the Georgian gowns of Mary, Countess of Howe, to the embroidered silk coats sported by the well-heeled men of Louis XVI's court."¹²

Given that the color pink hadn't been in the English lexicon for more than a century, and that the song Burns used as a template may have been at least that old, Burns may have continued using the term "red" to refer to a rosy colored flower.

It could also be that Burns, in describing the Rose, was using the colour red to denote passion or simply to create a poem more easily recited or sung, "A 'red, red, rose' is far easier on the mouth than a 'pink, pink, rose,' so being true to species may not have been Burns' first requirement."¹³

In conclusion, we may never know exactly which rose Burns had in mind when he wrote "My Luve is Like a Red, Red Rose" or which roses were in his thoughts in any of his other songs and poems. However, I believe we can at the least narrow our choices down to seven of the roses mentioned in this paper. If I were pressed to say to which rose I thought Burns was referring, I would respond with *Rosa sherardii*, with its deep rose colors; or *Rosa canina* with its rosy colored buds and pale pink petals. On the other hand I could just as easily accept Burns' "Red, Red Rose" as a well-turned alliterative literary device describing the youth and beauty of his "Luve," accepting that the first line of this beloved poem is one of the simplest yet heartfelt lines ever written.

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¹ Irvine, Robert, 14 June, 2018, A 'cargo of Songs': Robert Burns, the Hastie manuscript and The Scots Musical Museum, British Library: Discovering Literature: Romantics and Victorians <https://www.bl.uk/romantics-and-victorians/articles/a-cargo-of-songs-robert-burns--the-hastie-manuscript-and-the-scots-musical-museum>

² The Literary Digest Vol XV p131, No. 5 May, 1897, to December, 1897 Funk & Wagnalls Company Lafayette Place New York

³ Mackay, James A (1987) Robert Burns The Complete Letters: XIV. Letter to Alexander Cunningham, Dumfries, November 1793, p.468, Alloway Publishing, Ayr.

⁴ National Records of Scotland - Archivists' Garden - Rose (Dog) 12 June 2018, Available at: <https://www.nrscotland.gov.uk/research/archivists-garden/index-by-plant-name/rose-dog>

⁵ Botanical Society of Britain & Ireland - Distribution Database- BSBI Maps 15 May, 2018, Available at: <https://database.bsbi.org55>

⁶ Named after the British botanist, William Sherard, whose work on botanical classification greatly influenced Linnaeus.

⁷ Young, John (1996). *Robert Burns A Man for All Seasons* pp. 24-29. Scottish, Cultural Press.

⁸ Mackay, James A (1987) Robert Burns The Complete Letters: XXXVIII. Mrs. Frances Anna Dunlop of Dunlop. Ellisland Newyearday morning 1789 p. 164, Alloway Publishing, Ayr.

⁹Cunningham, Allen, (1842) O Luve will venture in. The Works of Robert Burns p. 407, George Virtue, London.

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¹¹ Will, Colin, 11 October 2011 "Robert Burns and geology," Sunny Dunny's Blog Available at: <https://sunnydunny.wordpress.com/2011/10/11/robert-burns-and-geology/>

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¹³ Thanks to Sue Millard and David-Muzeyyen-Merrick for their help and lively discussions at Roses (Rosa) of Britain and Ireland. 17 July 2017, Available at: <https://www.facebook.com/groups/144256102812996/>

THE ORCHID HUNTER: A YOUNG BOTANIST'S SEARCH FOR HAPPINESS

LEIF BERSWEDEN (2017) SHORT BOOKS, 360pp, £12.99

After leaving school and before starting his undergraduate studies at Oxford Leif set out on a remarkable botanical adventure - to find every orchid species native to the British Isles in a single growing season. Despite set-backs of weather, broken down cars and disappointments in love, he did it. He saw and photographed all 52 native species and what a wonderful gap year he had.

Not only are all the orchids described and photographs provided (not in taxonomic order, but in the order in which he found them), but there are also some very beautiful descriptions of the countryside, “of ravens floating on thermals, and the cacophony of bleating lambs”. There is also a lot of historical information on the Victorian orchid mania which drove many species to the brink of extinction e.g. slipper orchid and the ghost orchid, and of their resurrection.

Naturally, for a boy who is coming of age, there has to be the usual sexual drama of the bee orchid and the randy bee - so beloved of all first-year botany lecturers – but he does it very well.

“Excited by this, he alights and attempts to mate with the ‘female’, often vigorously and for prolonged periods. During these fruitless exertions, the bee knocks into the column — the reproductive structure consisting of both male and female parts — which drops two tiny, sticky pollen sacs on to the bee’s back. Eventually, he gets frustrated by the lack of action and buzzes off in search of a more enthusiastic partner.”

Probably my favourite passage in the book is when he deserts all the assembled guests at his mother’s fiftieth birthday party. “You would better not be orchid hunting”, texts his father, but that is of course exactly what he is doing, looking for the burnt orchid, dressed in his suit and tie. Actually, I envy his parents; my children may well have absconded too, but they would have been pursuing less worthy causes.

This book is a breath of fresh air. Many of us botanists have had similar love affairs with plants, of one group or another, and this book reminds us of the enthusiasms of youth, but also of the feeling of isolation that a geeky passion in an unusual hobby engenders. Leif is a very

lovable geek, and I for one can't wait to meet him in September when he comes to deliver the first lecture of the new season.

Maria Chamberlain

RHODODENDRON

RICHARD MILNE (2017) REAKTION BOOKS, 240pp, £16

Richard's Rhododendron book is one of the most readable works of non-fiction that I have ever read. As Richard is fond of telling his students, "Rhododendron is a tart of the plant world". That is why Rhododendron taxonomists (and I know one intimately) have had to spend a lifetime sorting out their classification. Their infidelity, especially when stuck in Victorian gardens, without one of their own kind to mate with, has led to a proliferation of hybrids, crosses and backcrosses, including some felicitous garden varieties, and others who have become relentless invaders of our countryside.

What makes this book different from any other Rhododendron book is that it explores their relationship with us. Rhododendrons have been used as weapons of war, as medicines, as food, and insecticides. Chinese boys and girls know exactly from which species they can suck the sweet nectar, while cows, should they get it wrong, will roll about in an intoxicated stupor.

The book is peopled with adventurous collectors, like George Forrest, Kingdon Ward, Robert Fortune, and Ernest (Chinese) Wilson, who risked life and limb to bring back their treasures; their tales are told with historical accuracy and humour.

The book deals with often asked questions: "What is the difference between Azaleas and Rhododendrons?" and "Aren't all Rhododendrons just weeds invading and excluding our native flora?" Nobody knows better than Richard the story of *R. ponticum*, the black sheep of the Rhododendron world. It is just one out of the 12,000 species world-wide, yet Rhododendron growers are still smarting from the bad name it has given to the genus.

Whether you are a botanist, educator, horticulturist or garden guide, this book is a treat. It deserves to be read.

Maria Chamberlain

SOLUTION TO *Phytolexicon cruciformis*

¹ C	A	² L	T	³ H	A	P	A	⁴ L	U	S	⁵ T	R	I	⁶ S
A		I		A			⁷ W	I	N	T	⁸ E	R	I	A
⁹ R	I	N	O	R	E	¹⁰ A		N		¹¹ D		U		L
E		N		D		N		A		¹² R	I	B	E	S
X		A		¹³ Y	¹⁴ H	E	N	R	Y	I		U		O
¹⁵ B	L	E	C	¹⁶ H	N	I	D	I	U	M		S		L
U		A		Y		M		A		¹⁷ Y	U	C	C	A
C		B		A		I		V		S				
¹⁸ H	Y	O	S	C	Y	A	M	U	S	¹⁹ N	I	G	E	²⁰ R
A		R		I				L		E				O
N		E	²¹ A	N				G		O	²² E			S
²³ A	C	A	N	T	²⁴ H	O	P	A	A	N	A	X		E
N		L	O	H		V		R		E		I		T
I	²⁵ N	I	D	U	L	²⁶ A	R	I	U	M		N		T
I		S	A	S	²⁷ C	L	U	S	I	A	C	E	A	E

BSS COUNCIL 2018-19

President:	Dr Brian Ballinger
Vice-Presidents:	Prof John Grace Dr Julia Wilson
General Secretary:	Julia Wilson / Liz Lavery
Treasurer:	Dr David Chamberlain
Programme Secretary:	Dr Maria Chamberlain
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BSBI Liaison:	Dr Liz Kungu
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Journal Editor-in-Chief:	Dr Laszlo Nagy
Newsletter Editors	
Receiving Editor:	Dr Jill Thompson
Co-ordinating Editor:	Mr Roger West
Publicity Officer:	vacant
Student Representative:	Ms Maude Grenier de Sigley
Website Administrator:	vacant
Councillors:	Ms Christina Smith Dr Chris Jeffree

LOCAL SECRETARIES 2018-19

Aberdeen	Dr David Burslem
Dundee	Dr Brian Ballinger
Edinburgh (KB)	Prof John Grace
Edinburgh (RBGE)	Dr Heather McHaffie
Glasgow	vacant
Inverness	vacant
St. Andrews	Prof Richard Abbott

THE BOTANICAL SOCIETY OF SCOTLAND SCIO

Draft Financial Statement for the Year to 30 April 2018

These accounts have been submitted to the Independent Examiner

Statement of Receipts and Payments	Accruals	Accruals
Year	2018	2017
	£	£
Incoming resources:		
Voluntary income:		
Subscriptions	5,119.71	5,833.96
Bequest	50,000.00	
Donations	285.00	290.00
Total	<u>55,404.71</u>	<u>6,123.96</u>
Incoming resources from charitable activities:		
Editorial Subvention	3,380.00	3,363.00
Royalties,- Journal (Taylor & Francis)	4,787.27	5,129.67
Sale of Merchandise	-	25.00
Miscellaneous (incl. excursion donation)	-	-
Contribution to a lecture	-	-
Gift-Aid 2015-16, 2016-2017	1,541.20	
Total	<u>9,708.47</u>	<u>8,517.67</u>
Interest (& Stock Redemption – 2016)	126.58	194.38
Total receipts	<u>65,239.76</u>	<u>14,836.01</u>
Payments:		
Costs of generating funds:		
Printing Members' Copies of Journal (pending)	<u>4,241.82</u>	<u>4,353.85</u>
Charitable activities:		
<i>Directly allocated to activities:</i>		
Lecture Expenses (£77 pending)	951.32	534.60
Printing Newsletter	732.10	1544.90
Student Essay Prize	200.00	200.00

Student Grants	-	-
Schools Photographic Prize	50	-
Urban Flora Project (data-base development, etc.)	-	-
Total	1933.42	2,279.50
<i>Support costs:</i>		
Committee Room Hire	-	62.50
Stationery & Postage	102.70	159.09
Printing	17.50	41.30
Insurance (pending)	130.63	-
Web page	93.72	84.00
Total	<u>344.55</u>	<u>346.89</u>
Total - Charitable Activities	<u>2277.97</u>	<u>2,626.39</u>
<i>Governance costs:</i>		
ICO (Data Protection)	-	35.00
Computer software	250.00	-
Subscription Rebates	12.00	99.00
Accounting Fees - 2016-17	150.00	140.00
Annual Meeting Costs	-	500.00
Secretary's Expenses (incl. postage)	331.13	109.33
Transfer to CCLA Deposit Fund	60,000.00	-
Total – Governance	<u>60.743.13</u>	<u>883.33</u>
Total Net Resources expended	67,262.92	7,863.57
Gross Expenses	67,262.92	7,863.57
Gross Deficit for the Year	2023.16	6,972.44

Statement of Balances		
Year	2018	2017
	£	£
Bank and cash in hand		
Closing balances at Bank	28,922.01	26,752.93
Opening balances at Bank	-26,752.93	-19,906.45
Cheques not cleared	-4,318.82	-
Stock Redemption/Interest	-	-
CCLA Interest	126.58	194.38
Less Paypal carry-over from previous year	-	-68.42
Deficit for the year	-2023.16	6,972.44
Closing balance		
Cash at Bank	28,922.01	26,752.93
Cash at Paypal	-	-
Cash in CCLA reserve fund	105,494.14	50,367.56
Net Assets (see note 4)	134,416.15	77,120.49
Reserves		
Designated funds		
Symington Grieve Trust Fund	500.00	500.00
Sir W. W. Smith Lectureship Fund	300.00	300.00
Urban Flora Project	2,342.00	2,342.00
Botany of the Lothians Fund	2,258.06	2,258.06
Total	<u>5,400.06</u>	<u>5,400.06</u>
General (unrestricted) funds	<u>129,016.09</u>	<u>71,720.43</u>
Total Funds	<u>134,416.15</u>	<u>77,120.49</u>

Notes to the Statements of Receipts & Payments

Note 1 Accounting Policies

Receipts and Payments

The accounts are presented on the basis of receipts and payments.

VAT

The Society is not registered for VAT and accordingly expenditure includes VAT where appropriate.

Unrestricted funds

Revenue

The funds of the Society which the Council are free to use in accordance with the Society's objectives. Any unrestricted revenue surplus is transferred to the unrestricted capital fund.

Note 2 Council members remuneration

Council members do not receive any remuneration in their role as council members

Note 3 Taxation

The Fund is recognised by the Inland Revenue as a charity and no charge for taxation arises on the results for the year

Note 4 Commitments and contingent liabilities

There are no contingent liabilities at the 2017-18 year end (for 2016-17, £nil). Editorial Subventions provided by the Publishers, Taylor & Francis, for 2014/15 and 2015/16, 2016/17 & 2017/18, totalling £13,418, are available to cover costs of the Journal Editor, including the promotion of the Journal at International Conferences.

Key points for our members (noted at the May AGM) are

- a) The Basil Ribbons bequest, received in January 2018 has been placed in the CCLA deposit account.
- b) We are proceeding slowly with investing some of our cash into Funds. The first tranche of £5000 had been invested in the CCLA Ethical Income Fund.
- c) We have received Gift Aid payments from members' subscriptions totalling £1541 for 2015-16 and 2016-17.
- d) The student dissertation prize of £200 and schools photographic prize of £50 were awarded.

e) There is a surplus of receipts over expenditure of £2,216 for FY 2017-18, however, we have not yet received the invoice from the publishers of Plant Ecology & Diversity for our standard members copies. The invoice is expected to be c. £4,200.

f) Cash at Bank £28,922

g) Cash in CCLA Deposit Fund £105,494. BSS Council has sanctioned that £80,000 of this will be transferred in 10 tranches to the CCLA Ethical Fund. This will establish an endowment which will provide an annual income of c. £2500 for charitable awards.

h) The Society's assets stand at £134,989.

i) Our designated funds held within our assets will be reviewed by Council. These include £16,000 that is available to assist the PE&D Editorial Team, as required by them.

j) As the financial situation is sound, the Treasurer stated that there is no proposal to increase membership subscriptions.

The President requested a preliminary approval of the accounts by the AGM. This was done by show of hands

BSS NEWS – INFORMATION AND GUIDELINES FOR CONTRIBUTORS

The Newsletter of the Botanical Society of Scotland ISSN 0967-5922

Editors:

Receiving editor:

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Roger West

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Aims of BSS News

The chief aims of BSS News are to communicate with the membership, to keep members informed and to act as a vehicle for members' contributions on all things botanical. All contributions are welcome.

Scope of the Newsletter

The content of BSS News is as kaleidoscopic as possible around the botanical theme and we are keen for this variety to continue. For a list of ideas for contributors see the BSS website (www.botanical-society-scotland.org.uk) and the following list, but please don't feel constrained by it. New ideas are welcome. Regular contributions include the following items:

- Reports of field excursions (leaders please take note), picking out the botanical highlights.
- Descriptions and recommendations of other botanical sites in the UK or abroad (it might help people to plan their holidays)

- Articles of current or historical interest, including ethno- and achemo-botany.
- Biographical profiles of botanists.
- Botanical poems.
- Botanical notes, news items, announcements of future events, reports of meetings attended, correspondence, small ads etc.
- Book reviews.
- Crosswords and quizzes.
- Illustrations, including paintings, photographs and line drawings, or even witty cartoons if they are your forte! A stock of small b/w line drawings of plants would be useful for filling areas of whitespace at the end of articles. Coloured illustrations can only be printed on the inside and outside cover, and usually illustrate articles.

Guidelines for contributors

Do not worry if you cannot comply with all the following guidelines. Just send what you can and the Editors will make adjustments.

File name for email submissions and web uploads.

Please include your own name and indicate article content in the file name. Also add your name, preferred title and affiliation etc. to the end of your article. If possible, please add a contact email address (see our template on the BSS website for full instructions)

Text

The Newsletter is set up on A4 pages in MS Word 2010 using Ariel font (size 15 for major text, 18 for main headings and 14 for references and acknowledgements). Margins are set at 2 cm (sides) and 2.5 cm (top and bottom), with headers and footers at 1.5 cm. Text is justified and single-spaced. Paragraphs are followed by 6pt spacing. **Please use the template on the BSS website to submit articles in this format.**

Illustrations

The cover is the display area for colour pictures. Please include the name of the photographer or artist with all images. Line drawings, maps or graphs in the text look best in black-and-white or greyscale.

Submission

Please send your contributions to the Receiving Editor by:

- Post at the address above.
- Email to the Receiving Editor at jill.thompson99@gmail.com

When sending something by post please phone 0131 258 2358 or email jill.thompson99@gmail.com to let Jill know that something has been posted.

The last deadline for the next issue will be 15th January 2019. Earlier submission would be appreciated.

Back cover pictures

Outside

Buddleja davidii, illustration by Janet Dyer for the article by Adrian Dyer on p. 29.

Inside

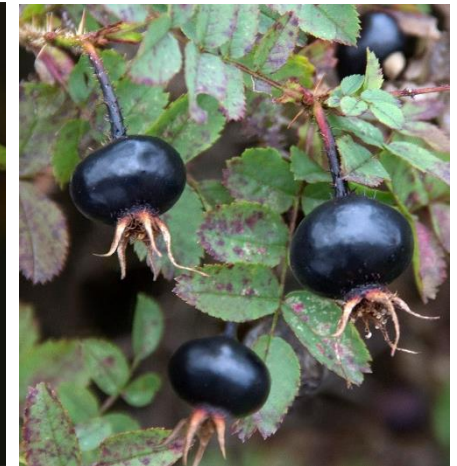
Photographs of *Rosa* species, to illustrate article by Peggy Edwards on p. 41. All photographs © Peggy Edwards:

Top row (l to r): *Rosa caesia* ssp. *glauca*, (Glaucous Dog Rose), flowers, fruits (hips), leaves.

Second row (l to r): *Rosa mollis* (Soft Downy Rose), flower, leaf, hips.

Third row (l to r): *Rosa sherardii* (Sherard's Downy Rose), flower, fruits (hips); *Rosa pimpinellifolia*, Burnet Rose, flower.

Bottom row (l to r): *Rosa canina* (Dog rose), flowers, fruits (hips); *Rosa pimpinellifolia* (Burnet Rose), hips





x10



x1



x20



x10



x10



x20