BSS News

The Newsletter of the Botanical Society of Scotland

No. 116 March 2021





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

Captions to front cover pictures:

Outside: *Cirsium vulgare.* See article by Peggy Edwards on page 50. Set 5, listed on page 54.

Inside: **Top:** *Phytophthora austrocedri* has led to the death of some of the juniper growing in Glen Artney, Perthshire (foreground of the picture); some healthy bushes can be seen in the back right. See article by Eleanor R. James on page 17.

Bottom: "Copsewoodforest.com". See article by Gabriel Hemery, page 47.

Images are by the authors.

BOTANICAL SOCIETY OF SCOTLAND

c/o Royal Botanic Garden Edinburgh
20A Inverleith Row, Edinburgh, EH3 5LR
Website: http://www.botanical-society-scotland.org.uk
You can follow the BSS on Facebook and Twitter.

Founded in 1836 as the Botanical Society of Edinburgh, the Society became the Botanical Society of Scotland in 1991. Meetings are held in Edinburgh, and at the invitation of local societies in Aberdeen, Dundee, Inverness, Perth and St. Andrews. We encourage the study of flowering and non-flowering plants. Our activities include lectures, field meetings, symposia, surveys, and an annual Scottish Botanists' Conference held jointly 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 our behalf. Standard members can also access all the Society's journals online, 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 Hon. General 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-societyscotland.org.uk/content/bss-membership.

Subscriptions fall due on 1st October each year,
Deadline for renewal is Christmas Day:

Standard rate (with the Journal Plant Ecology and Diversity)	£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

We hope that you are all managing during these still difficult times, and are taking the opportunity of daily exercise to enjoy a little botanizing on the way. You will see from the enclosed field programme that we have planned a limited range of excursions that we hope to run but it all depends on the government guidelines and Covid regulations applicable at the time of the excursion. You MUST contact, in advance, the leader of any field excursion you plan to attend, in order that you keep up to date with any changes or cancellations.

We also draw your attention to the arrangements for the Society's Annual General Meeting. This has been changed to the 27th May 2021, leaving the final lecture on its advertised date as planned. See further details in this newsletter on page 5.

You will also see that we have updated the value and eligibility of student field work project and training awards. These are now available to both undergraduate students and those in their first year following the date of graduation. If this applies to you, take a look at page 33.

We are very pleased that so many people have joined the online monthly lectures. Sorry for the times when this has not worked as smoothly as it might. Remember that the lectures will be available on our YouTube channel a few days later. We would be interested in your feedback as to how well this worked for you and what you would like next season: please see the item on page 56.

Note that there are two appeals for help from our members. One is for information on Scottish woodlands that may feature in a new book in preparation by Gabriel Hemery, and the other for observations on Cowslips.

Many congratulations to Barbara Sumner (a previous editor of this newsletter and ex-President of the BSS) who has just updated the wonderful and comprehensive Scarce, Rare and Extinct Plant Register for Midlothian. Chris Jeffree takes a look at this on page 35. Barbara has recently stepped down from her role as BSBI vice county recorder. Many thanks to her for her efforts to support botanical recording in Scotland.

Thank you to everyone who has provided articles for this edition. Please offer new articles by the next deadline on **15th July 2021**. Best wishes to all members of our society in these difficult times.

Jill Thompson and Roger West.

ANNUAL GENERAL MEETING 2021
CHANGE OF DATE TO 27th May 2021

When our Lecture Programme was prepared for printing last August, we thought that by now we would be back to holding events in person at the RBGE. However, this has not happened, and we are continuing to hold events online. The dates and times of our lectures have not changed from those advertised in the BSS news last September, and our members will receive an email a few days in advance about how to join a lecture online. If you are not receiving these emails, please contact me to update your records. If the lecturer agrees, the lecture will be recorded, and it will be available on YouTube a few days later.

Usually, our AGM is held immediately after the last lecture of the season, but online meetings are tiring for all, so we have decided to hold the AGM on a different day, at 6pm on 27th May 2021, which is one week after the final lecture of the season.

At the AGM we will report on our activities over the last 12 months, present our draft financial accounts, elect members to our governing body (BSS Council) and answer your questions about the BSS.

The provisional agenda for the AGM is as follows:

1. Chair's welcome, apologies for absence, opening remarks.
2. Draft minutes of the AGM 2020 for approval (they are available in the members' area of our website, and will be circulated in advance of the meeting).
3. President's Annual Report.
4. Treasurer's Annual Report and determination of subscription rates.
5. Election / re-election of Council Members.
6. Any other Business.

Further information about the AGM will be sent out by email. If you do not use email and wish to receive further information by post, please contact us in writing at Botanical Society of Scotland, c/o Royal Botanic Garden Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR at least 14 days before the meeting, marking your envelope 'AGM'.

Can you help us to run the BSS?

The BSS is run by volunteers, and we have some vacancies on our Council. We arrange the lecture and field programmes, keep financial accounts, manage membership, publish the *BSS News*, *Plant Ecology & Diversity* and our new blog 'Botany in Scotland', run a

website, organise projects, award student prizes and grants, and sometimes comment on relevant national strategy and planning issues (e.g. Coul Links).

You do not need to be a 'qualified botanist', an interest in plants and a willingness to help is all that is required. You will also help to keep the Society relevant to Scottish botany and to our membership. We hold about 5 Council meetings a year and use email frequently. If you are interested, or have further questions, please send me an email. Applicants to join our Council should provide a brief (one paragraph) résumé of their interests and experience, and details of two members of the BSS (a proposer and seconder) who have agreed to nominate them. If you wish to apply but do not know any other BSS members, please contact us and we will help you to sort this out. Nominations must be sent to the General Secretary of the BSS, to be received no later than 29th April 2021.

Julia Wilson, President BSS
jwi@ceh.ac.uk

Liz Lavery, General Secretary BSS
general.secretary@botanical-society-scotland.org.uk

JIMMY RATTER, BOTANIST AND LIFE MEMBER OF BSS

Born: February 15, 1934, in Cambridge. Died: November 3, 2020, in Edinburgh.

James Alexander Ratter ("Jimmy" or "Jim"), who has died aged 86, was an internationally respected tropical botanist. Based at the Royal Botanic Garden, Edinburgh, he devoted his work for 55 years, to researching and championing the preservation of the cerrado, Brazil's vast tropical savanna region. He is remembered as a dedicated scientist, selfless mentor and a man of generous spirit and sharp wit.

The eldest child of Helen and Alexander, Jimmy spent most of his childhood and early 20s in Liverpool, where he studied for his undergraduate and PhD, the latter researching the chromosomes of the sea-spurrey, *Spergularia*. There was one break from Liverpool in the Second World War when he was evacuated with his mother to live with her parents in the Blackhall area of Edinburgh.

Shortly after completing his PhD, and marrying Pamela “Pam” Allsop, in 1960, Jim accepted the position of Scientific Officer at the Royal Botanic Garden Edinburgh. He remained at the Garden his entire career, continuing long into his retirement. His work ceased only in 2017, when Alzheimer’s disease made work impossible. His final scientific paper was published in 2019.

Jimmy was devoted to the study and preservation of the plant diversity of the cerrado, which supports an amazing 10,000 plant species. He described plant species new to science and mapped patterns of plant diversity, providing vital data for identifying areas that should be conserved. His legacy is a much fuller understanding: today, these habitats are in the public spotlight, highlighting threats of destruction, such as in soy production for animal feed in Europe.

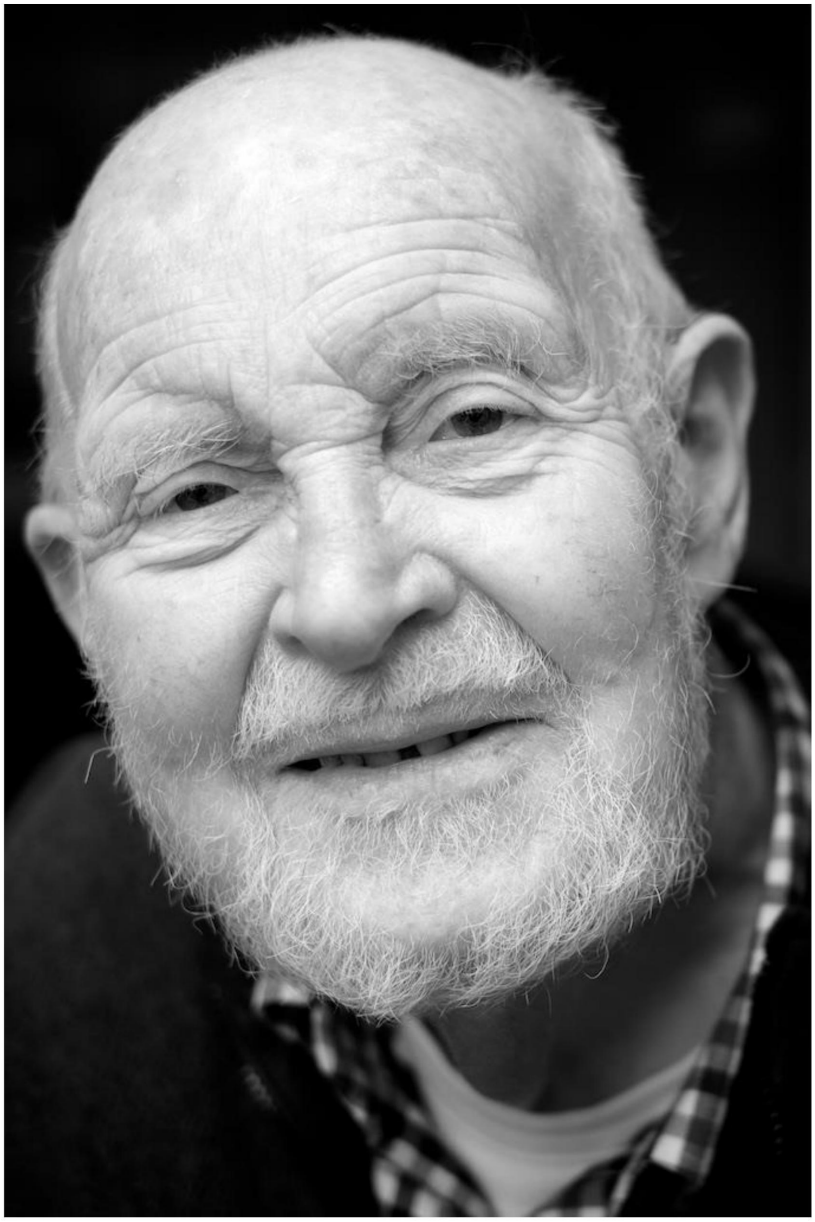
He loved Brazil, from his first visit in 1967 with the Anglo-Brazilian expedition to Mato Grosso, organised by the Royal Society and Royal Geographical Society. His fieldwork, which continued well into the 2000s, included leading the Ecological Survey of the Maracá Rain Forest Project. Led by the Royal Geographical Society at the invitation of the Brazilian Secretariat for the Environment (SEMA), it was one of the largest early multidisciplinary research projects in Amazonia.

Recognising the importance of speaking Portuguese, Jimmy quickly became fluent. His range of vocabulary and ability to use the vernacular of the varied areas he visited was extraordinary and surprised and delighted Brazilians wherever he went.

Most of all he enjoyed interactions with local people and shared the country’s love of the national drink – cachaça; the stronger and more rustically brewed the better! It is notable that his stories of times in Brazil never focused on illustrious scientists he travelled with, but his field assistants and drivers. Often from poorer backgrounds of the most rural areas of the sertão, they became life-long friends. Jimmy seemed to enjoy the maverick and the loveable rogue above the establishment figure. The detailed diaries of his travels now represent a culturally significant, albeit idiosyncratic, social history of central Brazil, which was a lawless frontier of agricultural expansion when he started working there.

He was blessed with an extraordinary memory, seemingly able to recall the exact situation and characteristic of every plant he ever collected. These amounted to over 8,000 and his specimens now form

the key reference point for cerrado plant diversity in collections around the world. It was particularly sad that this exceptional memory was slowly erased by Alzheimer's, yet it was a delight to see the smile on his face when he did recall his experiences and the exploits of old friends from Brazil.



Jim had legendary stamina in the hot, open, vegetation of the cerrado, despite some peculiar habits. He never drank water during the day because he claimed this caused tiredness. Rehydration came from copious quantities of cold beer, starting late morning - should a bar be passed for refreshment - en route from one field site to another and continued, whilst pressing plants, through the late afternoon and long into the evening.

Long nights or lunches drinking with Jim in Brazil, or in Edinburgh, exemplified a relaxed approach to academia and he rightly railed against colleagues who were “too busy” to spend an extra hour or two to chat. While that may have been partly about camaraderie, he realised the value of relaxed discussion - now often sadly lacking in the modern academic world - for generating ideas and team-building.

Jim was a brilliant botanist, an incisive thinker and writer of the clearest prose. That his academic achievements have not received the wide recognition in the UK that they have in Brazil, reflects his disdain for academic showmanship and loyalty to the Royal Botanic Garden Edinburgh. When most scientists would have directed papers to more prestigious multidisciplinary scientific journals, many of his most significant papers were published in the Edinburgh Journal of Botany.

Elected to the Royal Society of Edinburgh in 1998, Jim’s contribution to botany and conservation is well recognised in Brazil. His many honours include the Grand Cross of the National Order of Scientific Merit (Grã-Cruz da Ordem Nacional do Mérito Cientifico), one of the highest scientific accolades given by the Brazilian Government.

Jim’s most lasting impact in Brazil was in building capacity for biodiversity science. He was professor at the University of Brasília and helped found the influential Ecology Department in the 1970s. More recently, he assisted and guided the biological campus at the State University of Mato Grosso, where he has been honoured by a plant collection bearing his name, the Coleção Zoobotânica James Alexander Ratter.

His spirit shone until the end. A favourite activity was editing, redrafting and translating scientific manuscripts of Brazilian students, friends and colleagues and this persisted through the fog of Alzheimer’s. In summer 2019, I visited him in hospital after a fall broke his pelvis, and I left a copy of a paper he had co-authored. The following day, his daughter Alison called to ask if we had worked on it together as she had found it covered with Jim’s neat and precise handwriting; he had woken during the night and decided to give it the Ratter editorial treatment.

Jim is survived by his wife Pam, brother David, sons David and Andrew, daughter Alison and their families.

Toby Pennington

Reprinted with permission from Toby Pennington and the Royal Botanic Garden Edinburgh. Photograph of Jimmy by Roger Hyam.

WEBSITE: BOTANY IN SCOTLAND

Notes and Conversations on all things Botanical

In April 2020 we realised that it would not be safe or legally possible to run our field programme, due to the Covid-19 pandemic. Those of us involved in field visits were especially disappointed, as we had spent time and much e-mailing to set up visits, and were looking forward to investigating those parts of Scotland where we have few data for the Urban Flora Project (principally the West and North). The lockdown has also affected our lecture programme of course, as well as our AGM.

We did not want to disappoint our Members, so we decided to establish a botanical blog (the word blog is a truncation of Weblog). The idea was to publish informal articles ('posts') that would appear at least once a week and report matters of interest, such as diaries of peoples' plant-spotting walks, and whatever else came to mind (but strictly botany). We already have the *News* of course, and that is thriving (you are reading it now). The blog is different: it is 'immediate', a superb vehicle for images and most suitable for light-hearted articles, botanical illustration or opinion pieces. The *News* is good for more serious and scholarly matters, and acts as the archive of the Society. We wouldn't like to lose it!

We found it was easy to set up a blog site, and inexpensive. We used WordPress, probably the most frequently used site provider in the world (according to Wikipedia there are 60 million WordPress sites world-wide). It describes itself as a 'free and open-source content management system'. Sure enough, there is a free, basic version; however, we soon realised that we would need a bit more than the most basic, and the annual fee for something a lot better was easily-affordable. There was some discussion about whether it should be a password-protected site for Members-only, but we decided to make it completely open and wait and see what happens. We launched in May and asked a few people to write articles.

From the start, we found it unexpectedly easy to upload text that members submitted. To get the best presentation however, editors do need to learn the 'bells and whistles'. That is a longer process; we are still learning. Unlike editing a journal or magazine, there is no need to worry about format, font or page-breaks. One simply uploads a Word file and images (contributors should remember to send the images to us

separately, rather than already pasted into Word). Wordpress does most of the rest.

We decided to start a series called Plant of the Week (PotW), preferably featuring a species currently in flower. At the time of writing this, we have managed to produce a PotW every single week. Non-flowering plants and fungi are encouraged too, especially in winter. We editors can interrogate the site and see how many 'views' any post has received. Each PotW is published on a Sunday night, and the following day I always look to see whether anyone has viewed it. Typically, 50 people have visited any article by Monday night. On a good single day, the site as a whole has around 100 views but there are plenty of quiet days with only around 20 views. We advertise new blogs on Facebook, and that seems to result in a surge of viewing. Our Facebook site is: https://www.facebook.com/groups/botsocscot/.

The web is of course a great place for botanical images, and a typical PotW has several high-resolution photographs and often species distribution maps (BSBI for British and Irish distributions and GBIF for global distributions, reproduced with permission). Both Chris Jeffree and Richard Milne have a great archive collection of plant images, and Chris has often made truly remarkable close-up images especially for specific articles.

Aside from PotW we have published botanical walks, articles about main-stream science papers, plant identification notes and botanical essays. One of our most important features is the LEARN area, where we are trying to help beginners. It includes introductory videos on plant families prepared by Heather Forbes, as well as general advice on plant identification. Note well: the blog site can also cope with movies and power-point presentations, and it can make active links to other web sites.

We editors can see who our followers are (at least, their pseudonyms are visible). Most seem to be people we do not know, sometimes they are clearly botanists but frequently they are not. We have 48 'followers', many non-botanists and 26 others who do seem to be botanists (some well-known Members) who have requested email notifications every time a post is published.

We can also see where all our viewers came from. When I last checked, we had viewers from 63 countries, most from the UK as expected and some from USA, but regular views also from China and

Romania, as this map shows. The truly international appeal of botany is evident.



Within PotW, some species are more popular than others. The reasons for popularity are unclear- is it the inherent charisma of some species, or is it the author's skill in portraying the species? I really cannot tell. There are surprises: one of our most-viewed posts is about Eyebrights on Fair Isle. It is a niche topic but it easily beats both Common and Giant Hogweed. Mistletoe has rocketed to prominence after just a few days, and Sea Buckthorn has proved popular too.

We sub-titled the site "Notes and conversations on all things Botanical", expecting there would be a lot of feedback and dialogue. There has not been much, but these are early days and this aspect may develop. I had feedback today, from someone on a croft in Benbecula, asking how they might learn more about Hebridean plants; and I have corresponded with a teacher who wants her students to know more about plants.

How do people find us? The internet address is https://botsocscot.wordpress.com. We need to find out more about how google works, as we do not have a strong presence there yet. If I type Botany Scotland into my laptop, the site is only eighth from the top of the list. Our traditional website, still active and definitely the place to look for notifications about lectures etc., comes first.

There is scope for development of functionality. It has been pointed out that we need an index, though the 'Archive' tab lists articles in calendar order. We could (and should) accommodate emails. We could also use the site as the main (but not only) vehicle for selling

merchandise (postcards, T-shirts and the like) and membership payment. As for content, we do now have a YouTube account for recorded lectures, and so we should be able to host virtual field visits as well as our lectures and probably also some on-line tuition.
https://www.youtube.com/channel/UC8vz4IELFMp70aOxM6uo2oQ

We hope our Members will enjoy the various offerings, and perhaps contribute to the blog by sending a Post to me. You can use this address: jgrace@ed.ac.uk. Please put BSS blog in the subject line, and also get in touch if you would like more guidance on the preparation and formatting of articles.

John Grace
jgrace@ed.ac.uk

CONTINUED THREATS TO DUNES IN SCOTLAND FROM PROPOSED GOLF COURSE DEVELOPMENT

I write to update readers upon recent events that concern two fine dune sites in Sutherland, Scotland.

Coul Links

Like many people, I assumed that the Coul dune system in Sutherland had been saved from a major golf development, when the Scottish Government announced on 21 February 2020 that they had refused planning permission. The refusal followed a lengthy Local Public Inquiry over four weeks in February and March 2019. See reports by Julia Wilson and others, and Editorials, in issues 110 – 115, and my article in issue 115.

The two Inquiry Reporters had sided with the evidence of our objector groups in their findings, which were published with the decision by Scottish Ministers (see http://www.dpea.scotland.gov.uk/CaseDetails.aspx?id=119883). The list of likely adverse or uncertain environmental effects was very long and proposed mitigation would not avoid major damage to the ecological integrity of triple-designated ground (part of an SSSI, a Special Protection Area and a Ramsar Wetland of International Importance). The socio-economic benefits of development were important only at local and regional levels, insufficient to outweigh the national status of protected ground. This was a key test in assessing the planning balance under national guidelines.

Local support for the golf development has not accepted this outcome. The decision in 2020 coincided with a minority Holyrood government requiring their annual budget to be passed. Golf proponents and a local councillor believed that planning refusal at Coul was the price extracted by the Scottish Greens for budget approval. Whatever the truth of the matter, the decision has rankled and over the last 11 Covid-19 months, a further golf and hotel scheme has been quietly plotted, then announced in stages in late January 2021 (Community group formed to revive Coul Links golf plan (northern-times.co.uk); Investors prepared to back Coul Links Hotel (northern-times.co.uk)). The revised scheme aims to increase the socio-economic impact, adding a luxury hotel development to the 2017 championship golf course proposal, which will be relaunched. Together the golf course and hotel will probably be promoted as nationally important for Scotland, as part of measures to recover from the economic impact of Covid-19.

Details of the hotel are scant so far: an unknown number of luxury lodges with a breakfast centre. An application was described as imminent on 27th January 2021, but is not yet in the Highland Council planning system. The lodges will be set outside protected ground, upslope and west of the Coul dunes. Their setting is poor-quality improved pasture, rushy meadow, other rough grazing, gorse and birch thickets. They will be set on ill-drained hummocky land, which has had watercourses altered to provide small ponds for duck shooting. Tree planting and landscaping are mentioned in press releases.

The hotel developer is the Coul landowner. He too has not accepted the 2020 ministerial decision. NS (NatureScot, the new operational name for Scottish Natural Heritage) has tried to engage with him but I have Freedom of Information (FOI) material that shows long delays in responding to NS emails and only two detailed discussions in the period from March to late October 2020. NS has offered to fund production of a Site Management Plan for the Coul SSSI sector in the 20/21 financial year, as well as likely financial support to implement all management recommendations. In late October 2020 the landowner was prevaricating, quibbling on the detailed content of what should be in any such plan funded by NS.

This foot-dragging by the landowner, as a project developer, is similar to the fate of earlier proposals over the last decade, as past responses to SNH have demonstrated. These have included an ignored six-figure sum offered by SNH for management and Coul landowners in

that time period have left all long-negotiated agreements with SNH unsigned. Local environmental opposition to golf regards this as a deliberate ploy to allow the area to decline into seriously poor ecological condition. If correct, this could be intended to force NatureScot into approving a golf course in the Coul SSSI sector, along with an agreement to manage ground outside the golf footprint.

The site is in immediate need of stock grazing that must be carefully planned, a programme of scrub and birch removal, plus the removal of brash from an area of felled plantation.

I understand that NS only learned of the hotel scheme from media releases in late January. NS has the power to request that Scottish Ministers impose a Land Management Order (LMO) on the landowner, but as an organisation it is unlikely to do that. No request for an LMO has been issued since this measure was placed on the statute book in 2004, within the Nature Conservation (Scotland) Act. It is likely that NS will now come under pressure to take that path.

On a more positive note, the local opposition group 'Not Coul' has received an offer of financial support, to enable purchase of the SSSI sector. This has been put to the Coul landowner, with no response to date. Not Coul members are already discussing a campaign under a new name to achieve a land purchase that will enable management of dune habitat, as well as using additional ground for an ecological management/research and heritage centre. This would create salaried all-year employment and habitat management training for young people, in contrast to seasonal minimum-wage jobs for the hotel and golf course. Detailed proposals and a planning application will be prepared.

The immediate thinking, amongst some local experienced people in business, is that this golf course plus hotel package will not represent a development of national importance in Scotland. This view will be contested by the developers. The passage of the golf and hotel applications through the planning system will likely be as bitter as the first struggle to keep Coul as dune habitat. It could follow a similar complicated pathway. For example, the application is likely to be approved by The Highland Council who will ignore a recommendation from planning officers to refuse the golf component. The hotel development will be submitted and approved separately, as was the planning application for a reservoir and borehole abstraction in 2018, which received approval and has a CAR licence issued by SEPA.

The role of the Scottish Government (SG) will then be decisive, but not until after the Holyrood elections. The SG has the 2020 decision to refuse a golf development and I doubt if there is any need for a further Inquiry. That refusal was as decisive as can be, and a second refusal seems likely. However, a new majority government could ignore the 2020 decision. It might accept the additional economic and job potential of the hotel as sufficient to be of national importance in a post-Covid 19 context. There is of course a parallel here with the nationally-important economic promises attached to the Trump International golf development at Menie Links. Those promises for Menie enabled the award of planning permission in 2008, but the promises remain unfulfilled.

Foveran Links SSSI, Menie and Trump International

This development within an SSSI continues to make news. Aberdeenshire Council in recent months has awarded planning permission for housing development at Menie (inland from dunes), the first sign of economic and job development since the golf course was constructed between 2009 and 2012. It is much scaled-down from proposals set before the 2008 Menie Inquiry. The Council has also approved a second golf course, within the dunes, extending west and south to the Balmedie Country Park. That will stabilise the last remaining large area of moving dune south of the Ythan and dune habitat beneath the golf footprint will be destroyed. The second course is outside ground designated as SSSI, but all that area had been recognised as SSSI quality in 1999 during work for the Sand Dune Vegetation Survey of Scotland.

NatureScot announced on 9 December 2020 that it was applying partial de-notification to Foveran Links SSSI. The Protected Areas Committee of NS “has concluded that, following construction of the Trump International Golf Links course on the dune system at Menie Estate, this area no longer merits being retained as part of the Site of Special Scientific Interest (SSSI)”. Their evidence suggested that the remaining rare habitats and rare plants “did not represent sufficient scientific interest to merit special protection.”

I fear that a similar fate awaits Coul Links if the resurrected golf scheme somehow receives planning permission.

Dr Tom Dargie
Skelbo (near Coul), Dornoch
1 February 2021

UNTANGLING GENETIC VARIATION IN COMMON JUNIPER

Embarking on a PhD to Investigate Genetic Variation, Local Adaptation and Natural Regeneration to Improve Juniper Conservation

Juniperus communis L. – one of Britain's three native conifer species, is unfortunately in decline and has been for several decades. There are two main population centres, one in the chalk downs of Southern England and one in the Highlands of Scotland, and populations show discontinuous and fragmented distributions (Thomas *et al.*, 2007). There is a map of the distribution of juniper on the inside back cover. There are many factors contributing to this decline, including reduced seed production and seed viability with plant age, lack of seedling recruitment and the severe threat of the oomycete pathogen *Phytophthora austrocedri* (Thomas *et al.*, 2007; Green *et al.*, 2015). *P. austrocedri* was first described in Argentina in *Austrocedrus chilensis* in 2007 and has since been detected in the UK in 2011 - though it has likely to have been present for much longer (Greslebin *et al.*, 2007; Green *et al.* 2015. The epithet *austrocedrae* was proposed by Greslebin *et al*. 2007, but has been superseded by *austrocedri* in accordance with Latin spelling). The source of the introduction is likely imported plants, but the geographical source is unknown. The pathogen is now widespread in the UK (there is a map on the inside back cover), and causes girdling of the juniper stem, causing bronzing of the crown and in many cases leading to death. There is a photograph of juniper killed by *P. austrocedri* on the inside front cover. There is evidence of natural resistance to the pathogen in *J. communis*, and research into the potential heritability of this is ongoing (Green *et al.*, 2020).

I have begun a University of Edinburgh PhD project, supported by the Scottish Forestry Trust, along with The Botanist Foundation, The Woodland Trust, Forest Research and the UK Centre for Ecology & Hydrology, and over the next few years hope to fill in some of the gaps in our knowledge of this important species. I am asking the following questions: (i) How much genetic variability is there in our juniper populations and how is this distributed across the UK? (ii) Do these populations show local adaptation? (iii) What are some of the factors that affect seed germination and natural regeneration? (iv) How might

these results inform conservation strategies and management guidance?

The distribution of genetic diversity in British juniper is not known. I will be quantifying genetic variation using an existing dataset of genotyped individuals from 18 natural populations, and look at how this variation is structured across populations. This will give an idea of the relative ability of a population to adapt to coming changes (Fady *et al.*, 2016). If plant material needs to be sourced from outside a specific population for conservation purposes, then it is vital to ensure these plants will survive under the present and future conditions (Perks & Ennos, 1999).

As anyone who has seen juniper in the field can attest, there is an astounding amount of morphological diversity within this species (Thomas *et al.*, 2007). Individuals may be tall and tree-like, short and shrub-like, have different colour foliage, size of needle, density of needles and so on. Though this variation is well documented in juniper, the extent to which environment or genetics contributes to this variation is not so clear. A common garden trial has been established (see photo page 31), to enable measurement of traits relating to fitness differences under identical environmental conditions. This makes it possible to quantify adaptive traits and subsequently relate these to climatic and environmental factors. This method has been used to great effect, for example in phenology within the native Scots Pine (Salmela *et al.*, 2013; Wachowiak *et al.*, 2018).

I am in the process of gathering preliminary trait measurements on a subset of individuals in the common garden trial. Though still in early stages, there are already some measurable differences in some traits – such as length and diameter of the leading stem. Much of this diversity is within-population, but there is also some between-population variation. After I have completed this subset of measurements and a statistical analysis, I will choose the most tractable traits and measure these on the rest of the trial (approx. 900 individuals!).

Given the threat of *P. austrocedri,* it would be great if we could encourage natural regeneration of juniper, thus limiting accidental introductions of the pathogen from unknown sources. I have started designing some experiments to look at some of the factors affecting natural regeneration and germination, being mindful not to spread the pathogen between healthy and infected sites and disinfecting boots after visiting each field site.

I look forward to updating you all in the future with results from my research.

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GREET THE SPRING WITH COWSLIP OBSERVATION

A pan-European citizen science initiative 'Looking for Cowslips' welcomes everybody to follow the steps of Charles Darwin and contribute to exciting research

“No little discovery of mine ever gave me so much pleasure as making out the meaning of heterostyled flowers,” Charles Darwin wrote in his autobiography in 1887 (Darwin 1887). What was the phenomenon that prompted Darwin, the father of evolutionary biology, to express such fascination? He was puzzled by the fact that about half of cowslips (*Primula veris*) have flowers with a short style and long anthers (S-morphs or *thrum* flowers), while the other half of individuals produce flowers with a long style and short anthers (i.e. L-morphs or *pin* flowers). These are illustrated at the bottom of the inside back cover.

Darwin was not satisfied until he managed to figure out the purpose of this kind of floral polymorphism, which he called distyly. He was the first one to realise that distyly promotes pollen transfer between cowslip individuals and prevents them from self-fertilisation. This realisation gave him so much satisfaction that he reflected his delight in the finding, even after years had passed since this discovery.

To successfully produce offspring, cowslips with L-morphs need to spread their pollen grains to cowslip individuals, which bear S-morphs. The same system also works the other way round - the pollen from S-morphs has to reach L-morphs for successful fertilisation. In this way, the plant cannot pollinate itself and decrease the risks of inbreeding and genetic erosion. Cross-pollination between different types of flowers further encourages the exchange of genetic material and thus supports maintaining genetic diversity.

For ensuring high reproductive output, the optimal frequency of plant individuals bearing either thrum or pin flowers in cowslip populations is usually equal, i.e. 50:50. Deviations from this ratio reduce cowslip's opportunities to find a suitable mate, which impedes successful pollination and the exchange of genetic material. This, in turn, reduces the long-term viability of cowslip populations.

Recent discoveries have suggested that the loss and fragmentation of cowslip's preferred habitats — traditionally managed semi-natural grasslands — may shake the optimal balance of morphologically different plants. Lower opportunities for mating and

reduced size of cowslip populations resulting from habitat loss make this species particularly vulnerable to landscape change.

Now, nearly 160 years after Darwin's landmark study "On the two forms, or dimorphic condition, in the species of *Primula*, and on their remarkable sexual relations" (Darwin 1862), citizen scientists will again explore the patterns of cowslip heterostyly, but in this case all across Europe. With the help of this collectively gathered data, we will examine the consequences of drastic grassland decline for the complex 'marriage arrangement' of cowslips and related well-being of this beloved grassland plant.

This citizen science campaign was first piloted in Estonia in 2019. Observations of more than 200,000 cowslips originating from more than 1700 locations led to unexpected discoveries, which were recently published in the *Journal of Ecology* (Aavik *et al.* 2020). First, data revealed a systematic dominance of thrum over pin morphs. Second, morph frequencies were more likely to deviate in smaller cowslip populations. Third, deviations increased in landscapes with higher human population density.

The findings brought novel scientific insights: the systematic dominance of thrum plants is an intriguing, but previously undescribed aspect in this otherwise well-studied plant mating system. These discoveries are also relevant for conservation. Unequal morph frequencies are likely to threaten the viability of heterostylous plants through reduced mating success and lower genetic diversity, which make them more vulnerable to any future environmental perturbances.

Though we now have a better overview of the patterns of heterostyly in cowslips, the mechanisms behind this surprising observation are not entirely clear. Are the patterns similar across Europe? Are the differences in cowslip morph frequencies even more pronounced in human-dominated landscapes, with highly fragmented grassland habitats? How is this common grassland plant doing in European landscapes? Is cowslip still a "common" species in Europe? Everybody is welcome to contribute data to help us answer these questions.

The campaign received a warm welcome in Estonia. It engaged people from all age groups and proved to be a lot of fun. The observer does not need to have any other previous knowledge other than being able to recognise cowslips. One has to go into nature, take along a

smartphone/tablet with internet access (or print out observation form on paper), find cowslips, determine the morph type thrum or pin of about 100 cowslip individuals per location (it is also fine when there are fewer plants), fill in the online form, and finally, take photos of oneself and cowslips. All relevant instructions and data uploading tool can be found on web-page www.cowslip.science. This uploading tool can be used in any location, but the project organizers are working with Plantlife UK to produce a UK app. that might be easier to use in the UK. Check the Plantlife website for further information. All questions are welcome: info@nurmenukk.ee.

Of course, to ensure your health and safety while doing the observations, please do not forget to follow the local guidelines related to the spread of the Coronavirus Covid-19!

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USING OLD FLORAS – A STORY OF BUTTERCUPS

My introduction to the use of a Flora was when, as a sixth-former, our biology teacher told us not to worry about the A-level syllabus but instead learn the names of plants and do some proper science. Yes, he was an eccentric but several of us benefitted from this method of teaching. Others fell by the wayside. We would venture into the lanes and hedgerows of rural Bucks and Beds clutching Clapham, Tutin and Warburg (CTW) to identify the common plants; we were equipped with jars to collect *Pellia* and *Lemna* on which to conduct fiendish experiments (for these plants, we were told, are most excellent for experimental work of all kind).

I found CTW quite intimidating, and kept *The Observers Book of Wild Flowers* in my bag as back-up. When I finished my A-levels (with reasonable passes), I went to Sheffield University. The Head of Botany then was A.R. Clapham of Clapham, Tutin and Warburg (1952) fame. He took us to some memorable sites, mostly in Derbyshire, where we were expected to use CTW to identify the species. Books with pictures were frowned upon by Arthur Clapham; I think he despised anything that lacked intellectual rigour.

As time went by, I realised that my progress would be enhanced if I used a combination of CTW and Keble Martin's *The Concise British Flora in Colour*. I also realised that my true interests lie not in plant taxonomy, but in plant physiology and ecology. Nevertheless, I still enjoyed identifying plants and have always had these two books to hand, ready-to-go. I was somewhat dismayed when Stace's flora was published – I could not see the point: it was less portable and its plant descriptions were often not as good as CTW's. However, my interest in floras had been kindled and I would buy any old ones from second-hand bookshops. I often find them sitting on dusty bookshelves, often complete with a few pressed specimens between their pages and adorned with pencilled comments in the margins, sometimes even with postcards and notes, as if the book had been in use until the very moment of sale.

Table 1. *Ranunculus* species as reported by various authors. Those authors marked with * reported species in 'Glasgow', 'Clyde Area' or BSBI Vice Counties 76, 77, 99 (Renfrewshire, Lanarkshire and Dunbartonshire); Lightfoot and Hooker wrote floras of the whole of Scotland. (*continued on opposite page*)

Lightfoot (1777)	**Hooker (1821)**	**Scott-Elliot (1901)***	**Lee (1933)***
R. acris	*R. acris*	*R. acris*	*R. acris*
R. alpestris	*R. alpestris*	*R. arvensis*	*R. alpestris*
R. aquatilis	*R. aquatilis*	*R. auricomus*	*R. aquatilis*
R. arvensis	*R. arvensis*	*R. baudotii*	*R. aquatilis*
R. auricomus	*R. auricomus*	*R. bulbosus*	*R. arvensis*
R. bulbosus	*R. bulbosus*	*R. confusus*	*R. auricomus*
R. ficaria	*R. ficaria*	*R. drouetii*	*R. baudotii*
R. flammula	*R. flammula*	*R. ficaria*	*R. bulbosus*
R. hederaceus	*R. hederaceus*	*R. floribundus*	*R. drouetii*
R. hirsutus	*R. hirsutus*	*R. fluitans*	*R. ficaria*
R. lingua	*R. lingua*	*R. godronii*	*R. flammula*
R. repens	*R. repens*	*R. hederaceus*	*R. fluitans*
R. scleratus	*R. scleratus*	*R. lenormandi*	*R. hederaceus*
		R. lingua	*R. heterophyllus*
		R. peltatus	*R. hirsutus*
		R. pseudo-fluitans	*R. lenormandi*
		R. repens	*R. lingua*
		R. sardous	*R. omniophyllus*
		R. scleratus	*R. peltatus*
		R. trichophyllus	*R. penicillatus*
			R. pseudofluitans
			R. radians
			R. repens
			R. sardous
			R. sceleratus
			R. trichophyllus

Table 1 (*continued from opposite page*) *R. bulbosus1* refers to var. *dunensis* and *R. penicillatus2* and *R. penicillatus3* refer to variants: subsp. *pseudofluitans* and subsp. *pseudofluitans var. pseudofluitans.* The abbreviation BSBI refers to the Botanical Society of Britain and Ireland.

BSBI (1930-9)*	**Dickson (2000)***	**BSBI (2010-9)***
R. acris	*R. acris*	*R. acris*
R. aquatilis s.l.	*R. aquatilis*	*R. aquatilis s.l.*
R. aquatilis s.s.	*R. arvensis*	*R. aquatilis s.s.*
R. arvensis	*R. auricomus*	*R. auricomus*
R. auricomus	*R. bulbosus*	*R. bulbosus*
R. baudotii	*R. ficaria*	*R. flammula*
R. bulbosus	*R. flammula*	*R. fluitans*
R. bulbosus1	*R. hederaceus*	*R. hederaceus*
R. flammula	*R. lingua*	*R. lingua*
R. fluitans	*R. omniophyllus syn baudotii*	*R. omiophyllus*
R. hederaceus	*R. peltatus*	*R. peltatus*
R. lingua	*R. penicillatus*	*R. penicillatus*
R. omiophyllus	*R. repens*	*R. penicillatus2*
R. peltatus	*R. sardous*	*R. penicillatus3*
R. penicillatus	*R. sceleratus*	*R. repens*
R. repens	*R. trichophyllus*	*R. sceleratus*
R. sardous	*R. x bachii*	*R. trichophyllus*
R. sceleratus		
R. trichophyllus		

Nowadays, second-hand bookshops have contracts with Amazon, and one can browse on-line. Another development is the re-publication of some of them as facsimiles, for example in the series by the London publisher, *Forgotten Books*.

The purpose of this article is to ask, are old floras useful for detecting floristic change? Are they goldmines of information about the flora of yester-year (the 19th Century or earlier), or are they simply sentimental relics to be collected and admired, like antiques? In those earlier times botanists were nearly all well-off gentlemen, often physicians as well as botanists, like John Hutton Balfour (one of the founders of the BSS in 1836). They swapped specimens and built important herbarium collections; they were Fellows or Members of austere learned Societies (in London, the Linnean, established 1788; in Edinburgh, the Botanical Society of Scotland, 1836; in Glasgow, the Natural History Society, 1851); they corresponded with their counterparts in far-flung parts of Europe, and quite often they travelled.

My investigation focuses on the genus *Ranunculus*, the buttercups and crowfoots. I asked how many species were there in the Glasgow area and have any been lost or gained? My starting point was Lightfoot's (1777) *Flora Scotica*; I compared this with Hooker's 1821 book of the same name, then Scott-Elliot's 1901 species list for Glasgow, followed by Lee's 1933 *Flora of the Clyde Area* before going to the modern Dickson *et al.* (2000). I then compared these with the BSBI data base for the periods 1930 and 2000. However, this seemingly straightforward inquiry is more difficult than it seems, as species names have sometimes changed and subspecies may have been subsumed into species. There was a tendency, especially in Lee (1933) to elevate subspecies to species, and never have any of these authorities addressed the fundamental question of 'what is a species?'

Lightfoot (1821) has 13 species of *Ranunculus* and so has Hooker; one imagines that Hooker was influenced by Lightfoot's work – he needed something rather quickly as he had just arrived at Glasgow University and faced the task of teaching botany. Decades later, Scott-Elliot (1901) has 20 species but Lee (1930) trumps that with 25 species. All those on Hooker's list were present but he gained a further 12, as shown in Table 1, on pages 24-25. We can perform a check on Lee (1930) by using data from the same period from the BSBI (some of which were contributed by Lee himself). The BSBI's list of 19 bears rather little resemblance to Lee's: only 11 species are common to both,

whilst seven are lost and eight gained. Further research suggests this is not the result of species turnover, but that it occurs because the BSBI's clever software has done its best to bring the species names up-to-date. The BSBI list contains two related taxa of water buttercups: *R. aquatilis* s.l. and *R. aquatilis* s.s. as well as a new variant of *R. bulbosus*, var. *dunensis*. One of my favourite sources of taxonomic data is GBIF, the Global Biodiversity Information Facility (www.GBIF.org). It tells me that as many as 76 names have been used to refer to *R. aquatilis* s.l.

In frustration, I turned to Dickson *et al*. (2000) and the BSBI's modern list (2010-2019). There is relief here. The lists are more or less the same and they check against the 17 species in Stace (2019), all except for *R. ficaria* (lesser celandine; now *Ficaria verna*). It is now possible to translate Hooker and Lee's lists into modern species lists to discover that i). Lightfoot and Hooker probably missed a few species and ii). there hasn't been much change. However, *R. alpestris* (Alpine buttercup) has definitely been lost, and *R. arvensis* (Corn buttercup) is very rare.

This exercise has taught me that old floras, if they are to be used at all to detect floristic change, need much research to 'translate' old names into modern ones. It will always be better to use BSBI data if the period of interest is from 1930 onwards. Old floras can however be useful in other ways: many of them provide locational data (but no modern grid references were available until after 1936) and they usually have excellent botanical descriptions. Their authors were often great scholars; one may admire their vision and energy.

John Grace

Captions to Centrefold pictures, pp.29-32:

All centrefold pictures, except that at the bottom of page 31, illustrate the article by Peggy Edwards on Page 50. The species in each of Peggy Edwards' Sets are listed on the pages indicated. All photographs are by the authors.

Page 29: Peggy Edwards, Set 1; See page 53.

Page 30: **Top:** Peggy Edwards, Set 2; See page 53.

Bottom: Peggy Edwards, Set 5; See page 54.

Page 31: **Top:** Peggy Edwards, Set 3; See page 53.

Bottom: Young juniper grown from seed from across the UK, under common conditions in the glasshouse trial at UKCEH Edinburgh, demonstrating morphological variation in form. See article by E. R. James on page 19. This photograph has been cropped.

Page 32: Peggy Edwards, Set 6; See page 55.













STUDENT AWARDS: FIELDWORK PROJECTS, TRAINING COURSES AND STUDENT DISSERTATION PRIZE

There have been some changes this year, so please read on!
The BSS has benefited recently from bequests received from Basil Ribbons and Sheila Mary Reid. We have invested their bequests and are using the income from them to fund our student awards. Their kind generosity means that we have been able to increase the value and scope of our fieldwork and training awards.

At the time of writing this (January 2021), we are unable to predict if Covid restrictions are likely to continue into the summer, but ask students and academic staff to read this and think about the projects or training courses that might be possible to carry out. Given the uncertainties of this year, we may also be able to be flexible about deadlines for proposal submission, but for the time being we will apply the usual deadline of April 30th for project and training applications. The application deadline for supervisors to submit a nomination for the student dissertation prize will also remain as July 1st. Any changes to the deadlines or other aspects of the awards will be advertised on our website. If you have an idea, but are not sure if it fits with BSS objectives, please get in touch – we would like to hear from you.

Support for Student Fieldwork Projects
Fieldwork projects should not form part of a university or college course, but we encourage students to discuss project ideas with tutors, who may be able to make helpful suggestions. Also, talk to local volunteer groups and see if you could do a small project in line with their work.

The main features are given below, but please check further details on our website:

- We favour botanical projects conducted in Scotland, by students attending Scottish Universities and Colleges, but we do not exclude projects based elsewhere.
- Awards are for undergraduate students, and those in the first year following the date of graduation.
- The maximum grant available for fieldwork is £700.
- There is now no limit on the number of applications from a particular university or college, and a small group of students may work

together on the same project and each request an individual award of up to £700. To find out which fieldwork expenses may be covered see the BSS website.

- Up to 50% of the award may optionally be used as a daily allowance at a rate of £50 per day.

Recent awards have included assessing the effects of neighbouring tree species on resistance to ash dieback, and evaluating non-chemical methods of controlling Giant Hogweed. These were reported in the BSS News, March 2020 and March 2019.

Support for Student Fieldwork Training

These grants are intended to enable students to attend a residential or local short training course to improve their botanical skills.

Awards are for undergraduate students, and those in their first year after their date of graduation. The value of these awards is £500.

Depending on applications, we anticipate awarding up to four fieldwork, and four training grants.

Student Dissertation Prizes

The BSS awards an annual dissertation prize of £200 to the final year student of a Scottish University or College who produces the best dissertation on a botanical investigation carried out in their final year. The nomination for the award must be submitted by the student's supervisor, or other member of staff (not the student themselves).

Further details of all these awards and how to apply for them are on our website.

Julia Wilson, President BSS
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BSBI RARE PLANT REGISTERS

Three new Scottish Rare Plant Registers (RPRs) were published in 2020 for Midlothian, Ayrshire and Dumfriesshire. These Registers are a BSBI initiative to produce a set of mini floras of the least common plants in each Watsonian Vice County in Britain and Ireland. The aim is to collect detailed information on taxa at risk, to produce a national picture of the distribution of rare and threatened species. It is hoped that the information will be used for conservation and scientific research and to inform the owners, managers and users of the land about the species that are present, so that threats to their existence can be minimised by suitable management. These documents also provide a baseline from which to measure changes in plant species distribution, and hopefully will stimulate collection of gap-filling data to complete records for some of the species.

The RPR scheme has evolved over three decades since the suggestion made around 1990 by Franklyn Perring (co-author with Lynne Farrell in 1977 of the Red Data Book 1: Vascular Plants) that VC Recorders should compile lists of locally rare species.

Some of the earlier RPRs were little more than species lists, and in the absence of clear guidelines, were compiled to differing standards, making it difficult to compare the data, or form a coherent national picture. Specific criteria were gradually introduced, resulting in a first edition of new guidelines in 2001. In 2017 the BSBI produced detailed guidelines for the preparation of RPRs and the result has been increasing standardisation of the content and uniformity of appearance of these documents, the best of which are attractively illustrated with maps and photographs of selected species and contain a wealth of information.

The RPRs list those plants that are nationally rare or scarce, and those within the VC that occur in three or fewer sites (rare), or in 10 or fewer sites and are declining (scarce). The species covered are primarily nationally native species or archaeophytes (introduced prior to AD 1500). Some culturally significant neophytes, such *Centaurea cyanus*, appear as casuals in the VC but are included in the RPR because of their conservation status in the UK as a whole.

To date, RPRs have been produced for about half of the Vice Counties (VCs) in Britain and Ireland and for 15 out of the 40 Scottish VCs. Some of the keener participants have produced their second, third

or even occasionally fourth editions, and several VCs have produced new editions, the most recent offerings (in 2020) being the second editions for Midlothian (VC 83), Dumfriesshire (VC 72) and Ayrshire (VC 75).

The three newest offerings for Scotland are attractive documents and highly informative. They give summaries of the status of each species, tabulate the dates, locations and grid ref of each record and the name of the recorder. The penalty for this literary and data richness is that the documents are quite large. The production and maintenance with new editions of the RPRs is clearly a huge task. The second edition of the Midlothian RPR, published in 2020, is now 178 pages long.

The RPRs use the Watsonian VC boundaries, the advantage of which is that they have remained unchanged since 1852, unlike the constantly shifting local authority boundaries, so that studies of changing plant distributions can be made on a stable basis.

Although the locations of earlier records are often at hectad resolution, recent site locations are given at higher resolution, often as 6-figure National Grid references, giving a resolution of 100 metres. Some people may be sensitive to the idea that the location of rare plants is revealed to collectors or vandals with such precision, but the prevailing view among BSBI recorders seems to be that there is an even greater risk to vulnerable plants and plant populations if their location is unknown to landowners, planners and developers.

Midlothian rare plant register

Dr Barbara Sumner, who until recently was Recorder for VC 83 (Midlothian) has completed the mammoth task of updating the Midlothian Rare Plant Register (Sumner, 2020). It provides a wealth of information, attractively presented and must represent thousands of hours of work.

Changes since the first edition of the Midlothian RPR

The first edition of the Midlothian RPR included observations from 1 Jan 1970 to 31 Dec 2014, but the second edition runs from January 1st 1987 to 31 Dec 2019. This date range covers two periods of intensive recording for BSBI Atlases (the 2002 Atlas, and for the New Atlas that is currently in preparation).

Of the 2235 vascular plant species recorded in Midlothian in Sumner (2020), 427 are included in the RPR, of which 315 taxa are extant or presumed to be, and 112 are now believed to be extinct. Of the

315 extant rare species, only 32 are rare or scarce at the national UK level. Many of the species accounts have been expanded and updated to include new records since 2014. In this same period, a number of species have been reassigned to new genera because of new information about their molecular genetics. The first edition followed Stace (2010), while the second uses Stace (2019), and consequently, the order in which species are described in the RPR has changed. Shifting molecular taxonomy has also resulted in exclusion of some species, such as *Epipactis youngiana*, which is now identified as conspecific with the so-called "Glasgow orchid", *Epipactis helleborine*.

Several species that were included in the first edition of Midlothian RPR have been demoted as they have become too common in VC 83 to continue to be included as rare or scarce. These include *Atriplex prostrata*, *Leymus arenarius*, *Plantago maritima* and *Tripleurospermum maritimum*, all of which are maritime species common in adjacent stretches of the coast. To these may be added, among others, *Armeria maritima*, *Atriplex laciniata* and *Lysimachia (Glaux) maritima,* which were reported as rare in the first edition and are now promoted to scarce. The inclusion of these as scarce species, when they are common or abundant elsewhere along much of the coasts of southern Scotland, may reflect the absence of suitable habitat in VC 83, or the urbanisation of the coastal strip. Their actual increase in frequency may be due perhaps to declining industrial use of the coast, or simply be the result of the more intensive recording that has occurred since the first edition was published. Somewhat similar changes were observed in the RPR for Dumfriesshire, VC72.

Extinctions from the flora of VC 83 include 90 native species and 22 archaeophytes, many of which have not been seen for a very long time, since the publication of the Field Club Flora of the Lothians in 1934 or in many cases even as far back as the 19th century. A notable recent extinction from VC83 is the pyramidal orchid, *Anacamptis pyramidalis*, growing on a bing near Monktonhall in 2007, which was discovered by Richard Milne and recorded as new to the VC. The plants were monitored for five years up to 2012, only to become victims of engineering works during the construction of the Borders railway in 2013. *A. pyramidalis* has not been seen in Midlothian since then.

The intention is to update the RPRs periodically and some authors even suggest annual revisions, but the amount of work this entails is huge. Your observations count, so if you see or know about a native or

archaeophyte species that is not on the list or in a new location, please report your finds to your Vice County recorder, so that it can be included in later editions.

Chris Jeffree
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Resources

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List of Vice County recorders: https://bsbi.org/local-botany

Map of Vice County boundaries and Gridref finder:

https://www.cucaera.co.uk/grp/?refs=NC4500&map=ordnance&vcs=true&graticule=true&nsgrids=false&zoom=7&lat=55.93074077571185&lon=-2.5543212890625004&distinct=false&bedrock=false&superficial=false&sketches=Chris Jeffree

PLANTS GROWING ON EASTER ROSS TOWN and COUNTRY WALLS

In 2011 I studied plants growing on walls in 12 towns in Easter Ross (Ballinger 2014). This report is partly a repeat of that project to see what changes had occurred. In 2011 on a walk round the older parts of the towns, I identified 64 species of vascular plant on the town walls. This total was lower than some English surveys (e.g. Payne 2005) where the methodology was usually different, and a much larger area was often visited. Payne (2005) recorded 299 species in an intensive survey of plants on walls and buildings on the Isle of Ely. Walls are not an easy habitat for plants as they have poor substrates, and are liability to dehydration, and disturbance by pollution, and "tidying up".

The aim of the recent 2020 survey was to look at trends and to compare the urban findings in Easter Ross with other locations, such as rural walls and sections of the urban walls of the larger city of Dundee.

Method. The same Easter Ross towns and villages as in 2011 were included for the urban study, these being: Alness, Conon Bridge, Cromarty, Dingwall, Evanton, Fortrose, Invergordon, Muir of Ord, Portmahomack, Rosemarkie, Strathpeffer and Tain. The same route was followed and at the same time of year (July and August 2020) as in 2011. Vascular plants that did not appear to have been planted were included.

Twenty rural walls in Easter Ross were also visited in July and August 2020. They were selected for convenient access and in most cases were within 10 km of an urban centre. If possible, 50m of wall was recorded.

The data collected for Rural and Urban walls in Easter Ross were also compared with a recent Dundee study of short sections of urban walls (Ballinger 2020). I made all of the observations myself to ensure comparability.

Results.

Urban Walls in Easter Ross 2020: A total of 182 records were made on the town visits where I recorded each species I found only once in each town. This gave an average of approximately 15 species per town. Most plants were on mortared walls. In all 78 different plant species were found. The commonest, in order of decreasing frequency, were: *Taraxacum* (Dandelion), *Cymbalaria muralis* (Ivy-leaved Toadflax),

Festuca rubra agg. (Red fescue), *Dryopteris filix-mas* agg. (Male Fern), *Sonchus oleraceus* (Smooth Sowthistle), *Jacobaea vulgaris* (Common Ragwort), and *Chamaenerion angustifolium* (Rosebay Willowherb). Seventeen alien taxa (neophytes) were noted. See Appendix 1 for the complete species list.

Rural Walls in Easter Ross 2020: I recorded 184 plants on the 20 sections of rural wall in Easter Ross. There were 88 species recorded noting each species only once on each wall. The commonest species were, in order of frequency, *Festuca rubra* agg., *Taraxacum, Chamaenerion angustifolium, Polypodium vulgare* (Polypody), *Cerastium fontanum* (Common Mouse-ear), *Dryopteris filix-mas* agg, and *Poa pratensis* (Smooth Meadow-grass). Where the fern *Polypodium vulgare* (Polypody) was present, it was very abundant. Of the 88 species on rural walls only 44 (50%) had also been recorded in the Easter Ross urban walls survey, and only seven were aliens (neophytes). Most of the rural walls visited were not mortared and they were generally more vegetated than the urban walls studied.

Comparison of the 2020 with the 2011 survey of urban walls in towns in Easter Ross: Of the 64 different species recorded in 2011 45 (70%) were found again in 2020, and 32 additional taxa were noted in 2020. There was no great change in the abundance of the most common species – *Taraxacum* and *Festuca rubra* were the most frequent in both 2011 and 2020.

Comparison with the 2020 study of walls in Dundee: This study recorded sections of 50 urban walls in west Dundee, and the methodology was different, as the Easter Ross survey involved a walk round the whole town. Of the 54 Dundee species, in contrast to the urban Easter Ross study described above, the commonest were *Asplenium trichomanes* (Maidenhair Spleenwort), *Asplenium ruta-muraria* Wall-rue) and *Cymbalaria muralis* (Ivy-leaved Toadflax). The species totals are shown in Table 1 and the most frequent species in Table 2, both on page 41.

Discussion:

The results of the two Easter Ross urban wall surveys in 2011 and 2020 were similar, and there is no evidence of a loss of diversity- in fact slightly more species were found in 2020. The changes in the species present probably applies more to species not well adapted to the wall habitat, which only had a brief “accidental” stay on the wall. The species

better adapted to wall life may survive better, although there is no data about individual plants in this study.

Table 1: Species Totals urban walls in 2011 and 2020 in Easter Ross and Dundee, and walls in rural Easter Ross and urban Dundee in 2020.

	Total Species on walls	**Also recorded in 2020 in urban Easter Ross**	**Aliens (neophytes & introductions)**
Urban Easter Ross 2011	64	44 (70%)	12 (19%)
Urban Easter Ross 2020	78		17 (22%)
Rural Easter Ross 2020	88	44 (50%)	7 (9%)
Urban Dundee 2020	54	35 (65%)	18 (33%)

Table 2: Commonest species recorded on Easter Ross walls in 2011 and 2020, and Dundee walls in 2020

Wall Study	**Total species**	**Commonest Species**
Urban Easter Ross 2011	64	*Taraxacum, Festuca rubra, Chamaenerion angustifolium*
Urban Easter Ross 2020	77	*Taraxacum, Cymbalaria muralis, Festuca rubra*
Rural Easter Ross 2020	88	*Festuca rubra, Taraxacum, Chamaenerion angustifolium*
Urban Dundee 2020	54	*Asplenium trichomanes, A. ruta-muraria, Cymbalaria muralis*

Many of the more abundant taxa on the walls in both Easter Ross and Dundee were also frequent elsewhere in the locality, but some wall species are seen less often in other habitats. Walls seem to be an important habitat for small ferns in the genus *Asplenium.*

The rural investigation was conducted in a different way, as only short sections of wall were visited, so comparisons of species abundance cannot be made with the town walls. However, the species on the rural walls were very different from the town walls. Rural wall species lists also often resembled the surrounding habitats to some extent. Rural walls are very important for *Polypodium vulgare* (Polypody), which is present in great abundance on some walls in the

countryside. As might be expected, the proportion of alien species was much lower on the rural walls. The rural wall structure, with a predominance of drystone walls, was also very different from the town walls, which were more likely to have mortar. It is not possible to determine how much the species differences are related to location, and how much to wall structure. Presland (2008) discussed the differences between the vegetation of mortared and drystone walls in a rather different English setting.

The previously reported Dundee study (Ballinger 2020) was also quite different from the Easter Ross project so any comparisons must be made very cautiously. However, the greater abundance of aliens in the large city of Dundee is of note. There was also a much higher prevalence of the ferns *Asplenium trichomanes* and *A. ruta-muraria* in Dundee. This is an important habitat for these ferns and may be related to the frequent sea mist (haar) near the coast by the Tay. Some haar can occur in Easter Ross coastal towns on the Moray Firth, but this is probably less of an influence in many of the towns studied here. This phenomenon of the abundance of small ferns on some east coast walls is discussed by Page (1997).

Many lichen and bryophyte species were also present on these walls but these were not included in this study. In summary, wall habitats are of interest because of their particular plant communities and have conservation value for some plant species and they should be preserved and appreciated wherever possible.

Brian Ballinger

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WILD PLANTS OF SOME NORTHERN SCOTTISH RAILWAY STATIONS – THE LAST 19 YEARS

The Far North Railway Line runs from Inverness to Wick, and just managed to survive the Beeching cuts. It remains one of our great railway journeys. The Kyle line runs from Inverness to Kyle of Lochalsh, and is another fine railway route. Most of the stations are small and unmanned, and in the past have been host to many wild plants. However, management has changed in recent years.

In 2001 I surveyed wild plants growing on stations on the far North and Kyle of Lochalsh lines and in 2020 I repeated this exercise for the 12 stations in Easter Ross (Vice-county 106).

Methods.

In 2001 all 12 stations in VC106 were visited twice in the summer months, and each species of vascular plant growing in those parts of the station accessible to the public were noted. The stations visited were: Muir of Ord, Dingwall, Alness, Invergordon, Fearn, Tain, Ardgay, Culrain, Garve, Lochluichart, Achanalt and Achnasheeen. Six stations were in villages or towns of more than 500 inhabitants ("urban"), whereas six were in places with fewer than 500 people, often only consisting of a few houses ("rural").

In 2020 this exercise was repeated for the accessible areas of the stations in VC106, making two visits in the summer months. Conon Bridge was not included as it opened after the first survey. (See appendices for species lists).

Results.

In 2001, a total of 654 records were made, with station totals varying from 25 to 78 (see Table 1). There were 186 species, the commonest being *Holcus lanatus, Chamaenerion angustifolium, Rumex obtusifolius, Cerastium fontanum, Festuca rubra, Poa annua, Ranunculus repens*, *Sonchus aspe*r, and *Senecio vulgaris*, all being found on at least 10 of the 12 stations.

In 2020 a total of 349 species were recorded. Station totals varied from 6 to 40. I recorded a total of 114 species, the commonest being *Chamaenerion angustifolium, Epilobium montanum, Gnaphalium uliginosum, Holcus lanatus, Sagina procumbens, Trifolium repens, Taraxacum* agg., and *Plantago major*, all being noted on at least 9 of the 12 stations.

Some parts of stations that had been accessible in 2001 were no longer open to the public in 2020, having been fenced or re-developed. Network Rail has taken over station management from Railtrack and now there are usually daily visits by maintenance teams.

In 2020, 18 species were recorded that had not been seen in 2001. Those noted more than once were: *Sagina apetala, Cerastium glomeratum, Epilobium ciliatum* and *Spergularia rubra*.

A total of 107 taxa recorded in 2001 were not seen again in 2020. Those recorded at least 3 times in 2001 and not in 2020 were: *Calystegia sepium, Avenella flexuosa* (=*Deschampsia flexuosa*), *Elymus repens (=Elytrigia repens), Euphrasia* agg, *Juncus bulbosus, Lathyrus pratensis, Lotus corniculatus, Polygonum aviculare, Poa humilis, Rumex acetosella* and *Trifolium repens*.

Other species also showed steep declines. *Betula pubescens, Crepis capillaris*, *Cerastium fontanum, Festuca rubra, Hypochaeris radicata* and *Senecio vulgaris* were noted on six fewer stations in 2020 than 2001.

In 2020 there were differences between the six urban and six rural stations. 81 of the 114 species were seen on the urban stations and 85 on the rural. 33 were recorded in both urban and rural locations. There were five alien (neophyte) species on the urban list and eight on the rural. This is a contrast to other urban/rural comparison where neophytes are more numerous in town sites (Ballinger 2019) and the reason for this result for railway stations is not clear.

Table 1. Total plant species for railway station surveys in 2001 and 2020.

Year	Records	Species	Species in both 2001 and 2020	Urban stations species	Rural stations species
2001	654	186	90	141	126
2020	349	114	18	81	85

Discussion.

This survey indicates a considerable loss of botanical diversity on Easter Ross railway stations in the last 19 years. Most of this appears to have taken place more than 10 years ago, after the Network Rail takeover of management, as reviews in 2011 and 2017 showed a considerable

reduction in species present even then. A few new species have been recorded, and some of these reflect national trends

There are only slight differences in species totals between the urban and rural stations, although the species present differ. All of the station habitats are subject to human interference.

There has been a greatly increased use of herbicides and clearing of vegetation on the stations in recent years, as well as a loss of public access to areas such as disused goods yards. Stations have been awarded badges for “good” management and there has been volunteer involvement. Herbicide use and tree felling have also occurred on the railway embankments near to the stations, although botanical interest persists in places.

Given the nature of these railway station sites this reduction in botanical diversity was perhaps inevitable, but it is still a matter of regret. Railway stations have in the past contributed useful plant records in Easter Ross, including for instance the post 2000 Vice-County records for *Sherardia arvensis* (Field Madder) and *Trifolium arvense* (Hare’s-foot Clover), as well as the first Vice-county record for *Orobanche minor* (Common Broomrape) in 2010. It would be helpful if some less intensively managed areas could be left on stations to provide habitats for wild plants and other wildlife, thus preserving biodiversity.

Brian Ballinger

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Appendix 1: Plant list 2020 (*Indicates not recorded in 2001):
Acer pseudoplatanus, Achillea millefolium, Aegopodium podagraria, Agrostis canina, Agrostis capillaris, Agrostis stolonifera, Aira praecox, Alchemilla mollis, Alnus glutinosa, Anthoxanthum odoratum, Aphanes agg.*, Arabidopsis thaliana, Arrhenatherum elatius, Asplenium trichomanes, Bellis perennis, Betula pubescens, Calluna vulgaris*, Capsella bursa-pastoris, Cardamine hirsuta, Centaurea nigra, Cerastium fontanum, Cerastium glomeratum*, Chamaenerion angustifolium, Cirsium arvense, Cirsium vulgare, Crassula tillaea, Crepis capillaris, Cynosurus cristatus, Cytisus scoparius, Dactylis glomerata, Deschampsia cespitosa, Digitalis purpurea, Dryopteris filix-mas,*

Epilobium brunnescens, Epilobium ciliatum, Epilobium hirsutum*, Epilobium montanum, Epilobium obscurum, Equisetum arvense, Festuca rubra, Festuca vivipara, Fraxinus excelsior, Galium aparine, Geranium molle, Geranium robertianum*, Geum urbanum*, Gnaphalium uliginosum, Hedera helix, Heracleum sphondylium, Hieracium* agg.*, Holcus lanatus, Hypericum perforatum, Hypochaeris radicata, Ilex aquifolium*, Juncus articulatus*, Juncus bufonius, Juncus effusus, Juncus squarrosus, Lapsana communis, Leucanthemum vulgare, Linaria vulgaris*, Lolium perenne, Malva sylvestris*, Matricaria discoidea, Myosostis arvensis, Myosotis discolor, Orobanche minor*, Oxalis exilis*, Papaver dubium, Picea sitchensis, Pilosella aurantiaca, Plantago lanceolata, Plantago major, Plantago maritima*, Poa annua, Prunella vulgaris, Ranunculus acris*, Ranunculus repens, Rosa canina* agg*, Rubus fruticosus* agg.*, Rubus idaeus, Rumex acetosa, Rumex crispus, Rumex longifolius*, Rumex obtusifolius, Sagina apetala*, Sagina procumbens, Salix caprea, Salix cinerea, Scorzoneroides autumnalis, Jacobaea vulgaris* (=*Senecio jacobaea*)*, Senecio viscosus, Senecio vulgaris, Silene dioica*, Silene latifolia ,Sonchus asper, Sonchus oleraceus, Sorbus aucuparia, Spergularia rubra*, Stellaria graminea, Stellaria media, Taraxacum* agg*, Trifolium dubium, Trifolium pratense, Trifolium repens, Tripleurospermum inodorum, Ulex europaeus, Urtica dioica, Verbascum* ×*thapsi, Veronica arvensis, Veronica serpyllifolia, Vicia cracca, Vicia sativa, Vulpia myuros.*

Appendix 2: Plants recorded in 2001 but not recorded again in 2020:
Abies grandis, Aira caryophyllea, Alopecurus geniculatus, Angelica sylvestris, Anthriscus sylvestris, Anthyllis vulneraria, Artemisia vulgaris, Betula pendula, Buddleja davidii, Calystegia sepium, Campanula rotundifolia, Cardamine flexuosa, Cerastium semidecandrum, Chenopodium album, Claytonia perfoliata, Cotoneaster spp.*, Danthonia decumbens, Avenella flexuosa* (=*Deschampsia flexuosa*)*, Elymus repens* (=*Elytrigia repens*)*, Erophila verna, Euphorbia peplus, Euphrasia* agg*, Fagus sylvatica, Schedonurus arundinacea* (=*Festuca arundinacea), Festuca ovina, Schedonorus pratensis (=Festuca pratensis), Logfia minima* (=*Filago minima*)*, Fumaria capreolata, Geranium pratense, Glechoma hederacea, Helianthemum nummularium Hesperis matronalis, Holcus mollis, Hypericum pulchrum, Juncus bulbosus, Juncus conglomeratus, Laburnum* sp.*, Larix* sp.*, Lathyrus pratensis, Linaria purpurea, Linum catharticum, Lolium multiflorum, Lotus corniculatus, Lupinus* sp.*, Papaver cambricum* (=*Meconopsis cambrica*)*, Medicago lupulina, Mentha spicata, Montia fontana, Oenothera* sp.*, Odonites verna, Ononis repens, Papaver orientale, Papaver somniferum, Pentaglottis sempervirens, Persicaria maculosa, Phleum pratense, Picea abies, Pinus sylvestris, Poa humilis, Poa pratensis, Poa trivialis, Polygonum aviculare, Potentilla anserina, Rhinanthus minor, Ribes sanguineum, Ribes uva-crispa, Rumex acetosella, Sagina maritima, Salix aurita, Scrophularia nodosa, Sedum acre, Sedum*

album, Senecio squalidus, Sinapsis arvensis, Sisymbrium officinale, Sonchus arvensis, Spergularia marina, Symphoricarpos albus, Tanacetum parthenium, Tanacetum vulgare, Tragopogon pratensis, Trifolium campestre, Triticum aestivum, Tropaeolum majus, Tussilago farfara, Ulmus glabra, Veronica persica, Ervilia hirsuta (=*Vicia hirsuta) Viola arvensis, Viola tricolor.*

A GUIDE TO THE COPSES, WOODS, AND FORESTS OF BRITAIN

Former Director of Development for the BSBI and author Dr Gabriel Hemery explains the vision behind his latest book, and invites information from readers.

I have been humbled by the support received from people who share my passion for trees and nature since I announced my intention to write a guide to the copses, woods and forests of Britain.

My main motivation is to open the eyes of the British public to the diversity and importance of our forests (shorthand for wooded land at whatever scale) and their owners. I hope that the book will celebrate less well-known candidates alongside our more famous forests.

About the Book

Originally my intention was to produce a Domesday Book of forests, but the idea soon became tempered by the reality of my single lifespan, and of course the marketeers of various publishers. The aim therefore is to write a guidebook to a selection of copses, woods, and forests across Britain which can be visited and enjoyed by members of the public. Ultimately, I aim to reconnect the British public with the forests on their doorstep, to rekindle their interest in the natural world, and help them develop an appreciation of those who care for our forests. I feel strongly that by building a stronger affinity between people and the environment, this will provide the foundation to creating a more caring and sustainable society.

At the time of writing (January 2021) I am on the cusp of a book deal with a major publisher. It is possible that instead of a single book covering the whole of Britain, that a series of books may be produced which would allow the inclusion of many more forests. For example, there may be a single guidebook covering Scottish forests. Some forests will be comprehensively described, others less so, perhaps presented gazetteer style. The focus will be on forests that provide public access in

some form. While the forests will be the star, the owners will be the co-stars, and this is what I hope will set the book apart from a predictable guidebook format. Illustrations publicising the book are on the inside front cover and outside back cover. Likely publication date is 2023.

Get Involved

There are several thousand named forests in Scotland, including seven among Britain's top ten largest, including Galloway Forest Park (No.1) and Dornoch Forest (No.4). Famous forests abound, such as the oakwoods at Loch Lomond and Rothiemurchus Forest in the Cairngorms, while others deserve greater recognition including the ancient ash woodland at Rassal near Lochcarron. Scotland is also leading the way in adopting natural processes to restore and create woodlands, such as at Glen Feshie and at Carrifran near Moffat. Yet there are thousands more forests that can be celebrated, and these are the ones that I am keen to feature in my guide.

I have been delighted to receive helpful data from a number of environmental and woodland owning organisations, including many of the wildlife trusts and the Woodland Trust. I remain particularly keen to hear from individual private woodland owners in Scotland. I ask contributors to provide information about public access, history of the site, notable wildlife and more, including information about the owners, but of course only if they are interested in being named and featured.

I have created a dedicated website to help collect information from contributors at www.copsewoodforest.com While the public are able to suggest a woodland for inclusion, the main purpose of the website is to enable woodland owners to register information directly at: https://copsewoodforest.com/register . I expect to spend the next two years researching and writing the book, but I am keen to finalise contributions by the end of 2021.

The contribution form is straightforward and should take about 10 minutes to complete. Owners are able to *Register* a woodland but request that their name remains anonymous in the guide if they choose. Other questions deal with size, location, forest type and tree species, and history. I have included a text box to collect the main descriptive entry with a limit of 100 words. I am aware that this may be limiting, but in the first instance, it can help the contributor focus on essential information, and there is another box, which allows more space for comment. I am hoping to visit a selection of forests, to meet with the

owners for an interview and to take photographs, so there are some final questions, which allow owners to agree to this if they wish.

I am also offering the opportunity for individuals or companies to help support the research and production of the book by becoming a *Book Patron*. In return, patrons will be listed prominently in the front of the book(s), much the same they were in John Evelyn's 1664 Sylva, and they will receive a signed copy through the post when it is published.

If members of the Botanical Society of Scotland have any questions or suggestions for the project, then I would be very grateful to receive them. Please use my contact form which is available on the project website at: www.copsewoodforest.com/contact

About the Author

Dr Gabriel Hemery is an author, tree photographer, and silvologist (forest scientist). He served as the first Director of Development for the Botanical Society of the British Isles before co-founding the Sylva Foundation, an environmental and forestry organization which he has since led as CEO. He has written three books, both fiction (*e.g. Green Gold*, Unbound 2019 – a fictional narrative of the exploits of Scottish plant hunter John Jeffrey) and non-fiction (*The New Sylva*, Bloomsbury 2014). Dr Hemery appears regularly on TV and radio talking about trees and the environment, and writes a popular forestry blog. www.gabrielhemery.com

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FAMILIAR FACES

Discovering Similar, Invasive and Native Plants of Scotland and California

In 1891 the British naturalist and explorer, Alfred Russel Wallace, wrote in the *Fortnightly Review*, **"***The numerous English writers who have described their impressions of North America tell us all about the people, their manners and customs, their hotels and churches, the mode of travelling and the scenery, the rivers and waterfalls, the mountains and forests, the prairies and deserts; but hardly ever do they give us any information as to the kind of vegetation that covers the surface of the soil, or the flowers that adorn the roadsides, the forests, or the mountains. Hence it comes to pass that the majority of English readers, even those who delight in the wild flowers of their own country or the more varied beauties of the Alpine flora, have usually the vaguest and most erroneous ideas as to what flowers are to be found in the United States and Canada, and to what extent they resemble or differ from those of our own country*." (Wallace 1891)

For the past 14 years I have spent time exploring the flora of Scotland through travel and while performing volunteer field surveying. Being from California I was familiar with several Scottish species considered "invasive" in western North America such as Scotch broom (*Cytisus scoparius*), Atlantic ivy (*Hedera hibernica)*, the common daisy (*Bellis perennis),* and Gorse (*Ulex europaeus)*. I was also aware that many western species such as the common yellow monkey flower (*Erythranthe guttata*), California poppy (*Eschscholzia californica*) and a variety of conifers such as *Sequoiadendron giganteum* and *Sequoia sempervirens* had made their way to Scotland via the plant hunters and horticulturalists.

While exploring the Scottish flora I found that I was able to recognize some of the genera immediately through characteristics similar to those of western species; characteristics such as the three sepals and three petals typical of the *Iris*; and the square stems, opposite leaves and open two-lipped flowers of *Scrophularia*. With years of using such keys as *The Jepson Manual* by Willis Linn Jepson and *Abrams' Illustrated Flora of the Pacific States* under my belt, I found I was able to navigate through the keys recommended to me, such as Stace & Thompson's *New Flora of the British Isles*, Streeter's *Collins Wildflower Guide*, and Rose, O'Reilly and Collings', *The Wild Flower*

Key: How to Identify Wild Flowers, Trees and Shrubs in Britain and Ireland.

Occasionally I would discover a species I had encountered back home whose identity I only had to confirm, such as *Fragaria vesca* and *Pteridium aquilinum* since they both grow on my own land in the Santa Cruz Mountains, although the bracken in Scotland is much taller than that in our Mediterranean climate. I will never forget the day I came across a field of bracken over six feet tall while hiking with a friend, and immediately plunged into the field thinking what a wonderful thing this was, when my friend said, "Stop! There will be ticks in there!" She was right …

I was also able to narrow down a few of the species I encountered by the similarity of their general form and colour such as the Scottish bluebell or harebell which closely resembles the California harebell. The California species, *Asyneuma prenanthoides*, however, has divided petals unlike the bell-like flowers of *Campanula rotundifolia* found in Scotland. In fact, what I originally learned as *Campanula prenanthoides* is now sometimes referred to as *Asyneuma prenanthoides*. Another name that has changed for a species I encountered in Scotland is that of *Chamaenerion angustifolium* or Rosebay Willowherb called fireweed in the west. Native throughout the temperate Northern Hemisphere, I have seen it growing in the Sierra Nevada after a fire. Back in the Dark Ages I had learned its name as *Epilobium angustifolium*. Curiously another member of *Onagraceae*, *Epilobium canum*, the California fuchsia, was formerly known as *Zauschneria californica*, and is still referred to by us old timers as *Zauschneria.*

Encountering plants new to me in Scotland was exhilarating. You can imagine my delight when I came across *Stachys palustris* and *Stachys sylvatica* after seeing the very similar *Stachys bullata* every spring growing on the edge of the coast live oak woodland below my house; or finding a woodland in Scotland carpeted with wood sorrel, *Oxalis acetosella*, after seeing carpets of *Oxalis oregana* beneath the coast redwood trees of the California coast. My hunch is that a botanist visiting California from Scotland would find as many familiar faces here as I have over there.

In exploring "…*the Californian region, extending from the Pacific coast to the upper limit of trees in the Sierra Nevada*," Wallace wrote that, "*Few countries have contributed to our gardens a larger number of showy and interesting plants than California. The rich orange yellow*

Eschscholtzias, the brilliant Calandrinias, the showy Godetias and Clarkias, the beautiful little Nemophilas and Phacelias, the gaudy Mimuluses and the handsome Collinsias, (*and … the scarlet flowered Zauschneria Californica) are known to every lover of garden flowers …*" (Wallace 1891)

Two of these imports from the west have spread throughout Britain. *Lysichiton americanus* - American Skunk Cabbage*,* native to western North America, was introduced into cultivation in 1901 by ornamental plant collectors and had naturalised in the wild by 1947. Skunk cabbage can be found in wet woodlands where it crowds out native plant species. It is illustrated at the top of the inside back cover.

Another western species*, Erythranthe guttata (=Mimulus guttatus)* – Yellow monkey flower, and *Mimulus luteus*, were introduced to Britain 200 years ago from North America and South America, respectively. These produced a sterile triploid hybrid, *E.* x *robertsii* whose polyploid hybrid, *Erythranthe peregrina* evolved independently in both Orkney and South Lanarkshire. Spreading both by seed and vegetatively, monkey flowers are found in wet places by streams, rivers and ponds, damp meadows, marshy ground and open woodland. This is illustrated on page 31, top left.

In Scotland I was delighted to encounter a few native species that I had also seen in the west such as the bracken fern (*Pteridium aquilinum)* and wild strawberry (*Fragaria vesca*) mentioned earlier; common self-heal (*Prunella vulgaris*), and the shrubs Red-berried elderberry (*Sambucus racemosa,* formerly *S. pubens*), bearberry *(Arctostaphyllos uva-ursi*), and the common Juniper *(Juniperus communis*).

Through my years of exploring Scotland from the Borders to Orkney, from Skye to Dundee, and from the Firth of Forth to the slopes of Ben Lawers, as I encountered species that were unfamiliar to me, I was also pleased to find that many others were familiar enough to allow me to narrow them down to genus. Discovering similar plants such as the willowherbs, sorrels, milkworts, figworts and buttercups was always a treat, and taking comparative photos of the species in California and Scotland a joyous experience.

I have defined seven small sets of species from California and Scotland, as described below. You can find their photographs as

indicated. Hopefully the years to come will bring many more discoveries on both sides of the pond.

Set 1 Similar species in Cal. and Scot. (Picture: page 29):

Iris hartwegii Hartweg's Iris - endemic to California (Sierra Nevada, California).
Iris pseudacorus Yellow Iris (Gillies Hill, Scotland).

Epilobium canum California Fuchsia (formerly *Zauschneria californicum* as mentioned by Wallace) - native to western North America (Santa Cruz Mountains, California).

Chamaenerion angustifolium Rosebay willowherb (formerly *Epilobium angustifolium)* - native to Scotland and western North America (Gillies Hill, Scotland).

Oxalis oregano Redwood Sorrel - native to western North America (Santa Cruz Mountains, California).
Oxalis acetosella Wood Sorrel (Gillies Hill, Scotland).

Circaea alpina subsp*. pacifica* Small Enchanter's Nightshade - native to western North America (Sierra Nevada, California).
Circaea lutetiana Enchanters Nightshade (Gillies Hill, Scotland).

Set 2 Similar species in Cal. and Scot. (Picture: page 30, top):

Polygala californica California Milkwort - native to western North America (Santa Cruz Mountains, California).
Polygala vulgaris Common Milkwort (Durness, Scotland).
Polygala serpyllifolia Heath Milkwort (Ben Lawers, Scotland).

Scrophularia californica California figwort - primarily found in California (Santa Cruz Mountains, California).
Scrophularia nodosa Common figwort (Gillies Hill, Scotland).

Ranunculus californicus California buttercup - native to western North America (Santa Cruz Mountains, California).
Ranunculus repens Creeping Buttercup (Gillies Hill, Scotland).

Set 3 Similar species in Cal. and Scot. (Picture: page 31, top):

Asyneuma prenanthoides syn. *Campanula prenanthoides (*Campanulaceae) - native to California and Oregon (Santa Cruz Mountains, California).

*Campanula rotundifolia (*Campanulaceae) Harebell or Scottish bluebell - white variant (Loch Lomond Scotland).

*Campanula rotundifolia (*Campanulaceae) Harebell or Scottish bluebell — a species with a circumpolar distribution (Gillies Hill, Scotland).

Stachys bullata California Hedge Nettle - endemic to California (Santa Cruz Mountains, California).
Stachys palustris Marsh woundwort (Doune, Scotland).
Stachys sylvatica Hedge woundwort (Aberfeldy, Scotland).

Set 4 Species native to Cal. and Scot. (Picture: outside back cover):
Prunella vulgaris Common self-heal (Santa Cruz Mountains, California).
Prunella vulgaris Common self-heal (Gillies Hill, Scotland).

Pteridium aqulinum Bracken fern (Santa Cruz Mountains, California).
Pteridium aqulinum Bracken fern (Gillies Hill, Scotland).

Sambucus racemosa Red elderberry (Sierra Nevada, California).
Sambucus racemosa Red-berried elder (Gillies Hill, Scotland).

Fragaria vesca wild strawberry (Santa Cruz Mountains, California).
Fragaria vesca wild strawberry - fruit (Gillies Hill, Scotland).
Fragaria vesca wild strawberry - flower (Gillies Hill, Scotland).

Set 5 Invasive Plants, Scot. to Cal. (Picture: page 30, bottom):
Bellis perennis common or lawn daisy - native to Scotland and to western, central and northern Europe, naturalized in the wild in California. (Santa Cruz, California).

Ulex europaeus gorse - native to Scotland and to the British Isles and Western Europe, naturalized in the wild in California. Cal-IPC Rating: High (Gillies Hill, Scotland). Cal-IPC (2020) the California invasive plant council, rates species for their potential to be invasive (see www.cal-ipc.org).

Digitalis purpurea purple foxglove - native to Scotland and widespread throughout most of temperate Europe, naturalized in the wild in California Cal-IPC Rating: Limited (Gillies Hill, Scotland).

Cytisus scoparius Scotch broom - native to Scotland and to western and central Europe, naturalized in the wild in California. Cal-IPC Rating: High (Gillies Hill, Scotland).

*Cirsium vulgare s*pear thistle - native to Scotland and throughout most of Europe, Western Asia and north-western Africa,

naturalized in the wild in California Cal-IPC Rating: Moderate (Stirling, Scotland) (see photograph on outside front cover).

Hedera helix Common ivy - native to Scotland and most of Europe and western Asia, naturalized in the wild in California. Cal-IPC Rating: High (Glencoe Village, Scotland).

Set 6 Imported Plants, Cal. to Scot. (Picture: page 32)

Erythranthe guttata common monkeyflower (Kinbuck, Scotland).

Eschscholzia californica California poppy (Dundee, Scotland).

Sequoiadendron giganteum Wellingtonia Sierra redwood (Gourdiehill, Scotland).

Sequoia sempervirens coast redwood (Rossie Priory, Scotland). Photo by John Lamont.

Pseudotsuga menziesii Douglas fir (Scone Palace, Scotland).

Set 7 Invasive Plants, Cal. to Scot. (Picture: inside back cover, top left):

Lysichiton americanus - American skunk cabbage (Darlingtonia State Natural Site, Oregon)

Erythranthe guttata (Mimulus guttatus) – yellow monkey flower (Red Hills Tuolumne County, California).

Erythranthe guttata (Mimulus guttatus) – yellow monkey flower (Kinbuck, Scotland).

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Cal-IPC (2020). *California Invasive Plant Council* - Cal-IPC (2006-2020). https://www.cal-ipc.org/ 1442-A Walnut St. #462, Berkeley, CA 94709.

Calflora - information on wild California plants.

https://www.calflora.org/ 1700 Shattuck Av #198, Berkeley, CA 94709.

BSS LECTURES – ONLINE, IN-PERSON, OR BOTH?

Help us to plan for the next lecture series.

Due to Covid restrictions, we are holding the 2020-2021 lectures, on-line, using the Royal Botanic Garden Edinburgh (RBGE) 'Teams' system. Despite a few glitches, audience size has been good and recordings of the lectures are also being viewed on our YouTube channel. However, the audience composition differs to that at our normal live RBGE lectures. Many of our regular attenders at the RBGE lecture theatre are not joining our on-line events, but on-line we attract a more geographically diverse audience.

We understand that the RBGE may install a camera system in their lecture theatre so that future live lectures could be attended in-person, viewed live on-line, and recorded for later on-line viewing. This presents a dilemma: for the 2021-22 series. If Covid allows should we return to in-person events in the lecture theatre, or run combined in-person / on-line events? If we enable on-line viewing, would few people attend the live event, leaving the speaker in a nearly empty lecture theatre? How can we encourage local members to still come to the lecture theatre, support and meet the speaker, and be sociable? Should we charge non-members for on-line access? Would delaying on-line viewing by one month encourage people to attend in person? Are there other options?

We welcome your thoughts and suggestions. What are other societies planning to do? Please let us know by email or letter at the addresses below.

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A VISIT TO BRAEMAR IN THE 1870s: NEW SPECIES, AND LOSS OF BOTANICAL PRESTIGE

Following my description of various field meetings in the last News, I have been looking at records of other field meetings from the 1870's. Many of them are factual lists of species and habitats seen, but occasionally authors provide diverting glimpses of life at that time. A visit to Braemar (Balfour, 1873) provides both information about new species, and glimpses of botanical life.

The article by Professor Balfour in 1873 describes a visit by the Scottish Botanical Alpine Club to Braemar. The visit lasted several days and the article contains many species records and their locations. Among these records, Balfour refers to his assistant, Mr (John) Sadler, finding *Carex frigida*, *'a new British plant'* and a willow new to science, which was later called *Salix sadleri*. I can find no current records of *C. frigida* in Britain, though it occurs in continental Europe, but according to Plants of the World Online, *Salix* ×*sadleri* Syme was first described in 1875, in our Transactions (Sadler, 1875), and it is listed in Stace *et al.* (2015) as being a fertile hybrid between *S. lanata* and *S. herbacea*. The Royal Botanic Garden Edinburgh Herbarium contains a sample from this very expedition (see picture on inside back cover, top right). Current BSBI maps, show that it is a rare plant, found only around Braemar and Killin.

Although the Alpine Club visit was a success botanically, there were some problems with the logistics. The group arrived in Braemar at 5pm, but although the hotel had been forewarned, there was a shortage of rooms and beds. Balfour wrote that *'eight of the party were compelled to take up their quarters in a small cottage, one person occupying the top of a staircase, one a sofa, one a bed in the kitchen and one a small couch.'*

The botanists felt unwelcome and underdressed, *'In place of the ordinary tea-dinner, the party had to conform to the new arrangements at Braemar and sit down to a table d'hôte in their ordinary botanical garb amidst an assemblage of visitors in full dinner-dress with all the appendages of waiters, lacqueys etc.*'

Further, Balfour (1873) laments that '*The old botanical prestige of Braemar is now gone, and the custom of putting up plant specimens in the evening is at an end. In fact, botanists are voted a bore, and fashionable excursionists who pay well, eat, drink, and dress well, are*

now in vogue … . There is no sympathy with what the Prince Consort's keeper called 'herb gatherers' an epithet applied by him years ago to a botanist who attempted to climb Lochnagar'.

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References

BSBI maps, see https://bsbi.org/maps

Plants of the World Online, see http://www.plantsoftheworldonline.org/

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BSS NEWS – GUIDELINES FOR CONTRIBUTORS

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

Receiving editor: Dr Jill Thompson:
news@botanical-society-scotland.org.uk
All contributions should be sent to the Receiving Editor

Coordinating editor: Roger West.

Aims and scope of BSS News

The 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, for example:

- Reports of field excursions
- Descriptions and recommendations of botanical sites to visit
- Articles of current or historical interest
- Biographical profiles of botanists.
- Botanical notes, poems, news, announcements, reports, correspondence.
- Book reviews, crosswords and quizzes
- Illustrations, including paintings, photographs and line drawings

Guidelines for Contributors

Please follow the guidelines and use the template at https://www.botanical-society-scotland.org.uk/content/bss-news-newsletter-botanical-society-scotland. The space for colour images is limited to the cover and centre pages, please use black and white and greyscale for items within the text. Contact the Receiving Editor for help and advice.

The deadlines are **15th January** and **15th July** each year. Earlier submission would be appreciated.

Captions to back cover pictures:

All pictures are by the authors.

Outside: **Top:** See article by Peggy Edwards on page 50. Set 4, listed on page 54.

Bottom: Britain is blessed with forests at every scale, and from floodplain to mountain. Can you help author Gabriel Hemery by nominating forests for inclusion? Photo © Gabriel Hemery.

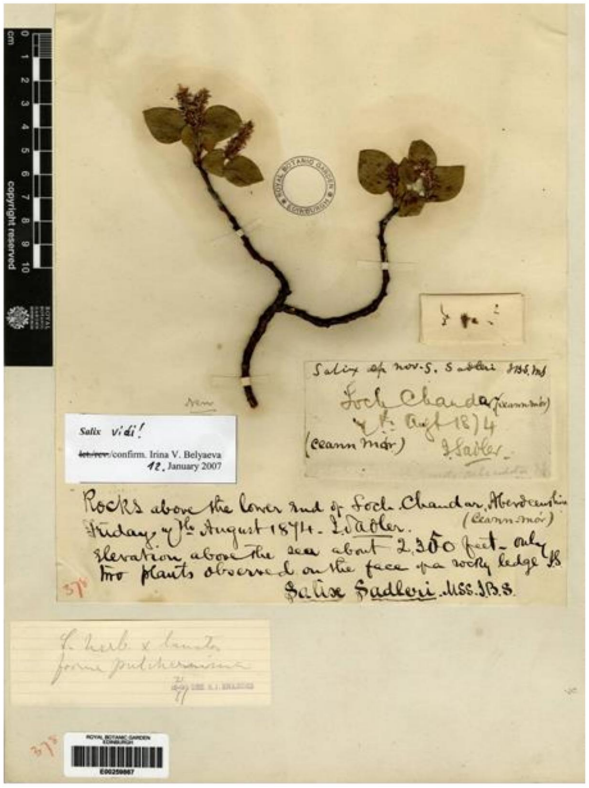
Inside: **Top:** See article by Peggy Edwards on page 50. Set 7, listed on page 55.

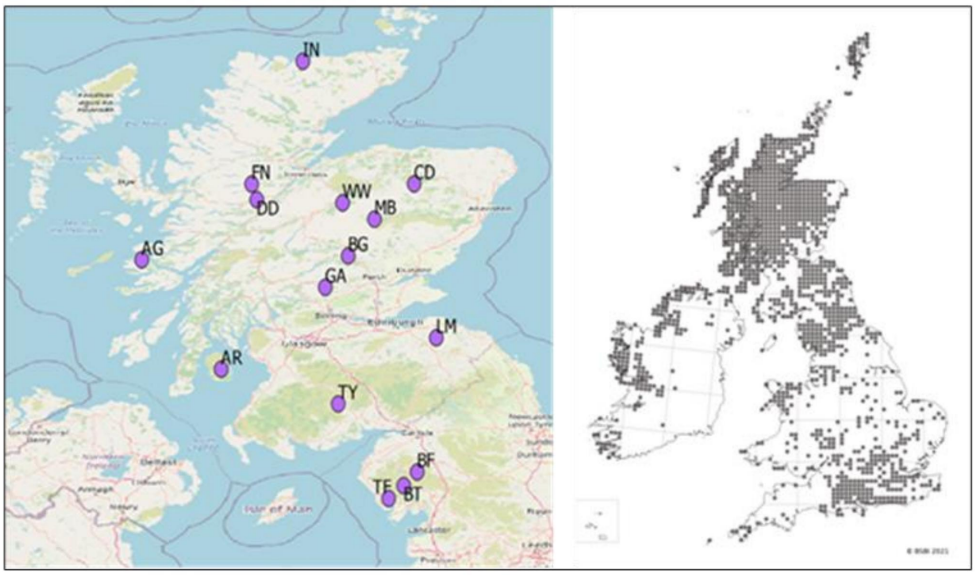
Inside Middle Left: Outbreaks of *Phytophthora austrocedri* on Juniper in the UK. See article by Eleanor R. James on page 17. Diagram by Eleanor R. James

Inside Middle Right: Distribution of *Juniperus communis* in the British Isles. See article by E. R. James, page 17. Map generated with Botanical Society of Britain & Ireland (BSBI) distribution database map tool, using curated records option (https://database.bsbi.org/maps/). ©BSBI 2021.

Inside Bottom: Pin (L-morph) flower (left) and thrum (S-morph) flowers of *Primula veris*. See article on page 20 by Tsipe Aavik




Salix Sadleri
Rocks above the lower end of Loch Chandan, Aberdeenshire
(Beinn Mór)
Friday 9th August 1874. J. Sadler.
Elevation above the sea about 2,300 feet. Only two plants observed on the face of a rocky ledge
Salix Sadleri. MSS. B.S.
Salix Vidi!
confirm. Irina V. Belyaeva
12. January 2007


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