



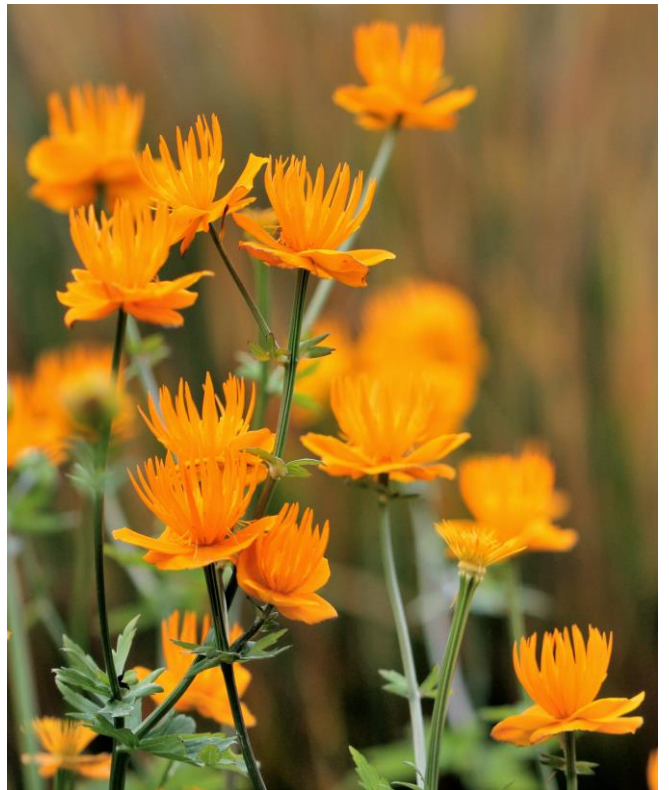
BSS News

The Newsletter of the
Botanical Society of Scotland

No. 101

September 2013







The Botanical Society of Scotland is a Charity
registered in Scotland (No. SC016283)

Front cover pictures

Outside

Echium virescens. Photo by Chris Jeffree. See article on page 12.

Inside

Top left: Photographing Trollius chinensis. Photo by Chris Jeffree. See article on page 12.

Top right: Trollius chinensis Golden Queen. Photo by Chris Jeffree. See article on page 12.

Centre left: Gloriosa superba. Photo by Anne Barker. See article on page 12.

Centre right: Aeonium tabuliforme. Photo by Chris Jeffree. See article on page 12.

Bottom left: Diplarrhena sp. Photo by Chris Jeffree. See article on page 12.

Bottom right: Hypericum pulchrum Slender St John's-wort. Photo by Peggy Edwards. See article on page 24.

Botanical Society of Scotland

(Incorporating the Cryptogamic 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 via the website.

Founded in 1836 as the Botanical Society of Edinburgh, the Society became the Botanical Society of Scotland in 1991. Meetings are held in Edinburgh, Glasgow, Aberdeen, Dundee, St. Andrews and Inverness. The Society incorporates the Cryptogamic Society of Scotland and so encourages the study of flowering and non-flowering plants. Activities of the Society include lectures, field meetings, symposia, surveys, and an annual exhibition meeting for exchange of information between botanists working in different areas. All people interested in plants are welcome to be members of the Society, including professional academic plant scientists, amateur field botanists and students. All members receive information about 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 the Botanical Society of Scotland and Taylor & Francis.

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. Please ask for a Banker's Order form if required.

Subscriptions fall due on 1st October each year:

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

Subscriptions can be paid by cash, cheque (payable to the Botanical Society of Scotland), or Banker's Order. Alternatively, you can now pay by PayPal via the BSS website membership page:

<http://www.botanical-society-scotland.org.uk/content/bss-membership>

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EDITORIAL

So lovely to be preparing the newsletter when the sun is shining, the sky is blue and it isn't too hot. Perfect Scottish weather!

We would like to particularly draw your attention to the article about changing the legal status of the Botanical Society from an unincorporated to an incorporated society (See page 7). The proposal to change the Society's status is very important as it provides protection to members against financial liability that might arise through legal action against the society. This issue will be considered at the annual general meeting on 19th September 2013 at the RBGE. No change to the society's status can be considered without a quorate meeting and a vote by members so we urge you to attend. Please note that the meeting will be back in the newly refurbished lecture theatre at the RBGE on Inverleith Row.

Immediately after the conclusion of business at the AGM, there will be a BSS talk given by Caithness artist Joanne B. Kaar with the intriguing title 'Bakers, Botanists and Whalers'.

Following the AGM and talk by Ms Kaar, there will be with another event that starts at 7.30 pm on 19th September. The British Ecological Society and Chartered Institute of Ecology and Environmental Management (CIEEM) are hosting a lecture to be given by Professor Louise Heathwaite, Chief Scientific Adviser for Rural Affairs and the Environment at Scottish Government: *Tactical Science to Build Strategies That Last*. This talk will be followed by a reception. The lecture and reception are open to the public and are free to attend, but please register using the form at:

<http://www.britishecologicalsociety.org/public-policy/policy-events/forthcoming-meetings/scottish-biodiversity-strategy/>.

In conjunction with the BES-CIEEM event on Thursday there is a meeting on Friday 20th September at RBGE to consider the new Scottish Biodiversity Strategy. It is so important that the wealth of knowledge and experience held by members of the BSS help to influence Scottish biodiversity policy. You can register for this event using the same form described above.

Edinburgh is an increasingly active place for ecologists and botanists and a new email list for Edinburgh based ecologists has been set up by Albert Phillimore at Edinburgh University. This aims to

encourage collaboration amongst ecologists and to publicise lectures and meetings. If you want to be added to the mailing list or to send information on forthcoming events then please contact albert.phillimore@ed.ac.uk

Remember that we are still celebrating the Year of Natural Scotland that was advertised in the Spring issue of BSS news. There are still events to attend so please look at <http://www.snh.gov.uk/enjoying-the-outdoors/year-of-natural-scotland-2013/>

As the AGM has moved this year from June to September the secretary's report, which has in the past been published in the September issue of BSS news, will now be in the Spring 2014 edition.

Thank you very much to all of our contributors for sending articles for this issue. If you are conducting botanical and cryptogamic studies then please tell us all what you are doing. If you are not so active yourself, but attend an interesting event or talk, then please ask the organizer or speaker to send a short article to be published in this newsletter.

We always welcome feedback and have put extra spacing between paragraphs in this issue in response to a comment from one of our readers.

Jill Thompson and Jane MacKintosh

PHOENIX

Here stands *Phoenix*, tall and straight.
Boy says to girl 'Let's make a date'.
Girl says to boy 'I've thought of mating,
which almost always leads to dating.
Oh, let's be married very soon
and fly off on our honeymoon.'
So it's arranged. They soon are wed
and rise up from their Palm House bed.
Phoenix-like they soar and fly
Towards the north Saharan sky,
Then land at Tunis, make a tour,
and visit cousin Deglet Nour.

Roger West



Botanical Society of Scotland

SECRETARY'S NEWS

The BSS Annual General Meeting will be held at the Royal Botanic Garden Edinburgh Lecture Theatre, Inverleith Row on Thursday 19th September starting at 5.30 pm.

There will be several positions to be filled on BSS Council. You can propose candidates for election to Council using the form enclosed with this issue of BSS news. Election of new members will be ratified at the annual meeting.

Changes in role of current members and internal secondments with the Society Council since January 2013 include:

Kim Harding - membership secretary

Niamh Britton - publicity officer

Jakob Assman - student representative.

BSS lecture 19th September after the annual meeting:

The annual meeting will be followed by the renowned Caithness artist Joanne B. Kaar who will be presenting a talk entitled 'Bakers, Botanists and Whalers' immediately after the conclusion of business.

BSS webpages

Keep up-to-date with Society news by logging in to the BSS website: <http://www.botanical-society-scotland.org.uk/user> and follow us on Facebook and Twitter (links from the website).

View Archived 16mm film of the Botanical Society of Edinburgh's Centenary Tea Party (see latest news section on the website).

BSS publication "Celebrating Diversity in Community Woodlands in Scotland" can now be purchased online at: http://www.botanical-society-scotland.org.uk/content/publications/community_woodlands_report.

PROPOSAL TO CHANGE BSS'S CHARITABLE STATUS TO A SCOTTISH CHARITABLE INCORPORATED ORGANISATION (SCIO)

BSS Council have recently been considering the case for conversion of BSS's charitable status from an unincorporated association, to the new legal form for registered Scottish Charities, the Scottish Charitable Incorporated Organisation (SCIO).

The principal benefit of this to BSS would be that it would protect the members of Council from any personal financial loss, which might result from any form of legal action against the society.

Currently, as an unincorporated association, the members of Council ('Trustees') are jointly and severally responsible for the actions of the Society, or its members, and could technically be sued to the limit of their **personal** assets (including the family home). Council members currently bear the risks as individual people rather than the risks being borne by the Botanical Society as a corporate body.

Although we believe that the risk of legal action against us is low and has no precedent in the Society's history, this risk increases with our degree of public engagement in the forms of meetings, citizen science activities, requests to society members to identify plants and to give botanical advice, and also from communications via the internet.

Another reason for the change is that if the society should wish to employ staff, a corporate body is needed to sign contracts and then we could incur extra liabilities such as the risk of employment tribunals and action under H&S legislation. As an SCIO, these liabilities would fall on the corporate body, not on Council members as individuals.

BSS can change its status to SCIO without losing its current name or changing its existing charity number, by merely transferring its existing operation to a new constitution and the SCIO legal framework.

An SCIO can only start to exist after a proposal from the BSS has been accepted by the Office of the Scottish Charity Regulator (OSCR). The process of becoming a SCIO therefore entails winding up the current organisation and setting up an SCIO. At present, our Constitution makes no mention of any provision for winding up the Society. Thus, in preparation to become an SCIO, BSS would first have to amend its constitution to include a clause specifying the

circumstances under which it might be wound up, and define the fate of any assets, so that they may be passed to the new SCIO.

Any proposal to change the constitution must have the backing of Council and must be approved by the membership.

During this summer a working group of council members will prepare a clause for winding up the present society that can be added to the society's constitution. We plan to have this ready in time to be put to the membership vote at the AGM on 19th September. At the same time, we hope that a proposal to apply to OSCR to become an SCIO will be also be ready to be put to the membership. It is very important that members vote on these issues and we encourage you to attend the AGM.

To reiterate, the advantages to the Society of becoming an SCIO are that individual members of the Council would be protected from financial penalty arising from any legal action against the Botanical Society. Any hostile action would have to be directed at the incorporated organization rather than against individual members and their personal assets. This would mean that the Botanical Society might be able to take on a more active role – if it wished - without fear of personal penalty.

Chris Jeffree and Julia Wilson

Guidance on the Scottish Charitable Incorporated Organisation for charities and their advisers prepared by the Office of the Scottish Charity Regulator can be found at:

www.oscr.org.uk/media/40050/cscios_a_guide.pdf

More information is available from the Scottish Council for Voluntary Organizations (SCVO) at:

<http://www.scvo.org.uk/information/organisational-structures/scottish-charitable-incorporated-organisation-scio/>

PLANT ECOLOGY AND DIVERSITY: BSS JOURNAL EDITOR'S REPORT

We have produced four publications so far this year:

- 1 Special issue: Forests, instruments and ideas – a tribute to John Grace's career (Vol 6 (1) March 2013). John Grace is the current president of our Botanical Society
- 2 One ordinary issue (June 2013)
- 3 The third issue for 2013 went to print in July. The topic is 'Climate change and extreme events – their impacts on alpine and arctic ecosystem structure and function'.

Abstract from the editorial to the 3rd issue of 2013

Climate change is usually described in terms of trends over periods in climate variables, such as temperature or precipitation. Observed changes in the response that is of interest (e.g. phenology, plant distribution, abundance, biomass production) over the same period can be related to observed climate variables. However, the average length of observation periods in ecological studies is short (for example an average research grant lasts three years) and, as a result, very few long-term datasets are available that allow relating how vegetation as a whole, or individual species, may respond (or not) to inter-annual variation in climate parameters. Thus, the roles of extreme climate events or climate oscillations often remain unexplored. This is a hiatus that is likely to influence the interpretation of short-term experimental/observational results and, importantly, is likely to bias the assumptions of climate change-related models.

- 4 Special Issue on the 'Ecosystem dynamics of Amazonian forests', guest edited by David Galbraith, Yadvinder Malhi, Luiz Aragão and Tim Baker. The date of the print publication is 18 August 2013 and copies will be available at the International Congress of Ecology (INTECOL) at the end of August 2013. Many articles are already available online on the journal's website, under 'latest articles' at (<http://www.tandfonline.com/toc/tped20/current#.Uc32YNgjXRI>).
- 5 Vol 7 of Plant Ecology and Diversity will be started in September 2013, ready for 2014.

Lazlo Nagy, Editor of Plant Ecology and Diversity

THE FLORA OF URBAN SCOTLAND – OUR NEW PROJECT FOR 2014-2019.

Since the end of last year we've been talking in Council about engaging with the public, especially young people, in a new project to survey the state of the urban flora of Scotland. Why? Our urban environment is being 'tidied up' by development (to the detriment of wildlife) and we'd like to provide baseline data in order to detect future change throughout Scotland. Climate change is probably having some effect as well, and so is the ever increasing flow of cultivated species from the rest of the world.

It has been over a decade since anything like this was done. Older members will certainly recall Phillip Smith's *Plant Life of Edinburgh and the Lothians* and Jim Dickson's *The Changing Flora of Glasgow*, and the veterans may baulk at the prospect of taking on something even bigger than those projects. But much has changed since then to make things easier. Firstly, access to computer software for scientific recording has advanced, and we have seen the emergence of Citizen Science, which makes use of that development to address serious scientific questions as well as to educate and entertain. Secondly, practically everyone now has a digital camera capable of making decent photographic records of plants and their habitats. Thirdly, making collections of botanical data is nowadays regarded as an important activity, supported Government in the name of biodiversity, developed in their agencies, and enshrined in law and in various proclamations such as the Scottish Government's 2020 Challenge for Scotland's Biodiversity, as outlined in the last issue of BSS News by Jane MacKintosh (see also www.scotland.gov.uk/News/Releases/2013/06/Biodiversity16062013).

Where will we record? We will record the plant life of cities and towns throughout the land, visiting walkways, waterways, allotments, old buildings (castles etc.), docklands, industrial wastelands, cemeteries and parks. This investigation will include not just vascular plants, but bryophytes and fungi as well (despite the evidence of molecular genetics, we are calling fungi 'plants' for now, as befits the Society's normal liberal use of the word 'botany!'). The records will be geo-referenced using postcodes (not everyone has access to a good GPS and postcodes in cities are usually within a few tens of metres of resolution).

Who will do the recording? We envisage regional teams containing members with three levels of experience: (i) a relatively small number of experts including BSBI recorders, (ii) a much larger number of knowledgeable recorders who will need help from time to time and (iii) many total novices who will work initially with a list of easily recognised species.

What will we do with the data? There is a software toolkit from the National Biodiversity Network (NBC) which enables records to be made and stored in a data Warehouse. You can read about this at www.nbn.org.uk. It has been used, for example, by the Mammal Society and the British Dragonfly Society. We may also develop our own software for smartphones and tablets. Once our Warehouse of data nears completion, we can address science questions with our students (undergraduate and postgraduate projects are likely to spring from this project). It would, for example, be interesting to compare north-south and east-west differences, or the incidence of alien species, or the differences in the floras of newly established and old-established allotments. Aliens were discussed in two articles in the last issue of the BSS News (GH Ballantyne and Cathy Horsley) and personally I plan to revisit Edinburgh's Giant Hogweed sites which my students Leslie Clegg and Fiona Stewart surveyed 40 years ago (Clegg & Grace, 1974). There will be plenty of opportunities for science papers. Ultimately we will publish a book, with many species illustrated so that it serves as an aid to identification as well as an archive of records.

Who will volunteer? We will need an advertising campaign and publicity material at the places where people interested in plant life are to be found: botanic gardens, universities and schools. We are not sure how far schools can be involved, as these days there is pressure on the timetable as well as health and safety concerns. I'd be interested to hear the views of any readers who are teachers. We hope to enlist a reasonable cross section of society.

Do we have the resources? We think projects like this are not necessarily expensive until it comes to final publication, but there will be a need for modest expenditure on publicity and software. We almost certainly will be able to obtain small grants and perhaps large grants (one could imagine a European Consortium grant to compare cities across Member States). For now, we do not think it will be necessary to increase your membership Fee!

Are there similar on-going projects? Considering the importance of the topic, and the proliferation of interest groups, I expect there are several. We know of a similar project in Birmingham and the Black Country (in this case, a survey of naturalised plants) and we have been impressed at the ease with which existing plants records can be accessed by postcode on the website of the Natural History Museum (www.nhm.ac.uk/fff/index.html).

Are you likely to volunteer yourself? If so, drop me an email saying 'yes'. Please add any relevant ideas that may have occurred to you.

Professor John Grace (jgrace@ed.ac.uk)
President, Botanical Society of Scotland

Reference

Clegg, L.M. & Grace, J. (1974). The distribution of *Heracleum mantegazzianum* (Somm. & Levier) near Edinburgh. *Transactions of the Botanical Society of Edinburgh* 42, 223-229.

PLANT PHOTOGRAPHY WORKSHOP 27 JUNE 2013

The plant photography workshop run by Chris Jeffree in the Royal Botanic Gardens Edinburgh on 29th June was a new event in our Field programme. It was attended by twelve keen photographers with widely differing levels of experience and a wide range of different kinds of photographic equipment, from simple compact cameras to sophisticated digital SLRs. The weather was kind to us, with cloudy bright conditions giving the perfect soft lighting for botanical photography.

People have widely differing reasons for photographing plants and everyone has a different personal take on image composition. That is one of the things that makes the subject compelling, but also makes it difficult to lay down rules about how to go about plant photography. Who needs rules anyway? At one extreme plants may only be used as sources of pattern, texture and colour and the plant itself need not be recognisable. At the other extreme the photograph is only a botanical record of the species either including its habitat or without. It needs enough detail of key characters to nail the species, and any aesthetic considerations are purely incidental. Plant photographers should probably come to the subject with some idea about their aims, but in practice the work of an experienced photographer can span a wide

range of the spectrum, even on a single day, as new plants and new sights appear.

The workshop began with a discussion of how to avoid some common mistakes that are made by inexperienced photographers:

Fill the frame. Often the picture is taken from too far away from the subject, so that it is a minor and insignificant part of the picture. Work close to the plant, and fill the picture area with the subject.

Focus on the subject. The picture is worthless if the subject is a blur.

Isolate the subject. Try to compose the picture so that the background is in soft focus, free of competing detail, and a contrasting colour. Often the sky makes a good background to an orchid, but you will need to get down on the ground to obtain this viewpoint. That's what your overtrousers are for! However, a bland background can look very artificial and the inclusion of some detail can be used to tell the story of the habitat in which the plant grows.

Take manual control of the camera. If your camera can be focused manually then switch off the autofocus. When working close to plants the camera hasn't a clue what it is you are looking at, and it will often decide that the background should be in sharp focus instead of the subject. If your camera has manual control of exposure I recommend taking it out of auto mode and setting it to Aperture priority. That gives you control of the depth of focus, the range of distances over which the subject is acceptably sharp.

And certainly when doing macro photography of plants switch the vibration reduction off. It won't help to correct wind-movement of plants in the field.

Photographing whites and brights. Exposure meters are pretty unintelligent. They are mainly only interested in calculating the average brightness of the picture, so white flowers or flowers in bright primary colours give exposure meters a lot of trouble. When photographing a white flower close up, the camera will probably try to set it to mid-grey rather than white, and it may need one, or even two stops of exposure compensation to correct this. Conversely, when photographing a white flower against a dark background, the camera may read the scene as too dark, and overexpose the whites.

Use the focal plane: Our eyes focus on objects at different distances quickly and automatically to sample the world in 3D. But a camera cannot do that - it focuses on a flat slice of the subject with a thickness that depends on the lens aperture. All parts of the image that you want to be in focus need to be in the same plane, and plant photographers get used to searching for that elusive optimal plane, before they even point the camera at the subject, and then adjust the camera's position so that the film or sensor is parallel to that plane.

The workshop day was occupied with a series of practical examples of plant photography in the rock garden and greenhouses. The first exercise was to photograph whole plants in their setting, and the group concentrated for a time on a magnificent specimen of *Trollius chinensis* Golden Queen, just at its flowering peak. The next exercise was to get in closer and to photograph a group of flowers in more detail, and here the challenge was to identify which set of flowers was closest to an ideal focal plane. The third challenge was to photograph white flowers, and we chose a group of *Diplarrhena* with pure white petals and yellow and blue markings that ranged in intensity from fully saturated colour to the palest tints that could easily be washed out by overexposure. Here the various cameras differed greatly in their ability to expose correctly. Mostly, they overexposed the flowers, and we discussed how to adjust exposure to record subtle gradations of brightness, colour and texture in the petals. After an *al fresco* lunch in the garden and a very brief review of our initial results, we spent some time in the calm, wind-free environment of the greenhouse photographing *Aeoniums* and *Echiums* from the Canaries. Superficially, the *Aeoniums* looked like easy two-dimensional subjects for macro photography, but we quickly found that the dished shape of the rosettes made them more 3-dimensional subjects than at first appeared, and it was a challenge to get the centre and edge both in focus at the same time. Here a simple trick was to focus manually at a point midway between the centre and the edge.

Time seemed to evaporate very quickly, and soon we were left with very little time to process and review the images we had taken before being thrown out of the building. Clearly we need to run a two-day weekend workshop, and perhaps a series of workshops covering progressively more technical topics, such as the use of flash, extreme macro photography and techniques of digital image processing.

Dr Christopher Jeffree

BSS FORTHCOMING FIELD MEETINGS

Saturday 21st September- Belhaven Bay

Leader: Dr Richard Milne

Meet 10.20 at Leith St., Edinburgh to catch X6 bus, OR Meet 11.25 at Car Park opposite West Barns Inn, West Barns – NT 655781. Highlights include a single patch of *Crithmum maritimum* nearing its northern limit on the East Coast, *Trifolium fragiferum*, and a large naturalised patch of *Clematis tangutica*.

Enquiries to R.Milne@ed.ac.uk.

Saturday 26th October- Plant Fossils of Fife - East Wemyss

Leader: Dr Chris Jeffree

Meet at the coastal path at 11 am, East Wemyss, NT337963 East Wemyss foreshore boulders provide a wealth of Carboniferous plant fossils, about 335 million years old. We hope to find roots, stems and leaves of the giant club moss - *Lepidodendron*, horsetail stem and leaves, - *Calamites*, also fronds of seed ferns - *Neuropteris*, (Pteridospermatophyta), and more. Bring lunch and a hammer and chisel.

Please contact Maria.Chamberlain@ed.ac.uk to coordinate transport.

Saturday 14th September- Fungal Foray -Tayport, Tentsmuir

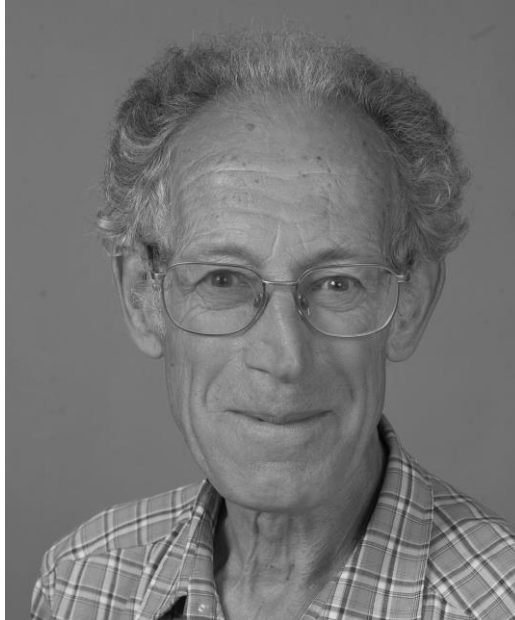
Leader: Jim Cook

Meet at North Links car park at 10.30 am (near Lundin Bridge). Grid Ref NO 467280. BSS Members are invited to join this Dundee Naturalists' Society outing.

Please contact Davie Stein, 01382 816863 to book a place.

OBITUARY

Paul Jarvis, FRS, FRSE: An Edinburgh botanist who showed the important links between forests and the atmosphere.



Paul Gordon Jarvis (born Turnbridge Wells 23/05/35; died Aberfeldy 05/02/2013) was a widely known and well respected plant ecologist who pioneered the scientific analysis of the exchange of water and carbon dioxide between forests and the atmosphere, and laid the foundations for decades of studies on the interplay between forests and the climate system.

Paul showed an early academic talent and went to Oxford to read Botany at Oriel College, where he met his future wife Margaret. They went on to graduate studies at Sheffield, investigating the growth and regeneration of oaks and the limits to the distribution of other trees in the UK. Later Margaret and Paul moved to the Institute of Plant Physiology in Uppsala (Sweden), where Paul gained a second doctorate.

Other alliances were forged when the couple moved to Australia in 1964, where Paul took up a position as permanent visiting scientist at CSIRO with Ralph Slatyer, an outstanding plant physiologist who later became Australia's first Chief Scientist.

However, much of Paul's career developed in the UK, first at Aberdeen from 1966 to 1975, and then at Edinburgh where he became Professor of Forestry and Natural Resources in 1975. He remained there until he retired in 2001. During those 35 years, Paul's career developed enormously, with ground-breaking studies on several aspects

of the environmental physiology of forests, measuring the behaviour of stomata under changing environmental conditions, the penetration of light into forest canopies, water transport in trees and the micro-meteorological measurement of the fluxes of water vapour and carbon dioxide above the canopy. All these studies were characterised by a very innovative combination of strongly physically-grounded principles, intelligent construction of novel pieces of equipment and a deep knowledge of the fundamental physiology of trees.

Paul was a founding member of the journal *Plant, Cell and Environment*, now one of the leading journals in plant science, and served on the Review Boards of several other international journals. He was President and Council member of the Society for Experimental Biology, various Research Council Boards, and he was a Commissioner of the Countryside Commission for Scotland; he was on several Scientific Steering Committees, including the IGBP and the John Muir Trust. He was elected Fellow of the Royal Society, Fellow of the Royal Society of Edinburgh, Fellow of the Royal Swedish Academy of Agriculture and Forestry, the Royal Science Society of Uppsala, the Institute of Chartered Foresters and the Institute of Biology and was awarded the Gregorius J. Mendel Medal by the Academy of Science of the Czech Republic for his services to science of that country. Along with Margaret, he was an active member of the Botanical Society of Scotland.

Paul trained many PhD students and postdoctoral scientists in his laboratory, and helped innumerable students who came to visit him or whom he met at conferences, generously giving his time to any student who demonstrated a real interest and a willingness to learn.

He was vigorous and intense during scientific debates at conferences and seminars. He set the bar very high for his younger colleagues and students, demanding the highest standards of intellectual rigour. He leaves a huge scientific diaspora, extending across many countries of the world, setting similar high standards today.

After his retirement to Aberfeldy in 2001, he continued to be very active scientifically and became involved in the restoration of native woodlands on the over-browsed hills of Scotland. Visitors to his house will find a small arboretum, developed from collections made when visiting collaborators in distant parts of the world.

Paul was widely admired and respected by all scientists in his field. His passion, intensity and love for botanical science allowed him to break many barriers across countries, disciplines and scientific groups. He is fondly remembered by many colleagues around the world. Paul leaves his wife Margaret and children Eric, Alice and Kathryn.

Maurizio Mencuccini and John Grace
Edinburgh University

OBITUARY

**Richard John Pankhurst PhD, FLS
(8 June 1940 – 26 March 2013)**



Richard went to Hamond's Grammar School, Swaffham, Norfolk. He had outstanding abilities in Mathematics, Physics and Chemistry and it became clear that he could pursue a career in nuclear physics. There was another side to Richard, which was already strongly evident at school. He was an extremely dedicated botanist and made many expeditions into the countryside to discover the variety of species in different locations and the occasional occurrence of an example of a rare species; his parents, who were also keen amateur botanists, actively encouraged him in this activity. His school had only recently extended the curriculum to include Biology and formal academic study of Botany was not relevant for Richard, as he could pursue his interest through practical observation and direct exploration of the countryside, which he did with great enthusiasm.

He went on to study Physics at St. John's College, Cambridge, and typically for him, after graduating in 1962, his interest in 'Atoms for Peace' led him to CERN, Switzerland. Meanwhile, he married Anne, in 1963.

He returned to UK academic life in 1966 at the Cambridge University Computer Laboratory, in the Computer Aided Design group. Then, under the influence of Max Walters, he moved to the university botany School and began the task of modelling the taxonomy of plants. It was a major and innovative initiative which opened up the world of plant life to computer-based applications. He was frustrated when people came along later and tried to re-solve problems he'd already investigated, but also proud of what he had achieved – no more so than when Scottish botanical recorders recently started using his computer key to dandelions (*Taraxacum*). It was typical of Richard that he looked wider than his passion for botany in applications of computer keys, and among his publications is one co-authored with a doctor, with medical diagnosis for the use of health workers in remote areas of Africa (where there is no doctor). His many presentations at conferences and membership of the Biodiversity Information Standards (TDWG) and Global Biodiversity Information Facility (GBIF) consolidated international connections with taxonomists working in similar fields, and when travelling around the world he never seemed to lack a botanical friend who could tell him where the best flowering plants were to be viewed.

He moved to the British Museum (Natural History) (BM) in 1974 as curator of the British Herbarium and to continue work on applications of computers in plant taxonomy, but before long the BM decided to undertake a project to do fieldwork and write a flora for a part of the British Isles that did not have one, and the Outer Hebrides was chosen. Richard first went there on a BM field expedition in 1979, made a number of subsequent trips, and when it came time to write up the flora, he was an obvious choice and was the lead author in the *Flora of the Outer Hebrides* (Pankhurst & Mullin 1991, 1994).

Unfortunately cuts at the BM resulted in the laying off of many staff just as the Flora appeared, and Richard was one of those who lost their jobs. He was able to find a new position at the Royal Botanic Garden, Edinburgh (RBGE), which he joined in 1991, continuing his work in the application of computer methods and databases to taxonomy and curation.

The combination of botany in the Outer Hebrides and working at RBGE led to a long association with Scottish botany. Richard took over as the Botanical Society of the British Isles (BSBI)'s recorder for vc110 in the early 1990s, and did a stint as chair of the BSBI's Scottish committee, during which he managed the setting up of the BSBI's Scottish officer position. He was also very active in the field on all sorts of meetings, and was always very helpful to people who wanted to learn, and a staunch supporter of the BSBI's educational field meetings. In the Outer Hebrides he could be as excited about an unknown piece of moorland as about a rich habitat, and there was always something interesting to look at or search for. He actively enjoyed looking at critical plant groups, and encouraging others in the same activity. It was he who got me started collecting dandelions, and it's fitting that a new dandelion species from St Kilda, *Taraxacum pankhurstianum*, was named after him in 2012. He was often in the vanguard of new technology, being first with a GPS, a tracking GPS, and recording onto a palmtop computer in the field.

Richard was diagnosed with cancer in 2011, but he carried on bravely, adjusting to it, and still managed several botanical trips to Scottish islands in 2012. He made two trips to the Outer Hebrides that year, including a visit to Gasgeir, an islet about 5 miles from anywhere, and full of flowers, where he is pictured in the above photo.

Richard was a committed Christian throughout his life, and practised his faith. It was central to many things that he did, and he and Anne were very hospitable to a wide range of visitors. He was a regular worshipper at St Mary's Episcopal Cathedral in Edinburgh where his memorial service was held.

Richard was an exceptional man, a very experienced botanist and taxonomist, and someone who helped others through teaching and encouragement wherever he went. He is survived by his wife Anne and daughter Lucie.

Paul Smith

FIGWORTS IN FIFE AND KINROSS: THEN AND NOW (INCL. *SCROPHULARIA AURICULATA*)

At face value, it is not easy to reconcile the word ‘fabulous’ with the description of the common species of figwort as being “ugly, brown-flowered and smelly” (Grigson, 1954); however, when its past medical uses are considered, there is *perhaps* a case for a rethink. I can’t say with honesty that I’ve ever felt admiration for it - in my notes in 1958 following the first time I came across it, I scribbled “a tall, coarse plant” and I recall thinking it was a bit strange, not least because I’d picked up its i/d in *Collins Pocket Guide* (McClintock and Fitter, 1956) on one of the few plates devoted to brown flowers, sandwiched between the ‘normal’ reds and yellows. Grigson begins his account of *Scrophularia nodosa* thus: “Another wort for the figs or piles, a signature plant like the Lesser Celandine... The knobs or protuberances on the root signified both piles and the kernels or tubercular glands of the King’s Evil (scrophula, on the neck). [These] and ulcers, cancer, the itch and worms were all amended by this ... herb, which long continued in folk-medicine”. For me, a few further encounters proved rather puzzling for I mistakenly thought I’d found *S. nodosa*’s lookalike, Water Figwort (*S. aquatica*) when I’d been searching watery places - but *both* favour damp spots.

“Water Figwort” presented problems in its own right, mainly because the name incorporated two distinct taxa, i.e. *S. aquatica* and *S. auriculata*, while in Scotland, the position was further complicated by the existence of a species for which the appellation was more apt, i.e. *S. umbrosa*. Thus the early botanists throughout Britain employed *S. aquatica* for any plant growing by water that was plainly not *S. nodosa*. This included the popular Victorian guides, one in particular stating of *S. aquatica* that “the blossoms have a lurid colour and fantastic shape, that give the plant a somewhat weird and uncanny look” (Hulme, c. 1890). This description would not have bothered plant enthusiasts north of the Border, where most pre-1970 county accounts credited with “*S. aquatica*” were in fact probably referring to either *S. umbrosa* or casual *S. auriculata*. The 1st edition of the *Atlas* in 1962 did nothing to clear things up, in contrast to *Finding wild flowers, a county-by-county guide* (Fitter, 1971) which reckoned *S. aquatica* to be “very scarce in Scotland”. That account considered *S. umbrosa* in Britain to be “widely scattered and very local”, dubbing it ‘Western Figwort,’ whereas ‘Northern Figwort’ might have been more appropriate: in Fife it is

virtually confined to the north-east, especially liking the River Eden and its tributaries e.g. the Motray Water and the Kinness Burn, where Charles Howie saw it before 1884. He called it *S. aquatica*, but before too long *S. alata* and then *S. erharti* were substituted before *S. umbrosa* became the accepted correct name.

By 2012, the situation had been aggravated by an apparent invasion of Scotland by *S. auriculata*. When the June 2012 version of the distribution map for the latter is examined, it shows a tremendous increase in records throughout GB and Ireland with no fewer than c.50 post-1987 new dots in the north. I'd guess that the majority have not been in aquatic habitats, rather the opposite as in Fife, where the first find in 1990 in the west was by a dusty roadside outside a disused quarry; this was from the Kincardine area and at the time I tried to relate my record to that of *S. aquatica* before 1863 from the same district by J.H. Balfour, probably unrealistically. Still in West Fife and in neighbouring Clackmannanshire (all in VC87), during the summer of 2010 Liz Lavery and Paul Stanley discovered several sites on old pit bings and similar old spoil heaps, as reported at the Exhibition Meeting of that year - however, they were mistakenly thought to be *S. umbrosa*. A bizarre report occurred in 2007, when unusual plants growing tall in patio pots in the Borders proved to be *S. auriculata* (Braithwaite, 2008).

So far, Kinross-shire has not had a mention, but the earliest note of a figwort in VC85 goes back well over 200 years there; this is of *S. vernalis*, the Spring or Yellow Figwort. It is much different to its siblings, being anything but ugly, brown or pongy - in fact to my eye it is soft, gentle and in its own way colourful, especially in a clump. It is thought not to be native to Britain and it is true that it usually occurs in places associated with man, eg "among trees outside the Garden of Kinrose [House]", noted by Dr. Hope in 1768 (Balfour, 1907), and where it may yet be seen, adorning the graveyard area of the Montgomery family, until very recently the owners of the building and grounds. It occurred too near the south-west side of Loch Leven, at Cleish, in the grounds of the local Castle, where Hooker saw it in the 1820s (Glasgow herbarium). It was still there in 1857, but was not reported during the 20th century. In Fife, Charles Howie, who was a nurseryman in St Andrews, commented in 1880 that "the old writers take no notice of this plant [as] it is generally considered an introduction... in renovating old gardens this stranger put in an appearance". He lists Lindores Abbey in Newburgh as a location, where it was initially observed in 1836, again in 1876/1914 while I

admired it among the ruins in 1976 and 2004. It also flourishes in a few sites elsewhere in NE Fife, along with the Kirkcaldy area and West Fife.

Still in Fife, in June 2012 Sandy Edwards, not long appointed as Joint Recorder for VC85, reported what he was sure was *S. auriculata* from near West Wemyss, just east of Kirkcaldy and very much in “my” home patch. Taken aback, it was then that I began to wonder if ‘Water Figwort’ might have assumed ‘a roving commission’ and deserted watery places, for although this new site was beside the Firth of Forth, salt water habitats had never been mentioned as a possible habitat. Rather bemused, over a fortnight later I set off on one of the numerous very wet days we had in June/July and duly found a large colony immediately adjacent to the Fife Coastal Path, with several plants now well over head height - however it had reached the location, it obviously was liking it! The patch certainly had not been there on my previous visit, some six years earlier, following which some renovation/realigning had been carried out - could seed have been introduced during this operation? In passing, it is of interest to note that, of the several ‘extra’ names for species of *Scrophularia* used during the 19th century, one was *S. balbisii*; this is subsumed under *S. aquatica* by Bentham & Hooker (1924, and probably earlier), who commented that it grew “in drier situations, with leaves more pointed”, descriptions that match the W. Wemyss colony.

Finally, to complete the inventory of *Scrophularias* recorded from Fife, *S. scorodonia* (Balm-leaved Figwort) was found at St Davids harbour (now part of Dalgety Bay) in 1912/13, presumably as an import in ships’ ballast. Its sole British sites are in Devon and Cornwall and it is within the bounds of possibility that the vector was a vessel from there contracted to collect a cargo of coal, the chief export from the little harbour. The report was by James Fraser, who made a point of searching for casuals and publishing them, though the finder was “Miss Dickie [who] found two plants new to Scotland, the other being *Geranium modestum* Jord., a shingle plant of southern England” (Fraser, 1912, specimen in Edinburgh herbarium).

George Ballantyne, Kirkcaldy.
Joint Recorder for Fife & Kinross, VC85

(N.B. This article was compiled in autumn 2012 but not submitted until much later.)

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THE SCOTS PINES OF GILLIES HILL

A possible relict population of *Pinus sylvestris* on Touchadam Craig, Stirling

“Lay on! Lay on! They fail!” So rang out the words of Robert the Bruce in the late afternoon on the second day of the Battle of Bannockburn calling the “Sma’ Folk” or camp followers down from their encampment on the flanks of Gillies Hill to join the battle at its crucial stage. The Gillies descended the slopes of the hill yelling, banging pots and pans, and waving pieces of clothing in the air at which point the English troops thinking the newcomers were reinforcements, fled; and the rest is history. Gillies Hill still stands today, a monument to the Sma’ Folk, and although the tale is shrouded in mystery, enough of it remains, including the name of the hill itself, to make us ponder.

Gillies Hill is located in Central Scotland east of the city of Stirling and south of the town of Cambusbarron within the Bannock Burn and River Forth watersheds. The hill rises gradually from an altitude of approximately 79 m at the Bannock Burn Bridge at Sauchie Craig on its southern end to drop off in a series of crags (cliffs) - some natural, some the result of quarrying - at its northwest end at an approximate altitude of 160 m.

The hill is one of a series of parallel “crag and tail” formations (including Abbey Craig (location of the Wallace Monument), Stirling

Castle Crag, Kings Park, and Sauchie Craig) that march across the Carse of Stirling between the Touch Hills and the Ochil Hills. These formations were created by the movement of glaciers over the carse shaping the more resistant (usually volcanic) plugs into cliff-like crags (“craig” in Scots) with trailing wakes of softer material called “tails.”



Statue of Robert the Bruce at Bannockburn with Gillies Hill in the background

Gillies Hill consists of 140 ha (350 acres) of timbered hillside classified in a Phase 1 habitat survey conducted in 2010 as including broadleaved semi-natural woodland, broadleaved plantation woodland, coniferous plantation woodland, mixed semi-natural woodland, dense continuous scrub, scattered scrub, recently felled coniferous woodland, semi-natural neutral grassland, marshy grassland, continuous bracken, standing water, running water, and rock exposure & waste/quarry. Dominant species found on Gillies Hill include sycamore, birch, broom, common ash, beech, larch, bracken, spruce, oak and willow.

The hill has been populated by humans since before the Iron Age, and although its flora has been altered over the centuries by logging, timber production (predominantly larch and Sitka spruce), estate plantings of exotic conifers and ornamentals, and the intrusion of invasive species, there are sections of the hill that remain relatively unscathed. One of these sections is the Scots Pine - *Pinus sylvestris* - woodland that clings to Touchadam Craig itself extending along the west side of Gillies Hill. Approximately 65 mature Scots pines, plus many young pines and seedlings, currently grow from the northern to the southern end of the crag. . Forty small pines between one and twelve feet tall were recently counted on the north third of the North Pincer alone. The northern stretch of the crag is intact, encompassing unsurpassed views across the Carse of Stirling to the Trossachs.

A public path parallels the northern top of the crag passing several veteran Scots pines and ending up at the site of an Iron Age hill fort (Scheduled Ancient Monument – Royal Commission on the Ancient and Historical Monuments of Scotland (RCHAMS) Site Number NS79SE 60).

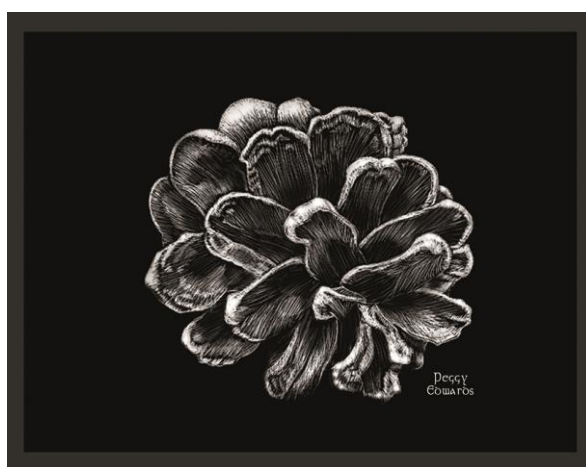
The central portion of the crag, what locals call the North Pincer, is more difficult to access; but is nevertheless intact with a steeper face containing many old pines and snags. Between the North Pincer and the South Pincer, the relatively wild southern extent of the crag that ends at the site of the Iron Age Walstale Dun (Ancient Monument - RCHAMS Site Number NS79SE 48) is a gap created by former quarry operations, on which the fabled Bonnety Tree was located. This was the Scots pine upon which Robert the Bruce's troops supposedly hung their bonnets before the battle.

Many of Touchadam Crag's pines are twisted and gnarled as would be expected of trees growing on exposed cliff faces. Looking nothing like the younger pines found elsewhere on the hill which are remnants of former plantations, these veteran trees resemble those found further north in the Highlands; indeed this group of pines may represent an southerly extension of the Caledonian pinewoods.

According to Dick Peebles of the British Mycological Society in his summary of a 2011 field survey of Gillies Hill by the Clyde and Argyll Fungus Group, "The last remnants of ancient woodland are either in very remote areas, or else in places such as cliffs or river gorges where there was little scope for human occupation, industry, agriculture or timber extraction. This is the case with our small area of Gillies Hill, where the fungi provide forensic evidence of a previously-unrecognized relict of a wood that has been there since shortly after the last retreat of the ice sheets." and "The most mycologically interesting area of Gillies Hill, unsurprisingly, is in the vicinity of the ancient pinewood relict at the very top of the crag adjacent to the Murrayshall quarry. The surviving pines here are believed to be over 200 years old and the presence of fungi such as *Russula integra* var. *integra* and to a lesser extent *Tapinella atrotomentosa* strongly suggest the continuous presence of this forest from prehistoric times. The heather-clad crag top also features a population of birch, and the presence of species such as *Cortinarius triumphans*, *Leccinum variicolor*, *Amanita crocea* and most particularly, *Hypomyces viridis*, is testament to the health and vitality of this woodland. This last species is rarely encountered in Britain (only 33 records on the FRDBI) and most of the finds have come from the

Scottish Highlands.” He goes on to say that, “The locale would be worthy of preservation as an ancient woodland relict in its own right, but what makes it even more special is that it is largely on calcareous soil, while almost all of Scotland’s ancient woodlands are on acid soils.”

A further four large pines have been located on the lower regions of Gillies Hill. These range from 3.03m to 5.69m in circumference. The “Big Pine” may be the fifth largest in the United Kingdom and the largest in the Stirlings. It is an enormous multi-trunked tree located along a footpath just north of ruined Polmaise Castle. Many of the pines along the crag, growing in a more exposed location, are over 2 m in circumference.



Scots pine cone

Trees and shrubs associated with the Touchadam Craig pines include: hazel - *Corylus avellana*; pedunculate oak - *Quercus robur*; silver birch - *Betula pendula*; common hawthorn - *Crataegus monogyna*; broom - *Cytisus scoparius*; and gorse/whin - *Ulex europaeus*. Of these and other woodland trees, 33, including the 4th and 6th largest rowans in Scotland, have been registered with the Woodland Trust’s Ancient Tree Search. In addition to the variety of trees a few of the understorey species found within the pinewoods include: bell heather - *Erica cinerea*; ling - *Calluna vulgaris*; wood sorrel - *Oxalis acetosella*, star moss – *Polytrichum commune*, harebell - *Campanula rotundifolia*, blaeberry - *Vaccinium myrtillus*; wild strawberry - *Fragaria vesca*; tormentil - *Potentilla erecta*; enchanter’s nightshade - *Circaea lutetiana*; dog’s mercury - *Mecurialis perenni*; great wood rush - *Luzula sylvatica*; common primrose - *Primula vulgaris*; wood avens - *Geum urbanum*; lady’s bedstraw - *Galium verum*; slender St John’s wort - *Hypericum pulchrum*; devils-bit Scabious - *Succisa pratensis*; and wild thyme - *Thymus polytrichus*.

Aging the native pines of the hill has been a challenge. The hill is currently owned by three different entities, so the trees cannot be cored. However, in 2012 winter winds caused severe damage to one of the pines on the North Pincer which provided the opportunity to count tree rings ten feet up one of the branching trunks totalling 148 years.

Unfortunately, this southerly pine relict woodland is currently under threat by the potential of renewed quarry activity as well as threats by vandalism, fire, and invasive plants including *Rhododendron ponticum* which has spread throughout the hill from the castle gardens; and Two-spined Acaena - *Acaena ovalifolia* which has colonized the quarry and most of the hill's pathways, at times engulfing native woodland understorey species. Indeed one of the major concerns regarding renewed quarrying is the potential for Acaena to be spread with each truckload of whinstone that leaves the quarry. According to a letter from Roy Sexton of the Scottish Wildlife Trust 2009, "We have become aware that Pirri Pirri (*A. ovalifolia*) is now the dominant ground flora plant in the Murrayshall quarry and in surrounding Gillies Hill woodlands at Cambusbarron, Near Stirling (NS 771 914). Recently Tarmac were granted permission to recommence quarrying operations at this site with the risk that they will ship the *Acaena* seeds with the chippings all over Scotland. If this plant were to colonise our machair and sand dunes I fear the consequences could be disastrous. The most recent proposed quarry renewal involves Drygrange Estates leasing to Patersons Quarries.

Since 2006 the Save Gillies Hill group backed by the Cambusbarron Community Council has strived to protect Gillies Hill from further quarrying with the goal of eventually creating a Community Woodland. To further its cause, each year the March of the Gillies takes place on the anniversary of the Battle of Bannockburn when the community marches from Cambusbarron to the Borestone to bring attention to the cause. The community, with the help of volunteer bryologists, botanists, mycologists and wildlife biologists, has spent years studying the hill compiling species lists, monitoring red squirrel, bat, and badger populations, meeting with Stirling Council and various government representatives, and creating informative brochures on the flora & fauna, recreation, and history of Gillies Hill (see website address below further information).

As with any endeavour, the more we learn, the more questions arise. Are these venerable pines truly relicts of the past and is there any

way to prove this beyond a shadow of doubt? Could they be considered a southerly extension of the Caledonian pinewoods? What would be the best approach to expanding the pine population's restoration and expansion? And perhaps the most crucial question of all, can Gillies Hill be saved?

Peggy Edwards
California Teaching Credential Community College:
Forestry and Natural Resources
peggedwards@sierranatureprints.com

The photo and scratchboard in the text are by Peggy Edwards. More photos of Gillies Hill are on the inside back cover.

If you would like to help the Save the Gillies Hill campaign see information at:
<http://www.savegillieshill.org.uk/index.htm>.

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ARE OUR NATIVE SCOTS PINE FORESTS AT RISK OF *DOTHISTROMA* NEEDLE BLIGHT EPIDEMICS?

The question of whether native Scots pine in the UK is vulnerable to epidemics of *Dothistroma* needle blight (DNB) is an important one for a number of reasons. Scots pine, the national tree of Scotland, is the only native pine in the UK and is a keystone species within Caledonian pinewoods. It is also extensively planted for timber, especially in Scotland, and therefore has great ecological, economic and cultural significance. Tree health is a highly topical subject, and will only increase in importance as the number of pests and pathogens that threaten our native and exotic species increases. In asking whether trees are vulnerable to disease epidemics, we need to establish the means and degree to which tree populations are able to defend themselves against infection (their resistance), whether these mechanisms are heritable (and therefore likely to also protect future generations), and whether the pathogen has characteristics which mean it is more likely to be a threat over time.

Dothistroma needle blight is considered one of the most important diseases of pine, affecting pine forests, and particularly plantations worldwide. *Dothistroma septosporum*, the main causal agent, is an ascomycetous fungus with a wide host range and symptoms of infection including red/brown banding of the needle, loss of older needles and a subsequent reduction in growth. Where infection is severe and prolonged, tree death may occur. Apart from occasional isolated reports of DNB in nurseries the disease was not reported in Britain until the late 1990s, and the incidence has since increased substantially despite the pathogen being listed by the EC as a quarantine organism. The increase in cases in the UK is probably due to a combination of a warmer and wetter climate, the extensive planting of susceptible host species (such as Corsican and lodgepole pine) and possible re-introductions through nursery stock.

Every forest district in Scotland has now recorded DNB infection, and there is a moratorium on planting Corsican pine, which has been one of the most severely affected. Assessments are being made on the distribution and severity of DNB in plantations across the UK, and research into the epidemiology of the pathogen, and host susceptibility in different provenances is also underway. The disease spreads predominantly through water droplets, but some spores are also wind-

borne. Standard care should be taken to reduce the movement of plant material on boots etc. when moving between forests.

Although the focus of DNB has predominantly been on its impact within planted forests, it also poses a potential threat to natural populations with the first report of this disease on a native pine in Scotland in 2011 (A. Brown, pers comm.). While established 'old growth' is assumed to be relatively safe from infection (the pathogen needs high humidity and continuous wetness which is more likely where needles are closer to the ground and host density is high), regenerating trees are thought to be at risk, and this could affect their competitive ability with potentially long-term changes in the species and age composition of these remnant forests.

Traits such as disease resistance are subject to enormous variation, both within an individual (due to environmental influences and variation in the pathogen) and across populations (due to genetic differences between individuals, as well as variation in the environment and pathogen). Therefore, to answer the question of whether our native forests are vulnerable to *Dothistroma* needle blight epidemics, we need to use a holistic approach whereby aspects of host biology and genetics, combined with pathogen biology and genetics are incorporated to understand the extent to which a tree's genes are controlling the observed variation in disease resistance, and also to understand how variation in response to disease within tree populations might change through time and space.

My PhD project is going to involve identifying, measuring, and estimating heritability values for variation in host resistance in Scots pine saplings that are representative of its natural range in Scotland, and also Europe. In addition to this, I am planning on isolating the pathogen from infected trees in a Scottish forest, and by fingerprinting each isolate using a set of ten DNA markers I will be able to calculate the genetic diversity of the population, how much asexual and sexual reproduction is occurring and over what scale. This will provide information on the potential the organism has to evolve (if there is lots of diversity, there will be a high adaptive potential) and whether there is any evidence that sexual reproduction is a significant component of the life cycle of the pathogen in the UK. In addition to this, I will also be looking for underlying genetic differences between resistant and susceptible trees in the hope that some of the genes controlling these traits are identified, but also so that we have the potential to develop tools with which to

predict what the susceptibility of a particular tree is, without having to expose it to the disease.

It is hoped that my research will allow us to be able to anticipate which native tree populations are particularly vulnerable to *Dothistroma* needle blight, whether the pathogen is likely to evolve and adapt over time, and potentially to identify the genetic basis underlying resistance to this disease.

For further information about *Dothistroma* needle blight in the UK, please visit the following Forest Research website link: <http://www.forestry.gov.uk/fr/INFD-6ZCKAE>

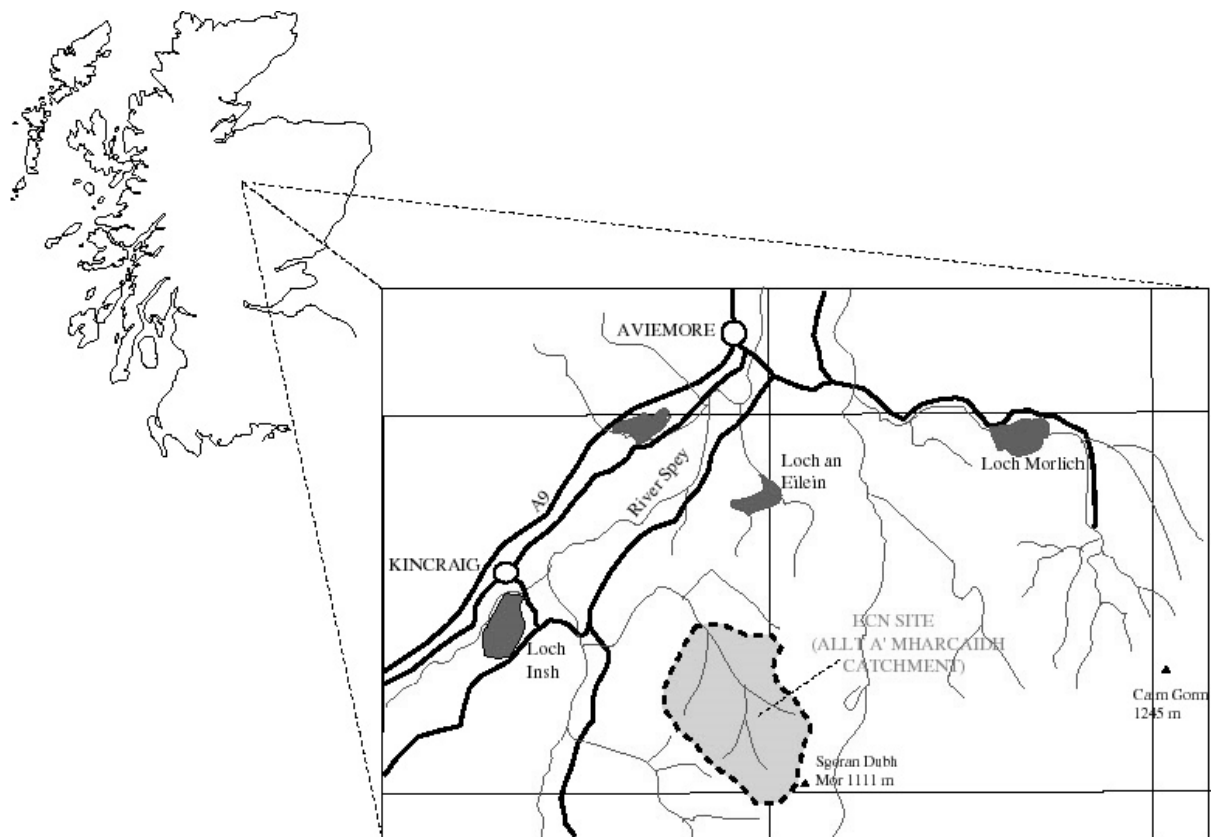
Annika Telford, PhD student,
Centre for Ecology and Hydrology, University of Edinburgh and Forest
Research
Supervisors: Stephen Cavers (CEH), Richard Ennos (UoE), Joan Cottrell
(FR) and Anna Brown (FR)

TOP TEN SCOTTISH ORCHID MOVIES: BY RHODY

10. The Greater Butterfly Effect
9. The girl with the Fragrant Orchid Tatto
8. North by Northern Marsh
7. Early Purple Rain
6. One Flew over the Bird'snest
5. The Lady's Tresses from Shanghai
4. Kind Hearts and Coralroots
3. Dr. Strangelove or How I Learned to Stop Worrying and Love the Bog Orchid
2. Twayblade Runner
1. Bring me the Hebridean Marsh Orchid of Alfredo Garcia

ARE SCOTTISH MOUNTAINS BECOMING SPECIES RICHER?

There is a school of thought which says that as a result of climate change there will be a general upward shift of plant species towards the top of mountains under a warming climate, resulting in a concurrent increase of species numbers at higher altitudes. While this is an attractive hypothesis due to its simplicity how can it be proved? Georg Grabherr, a leading Austrian mountain researcher and colleagues from around Europe in 2000 established a network of sites called GLORIA (Global Observation Research Initiative in Alpine Environments <http://www.gloria.ac.at>) focusing on the effects of climate change on high-mountain plant diversity. Four Scottish hills are part of this network. The Scottish National Heritage research site Allt A' Mharcaidh in the Cairngorm National Park was a natural choice for inclusion as it has formed the most northerly long term monitoring site in the UK's Environmental Change Network since 1998 (www.ecn.ac.uk).



In the GLORIA network of sites species richness was assessed in 17 regions from the northern boreal to the Mediterranean zone. In each mountain region, typically four sites on mountain summits of different altitude span and elevation gradient were assessed from the treeline

ecotone to the uppermost zone where vascular plants occur. In total 66 mountains were surveyed in 2001 and again in 2008 (in two regions only three mountains were surveyed because of terrain constraints). Each summit site was divided into eight sampling areas (summit area sections), which covered the summit terrain from its top down to the contour line 10 m below the summit. Each summit area section was surveyed separately for a complete list of vascular plant species.

Across the four summits surveyed in Scotland a total of five species of vascular plants were recorded in 2008 that had not been found in 2001. These were *Diphasiastrum alpinum* (L.) Holub, *Festuca ovina* L., *Festuca vivipara* (L.) Sm., *Pinus sylvestris* L., and *Scirpus cespitosus* L.. These small additions may be unconvincing when considered alone but as part of the GLORIA pan-European study they form a statistically significant story.

Between 2001 and 2008, vascular plant species numbers increased on 45 mountain summits, decreased on 10 summits and remained unchanged on 11 summits. Across all 66 summits the average numbers of species per summit increased by 8%, a change that was significantly different from a null hypothesis of constant species richness. However, these shifts had opposite effects on the summit floras' species richness in boreal-temperate mountain regions (+3.9 species on average) compared with Mediterranean mountain regions (–1.4 species), potentially because recent climatic trends have decreased the availability of water in the south of Europe. Because Mediterranean mountains are particularly rich in endemic species, a continuation of these trends might shrink the European mountain flora, despite an average increase in summit species richness across the region.

Dr Jan Dick
jand@ceh.ac.uk

Reference

Harald, P. et. al. (2012) Recent Plant Diversity Changes on Europe's Mountain Summits *Science* 20 April 2012: Vol. 336 no. 6079 pp. 353-355 DOI: 10.1126/science.1219033

PHYTOLEXICON CRUCIFORMIS B.S.SCOT EX WORD

Xword 8. In this crossword there are eighteen botanical names, mostly angiosperms but including two algae, one fern and the vernacular name of one fungus; nine words of botanical, ecological or biochemical terminology; and some other words to fill in the gaps. Words do not read across grey squares or thick lines. I hope you don't find it too easy! Alas! my expedition to The Land Where The Bong Tree Grows has not got off to a good start: Edward Lear didn't leave a navigational chart. But I still have hopes of bringing *Sudoku* into cultivation at RBGE.

Crucifer

Across

- 1 Cur hounds crisp into Irish moss for carrageen (Red algae) (8, 7)
- 10 and 36a. In proportion to, or a trap? (3, 4)
- 12A characteristic feature of Cucurbitaceae and some other families. (7)
- 13A characteristic feature of Rutaceae and some other families. (5)
- 15 Salutation inside a really nice letter. (4)
- 17 See 28a.
- 19 Fabric that's found in extensively crafted garments. (5)
- 21 Abominable, yet interesting inside. (4)
- 22 and 20d. Plant held by tribes and coming back in marginal land; currently laden with fruit (Saxifragaceae) (5, 5)
- 23 Sicana
- 25 Transfer messenger from carnation to all living things (3)
- 28 and 17a. I spurn mauve cherry when uranium replaces energy (6, 5)
- 29 Film speed-controlling bumf. (3)
- 30 Dig soil from silo, amazingly good for growing plants. (4)
- 32 Hamlet, perhaps, at home in Canada, nearly. (4)
- 33 and 39a. A cut pierces Thymus cambium; remove ribs; came for parasite (Convolvulaceae). (7, 9)
- 36 See 10a.
- 37 Osama's lurid gen about fern distressing monarchical quality. (7, 7)
- 38 Time consuming chore sounds right when seconds are removed. (4)
- 39 See 33a.

41 Genuine fear that when fern disappears a genus appears
(Myrtaceae). (7)

42 Inn's usual gloat at riverside tree (Betulaceae). (5, 9)

Down

1 Join four pollen sacs with energy – that joins them. (10)

2 Soup or hot rot, returned with a little mixture of ovules (12)

3 Edmonds perhaps backing Trotsky at Christmas.(4)

4 Orchid men dub absurdly epiphytic after leaving church
(Orchidaceae). (10)

5 Mount horse in arid environment. (4)

6 Praise a reconstructed plant (Rosaceae). (7)

7 See 37a.

8 Uncap a maturing tree, releasing delicious fruit. (type genus of its
family) (6, 8)

9 Leaves cell, guards fissile atoms at back! (7)

10 Elm and hop in unison: "We both have this!" (6)

11 Might include Portuguese Man O'War, for instance. (4)

14 Confusion ruin'd a valuable Malaysian fruit tree (Bombacaceae). (6)

15 Asylum's arranged for Crucifer. (7)

17 See 18d.

18 and 17d. Rare plant commonly noted in wound, worthy of use in
medicine, or when spy chats liana. (7, 6)

20 See 22a.

24 Rum as a medical concoction formerly (Aristolochiaceae). (6)

26 Found slouched in a chair, a monotypic genus that is the type of its
South African family. (7)

27 Local? Oh, where I can find this! (7)

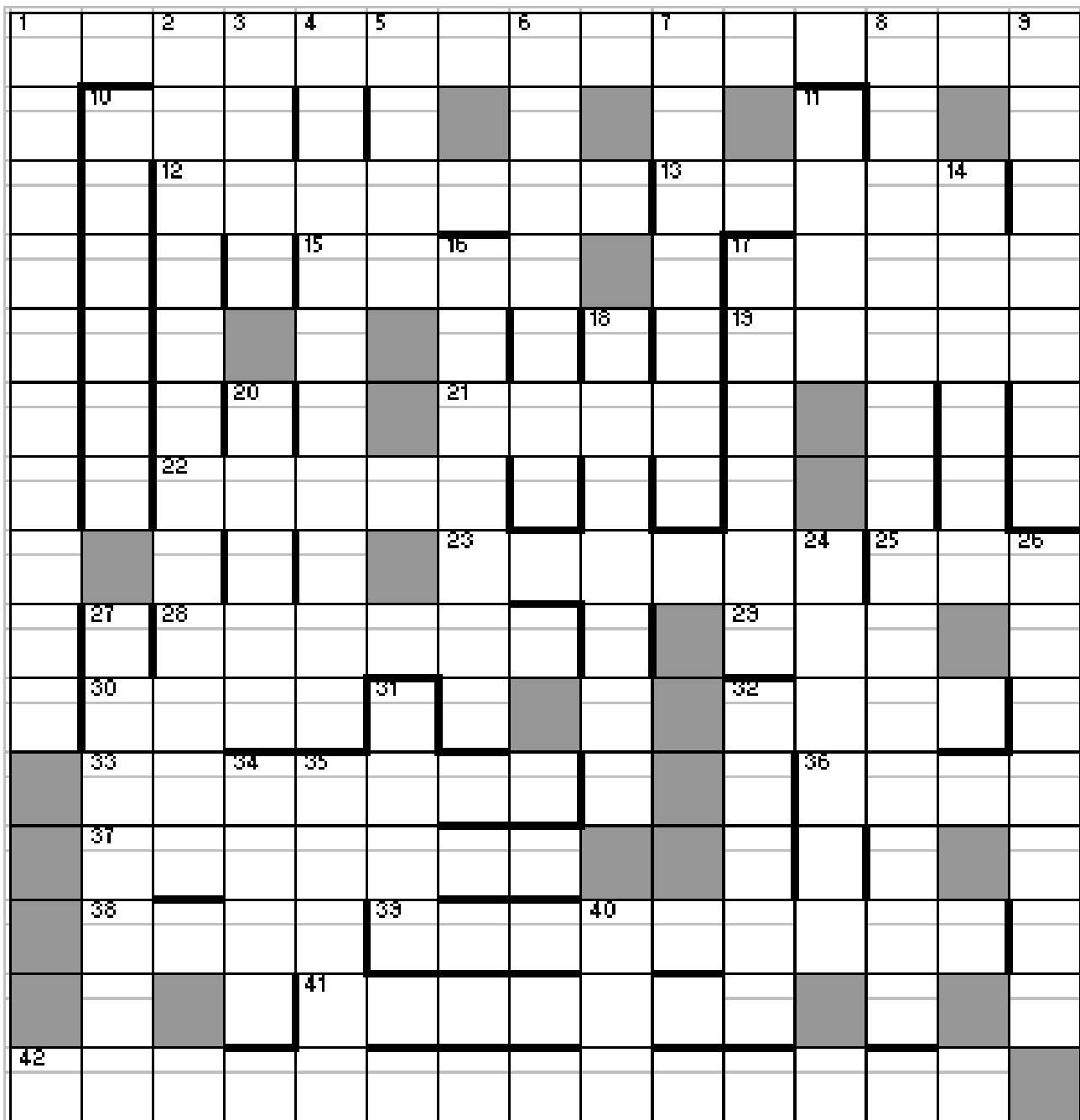
31 Littoral environment found in sand, unending in wind or waves. (4)

32 A daisy I relinquish in exchange for a beautiful seaweed. (Red
algae). (5)

34 Fungus about which I tell vernacular dirty jokes. (4)

35 Relieves illness with misspelled curse. (5)

40 Trust no terrorist initially – he'll set off an explosion whichever way
you look at him. (3)



SEPILOK SEEDLINGS

Assessing the role of species traits in determining forest growth and production

I will be spending the next seven weeks in the Kabili-Sepilok Forest Reserve in Sabah, Borneo, made famous by its Orangutan rehabilitation centre. My purpose differs somewhat from many of the visitors here though – I am on the lookout for tree seedlings!

The main aims of the research are to examine how the functional traits of seedlings differ across soil types and across taxonomic groups (species, genera, families). Functional traits include allometric traits which relate to size and shape (for example the relationship between stem diameter and height) and biomass allocation traits (for example how biomass is partitioned between above- and below-ground plant parts). Functional traits also include chemical attributes – where the plants allocate nutrient resources. It is useful to look at seedlings because it is possible to look at both the above-ground parts and the roots, whereas this is very difficult in adult trees.

Why Sepilok? The forest here grows on a variety of soil types, yielding contrasting forest formations and tree species assemblages. Primarily, there are three types: forests growing on nutrient-rich alluvial soils, sandstone hill forests and white sand forests, known locally as kerangas, where soils are very low in nutrients. This provides a good opportunity to test how seedlings differ in their traits along a gradient of soil fertility. I last visited the reserve in 2007 when I re-measured some permanent forest plots; we marked out one hectare of forest on each soil type and the diameter of every tree greater than 10 cm was measured and identified. As all these trees had previously been measured in 2000, I was able to calculate the growth and biomass gain of each tree. With this information it may also be possible to link seedling traits with adult performance.

If you are interested in the project, please follow me on twitter @I_banin and the project #SepilokSeedlings to receive updates! This project has been funded by a Royal Geographical Society (with IBG) Peter Fleming Award.

Dr Lindsay Banin
Centre for Ecology and Hydrology
Bush Estate, Penicuik, Midlothian, EH26 0QB

A VISIT TO BAILI IN CHINA

The Baili scenic area is a mountainous region covering 125 km² in Guizhuo, western China, which attracts rich Chinese tourists every year with its displays of multicoloured *Rhododendron* bushes. Last year the park managers decided they wanted to know more about their *Rhododendron* plants, so they invited David Chamberlain through BGCI (Botanic Gardens Conservation International) to come for up to six months to make an inventory. David had been there in the 1990s, and knew that most of the colours that bedeck the hillsides here in late March come from just two species: the bright red *R. delavayi*, and the white-flowered *R. irroratum*. These form massive populations of hybrids, with all colour shades in between. Knowing that the taxonomic problems could only be solved with modern techniques, he proposed that a shorter visit by a group of scientists including molecular systematists would achieve much more, and that Chinese researchers from Kunming Institute of Botany should be included in the collaboration. Thus it came about that David and Maria Chamberlain, Tobi Marczewski and Jane Droop from Edinburgh joined Professor Zhang and her colleagues and students from Kunming in the lovely Baili during March, and I followed in early April as soon as my teaching duties allowed.

So, in early April, I found myself staggering around a remote Chinese hillside recovering from jet lag and nine months without proper sleep (new baby), while around me more mentally competent people collected data on huge *Rhododendron* plants, and a film crew for the local news station caught it all on camera. Indeed, my colleagues had become minor local celebrities, being given front row seats at a pair of local festivals, including a flower festival where some (apparently fake) pigs were sacrificed to the Gods of Yi.

Tobi was leading some work to meticulously record morphological data on the *Rhododendron* hybrids, while David was cataloguing all *Rhododendron* species in the area. Already they'd identified a species new to science, shown to them by our local contact and all-round go-to guy Mr Huang [picture 1]. Meanwhile Maria and I were captivated by the extraordinary diversity of local ferns [picture 2], and China's answer to Superman was spotted, helping a film crew tidy up after shots of him flying over the *Rhododendron*-clad hillsides [picture 3].

Early on in my visit, I'd sleepily staggered around the thorny steep hillside behind our hotel complex, and recorded the first of three orchid species [picture 4].

Sadly, a week later it was gone, stolen we must presume by local children, who the others had seen selling these orchids by a roadside. Reasoning that the best way to stop this tragic plundering was to help the locals put a value on biodiversity, I soon set to work on a side project, creating a checklist of flowering plant families for the Baili area, which the park authorities could use to promote tourism outside of *Rhododendron* flowering season. The park goes from overcrowded with tourists to almost empty of them in the space of barely a week when the peak *Rhododendron* flowering period ends in spring. My plant family-finding quest was kicked off by finding a magnificent *Asarum* species in a damp crevice [picture 5].

After David and Maria left us to attend a *Rhododendron* conference back home, our team was reduced to me, Tobi, Jane, and our Chinese botanist friends Yongpeng and Xuemei. On walks together we found such treasures as *Illicium* [picture 6] and a fine *Clematis* [picture 7]. On the odd solo excursion I'd also found a remarkable shrub with flowers appearing to grow from the leaves (in fact the peduncle is fused to the leaf blade), later identified as *Helwingia* in the Cornaceae [picture 8].

I also helped Tobi and Jane locate suitable *Rhododendron* hybrids to include in their survey, and despite my advancing years turned out to be the best monkey in the group, for with the flowering period nearly over, often the only remaining flowers were on the uppermost branches. Sometimes I could reach these by climbing, sometimes not, so I improvised a lopper out of a stick, secateurs, string and gaffer-tape. Upon seeing this, Mr Huang promptly produced a far superior set of professional loppers; apparently he hadn't understood what we needed until I inadvertently showed him. I soon got over an acute case of lopper envy, and between us we collected flowers and leaves from about 80 hybrids, and Tobi and Jane were able to record some remarkable variation among them [picture 9].

I had time for a few excursions with Mr Huang, who was keen to help my quest to find new plants. One site he took me to was exceptional: in a very small area I found such gems as *Chloranthus oldhamii* [picture 10], an *Arisaema*, and a beautiful small tree that was identified after much struggle and help as *Decaisnea insignis* in the

Lardizabalaceae [picture 11]. The monstrously large *Cardiocrinum giganteum* was there but sadly not in flower yet, small *Thalictrums* and a yellow poppy hugged the crevices, but perhaps the best find was *Tupistra*, a bright orange-flowered monocot that naturally only occurs as rare, scattered populations [picture 12].

My goal was to produce a list of 100 families with pictures, but as the days ran out the search became increasingly desperate. Mr Huang reacted with disgust at my delight in finding *Phytolacca* (a local weed) in flower, and even a few stray leaves of *Epilobium* were greeted with joy. Though the family list did extend a bit after I left, through identification from photographs by Chinese experts, my list stalled frustratingly at 92.

David clocked up 42 *Rhododendron* taxa, but declared at least 13 previously recognised species as dubious. Tobi and Jane completed their data gathering but will return next year to collect more. Perhaps I too will return, to track down those last eight families, although the park people are very happy with my list so far. Jane however may need to return incognito, because she was called upon to do a voiceover for a park video, and is clearly going to be The Next Big Thing in this part of China! [picture 1].

We are all immensely grateful to the Baili *Rhododendron* reserve for their lavish hospitality and friendship throughout our stay.

Dr. Richard Milne
University of Edinburgh

Picture numbers refer to the photos on the outside back cover and are numbered as follows:

1	2	3
4	5	6
7	8	9
10	11	12

BOOK REVIEWS

Proctor M (2013) *Vegetation Of Britain And Ireland*. The New Naturalist Library, HarperCollins, London.

This book is a work of extraordinary breadth, inspirational and likely to be referred to by ecologists and botanists for many years to come. In 516 pages, Michael Proctor has surveyed the most important vegetation types of Britain and Ireland. It is not a text book, and not a reference work. True to the style of the *New Naturalist* series, it is written to be enjoyed by anyone interested in vegetation. One of its strengths is that it is lavishly illustrated: there are 328 Figures, mostly excellent photographs taken by the author but also line drawings explaining in simple terms some of the scientific principles that underlie the processes shaping the distribution of species. Another great strength is the engaging style of writing.

The first four chapters (pages 1-42) cover the background, especially the geography and history of the 'two islands' and the nature of plant communities. Chapters 5 to 20 broadly cover habitats, e.g. woodlands, grasslands, lakes and rivers, four chapters on peatlands, heathlands and mountains, three chapters on coasts. Each contains a wealth of information on species commonly found in these habitats, the interpretation of patterns and frequent discussions of science questions.

There is a short but thoughtful concluding chapter in which the author points out that almost all of our landscape is man-made, or 'cultural' as he calls it, and he (interestingly) redefines a 'native' species as one that reached our islands before the invention of writing. Finally, he touches lightly on climate change. When writing about these rather well-worn issues the author brings a most welcome freshness of vision.

Where does the book sit in relation to other works? Rodwell's *British Plant Communities* is a multi-authored and systematic work springing from an organised project starting in 1975 and taking 25 years to complete; it is a standard reference work, too expensive to be owned by individuals. In our Edinburgh University Darwin library the volumes were for many years kept under lock and key in the back room, lest students should steal them, and scholars consulted the appropriate volume or took notes before embarking on a field course. Michael Proctor's book on the other hand is one man's vision, resulting from a lifetime of travel, observation, photography and discussion, and written in an engaging and sometimes idiosyncratic style that entertains and

inspires as well as informs. We are fortunate enough in Britain and Ireland to be able to draw upon a noble line of reference books in vegetation science: Tansley's 1911 *Types of British Vegetation*, Praeger's 1934 *The Botanist in Ireland*, Tansley's 1939 *The British Islands and their Vegetation*, McVean and Ratcliffe's 1962 *Plant Communities of the Scottish Islands*, Burnett's 1964 *The Vegetation of Scotland*, as well as Rodwell's (1991-2000) *British Plant Communities*. They all have strengths, and are to be consulted from time to time; Michael Proctor's book brings freshness, it will illuminate the subject and open it to newcomers in a way that reference books cannot.

John Grace

Averis B (2013) Plants and Habitats: An Introduction to Common Plants and Their Habitats in Britain and Ireland (396 pp)

This book describes itself as an invaluable guide for students, ecologists, landowners, and land managers. The opening line of the introduction reads "This book is different from other plant books in several ways:" Bold statements indeed and I was curious to discover whether or not the content lived up to the blurb.

I was very pleasantly surprised by the quality and range of information presented in the book. In keeping with the BSS mission statement the content is not limited to flowering and vascular plants but includes the 700 common species that form the bulk of vegetation in the British Isles; including indicators of soil type and management. Descriptions of frequently seen mosses, grasses, invasives, ferns, a few lichens and some agricultural and forestry crops are included alongside those of native species.

Plants are grouped into general sections: woody plants, grasses, other grasslike plants, and other plants. Each section is then subdivided so that all of the broadleaved tree and shrub species (for example) appear together, instead of being scattered by accident of family allegiance throughout a flora, with a key that results in laburnum being compared with restharrow! A horrific thought for many botanists but so much easier for someone who knows that they are looking at a tree yet has no idea where it might fit into a plant phylogeny based on the intricacies of floral morphology.

‘Other plants’ are subdivided into six groups based on easily observed features of leaf morphology and position on the stem resulting in ferns and herbs with pinnately divided leaves all being in one group. Confusing? Surprisingly not. There is a simple, clearly written text describing how to tell them apart. Cow parsley is compared with hay-scented buckler fern to illustrate what a beginner should look for and where to look for it. Spore cases, scales on stems, sheathing leaf bases and, of course, flower heads (if appropriate) are all clearly described and illustrated.

Grasses and other grass-like plants are similarly presented together in one section. They are divided into groups (grasses, sedges, woodrushes and rushes) using a table of “easily observed differences” supported by text that stresses the importance of recognising where to look for sheaths, blades, ligules and nodes, and clearly labelled line drawings key features. More than fifty grass species (including oats, barley and maize) are grouped by flower head shape and in a summary table of leaf features with forty pages of description and illustrations to aid identification. The group of seventy-four mosses and liverworts receive similar attention with a few filmy ferns, clubmosses and lichens thrown in for good measure.

The final section of the book describes key habitats and how they can also be grouped using National Vegetation Classification (NVC) descriptors and codes. A table of Phase 1 habitat and their main NVC equivalents is also presented.

Within all of the sections multiple photographic images are used to illustrate the species. These are displayed with scale bars, arrows indicating key features, named locations and (uniquely) with the month when the image was taken. They are supported with black and white line drawings to clarify descriptive detail that may not be immediately visible from a photograph. The text is clearly and concisely written without resorting to botanical jargon.

Plant and Habitats is certainly different in its approach to identification with species being ordered by overall appearance. If you are looking for a definitive key to British flowering plant species this is not the book for you; nor does it claim to be. However, if you are a beginner looking to improve your basic identification skills or a more experienced botanist who wants to learn more about the groups of species that make up the habitats and vegetation types of the British countryside this book provides an easy to read, informative addition to

standard keys. Ecologists, foresters and other land managers will also find this an invaluable tool for expanding their knowledge and understanding of individual species within landscapes.

Barbra Harvie
University of Edinburgh

POLLINATION AND URBANISATION

Review of an article in Plant Ecology and Diversity

The effects of urbanisation on plants are not well understood. In a paper published in *Plant Ecology and Diversity*¹ an experiment on the effect of urbanisation on pollination by bumblebees is reported. Researchers placed potted specimens of *Lotus corniculatus* (L.) in gardens located in and around Paris, enlisting the help of volunteer householders to count the number of visits to the plants by bumblebees (*Bombus* sp.), and evaluating the extent of seed set. The researchers also recorded the extent of species that are known to attract bees, such as *Buddleja*, *Lavandula* and *Rubus*. Unsurprisingly, they found that the size of gardens and the diversity contained within each garden tended to increase with distance from the city centre. The richness and abundance of bumblebees increased towards the more rural end of the city-to-urban gradient. There were large variations in pollination success in *Lotus corniculatus*, but they were scale dependent. At the local scale, fruit set was correlated with the number of semi-natural areas in the garden. At the 100 m scale, pollination success was influenced positively by the proximity of large agricultural areas (often containing mass-flowering crops like oilseed rape, which offer huge rewards, or semi-natural hedgerows and herbaceous strips around the fields which offer potential nesting sites and food).

Despite the apparent simplicity of the experiment, the analysis and interpretation was complex, as there are many inter-correlated variables at work, and also the possible influence of factors which were not taken into account, such as pesticides, volatile organic compounds in the atmosphere, and gradients of biotic disturbances. Nevertheless, the paper adds significantly to our understanding of the vital service provided by bees. Without them, many of our native plants would not be pollinated, and many crops would fail to produce our food.

The senior author, Nathalie Machon, is a professor working at the Muséum National d'Histoire Naturelle in Paris. She has been developing citizen science programmes in urban biodiversity.

Anonymous

Reference

Pellisier V, Maurel N & Machon N (2013) Multi-scale assessment of pollination of *Lotus corniculatus* (L.) in a peri-urban fringe. *Plant Ecology and Diversity* 6, 195-203.

¹*Plant Ecology and Diversity* is an international journal published on behalf of the Botanical Society of Scotland by Taylor and Frances, and edited by Laszlo Nagy.

TREEZILLA, THE MONSTER MAP OF TREES

How many trees are there in Britain and how many different species? A new project undertaken by the Open University, Forestry Research and Treeconomics launched in June 2013 to help to answer these questions as well to calculate the 'ecosystem services' provided by each tree. Everyone can get involved by mapping trees in their local area and persuading the local council to upload their tree inventories. Towns and cities across the land will be turned into arboreta, you will be able to look at your smartphone and see the names of all the trees and get an idea of how they are benefitting the environment and human health.

How to take part

Go to <http://www.treezilla.org/> or download the iOS or android apps onto your smartphone. On the web or with the app, you will be able to browse and search all of the trees currently on the system. It is also possible to add trees from your own area. Don't worry if you can't identify the tree, it can still be added to treezilla, and you can also put on pictures of the leaves and other aspects of the tree and someone will help with the identification. We are looking for people to contribute who have some knowledge of trees, as well as members of the public, so that everyone helps out and people with greater expertise can help beginners. Don't forget to check back to see if anyone has commented on trees you have added or discussed your comments. The more people that take part the more trees we can map.

Public engagement

Two of the first areas to add their trees to treezilla were Walsall and Royal Botanic Gardens Edinburgh. The data for Walsall came largely from the council. The tree officer was very enthusiastic about treezilla and its ability to engage with the local people about trees. This has also allowed him to display the data on a map, and if anyone puts in a freedom of information requests about trees he can refer people to the map. The RBGE case is particularly interesting as the names of the trees were well documented but their trunk diameter had not been measured. Treezilla allows a bulk upload of datasets on many trees at the same time, such as accomplished for the Walsall or RBGE data sets. In addition data can be set so that it is editable by the general public. The RBGE data has been made editable as they want the public to help them to measure the diameter of their thousands of trees. Other councils are considering whether to make the data on treezilla editable or not, as they need to decide if they would gain useful additional information from the public or whether the public might try to damage the dataset by introducing errors. Even when the data themselves are not editable, photographs of individual trees can still be added and the comments box for each tree is also available for additional information.



Ecosystem services

Trees and other wildlife are part of the living ecosystem around us provide various 'services' to humans. Trees provide services include: cleaning pollutants from the air, reducing storm water flows that can overwhelm the urban drainage system, ameliorating the climate in urban areas so saving the energy costs of cooling buildings in summer and heating buildings in winter. Trees also take the greenhouse gas carbon dioxide from the atmosphere and produce the oxygen we need to breathe. Trees can also create a sense of wellbeing as people like being in areas of green space with trees. Property values are higher in areas

with trees compared to similar areas without trees. There has been a considerable amount of research establishing the levels of each of these ecosystem service benefits, however so far, much of the work has been done in the USA and we are using this information for treezilla calculations. Some of the benefit values do not reflect the built environment and tree growth in UK particularly well. Further work is being carried out in cities across Britain which should help to improve the accuracy of the ecosystem service numbers shown on treezilla.

Projects and activities

The treezilla activities are freely available. Example projects include a simple protocol for mapping the trees in your street and a comparison of the ecosystem services provided by different types of trees in the treezilla database.

Various other project ideas are being developed and put on the Open University and Wolfson Foundation: Open Science Lab (WOSL) website. The WOSL in general is available to anyone, although some of the projects are restricted to students or other specific groups of users. One of the other pieces of software on WOSL is nQuire, this general software helps with designing and carrying out projects using the scientific method. A tree related project using this software looks at a comparison of different methods for measuring tree height. We need to know how accurate and reliable are the different methods for tree height, is using your thumb outstretched arm and tape measure better than using a smartphone app. and what are the basic trigonometrical ideas behind the methods. Tree height may become more important for treezilla as it can help to improve the ecosystem service calculations.

Future

The treezilla project has only just started but already there are suggestions of many different types of data it could accept, not just individual trees from members of the public and councils but potentially millions of trees from aerial surveys. Public involvement in this case would be to provide the additional information such as the species name and size.

Dr. Michael Dodds
The Open University
<http://www.treezilla.org/>
<http://www.open.ac.uk/blogs/openscience/>

THE BRITISH ECOLOGICAL SOCIETY'S SCOTLAND POLICY GROUP

Are You Interested in Informing the Development of Environment and Science Policy in Scotland?

The British Ecological Society – the world's oldest ecology organisation – has recently established a dedicated policy group for Scotland, allowing Scotland-based BES members to keep up to date with policy developments and contribute to shaping Scottish policy.

The Group's latest activities include organising a joint conference with the Chartered Institute of Ecology and Environmental Management (CIEEM) and the Scottish Biodiversity Forum to explore the challenges and opportunities for science in the refreshed Scottish Biodiversity strategy, which was published in June. This event will be held in Edinburgh on 19-20 September, and further details are available on the BES website. On 19th there will be a free lecture in the lecture theatre at the Botanic Gardens Edinburgh at 7.30 pm delivered by Professor Louise Heathwaite, Chief Scientific Adviser for Rural Affairs and the Environment at Scottish Government: *Tactical Science to Build Strategies That Last*. This will be followed by a convivial networking reception. The lecture and reception are free to attend.

The Group has prepared consultation responses, including submissions regarding the Biodiversity Strategy and most recently to a consultation on the Scottish Rural Development Programme. Members are also involved in planning for a reception in Holyrood to celebrate the British Ecological Society's centenary this year, and to give a Scotland launch of our 'Ecological Issues' series, which aims to influence policymakers on topical areas of ecology.

The Group exists as an online community with an email group for members to share information and ideas with each other. The Group is open to all BES members based in Scotland with an interest in ecology and policy, and members receive a regular dedicated Scotland policy briefing from the BES Policy Team.

As with many of the Society's activities, the Scotland Policy Group relies on the enthusiasm of members to generate ideas for activities and work together to carry them forward, and the Secretary to the Group, Dr Rob Brooker (James Hutton Institute) would be pleased to see the group continue to grow.

If you would like more information or to get involved in the Scottish Policy group please contact policy@britishecologicalsociety.org

Martin Smith

Policy Manager

British Ecological Society

Email: policy@britishecologicalsociety.org

<http://www.britishecologicalsociety.org/getting-involved/scotland-policy-group/>

Editors Note: The lecture on 19th will follow the Botanical Societies Annual meeting. Although the lecture by Professor Heathwaite and the reception is free, the BES is requesting that people register in advance - see the BES web site: <http://www.britishecologicalsociety.org/public-policy/policy-events/forthcoming-meetings/scottish-biodiversity-strategy/>

CROSSWORD SOLUTION

1	C	H	O	N	D	R	U	S	C	R	I	S	P	U	S				
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	I		O	G	I		23	S	I	C	A	N	24	A	R	N	26	A	
	V	27	A	28	P	R	U	N	U	S	H		29	A	S	A		C	
	E	30	L	O	A	M	31	D	M		Y		32	D	A	N	E	H	
		33	C	U	34	S	35	C	U	T	A	S		36	A	R	A	T	A
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		38	H	O	U	R	39	E	P	I	40	T	H	Y	M	U	M	I	
			O		T	41	E	U	G	E	N	I	A		M			A	
42	A	L	N	U	S	G	L	U	T	I	N	O	S	A					

PLANTLIFE SCOTLAND EVENTS - AUTUMN 2013

Sat 12 - Sun 13 October, 1–4pm

John Hope Gateway at the Royal Botanic Garden Edinburgh

Drop-in event

Celebrate National Fungus Day with Plantlife Scotland. Come along to discover the mysterious world of fungi and lichens through activities, folklore and craft. Free admission.

Sat 19 October, 1–3.30pm

Haddo House, near Tarves, Aberdeenshire

Guided fungi walk

The estate lawns at Haddo House are internationally important for species of waxcap and coral fungi. Come along to see this dramatic display of colour and learn more about fungi identification and ecology. Free admission.

Sat 02 November, 10am–4pm

Centre for Stewardship, Falkland, Fife

Lichens in craft

The workshop combines ecology and craft. A chance to explore the Falkland estate, learn about lichens and then use Scottish lichens and fungi to create our own natural dyes. Taught by lichenologist Sally Eaton and craftswoman Sheila Bates.

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BSS NEWS – INFORMATION AND GUIDELINES FOR CONTRIBUTORS

The Newsletter of the Botanical Society of Scotland
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Editors:

Receiving editor:

Dr Jill Thompson

Tel. no.: 0131 258 2358 (evenings)

E-mail: jiom@ceh.ac.uk (work)

E-mail: jill.thompson99@gmail.com (home)

Coordinating editor:

Ms Jane MacKintosh

Tel. no.: 01968 675650 (evenings)

E-mail: jane.mackintosh@snh.gov.uk (work)

E-mail: jane.mackintosh@tiscali.co.uk (home)

Aims of BSS

The chief aims of BSS News are to communicate with the membership, to keep members informed and to act as a vehicle for members' contributions on all things botanical. By these means members can keep in touch with each other. There is also a further aim of providing interest, entertainment and stimulation for BSS members. Sometimes this may involve contributions from non-members. All contributions are welcome.

Scope of the newsletter

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

- Reports of field excursions (leaders please take note) picking out the botanical highlights.
- Descriptions and recommendations of other botanical sites in the UK or abroad. (It might help people to plan their holidays.)
- Articles of current or historical interest, including ethno- and archaeobotany.

- Biographical profiles of botanists.
- Botanical poems.
- Botanical notes, news items, announcements of future events, reports of meetings attended, correspondence, small ads., etc.
- Book reviews.
- Crosswords and quizzes.
- Illustrations, including paintings, photographs and line drawings (the latter to be in black ink on white paper). Subjects could include plants, habitats, people, events, or even witty cartoons if they are your forte!

Guidelines for contributors

Don't worry if you cannot comply with all of the following guidelines. Just send what you can and the Editors will make adjustments.

File name for email submissions and web uploads

Please include your own name and indicate article content in the file name. Also add your name, preferred title and affiliation etc. to the end of your article.

Text

The Newsletter is set up on a PC and saved as a document in MS Word 2010. Although it is printed on A5 pages it is set up on A4 pages using Arial font (size 15 for major text, 18 for main headings and 14 for acknowledgements and references). Margins are set at 2 cm (sides), and 2.5 cm (top and bottom), with headers and footers at 1.5 cm. Text is justified and single-spaced.

Text figures

Illustrations for the text can be line drawings, maps or graphs in black ink on white paper. Black and white photographs can also be reproduced. There is no colour reproduction in the text. Hard copy or digital images can be accepted.

Cover pictures

The cover is the display area for colour pictures (paintings, photographic prints or digital images). Original artwork will be returned to the author after careful use. Please ensure (and indicate in your correspondence) that you have appropriate copyright permission and permission from any people in photographs for publication in BSS news.

Submission

Please send your contributions to the Receiving Editor in any of the following forms:

- 1 E-mail attachment. This is the preferred option but, if you have many images, please send the images on a CD
- 2 CD
- 3 Hard copy (computer print-out and original artwork)
- 4 If you have no access to a computer, a typewritten or handwritten manuscript will be acceptable
- 5 Through the template on the BSS website: <http://www.botanical-society-scotland.org.uk/content/bss-news-newsletter-botanical-society-scotland>
- 6 If you are not a BSS member receiving the BSS News then please send a postal address to receive your copy of the newsletter

Send email with text and photographs to: jill.thompson99@gmail.com

For emailed pictures, please add the name of the photographer and the subject to the file name of the photograph. For photographs in articles, please add information and the credit to the photographer at the end of your article.

Send hard copy and CDs by post to:

Dr Jill Thompson
C/O Botanical Society of Scotland Newsletter
Royal Botanic Gardens Edinburgh
20A Inverleith Row
Edinburgh
EH3 SLR

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

**The LAST deadline for the next issue will be 15th January 2014.
Earlier submission would be appreciated.**

Back cover pictures

Inside

Top left: The view of Gillies Hill from below Stirling Castle. Photo by Peggy Edwards. See article on page 24.

Top right: The view to the north of the Trossachs from the northern end of Touchadam Crag. Photo by Peggy Edwards. See article on page 24.

Centre left: "The Wire Tree". Photo by Keith Ratcliffe. See article on page 24.

Centre right: "Ratty's Pine", 2.35 m in circumference. Photo by Keith Ratcliffe. See article on page 24.

Bottom left: Needle blight. Photo by Annika Telford. See article on page 30

Bottom centre: *Circaea lutetiana*, Enchanter's nightshade. Photo by Peggy Edwards. See article on page 24.

Bottom right: Recording a seedling in Sepilok, Borneo. Photo by Lindsay Banin. See article on page 38.

Outside

Twelve photos by Richard Milne illustrating his article on Baili, China, on page 39.

