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## **Front cover pictures**

### ***Outside***

The cake created by Thomas Waibel (email: [thomas.waibel@hotmail.co.uk](mailto:thomas.waibel@hotmail.co.uk), tel: 0131 477 6269) for the 175th anniversary celebration at the BSS AGM on 23rd June 2011. (Photo Derek Christie)

### ***Inside***

Top: BSS members at the AGM on 23rd June 2011. (Photo Derek Christie)

Bottom left: Wet recorders at Millerhill - see article on page 31. (Photo Richard Milne)

Bottom right: *Potentilla recta* at Millerhill - see article on page 31. (Photo Richard Milne)

## **Botanical Society of Scotland**

(Incorporating the Cryptogamic Society of Scotland)

c/o Royal Botanic Garden Edinburgh

20A Inverleith Row, Edinburgh, EH3 5LR.

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

RBGE website: <http://www.rbge.org.uk>

Founded in 1836 as the Botanical Society of Edinburgh, the Society became the Botanical Society of Scotland in 1991. Meetings are held in Edinburgh, Glasgow, Aberdeen, Dundee, St. Andrews and Inverness. The Society 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 1<sup>st</sup> October each year, and the annual rates are currently as follows:

|                                                        |        |
|--------------------------------------------------------|--------|
| Standard rate                                          | £32.00 |
| Standard rate for undergraduate students               | £28.00 |
| Basic rate (without the journal)                       | £15.00 |
| Basic undergraduate student rate (without the journal) | £2.00  |

Subscriptions can be paid by cash, cheque (payable to the Botanical Society of Scotland), or Banker's Order.

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## The Newsletter of the Botanical Society of Scotland

### EDITORIAL

Many congratulations to the Botanical Society of Scotland on its 175<sup>th</sup> Anniversary. Long may the society continue and increase in membership and activities. We are sure that everyone who attended the anniversary celebration in June will join us in thanking the organizers for a splendid anniversary occasion. It was heartening to see many more people at this event than normally attend the lectures and we hope that people will feel rejuvenated, will participate more in the future and encourage others to join the society.

We are sure that everyone really enjoyed the anniversary lecture by Dr Chris Page, from the University of Exeter, on *Araucarian*, *Archeosarians* and coniferous *pseudoskeletons* as much as we did, with its unusual foray into the potential for plants to develop animal like features in order to avoid the attention of large herbivores. We will be looking out for this in other species when conducting future research.

In recognition of the anniversary we have four topical articles. Pat Cochrane (Thoughts on the first century) and Barbara Sumner (BSS Present and Future) have contributed reflections on the first 175 years of the society. Professor Forbes MacDonald and Roger West have focused on two eminent early members namely Patrick Neill and William Edgar Evans who deserve recognition for their contributions as plantmen, naturalists and office holders in the society in the early years. Looking to the future we are also celebrating the acceptance of honorary membership by Professors John Raven, Janet Sprent and Mary Gibby. Professor Janet Sprent has sent us a short biography that demonstrates her continued enthusiasm and research interests in plants and the environment.

Many thanks to all contributors for the many articles we received for publication in this anniversary edition. We hope that this issue serves the members better than the last one for which we have to apologise for some errors. Firstly we apologise to those who received issues with some blank pages. This appears to be an issue at the printers that was not spotted in time. The heavier weight paper that we tried for Issue 96 might have contributed to the blank pages and was also responsible for the fact that some contributors were unfortunately charged extra postage to receive their complimentary copy. We are embarrassed

about this and hope that this did not detract too much from your enjoyment of the articles. The full edition is on the Botanical Society web site but if anyone had an issue with blank pages and would like a better copy then please let us know. We also apologize to two contributors for incorrect credits. The photographs for the Colonsay festival article for thrift and roseroot should have been credited to Richard Gulliver rather than the article author Debbie Butler. For further information on the 2012 Colonsay Festival of Spring, contact Sarah Hobhouse, tel 07850 230000, email [shobhouse@o2.co.uk](mailto:shobhouse@o2.co.uk). In addition Malcolm Elliot who wrote the *Phytophthora* article asked us to mention that he is mainly associated with University of St. Andrews and SASA (Science and Advice for Scottish Agricultural) with a minor role at the Centre for Ecology and Hydrology, Edinburgh.

We are trialling a new system where people can upload articles for BSS news on the web site. There is a template that will help format the articles ready for the newsletter that should make it easier to deliver articles, but be assured that we will be happy to receive articles in the normal email and hard copy formats. For the web template go to <http://www.botanical-society-scotland.org.uk/content/bss-news-newsletter-botanical-society-scotland>.





## Botanical Society of Scotland

### **SECRETARY'S REPORT ON BEHALF OF COUNCIL 2010/11**

The Society has seen an exciting and busy twelve months since the last AGM.

The number of new members welcomed to the Society has doubled from last year to thirty-nine (15 standard and 24 basic). Once again the total membership has increased despite the sad deaths of several members, including Barbara Ballinger, Bob Saville and Elizabeth Cutter whose obituaries were carried in *BSS News* and on the Society's website.

We are especially pleased to announce that Professors John Raven, Janet Sprent and Mary Gibby have accepted Council's invitation to become Honorary Fellows of the Society in this our 175<sup>th</sup> Anniversary Year.

The success of the Society's journal, *Plant Ecology and Diversity*, continues and we eagerly await the arrival of vol 4 (1). A short written report from the journal editor, Dr Laszlo Nagy, is attached. Council thanks Dr Nagy for all of his continued hard work in publicising the journal at conferences across the world.

The Society's other regular publication, *BSS News*, continues to provide a less formal medium for members to inform and entertain with items of botanical interest. Members are now able to access past issues of the News (from March 2010) via the members pages of the Society's website. Two excellent issues have been published in the past twelve months and our thanks go to Dr Jill Thompson and Ms Jane MacKintosh in this their first year of editing and producing the news letter.

The lecture programme of the Society has expanded in the last year with successful meetings being held in Aberdeen, Dundee, Glasgow, Inverness and St Andrews. Thanks go to the Local Secretaries of the BSS who liaise with universities and other societies to promote BSS-sponsored lectures throughout Scotland.

The Edinburgh programme continues to provide interesting and varied lectures throughout the winter months and these are well-

attended by both members and non-members of the society. The 2010/11 programme began in October with Dr Niall Green of SASA, presenting a fascinating insight into land races and the conservation of biodiversity in crop plants. Dr Andy Taylor of the MLURI (now the James Hutton Institute) presented the November lecture on the intriguing “hidden kingdom” of Scotland’s fungi. December and January provided talks from exotic locations presented by local speakers Mr Alex Twyford (University of Edinburgh), who delivered a colourful and educational piece on the evolution and diversity of *Begonia* spp in Mexico, and Dr Toby Pennington (RBGE), who introduced the audience to the threatened (but little known), seasonally dry, tropical forests of South America. Prof Jeff Duckett visited us from the British Museum, London in February to present insights into current research on plant/fungal symbiosis and stomata and Prof Howard Davies made the (slightly shorter) journey from SCRI, Dundee in March with a thought-provoking lecture on the scientific and public perception of GM crops and food security. The April lecture by Prof Alison Hester (MLURI) discussed the result of field experiments that showed variation in the regeneration of woody plants in relation to the timing of browsing and grazing and in May a joint lecture by Dr Hugh McAllister and Mr Ted Brabin introduced us to some of the more confused and confusing plant groups that have to be un-entangled by both field botanists and taxonomists. Thank you to Dr Maria Chamberlain, the programme secretary, who has once again arranged a varied and entertaining programme.

The 2010 Field Programme provided opportunities to record, study and learn within a rich and varied range of events. The programme included visits to both Dawyck and Logan Botanic Gardens, the Alpine field meeting at Ben Vane, fungus forays to Bonaly Country Park and Corstorphine Hill and a visit to the species-rich grasslands on Arthur’s Seat (run jointly with BSBI). Thanks to the many field leaders who gave their time and expertise to the various events and especially to Dr Stephan Helfer who has organised the Field Excursions for many years but has decided to ‘retire’ from this year.

The annual BSS/BSBI Exhibition Meeting held at RBGE in November 2010 was, as always, an outstanding success. An account was published in BSS News 96 and our thanks go to the organisers.

The annual prize for best final-year dissertation in 2010 was awarded to Lena Pokorny, a University of Edinburgh student, with a

thesis entitled "An investigation into the shape of flowering curves, its variation and possible causes". Lena was awarded her prize at the March meeting. The abstracts of all five entries for the Student Prize were published in BSS News 96.

No Symposia or Conferences to report on from the last twelve months but Alex Twyford, Student Representative on Council, has been busily arranging a major joint venture with the British Ecological Society that will take place from 18<sup>th</sup>-19<sup>th</sup> October at RBGE. Details of the Next Generation Plant Ecology & Evolution workshop 2011 can be accessed via the BSS website and registration is now open.

Last year saw the launch of the Society's new web-site at: <http://www.botanical-society-scotland.org.uk>. The web-site continues to expand and develop and the public access pages are nearing completion. The next twelve months and beyond will concentrate on the expansion of the members' section and related pages (your thoughts and ideas are welcome). Our thanks go to Kim Harding for his hard work in maintaining the site.

2010 was the final season of data collection in the four year Community Woodlands Project, a collaboration between BSS and the Community Woodlands Association. We are pleased to announce that the first publication from the project, a popular account entitled "*Celebrating Diversity in Community Woodlands in Scotland*", will shortly be available. There have been several progress reports presented in BSS News and there is additional information on the Society's website.

Council would like to express our thanks to Professor Stephen Blackmore, the Regius Keeper of the Royal Botanic Garden Edinburgh, for his continued support of the Society and for providing accommodation for our meetings. Council continue to encourage all staff of RBGE to become members of the Society.

Cryptogamic Secretary Dr Stephan Helfer, Publicity Officer Kirsten Findlay and Council member Dr Anne Barker retired from Council in June 2011. We would like to take this opportunity to thank them for their contribution to the Society during their terms of office.

Council welcome the following new members to the Society in 2010/11:

**Standard**

Dr RM Clark, Australia  
Ms J Kelly, Toward  
Ms S Pratt, Edinburgh  
Mrs L Kendall, Perthshire  
Dr B Lave, Edinburgh  
Dr GM Davies, Dumfries  
Miss Fiona Guest, Montrose, Angus

Prof M Koch, Germany  
Mr J Paterson, Tarbert  
Ms L Pokorny, Lochearnhead  
Ms F Thomas, South Queensferry  
Ms K Emberton, Cupar  
Dr R Buggs, London  
Ms L Ross, Newtonhill, Aberdeenshire

**Student Standard**

Mr D Duncan, Edinburgh  
Mr J Dyson, Edinburgh

Ms S Stetkiewicz

**Basic**

Mr R Dow, Edinburgh  
Miss A Murfitt, Edinburgh  
Miss L Blades, Edinburgh  
Mr T Macaphearsion, Canada

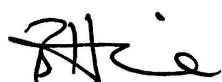
Dr R Milne, Edinburgh  
Mrs M Fraser, Inverness  
Mr JAR Kerby, Edinburgh

**Student Basic**

Ms N Biddis, Keswick  
Mr L Watt, Edinburgh  
Miss A Suleimenova, Edinburgh  
Mr C Bullock, Edinburgh  
Miss B Gronlund, Edinburgh  
Miss A Pass, Edinburgh  
Miss L Gerrard, Edinburgh  
Miss K Latham-Warde, Edinburgh

Miss E Goodyer, Edinburgh  
Mr I Cunningham, Edinburgh  
Mr SM Khan, Leicester  
Miss L Beveridge, Edinburgh  
Mr Z Gratton, Edinburgh  
Mr A Mason, Edinburgh  
Miss S Woodfin, Stonehaven  
Mr F Benvenuti, Edinburgh

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Dr Barbra Harvie (Hon Gen Secretary)

## **REPORT FROM DR LASZLO NAGY, EDITOR-IN-CHIEF OF PLANT ECOLOGY AND DIVERSITY**

Subscribing members should now have received Journal issue 4(1). Electronic access has been made available via the Taylor and Frances website.

There are currently two special issues in preparation (GMBIA Science Conference - Functional mountain biodiversity; Latin Amer Bot Congress), so later this year the projected publication dates of issues should be met (i.e. issue 4(4) is on schedule for December).

In addition to the Special Issues the editing team are processing regular unsolicited submissions. These are being presented in slightly higher numbers than previously and we expect numbers to increase considerably when the first Impact Value for the Journal is released in the next few days (expected last week of June 2011).

There are another two Special Issues that will go into the review process later this year (John Grace's Festschrift and the Niwot Alpine Long Term Ecological Research, Colorado) and also a special feature - a collection of papers from the VIIth serpentine conference in Portugal.

All of these forecast a healthy future for Plant Ecology and Diversity

## **NEXT GENERATION PLANT ECOLOGY & EVOLUTION WORKSHOP**

Dates: 18<sup>th</sup> – 19<sup>th</sup> October 2011

Location: Royal Botanic Garden Edinburgh (RBGE)

Leader: Alex Twyford

This is a two day workshop, sponsored by the Botanical Society of Scotland, on how next generation sequencing technologies can transform research in plant ecology and evolution. You can find further details on the BSS website at:

<http://www.botanical-society-scotland.org.uk/Next-Generation-Plant-Ecology-and-Evolution-workshop-2011>.

See the article on page 61, 'Plant evolution in the age of genomics', for an introduction to genome sequencing.

## THE BOTANICAL SOCIETY OF SCOTLAND - THOUGHTS ON THE FIRST CENTURY OF ITS LIFE

In the archives of a Society that has been in existence for 175 years, one would expect to find several papers written with a historical perspective. As early as 1870, only thirty-four years after the Botanical Society of Edinburgh was founded, Sir Walter Elliot took as the subject of his Presidential Address, '*The History of provincial Natural History and Philosophical Societies*'. According to him, the earliest of these was formed in Manchester in 1781, followed by that in Perth in 1784, and then by the Literary Society of Belfast in 1801. By 1863, this Society, had given rise to the Belfast Naturalists' Field Club. It is interesting to note in passing that this field club in 1870 had a membership of 232, of whom 81 were ladies, whereas, in the same year the Botanical Society of Edinburgh had only 10 lady members! Sir Walter provided his audience with more numbers. In 1870 there were 115 societies in Great Britain and Ireland which could be considered as Natural History and Philosophical Societies, 27 of which were Field Clubs. He also explained the basis on which he classified these organisations. Natural History and Philosophical Societies had possessions – premises, herbaria, museums, libraries - but the Field Clubs did not. In the early decades of the nineteenth century there was thus an upsurge of interest in natural history and recognition that the furtherance of knowledge could best be achieved when efforts were combined. It is not surprising therefore that in 1836 the leading botanists in Edinburgh formed themselves into a Society, and that in the years that followed, this Society flourished. The Society from its inception was not a field club. Its basic aim was the furtherance of the study of Botanical Science.

In his admirable Centenary Address (*available on the BSS website*), Professor F.O. Bower described the development of botanical knowledge in the 17<sup>th</sup> and 18<sup>th</sup> centuries. He gave an account of the state of botanical knowledge when the Society was founded in 1836 and then outlined the progress that had been made in the following century. In the first few years of the Society's existence the rate of accumulation of botanical knowledge was so slow that the President was able to present an annual lecture in which he described, and often criticised, most of the papers on botanical subjects that had been published in the previous year. This soon became an impossible task. Specialities developed within Botanical Science – taxonomy, plant geography,

ecology, plant physiology, genetics, morphology and anatomy, plant reproduction – knowledge expanded exponentially. Throughout all of these changes, the Botanical Society of Edinburgh survived. To find out why it was able to do so when other societies came and went we should look back to the foundation of the Society and to the statement of objectives made in 1836 and reiterated at intervals since then.

Published in the first volume of the *Transactions of the Botanical Society of Edinburgh*, under the heading, 'General Views and Objects of the Society' is the statement – 'It is intended that the Society shall turn its attention to the whole range of Botanical Science, and such parts of other branches of Natural History as are more immediately connected with it. It is proposed to cultivate the knowledge of these:- 1. By holding periodical Meetings for the interchange of Botanical information, - for the reading of original papers, or translations, abstracts or reviews of Botanical works, regarding any branch of Botanical knowledge, practical, physiological, or geographical, - and the application of such knowledge to Agriculture or the Arts.' Further paragraphs under this heading dealt with the formation of a Herbarium, a Library and a Museum, the organisation of Botanical excursions, and the appointment of Local Secretaries. The reports of meetings were to be sent annually to all Members. By 1868, this last activity was formalised as objective 2. 'By publishing in the Proceedings or Transactions of the Society, a selection of the papers read at the meetings.' Thus, from the very beginning the Society had a comprehensive and well-defined set of objectives. They have stood the test of time.

Who were the men who founded the Society in 1836 and who were the men and women who joined the Society in considerable numbers in the following years? The establishment of the Society is fondly recalled by J.H. Balfour, M.D., Professor of Botany, Edinburgh, in his paper '*Sketch of the Life of the late Professor Edward Forbes*', read to the Society on 14<sup>th</sup> December, 1854. 'Well do I recollect the evening when he and I, with eight others, viz. W.H. Campbell, now L.L.D. and attorney in Georgetown, Demerara; Dr Parnell, afterwards author of the work on British Grasses &c.; Dr R.C. Alexander, who subsequently published accounts of botanical tours in many parts of Europe and America; William Brand, now Secretary of the Union Bank; Dr Gilbert McNab, now practising in Jamaica; James McNab, now Curator of the Botanic Garden; Nicholas Tyaske, now physician in Chichester; Edward Charlton, now M.D. and Lecturer in the Medical School of Newcastle;

George C. Wallich, now in India; and Giles Munby, who wrote the 'Flora of Algiers', met to lay the foundation of the our Society. We received most important directions and aid from Forbes; and when, after launching the vessel, we supped together, his social and convivial powers were called forth in their fullest energy. His death constitutes the first blank in the little band.' These were energetic, enthusiastic young men starting out on their careers in the medical, legal and banking professions, bound together by their passionate interest in plants. Not many of them were or became professional botanists, though it should be remembered that at that time botany was an important part of the medical student's curriculum and Professors of Botany taught in Medical Schools. Old habits died hard. Some of the more senior members of the medical profession today had to study botany in their first year at university. It was hard to explain to them why this was deemed necessary!

In common with many young professional men at that time, several of the founding members found employment overseas and those who stayed in Scotland travelled widely whenever the opportunity arose. These men saw botany in a global context and one of their aims in establishing the Society was to set up an exchange system which would enable them to collect plants from all over the British Isles and the rest of the world and thus form the Society's Herbarium which would serve as a reference collection for Members. Mr James McNab was the first curator of the collection and he had a very busy time. On 8<sup>th</sup> December 1836, the first lady member, Miss Bailey (subsequently Lady Kane), Dublin, 'authoress of Irish Flora', was accepted by the Society and the following month she was joined by the Countess of Dalhousie who had donated to the Herbarium her extensive collection of plants of the East Indies. Shortly after this, the Society received the ultimate vote of confidence when Her Majesty Queen Victoria, within a year of her accession to the throne, accepted Council's invitation to become Patron of the Society. The number of lady members rose to 12 and stayed more or less constant for many years, their names enclosed in a list of Life Members or Lady Associates, not mixed with those of the Fellows, Members or Associates! These Life Members included: The Honourable Louisa Anne Neville, Audley End, Essex, and Miss Gage, Rathlin Island, Ballycastle. How did word of the Botanical Society of Edinburgh get to Rathlin Island or even to Audley End? Did these ladies ever manage to attend any meetings in Edinburgh? Imagine Miss Catherine Gage,

daughter of the Rector of Rathlin Island, setting sail in her father's boat manned by its liveried crew and landing on the west coast of Scotland from where she would travel by stage coach to Edinburgh. By July 1838 the membership totalled 199 and the Kings of Saxony and Prussia were Honorary Foreign Fellows. The list of Honorary British Fellows included Robert Brown, vice-president of the Linnean Society. The Foreign Members were mainly from continental Europe but also included several from USA. There was a long list of Local Secretaries based all over the British Isles and also in continental Europe and even in the Cape of Good Hope. There was also a list of about a dozen societies with which the Botanical Society of Edinburgh exchanged publications and reports. This list grew in size and in the geographical distribution of its components as the years went by. In 1870, copies of *Transactions* were sent to 40 other organisations, ranging from the Glasgow Natural History Society to the Philadelphia Academy of Natural Sciences. The Society certainly kept the Royal Mail busy. However, the Society's loyalty to the Royal Mail did not withstand the introduction of the local penny post. In 1840 Council decided to pay someone 2/6 to deliver all the Billets in Edinburgh! Membership numbers probably peaked about the year 1870 when the total was approximately 600. This included over one hundred Foreign and Corresponding Members and 10 Lady Associates – why so few? More significantly, in 1873, the Honorary British Fellows included George Bentham, Charles Darwin and Joseph Dalton Hooker, and the Honorary Foreign Fellows included Julius Sachs.

Although the Society's objectives encompassed the whole of Botanical Science, the predominant practical activity of its members in the early years of its existence was the building up of a central Herbarium and a series of Member's herbaria at locations throughout the country, stocked with specimens that had been verified in Edinburgh and could thus be used as locally accessible, reliable resource material. The need to ensure that the specimens were of a high standard prompted Dr Greville to address the Society giving '*Directions for collecting Botanical Specimens and preserving them for the Herbarium*'. He illustrated his paper with a drawing of a vasculum – much preferable to the ubiquitous polythene bag now used by field botanists. The Herbarium grew rapidly but the work involved in this project rapidly became impossible to accomplish on an amateur basis and there was the additional problem of where to store the specimens. In 1839 negotiations with the University of Edinburgh resulted in the

amalgamation of their Herbarium with that of the Botanical Society of Edinburgh. At the time of the amalgamation there were upwards of 60,000 specimens in total. This Herbarium formed the basis of what is now the Herbarium of the Royal Botanic Garden Edinburgh (RBGE). Similarly, the Library of the Botanical Society formed the basis of the RBGE Library. An entry in Volume XI of the *Transactions* records a list of publications donated by the Society to the Government Library at the Royal Botanic Garden during 1872-73. Donations to the Society's Museum were also recorded. In November 1863, Mr Stephens donated a sample of wood affected with dry rot! Mr William Brand, a banker, was Treasurer of the Society for many years. He had a penchant for statistics and was apparently a most methodical gentleman. His interest was in the distribution of plants and he devised a system in which he divided the British Isles into 42 regions so that specimens could be stored according to the location in which they had been collected. Was this the beginning of vice-county recording? The energetic and much-travelled members of the Society continued for several more decades to consider that the contribution of specimens to the Herbarium was an important part of their lives as botanists. However, as experimental work became more exciting and rewarding, the relevance of herbaria was less apparent. This led Professor James W.H. Trail, FRS, retiring President of the Society in 1907, to present a paper on *Herbaria and Biology* in which he argued for the great value of herbaria in teaching and other aspects of Plant Science, and dissented entirely from the views that had been expressed at the recent meeting of the British Association for the Advancement of Science at Southport at which it was said that only living plants should be studied, and that herbaria were dull and destructive and taught students little and bored them! Professor Trail would be glad to know that a century later herbaria, and particularly the Herbarium at RBGE that owed so much to the Botanical Society of Edinburgh, are much used and greatly valued.

Comparisons of past and present often focus on how much ideas and fields of study have changed over the course of 175 years. However, perusal of the early volumes of the *Transactions* reveals that the interests of some of the botanists in the mid-nineteenth century were remarkably similar to those of current members of the Society. The paper Dr Walker-Arnott presented to the Society on 11<sup>th</sup> and 25<sup>th</sup> July 1839 was entitled '*Review of the species of Fumaria*', and in April 1851, a rather diffident Mr J.A. Fenton read his paper '*On a supposed new*

*species of Rubus*'. During these decades there were papers on the '*Diatomaceae from Iceland*', on '*Lichen flora of Druidical stones in Scotland*' and numerous papers recording the distribution of mosses in the British Isles and in countries all round the world. These articles are evidence of abiding fascinations, while other contributions to *Transactions* suggest that in some cases the wheel of fashion has gone full circle. In recent years, pink, purple and white cabbages have appeared in window boxes on city buildings. Opinions vary as to the aesthetic value of these plants. Mr James McNab, addressing the Society in 1866 had no doubts concerning their merits. In his paper '*On the Varieties of Variegated Greens etc as Ornamental Plants*' he described 'triple curled, lacinated and proliferous kale plants in colours varying from almost pure white and green to beautiful rose-pink, purple and red.' He bestowed great praise on Miss Frances Hope of Wardie for her 'energetic labouring' in the production and maintenance of her collection of these plants. The more scientific side of James McNab's work is certainly of relevance to botanists currently engaged in phenological studies. Mr McNab was the son of a botanist and the father of a botanist. He was Curator of the Botanic Garden for 34 years and for 28 of those years he kept systematic records of temperature and of the blossoming date, &c. of 42 spring-flowering species.

The initiation and establishment of the Society coincided with the establishment and growth of an Empire which no longer exists. Professionally qualified men in Edinburgh sought opportunities overseas. Dr Hugh F.C. Cleghorn was apparently employed in for some time India for in 1850 he described his observations '*On the hedge plants of India*' and sixteen years later he discussed the more practical problem of the '*Supply of Wood-fuel to Indian Railways*'. Mr William Milne, late Botanical Collector in Captain Denham's Expedition to the South Seas, reported to the Society in 1859 in his paper, '*On some of the Plants used for Food by the Fegee [sic] Islanders*' that 'the inhabitants of the Fegee Islands subsist mainly on the fruits of the earth. The principle articles of food are yams, taro, breadnut and bananas.' Botanical studies such as these, carried out in far-flung areas and reported in the *Transactions*, may well be of interest to social historians but it is unlikely that twenty-first century botanists will find them relevant to their studies.

The *Transactions* provide a picture of a Society that seems to achieve a balance between what might almost be deemed parochial and

what was splendidly global in its outlook. For many years, Mr James McNab gave an annual report on how the vagaries of the seasons had affected the health of '*The Flowering Plants in the Open Air*' in the Botanic Garden, and Professor J.H. Balfour supplied accounts of the field excursions undertaken by students under his leadership. The published statistics of student numbers reveal that in Edinburgh, 54 students studied botany in 1777, 192 students studied botany in 1857, and that in the teaching of the 343 students in the Botany Class of 1875, 77,704 specimens of preserved and living plants were used! The report of an excursion to Clova in April 1869 records not only a list of the species of flowering plants and mosses collected, but also the fact that the three botanists 'were conveyed by dogcart from Kirriemuir to Clova' and were 'comfortably accommodated' in the Ogilvy Arms Hotel. The same volume of the *Transactions* contains a paper '*On the Botany of the Dominion of Canada and adjacent parts of British America*' by Professor Lawson of Nova Scotia. Similarly in 1907, Rev. David Landsborough's study of the extra-tropical trees of Arran is published in the same issue as '*Contributions towards the Botany of Ascension*' by R.N. Rudnose Brown BSc, Botanist of the Scottish Antarctic Expedition, and '*Notes on the Flora of the Coast and Islands of Portuguese East Africa with Photographs of interesting Trees, Plants and Forest Scenery*' by J.A. Alexander.

The titles of these contributions to the *Transactions* thus appear to indicate that the Society provided a vehicle for the publication of, and a valuable forum for the discussion of, world-wide studies of plant distribution. However, this was only one aspect of the much wider subject of Botanical Science that the Society aimed to explore. To assess how well the members of the Society were attuned to the very significant advances being made during the latter part of the nineteenth century and the early years of the twentieth century it would be necessary to assess the papers published in the *Transactions* in the context of the history of the development of Botanical Science during that period. That is beyond the remit of this article. It is nevertheless possible to trace some early contributions on topics that many now consider to be subjects in their own right. Early papers on Ecology such as '*The Grasslands of Orkney. An Oecological Analysis*' by G.W. Scarth, and '*The Flora of the Fenland, as Compared with that of the Bogs, Marshes and Mosses of Scotland*' by Arthur Evans, appeared in the *Transactions* in 1910. Reference to Conservation appeared as early as

1859. The reference was not to conservation of habitats or species in the British Isles. Dr Cleghorn presented a '*Report on the Conservation of Forests in India*'. In Plant Physiology one may smile at the report of an investigation of the chemical composition of gooseberries at different stages of development, and at the botanist who addressed the question '*Has colour in Flowers a Function to perform in the Fertilisation of the Ovule?*' but one must admire the detailed descriptions and accurate observations of W.R. McNab, Professor of Natural History, Royal Agricultural College, Cirencester, in the paper he published in 1870 on '*Experiments on the Transpiration of Watery Fluid by Leaves*', recording the results of 100 experiments. In the understanding of Plant Morphology, as in all other aspects of Botanical Science, much progress has been made in the last 150 years. However, it is still worth considering the words written in 1860 by Dr Macvicar of Moffatt in his paper, '*Vegetable Morphology – its General Principles*'. He wrote: 'The forms of plants in general, the plant form, why is it what we find it to be, and not otherwise? – that is a question which science has not yet answered.' The review of Charles Darwin's book, '*The Movements and Habits of Climbing Plants*' would seem to belong to the topic of plant morphology but it is in relation to the subject of Evolution that this paper, read to the Society in March 1876 by Thomas A.G. Balfour, M.D., is notable. Dr Balfour considers the book to be 'of no ordinary merit' but he goes on to say 'we cannot but differ from this distinguished naturalist in his views regarding "the evolution of species", and fail to see the cogency of the illustrations of that doctrine which he adduces'!

It is amusing to note that some of the features that are characteristic of the Botanical Society of Scotland today have their origins a long way back. The Society has from the beginning held its meetings on Thursday evenings and as early as 10<sup>th</sup> June 1839 it was decided that tea should be served after the meetings! The origin of the present day Alpine Section dates back to 1870 when it was proposed that an Alpine Botanical Club – Scotch [sic] Highlands should be formed. The objective of the members of the Club was to collect specimens. It was decided that those members who would receive *living* specimens would pay a higher subscription! Therein lies perhaps the first indication that plant-hunting would result in a loss of biodiversity.

The specialisation that was emerging towards the end of the nineteenth century became more and more marked in the twentieth century. Professor F.O. Bower in his Centenary Address to the Botanical

Society of Edinburgh in 1936, discussed the role of the Society in the much changed, and rapidly changing, scientific environment. He drew attention to the dangers of specialisation saying that 'Specialist's myopia is a disease that may threaten the scientific balance of any enthusiastic inquirer. The wider the spread of the science in its relation to cognate sciences the greater the danger becomes of pursuing a restricted or an extreme marginal cult, as it were between blinkers. The blinkered horse keeping the straight road does not visualise the countryside he traverses; and so the individual specialist is apt to miss the wider aspects of the science, specific details of which he pursues. It is here that a Society like ours may take an increasingly valuable place in these modern days of high specialisation, and of interests localised but divergent. It will naturally aim at welcoming into its proceedings all branches of the Science upon an equal footing. Professor Bower's vision was realised. The Society continued to make a valuable contribution to Botanical Science for another 75 years and it is still going strong!

M.P. Cochrane

## **BOTANICAL SOCIETY OF SCOTLAND – PRESENT AND FUTURE**

As you know, the Botanical Society of Scotland encourages the study of all plants, but what is a plant? We live in an era of taxonomic upheaval, thanks largely to the amazing revelations of DNA-profiling. As a result, plants (*sensu stricto*) have dwindled. Fungi were originally classed with plants, but have long been considered separate from the plant kingdom and now lichens have joined them. Algae are polyphyletic and have recently been in the taxonomic melting pot. Only green algae are now left in the plant kingdom. Much of the plant kingdom consists of bryophytes and vascular plants. However, I am sure that the BSS will want to remain inclusive and to encourage the study of all the above groups, perhaps under the general heading of 'plants (*sensu lato*)', or 'plants and plant allies'.

Coupled with the inclusive attitude to plants is an inclusive attitude to people. All people, of all ages, locations and walks of life, are encouraged to study plants and we welcome them all as members of the

Society. They include professional plant scientists, amateur field botanists, students, and members of the public who are complete beginners or wish to increase their existing knowledge of plants. The recent project on community woodlands in Scotland reached out to people and encouraged their appreciation of plants and biodiversity. Our lectures and field excursions are open to all and are both educational and enjoyable. In these days when botanical specialists in universities are fewer, the Society has an important role to play in stimulating interest in the subject and encouraging future botanists. At the same time, experienced botanists may look to the Society for intellectual inspiration and satisfaction. To cater for all the differing needs the Society adopts a variety of approaches.

One approach is through diversity of publications. All our members receive the newsletter, *BSS News*. Thanks to the Editors, Ms Jane MacKintosh and Dr Jill Thompson, this twice-yearly serial ably addresses topical and popular interests. Academic interests in Scotland and throughout the world are served by our scientific journal, *Plant Ecology & Diversity*, which is published jointly by the BSS and Taylor & Francis. The world obviously appreciates *PE&D*, because its high-quality papers have now been cited enough times in other papers to result in the award of a first Impact Factor of 2.053, which is excellent for a new journal. This success owes much to the vision and support of former President of the BSS, Professor Richard Abbott, to the dedication of the Editor, Dr Laszlo Nagy, and to continuing support from the Editorial Board. Congratulations to them all! Now that the journal has an Impact Factor more submissions can be expected, which should stimulate further interest in the subject, the journal, and the Society. (More information about Impact Factors can be found on the following website: [http://en.wikipedia.org/wiki/Impact\\_factor](http://en.wikipedia.org/wiki/Impact_factor))

In the past the Society has published stand-alone conference proceedings, monographs and check-lists, including *John Anthony's Flora of Sutherland*, edited and compiled by J.B. Kenworthy (1976), and the three check-lists of flowering plants and ferns of the Lothians, compiled and edited by D.R. McKean (Midlothian, 1988), J. Muscott (West Lothian, 1989) and A.J. Silverside and E.H. Jackson (East Lothian, 1989). Now that the community woodlands project has culminated in a report the Botanical Society is about to produce another stand-alone publication. This has entailed applying for an ISBN, so that the publication can be included in the British Library Catalogue. ISBNs

come in batches and do not have an expiry date. We have used one and we still have 99 left! What an opportunity for publishing further booklets and small books with botanical and educational content, under the Botanical Society umbrella. Our enthusiasm for plants can be conveyed far and wide. If you have an idea for a booklet or book that you would like to write and think might be suitable for publication by the Botanical Society, please let us know and come and discuss it with us. We would like to encourage the endeavours of our members in furtherance of the aims of the Society.

Items of botanical interest are published electronically on our website (<http://www.botanical-society-scotland.org.uk>). One idea, suggested by our previous President, Dr Chris Jeffree, is for an online serial publication, which would fill the gap between *PE&D* and *BSS News*. Chris is thinking in terms of '*Transactions*', to publish longer articles than can be accommodated in *BSS News*, but which do not meet the particular criteria of *PE&D*. Our lectures could be communicated to a wider audience in this way, as articles, which would be citable. The website is also a good place to publish field lists which are too long for *BSS News*, but which might extend a short report in *BSS News*. Botanical events can be publicised and news items communicated via the website. If you have anything you would like to communicate via the website, please contact our Website Administrator, Kim Harding (e-mail: [kim@kharding.co.uk](mailto:kim@kharding.co.uk)).

Audiovisual methods, e.g. podcasts and DVDs, can also be used to stimulate and feed botanical interests. By these means lectures could be communicated (with the speaker's permission) to all our members wherever located, so that they could then hear and see the lectures as they are or were delivered. These ideas, put forward by our former Publicity Officer, Kirsten Findlay, have not yet been developed by the Society, but could be pursued in the future. Skype, which is software for internet 'phoning, is another audiovisual method of keeping in touch, communicating lectures or holding meetings and conferences, and has been suggested by Professor John Grace. In fact the future looks full of options for methods of communication, so no BSS member need feel cut off from the centre of things.

Communication has benefited enormously from the development of e-mail. It is much easier, faster and cheaper to contact people, conduct botanical business and call a meeting by e-mail than by post. Facebook is also used by botanists as a means of keeping in touch with

each other. The Botanical Society has a Facebook group set up by Chris Jeffree. If you would like to know more about it, please contact Chris (e-mail: [c.jeffree@ed.ac.uk](mailto:c.jeffree@ed.ac.uk)).

Despite the speed and convenience of electronic communication, it is still more enjoyable and, for professional botanists, professionally beneficial, to come together in person for lectures, discussions and symposia. The Botanical Society has been organising symposia for many years and intends to continue doing so. In future they may be called symposia, conferences or whatever term is in keeping with the event and the times. Each conference focuses on a current hot topic, most recently phenology. A further conference is being planned (details in due course). It is very cheering that the student symposia have been revived after a long lapse and we hope they will go from strength to strength in the future. The revival is thanks to our Student Representative, Alex Twyford. He is currently organising an international symposium and workshop on *Plant Evolutionary Biology*, with some sponsorship from the Botanical Society.

Discussions often take place when botanists come together in the field. Puzzling plants generate much discussion! People sometimes ask what field meetings are for. BSS field meetings are held for education, for botanical recording purposes, for generating reports and pictures for the newsletter and the website and, last but not least, for pleasure. The meetings may focus on particular plant groups or be more general in scope. The botanical records gathered during a field meeting may contribute to a local or national database, or to a project being carried out by the Society. Everyone is welcome.

It is now 175 years since the foundation of the Botanical Society of Edinburgh and 20 years since the name changed to 'Botanical Society of Scotland'. As a society of academic origin, our lectures have traditionally taken place in universities or botanic gardens, which occur in cities. This leaves large areas of Scotland without access to any lectures. We would like to reach out to all parts of Scotland, if possible, and would welcome more contact with local research or educational institutions or naturalists' groups. As suggested above, our lectures could be communicated to members in remote areas entirely by electronic or audiovisual means (if the speakers are willing), but it would be interesting for members if they could occasionally meet a speaker in person and have a chance to ask questions. If you are in touch with a

well established institution or group who would welcome a botanical speaker, please let us know.

The future of the Botanical Society lies in the hands of its members, i.e. **you**. Your support is vital for the survival and growth of the Society. Your subscriptions and donations help to fund the activities and your time and effort ensure that the activities take place. Everyone is short of time. Jobs are demanding and leave little time for extra-mural activities, even for societies with professional associations, such as the Botanical Society of Scotland. Volunteers are always needed, as are attendees at all our events. Any time you can spare is warmly appreciated. Any new members you can recruit will be warmly welcomed. Thank you all for your continued support.

Dr Barbara E.H. Sumner, President.

## **PATRICK NEILL (1756 -1851) DOYEN OF SCOTTISH HORTICULTURE.**

Patrick Neill was a founder member of Edinburgh Botanical Society. He descended from a Haddington family of printers and booksellers, was head of the well established printing firm of Neill & Company in Edinburgh, specialising in Government publications, learned journals, legal and University works etc. He delegated the day to day business of the firm to his manager and eventual partner, leaving himself free to devote his time to horticulture, natural history, writing and civic duties which included service on Edinburgh Town Council. In 1806 he toured parts of Orkney and Shetland, first described as instalments in the Scots Magazine, and later published as a book. Acutely observed descriptions of the scenery, agricultural practice and social conditions ensured its historical value. His account of the relations between Shetland landlords and their tenants sparked a spirited response.

For a decade from 1808, he contributed regular '*Memoranda on Natural History*' to the Scots Magazine. These provided a commentary on events likely to attract the attention of anyone with an interest in the natural and social scene such as the consequences of extreme weather, stranded whales, the financial woes of the Edinburgh Botanical Garden, the alleged appearance of a mad dog, visiting menageries etc.

In 1813, at the invitation of the Board of Agriculture, he published a survey '*On Scottish Gardens and Orchards*'. This landmark account dealt with the history, distribution and general economy of market gardens and commercial orchards in semi-quantitative form, long before the appearance of official statistics. 1809 saw the formation of the Caledonian Horticultural Society with Neill as a founder member and Secretary, a post he filled by re-election for some forty years. He worked successfully for the establishment of the Society's Experimental Garden devoted to ascertaining the suitability for Scottish conditions of varieties of fruit trees, vegetables and other garden produce. He was also a founder member and long time Secretary of the Wernerian Natural History Society which enjoyed considerable prestige during its hey-day.

At the invitation of the Caledonian Horticultural Society Neill, along with James Macdonald, the Duke of Buccleuch's Head Gardener and William Hay, garden designer, visited Flanders, the Netherlands and Northern France to discover the state of horticulture after the long embargo on travel during the war with France. His published account is a valuable record of Continental varieties of fruit trees and of the orchards of leading breeders. Aspects of Scottish horticulture were often revealed in the visitors' comparisons of what they found with what they were used to at home. Neill also produced detailed guides to horticultural practice published in the Encyclopaedia Britannica and Brewster's Edinburgh Encyclopaedia. These provided the basis for his popular '*Fruit, Flower and Vegetable Garden*', published in 1845.

Neill was in touch with plant collectors in South America, Australia and elsewhere. He obtained newly discovered species many of which he flowered for the first time in his greenhouse or stove. He was a friend of William Jackson Hooker, Robert Brown, both the McNabs, George Don and many other well known botanists. Neill had a rose, and several species of tropical plants named after him, as well as a Himalayan shrub called Neillia.

Neill would probably have wished to be remembered as a plantsman. He was a keen field botanist but, more importantly, at Canonmills Cottage, he established a mini-botanic garden, which J.C. Loudon considered to be the richest suburban garden in the country. Edinburgh is indebted to Neill for the scheme of the East Princes Street gardens where, after the north loch was drained in 1820, five acres of ground were laid out and planted with seventy-seven thousand trees and shrubs under his direction

Near the end of his career Neill was honoured, in unprecedented fashion, with a testimonial, signed by more than 500 Scottish gardeners and a splendid piece of silver plate, now in the Scottish Museum. In his will he left funds to provide a periodical prize to be awarded by the Royal Caledonian Horticultural for a distinguished gardener or cultivator and another, of equal value, awarded by the Royal Society of Edinburgh for a distinguished Scottish naturalist Both these Neill prizes are still being awarded.

In the first half of the nineteenth century Patrick Neill was a well known and respected member of the Edinburgh intelligentsia. He made a lasting contribution to the welfare of his native city and never failed to offer hospitality to visiting naturalists. He merits wider recognition.

Professor Forbes W. Robertson

The book "Patrick Neill 1756 -1851. Doyen of Scottish Horticulture" was published by Whittle's Publishing in August 2011.

## **WILLIAM EDGAR EVANS (1882-1963)**

I must confess that I had not heard of William Edgar Evans until I opened Malcolm Cant's new book *Edinburgh and the Forth*. Members who live in Edinburgh may know of Malcolm Cant as the local historian of Edinburgh and its villages and a prolific author of local histories profusely and delightfully illustrated with old photographs. Mr Cant's principal interest in William Edgar Evans is that he was an enthusiastic photographer who left a large body of work, of which Mr Cant has included a good selection in his book. But William Edgar Evans was also the Curator of the Herbarium at RBGE from 1919 until his retirement in 1944.

On reading this I was sure that he had been a member of the Botanical Society of Edinburgh, as we then were, and very likely that he had held office in the Society, so I browsed through the Minutes of the Society from 1907 until the 1940's, expecting that I should find some mention of him.

As indeed I did. In those days the Council of the Society included a President, four Vice-Presidents, several Councillors and several officers responsible for various aspects of the Society's work. Tenure of office as

President, Vice President or Councillor were not time limited as they are now; the only survival of this old constitutional arrangement is that we still graciously allow those officers of the BSS who do the actual work to sacrifice their time and energy in our interest for as long as they like. William Edgar Evans was either a Councillor or Vice-President of the Society almost continuously from 1924 until 1944, and one of the small editorial committee of the Society's *Transactions* from 1933 to 1944, perhaps with some gaps in the 1940's. His Fellowship of the Royal Society of Edinburgh is mentioned in 1925, and he is recorded as giving talks and presentations to the Society on several occasions, the first in 1908. In 1926 the Society found itself unable to provide a suitable slide projector for presentations (I should explain to younger members that a 'slide projector' was the neolithic equivalent of the equipment now used for PowerPoint presentations), and William Edgar Evans was one of a three member subcommittee of Council appointed to find a solution to the problem. The solution they suggested was that meetings should be moved from 5 St Andrew Square to the Lecture Theatre at the Botanic Garden, where the RBGE had a fine slide projector. The very formal correspondence on this matter between the Society and the Regius Keeper has been carefully preserved, but it is not surprising that Professor William Wright-Smith, Regius Keeper of the Royal Botanic Garden, should cordially agree to a request that had just been endorsed by Professor William Wright-Smith, President of the Botanical Society of Edinburgh! That is why the Edinburgh branch of the BSS still meets in the Lecture Theatre at RBGE. To avoid the Gilbertian situation of Professor Wright-Smith writing letters to himself, the Society's side of the correspondence was handled by its Secretary.

While reading the Minutes I noticed some other curiosities. Council thought it proper, on the occasions of the deaths of two Sovereigns, to send loyal letters of condolence to their successors, and copies of these black-edged letters and the replies received from Buckingham Palace are carefully preserved. The Society had a category of Ordinary membership, to which many women were admitted, and also a separate category of Lady Member. Upon what criterion, I wonder, were membership applications from women assigned to one or other of these categories? In which category would our present President, General Secretary, Programme Secretary, Newsletter Editors and Local Secretaries have been accepted, had they applied at that time?

While Curator, William Edgar Evans catalogued George Forrest's huge collection of Asian plants. He was a bryologist, and made a substantial contribution to the accessions through his own collecting. Mr Cant's principal interest is in William Edgar Evans' family life and extra-curricular activities, on which he provides a treasury of information. His father and grandfather had been keen natural historians with a close connection to the RBGE, so it is not surprising that he inherited their interest. After a good education (he left Edinburgh University in 1905 as B.Sc. with Special Distinction in Botany) he held research and teaching posts at RBGE and Heriot Watt College. Here he developed an expertise in bacteriology, and so, after he had been conscripted into the army for the First World War, he was commissioned as a Lieutenant in the Royal Army Medical Corps, with responsibility for water supplies and sanitation. He was demobilised in 1919 and rejoined the RBGE. He was a staunch Baptist and an enthusiastic Scoutmaster. Scouting and botany are both outdoor pursuits, and I suspect that some of his collecting was done when with his troop. I don't know whether in those days the Scouts awarded badges for botanising, but if they did I bet that all members of his troop earned them! It is possible that some of the accessions in the Herbarium under his name were found by his Scouts but of course identified, preserved and labelled by him.

*Edinburgh and the Forth* is a fascinating book which relates in considerable detail aspects of William Edgar Evans' life which were complementary to his important work as a botanist. He emerges from its pages as a man with a strong sense of respectability and of the social duties and obligations that went with it. The tone of the Society's Minutes and of the preserved correspondence suggests that in this he was similar to other staff at the RBGE and other members of the Botanical Society of Edinburgh.

I thank Dr David Chamberlain for insights into William Edgar Evans as Curator, and Graham Hardy, librarian at RBGE, for access to their archive.

Roger West

Edinburgh and the Forth. Malcolm Cant. Stenlake Publishing Ltd., Catrine.  
ISBN: 978-1-84033-495-1

## ROBERT W. GALT (1927 – 2011)

Bob Galt graduated with Honours in Botany in 1949. This was when the Botany Department of Edinburgh University was housed in the RBG building at 20A Inverleith Row. After a year as Assistant in the Department he left to join the staff of an oil palm research station in what was then the British colony of Nigeria. Bob and Jane were married on his first leave in 1952 and returned to Nigeria until he moved to a research station in the Protectorate of Sierra Leone.

My husband was stationed in Freetown at the time and we visited Bob at N'Jala and accompanied him on an interesting trip 'up country'. Bob loved arriving, and reckoned that the best way to travel over deeply corrugated dirt roads was to drive fast, an alarming experience for his passengers!

In 1956 Bob returned to Edinburgh to do teacher training at Moray House. He then taught biology, chemistry and physics to 'Highers' standard at Edinburgh schools until his retirement in 2002.

Bob was a longtime supporter of the BSS, and served as Honorary Secretary for eleven years from 1992 to 2003. He regularly attended meetings and enjoyed BSS symposia, such as those on 'Atlantic Oakwoods' (Oban, 2005) and 'Arctic and Alpine Flora' (St. Andrews, 2007).

In April, 2010, Bob suffered a stroke which affected mobility and vision but, with the help of his daughters, Elizabeth and Anne, was able to live independently at home, until further medical problems were diagnosed and he became very ill. After a short stay in hospital Bob died peacefully on 8<sup>th</sup> January, 2011.

Dr Heather A. Salzen  
Formerly of the Nature Conservancy Council for Scotland (NCCS).



## **BIOGRAPHY OF JANET SPRENT - NEW HONORARY MEMBER OF BSS**

This is an abridged and expurgated account of bits of my life, which began in January 1934, when I had the good Scottish name of Findlater. After taking a degree in Botany at Imperial College, London, I had a job at Rothamsted Experimental Station where I met my statistician husband Peter and went to Tasmania where I did my PhD. After returning to England and encountering the first of several bits of discrimination (East Malling Research Station would not then employ married women on its scientific staff) I taught in a grammar school and then lectured at Goldsmith's College, London. When we got sick of SE England we decided to come to Scotland where Peter got a job at the University of Dundee and I took a gamble on the possibility of getting one in the expanding Botany department. After a few hiccups this worked out well and I proceeded up the academic scale to a personal chair and Dean of Science and Engineering and after partial retirement, part-time Deputy Principal. On the way I got involved in a whole variety of things such as National Environment Research Council (NERC), SHEFC and the Governing body of the Macaulay Land Use Research Institute, which I later chaired. After retirement I was appointed to Scottish Natural Heritage board and various other bodies such as the Royal Commission on Environmental Pollution. I was a member of the International Advisory Committee for the huge NitroEurope programme, which culminated in the launch of the European Nitrogen Assessment in Edinburgh in April 2011. On the way to all of these things I got a DSc from London University, an OBE (for services to Science and Education), Fellowship of the Royal Society of Edinburgh and, giving me particular pleasure, honorary membership of the British Ecological Society. Last October I received an Honorary Doctorate in Agricultural Science from SLU, Uppsala (catching up with John Raven who was awarded one earlier). At the moment I am on the advisory committee for the European Legume Futures programme and, to my great delight, a Trustee of the Royal Botanic Gardens, Edinburgh.

I firmly believe that hobbies are essential and en route I have had many, such as athletics and hill walking and, when I refused to play golf, flying, for which I went from a private pilot's licence to an unrestricted instructor's rating, to a commercial licence with an instrument rating. At one stage Peter (my husband) and I had a small aeroplane of our own

and in this were able to travel over much of Scotland including the western and northern isles (up to Unst). Somewhere I have a photo of John Raven holding a giant kelp on the shores of Tiree! More usefully, I was in the St John's Air Wing and ferried organs for transplant around the UK in the middle of the night and in foul weather. The Air Wing was later privatised and procedures for preserving organs for transplant improved greatly so ferrying of organs was no longer needed. I decided to quit flying some years ago, not wanting to become the equivalent of a Sunday driver.

So what am I doing now? In my field of nodulating legumes (plant root nodules contain bacteria that allow plants to fix nitrogen), there are lots of exciting developments and I am having a great time exploring various aspects from evolution, to adaptation to extreme environments, and studying the many 'new' bacteria that can nodulate legumes especially in low nutrient soils of the southern hemisphere. This is a great opportunity to extend old and forge new collaborations and my active ones at present are in Europe, Brazil, India, Africa and Australia. Some of these are aimed at improving legume crops for resource poor farmers. Last November I was in Cape Town (South Africa) working on the wonderful Fynbos flora and later this year will be going to the Centre for Rhizobial Research in Perth (Western Australia) to join in a study of some of the unique legumes of their area and those of South Africa. Life is fun and I have many friends and colleagues throughout the world, from MSc students to an old friend in Cape Town, aged 98 with whom I and a retired botanist from Belfast have a paper in press in Bot J Linn Soc. Although having an emeritus professorship at Dundee, my main UK base is the new James Hutton Institute, where I have an honorary fellowship. My publications include several books, lots of chapters and refereed papers, from all continents including Antarctica, which I visited when on NERC council, at the tax payers' expense.

Being awarded Hon Membership of BSS is icing on a rich cake for me, although some may say that my slice of cake has a nutty content!

Janet Sprent BSc. PhD. DSc. OBE

## **BOTANICAL SOCIETY OF SCOTLAND FIELD TRIP TO MILLERHILL (JULY 2011)**

Millerhill Bing is a hidden gem, a site known to few botanists despite its easy accessibility within Edinburgh, it being just south of the Fort Kinnaird shopping centre. On Saturday 9th July, eight Botanists gathered to explore the site. Near the road at its edge, a patch of *Geranium himalaicum* (or one of its hybrids) provided a taster of what was to come. Entering the site proper, we walked along a trackway dotted with plants such as *Alchemilla mollis*, *Filago minima*, *Linum catharticum* and *Trifolium arvense*.

A little further on, to the left, a patch of flat open ground carpeted with lichens and small plants contained a fine and possibly expanding patch of *Potentilla recta*, in full bloom. Beyond this, damp hollows were completely dominated by a huge mass of *Aster x salignus*, with the first flowers just opening; only occasional plants of *Dactylorhiza fuchsii* and *Vicia hirsuta* offered any competition. *Dactylorhiza fuchsii* occurs in grassy spots throughout the site, and seemed to show signs of introgression from *D. purpurella*, such as wide middle lip lobes and varying shades of pink up and down the inflorescence. Of course we couldn't be sure, especially as *D. purpurella* does not currently appear to be present on the site.

From here we ascended a couple of metres to the large plateau at the centre of the site. By far the most common plant here was *Hypericum x desetangsii*, which formed a sea of yellow across the coal waste. According to Alan Silverside, this hybrid reproduces apomictically and has replaced *H. tetrapterum* in much of Wigtonshire; given the uniform and unnatural habitat here, it was easy to imagine this hybrid prospering at Millerhill.

On closer inspection, however, the vegetation on the plateau is far from uniform. Chris Jeffree, on a previous visit, had observed how vegetation is clustered into islands here; within the islands were mosses and a range of angiosperms, often including *Sedum album* and/or *S. acre*. Outside of the vegetation islands only *H. x desetangsii*, *Filago minima*, and occasional *Lepidium heterophyllum* occurred with one or two other species. The largest such islands form around shrubs and trees, many of which were exotic: *Cotoneaster bullatus*, *C. simonsii*, *Philadelphus delavayi*, *Picea* sp. (complete with tinsel), *Spiraea japonica*, *Hypericum androsaemum* and the inevitable *Buddleia davidii*

were all present. *Salix caprea* was also present, with galls on its leaves being investigated by a wood wasp. In and around the shrubs could be found *Origanum vulgare*, *Centaurea montana* and *Hypericum olympicum*, the last clearly naturalising and spreading by seed.

In the SE corner of the plateau grows the only plant of *Anacamptis pyramidalis* ever found in Midlothian. It had honoured our visit by producing three short flowering spikes! Also present here were *Centaurea erythraea* and *Verbascum virgatum*, which is thoroughly naturalised on this site. This is one of several areas on the site where conditions approximate calcareous grassland, and in similar sites lower down *Gentianella amarella* was also present.

From here a track descends to a large expanse of concrete dotted with every form of rubbish imaginable, the graveyard of the Monktonhall Colliery. Among this desolation lurks a remarkable diversity of alien plant species, not least because the area remains popular for the occasional surreptitious dump of garden waste. On the east side, between this and the railway sidings lies a young wood of birch trees which have regenerated naturally since the colliery was abandoned. A patch of these was cut down last year apparently to make way for a new railway line, and this had brought forth a mass flowering of *Verbascum thapsus* and *V. virgatum*, together with plentiful *Reseda lutea* and one tiny plant of *Chaenorhinum minus* - spotted by the eagle-eyed Helen Jackson.

From here we returned to the concrete area, where we spotted *Campanula persicifolia*, *Polygonatum x hybridum*, *Geranium macrorrhizum* and *Lonicera tatarica*; however *Triteleia laxa*, seen here in 2009, did not make an appearance. *Malva moschata* was present in both white and normal pink forms. Moving on to a mound of soil apparently dumped in the winter of 2009/10, the following species were seen: *Silene coronaria*, *Viola x wittrockiana*, *Papaver somniferum* (one with pods the size of golf balls), and *Iberis umbellata*. In addition, the following were present but not in flower *Paeonia* sp., *Rhododendron* sp., *Primula denticulata*, *Sedum spectabile* (or similar) and more *Polygonatum x hybridum*.

By now the rain clouds which had somehow missed us were gathering for a concerted assault. We thus paid brief visits to clumps of *Nepeta x faassenii* and *Vinca major* on the way to a magnificent, metre-high plant of *Clematis orientalis*. Then the heavens opened, and we ran for shelter, in a spot where *Fragaria vesca* and *Rubus idaeus* offered

sustenance, while *Lonicera xylosteum* and *Sisyrinchium californicum* offered further botanical interest.

Ever since we'd descended to the concrete area, an enormous *Verbascum speciosum* plant had beckoned us towards it. With the rain now easing to merely heavy, we broke shelter to visit it, and Alan proclaimed it his "plant of the day". After this we unanimously elected to head for home. We saw a few last aliens on the way, including *Lysimachia punctata* and *Cymbalaria pallida*, plus fine stands of *Galium verum* and *Clinopodium vulgare*. Other oddities of the site, such as *Fuchsia magellanica*, remained unvisited.

The future of the site is far from certain, as plans are afoot to create a large waste processing plant there (<http://www.zerowastefuture.com/about-us/project-site.aspx>). It is to be hoped that if this goes ahead then at least the raised bed can be left intact, to preserve *Anacamptis pyramidalis* and the fascinating process of gradual re-vegetation that is going on there.

Dr Richard Milne  
Institute of Molecular Plant Sciences. The University of Edinburgh

## **EDIBLE GARDENING PROJECT AT THE EDINBURGH BOTANICS**

The Royal Botanic Garden Edinburgh's latest community-focused project aims to help people grow their own vegetables, salads and fruit by offering advice on how to get started. Come along to our drop-in sessions to learn about vegetable varieties, sowing seeds, composting, pruning, harvesting, storing and preparing your produce, and much more. Full details on the RBGE website or at the Garden.

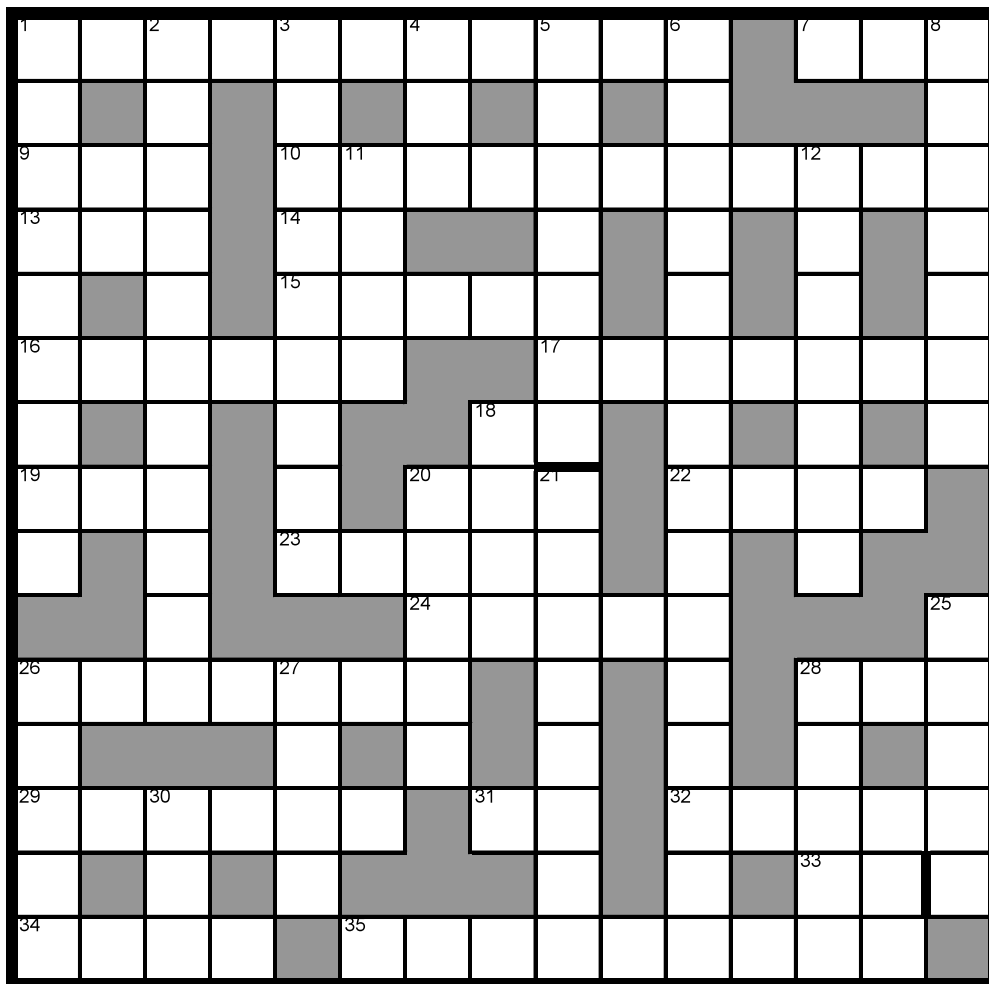
Visit our developing vegetable and fruit demonstration area to learn practical skills for growing edible plants. Or volunteer to share your skills, knowledge and experience with others. For more information about the project and volunteering opportunities contact Jenny on [Jfoulkes@rbge.org.uk](mailto:Jfoulkes@rbge.org.uk).

## PHYTOLEXICON CRUCIFORMIS B.S.SCOT EX WORD

**Xword 4.** In this crossword there are nine botanical names. Two are mosses, the rest angiosperms, including four vernacular names; thirteen 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!

I have tried planting crosswords cut from The Scotsman in my garden, but they don't grow. Evidently cryptogrammic species, like most other Cruciferae, are best grown from seed. The search for viable seed commences – dangerous expeditions to remote corners of the world will be necessary. The first will be to Erewhon. Any volunteers?

Crucifer



### ACROSS

- 1 Grasping stem (but not *H helix* etc) (11)
- 7 Those of us initiating brilliant scientific symposia? Oh yes! (3)
- 9 Product of *Elaeis guineensis*, *Carthamus tinctorius*, *Guizotia abyssinica* etc. (3)

- 10 Snap cancer perhaps and seek enlightenment? (11)
- 13 Small tree that will perhaps flower in a month. (3)
- 14 Interjection given in friendship. (2)
- 15 Botanist in Kosovo identified shape of *Prunus padus* fruit. (5)
- 16 Drug obtained from *Chondrodendron tomentosum*. (6)
- 17 Yes-men and twenty-sixth character make biologically important yeast extracts (7)
- 18 Nasty Nazis involved in Operation Barbarossa? (2)
- 19 American corporation starts growing *Incarvillea*. (3)
- 20 Plant seed of which we have great expectations. (3)
- 22 Massive stem of *Boletus* spp? (4)
- 23 The point of a leaf is to be sharp witted. (5)
- 24 Green environment held back by unpopular urban development. (5)
- 26 “I’m *Ulmus*” says plant to botanist, but it’s monkeying about. (7)
- 28 Shrub or container that dumb oxen drew. (3)
- 29 Pours forth matters of concern. (6)
- 31 Degree that advances science. (2)
- 32 Legolas perhaps finds himself inside description. (5)
- 33 and 18d. Experimental hybridization done here? (2, 4)
- 34 2d and 26d included here. (4)
- 35 and 20d. Pastoralist’s moneybag. (9, 5)

#### DOWN

- 1 Pick atomic jumble, without potassium and without sex. (9)
- 2 and 5d. Oi! I try some dull chap to discover bryophyte growing on acid soils. (11, 7)
- 3 Rue phobia? Not *Ruta* or bitter regret, but another genus. (9)
- 4 Nigerian people ensnared by ad lib or rehearsed speech. (3)
- 5 See 2d.
- 6 Idea: call a zebra; a family will be found with members in Chile, China, Himalaya and Japan (*Ranunculales*) (15)
- 8 Disaccharide that makes EU cross. (7)
- 11 Scene of industrious activity by pollinators. (4)
- 12 Shoot in seed of plum, *Ulex* and other angiosperms. (7)
- 18 See 33a.
- 20 See 35a.
- 25 Part of pollen grain that can flex in extreme conditions? (5)
- 26 Bryophyte found in British woodlands, but also returning in Jammu, in montane habitats. (5)
- 27 *Allium porrum* growing in Yorkshire town. (4)
- 28 Cleft in twain, struck dumb if ideas not forthcoming. (5)
- 30 Alarm call from Knossos. (3)

## NEW PHYTOPHTHORA THREATS IN SCOTLAND

Over the last couple of years there has been much media attention devoted to the topic of newly emerging tree diseases and the threats which such diseases pose to amenity, woodland and forest landscapes in Britain. This is not surprising given the recent introduction and spread of *Dothistroma septosporum* on pines, *Pseudomonas syringae* pv. *aesculi* on horse chestnut, and of course the infamous *Phytophthora ramorum* with its sudden, unpredicted jump on to larch. As if these weren't enough to deal with, Scotland is now facing the consequences following the unwitting introduction of *Phytophthora lateralis*, an aggressive and potentially fast spreading pathogen of Lawson cypress (*Chamaecyparis lawsoniana*), not to mention the surprising confirmation of yet another alien pathogen, *Phytophthora austrocedrae*, on Nootka cypress (*Chamaecyparis nootkatensis*) and Lawson cypress, both from sites in the Glasgow area.

The finding in late 2010 of *Phytophthora lateralis* for the first time in Britain, now confirmed at four different locations around Glasgow, is worrisome, particularly since genetic profiling suggests that these outbreaks represent at least two independent introductions of the pathogen. *Phytophthora lateralis* is thought to originate in south-east Asia, following its recent isolation in Taiwan from soil associated with old growth native yellow cedar (*Chamaecyparis obtusa* var. *formosana*), on which it causes little damage (Brasier *et al.*, 2010). This pathogen was most likely introduced into the Pacific Northwest of the USA in the 1920s, and has since spread to become a devastating pathogen of Lawson cypress across its native range of northern California and Southern Oregon, virtually destroying all commercial trade in that species in America (Hansen *et al.*, 2000).

*Phytophthora lateralis* is generally regarded as a root disease and can survive in the soil for several years as thick walled resting spores known as chlamydospores. The chlamydospores germinate to produce spore sacs known as sporangia, inside which develop the motile zoospores; the main dispersal mechanism for the pathogen (Hansen *et al.*, 2000). Zoospores can swim, hence *P. lateralis*, as with several other *Phytophthora* spp., favours cool, wet conditions, spreading in groundwater and other water courses. Zoospores infect the roots of Lawson cypress causing orange/brown-coloured lesions in the phloem which extend upwards, and which are often visible under the outer bark

at the stem base of infected trees. As the phloem dies, and the underlying xylem becomes disrupted, the infected tree's supply of nutrients and water are cut off and the tree dies rapidly, its entire crown turning first pale green and then bronze as a result of rapid desiccation of the foliage.

*Phytophthora lateralis* was considered to be absent from Europe until the recent confirmation of an outbreak in Brittany, France, affecting a 400 km<sup>2</sup> area of Lawson cypress that were planted as windbreaks in the 1970s (Robin *et al.*, 2010). One concerning feature of the French outbreak is the high number of aerial infections observed, thought to be due to the ease with which the sporangia can be broken off and wind dispersed under local conditions, infecting branches and stems directly. In Scotland, *P. lateralis* has been found causing aerial lesions at two sites, and although the majority of confirmed infections to date have been root-borne, the potential for aerial dispersal greatly increases the risk of this pathogen establishing irreversibly within Britain.

With the arrival of *P. lateralis* and *P. austrocedrae*, the latter described in 2007 from widespread dieback and mortality of *Austrocedrus chilensis* (Cupressaceae) in southern Argentina and Chile (Greslebin and Hansen, 2010), the obvious questions arise; where did these diseases come from and how did they get here? Prior to the disease outbreaks, three of the four infected Scottish sites had imported young, containerised host plants from overseas nurseries, and in the last few months *Phytophthora lateralis* has been isolated from young symptomatic plants of white cedar (*Thuja occidentalis*) and Lawson cypress imported into Scottish garden centres directly from Continental Europe.

Thus, the international trade in live plant material is implicated as the most likely pathway of introduction for *P. lateralis* and other newly established pathogens such as *P. ramorum* and *P. syringae* pv. *aesculi*. Concerns about the international plant trade and the risks that it poses to forest health worldwide are growing. In May this year, more than seventy delegates from seventeen different nations attending a meeting of the International Union of Forest Research Organisations (IUFRO, section 7.02.02) to discuss foliage, shoot and stem diseases of forest trees, and agreed to issue a declaration urging that all trade in high risk plant material should cease.

As with *P. ramorum*, *D. septosporum*, *P. syringae* pv. *aesculi* and, going back further, Dutch elm disease, *P. lateralis* may well be here to

stay. But what important lessons can be learned from the *P. lateralis* outbreaks in Scotland? Currently, Forest Research pathologists are working as part of a wider international group using genetic fingerprinting to determine the geographical origin of the pathogen and to trace its pathways of entry into previously uninfected areas. It is hoped that such studies will provide the necessary information required to force a tightening of international plant quarantine and biosecurity regulations, giving our economically, environmentally and socially valuable tree species the protection that they deserve.

Sarah Green, Forest Research, Roslin

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## **PHYTOPHTHORA RAMORUM/KERNOVIAE SURVEY IN HEATHLAND**

You can help efforts to protect Scotland's blaeberry (*Vaccinium myrtillus*) by keeping an eye out for any diseased-looking specimens.

*P. ramorum* and *kernoviae* are fungus-like pathogens causing serious and often fatal diseases on a wide range of trees and shrubs. Since 2008 the diseases have been found on blaeberrries (*Vaccinium myrtillus*) in some heathland sites, mainly in SW England but also at a woodland site in Scotland. SASA (Science and Advice for Scottish Agriculture) are conducting a survey to establish whether these pathogens have spread to blaeberrries in Scottish heathland.

The symptoms for both diseases are very similar. The infected sites on the twigs turn black. Because there are often several points of infection on the same stem a 'banding pattern' of green healthy and black necrotic tissue can be observed before eventually the whole stem becomes necrotic. Infected leaves are shed very quickly. This early defoliation can be noticed from some distance and is especially obvious in late summer.

BSS members are asked to look out for any diseased blueberry plants and, if possible, to send samples of any twigs showing symptoms to SASA at the address below, for diagnosis. Please follow this sampling protocol:

### **Sampling**

- For the laboratory testing procedure it is essential that the plant tissue, and with it the pathogen, is alive. Therefore only twigs showing some green tissue should be sampled.
- Use disposable gloves and for each sample take at least 5 symptom-showing twigs per plant or per patch of plants. Change gloves between samples.
- Put the twigs in a sealed polythene bag and add a sheet of moist tissue paper to keep the sample alive.
- Label the bag in print letters.
- Note the location as accurately as possible so that it can be found again. Photos of the site may help.
- Send the sample as soon as possible by 1st class post to:  
Dr Alexandra Schlenzig, Plant Health, SASA, Roddinglaw Rd,  
Edinburgh, EH12 9FJ
- To avoid spreading diseases, thoroughly clean boots before going to a new site, ideally with disinfectant.

## **CONFERENCE - SIR JOSEPH DALTON HOOKER**

A one-day conference on 9<sup>th</sup> December 2011, jointly organised by the Royal Botanic Gardens, Kew, the Linnean Society of London, the Kew Guild, and the University of Sussex, will celebrate the life and work of Sir Joseph Dalton Hooker (1817-1911). This meeting will appeal to anyone with an interest in botany and its history, exploration, empire or, of course, Kew itself. For further details please see [www.kew.org/jdhooker](http://www.kew.org/jdhooker).

## ANTHER SMUT FUNGI STERILIZING CARYOPHYLLACEAE IN SCOTLAND

Caryophyllaceous plants (*Silene* species) are widespread in Scotland, and several can be affected by the highly unusual anther-smut disease, caused by fungi in the genus *Microbotryum*. These fungi are obligate pathogens that sterilize their hosts by replacing pollen with dark brown or purple spores in the anthers; the female structures fail to mature, and in plants of dioecious species the fungus induces a male-like development with the production of spore-bearing anthers. The spores are transmitted from diseased to healthy plants by insects that normally serve as pollinators for the host. Therefore, the disease spreads via the same route as the plant's reproduction, which makes anther smut a sexually-transmitted disease. The diseased plants are usually completely sterilized, but the plant species does not appear to be threatened by the disease. The hosts and their host pathogens seem to co-exist in a dynamic network of populations, thanks to a low rate of disease transmission and regular extinctions of Caryophyllaceous populations, followed by recolonization. A herbarium survey has shown that endangered *Silene* species are little affected by the disease, probably because their small population sizes do not sustain pathogen populations. Only perennial plant species can be affected by the anther smut disease, as the fungus needs to infect the plant and the meristems before these develop the branches that will form flowers.

We have recently shown, using genetic analyses and cross-inoculations, that *Microbotryum* encompasses several distinct species. These species are morphologically similar but do not exchange genetic material, and each pathogen species is specialized on a particular species of host plant. Cross-inoculation experiments have shown that *Microbotryum* species indeed show strong specificities and population genetics analyses have detected a few stragglers (a fungus that would infect another plant species other than their usual host). Experimental crosses in the lab have shown that the hybrids between *Microbotryum* species are poorly able to infect plants and are most often sterile. We are currently trying to identify the genes involved in regulating the interaction between the anther smut fungi and their host plants. The whole genome sequence of one species has just become available.

The best-studied anther-smut fungi are those parasitizing the plants *Silene latifolia* (white campion), *S. dioica* (red campion), and *S.*

*uniflora* (sea campion). Our recent analyses of the genetic structure in natural populations of these fungi have begun to reveal the patterns of post-glacial recolonization of central and northern Europe, and we have shown that the different fungal species sometimes co-occur on the same host (as in two *Microbotryum* species frequently infecting the sea campion). We are now studying the population structure of the *Microbotryum* species throughout Europe, but we lack specimens collected in Scotland. We would be most happy to receive samples, kept in dry paper, with their location and GPS coordinates if possible. We would be happy to send more information to anyone interested in the detail of this system or our ongoing research.

Tatiana Giraud and Michael E. Hood

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Université de Paris-Sud 91405 Orsay cedex France

Michael Hood, Department of Biology, Amherst College, USA

**Editors note** – We have investigated and there are no restrictions on sending specimens of these flowers and fungus to France.

## ***NEPENTHES***

Within these leaves we may discern  
a flask like John Keats' Grecian Urn.  
Although no nymphs around it dance,  
nor any lusty shepherds prance,  
insects find it quite enthralling,  
creep on its rim, and soon are falling.  
Scales of wax have made them slip  
from the flask's so treacherous lip.  
In its nectar pool a frog  
may lie asleep like inert log,  
but, when a bug comes dropping in,  
eats it with a toothless grin.  
And thus Nepenthes' lethal pitcher  
may make its denizens the richer.

Roger West

## MEUM ATHAMANTICUM (BALDMONEY, SPIGNEL) IN THE OCHIL HILLS AND FIFE

**Prefatory note:** The Threatened Plants Project run by BSBI included for 2010 'checking older sites for *Meum* to determine its current distribution'. *Scarce Plants in Britain* (A. Stewart *et al.* 1994) gives its status as "scarce", and that it "has probably suffered some decline". Field-work for the BSBI survey reawakened my long-held curiosity as to the plant's common names, hence the notes here on their etymology and ethnobotany.

Although often described in Floras as being a plant of mountains, in fact *Meum athmanticum* (known as Spignel and Baldmoney) may be better thought of as occurring in upland pastures, including at quite low altitudes. In east central Scotland it was mentioned as being present in the Ochil Hills as early as 1728 (Blair) and the *Flora of Perthshire*, White (1898) lists it as being "widely distributed [but] by no means general; it occurs here and there in the Highland valleys, and on the Ochil Hills ..." (p.161). Owing to Watson's interpretation of county boundaries when he drew up his vice-county numbers about 1850, much of the extent of the Ochils was included in Clackmannanshire, West Fife and parts of Kinross-shire (VC87), or West Perth; North Fife is in VC85. "The Ochils consist of a bed of volcanic rock in the form of a high plateau with a steep southern face ... [their] unique characteristic lies in the contrast between the north's rolling braes and smooth grassy ridges, and the south where, in consequence of the Ochil geological fault, the hills drop steeply some 600 metres to the plain of the Forth ... and the range extends diagonally across the country from Dunblane to Newburgh on the Tay. The significant appeal of the hills is their dramatic changes in appearance as sunlight and cloud shadows play on the contours; and the woodland, rock, gorse and bracken add characteristic colour and variety to the ever changing scene" (Corbett *et al.* 1994).

Sites have long been known in Glen Eagles, Glen Devon and their neighbourhood, some of the most popular parts of the Western Ochils. Among the first local botanists to go there was John Syme (in his later guise as J.T.I. Boswell, Syme found some renown as the editor of the 2nd edition of *Sowerby's English Botany*) who as a young man lived in Dollar and was therefore well placed to find some unusual plants in the neighbouring Ochil Hills. Assuming Syme traversed the road in the vicinity of Glendevon House Lodge, he would have been attracted by

the vista photographed about a century and a half later (See Gendevon photograph on the cover). He certainly picked a specimen from 'Glen Devon' in 1838 (in **STA** – University of St Andrew's herbarium collection). This Gendevon photograph was taken by Liz Lavery, the local VCR, who commented "the view from the main road is why I visited the site in June 2009 when Spignel was abundant on two steep moraine hillocks beside the River Devon, deer fenced and planted with deciduous trees by the Woodland Trust. *Meum* was present in acid grassland but absent from patches of dense bracken"; Liz Lavery estimated the total number of plants to be some 11,622 and went on to say "In the Ochils, *Meum* seems to flower and thus becomes visible in areas where grazing has been recently removed or decreased, such as hill sheep pasture planted with trees".

A year earlier, in June 2008 Liz had visited Glen Quey, (along Glendevon and off it to its south-west), where she came across further thousands of Baldmoney plants in full flower. Having passed the deserted Balmony House (surely an omen?) she spied a small conical hill on the west side of the path, which appropriately proved to be named Baldmoney Knowe, covered as it was with some 5,000 plants (see photo), scattered over the area except in the thickest bracken, with density varying from c10 plants to 15-30 per 2 m x2 m area. Recently planted woodland also had scattered clumps of *Meum*, for she was in Geordies' Wood (of which Balmony Knowe is a part), so named by the Woodland Trust Scotland after its earlier acquisition of the land. In total here Liz reckoned that there were some 20,000 plants in a comparatively small area, again obviously flourishing following the exclusion of sheep grazing. Although the place names indicate the district was well-known for the presence of *Meum*, not all visitors seemed to be aware of it: a compiler of notes on the Dollar to Glendevon Walk said that as the traveller reached the Glenquey Reservoir the glen widened out and "in late spring and early summer [he could] admire the delicate blue flower of Butterwort, the deep pink of Lousewort, the yellow of Heartsease and the blue of Scabious" (Corbett et al, 1994) but there is no mention of *Meum*. It was Mountain Pansy that Liz additionally admired in 2008, as she was also to do a year later.

Other known Baldmoney localities in the Ochils include the lower Dunning Glen at Tonquey Faults (beyond upper Glen Queich); lower down from here, in Kinross-shire, it had apparently gone from banks by the B934, except in the Myrehaugh area while further south, into lower

Glendey and the confluence of the River Devon *Meum* seems also to have gone, despite being admired as being “spectacular” by N.F.Stewart in the early 1980s (NCC report). There are other parts of Kinross-shire where *Meum* may still be flourishing: in 1984 good colonies were encountered in the Golland area near Carnbo and further east in the Warroch area, above both Warroch East and Warroch West Burns; they were thriving in 2002 but were not accessible in 2010 and may well be to the fore.

Elsewhere, a small stand grows near Balvaird Castle, off the A912. There are no old records from the Eastern Ochils as they descend gently into Fife although an unexpected clump was spotted by Bill Hay in 2007 on the south side of Fincraig, above Newburgh (NO21). Back in Kinross-shire, *Meum* might have been expected in the Cleish Hills and on Benarty but there are neither old nor current sightings despite being well explored over the years.

So too in the Lomond Hills (East Law and West Law in Fife and the neighbouring Bishop Hill in Kinross), records might be anticipated but none has been reported save for a small stand on the east side of the East Lomond by the Lothrie Burn (NO20) in 1984 and 1999 and none were observed in 2010. In the East Neuk of Fife there are several low Laws flanked by suitable pasture land and there is one interesting old record: in his manuscript Flora of Fife (1884) Charles Howie commented “Prior to cultivation, a large quantity [of *Meum*] was growing on coal pit refuse heaps at Largoward (NO40), 50 years ago”, i.e. in the 1830s. This was not in the main Fife coalfield so the spoil heaps were probably more of the type associated with opencast mining, and covered in grass. The sole other documented site is inland from Kinghorn (NT28) where the New Statistical Account of Scotland dated 1843 records it under its other name of *Ligusticum meum*. This may well have been a genuine record as there are a number of suitable upland spots in the neighbourhood.

Elsewhere in Scotland, the headquarters of *Meum* is undoubtedly in Forfarshire, as befits its first recorded occurrences and here “there are several extensive populations in the low-lying parts of the Angus glens; other than some inappropriate management I have not noticed any significant decline” (summer 2010 B. Hogarth pers. com.). Neighbouring counties of VC90 also have colonies but curiously, the close-by Sidlaw Hills have none. Across Central Scotland, The Trossachs have two small populations, one at Garrison (Inversnaid) and the other near Loch

Ard but the Gargunnock Hills are devoid of any (E. Stewart and J. Jones pers. com.). The Lothians and Borders have no extant populations, whereas in the South West, there are long-known large clumps in west Dumfries-shire, and neighbouring Kirkcudbright complements these populations on its east side, with the largest in an open upland conifer plantation. In the Moffat Hills, only one plant is currently known (C. Miles and D. Hawker pers. com.). Still in Galloway, further to the west in Wigtonshire and the Machars, there have been no reports since before the 1930s. Across the Solway Firth, Cumbria is well off, historically being the English hotspot and quite a spectacle, as shown by G. Halliday's display at the BSBI/BSS Exhibition Meeting in Edinburgh in November 2010.

General threats include inappropriate management of colonies, especially on roadsides, the planting-up of apparently unproductive grassland with trees and over-grazing, although D. Hawker observed that in VC74 "the plant seems to be able to survive very high grazing pressures, although often difficult to find being only a cm or so tall" (pers. comm.). Bracken can shade out colonies, as can other invasive vegetation such as coarse grasses.

**Ethnobotanical notes.** The first references to *Meum*'s medicinal qualities appear to be by George Don in his 1834 treatise on gardening, in which, after describing it, he continues "the whole plant, especially the root, is highly aromatic, with a hot biting flavour like lovage, which it communicates to milk and butter from the cows feeding on the herbage in spring, the seeds, as well as the root, are carminative ["expelling flatulence"] and stomachic ['good for the stomach']" - this opinion was echoing James Robertson in his description of a tour of the Highlands during 1767-71 (Henderson and Dickson, 1994), where Robertson noted that Deeside people ate "the roots of Burnet Saxifrage and Bawdmoney (Spignel) with releif [sic], when they are troubled with pains in the stomach, or bowels arising from wind". George Don of course came from Forfarshire, not far south of Deeside and perhaps his county companions suffered from the same afflictions as those to the north. Patrick Blair, noted above as having found *Meum* in the Ochils, also resided in Forfarshire and significantly, was trained in medicine. The standard early Scottish Flora, that of Lightfoot (1777) comments that "the root has a warm, spicy taste and is sometimes used in medicine as a carminative and a diuretic".

More modern works tend not to mention the medicinal qualities of *Meum*, e.g. in none of T. G. Tutin's three accounts of Umbelliferae (1952/62, 1968, 1980) are any given; but perhaps they were considered to be not weighty enough. Polunin (1969) comments in his Preface to *Flowers of Europe* under 'Uses' that "the most important uses of European plants have been given [although] I have endeavoured to note only those plants which have well-tried remedial properties" and *Meum* does not feature in this respect. However, in the commentary accompanying the map of *Meum* in *The New Atlas* (2002) it is observed that "deliberate destruction [of habitat may have occurred] because it can taint cow's milk", presumably following *Scarce Plants in Britain* (in turn, perhaps a throw-back to notes by George Don in 1834). Anecdotes and opinions might have been expected by David McClintock in his *Companion to Flowers* (1966) and by Richard Mabey in his *Flora Britannica* (1996) but both are uncharacteristically silent on this issue.

**Etymology.** There is doubt over the origins of all the plant's names: Linnaeus called it *Athamanta meum*, explained by Grigson (1955/58) as being "identified with the *meon athamantikon* of Dioscorides" in his *De Materia Medica*. Some writers claim that the epithet indicates an association with Mount Athamas in Sicily, while others, possibly more correctly, attribute it to Athamas, King of the Minyans in Thessalia, where the ruler founded a settlement called Athamantia. Then for a time it was transferred to *Ligusticum*, as *L. meum*.

**Common names.** Most authorities cite three common names: Spignel (the most frequent), Meu and Baldmoney or Bawdmoney. 'Meu' is easily accounted for but the other two are much more difficult to explain. Most everyday dictionaries merely state that the etymology is obscure while even that bastion of English language origins and usage, the *Oxford English Dictionary*, is of little assistance; it does, however, refute the assertion made in *A Dictionary of English Plant Names* (Britten & Holland, 1886) that "Baldmoney is a corruption of Balder, the Apollo of northern nations, to whom the plant was dedicated", first put forward by J.D. Hooker. The *Scottish National Dictionary* says that the first mention of Baldmony and Spignel was in 1715 in Tweeddale. My view is that it *may* be not without significance that one of the meanings of the old Scots word 'bauld' or 'bawd' was sharp or pungent, but the

suffix 'money' is not easily explained. Neither has a satisfactory meaning for Spignel been tracked down.

Several of the sources noted above include a Gaelic name, with various spellings. As I have no knowledge of the language, the best I can do is to quote the *Scottish National Dictionary* entry for Micken, or moiken/muilcionn:

- a) Old Statistical Account of Scotland, (Aberdeenshire 1795): "grows in the forest of Clunie. The Highlanders chew the root of it like liquorice or tobacco";
- b) Gardiner's *Flora of Forfar* (1848): "Spignel, Mew or Bald-Money, called by the Highlanders "micken", and highly esteemed as a carminative, as well for its aromatic taste and smell" [cf. G. Don's entry of 1834, quoted above].
- c) D.M. Ogilvy Poems (1873), "Sweet michen and buttercups".

Finally, it should be noted that Baldmoney, in that spelling or one of its many variants, was also applied to an [unknown] species of Gentian.

**Acknowledgements.** I am indebted to numerous people for help, too many to list individually but especially those named in the text; particular mention must be made of Liz Lavery's input as VCR for VC87; various local Floras and lists were also culled for information. The staff of Scottish Language Dictionaries and my former librarian colleague Joyce Penney assisted with the etymological research. A search of sources on Google internet revealed some useful information but also - if the Editor will allow the 'pseudopun' - a lot of balderdash.

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## **CRITHMUM MARITIMUM IN EAST SCOTLAND: EARLIER RECORDS**

I read with interest the article by Richard Milne in the last issue (No.96, 2011:24-25) on his finds in Belhaven Bay, and must correct his assertion that his is “apparently the first ever record of *Crithmum maritimum* from the coast of eastern Scotland”: in fact there are two recent records, from Angus and Fife. It falls to me to outline the circumstances of these finds, as follows.

1) VC90: the VCR for Angus, Barbara Hogarth, remembers - “Pat Gaff [a sharp-eyed enthusiast from Dundee] probably came across the *Crithmum* late in 2004, however it was 22 June 2005 when he took me along to the site and we recorded it ‘formally’, growing in shingle at the base of sandstone cliffs in a bay just north of a point called Rumness which in turn is north of Auchmithie, NO64. In 2005 there were two good sized plants and one smaller one suggesting they had become established a few years earlier. In 2006 an additional small plant appeared. Between us Pat and I have made regular visits. Two plants are prone to getting battered by winter storms but the roots seem to be well anchored; they flower well and produce lots of seeds but too late for the seeds to ripen. We have searched lots of similar sections of the Angus coast but have yet to increase our tally of 3/4 plants”.

“I entered the record in Mapmate and passed it on for publication in *Watsonia*, [where it appeared in vol. 27, 2009, p. 378] so it should be in the system” (but apparently has been ignored) (pers. comm.). The find came just too late for inclusion in Barbara’s *Checklist of the Flowering plants and ferns of Angus* but this is rectified in her *Angus Rare Plants Register*, available online.

2) VC85: this record was provided by Dr Anne Reid (coincidentally, also from Dundee), who recounts - “I found the plant when helping my daughter to survey saltmarsh vegetation at various places on the east

coast of Scotland for her final year dissertation. On 28th July 2008, when checking a small patch of saltmarsh at Elie Ness we noticed a *Crithmum* plant at the top of the beach, a single plant with one umbel, on a small area of sand to the east of the 'bridge' leading to the lighthouse at the Ness, NT49" (pers. comm.). Dr Reid notified me shortly thereafter and sent a photo of the plant, which was put on show at the annual exhibition meeting in Edinburgh on 1st November 2008. The record subsequently was included in the abstract of my display at that meeting and appeared in print in *BSBI Scottish Newsletter*, no. 31, 2009, p. 12; it has not yet been notified to Plant Records for publication in *Watsonia* owing to the pressure of other business and ongoing poor health, which also prevented me from visiting the site in 2009 or 2010. Dr Reid did revisit the locality on 27 August 2009, when she "re-found the plant which looked smaller as there was no umbel this time", and again on 6 June 2011, when "the *Crithmum* is still there but has been partly buried by sand and is trying to grow above it; no bigger than 2 years ago, at least it is still there" (pers. comm., June 2011). In Angus, Barbara Hogarth comments "we paid our annual visit to the site on 29th March 2011- the sea has really moved the shingle about over the winter and whilst we found *Crithmum* remains the frosts have played havoc with all the top growth, so we'll have to go back later and see if the rootstocks have survived".

Other (northern) records away from the west and southwest coasts of Scotland include:

3) VC109: a curious red dot (denoting an introduction) appears in the *New Atlas* (Preston et al, 2002:461) near the tip of NE Scotland. An enquiry of the VCR for Caithness, Ken Butler, in whose county it apparently is, resulted in a reply "I was not aware of this record ... it is obviously nonsense. I have scanned all the records that I have submitted and cannot find it there as a snafu in my system, so I do not know how it arose" (pers. comm.)

4) VC108: in *John Antony's Flora of Sutherland* (Kenworthy, 1976), an entry reads "Strathy Point, three plants, 1959, M.McC.W. [i.e. the redoubtable Mary McCallum Webster]"; Ken Butler says of this record "apparently genuine, 1957, near Melvich".

5) VC96: in her own *Flora of Moray, Nairn and Easternness*. Miss M.M. Webster (1978) lists *Crithmum* as "casual, shingle by the sea. Recorded [about 1900] by Lobban [a local headmaster] from the coast at Auldearn [in Nairn]. Not seen in recent years".

The provenance of all of these plants is a matter for speculation. Tutin (1968 and 1980) considered that *Crithmum* occurred “on the Atlantic coast of Europe” but says nothing about possible dispersal by ocean currents. Dr Milne noted that this might be “a likely hypothesis because seed can float in seawater for up to a year”, while Dr Reid recalls that when researching her own Ph.D. on aspects of *Crithmum* germination, this view was echoed in another study which found that seed was still viable after 12 months in sea water (Okusanga, 1976). Following the Elie find, my own view was that seed must have come down from Angus but I now concur with B. Hogarth’s suggestion that “it is unlikely the Angus plant has ever produced ripe enough seed to colonise anywhere else ... it seems quite likely that seeds or bits of plant could have washed up from sites in East Anglia and found niches in both Fife and Angus during what was a period of relatively mild winters. A look at a map of the British Isles shows that the east coast of Scotland is predominantly southeast facing and the sandstone cliffs are known to support a number of ‘southern’ species because they absorb heat during the day” (pers. comm.)’.

However, Richard may have chance to encounter another rare maritime incomer to the east coast: *Lathyrus japonicus*, Sea Pea, has been known on the Angus coast for several years and was discovered (by Pat Gaff) on the beach at Tentsmuir in North Fife in 2008, a well established and spreading colony. Photos were also shown in the same display at the exhibition meeting referred to above and the postulation made that the seed had come from the Carnoustie population; although in this instance there may have been a dormant seed bank awaiting the right conditions to germinate, or seed could have travelled up from the south, or elsewhere. Whatever the circumstances, Richard should keep his eyes peeled for Sea Pea on the Lothians shores.

**Acknowledgements:** I am indebted to Barbara Hogarth, Anne Reid and Ken Butler for allowing me to quote, often extensively, from their personal communications to me and for suggesting improvements to the text.

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## EXTREME ATLANTIC HAZEL – TRACKING DOWN THE PROGENY

In July 2011, I spent a week on Shetland with two friends (Ro FitzGerald and Liz McDonnell), botanists from the south of England. They surprised me by saying that one of the rarest plants on Shetland was *Corylus avellana*, known from only two localities (Scott *et al.* 2002). I must admit, that in researching Atlantic Hazel, I had considered only the western seaboard (Kintyre, Argyll, north to Wester Ross and Sutherland, the Mid and North Ebeudes). I was aware that hazel occurs in the relict wood of Berriedale on Orkney (Bunting 1995, Coppins & Price 2009), but not that it could still be found on Shetland, so was curious to know more. Paul Harvey of Shetland Amenity Trust (SAT), put us in touch with James Mackenzie, the 'woodland officer' of SAT. James was mildly surprised that anyone should show enthusiasm to go and see the hazel, but agreed to meet up at one of the two remaining sites. But first, some background to Atlantic hazel on Shetland....

### **Hazel on Shetland: Early Holocene c. 10,000-5,000 years ago**

Today, much of Shetland is covered in blanket peat with a species-poor flora dominated by heather, grasses and sedges; trees where they are present are mostly planted and of non-native origin. This was not always the situation; there is evidence that following the retreat of the

last Ice Age, amelioration in climate saw the colonization of Shetland by a diversity of plants. According to Butler (1998), there is fossil pollen evidence from about 18 sites in Shetland (explorations ranging from 1965 through to 1993), some of which contain tree pollen. Around 9,500 BP, birch was the first tree species to appear in Shetland, soon followed by hazel and juniper. By 7,500 BP, woodland diversity included willow, rowan, oak and alder. Evidence for elm, aspen, pine and ash is still somewhat uncertain, as pollen evidence is inconclusive. In the early Holocene period, ferns and tall herb communities were also present (Bennett *et al.* 1992, 1997). There is evidence of birch being consistently the most widespread tree species, but hazel was locally dominant on less acidic soils (Butler 1998). The pollen evidence is complemented by wood remains in peat, which confirm the presence of birch, juniper, willow and alder. Hazel nuts have also been uncovered (Bennett 1997).

### **Later Holocene (c. 5,000 BP to present**

Impoverishment of the flora was due to a combination of events. Butler (1998) suggests that the colder, wetter and stormier Atlantic climate by the middle of the third millennium would inevitably lead to soil leaching, podsolisation and peat formation and thus natural decline of woodland. Prior to this, the warmer temperatures appear to have enabled sexual reproduction but today, the few relict examples of birch, rowan and hazel rarely, if at all, produce seed in the wild (Wynde 1986, James Mackenzie, pers. com). Undoubtedly, woodland decline was accelerated in the face of farming, and by the late Neolithic to early Bronze Age (c. 4,000-1800 BP), woodland nearly everywhere on Shetland had declined, and the natural environment landscape would not have been unfamiliar in many respects to that seen today. Harvey (in Scott *et al.*, 2002) gives a telling picture of the continuing rapid despoliation of Shetland's flora over the latter part of the 20<sup>th</sup> century, mostly a result of farming subsidies. It is only very recently that there has been a change, with raised awareness of how Shetland is losing so much of its native flora; initiatives and funding (mostly involving SAT and SNH) and community involvement projects are beginning to take effect. Part of this has been attempts to increase populations of native Shetland trees, including hazel.

## Shetland's hazel today

There are 18<sup>th</sup> and 19<sup>th</sup> century reports of hazel surviving on Shetland; the entry for hazel in *Rare plants of Shetland* (Scott *et al.* 2002) reads:

“*Corylus avellana* – Rare in Shetland. Native. First recorded in 1794 or earlier by J. Gordon, from ‘the mountains’ of North Yell and Fetlar. We have not attempted to map his records as no specific stations are given. The hazel has long been extinct in these parts, as it almost certainly is in West Mainland parishes of Sandsting and Aithsting where Bryden (1841) reported it from many of the holms in the lochs. Today, only two sites are known – a rocky streamside at Catfirth, Central Mainland HU45, and a holm in Punds Water, near Hamar, North Mainland (HU37).....”

Clearly, hazel is very vulnerable on Shetland. The Catfirth site is now a SSSI, under the care of the SAT. A stock-proof fence has been erected around the knowe where the hazel occurs, in order to keep out the ever-present sheep, and also to encourage the hazel to expand. It was to the Catfirth site that I went and met up with James Mackenzie in his waders and his amazing telescopic ladder.

**Catfirth, South Nesting (HU 437.538).** The Burn of Crookadale runs under the B9075 and just below the road cuts a small ravine (4m across and 3.5m deep) through calcareous schist. The site is about 100m from the sea, a very sheltered SE-facing inlet of Cat Firth. Hazel is growing at the top of the rocky face of the ravine, the woody stems emerging from between crevices in the rock. The top of the leafy canopy of this small stand (with an adjacent rowan *Sorbus aucuparia*) can just be glimpsed from the road. To get close to the hazel, one has to approach it from below, from a ladder set up in a deep pool at the bottom of the ravine. James was able to ascertain there were 10 individual ‘stools’ present, and that the hazel appears to be healthy and robust, although any expansion beyond the cliff edge seems to be only slowly advancing. James removed some of the unattached dead wood, in order to see what lichens may be present. Immediately adjacent to the north edge of the hazel is a rowan, gnarled and stunted, but in good foliage. Amongst the hazel at the south end of the cliff are several strong suckers of a dog rose *Rosa caesia* subsp. *glauca*; and stone bramble *Rubus saxatilis* is also present, trailing down beneath the hazel. So, this

site can be seen as a tiny microcosm of the native woodland that once was present on the more sheltered and richer soils of Shetland.

The Catfirth site is sometimes known as Klingrahoul – this name is derived from old Norse for Hill of the rose(s) ('Klingera'). This name also lends itself to a rare Shetland endemic plant which occurs here on the same cliff face as the hazel – *Hieracium klingrahoulense* (see pps. 35 and 106 of "Rare Plants of Shetland – then classed as 'Taxon B/C'). Paul Harvey has recently submitted an article to the monthly "Shetland Life" about the fragility of Shetland's hawkweeds, and mentions that they often share sites with relict trees (pers. comm. James Mackenzie).

Jay (1993, 1996) described the Catfirth and Punds Water sites in reports for SAT, commenting that there are no records of any other sites for hazel on Shetland this century (visits over 1984, 1993 and 1994). The first record of hazel occurring at Catfirth was made in 1954 by N.D. Simpson. Catkins have been recorded on several occasions in April, which is later than in the western mainland of Scotland, where catkins appear from as early as February onwards. As hazel cannot self-pollinate, it is unlikely that nuts will ever be produced in the wild from the Catfirth stand, assuming that all stools are in fact clones (or 'suckers').

I never visited the Punds Water site, which is accessible only by boat, so most of the following description comes from Jay (1993, 1996).

**West Holm, Punds Water, North Roe (HU 324.757).** A small island (holm) lying 70m off the west shore of the loch, and 50m north of a narrow headland that runs out into the loch. The holm is 20 x 15m, and only 2.5m above water level at the highest point. Hazel occurs as a single, small shrub of one main stem, which branches into two (latterly more) above; it emerges from clumps of wood rush *Luzula sylvatica*, and close to a clump of eared willow *Salix aurita*, which forms a band 3-4m thick all round the holm. This site is unprotected, and considered vulnerable to sheep gaining access (across frozen loch in winter), or from becoming engulfed should water levels rise. The hazel was first recorded here in 1967 by Walter Scott; subsequently it was visited and recorded in 1974, 1984 and 1993 (Jay 1993), and again in 1999 by Riddington & Johnson, who produced a small report for SAT. This report includes a photograph of the small shrub, plus an annotated sketch, showing the main stem to lie horizontally, with two emerging vertical stems, one 50cm and the other 60 cm high. Both these erect stems

divide producing a total of four leafy branches. The plant was considered healthy, and no signs of browsing were detected.

| <b>Punds Water site</b> |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1973                    | 6 cuttings taken   | Sent to A Gardiner, ITE Merlewood, Grange-over-Sands. One survived, grafted and produced seed “after open pollination”. One seedling produced, planted in 1975; sent to Unit of Tree Biology (UTB), Bush Estate, Penicuik, c. 1984. Planted out, and attained 1.5m height, but “not known to flower” (Wynde, 1986; Jay, 1994). Inadvertently destroyed recently by drain improvement works ( <i>pers. com.</i> Stephen Cavers, CEH Penicuik). However, James Mackenzie ( <i>pers. comm.</i> ) suggests there is some evidence to believe that more than one Shetland hazel was successfully grafted, grown-on and planted out at Penicuik (see below, 2002) |
| 1974                    | 6 cuttings taken   | Sent to John Pelham, Institute of Tree Biology, Univ. of Edinburgh – used liquid culture method, but all died due to infection (Wynde, 1986)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1975                    | 6 cuttings taken   | Sent to Ray Ottley, UTB, Penicuik (as above), used ‘Garner bin’ technique but apparently with no success. (Wynde, 1986)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Catfirth site</b>    |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1973                    | 6 cuttings taken   | Sent with Punds Water material to Merlewood. All died (Wynde, 1986)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1974                    | 6 cuttings taken   | Sent with Punds Water material to Edinburgh Univ. All died (Wynde, 1986)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1975                    | 12 cuttings taken  | Sent with Punds Water material to Penicuik. All died (Wynde, 1986)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 1980                    | Cuttings taken     | R.J. Mitchell, St Andrews University – cuttings failed due to “neglect by new nursery/greenhouse keeper” (Wynde, 1986).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 1990/92                 | Layering attempted | Unsuccessful (Jay, 1994)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Two photographs were also shown to me, of the Punds Water hazel, taken on 24 February, 2009. These show dense tussocks of wood rush, and emerging thin stems of the hazel. As it is February, and a lot of dead grass and rush, the leafless stems of the hazel are difficult

to detect, but two things are apparent: (i) the water level appears to have risen to submerge some parts of the hazel; (ii) there seems to be expansion of the stems, with branching of up to four counted.

### **The trials and tribulations in attempting to halt decline**

The vulnerability of these two remaining examples of native Shetland hazel were recognised and in the 1970s, first efforts were made to attempt to propagate cuttings to preserve the genotype from the Shetland hazel. Wynde (1986, in an unpublished report to NCC) and later Jay (1994, unpublished report to SAT) relate catalogues of what turned out to be a series of disasters. Efforts to preserve the genotype of other native Shetland trees were also undertaken at this time, with seemingly as little success. The struggle to find a successful method and the subsequent continual failures were worrying, as the resource was being gradually depleted by cuttings (especially the Punds Water hazel).

### **Initial exploration into the genetic individuality of Shetland's hazel**

2002 saw an exciting opportunity for activity between CEH at Penicuik and SAT's woodland officer, James Mackenzie. CEH agreed to run DNA analysis on Shetland hazel. James duly sent six hazel leaves from the Punds Water hazel. The tests were run by Stephen Cavers, who also included the grafted stems and the root stock of the 1970s Shetland hazel (growing in the grounds of The Bush at Penicuik). This is a tad more tricky for hazel than for single-trunked trees; hazel occurs naturally as a multi-stemmed shrub, so the root-stock will send up basal shoots, and the shrub will quickly assume a bushy, multi-stemmed habit. The grafted stem will have to be well labelled in order to be certain which it is. It seems that the grafted stem was duly labelled. Stephen Cavers was able to report that as anticipated, the root stock DNA of the 1970s hazel was completely different genetically from any other hazel samples they had tested, including hazels local to Penicuik. The conclusion reached was that the root-stock used in the 1970s grafting was local to Cumbria (Grange-over-Sands), which in itself was quite interesting. It throws up all sorts of possibilities about tracing the post-glacial flow of hazel into different parts of the British Isles.

The labelled grafted section of the 1970s hazel agreed genetically with the Punds Water leaves, so confirming that the hazel in the grounds of CEH was indeed the successful graft planted out 30 years ago.

However, to get a really strong indication of genetically differentiated samples, more detailed work needs to be carried out, with samples taken from the Catfirth site included (as the only other remaining source of native, Shetland hazel).

Although the hazel in the grounds of CEH that was used in the DNA fingerprinting work was recently destroyed (Stephen Cavers pers. comm.), there seems to be a half-forgotten suggestion that there were other grafted hazels planted out at CEH. However, even if these hazels fail to materialize, leaves from the destroyed hazel are preserved in cold storage for future DNA analysis.

### **The 2002-04 SCION project**

2002 also saw the successful inception of a joint hazel project involving Shetland, Orkney and Norway (SCION 'Scottish Northern Isles Conservation Project' may stretch the acronym somewhat, but it is a good name, 'scion' being a 'descendant, heir, a slip for grafting'.) The SCION project was funded by the Esmée Fairburn Foundation, SNH and the Carnegie Trust and was a collaborative project involving Abertay University. It was designed to get into cultivation native hazels in endangered populations in Orkney and Shetland – preserving native genotypes, and ultimately increase the stock by propagation in order to replenish Orkney and Shetland with native hazels of local provenance. The project is currently being continued by members of the Woodland Team at the Horticultural Unit of the Shetland Amenity Trust in Lerwick.

Hazel cuttings were again taken from the Pundswater site for Shetland, and cuttings from Upper Berriedale Wood and a hazel stand at Bu for Orkney. Hazel nuts were provided from the University of Bergen's Norwegian Arboretum at Milde, as examples of a northern strain of hazel. Norwegian hazels were grown from seed, and were originally intended to be used as root-stock for grafting Orkney and Shetland hazel cuttings.

Single-stem hazel cuttings were grafted onto young but well-established root-stock of hazel by the Scottish-based Christie Elite Nurseries (who have staff with experienced skills in grafting) and by project team members at Abertay. Unfortunately, for a variety of reasons, nearly all attempts to propagate scions (grafted hazel cuttings), failed (pers comm., James Mackenzie).

**“Out of the woods...” or “times wingèd chariot...”**

So, what is the situation today, what progeny are being nurtured to ‘save’ Shetland’s threatened hazel populations? When I visited in early July this year, I saw pots with hazels kept in controlled conditions in the Horticultural Unit, and they seemed to be doing well. One of the Orkney Berriedale specimens has successfully produced a hazel nut this year, cross-pollination being between the Berriedale grafted hazels. Shetland hazels produce catkins later than those of Orkney, and the Norwegian hazels have not flowered yet, an example, perhaps of differences in north/south genetic differentiation. There is only one successful Shetland hazel: “sad to say, we just have that grafted one from Penicuik, with some Punds Water “blood” in it, in the greenhouse. Another layered and rooted Catfirth shoot failed in 2004, after transfer to a pot.” (pers comm. James Mackenzie). So, not ‘out of the woods’ yet, and, as James said, “times wingèd chariot....”. What is the future for Shetland’s hazel? Why do all efforts with cultivation seem to fail? Does it require a new, concerted effort, or indeed, is the population become so reduced, that extinction is the only way?

**Acknowledgements** I am extremely grateful to James Mackenzie of Shetland Amenity Trust for his help in unravelling the story of Shetland’s hazel. I also want to thank Stephen Cavers at CEH, for answering my ‘long-shot’ enquiry about the fate of the 1970s Shetland hazel at CEH. This has been a great exploration for me, extending the ‘hazel frontiers’. I am now wanting to look at other ‘Extreme Atlantic Hazel’ of the Northern and Western Isles, and am hopeful that future genetic research will help shed a light on how hazel arrived in Scotland. I am also sure that the Catfirth hazel site on Shetland should certainly feature on RBGE’s website ‘Forgotten Forests of the world’. After all, not only is there the hazel, but the rowan and the rose, a tiny but true microcosm of Shetland’s lost forests.

Sandy Coppins

Sandy has a book Atlantic Hazel coming out later this year; this takes a fresh, in-depth look at the Atlantic hazelwood habitat – its history, ecology, special species, as well as offering management advice. A web version of some chapters can be found on SNH website: <http://www.snh.gov.uk/about-scotlands-nature/habitats-and-ecosystems/woodland/atlantic-hazel/>.

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## ETHNOMEDICA IN SHETLAND

At the end of November 2010 I visited the Shetlands to gather traditional plant lore for the Ethnomedica project. From my base in Lerwick I drove north to the island of Yell, where I interviewed two contributors, one in Seafield, Camb, and another in Mid Yell, both of whom had grown up in farming communities near Aywick and Gossabrough on the east coast of Yell. At the Seafield croft I learned that they grow traditional Shetland varieties of oats and vegetables, and have contributed seed from their 'land races' to the biodiversity conservation project, about which Niall Green gave a lecture to BSS in October 2010. Among the oral accounts I gathered, was a childhood memory from 1918 of gathering sphagnum moss, and then dragging the full sacks of wet moss to the pier at Gossabrough where it was loaded on to the waiting steamer; because there was a desperate need for its use as a wound dressing in the last year of the War, there was no time to dry it first. Other oral plant lore

included the use of eyebright in 1928 for 'sticky eyes' in the village of Seafield; playing at 'shops', before the First War, with 'dog's pennies' (a local Yell name for *Rhinanthus minor*, yellow rattle); using oatmeal poultices for 'skelfs' as well as for a bad chest; gathering the 'berry hedder' (*Empetrum nigrum*, crowberry) at the end of July; and using seaweed as manure, to feed cattle, and as famine food. Back on mainland Shetland, in Lerwick I did an interview for BBC Radio Shetland, and gave a talk to the Shetland Field Studies Group. In Lerwick, Levenwick, and Cunningsburgh, I collected accounts of plant uses from mainland Shetland and the isle of Whalsay, including crowberries, neeps, onions, bog cotton, sphagnum moss, oatmeal, tormentil, and ribwort. I visited a crofter in Skelberry who grows oats for thatching traditional buildings in Shetland. As soon as the oats are harvested in September, he puts his sheep on the field, where they stay until he sows the next year's oats at the end of May. He took me to see his neighbour, who uses the oat straw to make traditional Shetland straw baskets. I was also shown a working watermill where the oats are ground into meal after being fired in the 'coarn kiln'. Despite the snowy weather the trip was an unqualified success at recording a variety of plant uses and traditions.

On behalf of the Ethnomedica project, I am delighted to say that the plant lore that I have been collecting in Scotland since 2007 for the Ethnomedica archive--including stories from the Shetlands--will be made available to a wider readership with the publication of my book, *Remembered Remedies: Traditional Scottish Plant Lore*, which came out in August 2011 under the Birlinn imprint.

Anne Barker MNIMH  
Ethnomedica Scotland Coordinator



## PLANT EVOLUTION IN THE AGE OF GENOMICS

### Introduction

Genome Sequencing (GS), the process by which the order of nucleotides is determined for the DNA of an organism, has contributed a great deal to the field of plant evolutionary biology. The genome contains the genetic information carried by an organism, in the form of the genetic code, whereby the sequence of nucleotides, which come in four different 'flavours', determines the proteins produced. From an evolutionary point of view, however, the sequence of individual nucleotides is not the only point of interest. Any structural change, such as blocks of DNA moving within the genome and duplication of genetic material may act as either a barrier to reproduction, thus facilitating speciation or allow for the evolution of novel function within duplicated genes.

Unlike animal cells, which contain two genomes, those of nuclear origin or mitochondrial origin, plants have a third genome in the chloroplast. Plant genome sequencing is often quoted as having begun with the sequencing of the *Arabidopsis thaliana* genome, published in 2000. However, it was 15 years prior to the published *Arabidopsis* genome that saw the beginnings of plant genomics with the sequencing of two chloroplast genomes; that of tobacco (*Nicotinia tabacum*) (Shinozaki *et al.* 1996) and the common liverwort *Marchantia polymorpha* (Ohyama *et al.* 1986). Since 2000, many more plant genomes have been sequenced, and this work is continuing. The information gained from sequencing projects has been useful to many different disciplines of plant biology, including crop research, plant pathology, plant taxonomy and plant evolution. Our understanding of plant evolutionary processes has developed a great deal as a result of GS. Genome comparison studies reveal a surprising level of synteny (gene sequence similarity) and colinearity (gene order similarity) among species and within single genomes on different chromosomes. This has led to an appreciation of the importance of genome reorganisation in plants. Furthermore, this reshuffling of the genome appears not to be limited to the nucleus. Cell organelles, such as the mitochondrion and chloroplast are believed to be bacterial cells that were engulfed by an evolutionary ancestor of all multicellular life in the case of mitochondria, and all plant life in the case of the chloroplast. Comparisons between the genomes of the bacterial progenitor of the chloroplast,

Cyanobacteria, with both chloroplast and nuclear genomes, sheds light on the origins of chloroplasts. Insights into the evolution of the relationship between chloroplasts and the cells in which they are found have also been gleaned by the discovery of chloroplast genes within the nuclear genome.

Here I shall explore some of the highlights of the contribution made by plant GS projects to the field of plant evolutionary biology; focusing on gene duplication and evolution of chloroplast endosymbiosis (the relationship between the host cell and the chloroplast within).

### **Chloroplast origins**

The first person credited with suggesting chloroplasts may have originated from a cyanobacterial ancestor was Mereschowsky in 1905. He observed that not only was there a superficial resemblance, but also noted that chloroplasts self replicate. However it was not until much later that technology was at a level to gain further evidence. Lynne Margulis' work in particular has pioneered the endosymbiosis theory (Margulis, 1970). This theory has been one of the major breakthroughs in evolutionary biology of the past 50 years and has changed the way we view plants.

GS has recently contributed some of the most persuasive pieces of evidence to support this theory leading to the current acceptance that mitochondrial and chloroplast organelles in eukaryotes have independent bacterial origins to the cells in which they are found. The first chloroplast genome sequence to be published was that of tobacco (*Nicotinia tabacum*) in 1986 by Shinozaki *et al.*, closely followed the same year by a sequence for the common liverwort *Marchantia polymorpha* (Ohyama *et al.* 1986).

GS studies of the three plant genomes (nuclear, mitochondrial and chloroplast) has provided insight into the origins of cell organelles and their subsequent evolution in plants. Evidence even points to ongoing genomic evolution suggesting that the relationship between nuclear and chloroplast genomes is a dynamic one, where gene transfer regularly occurs in both directions. Sequencing of the chloroplast genomes of different plant species reveals an intriguing variation in gene number, with chloroplasts of different species encoding from 20 to 200 proteins (Timmis *et al.* 2004). Cyanobacterial genomes contain many more genes than chloroplasts, although they also show variation in the number of genes between species, which ranges from 1766 to 8488

(Integrated Microbial Genomes database, accessed 2009). This would suggest that chloroplasts have undergone large amounts of gene loss.

Reduction in genome size is often reported in parasitism, as fewer genes are required when host resources are exploited (Cole *et al.* 2001). Has the chloroplast lost these genes purely as a result of exploiting the nuclear genome? A closer look at nuclear DNA reveals this not to be the whole story, however.

The term 'promiscuous DNA', coined by Ellis in 1982, refers to the transfer of genetic material between genomes. The extent to which this occurs in plants was realised in 2000 with the publishing of the *Arabidopsis thaliana* genome (The Arabidopsis Genome Initiative, 2000). This project uncovered astonishing quantities of plastid DNA within the nuclear genome. Insertions were found on every chromosome, in particular around the centromeric region of chromosome II.

Martin *et al.* (2002) compared the genomes of Arabidopsis, chloroplasts and Cyanobacteria and estimated 18% of the nuclear genes of Arabidopsis are of Cyanobacterial origin and found that many of these genes have evolved to function outside the chloroplast. A similar study by Deusch *et al.* (2008) compared genomes of Arabidopsis, Rice (*Oryza sativa*), green alga (*Chlamydomonas reinhardtii*) and red alga (*Cyanidioschyzon*) with 215 other prokaryotic and 13 eukaryotic genomes. They estimated an average of 14% of proteins in plants were of Cyanobacterial origin.

## Gene Duplication

Plant genomes appear to contain a higher level of duplicated genes than observed in other eukaryotic (all life forms except bacteria, blue-green algae, and other primitive microorganisms) genomes (Lockton & Gaut, 2005). The origins of such duplications involve tandem duplication, segmental duplication, whole genome duplication as well as transposable elements. Tandem duplications generate gene clusters, whereas segmental duplication disperses copies of a gene across the genome. Genome sequencing prevents us confusing whole genome duplication events with segmental or tandem duplication by enabling the mapping of duplicated genes or chromosomal regions.

Cannon *et al.* (2004) set out to investigate the origin of gene families in *Arabidopsis thaliana* by analysis of the completed genome sequence. Gene families are believed to be generated when duplication

of a gene has occurred one or more times allowing one copy to diverge, without loss of the original function in the other copy, this process may then repeat many times to generate many genes of a common origin.

Phylogenetic analysis of major gene families within *Arabidopsis thaliana*, combined with mapping, unearthed a relationship between the size of the gene family and the means of duplication, as well as variation in evolutionary patterns among different gene families. Classifying families according to their levels of either tandem or segmental duplication allowed for correlation analysis, revealing that none of the gene families studied had high levels of both tandem and segmental duplication. Cannon *et al.* (2004) argued that gene function may underpin the evolutionary patterns observed, although no statistical analysis within the paper explored this possibility. Hanada *et al.* (2008) sought to further address this question (based on the observation by Rizzon *et al.* (2006) that tandem duplications appeared to be overrepresented in genes involved with “abiotic stress” from the environment) by exploring patterns in the evolution of function in orthologous gene groups (groups of genes that have originated from a common ancestor and diverged after speciation) that arose as a result of tandem duplication. Making use of available draft and complete sequenced genomes, orthologous gene groups were identified between *Arabidopsis thaliana*, *Oryza sativa* (rice), *Populus trichocarpa* (poplar) and the moss *Physcomitrella patens*. *Arabidopsis* Gene Ontology annotations were used to determine if there was a bias in plant function when the plant had tandem versus non-tandem duplicated genes. The study disregarded orthologous gene groups of more ancient origin, to avoid the influence of subsequent genome reorganisation on the results where possible. Analysis of orthologous gene groups suggested that rate of gene gain was not constant throughout the evolutionary history of land plants and that groups that arose as a result of tandem duplications are more common in certain groups of plants, in particular for those plant functions that were affected by stimulation from the external environment. The relationship between tandem genes and biotic stress was particularly strong. Hanada *et al.* (2008) point out this may be as a result of an evolutionary arms race between the plant hosts and their pathogens.

As tandem duplication events occur more frequently than other forms of duplication (Clark *et al.* 2007), this may provide an effective mechanism for plants to rapidly evolve new genes, whilst maintaining

the original version intact, so the plant is able to continue to evolve in response to pathogens evolving increased capacity for infection. This mechanism appears to imply an unlikely predictive behaviour on the part of the host genome however. Perhaps in looking for the occurrence of tandem duplication in biotic stress response, what was found was an abundance of both a rapidly changing selective pressure and a mechanism for response that occurs more frequently than others. Such a hypothesis would lead to the prediction that any selective pressures that continually change over time and thus affect the optimal fitness of a plant would also show as an overrepresentation of tandem repeats.

### **Whole Genome Duplication**

Based on analyses of the timing and synteny (gene sequence similarity) of gene duplication, it is believed that three rounds of whole genome duplication (WGD) occurred in *Arabidopsis* (*Arabidopsis thaliana*) after its split from rice (*Oryza sativa*) approximately 150 million years ago. Polyploidy is the result of such WGD events, where an organism has more than two sets ( $2n$ ) of chromosomes and is ubiquitous in vascular plants, and even in the small genome of *Arabidopsis* there is evidence of whole genome duplication events. Plants appear to have a special ability to tolerate polyploidy that other organisms, such as vertebrates, lack.

Even when the rate of whole genome duplication is low, the effect can be great, as each event doubles the number of every single gene. This highlights the importance of not just looking at the frequency of different kinds of duplication events, but also the magnitude of the effect, when considering their relative evolutionary contribution. Furthermore, increasing evidence points towards the importance of polyploidy in generating reproductive isolation in plants and therefore as a major driving force in speciation (Wood *et al.* 2009). Such barriers to reproduction are generated when differences in parental ploidy leads to uneven numbered chromosome complements in offspring, which results in sterility due to improper pairing of chromosomes at meiosis when cells prepare to divide as the plant grows.

One complicating factor in looking for large scale duplication events such as WGD or segmental duplication is the process of genome reduction, mainly as a result of loss of non-coding DNA. There is much evidence that this has occurred in many plant lineages. It is often seen

for example that two chromosomes can condense into one (Tang *et al.* 2008). Spangler *et al.* (1999) showed that within the *Sorghum* genus, the  $n=10$  species is actually the ancestral state, and that the  $n=5$  species arose as a result of chromosome loss. Such findings highlight the use of molecular dating in the analysis of duplication events.

Comparison of *Arabidopsis*, *Populus* (poplar) and *Carica* (papaya) by Tang *et al.* (2008) revealed three branches in each genome containing orthologous segments and from this they inferred a common ancestral hexaploidy ( $6n$ ) event. This pattern was also observed within the *Vitis* (grape) genome, a more distant relative of the *Arabidopsis*, *Populus*, and *Carica* group.

It has been suggested that such polyploidization events that increase the chromosome numbers have given angiosperms a selective advantage during mass extinction events. Fawcett *et al.* (2009) studied the genomes of six species of land plants, *Arabidopsis thaliana*, *Populus trichocarpa*, *Medicago truncatula*, *Vitis vinifera*, *Oryza sativa*, and *Physcomitrella patens*. Other species were also included based on evidence from EST libraries, (Expressed Sequence Tag libraries with information on which gene sequences are making proteins) that contain sequence information derived from RNA strands, produced by the cell, in protein production. Such RNA strands are copies of genes from the DNA, not the spaces between genes that do not code for protein. They specifically looked for younger independent paleo-polyploidization events and found they occurred from 43 million to 70 million years ago. Fawcett *et al.* (2009) suggest a link between this clustering of polyploidy and the Cretaceous–Tertiary mass extinction event 65.5 million years ago but this appears tenuous as the range is nearly 30 million years, and when looking for the most recent, paleo-polyploidy events, the window of time has substantially narrowed. The question still remains as to how WGD may have contributed to adaptation in plants. Recent evidence from Wood *et al.* (2009) certainly establishes the importance of WGD in speciation. They estimate that 15% of angiosperm and as much as 31% of fern speciation events are associated with an increase in ploidy.

Matzke & Matzke (1998) suggest that multiplication of the genome can lead to more experimental forms that arise as deleterious genes are masked by useful and functional spare copies. Whilst this may be true, Wood *et al.* (2009) found no evidence to suggest that polyploidy had led to any increase in species diversification, although their study focused

on recent events, not paleo-polyploid events. An interesting future study, as more plant genomes are sequenced, might address these ancient events, perhaps comparing the number of polyploidy events in a lineage with diversification. Jiao *et al.* (2011) looked at conserved gene duplicates believed to have originated from paleo-polyploid events and in doing so uncovered some interesting patterns, showing a bias towards certain functional groups such as floral development and reproduction. Such patterns agree with the theory that WGD may be an important driving factor in evolutionary innovation in plants.

## Conclusion

One of the major features of GS projects is the huge amount of data generated. The interpretation of such a large volume of information will be the rate limiting factor in genomics studies, as sequencing technology improves and further projects get underway. The studies in this report represent a summary of some of the important findings in plant evolutionary biology gained through analysis of genome sequences. Once more sequences are published, further hypotheses on the patterns of duplication events and their impact on plant evolution can be tested.

Niamh Britton, Edinburgh University

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## TREASURER'S REPORT 2010-2011

**Botanical Society of Scotland**  
**Financial Statements**  
**For the Year to 30 April 2011**

**Statement of Financial activities**

**Incorporating income and expenditure account**

|                                                               | Note | 2011<br>£        | 2010<br>£        |
|---------------------------------------------------------------|------|------------------|------------------|
| <b>Incoming resources</b>                                     |      |                  |                  |
| Subscriptions                                                 |      | 5,684.11         | 5,336.00         |
| Donations                                                     |      | 84.00            | 111.00           |
| Gift Aid Tax Rebate                                           |      | 806.95           | 915.99           |
| Activities in furtherance of the charities objectives:        |      |                  |                  |
| Journals and publications sold                                |      | 18.00            | 1,115.38         |
| Editorial Subvention                                          |      | 6182.70          |                  |
| Refunds, Royalties, etc.                                      |      | 3774.48          | 0.22             |
| Phenology Conference fees                                     |      | -                | 5,010.77         |
| Interest received                                             |      | 3.34             | 195.47           |
| <b>Total incoming resources</b>                               |      | <u>16,553.58</u> | <u>12,684.83</u> |
| <b>Resources expended</b>                                     |      |                  |                  |
| Costs of generating funds:                                    |      |                  |                  |
| Printing Journal                                              |      | 8,160.00         | 6,426.00         |
| Journal Editor's Expenses                                     |      | 2,566.00         | 70.25            |
| Printing newsletter                                           |      | 1,557.00         | 1,333.00         |
|                                                               |      | <u>12,283.00</u> | <u>7,829.25</u>  |
| <b>Charitable expenditure</b>                                 |      |                  |                  |
| Costs of activities in furtherance of charitable expenditure: |      |                  |                  |
| Lecture Expenses                                              |      | 696.48           | 484.37           |
| Student Essay Prize                                           |      | 200.00           | 200.00           |
| Summer Studentship                                            |      | 300.00           | -                |
| Other Projects Supported                                      |      | -                | 615.96           |
| Donation (RBG Edinburgh)                                      |      | 150.00           | -                |
| Phenology Conference expenses                                 |      | 2121.97          | 1,925.90         |
|                                                               |      | <u>3,468.45</u>  | <u>3,226.23</u>  |
| Management and administration                                 |      |                  |                  |
| Stationery & Postage                                          |      | 1,012.38         | 288.53           |
| Insurance                                                     |      | 190.63           | 190.63           |
| Accounting Fees                                               |      | 140.00           | 170.00           |
| Web page                                                      |      | 1,190.40         | 1,723.24         |
| Council expenses                                              |      | 59.20            | -                |
| Misc (Coach Deposit)                                          |      | 265.00           | -                |
| Subscription Refund                                           |      | 17.00            |                  |
|                                                               |      | <u>2,874.61</u>  | <u>2,372.40</u>  |
| <b>Total resources expended</b>                               |      | <u>18,626.06</u> | <u>13,427.88</u> |
| <b>(Deficit) / Surplus for the year</b>                       |      | <u>(2006.48)</u> | <u>(743.05)</u>  |
| Unrestricted Funds at 1 May 2010                              |      | 47,285.59        |                  |
| Unrestricted Funds at 30 April 2011                           |      | <u>46,181.11</u> |                  |

**Botanical Society of Scotland  
Financial Statements  
For the Year to 30 April 2011**

**Balance Sheet**

|                                     | Notes | 2011<br>£        | 2010<br>£        |
|-------------------------------------|-------|------------------|------------------|
| <b>Current Assets</b>               |       |                  |                  |
| Cash at Bank                        |       | 10,650.51        | 12,656.99        |
| Cash in reserve fund (estimated***) |       | 48,939.66        | 48,739.66        |
|                                     |       | <u>59,590.17</u> | <u>61,363.65</u> |
| <b>Creditors</b>                    |       |                  |                  |
| Amounts due within one year         | 4     | 6,231.00         | 6,900.00         |
| Net Current Assets                  |       | <u>53,359.17</u> | <u>54,463.65</u> |
| <b>Creditors</b>                    |       |                  |                  |
| Amounts due in more than one year   | 5     | 4,120.00         | 4,120.00         |
| <b>Net Assets</b>                   |       | <u>49,239.17</u> | <u>50,343.65</u> |
| <b>Funds</b>                        |       |                  |                  |
| Designated funds                    |       |                  |                  |
| Symington Grieve Trust Fund         |       | 500.00           | 500.00           |
| Sir W. W. Smith Lectureship Fund    |       | 300.00           | 300.00           |
| Botany of the Lothians Fund         |       | 2,258.06         | 2,258.06         |
|                                     |       | <u>3,058.06</u>  | <u>3,058.06</u>  |
| General unrestricted funds          |       | 46,181.11        | 47,285.59        |
| Total Funds                         |       | <u>49,239.17</u> | <u>50,343.65</u> |

**Notes to the Financial Statements**

**Note 1 Accounting Policies**

**Accounting convention**

The financial statements are prepared under the historical cost convention and are in accordance with applicable accounting standards in the United Kingdom, with the relevant statutory requirements and with the Statement of Recommended Practice "Accounting and Reporting by Charities" 2005.

**Income and Expenditure**

Income and Expenditure is accounted for on an accruals basis, except for investment income, which is credited to the income and expenditure account in the year that it is received.

**VAT**

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

## Unrestricted funds

### Revenue

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

### Note 2 Council members' remuneration and expenses

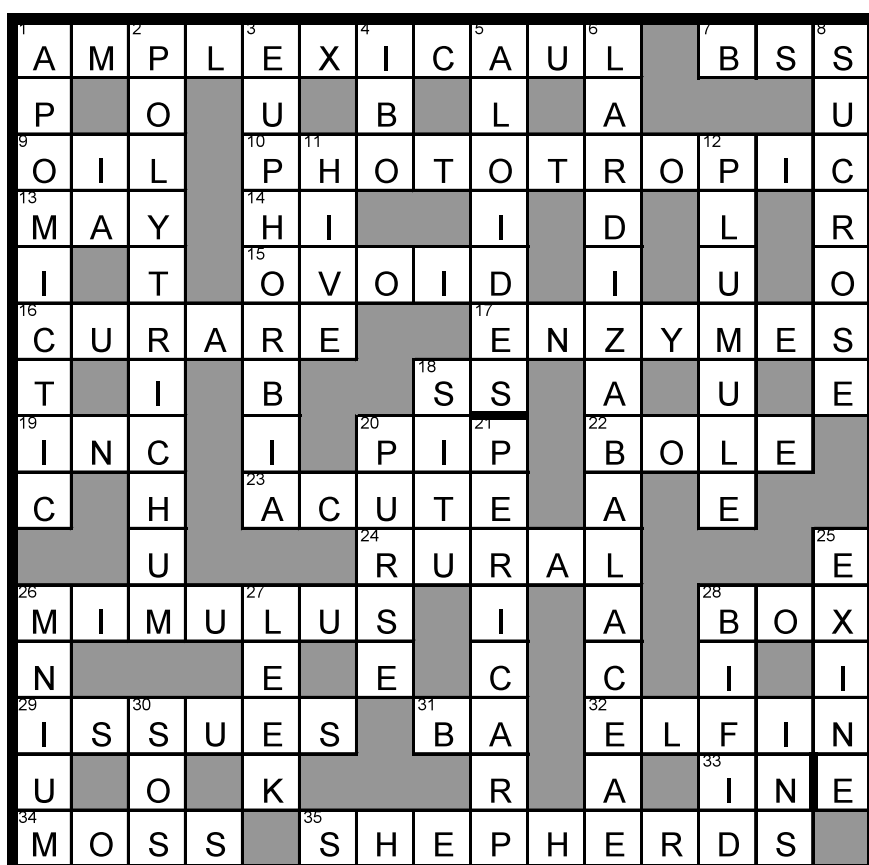
Council members do not receive any remuneration or expenses in their role as council members

### Note 3 Taxation

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

David Chamberlain, Treasurer

## CROSSWORD SOLUTION:



## BSS COUNCIL 2011/2012

|                          |                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------|
| President:               | Dr Barbara Sumner                                                                         |
| Vice-Presidents:         | Prof John Grace<br>Dr Chris Jeffree                                                       |
| General Secretary:       | Dr Barbra Harvie                                                                          |
| Treasurer:               | Dr David Chamberlain                                                                      |
| Programme Secretary:     | Dr Maria Chamberlain                                                                      |
| Cryptogamic Secretary:   | vacant                                                                                    |
| Alpine Secretary:        | Dr John Holland                                                                           |
| Conservation Secretary   | Dr David Chamberlain                                                                      |
| Journal Editor-in-Chief: | Dr Lazlo Nagy                                                                             |
| Newsletter Editors:      |                                                                                           |
| Receiving Editor:        | Dr Jill Thompson                                                                          |
| Co-ordinating Editor:    | Ms Jane MacKintosh                                                                        |
| Publicity Officer:       | Dr Anne Barker                                                                            |
| BSBI representative:     | Mr Kim Harding                                                                            |
| Student Representative:  | Mr Alex Twyford                                                                           |
| Web Site Administrator:  | Mr Kim Harding                                                                            |
| Councillors:             | Ms Niamh Britton<br>Dr Richard Milne<br>Liz Kungu<br>Dr Stephan Helfer<br>Ms Jenny Farrar |
| Local Secretaries:       |                                                                                           |
| Aberdeen:                | Dr David Burslem                                                                          |
| Dundee:                  | Dr Brian Ballinger                                                                        |
| Edinburgh (RBGE):        | Dr Heather McHaffie                                                                       |
| Edinburgh (KB):          | Dr Barbra Harvie                                                                          |
| Glasgow:                 | Mr Keith Watson                                                                           |
| Inverness:               | Mrs Margaret Fraser                                                                       |
| St. Andrews:             | Prof Robert Crawford                                                                      |

## **BSS NEWS – INFORMATION AND GUIDELINES FOR CONTRIBUTORS**

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

### **Editors:**

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### **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](http://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 list:

- 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 archaeo-botany.
- Biographical profiles of botanists.
- Botanical poems.
- Botanical notes, news items, announcements of future events, reports of meetings attended, correspondence, small ads., etc.
- Book reviews.
- Crosswords and quizzes.
- Illustrations, including paintings, photographs and line drawings (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 the following guidelines. Just send what you can and the Editors will make adjustments.

#### **File name**

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 2007. 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 more than one image, 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>.

Send email with text and photographs to: [jill.thompson99@gmail.com](mailto:jill.thompson99@gmail.com)

For emailed pictures, please add the name of the photographer and the subject to the file name of the photograph. Add credit to photographer at the end of your article if the photographs with your article are not by the article writer.

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](mailto:jill.thompson99@gmail.com) to let Jill know something has been posted.

**The LAST deadline for the next issue will be 15th January 2011.  
Earlier submission would be appreciated.**

## Back cover pictures

### *Inside*

Top left: Shetland hazel at Catfirth, with rowan, July 2011 - see article on page 51. (Photo Sandy Coppins)

Centre left: *Meum athamanticum* in Glendevon - see article on page 42. (Photo Liz Lavery)

Bottom left: *Meum athamanticum* at Baldmoney Knowe, Geordies' Wood in Glen Quey - see article on page 42. (Photo Liz Lavery)

Top right: James Mackenzie (Shetland Amenity Trust) on the ladder examining the hazel (and rowan) with Sandy Coppins - see article on page 51. (Photo Liz McDonnell)

Bottom right: A celebration toast - the BSS President and Treasurer at the AGM on 23rd June 2011. (Photo Derek Christie)

### *Outside*

Top left: 'Coarn kiln' at Skelberry, Shetland - see article on page 59. (Photo Anne Barker)

Top right: 'Coarnscrews' at Skelberry, Shetland - see article on page 59. (Photo Anne Barker)

Centre left: *Anacamptis pyramidalis* at Millerhill - see article on page 31. (Photo Richard Milne)

Centre right: *Verbascum spp.* at Millerhill - see article on page 31. (Photo Richard Milne)

Bottom left: *Silene coronaria* at Millerhill - see article on page 31. (Photo Richard Milne)

Bottom right: *Silene latifolia* infected by microbotryum - see article on page 40. (Photo Tatiana Giraud)