



**THE FRIENDS OF TREBORTH
BOTANIC GARDEN**

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NEWSLETTER

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Front	Bee on willow (Anita Malhotra, Bangor University)
Back	Adult rosemary beetle (www.rhs.org.uk)

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Chairman's and Secretary's Introduction

It is August as this is being written and Treborth is, on the surface, quiet. Most of the students have gone and some of the volunteers are on holiday, but there is a lot of planning going on under the surface. Some of this is as a result of a PlantNetwork conference we went to in Bath in mid July on Volunteers in Gardens and Arboreta.

Treborth wouldn't survive without its volunteers and we must look after them. At this conference we learned about managing volunteers, showing our appreciation of them, legal issues, development of volunteer programmes and much more. We also made many useful contacts with other university botanic gardens. It became apparent that the gardens that used volunteers most effectively had a volunteer co-ordinator; this is a person that we desperately need at Treborth. Is there anyone out there who would be willing to volunteer for this role? Let us know if you think you could spare a few hours a week and would like to know more. Thank you for all your support.

Judith Hughes and Sarah Edgar



News in Brief

Apologies to Iloff Simey, whose article on '**Old-growth Ancient Woodland in Wales**' (pages 24-26, plus photos) was by mistake not included in our index at the beginning of Newsletter 41, May 2011. The article was so interesting and we want to make sure that it is brought to our readers' attention.

Donations

Many thanks to Jennifer Rickards for donating £272 - the proceeds of two plant sales held at her open garden days this year.

Thanks also to Joan Bennington and Rachel Cave for their donations.

Curator's Report April – July 2011

Once again it is a great pleasure to record the success of STAG members among this year's crop of graduates. Congratulations to all, including: first class degrees to Gail Stride, Ellie Colver, Rachel Stroud, Ella Vogel, Adam Crowe, and 2/1s to Rachel Bolt and Tom Stanley. Hazel Perry, Lucy Parsons and Paul Davidson all gained Firsts at Masters level and Bethan Hobbs, 2/1.

Many graduates visited the Garden during Graduation Week in July along with their families and in particular there was a happy gathering at coffee on 15th July to congratulate our latest crop of graduates and wish them all well for the future – not only do they move on with a good degree to their names but also the satisfaction and experience of having helped Treborth in the best possible way through a difficult period – thank you!

In addition many congratulations to Dawn Thomas who was awarded a PhD for her research on fish behaviour, and to Tom Cockbill and Chris Moore who gained their PGCEs. Chris also gained a wife, Ellen, and we wish them every happiness.

Five undergraduate practical/field sessions were held during the period including two dawn choruses. There were 30 events/meetings for groups affiliated with Treborth including regulars such as the local moth group, Spinners and Weavers and Dept. of Life Long Learning as well as one-off visits by horticultural groups and a highly successful Identification Workshop on Bumble bees arranged through our local Biological Records Centre, COFNOD. Two successful Plant Sales were arranged which as well as engendering vital public support generate on average £1000 per sale. Treborth welcomed 5 overseas academic visitors and two horticultural staff – the latter being Alice Lumb, a second year horticulture Diploma student at Kew looking at the role of botanic gardens in conserving the native British Flora, and assistant curator of conifers at the Royal Botanic Garden Edinburgh, Tom Christian, who was checking on the progress of specimens donated by Edinburgh as part of their Conifer Conservation Programme. He was particularly impressed by our *Taiwania cryptomerioides*, a striking glaucous conifer restricted to three widely separated parts of E. and SE Asia. This specimen which marks the start of the arboretum and is part of Tom Cockbill's Fossil Tree trail was planted by previous Vice-Chancellor, Prof. Roy Evans, to mark the establishment of the Friends of Treborth Botanic Garden in 1997, so for all sorts of reasons it is one of the Garden's most precious plants.

Treborth hosted 12 schools sessions under the Training Opportunities Programme organised by the University – TOP offers local teenagers a taster of

university. I am grateful to Jackie Read and Tom Cockbill for considerable help in delivering these classes, and to Prof Tom de Luca for joining the delivery team when the Vice Chancellor, Prof. John Hughes, made a personal visit to see for himself what TOP does.

Treborth also hosted two special teacher training events, both in June, when Bangor University PGCE students designed their own activity classes based in the Garden. And in mid June, we welcomed 10 more teenagers for a Discover Science session highlighting the complex relationships between plants and insects – this scheme aims to encourage girls to take up science at University. As usual Treborth was on show for one of the University Open Days when prospective students and their parents are invited to see what Bangor has to offer.

Jackie Read kindly organised at short notice an opportunist visit by Dr Rosie Plummer and Dr Natasha de Vere, Director and Conservation Botanist respectively, from the National Botanic Garden of Wales in Carmarthenshire. They were entertained by the Friends of Treborth for several hours and spoke enthusiastically about future closer collaboration. A reciprocal visit has been arranged in late August.

On a disappointing note we have had to drop two of the three funding opportunities I highlighted in my last report – Interreg and Esmee Fairbairn. My thanks to all involved with those bids – in the end circumstances changed and the funding sources became unsuitable. We are still pursuing a Mon Menai bid. Work on the major refurbishment of the Rhizotron and the unoccupied house known as Rivendell (to create offices and research support space for the Rhizotron) begins in earnest in September and should be completed by mid November. Funded by the Royal Society with further top-up funding from the University, the newly fitted Rhizotron will be formally known as the Wolfson Below-Ground Carbon Laboratory and will represent the UK's most advanced facility for measuring soil carbon dynamics in situ. It will focus on the role of bracken (*Pteridium aquilinum*), such a familiar fern even at landscape level here in Wales.

Both the Friends and myself have been invited to a forum established to draw up a biodiversity strategy for the university. Some of the experience gained at Treborth will hopefully provide useful guidance. We are also closely involved with a review of heating options for the glasshouses and buildings at the Botanic Garden.

The six-month Groundwork placements, Jack Fairhead and Sean Evans, contributed enormously to Treborth during their time with us and Sean's involvement continues part-time this summer with the Friends' financial support. Jack threw himself into Botanical Beats with gusto and along with Dawn Thomas

formed the core of the organising team assisting Jackie Read. He moves on now to a postgraduate business course in Manchester with a placement period in China – a far cry from Treborth, and we wish him all the best.

Tom Cockbill has assiduously taken over Paul Lewis' horticultural commitments on the main University campus and in addition is part of the part-time team currently keeping on top of the gardening at Treborth this summer. The others are students Heidi Jones (2nd yr Zoology with Conservation at Bangor) and Huw Mithan (2nd year Geoscience student at Cardiff University). I am grateful to the Friends for funding this essential summer help.

Jackie has passed over responsibility for the Beacon Project to Alyson Sherriff and it is pleasing to report the success of the sessions with vulnerable adults and teenagers. One result is a productive vegetable plot by the 'Maize House'.

Last but certainly not least, the first week of June saw two major events at Treborth. The first involved the Vice Chancellor who kindly came to open the newly refurbished laboratory. The Friends provided excellent refreshments to a wide assemblage of invited university staff and fellow Friends and students, as well as representatives of affiliated organisations and also contractors responsible for some of the refurbishment works. It was a very successful event and I am most grateful to everyone who had a hand in its organisation – it spoke volumes about the cohesive support that Treborth enjoys from all quarters.

Botanical Beats followed later that week and what a day it turned out to be! – over 1000 visitors and a record number of performers easily made it the biggest and best BB to date. For a full report please see Jamie Stroud's article in this newsletter but may I take this opportunity to thank everyone involved. It was well planned, brilliantly executed and fantastically successful and enjoyable – what a team it has behind it! No other event commands more commitment than the summer BB and it really showed this year. As BB's reputation builds so too does the effort people make – eg Kew students arriving from London to help, the house band expanding to include brass and serious practice sessions, wildlife groups arranging eye-catching displays, STAG members giving their whole day to children's fun activities, volunteers working overtime to ensure the Garden was ready for 10 times more visitors than any other public event and so on – one event, thousands of volunteer hours – and all for the benefit of our Botanic Garden.

One common factor of course in the success of both major June events has been the involvement of Jackie Read ably supported by her partner Paul Lewis. Without their enthusiasm and drive and hard work, neither event would have worked out so successfully. They have been the catalyst and underlying drive for

recent BBs and Jackie's distinctive chords now the voice of the event. With their departure there is an enormous void to fill and we hope that we can somehow maintain the exemplary effort and organisation that they demonstrated.

As they begin their new lives in SE England we wish them every success and thank them both for their remarkable devotion to Treborth.

Nigel Brown



Bangor Fruit and Veg Bag Co-op

The Bangor Fruit and Veg Bag Co-op runs on Fridays, 5.30-6.30pm, in
Maes Glas Sports Centre on Ffriddoedd Road, Bangor.

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Weather and Wildlife April – July 2011

Table 1

Month	Rain		Temperature °C		No. Of Days	
	mm	inches	Max.	Min.	Rainfall	≥ 20°C
April	42.3	1.66	24.0	4.5	10	2
May	102.5	4.03	21.0	5.5	23	1
June	66.7	2.62	26.25	4.0	16	3
July	61.9	2.44	24.5	8.0	12	9

The dry spring continued into April (**Table 1**) which proved gloriously sunny from the 8th onwards – easterly air dominated, producing temperatures in the mid teens and on two days warm to very warm conditions (24 degrees on 22nd). May however proved much more unsettled with continuous westerly and south westerly air flow bringing frequent rain and even stormy conditions on 22/23rd. June began and finished in settled, dry mode but in between it proved very disappointing with frequent rain and relatively low temperatures. The very warm (26.25 degrees) conditions of 26th came as a surprise and were a one day wonder, the rest of the month producing only two other days >20 degrees. July produced a mixture of weather with alternating weeks, first fine then very changeable.

Insects, of course, respond very positively to temperature and general weather conditions and it is interesting to compare months and years – perhaps as part of climate change studies. It is hoped that Treborth’s extensive data set of nightly moth catches will provide insight here and Pat Denne’s noble achievement of digitising the complete moth catch record from 1987 will prove essential for future studies. In the meantime, before any extensive analysis is carried out we can use the data to make some simple comparisons. In the accompanying tables Heidi Jones and Pippa Jones compare the moth catches for June and July this year with the same period 2006-2008 (**Tables 2 and 3**) and Heidi has added average nightly catches for April and May this year (**Table 4**).

Table 2: Average nightly moth catches, given in terms of both the number of species caught and the total number of individuals caught during June and July

Average Nightly Moth Catch								
	2006		2007		2008		2011	
	<i>species</i>	<i>individuals</i>	<i>species</i>	<i>individuals</i>	<i>species</i>	<i>individuals</i>	<i>species</i>	<i>individuals</i>
June	30	99	22	76	15	36	24	59
July	48	240	30	99	34	145	31	112

Table 3: Temperature data for 2006-8 and 2011 showing the average daily max and min air temperatures (°C) for June and July

Average Daily Max and Min Air Temperatures (°C)								
	2006		2007		2008		2011	
	<i>max</i>	<i>min</i>	<i>max</i>	<i>min</i>	<i>max</i>	<i>min</i>	<i>max</i>	<i>min</i>
June	19.8	12.6	18.3	12.4	17.6	10.2	17.6	11.0
July	23.7	14.7	18.4	12.3	19.1	13.0	18.6	12.3

Table 4: Additional moth-catch data for April and May of 2011 (for comparison with June and July of previous years)

Average Nightly Moth Catch		
2011		
	species	individuals
April	9	57
May	11	21

These data clearly indicate how, overall, the number of species increases as the spring and summer progress in any year irrespective of the particular weather conditions; they also show that the monthly comparisons **between** years show significant variation which is positively correlated with temperature, eg compare the monthly figures for moths caught in 2006 with the same months in 2011.

Despite being generally inclement, May produced one or two significant moths including **Square Spot** (*Paradarisa consonaria*), a local species confined to mature deciduous and mixed woodland. Interestingly the final instar of the caterpillar of this species may feed on lichens and algae on tree trunks rather than leaves. The caterpillars of several moth species regularly feed on epiphytic lichens and algae, including **Buff Footman** (*Eilema depressa*) and **Dingy Footman** (*E.griseola*) – both of these moths have shown marked increases at Treborth over the last decade and both have a largely southern distribution in the British Isles and Europe. One might argue that they are responding to a warming of the climate and an improvement in air quality. **Brussel's Lace** (*Cleorodes lichenaria*) also fits into this expanding pattern of lichen feeders and is notably frequent at Treborth. **Slender Brindle** (*Apamea scolopacina*) feeds on woodland grasses and woodrushes at the caterpillar stage and has shown a marked increase at Treborth in just a few years; likewise **Black Arches** (*Lymantria monacha*), an oak feeder largely confined south of a line from Lincolnshire to Anglesey, seems to be freshly establishing at Treborth.

In contrast to the Square Spot, **Large Yellow Underwing** (*Noctua pronuba*) is the most numerous species in most years reflecting a widespread distribution and polyphagous habit. It is also migratory and the British population consists of both residents and migrants, the latter usually appearing in mid summer. Very rarely migrants from further south in Europe appear very well ahead of schedule as seems to have happened this spring when Treborth along with several other sites in North Wales recorded small numbers of relatively fresh individuals in early April.

As well as a few other notable moths eg **Puss Moth** (*Cerura vinula*), a species associated with Willow (*Salix*) and Poplar (*Populus*) and not commonly attracted to light, May saw the moth trap attract many other orders of insects apart from Lepidoptera. Visiting entomologist Dave Slade identified **Scorpion Fly** (*Panorpa germanica*) in mid-May and on 6/7 May the trap contained over 70 **Caddis Flies** (Trichoptera) of several species and several thousand **Mirid bugs** (Heteroptera). The latter, identified by Mike Howe from the Countryside Council for Wales, seemed to be all one species, an oak feeder named **Harpocera thoracica**. This handsome bug spends almost a year as an egg, then just two weeks as a nymph and only one week as an adult! It was exciting to witness a mass simultaneous emergence of adults between 5 – 8 May this year, the trap being alive with male bugs on each of three nights.

In July, Treborth hosted a successful identification workshop on bumblebees, organised by COFNOD and lead by expert Oliver Prys-Jones and his wife, Judith. 6 taxa were observed in the Garden and scrutinised under the microscope: these were *Bombus terrestris*, *B. lucorum s.l.*, *B. lapidarius*, *B. pascuorum*, *B. hortorum* and *B. vestalis* (the **cuckoo bumblebee**). John Bratton also drew our attention to a beautiful but deadly (to bumblebees, that is) **Conopid Fly** (*Conops quadrifasciatus*), a superb wasp mimic whose larvae eat bumblebees alive – adult conopids ambush unsuspecting bumblebees when they are visiting flowers and in a mid air grapple they inject their victim with a long, narrow egg. A strange, swollen bodied, endoparasitic larva hatches in the body cavity eventually causing the death of the bumblebee and in the process altering the instinctive behaviour of its victim which is stimulated to burrow into soil where the parasitic conopid is further protected.

This workshop was made all the more interesting by Oliver's extensive knowledge of the natural history of bumblebees and by his ability to highlight their crucial role as pollinators. Their sad demise in today's countryside should alarm us all and there is an urgent need to monitor their distribution and abundance and reverse damaging mis-management of our environment. As ecosystem service providers bumblebees are priceless, as well as being among our most cherished insects.

As we toured the Garden looking for bumblebees on what turned out to be quite a sunny though rather cool day, one could not help but notice butterflies – not in huge numbers but reasonable variety. Of particular note was **Small Skipper** (*Thymelicus sylvestris*) – absent in 2009, present last year and pleasingly active in the meadow plots once more. These and **Ringlets** (*Aphantopus hyperantus*) were coming to the end of their flight period for the year whereas **Hedge Brown** (*Pyronia tithonus*) was just commencing (and indeed about to burst upon the scene in big numbers). We saw a few second generation **Common Blues** (*Polyommatus icarus*) as well as **Comma** (*Polygonia c-album*), **Painted Lady** (*Cynthia cardui*), **Red Admiral** (*Vanessa atalanta*) and **Small Tortoiseshell** (*Aglais urticae*). **Green-veined Whites** (*Pieris napi*) were common at this time.

The new wildlife pond has remained gin-clear and its banks have coloured and lushed up with wildflowers (45 species by the end of June). Animal life has been most obvious in the form of black mobs of tadpoles concentrated in the shallows and darting dragonflies of three species, including the splendid **Broad-bodied Chaser** (*Libellula depressa*). Several **newts** (*Triturus helveticus*) have taken up residence and **diving beetles** (Dytiscidae) have arrived.

From time to time the pond acts as a loafing and foraging area for up to four Mallard duck (*Anas platyrhynchos*) and a wide variety of passerines visit to drink and bathe – we should have a better idea of bird usage once the viewing hide is completed (hopefully by the time you receive this newsletter). Perhaps we shall also see mammals using the pond – **Red Fox** (*Vulpes vulpes*) has been seen thereabouts in broad daylight in July as has **Stoat** (*Mustela erminea*). Predator numbers are high and reflect buoyant rabbit numbers as well as good numbers of mice, voles and shrews in the meadow plots and woodland. **Hedgehogs** (*Erinaceus europaeus*) however still give cause for concern with very few sightings this summer and little by way of scats in the garden. **Soprano Pipistrelle bat** (*Pipistrellus pygmaeus*) is common and there have been a few **Noctules** too (*Nyctalus noctula*).

The increasing number of **Red Squirrel** (*Sciurus vulgaris*) sightings is encouraging – a total of 10 sightings have come to my attention with two individuals being seen chasing one another around a tree on one occasion. All the sightings bar one are located along the new coastal footpath, through the main woodland near the Menai Strait. One other sighting occurred by Treborth Lodge. The population of both **Red** and **Grey Squirrel** (*Sciurus carolinensis*) is now being monitored by undergraduates using a standard hair tube technique, which relies on squirrels visiting a length of plastic tubing baited with food and leaving a sample of hair on one or more strategically positioned sticky pads inside the tube. 50 such tubes have been placed at regular intervals on either side of the main coastal footpath in partially concealed sites. **Grey Squirrel** control was carried out in June under the

direction of Dr Craig Shuttleworth. Further monitoring of squirrel numbers will take place in September and later in the year. If successful the establishment of **Red Squirrels** at Treborth would be the first instance of its kind in a broad leaved or mixed woodland on mainland Wales. The likely source of the **Red Squirrels** at Treborth is the dispersal of individuals from the reintroduction scheme at Plas Newydd, 2 km west on Anglesey – it is thought very likely that such movements involved the use of the Britannia Bridge.

Bird-wise it is pleasing to report the successful breeding of at least 15 pairs of **Common Tern** (*Sterna hirundo*) on the islet in the Strait immediately west of Church Island – their strident calls have been a welcome background to the summer gardening. **Grey Heron** (*Ardea cinerea*) raised several young despite concerns that the newly opened up woodland would no longer offer them the sanctuary they enjoyed until this spring. **Tawny Owl** (*Strix aluco*), **Sparrowhawk** (*Accipiter nisus*) and **Buzzard** (*Buteo buteo*) all bred successfully, the former occupying an old owl box 40 metres from the curator's house. **Raven** (*Corvus corax*) has not yet re-established after the persecution of autumn 2009. The most vocal of this year's song birds has to be **Blackcap** (*Sylvia atricapilla*), up on previous years with a conservative estimate of 8 pairs in and around the main garden and central woodland. **Goldcrest** (*Regulus regulus*) survived the winter's cold to breed once again in the arboretum alongside **Treecreeper** (*Certhia familiaris*). Two scarce visitors to Treborth gave voice to their brief presence this spring – **Common Whitethroat** (*S. communis*) and **Garden Warbler** (*S. borin*) could be heard 'duetting' near the glasshouses on 7 May, passage migrants just testing the waters and quickly moving on.

Happily, finch numbers have been buoyant this spring and summer, especially **Bullfinch** (*Pyrrhula pyrrhula*) with the offspring of several broods frequenting the borders and new wildlife pond. **Siskin** (*Carduelis spinus*) has once again bred and has been successfully double brooded. **Greenfinch** (*Carduelis chloris*) continues to make a slow but sure comeback after its disappearance from the Garden in 2008/9.

Perhaps the season's major ornithological winner has been **Jay** (*Garrulus glandarius*). What an entertaining bird! Its striking plumage combined with its curious antics and raucous, uncouth calls (the Welsh name, Ysgrech y Coed, describes it well – shreaker of the woods) attract attention and pose lots of ecological and evolutionary questions. Its cryptic patterning transforms its substantial true physical shape into a fluid mix of foliage and branches, forest floor and dappled light, then caught by the eye as it bounds through the air in butterfly stroke style, a flat bed of white rump feathers diverts attention. How to interpret the plethora of calls with their intimate inclinations, supported by sophisticated

moves especially in company, most notably in the lek? A fabulous display of extravagant showmanship, as branch to branch they hop in slow parade, crests flicked, wings ajar, throat feathers spruced and pouting, bills upturned and voice boxes speaking in a mechanical tongue – who’s in charge of the situation, who’s top bird? – who mates with whom? – who lives with whom? Is theirs a territorial existence or cohabitation for convenience of all? The answers await scientific enquiry and offer a brilliant insight into corvid society. After a highly successful breeding season there could be no better time to turn the scientific eye upon Treborth’s latest ornithological phenomenon.

And an objective eye is needed on the Rock Garden because here there is potentially something very intriguing going on – 3 flowering shoots of a **Helleborine** (*Epipactis*) orchid have appeared among the foliage of a native creeping willow from Scotland. At first I presumed them to be *E. helleborine*, the **Broad-leaved Helleborine** which grows naturally nearby. That was interesting enough as the Helleborine is rare and normally associated with much shadier situations; it is also mycorrhizal and is limited to certain host species, usually woody. On further inspection the helleborine looked ‘odd’ and when Richard Birch asked me how **Dune Helleborine** (*E. leptochila* ssp. *dunensis*) had become established on Treborth’s rock garden, I realised that this plant needed a very close investigation. The problem lies in the critical nature of much helleborine taxonomy, in other words when is a species not a species and where do we draw the lines of demarcation? The genus *Epipactis* contains approximately 25 species of which 7 occur in Britain. Three of these are habitually self-pollinated and several occasionally hybridise. Species limits are not robust. The rock garden specimens have the leaf architecture of Dune Helleborine, a very rare taxon restricted to a handful of sites in the UK including Newborough Warren. They have flowers which are again closest to Dune Helleborine. But the habitat is certainly not typical and we do have Broad-leaved Helleborine on site in natural circumstances – is the rock garden plant simply a variant of the Broad-leaved Helleborine? Whichever species it turns out to be its association with an arctic-alpine willow is by itself a curious phenomenon and approximates most closely to the strong mutualist connection enjoyed by Dune Helleborine and the sand dune inhabiting **Creeping Willow** (*Salix repens*). This raises the interesting possibility that the Helleborine is dependent upon the same mycorrhizal fungi that commonly consort with certain woody hosts such as willows.

If the ‘Treborth Helleborine’ turns out to be closest to Dune Helleborine it begs the question how did it arrive? Newborough Warren, the nearest known site for Dune Helleborine, is after all, 12 kilometres away. The answer might well rest with the seeds - orchids produce the world’s smallest and most light weight seed and they do so in very large quantities. It is certainly possible that Dune Helleborine seed could naturally disperse from Newborough to Treborth in the prevailing SW

airstream. This may well be the origin of another somewhat surprising discovery this summer – Yellow Bird’s-nest (*Monotropa hypopitys*), a remarkable non-photosynthetic flowering plant recently found a few hundred metres from Treborth on the opposite shore of the Menai Strait and most usually seen on sand dunes at Newborough Warren. It too is consorting with willow, in its new locality, this time **Goat Willow** (*Salix caprea*) – like Dune Helleborine, it is associated with Creeping Willow on the dunes where the association is an entirely parasitic one, the Yellow Bird’s-nest exploiting the mycorrhizal fungi which symbiotically nourish the willow.

Life’s not always as it seems and Botanic Gardens can harbour unexpected interlopers!

Nigel Brown



Stop Press

Treborth Needs your Vote, Please Spread the Word!

The Friends of Treborth have just been accepted to take part in the NatWest’s ‘CommunityForce’ Project. They are asking people to vote for their favourite charity. The 3 charities with the highest votes within the local CommunityForce Area will receive £6000.

The voting starts on the 26th of September and there will be a follow up email with details on how to vote electronically. For those wishing to vote via phone follow the details below and ask to vote for ‘The Friends of Treborth Botanic Garden’.

If there are any questions please contact Tom Cockbill on 01248 353398, 07792014166 or thomasjames83@hotmail.co.uk

Notes from NatWest CommunityForce on how to vote:

Voting will take place on the CommunityForce website from the 26th September (<http://communityforce.natwest.com/>), where you’ll be able to view all of the applications made in your local area. If you are unable to access our online site to vote, contact our CommunityForce helpline on 0800 2100 246. Customers with hearing and speech impairments can contact us by Minicom number 0800 0155 545. They will be happy to let you know which charities, projects and groups have applied in your area. You should know if you are successful by early November.

Membership Renewal for Annual Cheque and Cash Payers

It's that time of year again when we're after your money... The subscription year begins on 31 October so most of you have about a month of membership left. Members who joined after 1 May 2010 will have another 12 months in addition.

As you already appreciate, the Garden at Treborth needs constant attention - collections are tended with loving care, and propagation and maintenance work goes on all the time. Volunteer groups undertake much of this, but they need tools and other materials to carry out this work. There are a number of projects coming up, involving extra work and needing more resources. The Friends are dependent upon your membership contributions to provide a steady income for improving the gardens and facilities. The Garden has never looked better, and many people arriving at Treborth for meetings etc comment on what a great asset it is for the local community. This is in no small part due to the careful spending of precious income from you.

So for those of you who pay on an annual basis, please would you fill in the enclosed form and return it to me with your cheque or cash. Alternatively, you may like to complete the Standing Order form so that you can ignore my reminder next year!

On the subject of Standing Orders, you may remember our plea to those of you who made out mandates to pay our Barclay account to cancel these and set up a new mandate to pay our Co-op Bank account. There are a number of members who are still paying to our Barclays account – please could you print out a membership form from our website at www.treborthbotanicgarden.org, complete the standing order part and send it to Treborth. We will do the rest – thank you.

Angela Thompson



Kind hearts are the gardens, Kind thoughts are the roots,
Kind words are the flowers, Kind deeds are the fruits,
Take care of your garden, And keep out the weeds,
Fill it with sunshine, kind words and kind deeds.

Longfellow

The Rosemary Beetle

There seems to be no end to the list of opportunist invaders of the British Isles. No, I'm not referring to any international incident, but to alien invertebrates and to one in particular – the rosemary beetle (*Chrysolina americana*)

Its introduction to this country follows the route of that of the lily beetle (see Friends' Newsletter no 39, September 2010) and the harlequin ladybird. The beetle is native to southern Europe, but as international trade has developed and goods now reach us from afar, the beetle has hitched a ride, and, finding that it can survive in a UK made slightly warmer by climate change, is now flourishing. According to the Royal Horticultural Society, it was first noted at their Wisley Garden, Surrey, in 1994. This population, however, did not do well and it was not until 2003 that it was seen again at Wisley. By this time, it had become established near Waterloo Station in London and near Reading, Berkshire. By the end of 2005, the beetle had spread to many parts of London and beyond. It is now widespread in England, with greater numbers in the southeast, Norfolk and the Merseyside/Lancashire areas, and has been found in parts of Scotland, Wales (mainly the south), Northern Ireland and the Irish Republic. No doubt in years to come it will reach other parts.

The adult rosemary beetle (back cover) is very pretty and jewel-like: its carapace has distinctive, shiny, metallic green and purple stripes. The green stripes have double rows of pits. It has a rounded appearance and is about 7mm long. The adults are usually found in groups on the new growth of plants, turning the tips brown and causing die-back. They are usually first seen in late spring, and will mate and lay eggs in late August and September.

The eggs are about 2mm long, are laid on the undersides of leaves and hatch into larvae around ten to fourteen days later. Unlike the adults, the larvae are not so attractive (fig. 1). They are grub-like and light grey with darker horizontal stripes along their bodies. It is this stage of the life cycle that does the real damage, and if you have a bad infestation, the larvae can destroy your plants. They feed for a few weeks and once they have reached their optimum size, they drop to the ground, bury themselves in the soil and pupate over winter. In the spring, the adults emerge to start the cycle again.

Both the adult rosemary beetle and the larvae eat the same plants. They have a preference for rosemary (*Rosmarinus officinalis*) and lavender (*Lavandula* spp) but will also eat thyme (*Thymus* spp), hyssop (*Hyssopus* spp) and sage (*Salvia* spp). So, what can we do to stave off destruction? Obviously, prevention is better than cure, and frequent checking of your plants in late spring is essential to prevent



Fig. 1 Rosemary beetle larva

infestations. Ever hopeful, you can encourage insect-eating birds to your garden by hanging up feeders in the winter and nesting boxes in the spring, but at present there are no commercially available predators to control the pests. If you apply insecticides at the same time as your plants are in flower you risk killing pollinating insects. The only safe way is to remove the larvae and adults by hand (gloves can be used by the squeamish); you could also shake affected plants over an old sheet or towel on the ground, and then destroy the insects. Soapy water, made from a mild soap, not harsh detergent, may be effective, especially if applied to larvae (the hard-bodied adults are probably too resilient).

The RHS keeps a close watch on alien invertebrates likely to affect garden plants. It is currently surveying the occurrence of two other non-native species: the berberis sawfly (*Arge berberidis*) and the hemerocallis gall midge (*Contarinia quinquenotata*).

Angela Thompson



Rosemary only grows where the mistress is master.

Anon

Cardamom: Queen of Spices



Late last year I was involved in a study of the popular spice, cardamom (*Elettaria cardamomum*) at the Royal Botanic Garden, Edinburgh. Whilst being a generally inconclusive study, I thought it might be rather interesting to relate some of the findings, and to share some interesting facts about this exquisite plant.

Cardamom, which we in the west use for cooking, is derived from the seedpods of a particular species of ginger that grows in the verdant hills of the Western Ghats in India, the Malabar cardamom (*Elettaria cardamomum*). It is one species in a genus that currently contains 10 or 11 different species, which have a disjunct distribution, with two species from the Indian sub-continent and the remainder being found from Malaysia to islands in Indonesia. Very recently,

specimens from the genus were discovered to the east of the famous biogeographical boundary of Wallace's Line on the island of Sulawesi. This raised questions about why the genus was found in two different broad areas, and which of these it originated from.

First a little about the spice itself. Cardamom has apparently been used as a spice, aphrodisiac and symbol of wealth in India since the Vedic period (5000 years BP), having been mentioned in the ancient Ayurvedic Hindu texts. Its value as a commodity to be traded was recognised early, and records of its use have been found in ancient Assyrian, Babylonian, and Greek and Roman texts. However it has never been entirely clear if the ancients were actually referring to *Elettaria* as we know it today, or other aromatic plants such as *Amomum*. There are several species within the ginger family that bear the commercial name cardamom used in both international and internal trade across Asia. The black or Nepal cardamoms are usually *Amomum subulatum* or *A. costatum*. The true, green or Malabar cardamom is from the genus *Elettaria*. The Malabar cardamom plant looks and smells a lot like many other species in the ginger family, but its defining

characteristic is its trailing, often-subterranean inflorescence. The flowers themselves are quite beautiful, reminiscent of orchids with delicate green-white petals and a purple-splashed labellum.



It wasn't until the early twentieth century that large-scale plantations of cardamom were set up by the British East India Company in India and Sri Lanka. Although India was the original source of cardamom, Guatemala

has in recent years eclipsed its production of the spice. Cardamom was introduced to Guatemala in 1920 and in 1997 Guatemala produced over 60% of the world's cardamom, whereas India produced around 30% of a worldwide production of around 25,000 megatonnes. Other countries that produce cardamom are El Salvador, Indonesia, Malaysia, Nepal, Papua New Guinea, Sri Lanka and Tanzania.

The modern uses of cardamom vary around the world. In Saudi Arabia, the largest importer of cardamom, it is used in the preparation of a traditional spiced coffee known as gahwa. In India and other southern Asian countries it is used in making sweet teas, whereas in northern Europe it is used in cooking sweet food. It is still used medicinally around the world for the treatment of a variety of ailments, from upset stomachs to skin conditions, and it is also still used as an aphrodisiac, and both in perfumes and tonics. The exquisite taste and smell of cardamom has led it to be given the title "Queen of Spices".

Among the species of cardamom currently known, only Malabar cardamom is of major economic importance within the genus *Elettaria*. It probably was the cardamom of early commerce too, but this cannot be proved. Ceylon cardamom (*Elettaria ensal*) is also grown commercially in Sri Lanka, but it is widely acknowledged that the flavour of this particular species is inferior to that of Malabar cardamom, with Ridley commenting in 1912 that "...the seeds are larger [than *E. cardamomum*], more numerous and less aromatic". Of the species from Indonesia, none are of any economic importance, though some are used locally in traditional medicines.

Cardamom cultivation is of conservation concern as it can lead to the degradation of soils in some areas. In recent years a new high yielding cultivar of Malabar cardamom, 'Njallani', has been developed which has prompted concerns about soil degradation and environmental damage caused by cardamom plantations

in India. Its cultivation in other areas of high biodiversity such as Tanzania is known to have a negative effect (Reyes *et al.* 2006) though sustainable agroforestry can ameliorate the negative effects of intensive cardamom cultivation.

The basis of the study I undertook was to ascertain whether the cardamom genus was monophyletic. This means, do all the species fall into the same group when they are subjected to a genetic analysis? I'll not bore you with the lengthy details of how this is done, but the short answer is that they don't. The findings of my study suggested that the species from Indonesia and Malaysia form a distinct group of gingers that could be called a new genus. The new specimens from Sulawesi are therefore new species in a new genus. Several species of *Alpinia* from India were also found to be much more closely related to Malabar cardamom than was previously thought. However, further work needs to be done to verify all of this. There's no need to worry about the cardamom you use to flavour your cakes with though; its scientific name will not change.

If you're interested in seeing a cardamom plant, there is a specimen in Treborth's Tropical House. Have a crush of the leaves and smell the intense aroma; you might be momentarily transported to the lush hills of Kerala in India. If you're very interested in gingers as a whole, Edinburgh has an extensive collection and is a major research hub for the family.

Finally, thanks must be given to my supervisors on the project, Drs Mark Newman and Axel Poulsen who are based at RBGE.

Anthony Pigott



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Rediscoveries in the Treborth Botanic Garden

Way back in the 1970s, Len Beer (then the Curator) planted a number of interesting specimen trees and shrubs along the old carriage way through the Treborth woodlands (now part of the new coastal footpath), along the top of the steep drop down to the Menai Strait. Many of those plants got lost over the years amongst rampantly invasive growth of *Prunus laurocerasus* (cherry-laurel) and *Rhododendron ponticum*, and it was assumed that they had died out. But during the last few years, as the massive undergrowth has been removed so effectively, not only have new views of the Strait been revealed, but some of the long-lost specimens have also emerged.

First to be noticed was *Prunus lusitanica* subsp. *azorica*, an unusual shrubby tree from the Azores, with leaves broader and paler than the more common Portuguese laurel. This can be seen at the junction between the coastal footpath and the track that leads up from there towards the glasshouses. Then a *Magnolia campbellii* was found, with huge leaves that fall onto the footpath in late autumn: its trunk is rather thin and drawn and it hasn't flowered recently, but we hope it will do so now it has been released. This tree is on the mainland side of the coastal footpath, close to where the large coppiced lime avenue crosses over and extends down towards the Strait. Nearby, on the other side of the footpath, are two spindly stems of an unusual dogwood (probably *Cornus capitata*), carrying conspicuous white flowers like those of a *Cornus kousa* but with evergreen leaves. Two whitebeams (*Sorbus* spp.) have also emerged, though we cannot confirm their species until they have produced berries, and do not know whether they were planted by Len Beer or were bird-sown. Similarly there are at least two cotoneasters awaiting identification.



Fig. 1 *Davidia involucrata*

But the prize rediscovery occurred just a few weeks ago, when Julian Bridges noticed a mass of large white flowers high up in the canopy, half-hidden behind a Portuguese laurel. This tree is on the mainland side of the footpath, further towards the Britannia Bridge than the *Magnolia campbellii*. It is a *Davidia involucrata* (handkerchief, dove or ghost tree). Nigel Brown tells us that Dr and Mrs J Lloyd Lewis had kindly given

this tree to Len Beer in the 1970s and Len was known to have planted it in the woodland, but it had vanished from view many years ago. We could scarcely believe our eyes when Julian showed it to us - how could we have missed seeing such a splendidly flowering specimen? Obviously it had been totally obscured by the massive understory of cherry laurel that was removed during winter 2010/11.

What else might be found now that the woodland has been opened out so marvellously? Keep your eyes open: there may well be other treasures yet to be rediscovered!

Pat Denne



Tales of the unexpected

This is the first of what we hope will be a regular feature in the newsletter in which we highlight plants at Treborth with a story to tell. These three are all recent acquisitions.

***Ulmus laevis* (European White Elm)**

Two plants of this species were donated to Treborth a few years ago, but they resided in pots until recently when one was planted out at the suspension bridge end of the arboretum, close to the point where the new coastal footpath diverges from the drive. Both specimens were donated by Esmond Harris (a Bangor Forestry graduate) who has something of a mission to encourage wider planting of the species, mainly because it has shown signs of being more resistant to Dutch Elm Disease than many other elms. *Ulmus laevis* is native over a large part of Europe and into western Asia, but has been rather rarely planted in Britain and at widely scattered locations, so that if it were to succeed at Treborth and remain disease-free, it could become one of our 'special' trees – perhaps in time even rivaling the Lucombe Oak.

***Salix babylonica* (Napoleon's Weeping Willow)**

This plant has a history going back to the time of Napoleon's exile on the island of St Helena, and associated with his grave there. It was donated by John Whitehead who collected a cutting from one of the original trees in St Helena in the year 2000, and subsequently propagated it to the extent that he has been able to offer specimens to several gardens in North Wales and elsewhere. It turns out that his intervention was timely since the original trees have now been lost, and even an old specimen at Kew was lost in a storm. It is possible though that there are such trees

in Australia, for John alludes to “... a story resulting from the old shipping routes via St Helena to Australia that all the weeping willows in Australia could be traced back to an origin on St Helena.”

John describes his role in the conservation of this strain of *Salix babylonica* as follows.

“The first tree grown was planted in 2003 at the nearby Glynllifon Country Park where it is featured as one of the 50 specimens in the Tree Trail leaflet. Another tree has been planted at Portmeirion in 2004. In March 2011, two trees propagated at Pontllyfni were donated, one for the Royal Botanic Gardens, Kew and the other for Bangor University at Treborth Botanical Garden.”

+ *Laburnocytisus adamii* (Adam’s Laburnum)

This new planting was donated to TBG by Julian Bridges in commemoration of the work of the old Pen-y-Fridd Field Station (where Julian worked for many years), and replaces a specimen that once stood alongside the entrance drive, but expired some years ago for reasons unknown.

As its name suggests, this tree is an unusual blend of two species: a yellow-flowered laburnum and a purple-flowered broom. It is not a hybrid however, but a chimera in which the two species have been grafted together with neither one dominating, but rather with cells from both co-existing (hence the use of the ‘+’ sign rather than the usual ‘X’). The result is a tree with laburnum-like foliage but flowers that can be yellow on some branches and purple on others - or a strange colour halfway between the two. The original tree was quite a talking point in its day, and we are hoping that its replacement will attract similar attention. The site chosen is close to the drive in front of the curator’s house, so it will be hard to miss if it performs as expected.

David Evans



If you want to be happy for a short time, get drunk;
happy for a long time, fall in love;
happy forever, take up gardening.

Arthur Smith, British comedian and playwright

Heaven or Earth?

I've just returned from botanical heaven! The French Alps in late June/early July are an alpine plant paradise and, after days of immersing myself in an enormous diversity of plant-life, I left the place, head reeling and colour dancing before my eyes. Then I return to Snowdonia and, for a short while, my spirits sink as a monochrome vision of short green grass with little diversity dominates practically every vista. I've experienced these extremes many times now and so I should be used to it, but each time I still have to readjust to a return from heaven to earth! I do know however, that this readjustment will be fast and within days I'm excited by finding a new location for a rare plant, or making progress in discussions on management for a threatened habitat. It may not be heaven, but as conservationists, we can make our own local paradise with some imagination and effort!

We will never have such extensive, species rich alpine meadows; conditions are not right for these in the relatively mild, wet climate of north-west Wales. We do, however, have alpine plants which find a home here on steep, ungrazed, north facing cliffs, where the cool temperatures and lack of competition from more vigorous plants allows them to maintain a foothold well outside their alpine or arctic home. Similarly, an arctic habitat such as the montane heath right on the very mountain tops is more at home in arctic Scandinavia, but the altitude, exposure and thin soils have so far allowed it to remain here for a few thousand years.



Fig. 1 Montane vegetation in detail

The mountains of Snowdonia are the most southerly high mountains in Britain and so harbour a number of habitats and species which are somewhat outside their normal range. The examples above are remnants of more widespread vegetation present after the retreat of the ice around 10-12,000 years ago. As conditions warmed,

plants more suited to the changing conditions came to dominate, resulting in the retreat of the true 'mountain' vegetation to just a few sites which today are the focus of our work to maintain them in the face of intensive land use pressures and environmental change.

These sites include Cwm Idwal, which is well known, as is the work to redress the effects of years of heavy grazing there. But work is also needed on other sites which are also suffering, Have you recently been up onto the Carneddau and seen



Fig. 2 Gledrffordd erosion

the eroded blanket bog on Gledrffordd, or the damage to the remnant woodland around Dinorwig and in the Gwynant valley, or the proliferation of paths on the summit areas of the Glyderau? All these places support habitats which we are trying to restore, but sometimes making progress feels like banging your head against a brick wall! However, things are happening albeit slowly.

Together with CCW, the National Trust are trying to restore the upland oakwoods on the south slopes of Snowdon, while CCW, NT and the National Park Authority are all working hard to achieve a management agreement over the Llanllechid area of the Western Carneddau. Part of the objective of this agreement is to restore and protect the montane heath on the top of Carnedd Dafydd and Pen yr Ole Wen before it is lost altogether. Can you imagine that? This montane vegetation is included on Annex I of the European Habitats Directive and is a feature of the Eryri Special Area of Conservation and SSSI. Furthermore, due to its restricted distribution and to the adverse effects of ongoing impacts and threats, it has recently been designated as a priority Biodiversity Action Plan habitat. The site is also in the National Park and partly owned by the National Trust. With all these designations it's hard to believe that it is still under so much threat. Can we really lose this marvellous mix of tiny mosses and lichens and our smallest tree, the dwarf willow, braving some of the most extreme conditions our climate can throw at them?

But why should we worry about the few alpiners we have or the tiny remnants of montane heath or woodland? Shouldn't we be more concerned about the rain forests or the giant panda? Well yes, we should also be concerned about

these, but they tend to get a disproportionate amount of publicity and interest because they are so much more glamorous and so draw the lion's share of attention and effort to their conservation. But montane heath? It's like comparing a red squirrel with a slime mould— guess which gets the most votes! But we do need to be concerned about these species and mountain top habitats, particularly in Snowdonia where they are at the edge of their range. They have been damaged by overgrazing, recreation and pollution, resulting in the loss of important species and dominance by common grasses. The vegetation cover can also be broken up & fragmented, exposing the soil which is then eroded away, sometimes completely. And now there is the possibility that climate change may have an impact.....

We should also care about our plants and habitats in Snowdonia, because on a scientific basis, plants and animals at the edge of their range are often special and can have attributes and adaptations which don't occur in individuals in the centre of their range. These differences are the stuff of evolution and if we lose these, then we lose an important part of the variety and diversity of life and of future possibilities. Also, edge-of-range habitats and species are often the first to respond to the effects of environmental change and so can act as early indicators that things are not quite right, similar to the pit canary in a cage.

But for many people the reason to care has a more personal bias. Conservation is important on an individual basis as well as at a global level and the loss of something like the Snowdon lily in Wales would be extremely sad for many people, as it is more than an edge-of-range species, it represents something special to them and to their perception of the mountain environment in Snowdonia.

So what do we need to do? Well each circumstance has its own solution, but in many cases, just reducing the grazing levels or changing the grazing regime can be beneficial. However, in some instances, even low levels of grazing can still have a damaging effect and fencing out the most severely damaged areas to remove grazing altogether for a number of years until recovery is assured, can sometimes be the most effective measure we could take to ensure their survival. These are not easy options and landscape and access issues need to be considered alongside the ecological necessities. Snowdonia contains some of the most valued areas of perceived 'wilderness' in Wales and there is some antipathy to the idea of fencing out even small parts of some of our summits or around cliff faces. However, consider the alternative of losing the small jewel-like alpine plants which still grace our cliffs, or the mountain tops becoming a desert of eroding soil and exposed bedrock. This is already the case on a number of mountains. Just look at the top of Kinder Scout in the Peak District, or Snowdon itself. How natural are these summits and are we happy for this damage to spread? It need not be if we are prepared to accept some localised exclusion for a number of years to allow the scars to heal.

Working as an upland ecologist in Snowdonia is a see-saw occupation, one day surveying some of the most delightful alpine plants and the next monitoring the sad decline of a rare British habitat right on our doorstep. Balancing the requirements of conservation with the needs of the people who farm the land and the myriad of other demands which are increasing every year on the British uplands can, at times, feel like herding cats! However, we must continue to make the conservation case, stressing the value of the wildlife of Snowdonia in the context of Wales, the UK and even the rest of the world. It might not be heaven but an earthly paradise is a valuable thing.

Barbara Jones



The Value of Bees

“Bees and honey” is Cockney rhyming slang for “money”. So “Hand over your bees....” might be something you heard with a sinking feeling in the East End of London in the mid-nineteenth century. Now we know that bees do have a more obvious economic value. Recent estimates place the annual value of honeybee services (in terms of the value of honeybee-pollinated crops) to the UK economy at £1billion (National Audit Office, 2007) and to the US economy at \$15-20 billion (Morse and Calderone, 2000). A French study (Gallai et al 2008) estimated the global value of pollinating insects (mainly bees) in 2005 to exceed €153 billion/yr. These figures ignore additional ecosystem services that insect-pollinated natural flora provide. At the same time, the value of each individual hive in the UK has been estimated at £800 (Carreck and Williams, 1998): this figure includes both the value of bee products such as honey and beeswax as well as pollination services. According to a leading beekeeping supplier’s website, a beginner’s beekeeping kit (including some basic equipment as well as a hive) and a starter colony (nucleus) of bees would cost £350-£600. Small wonder, then, that attention of thieves has focused on the bees themselves as well as their rhyming equivalent! In 2009, the theft of “half a million honeybees” destined for the Prince of Wales’ Balmoral estate honey farm hit the headlines (this sounds an impressive number but given that there may be 50,000 bees in a single colony at the peak of the season, it only in fact represented 11 hives). However, theft of bee hives is on the increase all over the UK, including in Wales. Although the value of the honey contained in the hives is itself likely to be high, the bees themselves are worth quite a bit, as anyone considering setting up as a beekeeper has probably found out. Even if willing to pay a high price, nuclei are hard to come by and Beekeeping Associations have long waiting lists. There is, to put it boldly, a national shortage of bees.

The number of colonies being kept in the UK had seen a 75% decline in the last 100 years. Added to this have been markedly higher rates of colony loss over the last decade or so, of which the underlying cause has still to be pinned down (although major changes in land use, such as the loss of 98% of hay meadows, and the spread of parasites and diseases are all likely to be involved). Scientists generally agree that the parasitic mite *Varroa destructor* has a large role to play in the global decline of the honeybee. However, before I continue, I must clarify the use of the term “honeybee” here. There are in fact between 4 and 11 species of honeybee (bees in the genus *Apis*) recognized. The species which we are generally talking about in the context of honeybee decline is the western honeybee, *Apis mellifera*. The native range of this species included Africa, Europe as far east as the Ural mountains and parts of the Middle East and it did not naturally come into contact with other species of *Apis*. This changed when beekeeping became global (about 4500 yrs after it first began!) and bees began to be moved out of their native ranges. At first, this involved taking European bees to the colonies where no honeybees were present (North America, New Zealand, Australia, for example). The trouble began when *Apis mellifera* began to be kept in areas where a closely related species of bee, *Apis cerana* or Eastern honeybee, was native. Before too long, parasites which had co-evolved with *A. cerana* for millions of years were found in *A. mellifera*, which was not adapted and could not withstand them: the dreaded varroa mite had arrived. It inexorably spread all over the globe, causing havoc and wiping out colonies as it did so, and arrived in Britain in 1992. It has not yet got to Australia, but may do so soon. Beekeepers began to use miticides to eliminate the mites, but before too long, resistance to these chemicals had emerged. Research is ongoing into chemical and biological controls, but at the moment, beekeepers are faced with the increasing workload and cost of keeping their bees alive. As if that were not enough, varroa also aided the spread of bee viruses. In fact, it may be the viruses rather than the mites themselves that are the cause of the death of bees, having a variety of subtle effects on the brains of developing bees that may make it more difficult for them to forage and navigate, as well as causing more obvious deformities and paralysis. That is not all....there are other mites, bacterial and fungal diseases, nutritional challenges, and perhaps even intoxication by pesticides.

If not interested in beekeeping yourself, you can help honeybees (and other bee species) by planting nectar-rich plants such as buddleia, lavender, rosemary, poached egg plant and crocuses. It also helps immensely to support your local beekeepers by buying local honey. You may have noticed that the Friends of Treborth have started to sell honey produced in the Garden itself. The honey comes from hives managed by Ian Thorpe and benefits in its complex flavour from the wide variety of flowers available in the Gardens. Ian, a Bangor alumnus with a long history of association with Treborth dating back to his undergraduate days, gave up teaching at Ysgol Friars for the rather less stressful but uncertain life as a commercial



Fig. 1 Honours student Niamh Cahill carrying out her project at Treborth 2010

beekeeper in 2009. Around the same time, a small research program on honeybees was started at Bangor University's School of Biological Sciences by myself (the two events were not unconnected as Ian is my husband and my interest in bees was sparked off by Ian's bee obsession). While the main projects we are currently involved with are based elsewhere, the hives at Treborth give us a valuable base with easy access to Bangor for students to carry out research projects on bees. Having started out with little knowledge of bee biology, it has been a steep learning curve for my students and I. More about the research we are doing will be described in Part 2 of this article, which will appear in the next issue.

Anita Malhotra, Bangor University

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Look down in wonder

Like us, you have, no doubt, taken many a turn around the various fragrant and colourful displays on offer at Treborth; finding yourself immersed in the scent of the *hymenocallis* and indulged in a moment reflecting the intricacies of the *Fittonia argyroneura* leaf. The tropical house, in particular, with its lush vegetation and moist heat, may have provoked a feeling of the intrepid explorer or the ardent researcher in you. You can almost hear the cicadas above the trickle of water which passes over a tumble of stones into the warm tropical pond. Have you also, perhaps, gazed down and delighted in the merriment of the enigmatic, brightly coloured, little fish within. We have, but then we've done a lot of gazing at the so called "millions fish" over the past few years.



Male guppies selected for extreme body size in experiments studying the genetics of life history traits

The fish you see at Treborth have come from a wild population which, although common as a mosquito-quashing introduction world-wide, are endemic to only a small area of Southern and Central America and the Caribbean island of Trinidad. It is on Trinidad that they have been found in such high numbers that they have been given the local name of "millions fish". They are better known by one of the people who discovered them, the Trinidadian naturalist R.J. Lechmere Guppy, their Latin name being *Poecilia reticulata*. You might have grown to know a guppy or two by way of a tropical fish tank. We have bumped into many whom, on discovering the subjects of our research, have gloried in the recounting of their own experiences of these character-full fish. The wild guppy is certainly no less colourful

in manner but is perhaps a bit less vibrant in the tail. In fact, wild female guppies are just a dull brown-grey and the males may not have the elaborate patterns seen in their domestic counterparts. This hints at a reason for their success as a model research organism.

Guppies on Trinidad live within a natural experiment. Their habitat, in rivers flowing down from the mountain range in the north of the country, varies in the level of predation risk along its length. Guppies living in the higher reaches experience relatively low levels of predation from other fish, whereas those living lower down the river suffer much higher levels of predation. Guppies from the two differing areas have been shown to vary widely in physiology, morphology (including male colouration), life history and behaviour. The guppy has been a popular model system for many decades, providing valuable insights into other important subjects such as sexual selection and the development of familiarity and co-operation. These fish have been the subject of interest for two of us PhD students at Bangor over the past few years. One of us has been engrossed in deciphering how individual guppies interact in their social environment. The other has been mimicking the action of fisheries on several generations of these fish, to try and understand how fisheries affect the body size and genetic lay-out of fish in general.

You'll not be surprised to find that animals exhibit personalities, if you have spent any significant time in their presence. They're not measured in the same way as our human personalities. Instead, individuals are tested in a particular situation over time and assigned a measure (their behavioural type) along a continuum of behaviour. All sorts of creatures have been found to exhibit behavioural types from crows to chimps and squid to spiders. The bold-shy continuum is a major behavioural axis, indicating an individual's reaction to risk, bold individuals being risk-prone and shy being risk-averse. As you can imagine, the mix of personalities within a group can influence the behaviour of individuals and the group as a whole. Because female guppies tend to show more stability in terms of their shoaling partners and habitats than males (who are almost wholly concerned with mating, once they reach adulthood) much of the work investigating the pattern of social networks in the guppy at Bangor has been on adult females. This research has found that bold female guppies tend to interact mostly with shy guppies and vice versa. It appears that shy females might be leading this social pattern, as findings also showed that shy females exhibit a preference for bold females when given the choice, whereas bold females show no preference. Shy females have, elsewhere, been shown to follow bold females to a novel food and so have been likened to scroungers and the bold as producers, which are better at discovering food patches. If this is the case, then the disruption of this social patterning would be likely to interfere with the ability of the shy females to acquire food. Interestingly, the work carried out here has also shown that shy females showed a greater reduction in

weight gain when males were present. Male harassment has major impacts on females and, in the guppy, has been shown to disrupt female social interactions, foraging, anti-predator behaviour and energy levels, so is an extremely important social pressure. Much more work needs to be carried out, as is always the case with research, but there is no doubt that understanding the behaviour of individuals within their social environment is an exciting avenue of research and has been enhanced by work using these important little fish.

Besides showing such intricate behavioural patterns, guppies are also famous amongst scientists for their adaptations to the different levels of predation in the wild, in particular adaptations in their life history. It has been shown in the past that predation causes them to invest less in growth and more in reproduction. Or in other words, when the risk of being eaten is high, they mature at younger ages, produce more offspring and don't grow as large as their counterparts that don't have to deal with such a high mortality threat. These differences remain when you bring the fish into the lab and rear them in identical environments. This shows there is a genetic basis to these differences and indicates natural selection by predators has resulted in adaptations of life history strategies. Previous work has shown that the "millions" fish can rapidly adapt to changes in such a predation regime as well. Here in Bangor we have made use of this interesting capacity by breeding wild guppies in different selection lines where fish get to breed strictly depending on their body size. In a way, we have mimicked predation in the wild and induced rapid evolution of fish in the aquarium. In just a few generations of selective breeding we have created increasingly small guppies in some lines and increasingly large ones in others. Having these strongly divergent lines we are now in the process of identifying genetic differences between them and try to find out what is the genetic basis of this strong response to size-selective harvesting. Interesting for guppy biologists, but also from a fisheries point-of-view, because the selection by predators on wild guppies and in our selection lines, is similar to the selection enforced on exploited fish populations by commercial fisheries and it is a good model system to help understand rapid evolutionary change in marine species.

So you see there is a lot more to these little fish besides them being such busy little fish to watch. Their behaviour, interactions and evolutionary dynamics are all topics of intensive research by many researchers worldwide. There is even an international conference series and books dedicated to them. They've taught us a lot so far and, no doubt, will continue to do so in the future. So next time you visit Treborth, perhaps you'll now look down into the tropical pond and imagine yourself watching a fast acting, evolutionary, soap opera. You'll be gripped.

Serinde van Wijk and Dawn Thomas, Biological Sciences and STAG

Current Approaches and Equipment Used in Tree Risk Assessment

Tree Risk Assessment & Management

Trees have been an integral element of designed and urban landscapes throughout history. Trees were planted in ancient Persian towns in order to provide shade and were furnished with irrigated pits which diverted rainwater to the roots. More recently, trees were planted in the UK during the industrial revolution in order to intercept airborne particulates from the mills in urban areas. The value of the ecological services which trees provide have long been recognised, with the occasional tree-related safety “incident” being an acceptable cost to bear for the benefits imparted.

Indeed, there is little in the literature considering the potential risk posed by trees until the 1990s, with a significant increase being seen in recent years as legal charges and settlements from litigation from tree-related incidents have greatly increased. In that time there has been a commensurate increase in interest in the development of a reliable set of tools to assess the risks presented by mature trees.

Tree Assessment Methodologies

A recent study (Norris 2007) looked at 23 different systematic approaches to tree hazard assessment currently in use in North America, the UK and Australia. These systems vary in detail in their approach, but they generally share an underlying set of assumptions, which was first outlined in a simple form in the early nineties (Matheny & Clark, 1994), and is known generally as the Visual Tree Assessment (VTA) approach. These general principles are that the risk, which a tree may present, is a function of the following factors:

1. The presence of persons or property near the tree which it might affect (a target);
2. The presence of a defect in the tree, and the likelihood of that defect leading to failure;
3. The likely severity of such a failure.

Subsequent attempts to provide a methodology for tree risk assessment have had as a major, if not a prime objective, to make the resulting scoring of a range of inspectors as consistent and replicable as possible. The study cited above (Norris 2007), would suggest that such an exemplary approach has yet to be developed, such is the subjectivity of the inputs into each of the assessment stages that regardless of whether ordinal values or probabilities are used, variances from assessor to assessor are inevitable.

Improving Assessment Tools

With inherent inevitable subjectivity of the VTA approach being recognised as the chief source of inconsistency in tree assessment, there has been a move, over the last 20 years or so, to develop tools and techniques which will provide empirical

and objective data, to better inform such assessments. We will briefly discuss the two main devices used by Fairley Arboriculture, the IM Resistograph and the Picus Sonic Tomograph.

One of the first instruments to be developed specifically to assess the internal condition of trees was the **IML Resistograph**, developed by Dr Claus Mattheck, a highly -esteemed German engineer who has studied the mechanical properties of timber and other living materials, and the German instrumentation firm IML in the early nineties (http://www.imlusa.com/html/iml_resistograph.html (accessed 08.08.2011)). The Resistograph (and a number of similar instruments) works on the principle of a very thin drill bit, when forced at an equal rate into a tree stem, will offer variable resistance depending on the strength of the timber encountered. The output from this device is a variable strength trace on the Y-axis of a graph, with the x-axis indicating the depth of the drill penetration. The strengths of this device are that it is relatively easy to set up, is very portable (the author has used this device 15 metres up a tree from a rope and harness) and provides instant results. The downsides are that it only provides a linear reading along the path of the drill (pockets of decay can be missed) and that the graphical outputs, while straightforward to a trained and experienced practitioner to interpret, may be difficult to explain to a client.

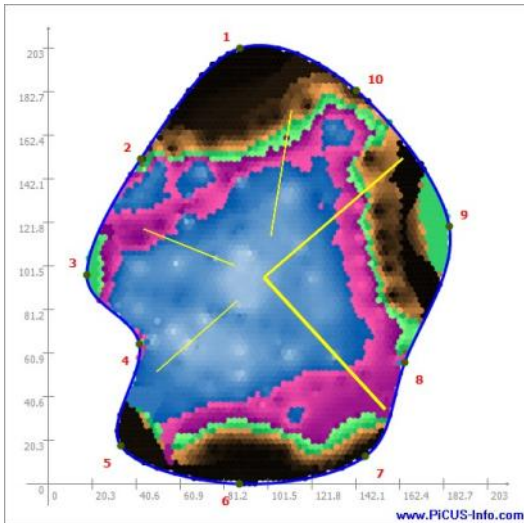
The **Picus Sonic Tomograph** was developed by German Electronics Firm Argus -Electronic and launched in 2000 (<http://www.argus-electronic.de/index.php/en/picus-sonic-tomograph> (accessed 08.08.2011)).



The device employs the same principle as tomography instruments developed for the medical imaging industry whereby the speeds of sound waves propagated between known reference points are measured. In order to take a reading, 10-12 sensors are set up around the tree and are attached to a large processing device and a weatherproof laptop. Sound waves are then produced by tapping the 10 sensors in turn, which then allows the software to build up an increasingly detailed picture of the inside of the tree. Research has shown the device, when used correctly, can produce highly accurate results (Gilbert & Smiley 2004, Schwarze *et al.* 2004).

Surveyor undertaking a Picus survey of a diseased beech tree in a churchyard in Penrtraeth

The 2-dimensional, full-colour section of the tree which the device and the sophisticated software produces are one of the Picus's key strengths. While it must be borne in mind that the Picus image is just one of the many pieces of information which the tree assessor is mindful of while risk-assessing a tree, it can provide compelling and revealing information about the internal condition of the stem, and allows other factors, such as crown condition, tree size age and specie, location etc, to be seen in context.



Actual Picus from that survey

In practice, and against personal expectations, the device, far from revealing other hidden faults and shocking decay, has allowed our firm to take a far more nuanced approach to tree risk assessment than we might otherwise be able to. We are able to assess the internal extent and progression of decay over time, rather than relying solely on the presence and size of fungal decay sporophores to determine the time to remove a tree. In many cases, reduction or retrenchment of a tree can be prescribed, which may allow time for replacement trees to become established, thereby lessening the sometimes drastic

alteration to a space which results from the removal of an established tree.

**Scott Fairley MSc(for)
Principal of Fairley Arboriculture & Landscape Planning**

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Madam Chairman's Secret 'Gems'

I am a passionate recorder of 'Grassland Fungi' and I am constantly on the lookout for new sites. This may seem an easy task with the acres of pasture available in Caernarfonshire and on Anglesey but sites where these particular fungi can be found are now quite rare. The Grassland Fungi, which comprise the Clavarioids (Fairy Clubs), *Hygrocybes* (Waxcaps), *Entolomas* (Pinkgills), Geoglossaceae (Earthtongues), *Dermolomas* (Crazed Caps) plus others, are commonly known as the 'CHEGD' suite of species. Although these groups are unrelated they all have similar ecological requirements and are very sensitive to any land improvement, especially the use of fertilisers. Most agricultural grassland, particularly in lowland areas has been improved now by ploughing, reseeding and fertilising and these fungi will have consequently disappeared long ago. In many lowland areas they may only persist in places like the grounds of stately homes, churchyards and cemeteries which although restricted in area can act as oases and be the 'last resting places' for the 'CHEGD' fungi. The importance of these sites is now being recognised; the grass there generally remains unimproved, receives no fertiliser or other chemicals and they are usually cut periodically with the clippings removed thus mimicking natural grazing regimes. Some of my richest mycological sites are well-maintained churchyards, with mossy, herb-rich turf. This is the situation locally and although I can still find unimproved upland pastures to record from and churchyards etc, there are very few suitable lowland fields.

So imagine my pleasure a few years ago when I noticed a stand of large red



-capped fungi while running past a local field, only a mile from my home in Felinheli. I climbed over the gate to investigate, (I admit to trespassing on this occasion!) and yes, they were as I suspected the large and showy fruit-bodies of the Crimson Waxcap, *Hygrocybe punicea*. This is one of the largest of the Waxcap fungi and very distinctive with its waxy, crimson or blood red cap and yellow fibrous

Crimson waxcap (*Hygrocybe punicea*)

stem or stipe. It occurs fairly late in the autumn and is regarded as an excellent indicator species of unimproved grassland. A few species of Waxcap are a bit more

tolerant but this species will disappear very quickly following any intervention and it only occurs on the very best quality sites. Even if use of fertiliser is curtailed it could be decades before any of the best 'Class A' species like this re-appear if ever.

I made enquiries and was really pleased to find that I knew the land graziers – none other than Judith and Peter Hughes, and I readily got permission from them to survey the field. It has proved to be a real gem of a site! I have recorded a total of 20 Waxcaps, 5 Fairy Clubs and 7 other species on the field and this total will probably continue to grow over time. Fungi are unlike plants and do not appear every season or at the same time in the autumn and are quite dependent on weather, especially rain and temperature, for their fruiting. They exist as fungal mycelia in the soil and the mushrooms that we see and record are equivalent to apples on a tree and they produce the fungal spores for dispersal. I have now been recording from the field for 4 years and each year the site list has been added to as new species are discovered.

Why is this field so rich in fungi when nearby fields have none? This is possibly easy to explain. The field is north facing and very steep, particularly at the eastern end and it has probably been historically impossible to either fertilise or plough with a tractor due to the severe gradient. (The western end is less steep and supports fewer species so may have had a little improvement at some time?) Judith and Peter are also advocates of natural grazing systems and the field is sheep grazed intermittently throughout the year so the grass length is kept fairly short and there is no poaching. The fungi obviously agree with the management and each autumn they fruit in large numbers if weather conditions are right.

The field is richest for its Waxcap assemblage. They are so called because of their waxy appearance and texture and are in general some of the showiest and brightly coloured of all fungi and include species with red, orange, yellow and pink coloured fruiting bodies. They are very charismatic and have been called the 'Flowers of the Field' and they do indeed look like flowers or jewels in the grass when fruiting in large numbers. Most importantly the list of Waxcaps recorded in the field includes 3 of the best 'Class A' indicator species, (plus a 'Class A' Fairy Club and Pinkgill), and some of the more common, less fussy 'Class C' species are found infrequently - a real quality site (see Table for full list).

Each year from September and right on in to November, the field is studded with a succession of species including large numbers of the yellow Golden Waxcap, *Hygrocybe chlorophana*, and groups of the bright red Scarlet Waxcap, *Hygrocybe coccinia*, which poke out between the blades of grass. A common, but very pretty 'Class C' species called the Parrot Waxcap, *Hygrocybe psittacina*, is very attractive with caps in a mixture of greens, yellow, pink and are slimy so shine in

sunlight. The Meadow Waxcap, *Hygrocybe pratensis*, is a large species with a dry orangey cap and has gills which run down the stipe (decurrent). It is the only species regarded as being good to eat but I would always rather just enjoy them in situ. One of the first species to appear is the Fibrous Waxcap, *Hygrocybe intermedia*, a beautiful fungus with a dry, bright-orange fibrous cap and it is often accompanied at this time by the greenish-yellow Citrine Waxcap, *Hygrocybe citrinovirens*. This is a fairly large species with a pointed cap and contrasting white gills and both species occur here in relatively small numbers. The brown-capped Nitrous Waxcap, *Hygrocybe nitrata*, can also appear early and is distinguished by a strong nitrous smell. It is always found singly or in small numbers in contrast to some of the other waxcaps and a single specimen of this 'Class A' species was recorded in 2008.

Grassland Fungi 'CHEGD' species, recorded on Field 2007 – 2010

Species	English name	Classification as Habitat
CLAVARIAS (5)	FAIRY CLUBS	Indicators (A highest)
<i>Clavaria amoenoides</i>	A Fairy Club	A
<i>Clavaria fumosa</i>	Smoky Spindles	B
<i>Clavulinopsis helvola</i>	Yellow Club	C
<i>Clavulinopsis laeticolor</i>	Handsome Club	C
<i>Clavulinopsis luteoalba</i>	Apricot Club	C
HYGROCYNES (20)	WAXCAPS	
<i>Hygrocybe calyptriformis</i>	Pink Waxcap	B
<i>Hygrocybe cantharellus</i>	Goblet Waxcap	B
<i>Hygrocybe ceracea</i>	Butter Waxcap	C
<i>Hygrocybe chlorophana</i>	Golden Waxcap	C
<i>Hygrocybe citrinovirens</i>	Citrine Waxcap	B
<i>Hygrocybe coccinea</i>	Scarlet Waxcap	C
<i>Hygrocybe conica</i>	Blackening Waxcap	C
<i>Hygrocybe flavipes</i>	Yellow Foot Waxcap	B
<i>Hygrocybe glutinipes</i>	Glutinous Waxcap	B
<i>Hygrocybe insipida</i>	Spangle Waxcap	C
<i>Hygrocybe intermedia</i>	Fibrous Waxcap	B

<i>Hygrocybe irrigata</i>	Slimy Waxcap	B
<i>Hygrocybe nitrata</i>	Nitrous Waxcap	A
<i>Hygrocybe ovina</i>	Blushing Waxcap	A
<i>Hygrocybe pratensis</i>	Meadow Waxcap	C
<i>Hygrocybe psittacina</i>	Parrot Waxcap	C
<i>Hygrocybe punicea</i>	Crimson Waxcap	A
<i>Hygrocybe quieta</i>	Oily Waxcap	B
<i>Hygrocybe reidii</i>	Honey Waxcap	C
<i>Hygrocybe virginea</i>	Snowy Waxcap	C
ENTOLOMAS (5)	PINKGILLS	
<i>Entoloma chalybaeum</i>	Indigo Pinkgill	B
<i>Entoloma conferendum</i>	Star Pinkgill	C
<i>Entoloma jubatum</i>	Sepia Pinkgill	B
<i>Entoloma kernervii</i>	A Pinkgill	A
<i>Entoloma papillatum</i>	Papillate Pinkgill	C
GEOGLOSSACEAE (1)	EARTHTONGUES	
<i>Geoglossum fallax</i>	An Earthtongue	C
DERMOLOMA (1)	CRAZED CAPS	
<i>Dermoloma cuneifolium</i>	Crazed Cap	B

A favourite of mine is the Blushing Waxcap, *Hygrocybe ovina*. This is a dull, chocolate-brown coloured species often with a pitted cap and derives its name from the way the flesh and gills flush a pinky-red when cut or bruised. My preferred name (coined by me) is the 'Sheep Turd Fungus' as they are dead ringers for sheep droppings and are actually quite difficult to spot in sheep grazed pastures. Despite all the survey work in recent years this remains a rare 'Class A' species and it occurs in small numbers but is widespread on the field. The beautiful Pink Waxcap, *Hygrocybe calyptriformis*, puts in a regular appearance; only 'Class B' but still regarded as a good flagship species for public surveys. It was the subject of the Pink Waxcap Survey a few years ago because its distinctive dusky-pink coloured, pointed cap, a cap rim which splits, and white stipe make it unmistakable. Its other name is 'The Ballerina' which is much more descriptive and it is always a pleasure to see. In 2010 *Clavaria amoenoides* was recorded for the first time. This 'Class A' Fairy Club was not on the British List in 2005 when I found it in a Caernarfonshire

churchyard. It has been recorded at a few other sites locally since then but remains very rare/uncommon so it was an excellent addition to the list.

Some of the last Waxcaps to appear are the Crimson Waxcaps, most impressive because of their size and the large number present on the steep eastern slope of the field. They persist right up to the frosts of early winter and I have this species to thank for my discovery back in 2005 of this 'Gem of a Site'. Sadly such lowland sites are now rare but hopefully this one will remain an oasis for a long time to come. My thanks go to Judith and Peter for allowing me to visit the field.

Postscript

If any reader has these fungi appearing in their garden or land this autumn and would like them identified, I would be happy to pay a visit.

Debbie Evans, Mycologist



Cofnod – your Local Records Centre



Wild Daffodils, by Richard Gallon, Cofnod

Cofnod? One of the first questions, certainly outside of Wales, is always, what does our name mean? It is the Welsh word for record. Next, 'what do you do?', what is a 'Local Records Centre?', 'will you take my old vinyl albums?!' It's difficult to explain the concept, as our office consists of 6 desks and associated PCs plus a few filing cabinets. Nothing to really grab the imagination, although our walls are plastered with posters of the wildlife that we are working towards conserving and

occasionally get outside to see. We have a very small team of 4 permanent staff members, which is enhanced through regular volunteer involvement either in the office or by remote working, and also occasional short term contracts. Although we cover the whole of North Wales, including six counties and Snowdonia National Park, we really are local to Treborth Botanic Gardens, as we are based within walking distance at Parc Menai.

What do we do?

Our main aim is to bring together, into one database, the vast amount of information which has been, and is being, collected on wildlife distribution in North Wales. The scale of the task itself is impossible to quantify, as this information stretches back through time and is increasing daily as one-by-one new records are created by a huge number of different people. The information may be held on paper or in a wide range of different electronic formats, with some of these being quite difficult to extract data from in a useable format. As a relatively young organisation (set up six years ago) we have so far prioritised bringing in electronic data, as entering data from paper records takes a considerable amount of time, but staff and volunteers have already managed to extract large numbers of valuable records from important paper datasets. The Cofnod species database now holds over 1 million records - still only a small proportion of the data that we know is out there. We also hold a range of information on the location of habitats, sites with statutory protection and locally designated Wildlife Sites.

What happens to the data once it is collated into this vast database? It is supplied to various decision makers, including public bodies like the Countryside Council for Wales and the Environment Agency, local planning authorities and ecological consultants, who finance our existence through various ongoing agreements or one-off payments for services. Depending on the conservation status of the species concerned, a record submitted to us may find its way onto one of our weekly planning list screening reports for example, and is labelled so that the data user can access information about the dataset to which it belongs through the Cofnod website. Our '**Data We Hold**' page is a good place to browse details on what information we hold and see the wide variety of individual recorders and organisations who supply data to us, and upon whom we are ultimately reliant in order to fulfil our aim of making high quality wildlife data available to decision makers.

Accessing distribution data

We are currently developing a facility which will enable data suppliers and members of the public to view distribution data we hold on individual species - look out for 'Wild Web Gwynedd' in the near future! We hope that this will stimulate record submission – there is nothing as effective as seeing a blank spot on a distribution map for encouraging us to share our knowledge of a particular area.

Training, surveys and other events

Cofnod has an online ‘**Calendar**’ with details of many events, surveys and training courses which are of relevance to recorders in North Wales. We also send out regular email digests with details of what is to happen over the coming month or so (you’ll need to register on our website to receive this). We would be delighted to receive details of any events which you would like us to advertise.

Treborth Botanic Gardens have been extremely helpful in providing an ideal venue for a small number of taxonomic identification courses which Cofnod have organised – this year Debbie Evans and Oliver Prys-Jones delivered two very interesting courses on Rust fungi and Bumblebees respectively. We hope to organise more such courses over the coming years as one of our roles is to support recording within North Wales, so please contact us if you have suggestions for particular topics (we tend to concentrate on species groups where we don’t believe training is being provided elsewhere in North Wales).

The importance of local experts

County Recorders and other local species experts are especially important to Cofnod, not only in terms of supplying data of a known quality, often collated from a large number of individual recorders, but also in helping us maintain high quality standards throughout our database. To date we have relied upon their involvement in checking ad hoc records submitted to us, but we will very soon be making all relevant data for their particular area and species interest available to them for their reference and also, where possible, to allow them to identify any data quality issues. All of these local experts are volunteers, often working on behalf of a National Scheme or Society, and have also helped with a number of recent ‘BioBlitz’ events, where members of the public can be enthused about recording any number of different species groups. Our hope is that some of these people will be inspired to start recording the wildlife they observe, and to submit these records either directly to us or to their local County Recorder (whose details can be found on the Cofnod website on the ‘**Submit Records**’ page).



Waxwing (*Bombycilla garullus*)
Copyright Laurence Clark, Castle
Vision Photographic

Observe, Record and Share using Cofnod’s Online Recording System!

Our systems for data collation and storage have been developed to take advantage of recent opportunities for information sharing using the internet. We encourage recorders to submit records to us using our Online Recording System

(one of the first of its kind), which allows someone to submit a record of any species to us from anywhere they have internet access. That record will be made available almost immediately to the relevant County Recorder for checking, and after that it will be ready for use in the Cofnod database. The original recorder will be able to log back in and see any of their records at any time – they will also be able to view all or a sub-set of their records on an online map.

This is the ideal data supply route for us, as we do not have to spend time re-formatting electronic data to make it suitable for our database, and neither is there any possibility of mis-interpretation of handwriting, meaning etc while entering records onto computer from a paper format. We have been working with various groups and individuals to help customise the online data entry process for them, which means that the proportion of records we receive using this system is increasing steadily. It is a popular option for someone who does not want all the complications of maintaining their own database. We would welcome any of your records, whether you choose to submit them using the Online Recording System, by email, post, phone or through the County Recorder system. See the '**Submit Records**' page on our website for more details.

Contact details and acknowledgements

For more information on Cofnod please visit our website at www.cofnod.org.uk, contact us on 01248 672603 or by email contactus@cofnod.org.uk.

The photographs associated with this article were all provided freely to Cofnod and can be viewed together with many others on our website (visit the '**Gallery**' page). Please send your wildlife photographs to us if you'd like to share them with others.

Aisling Carrick, Data Manager, Cofnod



Kind hearts are the garden,
kind thoughts are the roots,
kind words are the blossoms,
kind deeds are the fruit.

John Ruskin

Botanical Beats 2011



‘We’re getting the hang of this, you know...’

If Botanical Beats was not established as one of the best days out in North Wales on the 4th of June 2011, then it surely must have been by the 6th. This year’s Botanical Beats was our biggest and best yet, surpassing even the supposedly not-to-be-equalled event of 2008, which raised £3500 for the Garden. Botanical Beats’ combination of a family-friendly music and arts festival with a fascinating extravaganza of biodiversity, and of course its venue, make it truly unique.

This year’s event again spread performers across three stages, with the Main and Cabaret stages on the lawns, and a more intimate Courtyard stage between the glasshouses. John Steele, managing the Cabaret Stage, remembered being slightly alarmed when he noticed the size of his stage’s audience an hour into the event and thought that the band on the Main Stage must have been playing to an empty field. This might have been the case in previous years, but it soon became apparent that the huge audience in front of the Cabaret stage was in fact dwarfed by the crowd in front of the Main! Owing to the relocation of the tea and cake shop (which, incidentally, made over £1000 during the day) from the lab to the lawn above the rock garden, the Courtyard stage at times did not get quite as much attention as it deserved, but the organisers will think hard about how this can be addressed next year. Nevertheless, the acoustic performances in the courtyard were very much appreciated by those who came to sit and listen.

This year we welcomed some new exhibitors and performers in an expanded range of extra-musical attractions. “Dr Zig’s Dragon Bubbles” delighted children and adults alike with their giant floating bubbles, which no-doubt occasionally challenged performers with their mesmerising effect! Anyone who was particularly taken by the bubbles may be interested in Dr Zig’s mail order store at www.drzigs.com.

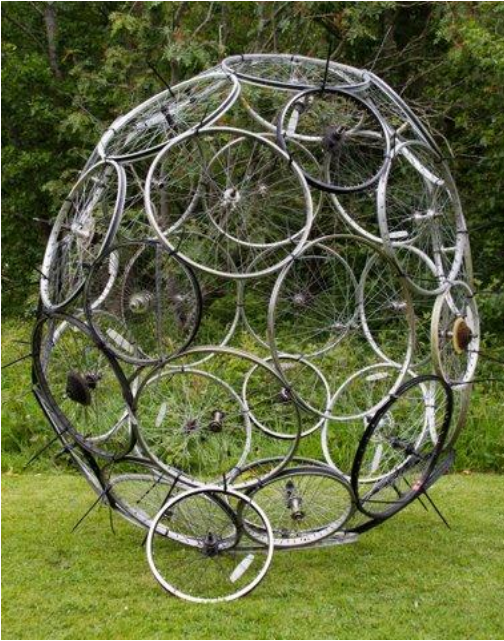


Gwynedd Axemen make short work of a large log

Also new for 2011 were the Gwynedd Axemen, who pitted chainsaws against axes, two-man saws, and bigger – than - average biceps, with occasionally surprising results! However, their show didn’t just consist of brawn – as well as racing through logs faster than one might have thought possible, the Axemen gave a demonstration of chainsaw carving, and left us with several carved children’s chairs, as well as plenty of kindling!

Another organisation making its first appearance at Botanical Beats was Recycle Cycle Cymru, a Bangor-based initiative which saves unwanted bicycles from landfill or scrap and repairs them to be used again. The refurbished bicycles are donated to local charities and to individuals on low incomes. As well as publicising their work, Recycle Cycle Cymru created some unique bicycle-based sculptures for us. If you have an unwanted bicycle and would be interested in donating it to Recycle Cycle Cymru, see their website

www.recyclecyclecymru.net.



Sculpture made from spare bicycle wheels



Jo Dulat with arthropod friend

Our collaboration with Wales Biodiversity Week has become one of the defining features of Botanical Beats, with a wide range of organisations from across the region coming with displays, live animals, and things to make and do. Visitors were able to make bird feeders, see and handle live mammals and reptiles, and find out about the biodiversity of our area. Special thanks must go to Laura Jones and Lowri Roberts, Biodiversity Officers from Gwynedd and Anglesey County Councils respectively, who between them made the biodiversity side of the event happen. Without their help we would certainly not have hosted such a broad range of wildlife-related organisations, and the success of Botanical Beats clearly owes a lot to Laura and Lowri's input. For more information about Wales Biodiversity Week, see the Wales Biodiversity Partnership website at www.biodiversitywales.org.uk.

The musical line-up was as eclectic as ever, ranging from ska through rock to folk and jazz. Special thanks are due here to Roger Hughes and John Steele, our "music men" who booked bands for the event and without whose insider-knowledge of the local music scene Botanical Beats would not be possible. Just as Laura and Lowri make the biodiversity happen with no effort on our part, so John and Roger make the music happen for us. It wouldn't be possible without them!

Two ensembles which are perhaps those most closely associated with Botanical Beats made slight changes from

the format of previous years. The Bangor Community Choir bravely gave a performance down by the Butterfly Border, away from the centre of the event. This experiment paid off, with a large audience enjoying the unique atmosphere of the alternative venue. Our very own Treborth House Band came of age by finally headlining the main stage, this time in a much augmented format; regulars Jackie, Davey, Doug, Chris, and Adam were joined by Ben Thompson (percussion), Adam Pearce (piano and a variety of questionable synths) and Ellen Stevens, Mitch Bradley-Williams, Rachel Bolt and Johanna Illers in the brass section, as well as a motley crew of other hangers-on (“backing vocals”). They were ably supported throughout rehearsals and during the event by their roadie and tech-guy, Pete Wieland.

Certain developments “behind the scenes” helped to make this year’s event the success it was. One of the most important of these was the fact that we were able to secure funding to employ Jack Fairhead, a graduate of Durham University, on a six month work placement. Jack worked as an administrator to help organise Botanical Beats and other events at Treborth. Jack was a huge asset to the Garden during his time here, as his considerable IT and design skills filled a significant gap in our talent pool. Another development that has taken place of the last few years is the steady growth of the event’s positive relationship with the University. This has been mediated in no small way by John Latchford, the Health and Safety Officer for the College of Natural Sciences. Health and safety is of necessity one of our greatest considerations when we are planning the event, and John is therefore someone with whom we have extensive dealings. We have always been extremely grateful for his “can-do” attitude and willingness to consider any problem and work with us to find a solution to it.

We received a very welcome input of volunteer help on the day from several graduates of the Kew Diploma in Horticulture, who had spent a week-long field course with Nigel earlier in the year, and had been so taken with Treborth and what goes on here that they had decided to come back for the event. They were willing to get stuck into anything, from directing traffic to helping Nigel give tours of the Garden. It is good to see that we are successfully building relationships with Kew on all levels, both professional and personal.

Our own students also put in a huge amount of volunteer time – before, during, and after the event. Both the incumbent and elect STAG committees worked hard to recruit volunteers and to run children’s activities (ranging from pond dipping to paper making) on the day.

It seems that most of the last few years have been marked out as significant in some way, and this one is no different. The House Band’s first headline performance was, unfortunately, also its last, at least for the time being, with Jackie leaving, Doug emigrating, Drummer-Adam graduating, and Chris and Ellen going off to get married (congratulations guys!). Jackie’s departure is

particularly significant, as it has been her more than any other individual person who has made Botanical Beats what it is. Jackie's energy, effort, and infectious enthusiasm for making Botanical Beats such a success will be hard to replace, but those of us who remain, and of course those who join us over the next year, will do our very best to maintain and build on what we have achieved already.

As anyone who was there will remember, this summer's Botanical Beats was something of a "perfect storm". We had capitalised on five year's experience to execute our most thorough planning and publicity campaign to date. Coupled with dry weather on the day, and an all-round determination that the event was going to be the best yet, we drew in over a thousand attendees and made over five thousand pounds for the Garden. The final thing that must be said is that Botanical Beats happened as a result of a huge effort on the part of a huge number of people, not just the handful singled out here. Everybody who was involved before, during, or after the event can consider this to be their success. Thank you, and see you next year!

Jamie Stroud



And finally...

..an appeal. As many of you know we now own two large marquees that have been used very successfully for several events, not just Botanical Beats, and are starting to earn money for the Garden. We use carpet to help protect the lawn in the marquees, but we have had to dispose of the carpet we had as it had got damp and was beginning to go mouldy. This carpet was acquired after the University Summer Ball, and would have otherwise been thrown away (seems very wasteful to me, but apparently this is standard practice for such events). We know we can acquire the carpet from next year's Summer Ball in time for Botanical Beats, but we have an event coming up on the 4th October when the Vice Chancellor of the University is coming to officially open the Coastal Path. We will need to use both of the marquees on the lawn, which will almost certainly be wet and will need protecting.

Does anyone have any carpet they could donate? Large pieces would be preferable, and if you have some you had earmarked for compost bins or similar, we are happy to return it after the event, but we can't guarantee it will be very clean, so please don't consider letting us borrow your best Persian rug!

If you can help, please e-mail petewieland@gmail.com or phone 01248 370551

Pete Wieland

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