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Front cover : Purple Saxifrage 'Ruth Draper' cultivar, *Saxifraga oppositifolia*,  
on Treborth Rock Garden March 2010  
Photo by Paul Lewis



## Editorial

It is now late March and winter (a long hard one but more normal to those of a certain age) is firmly behind us. Spring is here and many people are busy, not only in their own gardens, but at Treborth making preparations for our 50<sup>th</sup> Anniversary Celebrations in June. By the time you read this, June will be just around the corner. You can read about the week's events further on in these pages.

We very much hope that you will be able to take part in this time of celebration, whether it be making cakes for Botanical Beats and the Alumni Day, or helping to get the Garden looking beautiful. Of course, we hope to see you at Treborth during that week too.

The Botanic Garden is a very important place to so many people: Friends, volunteers, students studying for degrees and volunteering as well, schools and the wider community. It is hugely important for its plants, animals, birds, insects and all other natural life. Although its development has been spasmodic over the last 50 years, we hope we can look forward to sustained development in the future.

Unfortunately, we aren't able to provide an update on the future use of the Rhizotron in this issue. We had hoped that Professor Tom DeLuca would have more details but he has not yet had a decision from NERC about his funding bid for the project. More news next time maybe...

We are hopeful, with the help of our supportive Professors Hawkins, Turner and DeLuca and their staff, that we can take a secure Treborth on from this 50<sup>th</sup> year to a bright future.

**Judith Hughes, Chairman**  
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## A History of Treborth Botanic Garden

Living plant collections were once a commonplace and vital accessory for university botany departments and in Bangor during the 1950s this service was provided by a collection of glasshouses positioned on the science campus at the base of Glanrafon Hill behind the Thoday Building. As the then School of Botany grew so too did its ambitions for a Botanic Garden worthy of its international status in plant systematics and plant ecology. Professor Paul Richards, Head of the School and a world authority on rainforests, championed the establishment of a sizeable Garden on the present site by the Menai Strait and won the support of no less a botanical heavy weight as the Director of the Royal Botanic Gardens, Kew, Sir George Taylor. The University College of North Wales as it was known then, finally acquired, in January 1960, 40 acres at Treborth for the establishment of a botanic garden to provide plants for teaching and research.

The first curator, Barry Shearman, set about planting part of the land at Treborth to the north of the main drive known previously as the Black Sheep Field and clearing areas of dense mixed woodland to the south of the drive including the site for the main building and glasshouses. Three of the glasshouses on the original Thoday site in Bangor were moved up to Treborth in the early 1960s and are still standing as the present Tropical, Temperate and Orchid Houses. Now in their 7<sup>th</sup> decade they have served the university well.

In 1965 Len Beer took over as Curator; an outstanding plantsman and plant collector, Len had honed his skills at Cambridge University Botanic Garden and quickly established a diverse range of plant species at Treborth. These included notable collections of alpinists, Himalayan plants and Mediterranean species, many as a direct result of Len's own plant hunting expeditions. Senior members of staff in the School of Botany, principally Professors Paul Richards, Peter Greig-Smith and Bill Lacey, contributed significantly, helping ensure



that a fine teaching collection evolved with strong representations of orchids and other monocotyledons, as well as major phyla of evolutionary importance such as cycads and ferns.

In order to accommodate the burgeoning plant collection another large detached glasshouse was erected in 1966 to the east of the original trio involving yet more scrub clearance. A remarkable insight into the techniques of the time recently came to light in the form of photographs showing the laying of explosive charges by gardeners in the mid sixties beneath awkward tree stumps on the site of the present Small House (originally an orchid house donated to Treborth by a grower in Colwyn Bay) - ironically we are faced with exactly the same problem right now just metres away from the sixties blast site, this time in the form of an immovable elm stump – but these days explosives are not an option unfortunately and some of the sheer excitement of gardening has been lost!

Len worked tirelessly on both the indoor and outdoor plant collections assisted by a happy and talented team of gardeners which at its peak numbered six, some of whom also worked at Pen y Ffridd, a plant research station established by the University at the same time a kilometre south near the present day hospital, Ysbyty Gwynedd, to provide teaching and research facilities for staff and students studying agricultural botany.

Under Len's direction, a tropical pond fit for the giant Amazon Water Lily (*Victoria amazonica*) was constructed in the present Temperate House in 1967. Famously the young daughter of the then landlord of the Antelope Pub by the Suspension Bridge was photographed sitting on one of the waterlily leaves. It was surrounded by collections of *Begonia*, *Philodendron* and other aroids, *Allamanda*, *Hibiscus*, and plentiful Marantaceae and Commelinaceae. The southern end of this house accommodated Ferns and Cycads galore, the present *Cycas revoluta* being one of the prominent specimens and now the oldest plant in the collection (approximately 75 years old). The northern end accommodated a diverse collection of epiphytic orchids many collected by Len on his excursions abroad as well as material collected by Profs Greig-Smith and Richards.

The present Orchid House functioned as the main propagation unit but also accommodated many carnivorous plants including splendid Bladderworts (*Utricularia*). The present Tropical House held a wide range of plants including fruiting bananas and palms set in a central bed with perimeter benching displaying a varied teaching collection covering prominent subtropical and warm temperate species. Cacti and succulents were grown in what is now the Cool House.



Helen Cornell with blasting material - 1965



*Amazon Water Lily 1967*

Outside plantings of specimen trees and shrubs took off under Len's curatorship, most notably with the establishment of diverse collections of *Cotoneaster* and *Olearia*, *Cistus* and *Elaeagnus*. Sadly many of the original plantings have succumbed to disease and/or natural senescence. An extensive rock garden took shape in the early seventies mainly to

accommodate some of Len's favoured alpines including many gems from the Himalaya and the European mountains. Herbaceous borders were established on the approach to the main building, roughly where the *Betula celtibirica* stands today and an important collection of shrub roses were increasingly prominent below the rock garden as botanists in the Department

researched seed dormancy in Rosaceae and developed a novel so-called 'bud-gun' for economical vegetative propagation of roses.

Plantings in the woodland were mainly confined to a strip alongside the main east-west track (and included *Magnolia* species) and around and to the



*Treborth winter -1968*

south of a natural spring 100 metres NNW of the main glasshouses where Len started a bog garden.

The main building which now houses the laboratory was always referred to as 'the shed' because originally that is exactly what it was, accommodating as it did potting benches, tractor bay, a simple work canteen and Len's basic office area as well as the old steam boiler which required daily attention by a gentleman who twice daily blew the boiler down, a process involving much steam and noise and commotion.



Two houses were built on site in the early seventies, one for the Garden Curator, the other for the Groundsman of the newly emerging University Playing Fields which were being established to the west of the Botanic Garden by an equally skilled practitioner, Dave Taylor. Dave had previously worked for the War Graves

Commission in France and committed himself to the new playing fields project with gusto transforming once undulating marshy fields to a series of level terraces fit for the fast expanding demands of the university Physical Education Department. Tennis courts and cricket nets were included occupying part of the present day athletics track. All this development inevitably led to increased traffic along the single-track driveway which the Botanic Garden shares with the playing fields.

Len's garden team, including Sandra Williams, Sue Jones and Helen Cormell, were an effective force in establishing a diverse collection of indoor and outdoor plants for teaching and research. This was important since by then Bangor's Botany Department had an international reputation, attracting healthy numbers of home-grown students as well as a very



significant proportion from overseas. With the amalgamation of agricultural botany with botany the Department grew even more in stature and appointed the legendary Professor John Harper as Head of the new School of Plant Biology.

It might be justifiably said that the seventies were the Golden Age for botany at Bangor. Headquarters for this robust but endearingly friendly School was the Thoday Building, known then simply as Plant Biology. Here thrived teaching and research in an extraordinarily harmonious and constructive atmosphere cultivated with style and panache by Harper and Co. Its working sphere included Treborth which daily supplied the lecture theatres and laboratories with fresh material from around the globe. As a young student then I clearly recall Greig-Smith's monocot lectures during which lush foliage festooned the podium and yielding illustrative features to substantiate the great man's learned words – as we sat waiting for the performance to begin Len Beer would enter draped in orchids or palm fronds, lay them down upon the podium with deference, frequently hurriedly disappear to retrieve a vital omission from the Prof's wanted list and then the story of monocots would unfold, species by species, family by family, their unifying features paraded in a fanfare of educated glamour – irresistible stuff for young minds eager for botanical enlightenment and evolutionary understanding.

To complement the School's undoubted expertise in Angiosperms (the Flowering Plants) Prof Lacey established an excellent collection of Gymnosperms (Conifers and Cycads) and Pteridophytes (ferns, horsetails and clubmosses) at Treborth. These included many scarce taxa such as *Welwitschia*, *Ephedra*, *Bowenia*, *Selaginella* and *Schizaea*. Wyn-Parry encouraged a collection of Grasses to complement his researches in this field while Richards encouraged an all pervading interest in diversity, great and small – no man had a more complete experience of nature's vegetative richness and he wanted Treborth to be a microcosm of his life's work in this respect. And so the plant collections and their usefulness to the School grew.

As the science of ecology developed in the late sixties and early seventies Harper's lectures became the stuff of legends on the degree circuit, incisive displays of clear minded botanical exuberance which time after time drew sustenance from the plant life of the School's botanic collection – and not only the exotic morphologies and life histories of tropics but also highlighting the surprising complexity of our native species so well catered for in Treborth's semi-natural woodland and meadowland. Harper promoted the close scrutiny of plant populations in the wild in an attempt to unravel the driving forces behind evolutionary change. He valued the natural diversity of grassland plants at Treborth, a fortunate consequence of a lack of agricultural disturbance since the fifties whereby the 6 acres of 'field' had experienced no artificial fertiliser, nor herbicide nor plough. Here Harper could witness the natural interplay of plants and subject their life stories to quantitative analysis. And so it became commonplace to observe students singly or in well spaced classes lying prone for hours examining the herb rich turf of Treborth, the daisies as well as the orchids sharing their secrets with the scientific world. Experimental plots were sometimes required to be left uncut and so began a tradition continued to the present day of managing much of the field area at Treborth as meadow plots, cut just once or twice per year and in the meantime yielding an attractive floral display with all its attendant insect and other animal life.

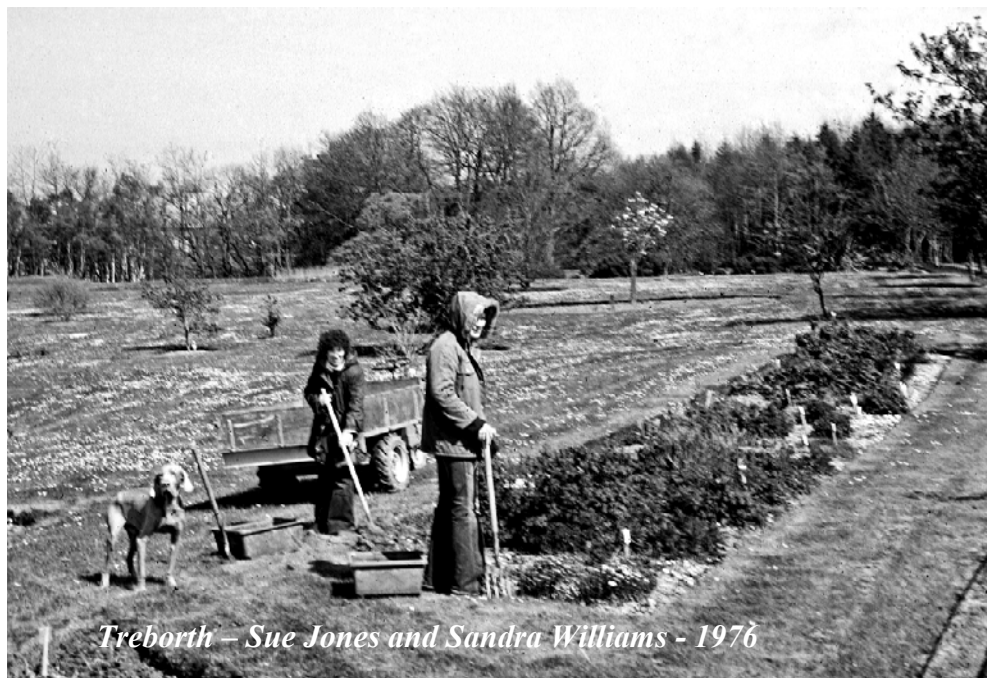
Indeed as the stature of ecology in general grew in the seventies and in the eighties the value of Treborth came to be viewed increasingly as a happy amalgamation of both zoological and



botanical diversity and the true worth of the Garden might be best summed up as an outdoor laboratory/field station rather than botanic garden per se.

But let us return to the historic development of the plant collection. In 1976 the 'Small House' was added to the glasshouse range, gifted by an orchid grower in Colwyn Bay and erected just to the east of the Cool House. 1976 also marked Len's departure to take up an equivalent post at Durham University Botanic Garden. Tragically Len died the following year aged just 34, a terrible loss for all who knew him and for horticulture generally. In memory of his plantsmanship a series of annual lectures were instigated in the early 1980s for which the first speaker was the renowned Roy Lancaster who had accompanied Len on perhaps his best-known Himalayan plant hunting trip in 1971. Each year since a horticultural luminary has widened our horizons and the Len Beer Lecture is firmly established as the foremost horticultural talk on the North Wales scene. It is jointly organised and funded by the Friends of Treborth Botanic Garden and the N Wales branch of the Alpine Garden Society.

During the spring of 1976 the Garden was ably managed by Sue Jones and Sandra Williams until my appointment in June as Curator with a teaching role. I had come to experience the Garden during my second and third years as an undergraduate studying Botany at Bangor. Len was a great help to me as I progressed my final year project which was an assessment of the plant communities of Treborth's woodlands. Being appointed Curator within a few weeks of graduating and before my 21<sup>st</sup> birthday was daunting but also very exciting. Learning to be a curator proved a steep learning curve.



*Treborth – Sue Jones and Sandra Williams - 1976*

I well remember that summer, hot as it was, day after day watering, driving large water containers down to resuscitate the outdoor plantings as well as constantly attending to the glasshouses which had no automatic watering system. Mowing at that time was undertaken partly with a tractor and gang mower operated by Alan Savage who was based at Pen y Ffridd Field Station as a

horticultural technician. I completed the task manoeuvring a pedestrian rough-cut mower into all the awkward areas including the arboretum. We used an Alan Scythe to reduce the meadow plots at the end of the growing season and to keep the woodland path clear. When either machine broke down I resorted to an old fashioned scythe. In the execution of this ancient technique I was ably instructed by the bee man, a dear old gentleman from Menai Bridge who kept his hives in the NE corner of the Garden hidden among the Cotoneaster

collection. The aroma of bee work would scent the Treborth air on summer days as the bee man fanned wood smoke into the hives to subjugate the inmates and examine their combs of burgeoning honey. From time to time the bees would swarm and pursue me up the Garden but this was a small price to pay for an annual gratuity of neat jars of fresh Treborth honey.

My first year as Curator was eventful and exciting as it was decided to relandscape the interiors of the existing glasshouses and reshape and enlarge the rock garden. I was helped by local school leavers employed under a 'Job Training Scheme' and ably supervised by Alan Savage's father John. Remembering the names of all but one of these lads posed no problems then or now – 5 of them were David Jones! With their help, progress on the conversion of the then Temperate House to the present Tropical House went ahead smoothly and involved constructing a new tropical pond flush with Water Hyacinth (*Eichhornia crassipes*), extensive planting beds so that every specimen was cultivated directly in soil rather than as previously the majority being in pots, and an undulating path to provide variety of views of the new collection. It gave us all great satisfaction to see the whole project take shape and within a year reach Eden-like splendour, well at least on a small scale. Early highlights of that era included Mexican Granadilla (*Passiflora quadrangularis*) whose vine like shoots smothered the far end of the glasshouse with alarming alacrity and then produced a daily succession of 10 cm diameter blossoms of such visual delight and scent. Alongside thrived *Allamanda grandiflora* and *Aristolochia grandiflora* also boasting dramatic blossoms, gingers with thick scents and Blood Flower (*Asclepias curassavica*) with striking deep carmine flowers. Research interests at the time meant that we cultivated cold sensitive plants such as *Episcia*. Combining species for amenity with species for teaching and research in an overall natural looking landscape created an attractive and stimulating display and we soon discovered that specimens grew more happily and flowered more frequently than before.

One aspect of botanical interest which benefited from this change of husbandry was plant architecture and plant morphology as researched by Adrian Bell who quickly assumed an international reputation for understanding the developmental evolution of plant parts and the shapes and organised systems they create. Adrian's plants needed plenty of space to spread and the new borders quickly filled with sympodial rhizome systems of gingers and *Sanseveria*, aerial canopies of figs and *Fuchsia*, stem adaptations for climbing and capturing the sun, palms to dazzle with complex plumbing. The Treborth collection provided many of the examples highlighted in Adrian's authoritative and popular treatise, *Plant Form*, first published in 1991 (with a fine update in 2008) and expertly illustrated by former Bangor botany student Alan Bryan.

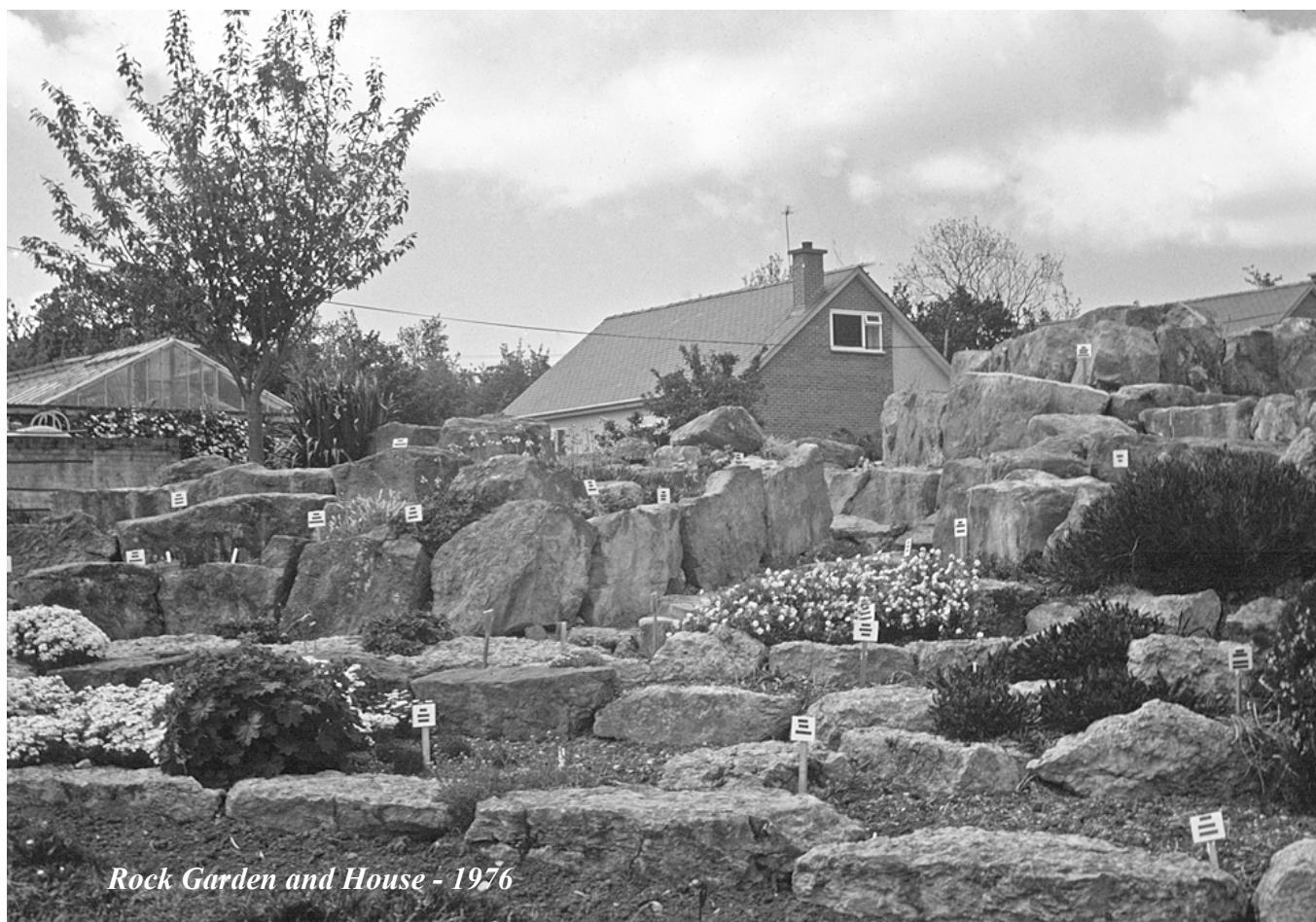
Following on from this, the original propagating house was revamped to accommodate the epiphytic orchid collection and the original Tropical House became the Temperate House, sadly losing its Amazon Water Lily in the process but freeing the space for a wider range of species. For the first time students came along to help with such development work and extended their efforts to reshaping the rock garden as well. This project was an enormous undertaking involving much soil improvement and strenuous shifting of massive blocks of limestone and sandstone using rollers in a style reminiscent of the building of the pyramids. The aim was to use more of the existing slope of the Garden to create a more natural looking rock outcrop.



*Rock Garden area - 1974*

In the end, these large-scale projects took two years to complete and involved many man-hours much of it provided by work experience lads as well as students. Further work was carried out on landscaping the main shrub borders and the layout of the borders as we see them today was largely complete by 1980.

One important component of the work force not yet referred to was the Horticultural Scholar. Each year a young local person was appointed to a scholarship scheme which offered training and work experience at the Botanic Garden and at Pen y Ffridd Field Station for up to three years. We were fortunate indeed to engage the help of some outstanding young people through this scheme which was instigated by Charles Ellis, superintendent of Pen y Ffridd for many years. These positions helped fill the gap left by the retirement of permanent gardening staff such as Sandra Williams and Sue Jones. Despite the success of



*Rock Garden and House - 1976*

Botany and Ecology at research level the call for botany at undergraduate level was declining reflecting a national trend and this meant financial cutbacks. The reserve of horticultural scholars helped keep Treborth functioning and two of them in turn assumed permanent posts at Treborth as the gardening staff was reduced to just one by the mid eighties. The first of these, John Cooper, sadly died in a road accident aged just 21 and a fund was created by his parents in his name which finances plant purchases for the Garden. The second, Mike Roberts, undertook further training at Hilliers before assuming his role as horticultural technician in 1985 and remained as my right hand man until 2006. In between John and Mike, a Youth Trainee named Brian Williams held a horticultural post at Treborth before further training at Hilliers and later a career with York City Grounds and Gardens. The list of horticultural scholars also includes Evan Edwards, a fine young horticulturist who went on to serve Edinburgh Botanic Garden well but who also tragically died young as a result of a car accident. Andrew Robinson migrated south after finishing his scholarship and has served at Greenacres in Devon as well as other major south coast gardens. Katy Butters went on to pursue a horticultural career in Lancashire while Rob Hughes is now Head of Grounds and Gardens at Bangor University. Treborth owes all of these one-time scholars a huge debt of gratitude. Nor should we forget the late Deiniol Ward who contributed to Treborth on a later work experience scheme and who is remembered by the planting of *Rhododendron auriculatum* by the old pond.

While Treborth grew strongly as a botanic garden in the late seventies and early eighties, there were worrying trends unfolding with botany generally throughout Britain and many other countries. Biological research went molecular and plant studies lost ground to animal studies right across the board. A generation of traditional organismal botanists gave way to high tech. analysers of life and Bangor found itself ill equipped to cope. The new science of ecology was quickly overtaken by other aspects of biology and Bangor's pre-eminence in this field began to wane. Botanic gardens were widely seen as expensive luxuries which universities could ill afford in the new age of molecular biology. Professor Richards had retired in 1976 and then in 1984 the School lost 5 senior botanists at a stroke through early retirement, including Harper, Greig-Smith, Lacey and Wyn Parry. The School of Plant Biology merged with the School of Animal Biology in the mid eighties, creating the new School of Biological Sciences (SBS) and this heralded a further erosion of botany within the university. By the late nineties Bangor dropped Plant Biology as a degree due in part to lack of demand and lack of teaching staff. This was a body blow to the academic *raison d'être* of Treborth. Talk of closure became commonplace and merger of the School's field stations looked likely. Serious closure threats were narrowly avoided in the late seventies, mid eighties and one again in the nineties. Of the 30 or so staff that made up the School of Plant Biology in the late seventies, only the Curator remains and no one else has been replaced.

Closure was averted in each case then by arguing the case for Treborth's value as a general educational resource not only within SBS but also the School of Agriculture and Forestry, as well as the curator's extensive teaching responsibilities. Treborth's role as a field station as well as a botanic garden helped enormously as the swing to zoology continued apace. Undergraduates regularly undertook bird and small mammal projects within the grounds and the adoption of a nightly moth trapping routine ensured a regular crop of budding entomologists utilised the Garden. Dr Malcolm Cherrett and Mrs Joan Morgan demonstrated

other insect trapping techniques using the hay meadows and woodland edge and pit fall trapping became a regular practical technique under Dr Wolfgang Wuster's direction.

One of the most valuable new initiatives to benefit Treborth was the establishment of two underground laboratories (so called rhizotrons) in the grounds. This was the brain child of Malcolm Cherrett in close association with zoological colleague John Ford as well as botanists Prof Geoff Sagar and Bob Whitbread. The aim was to elucidate the interplay between soil and its biological components with the growth of plants such as grasses and clover. The first rhizotron constructed in 1983 by technical staff in the School of Animal Biology proved enormously successful under the direction of a postgraduate student from New Zealand, the late Alan Carpenter – Alan revealed for the first time in situ the scale of predation of grassland roots by soil microorganisms. His success led directly to the establishment of a much larger facility in 1987 with 34 windows looking out into the soil, the largest rhizotron in Europe. Several researchers from home and abroad completed their PhDs or postdoctoral research in the larger rhizotron.

More recently a pigeon loft has been established in the Garden to house racing pigeons for bird flight research coordinated by Charles Bishop. This relies on cutting edge technology, using miniature probes, data loggers, GIS and accelerometers which measure and record the vital functions of the bird's body in flight allowing us a deeper insight into how birds fly physically and physiologically.

There has always been public interest in Treborth and the Garden has always been freely open to everyone. Guided tours of the glasshouses and outdoor Garden have featured since the seventies and Treborth enjoys the support of many local organisations, none more so than the Friends of Treborth Botanic Garden established in 1997 under the Chairmanship of Alfred Williamson.

The role of the Friends has matured during the first decade of the new Millennium so that by now they achieve a strong operational role and promote new projects in the Garden including its wooded areas. This has become even more the case since Treborth's last remaining horticulturist, Mike Roberts, was made redundant in 2006. The Friends number some 350 members and organise a healthy programme of events both within the Garden and further afield catering for all aspects of gardening as well as natural history and botany. They help finance new plant acquisitions, tools and materials for Treborth as well as seasonal student help, they run workshops and courses to educate and inform and they act as experienced advisers and supporters for our undergraduates. On-going projects which are largely Friends initiatives include a new wildlife pond, a major revamp of the Tropical House to establish a collection of crop plants, the expansion of the cacti and succulents with special emphasis on S. Africa, the upgrade of the orchid collection, replanting of the old pond area, continued improvement of the old 'key-hole' border, and the most significant improvements to the woodland in the last 50 years including clearance of invasive rhododendron and cherry laurel, reinstatement of coppicing and interpretation of the woodland features along the main path. These are enormous achievements for a volunteer group and give Treborth a working and developmental base without which it would have surely folded.

Their ally in all of these efforts has been the student body, especially since 2006 when Treborth faced its most serious threat of closure. This was narrowly averted by a forceful and effective protest by all Treborth's supporters not least the students, and the university was stung into a reappraisal. The Students for Treborth Action Group (STAG) stemmed from the 2006 emergency and has remained a potent force for good for Treborth, closely involved as it now is with all the Friends projects and responsible for its own excellent and varied programme of activities which help nurture a real sense of responsibility for the Botanic Garden and a general appreciation of plant life. Perhaps the best-known STAG-generated event is Botanical Beats, a regular musical extravaganza which promotes Treborth and raises funds for the Garden.

Another valuable method by which students contribute are the Work Parties when up to 35 students spend the day at the Garden engaged in projects large and small and receive a free lunch for their efforts provided in house by either STAG and/or the Friends – these are successful at getting jobs done and provide an excellent extracurricular activity involving reciprocal advantage to everyone involved.

Treborth has forged close links with the Royal Botanic Gardens, Kew and each autumn welcomes a class of Kew Diploma students for a field course. In 2004 we were twinned with the National Botanic Garden of Lesotho in Southern Africa and two undergraduate students (Sophie Williams and Tom Little) went out to study the conservation biology of one of Lesotho's most characteristic but threatened plant species, the Spiral Aloe (*Aloe polyphylla*).

An increasing number of schools make use of Treborth as well as the Department of Life Long Learning at Bangor University and a range of local special interest groups. In terms of sheer numbers using the Garden there has never been more going on.

However the present situation is far from ideal since further university cutbacks seem inevitable and glasshouse space seems set to be 'space-charged' at an exorbitant rate; despite this everyone remains optimistic and willing to help in every way imaginable, from wielding a fork to sourcing outside funds. Circumstances have forced Treborth into ending up being a garden with at best a part-time Curator and no paid gardeners, a unique situation, unenviable in many ways but also extraordinarily inspiring since it reflects the best efforts of people that really care for their environment, locally and globally.

A milestone has been reached this year many might say against the odds. It's time to celebrate the Garden's survival and plan its real purpose in a world which needs botanic gardens and a population mindful of plants.

**Nigel Brown**

With thanks to Helen Cornell and Sue Jones for valuable historic information and Sheila Hargreaves for further background and images; any errors are my own.

## The Botanic Garden before 1960

The 90 acre site of the Garden formed part of the Treborth Isaf estate until 1846 when it was purchase for £18,000 by the Chester and Holyhead Railway whose Chief Engineer was Robert Stevenson, son of George Stevenson. The railway required so much land because it needed to tip spoil from its tunneling at Bangor station and had to approach the Britannia Bridge at a right angle to the bank and therefore had to move away from the banks of the Strait in a gentle curve.

On completion of the bridge the company found themselves the owners of at least 80 acres of surplus land. Joseph Paxton, who designed Birkenhead Park, was associated with the company and may have suggested that they create a resort similar to a continental Spa. He produced a design, based on Birkenhead Park, which consisted of pleasure grounds (areas for walking, plants and recreation.), housing, and most surprisingly a 500 bed hotel. The architect for the hotel was Charles Reed who had designed Rhianva on the Strait.

The company decided to use Paxton's design calling the development Britannia Park and work started in March 1851 but as the company was in financial difficulties work stopped in September 1851. Some work was carried out on the hotel, the east wing being located on the site of the new dipping pond but there are no signs of this. The only significant construction now visible is the drainage tunnel that feeds the cascade. The groundwork for the pleasure ground was started probably under the supervision of Richard Kemp 'Landscape Gardner Birkenhead Park' who worked with Paxton on that park. It is not clear if any earth movement was carried out although it is probable that drainage was laid and the major footpaths of the garden are probably those created at this time. The lay out of the paths and their construction shows arrangements similar to those specified by Kemp in his book 'How to Layout a Garden'.

The company asked Paxton to produce two further layouts for the site with a much smaller hotel and a great deal more housing but no further construction took place. A copy of the last of these layouts was on the boardroom wall of a local electrical contractor who is no longer in business and the location of this layout is not known.

In 1858 the railway company built Menai Bridge Station on the site above the present industrial estate at the Garden's entrance having obtained access over the Crown Land at the south end of the suspension bridge.

At Easter 1865 it was proposed that horse racing and games should take place near 'The Britannia Park Refreshment Rooms' which was probably near the tubular bridge but the company refused permission. That area appears to be fated to be used for games!

In 1867 Treborth Isaf was purchased by Richard Davies MP who later purchased Britannia Park, built the bridge across the Railway and the Lodge at the entrance. The Park area was again part of the estate after just over 20 years.

In the 1890s the house Ceris was built by Richard Davies for his son John Robert Davies. The house was built close to the suspension bridge and the Strait. The owners closed the

footpath which runs along the edge of the Strait depriving the fishermen of Ynys Gorad Goch of access to the railway station via the Pilot's Steps just west of the end of the paved footpath. The fishermen then had to obtain access via the north bank of the Strait through Coed Môr wood. To ensure privacy J R Davies purchased the island in 1915. Ynys Gorad Goch was famous for its fish teas at one time.

During both wars some of the Park was probably ploughed and there are signs of possible military trenches in the woodland.

In 1953 the training ship 'Conway' was being moved down the Strait for refurbishment at Liverpool when it went aground east of the cascade near the two mounds which probably formed part of the Paxton works. Parts of the ship are littered on the ground. After the removal of the ship it was proposed that this area of the site should be used for chalet-style second homes and two local people bought the site to forestall this plan.

We were fortunate that the railway company's scheme did not go ahead. 'The Park' aspect of the scheme would have been very, very limited and would probably have been destroyed by later owners' attempts to make it pay and the hotel could never have been successful because at this time both the local Coaching Inns (Penrhyn Arms (130 beds) and The George) were failing. As it is we have a good site for a botanic garden, a very nice drainage tunnel, some well drained paths considering they are 150 years old, the kudos of being associated with Stevenson and Paxton and the ancient woodland was not cut down for housing.

**Bryan Hyde**

Acknowledgments.

Many brains have been picked, with thanks, but the major contributions are Prof. M.L. Clarke 'Transactions of Caerns. Hist. Soc., Vol.19 1958.' pp 54- 60. and David Senegles 'Story of Ynys Gorad Goch in the Menai Straits' Private pub. March 1969.

## **Donations**

Many thanks to Colin Stroud, Ashley Tweedale, Hilda Thompson and George Smith for their donations to the Friends.

**Sarah Edgar**



## **The Treborth Botanic Garden Plant Collections: Looking to the Future**

According to the definition of the Botanic Gardens Conservation International “*Botanic Gardens are institutions holding documented collections of living plants for the purposes of scientific research, conservation, display and education*”(BGCI, 1999). Clearly, to maintain the international reputation of the Treborth Botanic Garden, we have to plan for the future, ensuring that our collections are “fit for purpose” and properly documented. To that end, a small Plant Collections Group (Nigel Brown, David Evans, John Gorham, Pauline Perry, and Pat Denne) has been meeting over the past few months. Their remit is to ensure that the Treborth Plant Collections are focussed and well managed, with detailed records kept of all plants that the Garden acquires.

A number of specialist collections of plants already exist amongst the overall general collection; these are the “Named Collections”, some of which are groups of related species (such as the orchid collection), some for particular environments (such as the xerophytic plants collection), and some for specified purposes (such as the economic plants collection). Each named collection has one or more designated “keepers” who have initial responsibility for management, maintenance, interpretation, and development of that collection (see below for named collections and keepers). Each keeper is now being asked to produce a summary of the status of their collection, including its strengths and weaknesses, and a wish list for the future.

Given our present limited resources of manpower and finance, we need to be realistic about what it is possible to achieve, building upon our strengths and available expertise, rather than stretching ourselves too thinly. As you will probably know already, a new policy is now in place for accepting plant donations (copies available at the Garden or on the TBG website); some may perhaps consider this to be draconian, but it is essential to ensure the future integrity of the Garden.

### **Named Collections at present with designated keeper(s)**

1. Insectivorous plants - Anthony Piggott/Mark Long
2. Lesotho plants - Pauline Perry
3. Xerophytic plants (mainly cacti and succulents) - John Gorham
4. Economic plants (edible, medicinal, fibres) - John Gorham/Pat Denne
5. Evolution (including lower plants, ferns, “fossil” plants) - Nigel Brown
6. Rare/threatened native plants (especially N. Wales) - Nigel Brown/Trevor Dines/David Evans
7. Orchids - Simon Retallick/Angela Thompson
8. National Vegetation Classification (NVC) Beds - Pat Denne
9. Alpines - Paul Lewis
10. Bamboos - Nigel Brown/David Saunders
11. Sorbus spp - Nigel Brown/Trevor Dines

**Pat Denne**

## **50 years!! Now that's something to Celebrate!!**

Treborth turns 50 this year and by way of celebration there will be activities aplenty.

The events will run from 6<sup>th</sup> to 12<sup>th</sup> June and are set to keep everyone very busy enjoying themselves!! Treborth has an amazing history and the potential to have an even more amazing future. This week of celebrations is intended as a way of bringing you into the Garden to enjoy everything it has to offer. Its peace and serenity, its natural sounds and aromas together with experiencing it as a place to explore our planet's natural diversity, to learn, to have fun, to help contribute to its future.

The week of events kicks off on Sunday 6<sup>th</sup> June with an anniversary within an anniversary - the 5<sup>th</sup> birthday for Botanical Beats - a Wild Day Out! A very special event in itself, a family day out which combines the arts with a celebration of our wildlife. There will be the usual mix of local music in three tents, the main stage, DJ tent and the acoustic tent with an open mike feel, workshops where you can try an instrument or have a go at putting poetry to music.

2010 is The International Year Of Biodiversity (<http://www.cbd.int/2010/welcome/>) and we are signed up as partners together with a fine collection of our North Wales partners and fellow conservationists such as Anglesey and Gwynedd Councils, Marine Awareness Wales, Wildlife Gardening North Wales, North Wales Wildlife Trust, Snowdonia National Park, Countryside Council for Wales, Pili Palas, Moelyci and many, many more! Activities will range from making bat and bird boxes, bug hotels and mini-beast hunts, pond dipping, live mammals and a very exciting opportunity to be part of a national ladybird survey conducted by The Centre for Ecology and Hydrology!

The BBC is this year extending its Breathing Places Campaign and has once again asked if Botanical Beats would like to be involved. The benefits are clear! We get their resources for publicity and possibly some funding to help with our local publicity. Banners, activity packs, ladybird goodies, support on the day and most excitingly the possibility of being featured on Springwatch which starts on May 31st. Watch this space!!

On Tuesday 8<sup>th</sup> June we have our Classical Music Event: bring a blanket and a bottle - watch press for details.

Wednesday 9<sup>th</sup> June is our Wildlife Pond Opening Day and to celebrate the development of this new very special area for wildlife and education, we are inviting local school children to come and sample its delights. There will be a grand opening ceremony with local biodiversity groups and refreshments will be served.

The last event in the schedule is our Alumni Day on Saturday 12<sup>th</sup> June. On this day we hope to bring together past and present students and staff from the university with a generous helping of volunteers that have supported us over the decades. The day will consist of Garden tours, talks from students and staff and the opportunity to see how the Garden has developed over the 50 years and put forward ideas for its future. There will be music, a light

buffet lunch with wine and refreshments served throughout the day and most importantly time to catch up with friends!

In summary, here are the dates for your diary:

<b>Date</b>	<b>Event</b>	<b>Time</b>	<b>Price</b>
Sunday 6 <sup>th</sup> June	<i>Botanical Beats-A Wild Day Out!</i>	1pm til 8pm	£6 adults Children free
Tuesday 8 <sup>th</sup> June	<i>Classical Music Event-bring a blanket and a bottle</i>	Early evening-TBC	Approx £10 TBC
Wednesday 9 <sup>th</sup> June	<i>Wildlife Pond Grand Opening</i>	9.30am til 1pm	Free-donations welcome
Saturday 12 <sup>th</sup> June	<i>Alumni Day-Garden Party</i>	10.30am til 6pm	£7.50 including music, buffet lunch and refreshments

As you can see the week is going to be a lot of fun but also a lot of work and I'm sure a lot of you have heard rumblings of these ideas already. As ever we value any input that you can give and here are a variety of ways that you can support us:

- Bake us some cakes
- Volunteer on the day to help out - always lots of different ways in which you can take part from stewarding to making tea to showing people around and general mucking in
- Lend us your photos and memories for the Alumni day - we hope to have interpretation for the Garden with a history in pictures as well as words so if you have any interesting stories please get in touch

Whatever you have to offer we are happy to receive - just contact us in the normal way or if it's for the Alumni Day we have a dedicated email address: [treborthalumni@gmail.com](mailto:treborthalumni@gmail.com)

I look forward to seeing you.

**Jackie Read, Publicity Officer**

## 50 Years of Wildlife at Treborth

Gardeners are well aware every year brings with it variations in plant performances and over time any garden matures and experiences natural changes in its complement of plants. And so it is of course with the wider countryside though sometimes the changes are less easily observed or monitored.

I thought it would be a useful exercise to consider how Treborth's wildlife has changed over the last 50 years. Of course I was not at the Garden when it was established in 1960 but some things can be inferred from national trends. And my direct experience of Treborth extends back 37 years during which time I am certainly aware of some changes.

For the purposes of this brief review I have included the adjacent Menai Strait as it has so much influence on Treborth's environment.

**Table One – Plants and animals which show well-defined frequency trends at Treborth over the last 50 years. In each group species are presented roughly in order of degree of trend ie starting with species displaying the most acute change.**

	Trend	
Increase		Decrease
<b>Mammals</b>		
Rabbit		Hedgehog
Grey Squirrel		Red Squirrel
Otter		
<b>Birds</b>		
Buzzard		Greenfinch
Peregrine		Willow Warbler
Raven		Cuckoo
Collared Dove		Spotted Flycatcher
Great Spotted Woodpecker		Green Woodpecker
Nuthatch		Pied Flycatcher
Little Egret		Wood Warbler
Red –breasted Merganser		Stock Dove
Greylag Goose		Turtle Dove
Canada Goose		Pied Wagtail
Goldfinch		Song Thrush
Jay		Redpoll
Blackcap (wintering)		Woodcock
Chiffchaff		Redwing
Goshawk		Fieldfare
Siskin		Arctic Tern
Kingfisher		Common Tern
Osprey		Roseate Tern

## Increase

## Decrease

### Butterflies

Comma  
Small Skipper  
Ringlet  
Meadow Brown  
Gatekeeper  
Speckled Wood  
Holly Blue

Wall Brown  
Small Pearl-  
bordered Fritillary  
Small Heath  
White-letter Hairstreak  
Small Tortoiseshell

### Moths

Lime Hawk Moth  
Blair's Shoulder Knot  
Dingy Footman  
Buff Footman  
Pretty Chalk Carpet  
Black Arches

Garden Tiger  
September Thorn  
Ghost Moth  
Peppered Moth  
(melanic form)

### Trees and shrubs and climbers

Turkey Oak  
Yew  
Ash  
Aspen  
Holly  
Rhododendron  
Cherry Laurel  
Traveller's Joy  
Ivy

Wych Elm

### Herbaceous plants

Variiegated Yellow Archangel  
Bee orchid  
Broad-leaved Helleborine  
Eyebright  
Hay Rattle  
Agrimony  
Common Twayblade  
Bluebell  
Stinking Iris  
Hedge Bedstraw  
Herb Paris

Scarlet Pimpernel  
White Dead-nettle  
Coltsfoot

Crassula helmsii

### Fungi

Redlead Roundhead  
Bird's nest Fungus  
*Agrocybe rivulosa*

Fly Agaric

This list in **Table One** is subjective in that it is based solely on my casual visual records. Where quantitative data exist eg moths I have not yet analysed the trends. And doubtless more species could be added to the list for invertebrates generally. Lichens have not been considered, a pity since they are so sensitive to atmospheric quality. I have not bothered to list reptiles as remarkably they seem to be entirely absent. Amphibians number just three species and none of these show any change. Bryophytes are a serious omission which I regret – the only observation I can make there is that in the 1970s and early 1980s, when the shrub borders were far more open and there was far more bare soil on display, an interesting bryophyte flora typical of disturbed ground and arable fields succeeded well. Despite these omissions and failings the review is hopefully still worthwhile.

One or two features become obvious. Firstly there would appear to be more species increasing than those decreasing, especially among the flora. One has to be careful – sometimes it is easier to spot the newcomers such as **Small Skipper** (*Thymelicus sylvestris*) than those species which are quietly declining, a process which can take many years eg **Small Pearl-bordered Fritillary** (*Boloria selene*). Secondly several species are brand new colonists such as **Little Egret** (*Egretta garzetta*) and before that, **Collared Dove** (*Streptopelia decaocto*). But some of the colonists are not natural – they represent introductions from abroad and are generally described as aliens – they include well-known species such as **Grey Squirrel** (*Sciurus carolinensis*) and the troublesome floating aquatic plant, **New Zealand Pigmy Weed** (*Crassula helmsii*).

The mammal picture is surely incomplete, covering as it does a group which is largely nocturnal and difficult to monitor. I have no idea how many of the small mammals have fared (including bats) as we have only carried out sporadic live trapping for particular projects. But I am confident that **Grey Squirrel** has increased significantly as elsewhere in North Wales and I strongly suspect that **Hedgehog** (*Erinaceus europaeus*) has declined, this decline having been particularly noticeable in the last decade. **Red Squirrel** (*Sciurus vulgaris*) is an interesting situation as it used to occur at Treborth naturally, the last sighting being Sept 1976 as reported in the last newsletter. Recent sightings and one capture confirm that individuals observed within the last 9 months originate from a re-introduction scheme on Anglesey, so need to be viewed somewhat differently. **Otter** (*Lutra lutra*) is a most welcome increase with no known sightings prior to the mid to late nineties. One might confidently hope that they will recolonise the Menai Strait if left undisturbed – the wildwood of the steep Strait-side bank at Treborth looks perfect real estate for an otter! **Rabbits** (*Oryctolagus cuniculus*) are a menace presently from a gardening point of view and the problem has been steadily increasing especially in the last 5 years. It may have a little to do with my ageing Jack Russell Terrier simply being no longer up to the job of bunny biting but I suspect that there are a number of more influential factors at play here – not least a holding back of fox numbers due to persecution and partial immunity to myxomatosis.

There is a more complete picture for birds and it is interesting to note that the present list of species displaying significant trends numbers 36 representing 30% of the total species list for Treborth in the time period under review. As already mentioned we see examples of recent colonists to Britain such as **Collared Dove** (first bred in Britain in 1959) and **Little Egret** which has increased in dramatic fashion since its first successful breeding in the UK in Hampshire in 1998 and first breeding in North Wales which took place on one of the small

islands in the Strait opposite Treborth in 2003. While the arrival of two previous colonists in the UK and including Wales was due entirely to natural dispersal, **Greylag Goose** (*Anser anser*) and **Canada Goose** (*Branta canadensis*) received a helping hand from Man. The vast majority of individuals of these two geese form feral populations here, derived from deliberate introductions and escapees. Both species have increased dramatically in the Menai Strait area in the last 30 years and twice daily traverse Treborth's airspace enroute to feeding grounds and roost sites.

There has been a notable increase in birds of prey reflecting for the most part a corresponding decline in direct persecution and stricter control of pesticides (though note article on dead **Buzzards** (*Buteo buteo*) found at Treborth in October 2009 – there may be signs of an unwelcome resurgence of direct and collateral losses from such illegal activities). **Peregrine** (*Falco peregrinus*) suffered very badly from pesticides such as DDT during the late 1950s and 1960s, an effect felt throughout the UK and here in NW Wales there were probably fewer than 5 pairs left by the late 1960s. A recovery commenced in the 1970s but at first was hampered by egg thieves and falconers. Without intense nest protection by volunteers and the RSPB their recovery would have been a very slow process but as it is they had regained all their lost territory by the 1990s. This increase in fortunes translated to daily sightings during the breeding season here at Treborth as breeding on the Britannia Bridge recommenced in the 1990s. However during the last 5 years persecution from pigeon fanciers has cost the Peregrine dear and breeding on the Bridge has been sporadic.

**Raven** (*Corvus corax*) has enjoyed a dramatic change of fortune in the last 50 years throughout most of its UK range due to reduced persecution and increased sheep numbers and resulting carcasses on which to scavenge. No-where has this increase been more pronounced than North Wales where this species is almost certainly at an all time high now. Pressure on nest site availability has forced breeding pairs to utilise trees as well as natural cliffs and indeed the regular pair at Treborth can be found each spring raising their young in a massive old nest in pines near the Menai Strait.

According to the British Trust for Ornithology, two of the most rapidly increasing birds in Britain over the last 30 years are **Goldfinch** (*Carduelis carduelis*) and **Great Spotted Woodpecker** (*Dendrocopus major*), both displaying increases of over 300%. Their status at Treborth certainly reflects this national trend. Nowadays 2-3 pairs of Great Spotted Woodpecker breed at Treborth including a regular pair in the large ash tree opposite the curator's house by the bamboos – their drumming commences even before Christmas some winters. 3-5 pairs of Goldfinch breed semi-colonially and in the late summer, flocks of over 100 can be disturbed from the long grass plots where they feed on the ripe seeds of Knapweed (*Centaurea nigra*). Another woodland-cum-parkland bird to show a pronounced increase at Treborth has been **Nuthatch** (*Sitta europaea*), very scarce when I was conducting my vegetation survey of Treborth in 1976 but now frequent and rarely out of ear shot in spring. **Jay** (*Garrulus glandarius*) too now breeds in modest numbers but was decidedly scarce in the mid 1970s and in addition we seem to attract larger numbers of migratory individuals in the autumn when they can be seen gathering acorns and caching them in the lawn.

Among the woodland birds that have fared less well, **Green Woodpecker** (*Picus viridis*) is the species I miss most since its ringing call echoed throughout the Garden in the 1970s and much of the 1980s. There was probably never more than a single pair and it could not be said to have been common in our area generally but now it is markedly local and indeed has disappeared as a breeding bird at Treborth with at best just a single sighting (or yaffle heard) most years, interestingly usually in April. **Willow Warbler** (*Phylloscopus trochilus*) formerly bred regularly at Treborth but now only appears on passage in early spring. **Wood Warbler** (*P sibilatrix*) and **Pied Flycatcher** (*Ficedula hypoleuca*) appeared in small numbers from mid-April to mid May in the past, simply as itinerants on migration but no longer, a decline echoed throughout their UK range. **Spotted Flycatcher** (*Muscicapa striata*) bred in small numbers at the woodland edge and in the grounds but is now rarely observed and has not bred for 10 years. This overall decline in woodland migrants, all of which winter in sub Saharan Africa, is a particularly worrying trend, the causes unknown but very likely to be centred in the wintering quarters and/or migratory routes. Sadly we have to include **Cuckoo** (*Cuculus canorus*) in this unenviable category – in recent years it has gone unrecorded at Treborth or at best recorded by call on just a single day.

Migratory terns still fly through the Strait but have been mainly absent as breeding birds during the last decade due to disturbance at their former colony on Gorad, the island in the middle of the Swellies. Previously this charming island supported a locally important mixed species colony of over 100 pairs of terns and their strident calls enlivened the Strait day and night.

The demise of **Song Thrush** (*Turdus philomelos*) has been well documented and highlighted in various parts of the UK especially southern parts. Despite a downturn, this species still breeds in reasonable numbers at Treborth and its repeated fluting song happily remains a strong sound bite in the Garden. **Greenfinch** (*Carduelis chloris*) however has taken a nose-dive over the last two or three years and the cause is very likely linked to outbreaks of the highly contagious bacterial diseases Salmonellosis and Colibacillosis plus another contagious disease known as Trichomoniasis caused by a microorganism in the blood. It has been alarming to witness such a steep drop in such a familiar and much loved finch which ten years ago was top dog at the bird feeders and bred in busy, noisy colonies in the specimen shrub borders. I am pleased to say that there are the early signs of a possible recovery this year with the reappearance of a pair around the glasshouses this spring.

30 species of butterfly have been recorded at Treborth over the last 34 years with 12 species (40%) showing marked changes in fortune. Among the winners **Comma** (*Polygonia c-album*) is particularly welcome; a resident species, the Comma has shown a northerly expansion in the UK in the last 50 years and certainly in the 1970s and early 1980s it was extremely scarce at Treborth. But now it is regularly one of the first butterflies to fly at Treborth as it emerges from hibernation on sunny days in late February or March. The adoption of a hay meadow regime for large areas of Treborth's semi-natural grassland has significantly helped three grass feeding butterflies all strongly associated with rank meadowlands, namely **Ringlet** (*Aphantopus hyperantus*), **Gatekeeper** (*Pyronia tithonus*) and **Meadow Brown** (*Maniola jurtina*). By the same token however **Small Heath** (*Coenonympha pamphilus*) has declined as its favoured short grassland habitat has been somewhat reduced at Treborth. The grassland species to make the biggest impact however is



**Small Skipper** (*Thymelicus sylvestris*) which first appeared at Treborth in 2003 and rapidly built up a strong population in line with a northerly expansion in other parts of Wales and England.

The woodland edge firmly belongs to **Speckled Wood** (*Pararge aegeria*) which may be seen in high numbers from late March to November as it goes through three generations per year. It has undoubtedly increased since the mid 1970s. **Holly Blue** (*Celastrina argiolus*) has made significant gains in the same time though it is susceptible to marked swings inherent in its natural population dynamics. **White-letter Hairstreak** (*Strymonidia w-album*) is now far more scarce than the mid 1970s when its food plant, Wych Elm (*Ulmus glabra*), still grew commonly at Treborth, now decimated as elsewhere by fungus disease. It may still be seen some years on low branches of the few surviving elms scattered through the woodland. **Small Pearl-bordered Fritillary** (*Boloria selene*) is a sad loss with no sightings in recent years despite there being suitable unkempt woodland margins and rough grassland where its food plant, violet, still flourishes at Treborth. **Wall Brown** (*Lasiommata megera*) has shown the same astonishing decline as elsewhere and nowadays it is a rare sight at Treborth despite no obvious loss of habitat.

The situation with moths is far more complex as so many more species are involved – no less than 400 species of macro-moths (the larger kinds) have been recorded by night time trapping in the Garden since the mid 1980s using a standard Robinson Light Trap which employs a high pressure mercury vapour bulb to lure nocturnal insects in harmless fashion. Many species have waxed and waned including several well known species such as **Garden Tiger** (*Arctia caja*) which is now very scarce having been quite common in the 1980s and 1990s, a decline sadly mimicked across most of its southern range in Britain amounting to an 89% decrease in the national population index over the period 1968-2002. Research indicates that wet winters followed by warm springs result in significant losses in Garden Tiger, probably due to reduced survival rates in the larvae. Interestingly, wing shape in this species appears to have changed in the same period, becoming narrower, a development which might favour flight dispersal over longer distances. This potentially advantageous trend may however be cancelled out by reduced genetic variation revealed by multiple comparisons between modern populations and historic collections.

No recent records of **September Thorn** (*Ennomos erosaria*) suggest this species has gone extinct at Treborth despite the presence of its food plants, oak, birch, lime and beech. The same story applies to **Lead Coloured Drab** (*Orthosia populeti*) and **Blossom Underwing** (*O. miniosa*) while another *Orthosia* species, **Powdered Quaker** (*O. gracilis*) has declined markedly. *Orthosia* moths are fairly generalist feeders at the larval stage, including willow, sallow and poplar, all of which are common at Treborth, so the reason for the decline of some species remains a mystery.

On the gains side, the once politically-correct **Blair's Shoulder-knot** (*Lithophane leautieri*) is now well established at Treborth after first appearing in the late 1990s. This autumn flying moth is a natural immigrant from southern Europe where it feeds on the foliage and flowers of Cypress trees such as *Cupressus sempervirens*. 60 years after its arrival in southern England it continues to spread northwards (by 226 miles since 1980) and has now reached the Midland Valley of Scotland. At Treborth its main food plants as elsewhere in its

newly acquired range are ornamental *Cupressus*, *Chamacyparis* and the familiar *Cuprocyparis leylandii*, Leyland's Cypress.

**Lime Hawkmoth** (*Mimas tiliae*) also shows a northward trend (70 miles since 1980) and was first recorded at Treborth in 2001. **Dingy Footman** (*Eilema griseola*) and **Buff Footman** (*E depressa*), both lichen and algae feeders, have become firmly established here in line with well-documented northerly range expansions in Wales and beyond. **Black Arches** (*Lymantria monacha*), an oak feeder, is a much more recent addition to the Treborth list – an eye-catching tussock moth, it is associated with mature oak woodland in southern and western parts of Wales and some parts of southern England. Another attractive addition which is now regular in good numbers is **Pretty Chalk Carpet** (*Melanthia procellata*), no doubt resulting from the local spread of its food plant, **Traveller's Joy** (*Clematis vitalba*). These are just a few of the changes documented by nightly trapping at Treborth and a priority will be the scientific analysis of the many thousands of records accumulated over the last 25 years.

Finally on to floristic change. Again, this really deserves a far more incisive analysis and the comments here are subjective. The immediate impression gained from the list in Table One is one of accumulation of species at Treborth. Additions and expansions include a number of widespread alien species such as **Rhododendron** (*Rhododendron ponticum*), **Cherry Laurel** (*Prunus laurocerasus*), **Turkey Oak** (*Quercus cerris*), **Variegated Yellow Archangel** (*Lamiastrum galeobdolon variegatum*) and **New Zealand Pigmy Weed** (*Crassula helmsii*). This is not a welcome trend and strenuous efforts have recently been made to control Rhododendron, Laurel and Pigmy Weed since their impact on wildlife diversity is known to be serious. Intermittent control of Variegated Yellow Archangel needs to be stepped up since this vigorous, evergreen herbaceous ground cover plant of horticultural origin smothers the vernal flora of the woodland margin. Turkey Oak has been around for approximately 100 years which means by now there are many mature trees in and along the edge of the woodlands at Treborth and their annual crop of fertile acorns is encouraging a marked increase in a new generation of alien oaks which come with the added worry that they harbour the **knopper gall** which can badly afflict the acorns of native oaks and thereby severely reduce their reproductive potential.

On a happier note it is pleasing to report a natural increase in native **Yew** (*Taxus baccata*) wherever limestone outcrops. The **aspen** (*Populus tremula*) grove continues to expand slowly as the one-time Donkey Field naturally becomes a forest while **Ash** (*Fraxinus excelsior*) has bulked up its population enormously where there is a combination of lack of grazing and limey soils. **Holly** (*Ilex aquifolium*) has become locally dense, eg in the ancient woodland, and is now being thinned out. Conifers which were planted in the 1950s presumably for commercial purposes (mainly *Pinus sylvestris* and *Pseudotsuga menziesii*) have by and large been neglected and form a high canopy locally.

**Ivy** (*Hedera helix*), always present, now smothers shadier parts of the woodlands while **Travellers Joy** (*Clematis vitalba*) enjoys well-lit wooded areas and especially the railway corridor – it has increased markedly. **Bluebell** (*Hyacinthoides non-scripta*) has increased in wooded areas free of *Lamiastrum*.

The adoption of a hay field approach to some areas of the grassland at Treborth has resulted in an increase in native herbaceous plants now totally 150 species in the 5 acres of meadow. Among the newcomers are several orchids eg **Bee Orchid** (*Ophrys apifera*) and **Common Twayblade** (*Listera ovata*), hemi parasites such as **Hay Rattle** (*Rhinanthus minor*) and **Eyebrights** (*Euphrasia* sp.) as well as herbs such as **Agrimony** (*Agrimonia eupatoria*) and **Hedge Bedstraw** (*Galium mollugo*).

Associated with certain planted specimen trees **Broad-leaved helleborine** (*Epipactis helleborine*), a local species in NW Wales, has arrived and established itself naturally, being associated with the mycorrhizal fungus flora of birch. A fine colony of over 100 flowering shoots of **Herb Paris** (*Paris quadrifolia*) stems from an intentional introduction some 25 years ago, the material derived from a woodland on Anglesey threatened with inappropriate development. Interestingly Herb Paris occurred naturally in woodlands less than a kilometre away alongside Treborth Road when Griffiths wrote his flora of the area in 1895.

Finally a brief mention of fungi which are richly represented at Treborth both in the semi natural woodlands and grasslands as well as in mycorrhizal association with specimen trees. Treborth's chemical free management regime encourages fungi and adds to the seasonal diversity. The vigorous growth of specimen trees such as *Betula celtibirica* is testimony to their therapeutic effect. Several genera of fungi have increased as host trees have matured eg *Paxillus* and *Naucoria* on Alders (*Alnus*). With fungi, apart from recording new arrivals, it is difficult to judge long-term trends since their appearance is not necessarily predictable from year to year – there are good years and there are bad. I wish I had established some permanent quadrats in the woodland years ago to count the numbers of toadstools each year in a systematic way. Eye-catching species such as **Fly Agaric** (*Amanita muscaria*) seem to me less common than say 15 years ago but I cannot be sure. On the lawns, the various 'fairy ring' fungi have generally increased as their colonies have remained undisturbed in the permanent pastures and meadow areas.

One group of fungi has certainly increased, unquestionably – the mulch fungi. The widespread adoption of bark mulch here in the UK and beyond has resulted in an unprecedented expansion in range and frequency of a variety of saprotrophic species such as **Redlead Roundhead** (*Stropharia aurantiaca*), **Pixie Cups** (*Peziza* spp), **Bird's nest Fungus** (*Cyathus striatus*), *Gymnopilus* and *Panaeolus* species, **Ink Caps** (*Coprinus* species) and even a species new to science, *Agrocybe rivulosa* which in the 7 years since its first discovery, in Holland, has become widespread in the UK including Treborth. There is now a global community of mulch fungi and Treborth is a typical example. In addition we may also be witnessing climatically induced range expansions in some fungi eg *Psilocybe cyanescens*, now regular in the borders at Treborth. Of curiosity a number of warmth loving fungi have turned up in the glasshouses and some persist. The most recent example is the unappealingly named **Stinking Slime Truffle** (*Melanogaster ambiguus*) the odour from which now greets me each morning when the time comes to open up the Temperate Glasshouse and commence the daily watering.

I hope that this brief review of the changing wildlife scene at Treborth illustrates how dynamic nature naturally is and also how man has influenced the diversity of species, sometimes for good, sometimes for bad.

**Nigel Brown**

## **Report on Dead Buzzards found at Treborth**

You may recall that in the last newsletter I highlighted a disturbing incident involving two Buzzards (*Buteo buteo*) found freshly dead on the lower playing field adjacent to the Botanic Garden in October last year. At the same time both resident Ravens (*Corvus corax*) disappeared.

The Buzzard corpses were sent for autopsy at the Food and Environment Research Agency Laboratory at York and the results received at the end of March. Residues of two rodenticides were detected but not thought to have been sufficient to have resulted in death. So the mystery remains.

However as a precaution the local police wildlife liaison officer has been informed and local farms and properties where such poisons may be in use will be advised on their proper deployment. One of the rodenticides detected, brodifacoum, has an acute effect and is strictly for indoor use only; the other, bromadiolone, is more widely available eg as the active ingredient in Slaymore. Both compounds are anticoagulants and have been shown to cause fatalities in predatory mammals and birds which have ingested poisoned rodents such as rats, mice or voles.

Anyone who finds dead or dying wildlife at Treborth is requested to immediately report the incident either to the Curator or to the police. As a precaution, do not handle a corpse or dying animal without gloves.

**Nigel Brown**

### **Friends of Treborth Coach Tour 7-10 September 2010**

There are still places available for this year's coach tour. The three night trip will be based in Bromsgrove and will include visits to Birmingham Botanical Gardens, Old Court Nurseries at Colwall, Cotswold Garden Flowers, Stone House Cottage Gardens, Whitley Court, Whitlence Gardens and the Dorothy Clive Garden.

The cost is £259 plus £70 for a single room supplement. If you are interested please contact Hazel Cave on 01492 622868 or Sarah Edgar on 01286 674934.

**Sarah Edgar**

## Weather and Wildlife December 2009 – March 2010

Month	Rainfall		Temperature			Frosts			Number of Days above	
	mm	inches	Max	Min	Air	Ground	Snow	5°	10°	
<b>Dec</b>	112.4	4.43	12.5	-1.0	6	15	15	26	7	
<b>Jan</b>	58.5	2.30	11.0	-4.0	10	20	15	16	2	
<b>Feb</b>	47.3	1.85	10.5	-2.0	7	19	5	24	3	
<b>Mar</b>	83.1	3.27	15.0	-3.25	6	10	1	31	15	

According to the Met Office, the winter just passed was the coldest to affect North Wales since 1978/79. This assessment is based on weather records covering the period Dec – Feb inclusive. Certainly it has been the coldest continuous spell at the Botanic Garden since our records commenced in 1988. Though lower night-time minimum temperatures have been experienced in other years (down to – 6 degrees) and bitterly cold daytime conditions endured for short spells in 1982, 1985 and 1987 when midday temperatures remained below zero (so called ‘ice days’), it was the extended period of cold (mid-December through till mid-March) which marked out this recent winter reflected by the high number of nights with air frosts for example.

In addition this winter has been unusually snowy though the amounts at sea level were not excessive and frequently < 2cm. The low number of windy days helped plants withstand the low air temperatures, the wind chill factor being negligible and therefore the risk of desiccation damage small. To date the vast majority of plants in the Garden have come through reasonably well, exceptions including the Eucryphias. Precipitation has been generally low especially in February and the first half of March. Indeed there was no appreciable rain in March until the 19<sup>th</sup>.

The cold conditions delayed plant growth in March and this was most evident in the response of grass which remained browned off until the end of the third week of March and then greened up within the space of a few days. Such greening is due to the rapid conversion of the pale yellowish-green pigment protochlorophyllide to the familiar green pigment chlorophyll responsible of course for the absorption of the sun’s electromagnetic radiation and its conversion into chemical energy which fuels carbohydrate synthesis and growth. Lying snow, so much a feature of this winter, effectively cuts out much of the incident light and grass buried below becomes etiolated and yellowish as chlorophyll production jams at the protochlorophyllide stage. It needs a minimum threshold of light to activate the conversion process. Temperature also moderates the speed with which leaves turn green at the end of winter by directly affecting the rate of uptake of magnesium from the soil – magnesium lies at the heart of every protochlorophyllide and chlorophyll molecule and without sufficient magnesium these important photosynthetic pigments simply fail to form. In March daytime temperatures exceeded the 10 degree threshold from 14<sup>th</sup> onwards and after a short lag of a week or so the increased magnesium uptake which the temperature increase had stimulated resulted in increased chlorophyll production and consequently greener leaves.

Despite improving temperatures there was still only one individual hazel shrub in leaf by the end of the month, all other deciduous species still outwardly dormant. Daffodils were

certainly in very short supply for St David's Day, the majority not blooming until the last few days of March and the first week of April. Lack of herbage has forced the high rabbit population to seek buried sustenance including bulbs and roots resulting in scrapes and holes throughout the Garden and subsequent injury to specimen plants.

As widely predicted, the cold winter weather affected small birds badly and numbers of all the tit species and especially wren were reduced at the feeding station by the Curator's house. Blackbird numbers were higher than normal during the cold spell and included a dominant male, colour ringed some 4 years ago. Natural dispersal of blackbirds and chaffinch was reflected in a marked reduction in numbers of both species around the feeding station in late March/early April, leaving just the dominant male blackbird and half a dozen chaffinch (down from 25 a few weeks earlier). The destination of the missing birds can be inferred from ringing recoveries suggesting strong easterly and north-easterly movements of both species reaching as far as Eastern Europe and Scandinavia. Of course some individuals simply adjust their foraging behaviour between winter and summer and establish exclusive territories for breeding purposes elsewhere at Treborth or further afield and so no longer register at the Garden's feeding station.

But as some birds disappear other species make a welcome appearance, and right at the end of March three Redpoll (*Carduelis flammea*) discovered the niger seed (*Guizotia abyssinica*) container and became regulars at the feeding station, their distinctive chuch – chuch flight call vying with the twangy twitter of Siskin (*C. spinus*). Redpoll have been very scarce at Treborth in recent years, rarely feeding here, most usually recorded as fly-byes on migration. Crossbill (*Loxia curvirostra*) was another species to put in an appearance right at the end of March, further evidence of the build up of migrant birds on passage as the seasons turn.

Of course it is the trans-Saharan migrants that receive the warmest welcome at this time of the year and the first such summer visitor to arrive this year (as indeed it is most years) was Chiff-chaff (*Phylloscopus collybita*) (on 23<sup>rd</sup> March) – a few days later than usual. Interestingly the first Chiff-chaffs to sing each spring are located along the railway track and then over the course of a few days they are joined by others using songposts scattered right through the Garden. It is as if the railway track is their preferred route to Treborth – is this true? We know that some species of migrating birds use visual clues to navigate (as well as geomagnetism, stellar positioning and even olfactory clues) and it is therefore plausible that railway lines act as navigation aids – but this notion needs further testing.

Not surprisingly butterflies have been scarce during this early period with a total of just 4 individuals of 4 species seen – Comma (*Polygonia c-album*), Peacock (*Inachis io*), Red Admiral (*Vanessa atalanta*) and Small Tortoiseshell (*Aglais urticae*). Moth numbers have been low too with only one night during the first three months of 2010 registering more than 50 moths of 10 or more species. The appropriately named March Moth (*Alsophila aescularia*) was markedly below average and numbers of all the Quakers (genus *Orthosia*) were also depressed (though with warmer conditions in April we may yet see their numbers increase as peak emergence times are delayed.) Of course inferring actual numbers of moths from moth trap catches is not exact science – it provides simply a sample and is prone to sampling error. In the case of the March Moth the estimate is further complicated by the fact that the female is a wingless, barrel-shaped little beastie which simply crawls up tree trunks

at night to await itinerant males which are winged – so the moth trap registers only the male component of the population.

Flowering times of traditional prevernal plant species have certainly been delayed with Wood Anemone (*Anemone nemorosa*), typical of this set of species, not flowering before the end of March this year.

As if to emphasise the dominating effects of weather and the unpredictable nature of this most basic environmental factor the final two days of March bring a return to unsettled conditions with over an inch of precipitation in squally sleet and rain showers. My thoughts turn to the newly hatched heron and raven chicks crouched in their tree-top nest sites high above the turbulent Strait – if they survive the next few hours life may yet be sweet but nothing kills so quickly as cold pelted rain on down feathered flesh. After all the winter's long chill these two foul days might be key.

**Nigel Brown**

### **Reminder - FTBG Photo Competition**

Don't forget to use your camera this summer and send your entries in for the Photo Competition.

The closing date is 31st October 2010 and the categories are:

Trebroth Botanic Garden, FTBG and STAG events, People, Nature/wildlife and Plant Portraits.

For full details see the last page of the September 2009 Newsletter (Number 36), or visit the web site.

**John Gorham**

## **Didn't we have a lovely time the day we went to Brussels**

A few weeks ago I was fortunate enough to be asked to participate in the STAG annual outing. Last year we had a very pleasant journey to CAT and the National Botanic Garden of Wales, but this year the level of ambition was raised, and we went to Brussels. Not a place immediately linked with botanical excellence, but it had the benefit of Katie's parents, who very kindly offered to provide accommodation for the entire team. I was involved as a responsible adult, because none of the students were old enough to drive a minibus abroad. When I suggested that it would be a good idea if someone wrote up the trip for the Friends newsletter, I was told in no uncertain terms that it would be better done by someone who wasn't about to undergo ordeal by finals.

After Jamie and Tim had organised it all, all I had to do was turn up at the students' union at 07.30 on Saturday morning when the whole team appeared and were loaded into the bus; once everyone was packed in with our luggage the bus had a similar density to a neutron star. Off we went, Tim driving the first shift to Oxford, when Ellen took over for the rest of the UK journey. The only worthwhile nature table stuff was the large population of red kites showing off above the M40 through the Chilterns near Oxford, before the nightmare of Heathrow and the M25. As we rolled through Kent at the relaxed and limited speed of 62 mph nobody knew what an oast house was except me. (Humph! young people these days.) However there was interesting stuff, because we had devices known apparently as iPods, each of which contained about a shipping container's worth of vinyl LPs. These were plugged into the auxiliary socket in the bus, and then transmitted their contents by wireless to the bus radio. (Hmm, perhaps they are not so stupid after all.) The majority of the music was that to which I used to fail to do my school homework in the 1970s, and apparently was gleaned from the record collections of their parents. We arrived in Folkestone in plenty of time, and just squeezed into the train before the one on which we were booked. Ellen was still driving, and thrilled by the novelty of driving the bus onto the shuttle. It's so much quicker and easier than the ferry, and we were in France in half an hour. I took over the helm, and we spent a couple of slow and steady hours on French and Belgian motorways until finding our way around the Brussels M25 and to Katie's folks. I was slightly sceptical about this, imagining the response of my parents had I turned up with 14 friends for the weekend. However a huge cauldron of curry appeared magically, which we were told by Pam (Mum) that David (Dad) had made especially mild for us. With eyes watering, noses running, and tongues dissolving we were all too tired and polite to make any comment, as the curry etched its way through the glaze on the plates. Pam had borrowed mattresses and airbeds from the neighbours, and turned the house into a youth hostel for the weekend. In the morning we found that a vast pile of lunch material was waiting for us to make up to take with us.

Sunday morning we were bound for the National Botanic Garden, on the other side of Brussels, and we found it occupying a park, with a similar feel to Kew, including a lovely little castle by the lake in the centre. The weather made the glasshouse complex the most attractive prospect, very good collection, although there were major works in process and not everything was open. Poignantly the tropical rain forest appeared to have been clear felled, well dug up and put in containers anyway, but the rest of the world collection was very



interesting. The best glasshouse exhibition was the evolution house; 500 million years of plant evolution, with everything from replica stromatolites through giant horsetails and tree ferns to Johnny come lately flowering plants. It was great to see plant evolution displayed like this, we are used to the evolution of creatures being demonstrated by a this kind of timeline, the first things wriggling out of the sea onwards past the dinosaurs to us, but the development of plant life displayed in this way was really well done.

Outside in the drizzle, the medicinal plants and herbetum were less than thrilling, a function of the time of year, but interesting to see how it was all laid out and displayed. Lunchtime came and we chatted up the man in the shop to eat our lunches in the conservatory rather than the covered picnic area. There were the sensitive *Mimosa pudica* and the Venus flytrap *Dionaea muscipula* for sale and of course they were both tormented with coffee stirrers.

After a further turn around the gardens we went into the centre of the city. I've driven our camper, with boat attached, all over Europe, but it was still a bit of a laugh to thread our way through the centre of a foreign capital, especially as it contained random wandering trams appearing unexpectedly. We found ourselves doing the tourist bit, chocolate shops, waffles, and of course the little boy having a pee. He was not impressive; he's only about a foot tall, and even the Japanese tourists looked unimpressed. However, the main town square was marvellous, totally over-the-top baroque architecture from the 1690s, which has fortunately survived the centuries and wars which have happened since it was built. A coffee outside a street café before returning to see what was for tea tonight. Pam had produced the cauldron this time; today it was a tasty beef stew. As we were in Belgium I checked carefully but there were certainly no horseshoes in my portion. After tea we went out to the local bar, a local pub for local people. Two things of note, smoking is still allowed in bars in Belgium which was a real surprise, and meant that we all stank when we got home, and secondly, how many bars in Bangor would have 'good old boys', local lads out for their Sunday night, able to hold social and political conversations in a foreign language, especially when distracted by attractive tipsy young women in skimpy tops playing pool. It had probably never happened before, and will probably never happen again. I left a penny with the manageress, and hopefully it will be stuck up above the bar.

Monday morning and we have a short trip from the house to the national arboretum. It was a lovely morning and we park up at the edge of Tervuren and walk into the arboretum. It's been established a long time, and the roadways are lined with beautiful avenues of beeches. We walk in through the plantations that surround the arboretum proper and two white backsides disappear through the trees. Enough people saw them to be fairly sure they were fallow deer. There was a wide variety of woodland birdlife, and eventually we are walking through 'Western North America', and 'Chile' and other regions of the world. A selection of nuts and seeds found their way into my pockets, including a monkey puzzle cone, which we will attempt to germinate – any tips? Chris and Ellen disappear to play a strange mixture of treasure hunt and orienteering called geocacheing. This involves solving the clues to the location of the buried treasure, and leaving a message or object in the buried box. They return to rejoin the main party in time for us to walk back together into town. Tervuren is a pleasant dormitory town just outside the main conurbation, and we sit on the steps of the church on one side of the town square and eat lunch. Some go and shop, and some drink coffee while watching the world go by.

The last activity of the day was to board a tram for a trip to a different part of the centre of Brussels. The previous day we had been to the equivalent of Trafalgar Square or Piccadilly. Today it was much more South Kensington. The main treat was the fact that I could look out of the windows, although everyone enjoyed the tram journey, from the furthest terminus in the suburbs, into the centre. The walk from the tram and metro station to a very impressive monument, similar to the Brandenburg Gate in Berlin, is about half a kilometre. We walked along a boulevard of gloriously mixed architectural styles, mainly the exquisite art nouveau and deco styles town houses of the wealthy of a century ago. A large number of these are now the embassies to the EU of the countries of the world. A walk around and another coffee, this time in a gorgeous building full of deco details. Back on the tram, a trip to the supermarket for beer and presents, and back to the ranch. This evening pizzas came out of the kitchen like Frisbees and we sat and discussed the highlights of the trip. This was followed by board games and, I believe the colloquialism was, chilling out.

Tuesday morning and the rush hour around Brussels gave way to the flat rural landscape of northern Flanders before we arrived at Calais at the train terminal. Here we experienced the joy of re-entering Britain. In stark contrast to the border between France and Belgium, which was no more than a sign by the side of the motorway, we had to file through security and have our passports checked against a computer database of potential terrorists. Sometimes I wonder if we really get Europe - is it perhaps because we have never experienced men in jackboots on our high streets in the way that so much of Europe has done in the past? While in the tunnel, Ellen fights for the drivers seat so she can experience the novelty of driving back off the train into the maelstrom of south east England, and I join Chris in the steerage accommodation at the back of the van. We drop Rosie off in Birmingham, and we get back to Bangor in the early evening.

Congratulations to Jamie, Tim and Katie for organising the trip and especially to Pam and David for putting us up. It was a splendid trip out for all and a last treat for the third years before the exams begin to loom.

**Julian Bridges**

## **Busybees - Bangor**

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## A Postcard from Belize

In what now appears to be a regular travel slot in *The Newsletter* I thought I'd give a brief account of my latest botanical adventure to Belize. Flying across the Caribbean Sea, I got my first view of the tropical paradise that is Belize. It looked dark and green, like a field of broccoli from way up high, absolutely cloaked in forest. Stepping off the plane I was greeted by a hot humid blast of air, and a pummelling from torrential tropical rain. I was definitely 5000 miles away from cold, snowy Britain. I had come to Belize to take a course in tropical field botany as part of my Masters at the Royal Botanic Gardens Edinburgh, but had decided to go a week early in order to see a bit more of this incredibly diverse country.

Belize is located in Central America, bordered by Mexico to the north and Guatemala to the west and south. Using that common measure of country sizes, Belize is equal to about one Wales. Up until the 1960s, Belize was known as British Honduras, and was administered as a British colony. In 1981 Belize gained its independence, though it still retains the Queen as head of state. Unlike most other Central American states, which are predominantly Spanish-speaking, Belize's official language is English due to its history as a base for British pirates, and later foresters. Due to its colonial history, Belize is an incredibly diverse country with people from African, Mayan, Spanish, Mennonite, British, Chinese, American, and Indian descent. The cultural diversity of Belize is mirrored by the outstanding biodiversity of this tiny country.

My introduction to the diverse flora of Belize was to begin at the Belize Botanic Garden near the town of San Ignacio close to the Guatemalan border. Belize Botanic Garden was set up in 1997 by the late Ken duPlooy as a place to showcase Belize's native plants. It covers an area of around 18 hectares in a tropical-forested valley. Pride of place is given to Belize's only endemic palm, the silver pimento palm (*Schippia concolor*) at the entrance to the Gardens. Orchids are a speciality of the Garden, and through a partnership with the National Botanic Garden of Ireland, Glasnevin, the staff are contributing to the research and conservation of Belizean orchid species. Among the orchids in flower was the stunning black orchid (*Prosthechea cochleata*), the national flower of Belize.

Plants feature at the very heart of Belize's complex history. The fact the Belize even exists as a country is due to one particular tree that I came across whilst wandering around in the tropical drizzle at the Belize Botanic Garden. Back in the 17<sup>th</sup> century, British pirates prowled the waters of the Caribbean, attacking and robbing the Spanish galleons of their goods. Among the Aztec and Mayan gold was timber known to the Spanish as Tinta, and to the Maya as Ek. This wood was particularly valuable as it was used to produce purple dye back in Europe. Recognising the potential to make some "legitimate" riches, some of the British buccaneers traded in their seafaring lives to harvest the wood of *Haematoxylon campechianum*, which became known as (not very imaginatively I know) Logwood. Logging camps were set up in the Belize area, and the foundations were laid for British claims to the land, and ultimately Belize as we know it today.

But long before the British pirates set up camp on land, and started to harvest the timber from the rich forests, the land belonged to the Maya. The Mayan civilisation reached its peak in around 900AD, but has declined since then. Mayan ruins are a prominent feature of

the present-day Belizean landscape. I managed to visit two during my travels: Cahal Pech, a hilltop ceremonial site overlooking the town of San Ignacio, where I was treated to the sight of a giant blue morpho butterfly flitting through the dappled shade of the trees that now grow from the cracks of the once great cathedrals of the Maya, and the lakeside citadel of Lamanai, now inhabited by a very loud troop of howler monkeys. Sacred to the Maya was the Yax che (*Ceiba pentandra*), a colossal legume that was thought to have branches that reached up to the highest levels of heaven, and roots that plunged to the deepest pits of hell! At Barton Creek Cave, on the edge of the Maya Mountains, the stalactites that hang from the vaulted roof were thought to be the tips of the Yax che roots. The cave was therefore considered to be a holy place of the rain god, and blood sacrifices were made to appease it in times of drought. Unfortunately for the Maya (and even more unfortunately for the sacrifice victims), the sacrifices didn't work, and the decline in the Mayan civilisation is attributed to crop failures and drought. However their mark has been left on the landscape, as surprisingly little of the forest in Belize is actually primary rainforest; the Maya cleared most of the forest for agriculture centuries ago. And this isn't to say that the Maya have been and gone, as the Maya community today forms a vital part of the rich tapestry of cultures in modern Belize.

But one tree drew all the people of Belize together: Mahogany (*Sweiteinia macrophylla*). When the British had harvested all of the Logwood from the coast, they began to move inland, where they found the gigantic mahogany trees. This brought them into contact, and conflict, with the indigenous Maya. But in order to harvest the lucrative timber and transport it to the coast, in 1779 the British brought over thousands of African and West Indian slaves. These people of African descent now account for nearly 90% of the current population of Belize, known as Creoles. Such is the significance of this tree to all the people of Belize that it has the honour of being the national tree. Unfortunately it is now exceptionally rare, and can now only really be seen on the flag of Belize. As I had seen the black orchid and the mahogany, I endeavoured to see the complete set of national symbols. I was lucky enough to spot a pair of keel-billed toucans (*Ramphastos sulfuratus*) in the Maya Mountains, but the closest I got to see the final national symbol, Baird's tapir (*Tapirus bairdii*), was a pile of tapir poo by a forest stream! My other experiences with Belizean fauna were even more unpleasant, as I was attacked by a swarm of bees, dive-bombed by a parrot, and had my glasses stolen by a monkey! This is why I'm a botanist - plants are far easier to get along with. That is, they are except for the black poisonwood (*Metatopium brownei*), a tree that is a relation of the mango and causes severe rashes when touched or even stood under.

These days, Belizeans are especially proud of their biodiversity, and there is a real drive to document and preserve as much as they can. As such, the UK-based Darwin Initiative funds many biodiversity related projects in Belize, including our own looking at the savannah flora of the Rio Bravo Conservation and Management Area in the northern district of Orange Walk. Belize is mostly covered in dense, dark forest, but the savannahs are somewhat neglected, but no less diverse. Orchids again are a prominent and colourful component of the savannah, such as the beautiful Dama de Noche (*Brassavola nodosa*), a beautiful smelling epiphyte in the numerous calabash trees (*Crescentia cujete*) that stud the grasslands, and the purple *Bletia purpurea* that grows beneath the Caribbean pines (*Pinus caribaea*). Unfortunately for us poor students, Belize had an unprecedented amount of rain over the weeks before our arrival, meaning that the savannah had flooded. The daily commute to the

survey site via canoe and slogging through waist deep muddy water was a bit of a chore, but I suppose we had a taste of difficult field conditions.

Belize is a stunning part of the world, a jewel on the edge of the Caribbean, and well worth a visit to see its exceptional plants and animals, and if you're feeling a bit adventurous.

**Anthony "Badger" Pigott**  
**Royal Botanic Garden, Edinburgh**

**Tales from a Hot Island,  
being the second part of the Tenerife trip 2009**

By the time we reach the fourth day of our trip, it has become strangely routine that this is what we do with our lives. Get up in the morning, eat enough breakfast and drink enough coffee to wake up properly, liberate enough fruit from the breakfast buffet to complement the lunchtime rolls, cheese and pate from the supermarket and make sure we are in the bus before the children get there. Today should see the final lizard fondling, and a proper walk through the extensive and ancient laurel forests of Anaga in the north east corner of the island.

Roll right around the southern part of the island on the autostrada, there's a lot to see out of the coach windows, although the majority of the students seem to consider this to be a chance to catch up on some sleep. They miss the bone-dry landscape dotted with the intense green of the unsustainably irrigated golf courses, hotel gardens and airport surroundings. It is an unfamiliar species of broad-leaved grass and the contrast between the bright green and the grey brown 'real' landscape is striking. There is a substantial wind farm, and an oil fired power station which provides the majority of the island's power. We climb over the north-south divide near the capital, Santa Cruz de Tenerife, and it is immediately more verdant, and more worryingly, cloudy. Onwards through the suburbs and out to Valle de Guerra where we hope to find lizards, but Wolfgang the lizard king has a face as gloomy as the sky by the time we arrive at the venue.

This is a museum of country life, where we can lizard in peace, drink and dispose of a coffee, and amuse the staff. More importantly it provides south facing walls where the herps might just be active. On the way in, in the gardens, is an *Agave americana* in the midst of a state of some excitement, just like the one we saw in Treborth a couple of years ago. The inflorescence was a good three or four metres high but had not yet begun to produce its bracts. Unfortunately I didn't have the wit to measure it as we arrived and left, it would have been interesting to see how much it had grown during the morning. After the traps are put out, there is time to view the 'manor house' which was the centre of a small estate, and contains displays of rural crafts, and is surrounded by display plots of all the crops, ornamental, aromatic, and medicinal plants that would have been grown on the estate. Economic botany, my favourite, especially as neither Adrian nor Chris could identify the

mystery *Malvaceae*, which, had they done field observation properly, and seen the admittedly few ripe bolls instead of concentrating on the flowers, was very obviously part of my history, as one of the commercial cottons that John Gorham and I spent happy years tormenting. For the fans of Fred Dibnah there were various antique agricultural machines and mills, and, not part of Welsh agricultural history, an historic water meter. Back to the lizards, and although the catch is disappointing, there are a couple to show, and the annual strength of stomach test as a lizard drops its tail in an attempt to escape. It is unfortunate, but it happens frequently in nature, as rather than be dinner, my tail drops off because I have specially perforated vertebrae, and I scamper off into the undergrowth while the detached tail flicks about on the floor distracting the predators. Strangely enough, this time, most of the predators seem to be screaming in horror, or turning slightly green. This was the last major lizard session, and we finally had the evolution question sorted out, but obviously I would have to kill you immediately if I told you the answer, because you might tell those who are going this year. Ten minutes round the rest of the gardens, including a fine millipede about 70mm long before walking back to the bus.

Lunchstop today is at the Cruz del Carmen viewpoint, the first experience of the forest. It's now quite damp, a fog blows up through the laurels and tree heathers which are coated in various lichens, and we see a substantial number of the *Plutonia* semi slugs, snails with small relict shells which are the size of a little fingernail, on their way to evolving into slugs. What's the point in doing that then my slimy little friends? Then onwards into the interior. It's not the heart of darkness, but as the bus winds slowly along the narrow twisty roads with the foliage brushing against it, we are obviously now somewhere closer to Beddgelert than southern Tenerife.

Occasional spectacular views right down to the coast to both sides as we creep along the spine of the island; at times it's like a road along Crib Goch. Towering like spires above the forest are a couple of splendid volcanic plugs, the resistant central remains of ancient cones from which the softer ash deposits have been eroded.

The bus stops and we pile out by the side of the road to start the walk. The walk is only a couple of kilometres, but it's slow and interesting along a steep rough trail through the woods. Cath sets off first, to stop the less interested students from trotting round too fast without paying attention, I bring up the end of the single file, and the other grown-ups are spaced along the line to educate, inform and on occasion entertain. The botanical silverbacks, Adrian and Chris, delight in winding each other up when we pause in clearings or glades for the botanical wonders. There are tree heathers 6 and 7 metres tall, laurel species almost beyond count, well at least a dozen, with tiny trainspotter differences between them, and lots of glorious ferns including *Woodwardia radicans*, the chain fern, which makes rooting babies on the end of each frond so as they bend to the ground the next generation roots and continues to spread. The Killarney fern *Trichomanes speciosum* is a very rare, almost translucent, delicate plant. There is a small colony a few muddy metres off the trail, and each year it is reverentially visited by the botanical keenies because Nigel has stressed its importance. This year we find another, almost familiar, small tree, and the books come out to identify it as *Ilex canariensis*, the Canaries version of a holly tree. Meanwhile Cath has been using her walking poles to keep the disinterested of the group from rushing on too fast, and they have now arrived back at the road. A shiny four by four pulls up and out

jump two guys in uniform. Although they seem somewhat agitated they fortunately don't draw their handguns. They appear to be a cross between national park wardens and local police and they are somewhat cross to find that we have no permit for the walk. They are somewhat crosser by the time a runner is sent back to find Wolfgang, which takes about 30 minutes, so he can do apologising properly in Spanish. The situation is resolved, although we have done this walk since time immemorial without realising the need for a permit. Those still interested in the botany back in the woods are delighted to find that the emblematic canary bellflower *Canarina canariensis* was, in a couple of sunny spots, flowering beautifully, the bright orange-red bells standing out from the background of green.

The officers' mess that evening was full of concern. The gorge walk planned for Friday would be impossible as the authorities were repairing the footpaths. We would have to make something up sharpish. Maps and guidebooks out and a plan is hatched.

Setting off in the morning around the autopista again we turn westwards along the spinal road at Santa Cruz de Tenerife and up into the lower part of the forest. We are again on the north side of the divide, it's drizzling gently, the pines are dripping from their needles and the lichens are sponging the mist out of the atmosphere. Stopping to look at the forest species we find a rather splendid volcanic bomb. These are highly prized by our geologist, and have in the past led to much silliness in airports as to whether we have packed the bombs in the hold or the hand baggage. Those however are bread roll size specimens as opposed to the large pillow sized one we have here. As an eruption proceeds bits of molten rock are spat out into the air as liquid and they cool and solidify as they fall back to earth. Frequently curved and fluted as they spin through the air, they are an attractive feature of a geologist's mantelpiece. This one is cracked and shaped like a soft centred chocolate would be if you threw it on a hard floor. The outer layers had solidified in the air, and broken on impact with the ground with the centre still as soft as Turkish delight. We climb upward and westwards through the damp greyness, until at about 2000 m we break through the clouds. It's similar to being in an aeroplane, suddenly we are bathed in sunlight, and the upper surface of the clouds spreads northwards away over the sea, but we are still in the bus, and apparently driving along a shoreline as the sea of clouds lap against the hillside. In the distance is the conical peak of Teide but we stop below Montana Negra where the road cuts through some dramatic features. There are at least 50 vertical metres of ash, scoria, and pumice deposits in sharply distinct bands of colour, known in Spanish as the 'tarta' or cake. The pumice is white as snow, the scoria black as your hat, and the ash is in various shades of grey and brown. Nobody has seen this before, it's something we knew about as worth a visit, but we have never had the chance to go there previously. The students seem impressed so we take them on to the base of the peak where there is a small visitor centre for the Parque Nacional del Teide. Lunch sitting outside in the sun, where there is a small but well laid out garden of the high altitude flora of the caldera. This also provides a chance for the lizard people to examine the critters in a venue in the centre of the island. Lunch done we explore the centre. This does the volcanic and natural history of the national park very well, and I chat up the receptionist to run their movie in English. Its rather corny, but sequences of eruptions and lava flows in action make up for that.

The last day is held in reserve, in case we have some form of disaster earlier in the week. We have said goodbye to our driver and coach and pick up the minibuses. As we have done everything that we planned to, this is a day for optional activities. The staff offer activities

connected to their interests, or the students, in minibus size groups, have to come up with an idea with some intellectual credibility. This year some want to go whale watching, so Adrian and Alison organise that from the hotel, some students shiftily want to do nothing or go shopping, and some want to come out to play with the grown-ups. In previous years we have had another go at the Botanic Gardens, or succeeded in going to the top of Teide if we have been unable to earlier in the week. This time it appears that the lizards win. There is a relict population of a highly endangered species, *Gallotia intermedia*, that lives in a couple of remote clifftop sites. They were only discovered ten years ago and are the lizards Holy Grail for the trip. Two minibuses full of keen and wannabe herpetologists drive to the other side of Los Christianos. Los Christianos is one of the least attractive parts of the island, being one of the central foci for all day English breakfasts and Sky Sports. However, only a kilometre outside the town at the end of the road we are faced by a steep cliff above a small empty beach. With the prospect of seeing these wonderful creatures, Wolfgang and Roger Thorpe are now almost as calm as Nigel would be if we told him there was a family of ospreys rearing their young at Treborth. They race off up the rough track up the cliff. It's in full sunshine and very steep and unconsolidated. By the time we reach the top the front markers are almost out of sight, I bring up the rear as we straggle across a landscape that could have been used in a Clint Eastwood western, one where the bad guys take his horse and water and leave him to die. The only things alive are us and the dryland plants which have had the misfortune to germinate. Fortunately it's only about a kilometre to the site where we sit on one edge of a gully running over a cliff, and look across with binoculars and cameras to the other side of the gully, about fifty metres, to where the creatures are meant to be. After the first hour I decide to explore, and astonishingly there are quarry tailings, as if there was some form of extraction going on here, in one of the more inaccessible hot and unpleasant sites in an island that is totally made of rock. There is evidence of flash floods down the gullies and the *euphorbias* have monstrous root systems to gather whatever moisture there might occasionally be. Meanwhile back at the gully, not that many of the students have actually started to cry, and eventually, by standing next to Wolfgang and whispering 'cold beer' softly for some time, it is decided that they aren't coming out to play. In fairness, there was an annoying streak of banner cloud coming from the top of Teide directly across the site, the chance of a sighting is only about sixty percent anyway, and we didn't have the lizard inciting equipment, a catapult to fire tomatoes across the gully to provide lizard lunches. So we go and have our lunch instead. I think it's rather splendid though, that a species, however mythical, which is over a foot long, and lives on a highly studied island, should have managed to evade science until only a decade ago.

En route to the second major venue of the day we stop at the site of the most recent eruption on the island in 1909; this is an exploratory stop, and the interest is that after a century there are the first steps of plant colonisation with a very few species very widely spread. Thinks, might be a good place to do some form of quantitative survey, thinks again, might be a good place to break student ankles on the rough lava. Piling back into the minibuses and off to the furthest northwest corner of the island. The plan here was similar: let's look and see what we find. There was talk of a 'gecko shelter preference survey', or, seeing what kinds of stones they like to lurk under, could be interesting with dark stones absorbing more sun and therefore supposedly being warmer than the lighter coloured ones. Many stones are turned, and many geckoes are surprised out of their afternoon naps, however no impression could be gained as to whether this would be a viable days exercise. There was also a semi derelict



glasshouse complex, a very melancholy sight, although it was still producing tomatoes from the parts of it that had not actually fallen down yet. And what could that remind me of then?

OK, back in the minibuses and home to the hotel, the pleasure of handing back the minibus keys without having hit anything in Spanish, and a last night sitting out in the town square until the small hours. We had an easy day travelling back on the Sunday, getting home at a reasonable hour to the reality of Bangor in November. It was a great week, again, for both the staff and the students. This year the homework for the students was in two parts, a facsimile of a scientific paper describing the lizard microevolution, and as a new feature for this year, they had to complete field observation notebooks, and hand them in immediately on return to Bangor. This seemed an excellent idea, and, looking at some of the work that was being done during the trip, it looked as if we had some members of the crew who were well on the way to producing something worthy of inclusion in the records of the voyage of the Beagle. Hopefully it will all still be there for us this November, if our contribution is again required.

This year we also had a strong contingent of Treborth volunteers on the trip, and, as they have shown themselves so supportive of the gardens, I will take the opportunity on behalf of Cathy and myself, to wish them well in their finals and futures: Tim, Paul, Hazel, Lynwen, Chloe, Jo, and Lucy, and anyone else whose name I didn't get, if it wasn't for the work put in by you lot, Treborth would be a much poorer place.

**Julian Bridges**

## **How Gardening can ruin your Relationship**

Scene. A largely sunny but not cloudless garden.

“Where do you want these?”

“Just take a handful and scatter them. Plant them where they land. It looks natural that way.”

“Okay... .” *Examines instructions for bulbs.* “It says four inches deep. Shouldn't we have some kind of measuring implement?”

“I don't think you have to be so... Look, it's not quite the full length of this fork thing.”

“Really? Do you think that'll be alright? It does specifically say...”

“It’ll be fine.”

“What does this mean, then? ‘Plant at half moon.’”

“Half shade, half sun.”

“Well, that’s a bit naff. When you think about it, half shade could be construed either as half shade all the time, or full shade one minute full sun the next, fifty-fifty. It’s not quite the same, is it? Anyway, are you sure this is the right place? I had to move the sundial from here, remember.”

“You moved the sundial because you forgot the clocks went forward. Just plant.”

“How do you know which way up they have to go?”

“This end at the top, flat bit with the rooty things at the bottom.”

“Really? The blurb seems to indicate otherwise.”

“That is a trowel icon.” *Pause.* “Why are you moving them?”

“It says four inches apart.”

“I’ve told you, there’s no need to be so...”

“Well, if it’s four inches deep and four apart, we measure with the forky thing like this... and then we make it equidistant...*comme ça!*”

“Thank you.”

*Pause.* “So, you reckon this really is four inches, then? I suppose you know that joke about why women are bad at parking.”

“This, from someone who wanted to know the difference between a heaped and a level tablespoon – in millilitres.”

“Reasonable question.”

“Yes, but you can’t have a heaped tablespoon of olive oil.”

“It says plant these in a weed free area. Ha! Fat chance. Perhaps if we just...”

“*Don’t touch those!!!*”

“Sorry. You seem a bit laissez-faire about this, if you don’t mind me saying so. I bet they aren’t so cavalier when it comes to those gardens at that flower show. Hornsea. Swansea.”

“Chelsea.”

“Chelsea. What does this mean, then? It says these can be forced in a pot.” *Frustrated activity followed by a short, sharp sound and a pause.* “Oh, never mind. Where did you get that crap pot in the first place?”

*They continue to plant in silence at their respective paces.*

“It says on these ones to plant them two to three times the height of the bulb itself.”

“That’s right.”

“Well, that’s a bit vague, isn’t it? Is it two or is it three...?”

“Just plant the damn...”

“...only some of these ones are smaller than others.”

*Pause.* “I really, honestly do not think that nature is, quite frankly, that bloody bothered whether it is two or three or even, on occasion, one point five or four times the depth of the perishing bulb.”

*Aware that for some reason a bit of a nerve may have been touched.* “Oh, right...”

“The—bulb—will—sort—itsself—out—later.”

“Well, I have to say that that’s not the impression you get from the packet.” *Pauses and looks heavenwards.* “Did you feel that? I think it’s starting to... Gosh – you seem to have done an awful lot more than me. How have you managed that?”

“Right. That is *it*. I am going in.” *Tears off gloves.* ”You sort these out. They need moist dry shade with plentiful sun, well-drained clay, and protection from north, south, east and west winds.”

“What? Why? That’s a bit rough. It’s not my fault there’s a bit of precipitation...”

**Andy Macfarlane**

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