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of the
HARDY ORCHID SOCIETY**

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The Hardy Orchid Society

Our aim is to promote interest in the study of Native European Orchids and those from similar temperate climates throughout the world. We cover such varied aspects as field study, cultivation and propagation, photography, taxonomy and systematics, and practical conservation. We welcome articles relating to any of these subjects, which will be considered for publication by the editorial committee. Please send your submissions to the Editor, and please structure your text according to the "Advice to Authors" (see website www.hardyorchidsociety.org.uk, January 2004 Journal, Members' Handbook or contact the Editor). Views expressed in journal articles are those of their author(s) and may not reflect those of HOS.

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Cover Photographs

Front Cover: *Ophrys speculum* – the fabulous Mirror Orchid is one of the Algarve’s star wildlife tourist attractions.

Photo by Sue Parker (see article on page 132)

Back Cover: *Spiranthes spiralis* with *Narcissus serotinus* in Crete

Photo by Rosemary Webb (see article on page 114)

Contents

| | |
|---|-----|
| Editorial Note | 111 |
| Chairman’s Note by John Wallington | 112 |
| <i>Erratum:</i> Earth, Wind, Fire and Ice: Orchid hunting in Iceland | 113 |
| Orchids in Crete in Autumn by Rosemary Webb | 114 |
| Modelling Orchid Spread Indicates a Helping Hand is Needed by David Trudgill | 124 |
| Reflections on an Algarve Gem by Sue Parker | 132 |
| Book Review: <i>Wild Orchids of Bedfordshire</i> by Simon Tarrant | 136 |
| Book Review: <i>Wild Orchids of Somerset</i> by Les Lewis | 138 |
| Broad-leaved Helleborines with pigment deficiencies by Richard Mielcarek | 139 |
| An Interesting Hybrid by Nigel and Lois Harbron | 142 |

Editorial Note

We have another issue filled with interesting and varied articles. Rosemary Webb contributes an account of her trip to Crete with Nigel Johnson. This is especially notable for its autumn timing and their observations of *Spiranthes spiralis*. Sue Parker provides a piece on the Algarve, and there are reports of pigment variants in the Broad-leaved Helleborine from Richard Mielcarek and an interesting hybrid from Nigel & Lois Harbron. There are two reviews of new county-focused orchid books and David Trudgill has contributed another thoughtful and thought provoking article. This time he addresses orchid seed spread, based on his own experiences in creating an orchid meadow. In some ways this relates to earlier discussions in *JHOS* about the nature of interventions in orchid conservation involving Richard Bateman, Svante Malmgren, John Haggard & others and a source of some lively debate!

This issue proved difficult to fill due to a lack of submitted articles right up to the end of September. Please do consider contributing to the journal if you have interesting observations or enjoyable trips to report. Cultivation material is rarely submitted but is of great interest to a growing number of HOS members. I am always able to help in putting material together for the journal and happy to discuss ideas for articles!

Chairman's Note

John Wallington

This note was written just after the Northern Meeting, held at St. Chad's Parish Centre in Leeds on 5th September. It was my first meeting as Chairman so I was a little apprehensive as the date drew closer. I need not have worried. The organisation of the meeting was splendid and everything ran smoothly. For this I would like to thank John and Sheila Temporal as well as the staff of St. Chad's. I would also like to record my thanks to Steve Pickersgill for managing the projection and to Andrew Wells and Lesley Goode for ensuring that all of the speakers could be clearly heard throughout the hall. Thanks are also due to David Hughes for putting together a varied and interesting programme. The programme differed from that initially advertised as two of our speakers were unfortunately unable to attend the meeting. So a very big thank you to Celia Wright who, instead of quietly enjoying her first meeting since occupying the Chair, stepped into the breach and provided a splendidly illustrated and interesting presentation on the *Cypripediums* of south western China, covering their location in the wild and good advice on their cultivation. I hope that those present also enjoyed the last minute potpourri of orchids from the Italian and Swiss Alps that I produced to fill in the other gap.

It seems to me that one of the major benefits of membership of the Society is the three meetings that we hold each year and I would urge all of you to try and attend one (or all!) of these meetings. They provide great opportunities to meet other orchid enthusiasts, to hear about, and exchange ideas on aspects of orchid cultivation and conservation. It enables us to delve into the science behind the appearance and behaviour of the plants that we all love and to share knowledge of the places in Britain and abroad where wild orchids can be found and enjoyed.

I would like to suggest to all of you, and perhaps particularly the newer members, that there are many ways in which you can contribute to the Hardy Orchid Society and to the pleasure it gives to all of its members. You could think about leading a field trip to one or more of your "local patches" – remember they are the places where you are the expert. You may like to think about giving a presentation at one of our meetings. A talk can be any length, from 5 minutes to an hour or more and can relate to finding, cultivating and conserving orchids, or to the science that underpins these activities. Don't worry if you are not experienced in giving talks – there are lots of people who can provide help and encouragement.

If you feel that presentations are not for you, how about writing a piece for the Journal and include some of your own photographs. You may like to offer your assistance in running the HOS. There is always room for more expertise on the Committee and also room for help in the jobs that do not entail Committee membership. And finally don't forget to enter the plant competition at the Spring Meeting and the photographic competition in the Autumn Meeting (I think it is too late for this year, but the great pictures you took this year may be eligible next year).

Erratum

Earth, Wind, Fire and Ice: Orchid hunting in Iceland
by Richard Bateman & Paula Rudall

Due to an editorial *faux pas* in the last *JHOS* there was a mismatch between the last image and its caption in Richard and Paula's Iceland article. The intended image and its caption are included here and the digital (website) version of *JHOS* has been corrected.

The correct caption for the waterfall image that was included in the last journal is "*Pseudorchis straminea* growing in the spume of Skogarfoss waterfall, Iceland".



Dactylorhiza maculata ?subsp. *islandica* sheltering in the lee of a volcanic crater, Kerith, near Selfoss, Iceland.

Photo by Richard Bateman



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Orchids in Crete in Autumn Rosemary Webb

I have been visiting Crete in the spring since 1987. Over the years I have found many sites which have become favourites because of the wonderful array of orchids to be found on them. Some sites are very small and it is surprising to see so many different species in such a tiny patch of ground. I always stay in Aghia Galini which is a lovely little place and very convenient for sites in both the east and the west. The whole area is mountainous and is dominated by Psiloritis which in spring is still snow-capped. There are many small roadside sites that can often be rewarding, especially off some of the smaller roads.

One of my favourite sites consists of two small areas of open phrygana on sloping ground. A very damp area passes through the higher site and water drains into a culvert below the side of the road. In the dampest area there is *Anacamptis laxiflora* and quantities of *Serapias lingua* in many colours, varieties of pinks and reds. On the open banks, which are almost bare of vegetation, the tiny, blue Cretan endemic *Solenopsis minuta* ssp. *cretica* blooms. Amongst the low spiny bushes, the star plant for me is *Ophrys candica*. I know of no other sites where this plant flowers quite so early. By the second half of April, flowers come thick and fast in a wonderful array of colour and lip markings. There are also quantities of *Ophrys bombyliflora* and a few *Serapias bergonii*. This site is really tiny.

On the other side of the road, the site continues but is a little larger in area, sloping gently down to an olive grove. The same orchids are here but with slight variations. The site is shaded at the top by small trees and there are grassy areas between the heather and shrubs. There are less *Ophrys candica* here but there is also *Ophrys heldreichii*. Once we found an amazing hybrid between the two species with very spectacular flowers. There are also *Orchis italica* and orchid plants in bud which I had never managed to find open while I was there.

The spring of 2014 was early and warm. On or about the 22nd April, I discovered that the budded spikes were in fact Bee orchids (*Ophrys apifera*) which were opening beautifully. Bee orchids are special to me as it was these which set-off my life-long love of wild orchids as a child. We had been living in Africa and went for a picnic on Portsdown Hill behind Portsmouth where Bee orchids were in flower. I was a child who was fascinated by flowers but nothing, even in Africa, caught the imagination

Fig. 1: Dark form of *Ophrys candica* Fig. 2: Another *Ophrys candica*
Fig. 3: *Ophrys heldreichii*
Fig. 4: *Ophrys candica* × *Op. heldreichii* hybrid
Photos by Rosemary Webb

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like this little orchid that looked just like an insect. It was especially poignant for me to find these *Ophrys apifera* in Crete, as I realised that in fact 2014 marked the ‘diamond jubilee’ of my finding that first Bee orchid (the Queen is not the only one to have a Diamond Jubilee!). I just had to have some photographs of these Cretan ones. I put my camera bag down and started to prepare for my shots. I noticed that I had put my bag almost upon a rosette of leaves, obviously an orchid with no emerging flower spike. I realised, with excitement, that this was Autumn Lady’s Tresses (*Spiranthes spiralis*). I have always read that these are rare in Crete. I was sure that this is what this was.

Over the next few weeks, I began to think about an autumn trip to Crete to see them. Some would consider it strange that I would go that far to see an orchid that grows naturally on my lawn in Hampshire. However, I have been going to Crete for more than 25 years and have seen most plants that are possible to see in the spring. An autumn trip would complete the picture and *Spiranthes spiralis* is another special orchid for me. On October 11th 2014 I walked down to the site. To my great

delight there they were – 17 flowering spikes. Looking at the flowers, this seemed to be the ideal time, all were perfect. Already, most had a good rosette of leaves forming to the side of the flower spike, giving promise for autumn 2015. I could see that they will develop into the sizeable rosettes, like these I saw in spring 2014, by the time I visit in April 2015.



The next task was to decide which plants to photograph. The obvious choice would be the spike from the leaves I had seen in the spring. There were three spikes but they were all still in bud. It was in the shadier, damper parts where the best flowers could be found. These were in peak condition, no flower beginning to fade at the bottom and still some unopened

Fig. 5 (above top): *Spiranthes spiralis* in the of spring 2014

Fig. 6 (above bottom): The same *Spiranthes spiralis* plant in the autumn of 2014 with spike and new rosette

Fig. 7: *Ophrys apifera* Fig. 8: *Anacamptis laxiflora*

Fig. 9: *Serapias lingua*

Photos by Rosemary Webb

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buds at the top of the spike. A feature seemed to be that plants in shadier places were in a more advanced state of opening. It was clearly damper here and this is the other feature of the development of the plant. They ‘pop up’ when the rains come, even at home and develop quickly. At this time, here in Crete in mid-October, it was still very dry, although I was told that there had been some showers a few days earlier. The weather was now warm and calm, the sky was clear of haze and fabulously blue. Each day was as lovely as the best mid-summer day in the south of England. I was here, in Crete, looking at *Spiranthes spiralis* – there are still orchids in Crete! The plants were growing in a terrain that was more bare than at home. It can be quite difficult to photograph the forming rosette and the spike together in Hampshire. There were some lovely configurations of flowers too, no wind making close-up shots so much easier. A very rewarding day.

Having established that Autumn Lady’s Tresses were in flower, it was obvious that other sites deserved a visit. There are several good orchid sites around the village of Vatos. The geology in the area is complex and this creates habitats for very specific individual plants. In spring, one can spend many hours here and if you are a photographer you are spoilt for choice. It was obviously a place to search in autumn too. Another beautiful, sunny, warm morning and the only decision was where to start. Walking into a hillside meadow which faces north, this grassy field is a rich site for orchids in the spring. The meadow also has ridges leading up to several higher areas. Almost immediately, in a place which is often damp in spring, there were Autumn Lady’s Tresses in groups of 3-7 spikes in each group. From here there are views across the valley towards Mt. Kedros. I particularly wanted to photograph these plants with a view. It would be unmistakably Crete – not my garden! The distant mountains were a purple-blue with a clear, deep blue sky above. The light was coming partially from the side, so it was important to get on with the photography before the sun got round to where I or my camera on its tripod would cast a shadow.

The plants were lovely, lower flowers completely out but still some to come at the top of the spike. They were perfect, no brown spots, none going over. Here I was in this warm, idyllic spot with the last orchids of summer – at home they finished a month ago. Wandering on, near one of the ridges, at the top of the site, there were some more flowering plants. There were none in between the two sites, they seemed to be quite particular in their habitat requirements.

We moved on to a higher site that we know well. We have always found this to be a good place in spring, not least because it is a site for *Orchis provincialis* which is rare in Crete. There are also quantities of *Orchis simia* and *Orchis sitiaca* amongst

Fig. 10: Autumn view of *Spiranthes spiralis*
Photos by Rosemary Webb



a myriad of more common species. The site consists of small, mostly disused fields and terraces interspersed with areas of phrygana and again it faces north. We soon found some Lady's Tresses, this time mostly growing in the shelter of rocky terraced walls or low bushes and scrub. On first sight, this looks very different habitat to the earlier sites but in fact the bushes were acting as shade just as the rocks and ridges were on the other sites. These plants were taller than the ones previously. There were lovely groups of spikes that made good subjects for close-ups but were not suitable for whole plant shots as the bases of the plants were hidden in the vegetation.

The next day was a search on the Gious Kampos which is so famous for its orchids. We drove up the mountain road from Spili and at the top, the area of small plain and humps opened out with Mt. Kedros on the far side, looming over the scene. I was struck by the wonderful heather *Erica manipuliflora* which coloured the phrygana-covered hillsides on the left-hand side of the road. An array of purples and pinks that can match anything on a Scottish moorland in autumn, giving brilliant and vivid colour to a Cretan autumnal landscape which would otherwise seem to be dry and brown. The Spili mounds on the other side of the road are the definitive site for orchids in Crete – possibly too well known. At this time of year, even these look rather unlikely places for flowers, only ever-green shrubs still giving a little sign of life. The small fields around them are all harvested and brown and the whole place seems silent and abandoned.

Because this area is so rich in spring orchids it would be wonderful to find the last orchid of the Cretan year. We were not disappointed. The search started on the north side of the road, in an area which is often very damp in spring but bordered by drier, rocky terraces. On these we found a number of Autumn Lady's Tresses, all growing in the shade/protection of the various spiny, low-growing, bushy plants that are typical of the Cretan phrygana. All the flower spikes were perfect. Most had open flowers at least three-quarters of the way up the spike and none were marked or withered. They presented another opportunity for photographs showing them in their Cretan habitat.

There are many sites to visit on the Kampos and we returned several times. We found that each mound had some *Spiranthes* and once one had found the first plants others became visible. Again it seemed the right time for them. All spikes had some open flowers but none were over or even beginning to fade. One very noticeable factor was that all of them were growing on the north facing side of the mound and mostly on the lower part of the slopes. They were all growing through low vegetation making it difficult to see if there were any in bud still hidden.

Fig. 11: *Orchis simia* Fig. 12: *Orchis sitiaca*
 Figs. 13 & 14 *Orchis provincialis*
 Photos by Rosemary Webb



One site was particularly inspiring. It is further away from the mounds which are so overwhelmingly hunted on by orchid enthusiasts in the Spring. There is more grass here and in one place there was a group of 45 *Spiranthes* all growing together, the largest group we had seen so far. Here there were plants with all their flowers out. Unfortunately it was rather breezy and the sun was getting low in the sky. The best vantage points for photography were not accessible as it was not possible to eliminate one's own shadow and the contrast was great, giving hot-spots and black shadow. We decided to return, the flowers were so fresh that there would be no problem. On the way back to the car, I disturbed a hare, he took fright and disappeared down the hillside. I was so pleased to see this beautiful creature. I have never seen any wild animals in the spring except for the occasional snake, lizards and of course, the beech marten (*Martes foina*) so frequently seen dead on the road. I would not have seen the hare if it had not decided to run. It seemed quite strange to be in a place consciously looking for one plant, knowing that it is the only orchid to be found. In the spring one can find 20+ species of orchid here. However, there are some beautiful bulbs just starting to flower which remind one that the Cretan Spring is not too far away. On the mounds short, grassy areas are covered with the little yellow stars of *Ranunculus bullatus*, a very low-growing member of the buttercup family. Amongst the rocky areas are the first crocuses- *Crocus laevigatus*, *Scilla autumnalis* and the tiny *Colchicum cretensis* seems to be everywhere in an array of purple, pink and white. Perhaps the most showy plants are the small, beautifully scented *Narcissus serotinus*, growing in quite large patches in places. I even found *Spiranthes* growing amongst some. The most unusual plant was *Biarum davisii*, rare and extraordinary. The small flower grows straight out of bare, stony earth with no leaves. We found this on a different hilltop in a bare, rocky place near some spectacular *Sternbergia sicula* not on the Kampos.

Following our idea that we would visit sites we know to have many species of orchid and also some of the tiny roadside sites that are always a pleasure to visit, we decided to tour from one site to another. We started at Phaistos and Aghia Triada where we were rewarded with just one plant in bud. These are lower, hot, dry sites, perhaps there would be more here later. We then went up the Amari Valley. Each site had a scattering of plants ranging between one and twelve in flower. On to the late Minoan cemetery at Armeni, where we found just two magnificent specimens in a cool, shady corner of the site. Returning eastwards we went via Mournes where we found 26 in a rocky area near a dried stream-bed.

Figs. 15-18: *Spiranthes spiralis* in Crete
Photos by Rosemary Webb

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The next day we returned to the Gious Kampos, again it was silent and empty. Full of anticipation, we made our way to the site of the large group of *Spiranthes* at a good time for photography. The day was beautiful and the light was just right. The sight that was before us was almost unbelievable – there were no orchids there, except for a couple of half-eaten ones in the shade of a thorny small tree. What had happened? I have a nasty suspicion that the hare, which I had admired so much, might have had something to do with it. One can revise feelings very quickly! How lucky we were to have found them earlier, they were quite the best group that we had seen.

During the course of this visit to Crete we visited most of the sites more than once. In the ten days we were there, we visited all our favourite spring sites and found *Spiranthes spiralis* at nearly all of them. The first site, where we had found the rosette in the spring had increased in numbers of flowering spikes by the end of the visit, so there were probably more to come in most places. There were fresh young spikes in tight bud. Timing is obviously important. There must be some rain to trigger the flowering although we only had a prolonged shower while we were there. Just like those on my lawn in Hampshire, the flowering period is determined by some rain and seems to cover a period of time. The first flower spikes are often going over while others are still in bud.

Almost every book on Cretan orchids reports that *Spiranthes spiralis* is ‘rare’ or at best ‘sporadic’ but some authors also say that the late flowering time may be responsible for the lack of records. We certainly did not see anyone else looking for anything. As I have already mentioned, our findings ranged from one plant to 243 on Gious Kampos and 383 combined on the Vatos sites. It was a lovely and a worthwhile trip. We counted a total of 716 flowering spikes in this central, southern part of Crete. All the sites were in the hills (more rain?) there are still more sites to visit another time, I cannot wait to return.

Modelling Orchid Spread Indicates a Helping Hand is Needed **David Trudgill**

Most orchid species in the UK have been in decline (Harrap & Harrap 2009) and some are subject to special conservation measures e.g. the Lady’s-slipper Orchid has been the subject of a long-term (and expensive) programme involving the re-introduction of micro-propagated plants to sites where it previously occurred. Conservation of other rare species depends on protecting and managing existing sites (‘fortress conservation’) whereas yet others rely on the protection afforded by the Wildlife and Countryside Act. However, Swarts & Dixon (2009) comment that ‘conservation through reserves alone is now considered unlikely to achieve protection of plant species necessary to mitigate direct losses of habitat and the pervasive impact of global climate change’.

The occurrence of the Lesser Butterfly-orchid (LBO, *Platanthera bifolia*) has decreased by almost two thirds since records began (Harrap & Harrap 2009). In Scotland, especially eastern Scotland, it is the subject of several projects to reverse its decline, one component of which is advising land managers on habitat improvement. However, to extend the distribution of LBO these projects rely on natural colonisation of improved sites. We know that natural spread does occur, sometimes over long distances, but this article questions whether relying on natural spread is likely to be the most effective approach. My experience (as a total amateur with an agricultural background) suggests that deliberately spreading seed at such improved sites will be a much more effective approach.

Some of the sites in eastern Scotland where LBO occurs are small and widely separated. Although orchid seed can travel long distances ‘on the wind’, research indicates that the majority of terrestrial orchid seed is deposited close to the mother plant. In a recent study at two sites Jersakova & Malinova (2007) suggested that the median distance of spread of *Orchis purpurea* was between 4 and 7m. They also presented unpublished data in which seed of three species (*Pseudorchis albida*, *Anacamptis morio*, *Dactylorhiza majalis*) was captured on agar plates set out in three directions. The proportion of seed deposited decreased to almost zero within as little as 2.5m from the mother plant. They concluded that ‘the typical seed rain density in terrestrial orchids decreases as a function of distance’. This is because of two effects: 1) there are progressively fewer seed left air-borne as the distance increases and 2) the area for seed deposition potentially increases with the square of the distance from its source. Consequently, the probability of a new plant becoming established decreases rapidly with increasing distance.

Estimating the likelihood of a new orchid plant developing as the distance from its source increases is fraught with difficulties because of the number of variables and assumptions involved. However, I hope that what follows shows that it is instructive to make the attempt by using a simple ‘model’ (with LBO as an example), hopefully giving a range of realistic values to the variables involved. Let us base the model on the assumption that the proportion of the seed that remains air-borne progressively halves with the square of the distance from their source. This ‘model’ provides for the majority of the seed to be deposited close to their source (as observed by Jersakova & Malinova 2007), but for a decreasing proportion of the seed to travel much further. Let us also assume that the source is a single orchid (the ‘mother’ plant) that produces 100,000 seed. Based on these assumptions, 50,000 seed (50%) will be deposited on the ground within 2m of the mother plant, 75,000 (75%) within 4m, 87,500 (87.5%) within 16m, and 93,750 (93.75%) within 256m. Hence, beyond 256m only 6250 seed (6.25%) will remain air-borne, half of which will be deposited over the next 65.54km, an area of 13,488km².

We also need to make assumptions about the availability of suitable land and the probability of any seed landing on such land developing into a mature plant. The current proportion of land 'suitable' for LBO colonisation is unknown and will vary depending upon the region, but it is likely to be very small. Therefore, let us also assume that only 0.1% of the land beyond the site of the mother plant is suitable (i.e. 13.2km² in an area with a radius of 65km). Furthermore, from my own experience I know that only a very tiny proportion of LBO seed will develop into a mature plant, even when the seed lands at a 'suitable' site. For the purposes of the model let us assume that 1 in 10,000 seed that lands at a suitable site will eventually develop into a mature, flowering plant.

Based on the above assumptions and values, it can be calculated that the probability of a new orchid plant becoming established at a new site in the zone between 256m and 65km from the mother plant is very small, only 1 in 3200. We can change the values assigned to the different variables e.g. by assuming there are 100 mother plants rather than one, when the odds increase to 1 in 32. If we further assume that the wind blows from only one quarter the odds of establishing an adult plant further increase to 1 in 8 i.e. a new flowering plant will be established approximately once every 8 years.

We can also explore changing the more fundamental parameters of the model e.g. let us decrease the rate of seed deposition so that 75% of the seed rather than 50% remains air-borne with increasing square of the distance. If we do this it can be calculated that 31.6% of the seed will remain air-borne beyond 256m. But there is a trade-off between the proportions of seed that remains air-borne and that which is deposited. Consequently, if the percentage remaining air-borne is increased from 50% to 75% the rate of deposition per unit of distance is decreased from 50% to 25% and, the probability of a new, mature LBO plant becoming established between 256m and 65km is increased by only $\times 2.5$ i.e. the probability with one mother plant increases from 1 in 3200 to 1 in 1266. If there are 100 mother plants the probability of a new LBO plant is now 1 in 13, and if the wind blows from one quarter there is a ca. 1 in 3 probability of establishing a new mature LBO plant somewhere in an area covering a total of 13,161km². However, with terrestrial orchids whose seed are released close to the ground, I suspect that only in exceptional circumstances will 31.6% or more of the seed remain air-borne beyond 256m.

The simple model I have used will, at best, only provide a general guide to orchid spread as there will be special circumstances and exceptions (e.g. when the air-flow is strong and turbulent), but it does provide pointers to how rates of orchid spread may be increased. For example, there are situations where the 'suitability' of a site may be improved e.g. disturbed/excavated soil can be exceptionally favourable for colonization by some species of orchids (see later). Increasing the proportion

of 'suitable' ground for orchid establishment will also increasing the likelihood of establishing plants at new sites. Thus, if 1% rather than 0.1% of the surrounding area is suitable the probabilities given above are all increased 10-fold. Therefore, with one mother plant and a 50% deposition rate the probability of establishing a new plant between 256m and 65km increases from 1 in 3200 to 1 in 320.

Depending on the species involved, the year, the area of the country etc., the assumptions on which the above is based may be too optimistic, or overly pessimistic. Furthermore, the model I have used is simplistic (e.g. one only has to think about drifting snow to realise how deposition patterns can be affected by topographic features). But I suggest it is adequate for our purposes and serves to confirm the rapid decrease in the probability of a new orchid plant developing with increasing distance from the seed source, and the improbability of a rare and/or localised orchid species spreading either widely or rapidly by natural means.

Can we improve on natural spread as a means of establishing new populations of orchids? My limited experience suggests that we can. My wife and I have a meadow with several orchid species most of which we have established from seed. Our wild flower meadow is 0.125ha and prior to 2001, apart from a small boggy area it had been part of a field in an arable/grass rotation. Initially there were just four plants of Northern Marsh-orchid (*Dactylorhiza purpurella*) in the boggy area. There was also Common Spotted-orchid (*D. fuchsii*) in an adjacent field. As part of the process of creating a wild flower meadow we dug a pond. The resulting spoil-heap must have provided exceptionally favourable conditions for colonisation because 4 years later dozens of flowering Northern Marsh-orchid plants and a few Common Spotted-orchids appeared on the spoil-heap. Spurred-on by this event we collected seed from these plants and spread them (down-wind) across the rest of the site. In 2002, we also introduced seed of LBO from a site ca. 20km away where it was abundant (I have never introduced plants for many reasons, but especially because plants that establish from seed must, by definition, be in a place suitable for that species). In more recent years we have introduced seed of several other orchid species. All the seed were acquired with permission. In 2006 there appeared a single plant of LBO, with four more in 2007 and we collected and further spread the seed from these plants and from the Northern Marsh-orchids and Common Spotted-orchids. By repeating this process we have increased orchid numbers so that by 2015 we had more than 60 flowering LBO plants and several hundreds of Northern Marsh-orchids and Common Spotted-orchids and their hybrids. In addition to the LBO we have also established from seed small numbers of plants of Greater Butterfly-orchid (*Platanthera chlorantha*), Early Marsh-orchid (*D. incarnata*), and Heath Fragrant-orchid (*Gymnadenia borealis*) and Heath Spotted-orchid (*D. maculata*). In 2014, to our greater surprise, we found four plants of Marsh Helleborine (*Epipactis palustris*) that derive from a small amount of seed taken (in 2010) from a plant, bought from a garden centre, that was growing in

our adjacent garden. In 2015, I found two flowering plants of Early-purple Orchid (*Orchis mascula*) and four groups of Marsh Helleborine, some with flower buds.

I am not the first to spread orchid seed as a means of creating a new population. Henry Wilks introduced Monkey Orchid (*Orchis simia*) to the Kent Wildlife Trust reserve at Park Gate Down by just such a means and now is celebrated as a conservation hero (Malmgren & Haggard 2013). Greater Butterfly-orchid (GBO) is now thriving in large numbers at Plean Country Park near Stirling where, 7 years ago, hay from a meadow where GBO was abundant was spread on an old potato field (Sexton *pers. comm.*).

Some feel that introducing orchid seed in this way is inappropriate, a form of 'gardening' (Bateman 2010). However, it is a much more natural process than planting out micro-propagated plants and our meadow only differs from other protected and managed sites growing wild orchids in that we have introduced the orchid seed. Introducing seed to a site makes the most effective use of any seed that is available and by moving around whilst spreading the seed, the whole site can be covered and most of the seed will land on the site selected (provided account is taken of wind speed and direction). Where this is done, and using the initial parameter values given earlier, approximately 10 new flowering plants would be expected per seed head used. My experience indicates that, unless the ground is bare, at most only one or two new plants can be hoped for (i.e. the value in the model of 1 in 10,000 for seed establishment is optimistic) but, even so, deliberately spreading seed at a site potentially increases the likelihood of establishing an orchid species by several 1000-fold depending on the effectiveness of site selection and management. But do the simplistic model and the values I have tested approximate to reality? This is uncertain, but I suggest that the foregoing modeling has demonstrated that the likelihood of new plants becoming established decreases rapidly with increasing distance from the source of the seed. Also, because most of the seed is deposited close to its source at what is probably a favourable site, we can also anticipate that, following the initial colonisation orchid populations should progressively increase. Where this does not occur, it may be instructive to search for the reasons.

The factors involved in determining the suitability of a site for orchids are not fully understood. For the grassland/meadow species considered here, everything we know indicates that competition from vigorously growing grasses and herbs is undesirable. For that reason we mow most of our meadow every September and remove the cuttings to decrease soil fertility. A small part of the meadow is not mown and contains no orchids. The soil pH is not as high as I expected; the pond in the meadow is fed from the local river and has a pH of ca. 8.0, but recent measurements indicate the pH of the soil in the meadow ranges from 5.5 to 6.0.

Views of our orchid meadow.
Photos by David Trudgill



The presence of specific mycorrhizal fungi was regarded as a requirement for orchid establishment and as major factor limiting orchid distributions (Bateman 1997). However, in a recent review Bateman (2014) concluded that for many grassland species of orchids the association with mycorrhizal fungi may not be so restrictive either because it is less specific/important than previously assumed, or because the fungi involved are widespread and abundant. This conclusion is supported by the readiness with which the nine species of orchid in our meadow were able to establish themselves and indicates that many of our grassland orchid species have a greater potential for spread than previously recognised. Consequently, it can be argued from the foregoing that many potentially suitable sites may remain without orchids only because adequate numbers of seeds have not reached them. It can also be suggested from the foregoing that the rarer a species, the smaller the amount of seed that will be available, and the smaller the proportion of suitable land that is likely to be colonized by it.

If it is accepted that many of our orchid species are now restricted to too few sites and that man has been responsible for most of the recent decline in orchid distribution and numbers it seems appropriate that he should do something to reverse that decline. There are several reasons why we should do something, not least to prevent a species becoming extinct in a region/country. Some are opposed to introducing seed to a new site, arguing that it causes confusion amongst scientists interested in orchids and that the unique (and well-adapted?) gene pool of native populations must be preserved, even if populations are isolated and inbred (Bateman 2010). I am perplexed by this view, as were Malmgren & Haggar (2013), as many of our orchid species have specialised pollination strategies, presumably designed to increase cross-pollination and maximise heterogeneity. Also, any new orchid populations established by natural means will have derived from seed that has travelled some distance; possibly a long distance from an unknown source when it may bring with it a 'foreign' gene pool. At least, the source should be known with introduced seed. Furthermore, as demonstrated by our Marsh Helleborine, plants bought from garden centres and commercial growers may act as a source of seed that can spread into, and thrive in the wild (see Malmgren & Haggar, 2013).

It is clear that where seed is used to establish orchids at a site the facts must be recorded (I have recorded it with the local plant recorder), the seed source and its appropriateness must be considered, appropriate permissions must be sought, and the subsequent results must be monitored and reported. My orchid meadow may be viewed as unnatural – an orchid garden – but then most of the habitats in which our orchids grow are not 'natural' but have been created by, and are managed (or mismanaged) by man e.g. many of the sites in England where Lizard Orchid (*Himantoglossum hircinum*) occurs are on golf courses, race courses and similar sites. Lizard orchid is unusual as its distribution has increased recently, probably following years with

favourable weather resulting in greatly increased seed production (Carey *et al.* 2002). Bee Orchid (*Ophrys apifera*) is another species that appears to be extending its range (northwards) – it is now found close to Edinburgh (B. Allan *pers. comm.*).

My meadow may be unnatural, but like other managed sites it provides a source from which LBO seed can spread ‘naturally’ and it contributes to stemming the decline in LBO numbers and distribution. In the last 2 years, with the farmer’s permission, I have been spreading LBO seed back at the site from where it came as it appears to have disappeared from part of the site following a change in the grazing regime. However, I have recently learned that this field has been sold and that the new owner intends to ‘improve’ the grazing. I suggest we have a responsibility to future generations to ensure that orchids flourish in those regions of the UK to which they are (or were) native. Marsh Helleborine occurred at more than a dozen sites in mainland Scotland pre-1970, but has been allowed to decline to only one site (Harrap & Harrap 2009) without any remedial action being taken. In 2013 and 2014 no seed was produced at that site as it was heavily grazed by sheep – a neglect of our responsibilities as custodians of our native flora? My meadow, even if it is a ‘garden’, has given pleasure to many, it has generated interest in orchids and their conservation in some of our farming friends, and it helps ensure that species such as Marsh Helleborine will not be lost from Scotland.

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Reflections on an Algarve Gem Sue Parker

Ignoring the fine example set by the early spring bulbs, whose fabulous fireworks displays light up the landscape, the Algarve's wild orchids begin with something of a damp squib. *Gennaria diphylla* is small, green and unimpressive, and by late February it has flowered and is setting seed. Even to the hoards of devout orchid pilgrims (never say twitchers; that is strictly for the birds) who set off for their Mediterranean Meccas to kneel in worship before basal leaf rosettes *Gennaria diphylla* has but one interesting feature: like Tigger, it is the only one. (The *Gennaria* genus contains just this one species, but at least it is something to look out for while we wait for real beauties to burst into bloom.)

The Algarve is snootily dismissed by some orchid 'experts' as beyond its use-by date because coastal development has replaced formerly orchid-rich land with golf courses and pretentious garden palms no more native than the English rose. They are wrong, and their misguided prejudice is depriving them of some truly amazing orchid extravaganzas.

Some things have changed. To see the Algarve's finest orchid wonders you now have to travel further from the coastal towns and holiday resorts, but those who make the effort are more than amply rewarded. It is no coincidence that some of Europe's most famous orchidologists have set up bases in the Algarve in order to research the orchids there, particularly the bee orchids. Chris Thorogood, co-author of Kew's Field Guide to the Wildflowers of the Algarve, regards the area as one of the most rewarding for spring excursions to see Mediterranean wild flowers in general and Iberian Peninsula endemics in particular.

What has not changed significantly – and in this respect the Algarve has the edge on so much of western Europe – is the habitat quality of most of the countryside. The Algarve has so far been spared the worst enemy of wild flora and fauna – large-scale intensive farming. Away from the lowland citrus groves (encouraged by EU grants) and hideous upland eucalyptus plantations, there is still a wealth of wonderful places throughout the Algarve where people can enjoy wildlife and wild flowers at their very best.

Fig. 1: *Serapias cordigera* – Heart-flowered Tongue Orchid

Fig. 2: *Gennaria diphylla* – Two-leaved Gennaria flowers from January in the Algarve

Fig. 3: *Ophrys lusitanica* – an ugly sister to the Mirror Orchid but fascinating nonetheless

Photos by Sue Parker



At least twenty-five Mediterranean orchid species thrive in the Algarve. Among them are some gems rarely seen in other parts of Europe. For those seeking a spring cure for their powerful addiction, the marvellous Mirror Orchid *Ophrys speculum* (cover photograph) is a must-see member of the bee orchid family, and the Algarve is its World HQ.

Even the uninitiated will know when they have found a Mirror Orchid. The startling glint of sunlight reflecting on the silvery-blue lacquered lip of the flower - the feature that puts the 'mirror' into Mirror Orchid - is an irresistible invitation to enter the mysterious world of these amazing plants.

Bee orchids have evolved to play tricks on unsuspecting insects and so secure the future of their kind, imitating the appearance and sometimes the smell of particular kinds of female insects. Smitten males are fooled into landing on the flowers. There, instead of being greeted by a mate they are tricked and treated to a burden of pollen which they may transport to other flowers of the same species. Job done - for the orchid if not the insect!

In this Algarve fairy tale it is the mirror not the maiden that is the fairest of them all, but just like Cinderella the Mirror Orchid has two ugly sisters. One of these, *Ophrys lusitanica*, despite being a next-door neighbour, is rarely seen. Also centred on the Algarve, this orchid has a shiny metallic-looking lip too, but there the similarity ends. Regarded by some authorities as merely a subspecies of the Mirror Orchid, it is otherwise a tragic travesty, trailing three weeks or so behind its beautiful sister and hanging around on stony edges of dusty tracks. Despite this, its rarity makes *Ophrys lusitanica* one of the most sought after orchids in the Mediterranean region, and hence another of the Algarve's orchid tourist attractions. The second of the ugly sisters, *Ophrys regis-ferdinandii*, lives in exile in the Greek islands, where it is also a foil to the beauty of the rarer (there) Mirror Orchid.

Encouraging wildlife tourism is one of the Algarve Tourist Board's stated priorities, but still we see approval for yet more holiday developments aimed at anyone but those who value the natural world. Allowing such developments to encroach further onto the Algarve's prime wildlife habitats could drive already threatened species (including wildlife tourists) to extinction. There are numerous abandoned holiday developments dotted about the Algarve; they failed because income could not cover the high cost of maintenance. In contrast many natural 'golden eggs' are truly self sustaining, requiring only minimal conservation management and protection.

In recent years the economic slowdown has slammed the brakes on many of the proposed tourist developments in the region and has prompted local authorities to focus on improving facilities for wildlife tourists. Some of the top orchid walks

are now signed and have information boards to help tourists find Algarve wildlife specialities. The Board has also funded new maps and books which are available from tourist offices throughout the region.

The weak Portuguese economy means that there is not much money available to support wildlife tourism or environmental projects, but a number of tenacious voluntary organisations, with severely limited resources, fight tirelessly to protect and promote the wonderful wildlife of the Algarve. They challenge the indifference of officialdom and strive to alert the embattled, cash-strapped local communities of the importance and economic value of the wildlife wonders around them.

Most visitors and residents may be unaware of the wealth of wild orchids in the Algarve, which in places carpet the ground and are not at all hard to find, but orchid hunters and other wildlife tourists certainly know. In March and April, when other tourism activity is minimal, these eco-tourists are crucial to the economy of the region. At last this is being recognised.

Sue Parker author of Wild Orchids of the Algarve - how, when and where to find them. She can be contacted via: www.algarvewildlife.com

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**Book Review: *Wild Orchids of Bedfordshire*
Simon Tarrant**



Wild Orchids of Bedfordshire, by Richard Revels, Chris Boon & Graham Bellamy, edited by Rosemary Brind; Bedfordshire Natural History Society 2015; ISBN 978-0-9506521-9-1; 156pp; £20 plus postage. Obtainable from www.bnhs.org.uk

This book is the published outcome of the Bedfordshire wild orchid survey which took place during 2013 and 2014, supported by Bedfordshire Natural History Society. Local naturalists realised there was a lot of interest in the orchid flora of their county, as well as valuable historical data on some species. The records obtained by the survey added to the existing records from the 1790s onwards to provide a total of over 8,000 orchid records for the county. A team of experts undertook the different aspects of logging data, creating maps, writing the main text and providing suitable photographs. The last two tasks were the responsibility of Richard Revels.

The Bedfordshire scene is set with an opening chapter on habitats and conservation. The geology of Bedfordshire ranges from Cretaceous chalk in the south of the county through sandstones and clays to Jurassic limestone in the north. There is a very revealing table of land use in the 1980s, indicating that 64% of the land surface is arable farmland and 10% is built up. Unimproved calcareous grassland accounts for less than a quarter of 1% of the land area, but it is one of the most important habitats for orchids in Bedfordshire.

By good fortune long-term monitoring has been undertaken of Autumn Lady's-tresses (*Spiranthes spiralis*) at Knocking Hoe NNR, running from 1962 to 2014, and a detailed report is presented here. Flowering frequency was at a peak in the 1960's, and declined in subsequent decades, but an increase in 2014 may indicate successful management, in particular the protection of flowers during the flowering season. As well as the detailed report on Autumn Lady's-tresses, there is a chapter describing the monitoring of other rare orchid species throughout Bedfordshire.

The bulk of the book, as may be expected, is given over to a detailed account of each of the orchid species occurring in Bedfordshire. In all, 27 species are described, including species formerly recorded in the county, such as Marsh Helleborine. A consistent layout is used throughout, and is explained at the start of the species accounts. The text is presented in seven sections, covering status, habit, threats,

variation, hybrids, open access locations and information on the first, or earliest, Bedfordshire record. An impressive feature is a text box for each species called “At a glance”. This summarises the rarity in the county, the flowering period and some of the more significant open access locations for the species. Open access locations are sites where public access is readily practical. Also impressive are the large clear distribution maps indicating past and current population distribution, and the really superb range of photographs. As well as illustrating whole plants and flowers in close-up, these include developing leaf rosettes and ripe seed-pods, and even a few pollinators at work.

For me this book works at two levels. Firstly it is a scholarly presentation of the results of many hours of dedicated fieldwork by a large number of people, demonstrating past and present population trends and habitat requirements of the orchids of Bedfordshire. It is also a clearly presented guide to the orchids of the county, with practical suggestions of the best locations and seasons to see the different species. My personal experience of Bedfordshire orchids has been limited to a Hardy Orchid Society field trip; the book confirms that the sites we visited were true orchid “hot spots”, it also provides lots of inspiration for future exploration. I can thoroughly recommend the book for anyone with an interest in orchid conservation in the UK or interested in finding our native orchids in their natural habitat.



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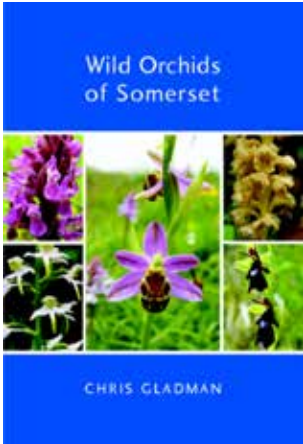


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Book Review: *Wild Orchids of Somerset*
Les Lewis



Wild Orchids of Somerset by Chris Gladman
60 pages; Self-published.

Available from the author – e-mail contact:
chris.gladman@btinternet.com

(Currently listed on NHBS website at £11.99)

Chris Gladman's book is a welcome addition to the UK flora literature. Possessing a good range of habitat, Somerset is rich in orchids with a total 28 species having been recorded there.

After a short Introduction, there is a section on the County's coastal orchids. This is followed by detailed accounts of all the recorded species which constitute the bulk of the book. The book then finishes with sections on hybrids in Somerset, abnormal orchids, pollination and insects, other British orchids and other British hybrids. The nomenclature is up-to-date including, for example, *Dactylorhiza praetermissa* subsp. *schoenophila* for the southern form of Narrow-leaved Marsh-orchid recently split from the more northerly *D. traunsteineroides*.

All of the orchids are illustrated by good quality photographs, nearly all taken by the author himself. What sets this book apart from other British orchid books is the large number of photographs showing the range of morphological variation found in the various species. Thus, there are 25 photographs of the Fly Orchid, *Ophrys insectifera* and 28 of the Bee Orchid, *O. apifera*, with further ones in the "Abnormal Orchids" section. There are even 15 photographs showing the rare Lizard Orchid, *Himantoglossum hircinum* in its various forms. In addition to being a comprehensive list of the orchids of Somerset, the book provides an important record of the morphological variation of many British orchids and is thus of much wider interest than just that county.

Journal Articles Needed!

Production of *JHOS* is totally dependent on the supply of material from members. Currently, submitted articles are rather thin on the ground. The October issue was only filled at the last minute, so we urgently need more articles – help is always available to contributors. Please contact Mike Gasson for information/advice if you feel able to contribute something (moorend@globalnet.co.uk).

Broad-leaved Helleborines with pigment deficiencies Richard Mielcarek

Broad-leaved Helleborine (*Epipactis helleborine*) flowers are well known for being variable in colour, ranging from dull greenish white, through pink to purple with the colour not just confined to the epichile but extending onto the sepals and petals, with the inside of the hypochile consistently being a dark reddish-brown.

It also, rarely, suffers from pigment deficiency of two different types;

- lack of anthocyanins, resulting in a totally green plant, including the inside of the hypochile (see Fig. 1). Such plants, which are the less scarce of the two, are impossible to identify until they flower. Also, intermediates occur, where faint traces of colour remain on the edge of the sepals or the inside of the hypochile is olive brown as opposed to bright apple green. Although this form is often called *E. helleborine* var. *viridiflora* this name is in fact a synonym for Violet Helleborine (*E. purpurata*), as listed in the Kew World Checklist of Selected Plant Families; the correct name is *E. helleborine* var. *chlorthantha* Vermeulen (L Lewis, pers. corr.).



Fig. 1: *Epipactis helleborine* lacking anthocyanins resulting in a green plant
Photos by Richard Mielcarek

2



3



- rarer is the form that lacks chlorophyll, resulting in a ghostly plant that can be identified at all stages of growth, with white leaves and bracts and the petals, sepals and lower part of the stem are white or yellowish-white suffused pinkish-violet, while some plants have totally pink flowers and white leaves; the inside of the hypochile is bright pink (see Fig. 2). This form has two valid names: *E. helleborine* var. *monotropoides* at the rank of variety and *E. helleborine* f. *monotropoides* at the rank of forma. Although *E. helleborine* f. *albifolia* has been used by some authors, this is not the valid name because f. *monotropoides* was published first (Lewis, 2015).

So what would a plant that lacked both anthocyanins and chlorophyll look like? In the summer of 2015 Steve Tandy found an unusual helleborine growing on the verge of a quiet road in the Cotswolds, with white leaves, straw coloured stem and bracts and bright yellow buds (see Fig. 4). At the time it was unclear what species was involved but there were a few other more normal (i.e. green) helleborines in bud close by and flowering was eagerly awaited. At the start of August the first of the nearby helleborines started to flower, and the closest plant turned out to be a Broad-leaved var. *chlorantha*. The next day the first yellow bud on the target plant started to open and it could be seen to have a strong viscidium, confirming it was also a Broad-leaved Helleborine; however the whole flower, including the inside of the hypochile, was essentially yellow with a whiter epichile (see Fig. 3).

For his thoughts on how pigment deficiencies might arise see Steve’s blog at http://www.muba.eclipse.co.uk/Steve's%20Orchids/html/achlorophyllous_blh.html

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Fig. 2: *Epipactis helleborine* lacking chlorophyll
 Figs. 3 & 4 : *Epipactis helleborine* lacking both anthocyanins and chlorophyll
 Photos by Richard Mielcarek

An Interesting Hybrid Nigel and Lois Harbron

Augill Pasture is a small (2.7 hectares) reserve on the slopes of the Pennines on the Cumbria/Durham border. Roughly half of the reserve is woodland, allegedly ‘ancient’, but not of great quality, whereas the other half, above the woodland, is an open, species-rich pasture. Nowadays, the dual-carriageway of the A66 runs along the western boundary of the reserve, and endless traffic grinds its way over Stainmore. However, the reserve probably owes its existence to the main road. Back in the 1980’s when the A66 was improved, the initial intention was to run an extra carriageway through what is now the pasture, but a successful campaign led to the new road skirting round the sensitive area. Plantlife subsequently acquired the reserve, although it is managed by Cumbria Wildlife Trust. We have been Honorary Managers of Augill Pasture for several years, and have always enjoyed its summer flora, although summer at Augill is always late, and often brief!

The pasture sits above an old lead smelt mill, and was used for decades as grazing land for the ponies involved in transporting materials around and off the site. The reserve is probably best known for its astonishing display of Devil’s-bit Scabious (*Succisa pratensis*) in autumn, but it also contains a good number of orchid species, from ‘Early Purples’ through to a few Broad-leaved Helleborines (in the woodland), with Heath Spotted-orchid, Northern Marsh-orchid, Frog Orchid, Twayblade, Fragrant-orchid, Greater Butterfly-orchid and Common Spotted-orchid in between. For several years, we have monitored the Frog Orchid population, which grows in two discrete parts of the reserve. There are around 100 plants most years, but they do seem to come in two bursts, with an early ‘shift’ in mid-June, then a later one in late July/August – so accurate counting is not easy (not least because Pennine gales tend to blow away any subtle markers!). Occasional Heath Spotted-orchid/Common Spotted-orchid hybrids have been recorded.

On 21st July 2015, we were on the reserve in advance of the annual visit from Joe Costley, Plantlife’s Reserve Officer, and came across an unmistakable hybrid. Many of the Frog Orchids at Augill are quite red in colour (perhaps reflecting the lead-contaminated nature of the soil), but most are small in stature. This orchid was relatively tall, decidedly pink in colour, and had lightly spotted leaves. It was a hybrid between Common Spotted-orchid and Frog Orchid. By chance, we were meeting Alan Gendle that day, and he confirmed our sighting. Richard Bateman kindly ratified the finding when sent a picture by Alan. Apparently, only around 15 similar plants have been recorded in the UK this century, and Dr Trevor Dines from Plantlife thinks that the Augill plant might be the only one in flower in the country at present. (Having said this, Foley and Clarke (2005) describe the hybrid as ‘quite frequent in Britain and Ireland’!) For those who like to reel off long Latin words, the hybrid is



A typical Frog Orchid at Augill, (left) & the hybrid (right).
Photos by Lois Harbron

known as *×Dactyloglossum mixtum*. Since its discovery, there has been quite a lot of publicity both nationally and locally, and there have clearly been more visitors to this quiet reserve than would usually be the case. As of 11th August 2015, none has come with a trowel and pot, but we remain concerned for the couple of dozen small Frog Orchids in the immediate area, given that orchid photographers always seem to have to lie down when taking pictures. It's always difficult balancing the positive effects of publicity with the possible/likely damage that will occur as a result.

Your Help is Required!

Alan Bousfield

For the January issue of the Journal, I produce a list of the Field Trips for the forthcoming season. If you know of a special orchid place near you, please consider sharing it with other members. We need members to run Field Trips in 2016 and we are looking for new locations to visit. If you feel you can help, please contact me: alan.bousfield@ukgateway.net

