The Hardy Orchid Society Newsletter

No 5 July 1997

Contents

COMMITTEE NOTICES

Richard Manuel

Revision of the Show Rules - I have had no time to formalise the ideas put forward at the AGM for this issue, but this will be done for the September Newsletter. We will need to call an EGM for the November meeting to execute in these changes.

Next Meeting The date for the next meeting has been fixed as Saturday 29th November 1997, at Pershore. As usual, I shall be glad to hear from anyone who is willing to give us a slide show, however brief, of their orchid travels and experiences this year, or any other year for that matter.

Photographic Competition. This was suggested after the AGM and seems to me an excellent idea. We could run it to add interest to the November meeting, where we have no show, and we can also continue our displays of other orchid related art.

We will invent some rules for this competition at the next committee meeting, but I propose for now that we restrict it to 10 x 8 prints, so that everyone can get a good look, perhaps in two classes: orchids in their habitat, and close-ups of orchid faces. Further suggestions would be gratefully received. So get your cameras out this spring and summer and get clicking!

Review of AGM & Spring meeting 10th. May 1997 at Pershore

The meeting was well attended with a good many members bringing plants for the show. Members were reminded that subscriptions are due for renewal, and that a change in the rule book is planned at the next reprint, which will state that membership renewal is due at each AGM. In order to try to reduce the confusion it was also decided that all money should be sent direct to the treasurer (rather than to the membership secretary as previously advised). Cheques should be made payable to the Hardy Orchid Society and sent to the treasurer -Mrs Christine Cook, 15 Weald Rise, Tilehurst, Reading, Berkshire, RG30 6XB
If you are in any doubt as to whether you need to pay (if you have only just joined you may not need to renew yet) please contact either Mrs Cook or the membership secretary, Mr Richard Nicol, 1364 Evesham Road, Astwood Bank, Redditch, Worcs., B96 6BD. Apologies for the conflicting information given in previous newsletters - hopefully this will reduce the confusion in the future. The subscriptions remain unchanged at £6 for an individual or £9 for a family membership.
Plans were made to hold the Autumn meeting at Pershore College on Saturday 29th. November 1997. There is some doubt as to whether we will be able to meet at Pershore next year as the financial pressures on the College mean that it is booking more and more conferences which run Saturday to Saturday. Alternative venues are therefore being sought, Birmingham, because of it's motorway links was suggested as possibly being suitable. Members were asked to make enquiries about suitable locations - a lecture theatre (with slide projector and overhead projector), two rooms for the show and plant sales, and an area with tables & chairs for a buffet lunch would be ideal. Please send all suggestions to the secretary Richard Manuel, 45 Thorncliffe Road, Oxford, OX2 7BA, with an indication of the likely hire charge.
Changes to the contributions made to the HOS by members selling plants were also discussed. Amateur growers will in future be requested to donate 10% of income from sales made at society meetings, up to a maximum of £10 per table used. Growers selling larger volumes of plants, Professional and Trade growers will however be asked to donate a set fee of £10 per table rather than a set percentage. It is hoped that this will encourage more nurseries to sell plants at meetings, giving members a wider selection of material to purchase.
Thanks were given to Adrian Blundell for running the seed and fungus bank which had been of great benefit to many members, and also yielded extra income for HOS. A request was made for members to donate fresh seed as soon as it became available. Please send donations of seed and requests for fungi to Adrian Blundell, 35

King Street, Cherry Orchard, Shrewsbury, Shropshire, SY2 5ES. Please contact him if you have any doubts about packaging, or storing seed.

NEW COMMITTEE

Chairman	Paul Harcourt Davies
Vice-Chairman	Trevor Marks
Secretary	Richard Manuel
Treasurer	Mrs Christine Cook
Membership Secretary	Richard Nicol
Show Secretary	Tony Hughes
Assistant Show Secretary	Mrs Kath Dryden
Newsletter Secretary	Mrs Carol Dash
Conservation Officer	Alan Dash
Ordinary Member (seed & fungi bank)	Adrian Blundell
Ordinary Member (Publicity Officer)	Carl Hardwick
Ordinary Member	Bill Temple

Richard Bateman from Edinburgh gave the morning lecture with a preview of the results of his DNA sequencing work on orchids. After lunch Trevor Marks gave us a brief resume of the HOS trip to Cyprus. Unfortunately our third speaker, Tom Norman was unable to attend due to ill health. We are very grateful to Kath Dryden for stepping in and leading a lively and useful symposium on various aspects of orchid culture.

RESOLVING PLANT PATERNITY SUITS

Richard Bateman.

Richard introduced his talk by saying how the joint project, to look at the genome of orchids, at The Royal Botanic Garden Edinburgh, and at Kew with Alec Pridgeon & Mark Chase, began a year ago. The project was looking at two sections of the DNA, and the sequence of bases, or absence of a series of bases, in these regions. In order to illustrate the evolutionary changes Richard then proceeded to show a series of overheads and slides in which he had arranged the existing genera and species in an order corresponding to the number of bases that were different between each genus and the number of bases difference between each member of the genus, the certainty of the differences was also included. These evolutionary trees are known in the profession as phylogenies.

The conclusions were stunning.
1) The Orchis genus for example was clearly not a single genus at all, but in three parts.
2) Some genera seem to be illusory e.g. Coeloglossum would be better called Dactylorhiza.

3) In some cases the visual similarities between flowers of what appear to be members of the same genus, have resulted from identical evolution from two different genera e.g. Orchis morio is considerably closer to Anacamptis than it is to Orchis mascula
4) Some 'species' could not be separated from a 'different species' e.g. Ophrys speculum & Ophrys regis-ferdinandii, and some of the Serapias.
5) There were strong indications that Dactylorhiza fuchsii and Dactylorhiza incarnata may have hybridised and given rise to many of the chromosome doubled 'species' of Dactylorhiza, hence the nightmare in sorting them out in the field!

A brief list of some of the new found anomalies is as follows -
Nigritella DNA suggests that it would be more appropriate in Gymnadenia
Coeloglossum DNA suggests that it would be more appropriate in Dactylorhiza
Aceras DNA suggests that it would be more appropriate in Orchis
Orchis ustulata, Or. ustulata, Or. tridentata DNA suggests that they would be more appropriate in Neotinea
Orchis sancta, Or. collina, Or. coriophora, Or. boryi, Or. champagneuxii, Or. morio and Or. papilionacea DNA suggests that they would be more appropriate in Anacamptis
Orchis laxiflora, (and some closely related species) DNA suggests that it may be more appropriate in Anacamptis at present, but that it may ultimately be recognised as a new genus.

These would explain why orchids, previously regarded as being of the same genus, are reluctant to form hybrids while they appear to hybridise with orchids that were previously regarded as being of a different genus.

Talking to Richard at lunch time revealed that amateurs tend to be happier with the new evidence than professional botanists, which is not really surprising. Amateurs often struggle to identify specimens which appear to be intermediate between two 'species'.
I hope that Richard will write an article for HOS, to supplement this brief summary, after his current work has been published in Lindleyana, the Journal of the American Orchid Society, Parts 2 & 3 (June & September). Please note that it may be some months after publication before reprints are available, and that these articles will be very technical. I believe that a more popular article is planned for Journal Europaiacher Orchideen, but it may be many months into the future.
We have had a great privilege to hear this talk and see the wonderful slides of orchids that accompanied it. Richard is looking for specimens to allow this work to continue, his list has been reproduced below, if anyone can help with this revolutionary task, please do so by sending him a few flowers of the required species. Before collecting and dispatching flowers, please contact Richard who will tell you if he still needs that species, and will supply little bags containing silica gel to put the flowers in.

Bill Temple

Dr Richard Bateman
Head, Science Division Royal Botanic Garden 20A Inverleith Row,
Edinburgh,
United Kingdom, EH3 5LR
Tel. 0131 552 7171 x 471
Fax 0131 552 0382
e-mail: richardb@rbge.org.uk

LIST OF ORCHID FLOWERS (OR LEAVES) STILL NEEDED FOR DNA SEQUENCING

TOP PRIORITY
Amerorchis rotundifolia (US)
Chamorchis alpina
Comperia comperiana
Gymnadenia odoratissima
G. conopsea ssp. densiflora
Neottianthe cucculata
Nigritella (any species)
Ophrys argolica s.l.
Orchis palustris ssp. robusta/elegans
Orchis patens s.l.
"Pseudorchis" frivaldii
Piperia (any species: US)
Steveniella satyrioides

SECOND STRING
Aorchis (any species: ASIAN)
Chusua (=Ponerorchis: any species; ASIAN)
Dactylorhiza osmanica
Himantoglossum affine
Himantoglossum formosum
Ophrys omegaifera s.l.
Ophrys attica s.l.
Ophrys arachnitiformis s.l.
Orchis troodii
Orchis mascula (Mediterranean segregates)
Platanthera oligantha
Also any unusual Epipactis or Cephalanthera species

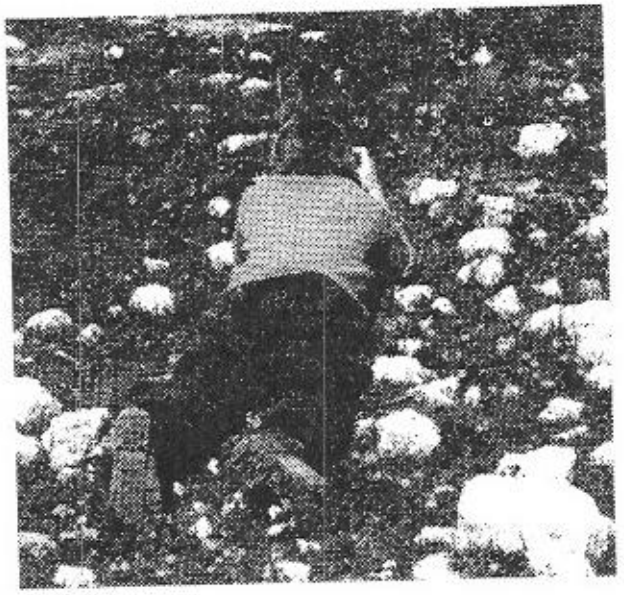
Many thanks: Richard

Hardy Orchid Society 1997 Field trip to Cyprus

Jim Hill (+ drawings by Sarah Marks & sneaky photography by Bill Temple)

It was a warm sunny day on the 13th March, 1997, when our Chairman, Paul Harcourt Davies met the other nine HOS members he was leading on a Field trip to Cyprus in terminal 2 at Heathrow,. The trip to Cyprus was uneventful and we were met at dusk at Paphos Airport by the Sunvil Rep. who put us on to the small coach which was to take us to our hotel at Drouseia. The coach clattered and banged its way as it climbed on its twenty five mile journey to our Hotel, two thousand feet above sea level.

We awoke next morning to superb views over the Hotel extensions building works to the distant hills of the Troodos Mountains and to the sea at Chrysochou bay about six miles away. As with every other succeeding day we started with a good hearty breakfast and then piled into the two Mitsubishi Shoguns that Paul had hired. It wasn't long before we were at our first orchid site at Neo Chorio (Khorio on some maps) where amongst the limestone boulders and outcrops we were introduced to our first Ophrys (elegans) and to that comparative rarity, the yellow flowered Orchis punctulata growing close to Asphodelus microcarpus, Lloydia graeca, Chrysanthemum coronaria, Tragopogon hybrida, Cistus and Salvia species and many other interesting plants.



Kathis horizontalis

It was also there that we found that although the members of our party are all upstanding citizens there are times when some can stoop very low.

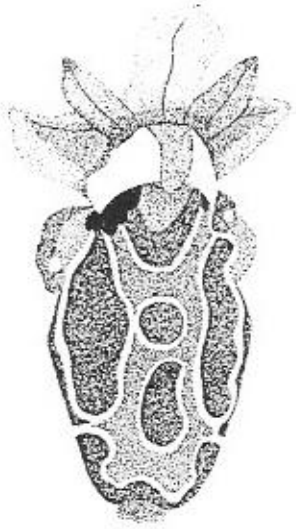
All of us crouched to get our photos and on that first day there were photos taken in plenty. Paul Davies and Kath Fairhurst seemed to be competing to see who could best prostrate themselves before their chosen flower. An outsider might have reckoned that we were a crowd of flower worshippers and probably would not have been far off the mark.

A short drive took us into the Akamas and another stop at Smigies produced anther clutch of orchids, (Orchis syriaca, Or. quadripunctata, Ophrys lutea minor, Op. fleischmannii, Op. elegans, Op. lapethica, Neottinea maculata, and Dactylorhiza romana) all of which we eagerly added to our list of photos.

Continuing our trip we soon came to realise why Paul had arranged for our four wheel drive vehicles as we went along rutted steep forest tracks to the Pyrgos tis Rigainis ruins. A stop for lunch, a climb to a superb viewpoint looking out over the Akamas Peninsula and a short walk to see some tulips growing in the woods all combined to make a good day which was rounded off by a good meal back at the hotel.

The following and each succeeding day started as the first with breakfast at the hotel followed by a trip out in the Shoguns. We returned to Neo Chorio on a number of occasions and each time made new discoveries. Life was made easy by Paul, there was no need to check in books to find what we had seen, we only had to ask Paul and we all swallowed what he told us hook, line and sinker. The second day after a trip to Neo Chorio we went to a site with Ophrys umbilacata and watched a donkey trying to avoid us. As at Neo Chorio gladioli grew in profusion as a cornfield weed. A stop for lunch in a field full of Ornithogallums next to an old Byzantine Church and then a drive through Polis and along the north coast where we turned inland into the Paphos Forest finding on our way Dactylorhiza romana, Orchis anatolica var. Troodii and Orchis syriaca. We'd left a dry England but the reservoirs in this forest and elsewhere in Cyprus were far emptier than anything we had left behind, Cyprus needs many more of the storms we had just experienced in Polis. A return to the hotel and a short evening drive took us to a nearby site with a mass of Orchis italica, Ophrys mammosa, Ophrys leventina and Barlia robertiana.

Orchis italica



Ophrys kotschyi

Our third day started with a long trip to Akroteri to find the endemic Ophrys kotschyi. We found it, Orchis coriophora var. fragrans and Ophrys fusca and we found the rain. It poured, it thundered, it hailed and roads became streams. We also found Ophrys apifera growing among the rushes on the edge of a salt marsh and being far more robust than any I had seen in Britain.

The following day was fine most of the day apart from a brief heavy shower during our morning walk. We started with a short trip to 'The Baths of Aphrodite'. We didn't find Aphrodite but despite that we had a botanically and scenically interesting walk along the coast where Cyclamen persicum and the yellow form of Ranunculus asiaticus grew in profusion and we also found the very local endemic Gladiolus triphyllus. The local priest was waiting near our car but off we went again into the Akamas along 'roads' which were more suitable for tanks than for cars. There was a beautiful red horned poppy which let most of us photograph it but which as soon as our esteemed leader tried, dropped its petals. C'est la vie!. Further on there were more Ophrys umbilicata, a few mandrake plants and more gladioli as cornfield weeds. Another bumpy drive took down from the hills to a rutted dirt main road which leads to the turtle beach at Lara. No turtles at this season but there were plenty of signs just above the high water mark where their nests had been. A drive south along the coast to look at the old Agios Georgios church and rock tombs at Cape Drepanon and then back to our hotel.

We awoke on Tuesday to a day which started overcast, wet, windy and cold but that wasn't going to stop the HARDY Orchid Society team. A short trip from the hotel and we were looking at more orchids. There were plenty of Orchis italica, some white Barlias and some Ophrys lutea minor. The sun came out and we went to Polis. The sky turned black, the thunder and lightning shook the town and we all sheltered from the torrential downpour until we could get back to the nearby cars. Off we

went again into the hills to Agios and Pano Panagio and to near the Khrysorroyiatissa Monastery. We went to find the very rare endemic Scilla morrissii and on our way succeeded in finding only one hail battered flowering specimen. This had a lax white spike of flowers but doesn't compete with our bluebells and most other cultivated scillas. In the woods near the monastery we found a few Ophrys sintenisii and a superb rosemary bush. There was now sun and showers and off we went again through Kritou Marottou and Lasa to Skarfos Bridge. We did have our bits of culture on this trip and Skarfos Bridge was one of them. This is an old bridge on a packhorse trail dating from the Venetian occupation of Cyprus. The river (stream) is still there but it has taken the easy option and no longer runs under the bridge but goes around it. There were very few orchids here but the iris relative, Gymnadiris sisyrinchium, formed the odd splash of blue. There wasn't much water in the stream but there was plenty up top trying to come down and although we remained dry, members of our party did try photographing the spectacular lightning flashes which occurred on our horizon.

A short trip down the valley took us to Evretou, the site of a large (three quarters empty) reservoir and one of the sad residues of the Turkish invasion, the deserted Cypriot Turkish village of Evretou. We drove into this village through a spectacular mass of the brilliant yellow Chrysanthemum coronaria, stayed a short while and then made our way back and up the hill, past hillsides covered with Almond trees in flower, through the village of Filousa to some terraced bean fields. Like much of this area of Northwest Cyprus the soil is thin over a rather crumbly limestone. The uncultivated terraces were covered in orchids and again our Orchid worshippers prostrated themselves before their chosen plants. Barlia robertiana was abundant as was Orchis italica. There were a few Ophrys, including a rather nice flavo-marginata x umbilacata, and the occasional Serapias vomeracea. Back to Drouseia and to a superb meal in a local Taverna finished the day off.

Serapias vomeracea

Wednesday was planned to a GORGEous day and so it started off. The sun was out and we went the short distance to the to the dirt track which led to the Aspros Gorge. Our two gallant drivers (Paul Davies and Bill Temple) drove the Shoguns along the quite good track to about a mile from the end of the gorge. The rest of us hiked through this magnificent limestone scenery, finding the odd Orchis italica and other plants on the way, until we met up with the vehicles again on the top of the plateau. The vehicles were parked in an area dominated by dwarf cistus and some sage (Salvia vervanacea) with plenty of Ophrys iricolor and Orchis syriaca in both normal and albino forms. Our resident artist Sarah Marks was kept busy sketching the wonderful flowers we were seeing. After about a very interesting hour or so off we went again, the easy way this time, by car. A short distance further on we all had to stop at a superb meadow which was filled with Anemone coronaria in a wide range of colour forms. It looked so much better than St. Brigid and other varieties we grow at home. The young pigs whose home this really was didn't know what to make of this crowd of odd humans. Past the goats and on down some rough tracks to the seashore and then a short distance along the coast road to the bottom of the Avakas Gorge.

The Aspros Gorge was wide and the Aspros river (just a trickle) ran through it. The Aspros river joins the Avakas (or Avgas) river after it has emerged from the Avakas Gorge. The Avakas gorge is narrow, at times not much more than eight feet wide with cliffs of one hundred feet or more. The Aspros Gorge was spectacular, the Avakas is stupendous but is only accessible by those who can hop from boulder to boulder up the stream bed. There were few orchids but this was made up for by the scenery and by the other plants, including Arisarum vulgare and masses of maidenhair ferns on some of the cliffs in the gorge.

Back to the cars, a few miles drive down the coast road to what on the map is called sea caves but which turned out to be not only caves but an eroded limestone sea arch which looked like Durdle Dor in Dorset, and then back to the hotel in Drouseia.

Paul Davies had promised us a day in the Troodos and this was our trip for Thursday. After a half hour stop in Paphos, we drove down the coast road to near Episkopi and then turned inland towards the Troodos mountains. A stop with a ruined Venetian watermill on one side of the road and a hillside with white and normal forms of Orchis syriaca, Orchis quadripunctata, Ophrys and a few plants of Cyclamen persicum, not yet in flower. Off again climbing up towards Troodos and Mount Olympus, past road signs warning that snow chains might be needed to just beyond Troodos where snow was still lying under the Pinus nigra / Cedrus libani forest. Small pink Crocus cyprium flowers were poking through the snow at the melt edge. On again, past the abandoned Pano Amadios asbestos mine, impressive with rivulets of snow on the black waste heaps, and downhill to a pine forest where the rare Chionodoxa lockii grows. Although not an orchid this diversion was well worth while for the large blue flowers growing under dense pine vegetation. The return journey took us back through Troodos and then off on a side road to a hillside where after

much searching we found Orchis simia, the occasional Orchis quadripunctata, Serapias parviflora and hundreds of Orchis syriaca. Throughout this holiday we had been finding Pine processionary moth caterpillars, first in their communal silken webs on bushes, later as communal masses on the ground and now these masses were beginning to break up and the caterpillars were going their own individual ways. We went back towards Paphos and saw the odd interesting plant, including the endemic Scabiosa prolifera, and on to the hotel and then out for supper at a Sea Food Restaurant in Latsi.

Our last full day, Friday, started out sunny but windy and remained so all day. A culture day. After a trip to one of our favourite sites at Neo Chorio to pay our last respects and make our last supplications to the orchids and other plants we drove to Paphos and on to the Tombs of the Kings. This large archaeological site with many excavated Hellenic tombs by the seashore was remarkable not only for these remains but for the plants which were growing on them. Despite the apparent aridity and exposure of the limestone rocks from which the tombs had been carved, Cyclamen persicum grew in profusion in any little crack or cavity. Pity there were no orchids. Off again to the harbour area of old Paphos, to look at the ruins of the Byzantine Castle and see the Paphos Fort and lighthouse in the distance. Not a great deal of botanical interest but definitely uplifting and cultural. Then a short drive to the shops to get Turkish, sorry Cyprus, delight and the odd bottle of Commanderia and Orange liqueur and back to the hotel for a lecture after supper by Paul D. on the orchids of Cyprus. I wish my photos looked like his.

We were due to leave the hotel at mid-day on Saturday so off we went for a couple of hours to two of our nearby orchid sites. The one with swathes of Orchis italica, the odd Orchis simia, and hybrids between them, Ophrys bornmulleri and Ophrys lutea minor, and at the other site close by, a very pale coloured Serapias laxifolia. Quite a good end to the orchid part of the holiday and all that was left now was the long trip in our small coach to Larnaca airport and the flight back to Heathrow.

What do I remember most about Cyprus. Well, first the company. I don't think that I could have been with a better crowd of companions (Jane Brown, Kath and Peter Fairhurst, Sarah and Trevor Marks, Richard Nicol, Bill Temple and my wife Rosemary) all superbly led by our chairman Paul Harcourt Davies. Secondly Paul's enormous knowledge of the flora and fauna of Cyprus and knowing how to cram an enormous amount of interesting and relevant detail into the relatively short time that we had available. Thirdly the surprising number of orchids and other flowers that happened to be out for us. Fourthly, the hospitality of the Cypriots. Fifthly, the beautiful scenery in this western and central end of Cyprus and finally the extreme variability of the weather, ranging from very warm to wet, windy , sleet and lying snow. If Paul arranges another trip, will I be there?. I hope so and would I go with the same companions?. Definitely if they would have me.

Symposium on orchid culture

Kath Dryden, who lead the symposium, began by describing problems which she had encountered in established Cypripediums. The problems were associated with the use of a compost consisting of bark and leaf mould rather than bark plus loam, and the plants looked as though they were suffering from a nitrogen deficiency. Kath said that she had been using foliar feeds of Miracid and Miracle Grow and that the plants were starting to improve. The concern was expressed about the possible build up of salts in the compost. Kath was considering using very coarse peat plus Perlite, sand and charcoal in future mixes, thus eliminating the bark. It was suggested that the breakdown of bark, leaf mould and peat could use up nitrogen, rather than allowing it to be available to the plants, so that the plants possibly were nitrogen deficient. Peter Corkhill told us of his visit last year to various Cypripedium growers in Germany. He was of the opinion that the structure of the compost was of greater importance than its actual composition and that it must be free draining. Plants grown in hydroponics systems were fed weekly, after being well flushed with water before hand in order to remove any unused salts. Measuring the total dissolved solids in the water, and maintaining below 300 ppm, was also felt to be important. Special care was felt to be necessary if rain water was used. It was also noted that the German plants were fed a balanced feed even in winter, which was considered risky. If loam based composts are used for Cypripediums, the type of loam used was considered vital since it must not form a muddy sludge when wet. Hard baked, free-draining (limestone) soil was desirable. Biosorb, a similar product to Seramis, is available from Garden Direct, was considered. It holds more water than Seramis therefore care must be taken not to over water if one is used to Seramis. The product is said to be natural calcined earth, it darkens when it is wet or humid.
Bill Temple raised the query of whether acidic agar media were suitable for sowing seeds of orchids which grew naturally under alkaline conditions. In reply it was suggested that it may be the fungi that are more dependant on alkaline conditions, rather than the actual orchids themselves. Richard Manuel is experimenting with raising the pH of media and has found that on potting up seedlings they do respond well to increased lime levels. Phil Meek felt that some fungi from alkali loving orchids do not grow very well on high pH agar - the maximum pH being 7 -7.5. Kath Fairhust also pointed out that there was also a lower limit of about pH 5.8, and that the upper limit may be due to a shortage of some minerals. It was also pointed out that many plants growing on limestone in the wild may actually find their seeds germinating in the top few centimetres of soil which may even be acidic. There followed a brief discussion on the relative merits of clay and plastic pots. Norman Heywood mentioned ongoing problems with "Black Death" in a Dactylorhizas. This is a fungal disease thought to be spread via the plunge bed aggregate. Meticulous hygiene plus monthly fungicidal sprays have been suggested as preventative measures.

British & European Orchid Conservation Workshop Tuesday April 22nd

Alan Dash

Four members of HOS attended this afternoon at Kew. We heard an update of orchid conservation projects including the Sainsbury Orchid Conservation Project and a lecture on orchid seed storage, as well as a request for help in seed collection for the Millennium Seed Bank. There was also an opportunity to see behind the scenes at Kew, with a tour of the laboratory facilities and their hardy orchid collection.
Dr Hugh Pritchard and Simon Linnington gave talks on orchid seed storage. Their studies have shown that orchid seeds retain their optimum viability and longevity at around 5 -6% moisture levels, (and that this is achieved by drying at about 12% relative humidity) When seed has been dried to this level it can be frozen and stored at liquid nitrogen temperatures.

The Millennium Seed Bank Project

This project aims to collect seed from virtually all British species of flowering plant, when it comes to relative rarities they are requesting the help of Nature Trusts, land owners (and members of HOS?). The project already has pledges of seed, from various sources, for about one third of the British Orchid species. If you feel you may be able to help with seed collection (bearing in mind that you must have the landowner's permission, and permission from English Nature to collect seed from 11 species.) you must contact Steve Alton (☎ 01444-894077/9) or Simon Linnington (☎ 01444-894075) RBG Kew, Wakehurst Place, Ardingly, West Sussex, RH17 6TN first. They will be able to say if they will be able to say if the seed is required and will send collection equipment and instructions.

Sainsbury Orchid Conservation Project

Margaret Ramsey gave an update on successes and difficulties of seed propagation and the re-introduction projects for Cypripedium calceolus, Orchis militaris, Liparis loeselii, and mentioned some work with Orchis mascula, Orchis ustulata and Mexican Cypripediums. I was most interested to learn of the considerable success on growing seedlings of British Cypripedium calceolus (something in excess of 6000 seedlings raised last year alone!) Margaret was able to hint at the beginning of some success in re-introduction into known previous British sites. When more information on this project is available for release I hope the HOS will learn about it at one of our meetings.

HOS Native Orchid Conservation Project - Dudley Zoo

Alan Dash

HOS members Carl Hardwick, Adrian Blundell & Alan Dash have donated plants and seedlings of six British native orchid species for re-introduction/introduction at Dudley Zoo. A start has already been made by planting approximately 40 plants in April 1997. The press was invited and to date a favourable article has appeared in the Birmingham Post, we have yet to see an article in the Times. This publicity has already attracted enquiries to HOS. The site is the castle mound which has a layer of loam (between 1 and 6 inches deep) over limestone, on a steep slope of around 1:2.

The aspect varies from NE to W. The land has not been fertilised in living memory and the grass growth appears suitably poor. It will be managed by a late hay cut, followed by sheep grazing through to December. Carl Hardwick has agreed to keep an eye on the site.
If people are able to help with offers of donations of suitable plants, tubers, seed etc. of known British origin PLEASE contact Carl Hardwick (☎ 01902-563573) or Alan Dash (☎ 01886-884780).
The Zoo has cleared the project with English Nature and the plan is to re-introduce only Native British Orchids to the site - preferably species which would normally grow in the Midlands.

SYMBIOTIC CULTURE OF HARDY ORCHID SEEDLINGS

Jim Hill

The following article first appeared in the National Pleione Report (inc. Hardy Orchids) in 1995. It is reproduced below with the kind permission of Peter Bradbury, and by popular request following the HOS meeting in Autumn1996.

It is now possible to grow many orchids from seed using sterile asymbiotic techniques. Although many tropical orchids have been grown from seed using these techniques, until recently culture of many of the temperate terrestrial orchids using the same technique has proved to be very difficult. Orchid seeds are characterised by having little or no food reserves and are unable to develop without some external source of suitable nutrients. Sterile laboratory methods of seed raising aim at supplying the nutrients necessary to see the orchid seedling through their early stages of developments. The soluble sugars and other substances used in the laboratory are not readily available in the wild. These needs are invariably provided in the wild by a suitable symbiotic fungus partner. The fungus may not be necessary always for germination of the seed but is crucial for the early development of the seedling. Only a limited number of fungal species are suitable symbionts and a fungus which is a successful symbiont with one orchid may not be suitable for all others. Orchids can be raised from seed in the laboratory using the correct symbiotic fungus. Different media from those used in sterile methods of culture have to be used. The medium must support the growth of the fungus but not to be so nutritious that the fungus grows too rapidly. The standard orchid seed media such as Knudsons etc. cannot be used. Mark Clements in 1982 showed that Australian terrestrial orchids could be germinated and grown in the presence of a suitable fungus on a medium containing agar and rolled oats. He later showed at Kew that very similar methods can be used with many of our European terrestrial orchids. The real difficulty with these symbiotic methods of raising orchids from seed is in isolating the active fungal symbiont. Robert Mitchell described the methods used at Kew (R.B. Mitchell, 1989 Growing Hardy Orchids from Seed at Kew, The Plantsman, Vol. 11 part 3 pp. 152-169). The fungus associated with the orchid is usually found as hyphal masses (pelotons) in cells in the orchid roots. With a suitable microscope, a

very steady hand and a sterile room or laminar flow hood it is possible to do, as the professionals do, to tease out these hyphal masses and subculture them on suitable media. If you are suffering too much from the night before or your hands are not too steady for other reasons and you do not have a microscope or a laminar flow hood it would appear to be impossible for you to separate fungi active in sustaining orchid seedlings. The purpose of this article is to describe a way in which most orchid growers can isolate active fungal symbionts without the need for the expensive techniques and equipment used by the professionals.

Equipment needed. A container which is big enough to work in with ones hands. This need be nothing more than a large clear polythene bag or better still a cardboard box constructed to form a glove box. The cardboard box is lined with aluminium foil with two holes in the front, large enough for hands to be placed through, and with the open top covered with cling film or other clear plastic. Sterilisable glass jars with metal or polypropylene lids. Many jars used in the kitchen are suitable. I use Sainsburys coffee jars (polypropylene caps) or Sainsburys Sandwich Spread jars (metal tops). Any other similar jar could be tried. I use a pressure cooker for sterilising media and equipment and the jar and lid must stand up to this treatment. Scalpel or craft knife or razor blade or any other very sharp small knife. Tweezers, small scissors etc.
Measuring equipment. If you have not got laboratory measuring cylinders any graduated measure such as kitchen measuring spoons or the graduated measures supplied with some washing powders are suitable. Sprayer (the sort used for some kitchen cleaners or window cleaner etc.) Pressure cooker for sterilising media and tools. A microwave oven can also be used with care and provided suitable safety rules are followed. Failing these chemical sterilisation with domestic bleach is also possible. Rubber gloves to wear while working in your sterile area.

Materials Rolled oats (from most grocers) Agar (try your Health Food shop or maybe your local pharmacist might be able to help). Salt free powdered yeast extract (try your Health Food shop). Domestic bleach (available from your supermarket). The thin cheapest sort, not the thickened variety. Purified or distilled water (garage, car maintenance shop or pharmacist)

Method Prepare the medium you will use. A medium similar to that described by Sments contains 3.5g rolled oats (Sainsburys or similar), 100mg salt free powdered yeast extract and 8g agar in 1 litre of purified water. The medium is prepared and the agar dissolved by heating to boiling and poured into sterile jars. I use 50ml per jar. The jars and their lids are sterilised, preferably in a pressure cooker at maximum pressure for 15 minutes or in boiling water for the same time. Boiling water is not as effective. After I pour my medium into the jars I prefer to resterilise the lot in my pressure cooker. Remember that containers with screwed on lids can explode on heating. **Make certain the lids are loose while heating. Remember also that if you use a microwave oven metal lids cannot be used and that plastic lids must be very loose.** Remove your jars, screw down the lids tight and allow to cool and set. I leave

my jars for several days to ensure that they are not contaminated and are still sterile. Prepare a 10% solution of domestic bleach (1 part bleach to 9 parts purified water). This should be prepared on the day of use. Remember this will bleach many clothes, carpets etc. use with care and in an area where spillages will not matter. Spray some of this solution inside your glove box, polythene bag or other area you will use as your sterile work space. Swab your rubber gloves with this bleach solution and wear these gloves when handling your sterilised tools and tissues. Sterilise your tweezers, scalpels or razor blades either in a pressure cooker at top pressure (15 p.s.i. preferred) for more than 5 minutes at full pressure or with undiluted bleach for 15 minutes or by heating in a gas or spirit lamp flame. Keep tools sterile until used. Sterilise the purified water you will be using either in a container in a pressure cooker or by boiling for 10 minutes. Keep any screw on lids loose while heating but screw tight before cooling.

The fungus occurs within the roots of actively growing orchids, usually in a region slightly away from the root tip and then extending for a short distance up the root. Select a healthy looking root from an active growing terrestrial orchid, preferably during the pre-flowering stages of growth, and remove from the plant. Wash with cold or tepid water with a few drops of washing up liquid and rinse. Sterilise by placing root in a 10% solution of domestic bleach and leave for 15 minutes. Remove with sterile tweezers and rinse with sterile purified water. Place on a sterile surface (e.g. a bleach swabbed and rinsed tile) in your sterile enclosure and slice the first 2 or 3 cm of root from the root tip into thin cross-sections. Discard the first 2 to 3 mm from the tip. Place the sections on the surface of your prepared medium, screw down the lid and leave at room temperature in the dark. Within a few days a thin fungal film may appear on your medium which may or may not be symbiotically active. Prepare some more medium as above. Sterilise some orchid seed of the same or related species to the one whose roots you used (place seed in 10% bleach for 15 min. filter and wash seed with sterile purified water, filter). Using a sterile loop of wire (ordinary thin garden wire, copper wire or other wire sterilised by heating in a flame) to transfer a small piece of your fungus infected agar on to new medium. Seal the jar and place in the dark. Depending on the species of orchid and whether your fungal isolate is active, the orchid seed will germinate within 2 weeks to several months. If no germination occurs try placing in your refrigerator for 2 to 3 months and return to the dark. If your seeds do germinate and grow well you have probably isolated an active fungal symbiont for your orchid. Keep pure by subculturing on to fresh medium and try with seed from other orchid species. Your seedlings can be treated as any other orchid seedling and can be replated when big enough onto new medium. Move to the light when leaves show and pot on later into a compost suitable for your orchid species. Often symbiotically grown orchid seedlings grow more strongly than similar seedlings raised in sterile conditions. Enjoy your growing and let others know how you succeed. If you do have an active culture do not keep it to yourself, let the Sainsbury Orchid Unit at Kew know and if they wish, let them have a sample, and donate a sample to the HOS fungus bank.

Cypripediums

The following article on Cypripediums has been written by Carson Whitlow, The American Hardy Orchid nurseryman and pioneer Cypripedium hybridiser. It has been downloaded from the World Wide Web by HOS member Ian Rodgers. For members who wish to have further access to his information Carson Whitlow's orchid pages are at :- http://www.netins.net/showcase/novacom/cyphaven/chorcmal.
This article has been reproduced with Carson's permission.

Introduction
Carson became interested in orchids in 1958 when he was a sophomore in college. The following years he worked on the weekends and summers repotting orchids for a firm in Springfield, Illinois. After graduating, Carson went to Santa Ana, California to work for the prestigious firm of B. O. Bracey and Company A year later, he changed his direction and entered upon a career in government service. After leaving Bracey, he established his own collection, mostly of blue Cattleyas, with which he undertook hybridising in association with Fred A. Stewart, Orchids, in San Gabriel, California. From 1964 to 1969, he produced in excess of 60 blue Cattleya hybrids, many of which are still in collections, arising from the original seedlings or as mericlones. Many are used as basic parents in today's blue Cattleya breeding.
In 1973, Carson took a distinct change in direction, working with the hardy terrestrial orchids, primarily the Cypripediums and Calopogons. His worked resulted in the first registered artificial Cypripedium hybrid in 1987 and Calopogon hybrid in 1991. He continues to hybridise these genera and has built a small business, Cyp Haven, as retail outlet for his work.
Carson's hybrid work is recognised throughout the world. He has published over 30 articles in U.S. and European journals. He has been giving presentations on his breeding and propagation for over 25 years, throughout the United States, and in Scotland at the 14th World Orchid Congress in 1993. He is truly a world-class hybridiser, author and speaker.

He may be contacted at the address at the end of the article, or by e-mail at: SlipperGuy@aol.com.

Cypripedium Seed Germination

I receive a lot of questions about Cypripedium seed germination, reflasking and soil media for seedlings. I hope that which follows will provide some guidance in this area.
For seeding there are a number of medias which are satisfactory for various species. Withner (1) has several. Riley (2) recommends a modified Lucke. Anderson (3) lists several. Harvais media is another one I have heard about. The one I use is proprietary, however, I don't think much different than some of the others

Seed can be taken green pod or mature. I prefer green pod at about 60 days as it is easier to handle and it gets the seedlings off quickly (no chilling required). The parent plant likewise has more time to build its reserves and strength for next year. With mature seed, there may be dormancy factors and/or inhibitors which may interfere with germination and subsequent growth, and cold treatment is often recommended. For cold treatment, I recommend a four month chilling it near freezing to no more than 35 degrees Fahrenheit, to be on the safe side. At no time should plants or seed be placed in the freezer where the temperature gets well below freezing.

Once planted, the seed is placed in total darkness (I use boxes) to germinate. Temperature is between 65 and 70 degrees F. When the seed has formed small pin-head size protocorms, they are reflasked approximately one half inch apart in bottles. They are again placed in the dark to continue development. So far, Cypripedium irapeanum is the only one I have found that requires light at this stage for further development. Cypripedium reginae, if brought into the light at this time will form leaves and eventually a new growth, but this wastes time.

Germination may come on very heavy and development look superior, only to have the entire population die off within days. Some will germinate and produce comma-like forms which never grow any further. Germination is often sparse, even with what appears to be very good seed.

The objective of the seed germination phase and rhizome development is to produce a growth bud for the following season Keeping them in the dark encourages this. The larger the growth bud, the stronger the seedling will be.

However, they sometimes develop to a point and then die back. They must be chilled before they reach that stage. It is not a problem with most however.

Once the growth bud is about a half inch tall and as round as a toothpick, they can be chilled. For most, it takes about a year to reach this stage. Chilling can be accomplished in flask or after removing, cleaning and planting in, preferably, flats or community pots. I do not recommend planting first year out of flask seedlings in natural conditions. They are too small and fragile and often develop rot and are lost. Chilling is explained above.

For most species and hybrids, I have found that coarse vermiculite is a superb media for seedlings just out of flask, even growing them to maturity. This media is proving to be very satisfactory for even some of the more acid types as Cyp. guttatum and Cyp. acaule hybrids. [One exception to this is that Cyp. kentuckiense can be grown is sandblasting sand (silica sand primarily).immediately. Mature plants of this species are grown in it as well.] Cypripedium acaule has not been tried in vermiculite, and I question whether it would work for it or not.

The seedlings are grown in 75 percent shade or about 20 inches below florescent tubes. They are kept fairly wet in the early spring, tapering off later to keeping them damp. When watering, water thoroughly and wash any accumulated salts or phenols out of the media. Replace the vermiculite annually. Fertilise in the spring and early summer with one-quarter strength fertiliser - Peters, etc., or half strength Dyna-Gro.

The plants will often go dormant on their own. Outside, they can get frosted off. Or they can be put in the refrigerator after about six months of growth. Check the size of the new growth. It should be nice size by then. My seedlings are grown in plastic

boxes with holes drilled for drainage. I put the top on them, put them in a plastic bag, then into the refrigerator. This keeps them from drying out - the media should be just damp, not wet. Chill as above.
It is interesting that some of the initial seed germination work was done with Cyp. acaule, with 100% mortality when removed from flask. This species is by far the most difficult to grow, so it is no wonder there was such a failure rate for seedling. I find that germinating Cyp. Pubescens Is extremely difficult. I believe that some of the species are more selective regarding the media on which they will grow, and this can explain some of the germination problems
Note that in this and other writings I refer to Cyp. Pubescens, Cyp. parviflorum and Cyp. calceolus as different species. This is in the horticultural sense only, I will not get into the taxonomic argument about it. They are distinct in their culture and several genetic aspects. When someone says they are growing Cyp. calceolus, the first thing I have to ask is which one. Using these as species names, recognising that we are speaking horticulturally, will save a lot of confusion and lost time. It is important to note that they are recognised as separate species in the hybrid registrations.

References:

(1) Withner, C.L. (ed) 1959 The Orchids: A Scientific Survey. New York: Ronald Press.
(2) Riley, C.T. 1983 in: Plaxton E.H. (ed), North American Terrestrial Orchids, Symposium II, Proceedings and Lectures. Southfield, MI: Michigan Orchid Society.
(3) Anderson, A.B. 1990 in: North American Native Terrestrial Orchid Propagation and Production, Conference Proceedings March 1989. Chadds Ford, PA: Brandywine Conservancy.

Carson E. Whitlow
CYP. HAVEN
2291 - 280th Street
Adel, IA 50003
e-mail: GL593@kanga.ins.cwru.edu
Phone(eve)/FAX: (515) 993-4841

Flasking Forum Part 4

Richard Manuel

STERILE WORK AREAS

For those who wish to sow and grow orchid seeds **at home there are** many problems to solve. Those of producing sterile media and sterilising seeds are obvious, but less obvious and generally more important, is where to do the work. A Sterile Work Area (SWA) is the first requirement in many laboratories where microbiological work takes

place; other aspects of the work are secondary. An SWA can be anything from just a clean room and work surface to a sophisticated and expensive laminar flow cabinet.
Before starting sterile work it is vital to appreciate **what** you are trying to achieve, and what to avoid; and to think about it! Most micro-organisms - bacteria, fungi, some single celled animals (protozoa) and plants (algae), if given the opportunity, will colonise your agar plates and flasks and grow and reproduce happily there. They don't necessarily eat your seedlings but will certainly overgrow and smother them. These organisms arrive in your cultures in the form of spores - the dormant resting stage, like seeds. Spores are very small - don't bother trying to see them, you need a very powerful microscope - and they occur everywhere, often stuck to dust particles, or your skin, hair, or clothing, and many just float around in the air, being kept airborne by the slightest disturbance. But most will eventually settle on any upward facing surface.
The work surface should be easily cleanable, a plastic laminate being best. Before starting work, swabbing all surfaces with a solution of 10% household bleach kills most spores (99.9%!) as will a spray of meths diluted to about 75% with water to reduce its flammability (which is its main disadvantage). Wash your hands and forearms thoroughly before starting, and sterilise the surface of your surgical gloves by wiping them with a cloth soaked in 10% bleach. When working, move as smoothly and gently as possible, avoiding sudden or violent movements (**never** tap intruments to remove some obstinate lump of medium). Remember that any airborne spores will tend to drop downwards, though ever so slowly. So if removing lids of flasks or plates do so gently, and for as short a time as possible. Working with the openings facing sideways, rather than upward, helps keep things out. Just a closed, draught-free, very clean room - anywhere where the rain of spores is minimised - can be adequate as a work area, especially if you wear a clean 'lab coat' and some sort of clean cap enclosing your hair, and surgical gloves. Such a room can be used for pouring hot, molten, newly sterilised agar medium into petri-dishes, with very few extra precautions. Simply lift the lid of each dish and move it sideways just enough to allow you to pour the liquid medium into it and then replace the lid. The jug (or whatever) containing the sterilised agar will be covered (since it was put into the pressure cooker or autoclave with a 'hat' of kitchen foil) and this can be arranged so that there is a gap above the spout -leaving it pourable but still under cover. The foregoing method is used in a room in my department for pouring large numbers (loops) of plates for student's microbiology classes and the level of contamination is very low, sometimes non-existent.
The next level of technological wizardry is to work in some sort of transparent box which can be thoroughly cleaned and sterilised inside with the bleach solution, as must every item you put into it. At its simplest this can be something like a glass fish tank on its side, allowing you to work through the open side. A further refinement is to have a front with holes through which you can poke your hands, or which have fixed gloves to work in so that the whole inside of the box can, in theory, be sterilised. The problem with having a more or less sealed box is that you have to anticipate every possible need in advance, and put into the box everything that you will need before you close it; and this may not leave much room for you to work!

Apart from this, the basic requirements set out in the first paragraph still apply. If you are planning to build such a box, make it as large as you can; at least two feet wide by 18 inches deep is the minimum. The trouble is, big enough is usually too big to be portable.

The ultimate sterile work area is undoubtedly the flow cabinet (aka laminar flow cabinet, which is not strictly correct). This is a purpose-built box with an open(able) front, which has at its top or back a large microbiological air filter, known as a HEPA filter, through which clean air is blown by a large fan arrangement. In theory, once the inside is sterilised nothing in the way of spores can drift in against the air flow and you can work with reasonable confidence of no contamination entering that way - but don't keep your pet budgie in the same room! The front can be entirely open or have a hinged clear plastic panel which can be folded away during use. But before starting work, as with all other types of SWA, the surfaces must made as sterile as possible by swabbing with 10% bleach or spraying with meths; you must wash your hands and forearms thoroughly, and the use of surgical gloves, suitably sterilised once on your hands, is strongly advised. In other words, because you have spends zillions of pounds on your SWA it doesn't mean you can afford to overlook the basics!

Flow cabinets are expensive to buy - a couple of thousand pounds for the cheapest. But the two vital components, the fan and **the special** microbiological filter, can be bought from firms that supply and service flow cabinets, and the rest can be manufactured using a little imagination and forethought. Mine was built for about £300. A filter, and sometimes second-hand fans, can be obtained from George Hitchings. Hitchings Clinical Services. 39 Daniell Crest. Warminster. Wilts. tel/fax 01985 213131. However, if you are only interested in sowing and growing a few species per year a flow cabinet is rather an expensive luxury which takes up a lot of space and still requires cleaning/sterilising before use. Neither does it guarantee a perfectly sterile environment; only the operator can do that!. With similar care and good technique the fish tank set up works just as well.

But there are more snags to be overcome, principal among which is the sterilising of instruments. When sowing, replating or flasking your sterile seedlings, you will be using various tools such as forceps, scissors, etc. These can be sterilised in the pressure cooker while wrapped in kitchen foil, then unwrapped in the sterile area (remember to wipe the outside of the package before opening if it has been carried through non-sterile air from pot to SWA). This is fine but not reliable except for very short usages. In other words it is best if you can sterilise your instruments, repeatedly, inside the SWA. For instance, if you have worked with a fungus and then need to switch to cultures which do not want a fungus, or use a different fungus, you must sterilise in between to avoid cross-contamination. The usual method is to use a little spirit burner, which is adequate but troublesome - it blows out frequently, the fuel supply runs out or the wick burns down, and so on. The best machine I know is a purpose-built gas burner, which has a pilot flame and a main jet which is operated, one handed, by a pressure pad, allowing free use of the other hand. This works brilliantly and, as you might expect, is not available in this country; mine was made in the States by a firm that no longer exists. My home alternative is a 'semi-

automatic' bunsen burner, run off a small LPG gas cylinder from a camping shop, which has a pilot flame and a clumsy lever to operate the main jet. It works, but is not as easy to use as the other burner. This of course is made in Britain.
Sterilising seed has already been described (FF1) but there are a few further tricks worth knowing. Sowing is the stage where contamination appears most regularly, and it comes from two sources. Firstly it is easy to introduce contamination as you work, as there are so many tasks involving instruments, etc. This sort of contamination can take the form of small spots of 'cotton wool' (not necessarily white!); rapidly spreading patches of green mould or stipplings of green, blue red, or virtually any colour; a thin slime, colourless or psychedelic. The range of forms is endless. These are usually arranged at random on the plate, often starting at the edge which suggests that something crawled in and donated a spore where it arrived. The second type of contamination can be brought in with the seed itself and is recognisable as the contamination is centred on one or more seeds on the surface. These forms are usually slimes of various hues and textures.
The first type of contamination can be reduced by brushing up your methods, and thinking about how it might have been introduced. For instance, you may have been handling something that was not sterile, such as the outside of a container, during your work. Some contamination is due to bad luck or invasion by a mite or small insect, but most are can be traced back to a careless moment by the worker.
Seed-carried infection is another matter and once it happens there is little chance of saving the culture. It is often caused by 'delayed action' spores, which can resist the bleaching when the seeds are sterilised, and then 'hatch' afterwards. The only thing to do is sow more seed, this time pre-treating it to trick the bleach-resistant spores into thinking they are safe. Prepare the seed packet in the usual way and then soak it in clean distilled water with a drop of detergent and a little sugar. This slightly nutritious medium fools the spores into germinating - i.e. emerging from their resistant spore shells - only to be clobbered when the seed is bleached. Two days soaking prior to bleaching is usually enough, but this may requires some trial and error. This sort of contamination is typical of seed which is collected after the seed capsule has split on the plant. It is amazing how rapidly the spores and other nasty organisms get into the capsule, amongst the seed. I recently had a culture of seed which produced a crop of sterile mites, which somehow had survived bleaching, presumably as eggs, and so were sterile and able to live in and wander around the culture without spreading any contamination. They ate all the seeds.
If you study your sowings carefully every day for about two weeks, you should be able to spot anything nasty starting to grow and remove it with a sterile spatula, taking a good surrounding lump of the agar with it, before it gets big enough to reproduce. A few drops of 10% bleach into the excavation will help to eliminate any bits you miss. This method is not infallible and in fact if it works half the time you are not doing badly.
The final requirement for competent sterile work is to be thorough in your preparations:
10% bleach to kill the micro-organisms before you dispose of them. I am not sure what are the legal requirements of disposing of such cultures in a domestic siuation,

but I assume it is best to get rid of the used, sterilised agar onto the compost heap or to the dustmen in a sealed plastic bag. In a laboratory it is a requirement that all such cultures are killed by autoclaving before disposal.

Reintroduction of Orchis ustulata

Linda Kergon

I am currently researching the possibility of reintroducing Orchis ustulata to one of its former sites in the North East of England.
Records show that it grew on the coastal banks between Cullercoats and Tynemouth during the last Century, disappearing at some time between the 1860's and 1935.The aims of my study are to establish possible reasons for its disappearance, and to determine whether or not the site is suitable for a reintroduction.
The land owners, English Nature and the local Wildlife Trust are supporting this programme, and I am using the IUCN guidelines for reintroductions as recommended by English Nature (appended)
The main stumbling block to date is determining a suitable donor population.
Translocation of the plants from other sites is unlikely to be an acceptable option, as it is a Nationally declining species, and although it is impossible to establish the genetics of the extinct population, its habitat is of dune grassland. I only know of one similar extant site on dune grassland, and would welcome information as to any dune sites in this Country, as I need to determine whether dune plants are different or not from those growing on chalk and limestone grassland.It is looking probable that the only source of material would be to raise plants from seed, and advice on methods of germinating seed would be welcomed.I would also be grateful to receive any spare seed you may have, to allow me to establish a method of germination and growth. At this stage, its source is immaterial, but for transplanting, I need to do my best to ensure that the plants are of the same genetic type as those that were originally there.Orchis ustulata is one of my favourite orchids, and I would much like to see a reversal in its decline. Help from members of the society would be welcomed. For those of you at the AGM, for Orchis ustulata read Neotinia ustulata!

Linda can be contacted on 0191 2372011
7 Bardon Crescent, Holywell, Whitley Bay NE25 0TS

Appendix
1 There should be good historical evidence of former natural occurrence
2 There should be a clear understanding of why the species was lost. In general, only those lost through human agency and unlikely to recolonise naturally should be candidates for re establishment.
3 The factors causing extinction should have been rectified.

4 There should be suitable habitats of sufficient extent to support the re-established population, and allow it to expand
5 The donor population from which individuals are translocated should be as close as possible genetically to that of the original native population.
6 The loss of individuals taken for reestablishment should not prejudice the survival of the population from which they were taken.

Other news

Carol Dash

Apologies to members of HOS for the spelling mistakes in the last newsletter, and in particular to Tony & Diana Hughes for mistakes in their article on their visit to Rhodes. The problem was primarily due to my not being able to check the final newsletter prior to printing it because the mother board of my word processor blew up!! (It is easy to do when you know how!) As my word processor is incompatible with most others, I was panicking at the thought of having to re-type the entire thing, when a total stranger kindly allowed me to print out a copy. Under these circumstances I didn't feel that I could ask if I could edit the newsletter on his machine before printing it. Copies of Tony & Diana's article, without spelling mistakes, can be obtained from them.
Some new members have expressed an interest in obtaining back copies of the HOS newsletter. At the AGM we decided on a charge of £2.50 per copy including p&p, or £8 for a full year's issues (4 copies). If you would like any back issues, please write to me, telling me which ones you want. Please make cheques payable to the Hardy Orchid Society.

Mrs Carol Dash
Lower Lakes
Suckley Knowle
Whitbourne
Worcs., WR6 5RH

Chris Raper, the Volunteer Reserve Manager at Hartslock SSSI, has been involved in tracing UK herbarium specimens of Monkey orchid (Orchis simia), and looking at historical records. He hopes that by building up a database of notes he will be able to find out where Orchis simia grew in the past, and obtain an better understanding of the potential problems likely to be encountered in future re-introductions. He is particularly interested to know if any members have any Orchis simia which originated in the UK (plants of foreign extraction are of no interest). He is also interested in any aspect of their cultivation e.g. how well they grow, flower and set seed. Any photographs of cultivated plants could also be of interest. If any members know of old sites of Orchis simia, or if members have had any success at propagating Orchis simia, Chris would be interested to have details. Although the project is currently in its embryonic stage there is the long term possibility of an

exciting, and challenging, task propagating BBONT Orchis simia seed (under English Nature permit) with a view to re-introducing the resulting plants to old sites. Chris Raper can be contacted at "Stevaldon", 22 Beech Road, Purley on Thames, Reading, Berkshire, RG8 8DS ☎0118-9843574

Letters to the editor

A number of thoughts/questions have come to mind since the AGM Symposium. I formed the impression that total dissolved solids (TDS) meters were regarded as mysterious black boxes, in a way TDS meters are mysterious as they usually work by applying a fudge factor to the electrical conductivity of the solution. Rain water is naturally acidic, usually in the range pH4 to 5.5 ,the pH can however be much more acidic than this when down wind of industry/power stations etc. and it can contain up to 100 ppm of total dissolved solids near the coast, due to sea water entrainment. Due to the variable acidity, problems could easily be envisaged when using it, unless the pH is controlled. Tap water however is usually at around pH 7.5, unless the water is known to be from a peaty catchment. Unless they are prepared to spend large sums of money on analysis, potential hydroponic growers may find it safer to start with reverse osmosis or de-ionised water (I do not mean the ion exchanged water from dishwashers etc. which is high in sodium chloride). Tap water and rain water can be very variable, even in a given location. If Cypripediums were growing in compost and fertiliser was given during the dormant season, then there would be a risk of increasing the total soluble solids in the compost, which could be harmful. In the hydroponic method, would feeding in the dormant season be a problem, given that all the salts are supposed to be washed out, or would it merely keep the plants habituated to a cycle of consistently changing ionic strength?

Bill Temple

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Dash, Lower Lakes, Suckley Knowle, Whitbourne, Worcs. WR6 5RH. The next edition is due in October 1997 with a copy date of 1st September

Orchids of Cyprus

by Gisela & Karlheinz Morschek.

This book is a pocket sized bilingual book of 189 pages with 108 colour illustrations, recently published in Germany. It received a favourable review in the Spring edition of the Orchid Review. Opposite a photograph of each orchid is a German text alongside an English translation. There is also a full bilingual introduction to the island's geology, soil conditions and orchid habitats. The book (14.8 x 21 cm) has "a photograph of every orchid known to grow on the island" and in nearly every case these occupy a full page.
Copies of the book can be obtained from the translator Mr D Mahen, 23 Gaves Lane, Formby, Merseyside, L37 3NT price £13.99 + £1.50 p&p. This may be of use to those who are hoping to visit the island in Spring 1998.

NEWBURY HORTICULTURAL SHOW, including ORCHID show.

This show takes place on 28th and 29th of June 1997 10 am to 5 pm.

It is easily found at the junction of the A34 and M4 by following the RAC signs. Entrance is £3 per person, OAPs £1.50. Car parking is free.

Approximately 20 societies will have display and sales areas with about 25 associated trade stands as well.

N.Heywood.

NOTES ON BRITISH AND IRISH ORCHIDS

This is a new book by Hardy Orchid Society member Mr D.M.Turner Ettlinger.

One hundred and forty-seven species, subspecies and named varieties of orchid found wild in Britain and Ireland are described under the paragraph headings of Field Characters, Status and Distribution, Habitat, Variation, and Hybrids, with numerous additional notes; a number of these have not been mentioned in any previous British orchid book. Twelve casual or extinct species have been included, in less detail. The ranks at which many of these taxa should be regarded is open to argument - to which the author contributes in the introduction. Since the book is unillustrated the text is comparative and is designed to be used in amplification of any earlier book which has reasonably adequate illustrations of the major and most distinctive full species.

The book represents probably the most comprehensive and up to date work of its kind on British orchids currently available on the market.

The book is A5 in size and 160 pages long. It is available from the author (address below) or selected specialist Natural History booksellers.

PRICE.....£17.95
Plus Postage and Packaging.....85p (UK)
" " " ...£1.30 (EU including Irish Republic) EU payment by EUROCHEQUE, please.

AUTHOR and PUBLISHER - D.M. Turner Ettlinger, Royden Cottage, Cliftonville, Dorking, Surrey, RH4 2JF. Publication date 1 June 1997. ISBN 9-953380-0-9.

OUTSIDE ORCHIDS

LES ARCIES
24390 BOISSEUILH
HAUTE FORT
FRANCE

TEL/FAX: 0033 5 53 50 45 55

Robert and Karen Mitchell grow a variety of Dactylorhiza, Orchis and Ophrys etc from seed in their French nursery. They are particularly keen on growing large numbers of young plants for use in conservation projects or for private gardens. All plants on their list are grown from seed and have all necessary certification. If you are interested contact them for a list, or if you have a colony of plants on your land which you would like increased, contact them as they may be able to help by sowing seed for you and rearing the young plants.