The Hardy Orchid Society Newsletter

No. 20 April 2001

The Hardy Orchid Society Committee is…

Contents

Annual Subscription Renewal is included as an insert between pp. 12 and 13.

Enclosed with this Newsletter: Application Form for the Spring Meeting.

Cover illustration: *Calypso bulbosa* by Sarah Marks

With This Newsletter…..

- Included with this Newsletter is a folded insert of an evolutionary tree based on Prof. Richard Bateman's work in DNA sequencing. It has been printed separately so that you can lay it out beside you whilst reading the next part of Bill Temple's report of Richard's talk at last October's HOS meeting. Don't lose it though, as the final part will appear in the June Newsletter.
- So to ensure that you get to read about all of Richard's ground-breaking work, don't forget to renew your membership. The centre pages of this Newsletter can be pulled out to give you a ready-made renewal form.
- And while you have your cheque book handy, the third inclusion is the form and map for the AGM and May 2001 meeting at Wellesbourne.

We look forward to seeing you there.

Spring Meeting, 2001

Colin Clay, Meetings Secretary

The next meeting will be on Sunday 6th May 2001 at Horticulture Research International, Wellesbourne, near Warwick and incorporates the ninth Annual General Meeting (AGM) and the Spring Show.

Nominations are invited for officers and committee posts. The following positions will become vacant at this meeting – President, Chairman, Vice-Chairman, Secretary and Conservation Officer. Co-opted or 'Ordinary' Committee Members are also sought. All nominations for the committee should be received by the Hon. Secretary 14 days prior to the AGM (if possible), with the names of a proposer, a seconder and the consent of the nominee. Nominations have already been received for some of these posts but please **do** apply if you are interested. In the event of no nominations for an office being received, nominations shall be accepted from the floor.

Please bring your competitive entries for the Plant Show (see next article in this Newsletter for Plant Show schedule); also there should be room to display any other orchid-related material that you would like to exhibit (Please forewarn us of large amounts or posters etc.). All proceedings are on the ground floor and cars may pull-up adjacent to the Conference Facility for easy unloading / loading of plants.

We have assigned a significant proportion of time at the Meeting to 'propagation and culture', due to requests from newer members of the Society.

Plant Sales table costs will be at the new rate - £25 for a whole table. Alternatively, members may use the Society Plant Sales table for a few plants, on the basis that 10% of proceeds are given to the Society. Plants must be clearly labelled with species name, seller's name and price.

A sketch map plus Application Form is enclosed with this Newsletter. Use of the application form is **essential** to give us information on attendance and for catering requirements – lunch, drinks etc. Those not paying for lunch will need to pay a small amount in advance to cover the cost of coffee, tea and biscuits etc. Guests may accompany members but must pay an ***additional charge*** of £3 – please include them on your application form.

Members are asked to bring their Membership cards with them.

A B&B list is available from Colin (please send a sae) but there is no shortage of B&Bs locally as HRI is very near to Stratford-upon-Avon.

Programme

09:00 Meeting opens: Coffee / Tea, informal chat. Plant Sales Tables open. Staging of entries for the Plant Show and non-competitive materials before 10.00.

10:45 Chairman's introduction and welcome to HRI-Wellesbourne

11:00 Annual General Meeting

12:00 Hardy Orchid Propagation and Cultivation Workshop (part 1) - Richard Manuel, Adrian Blundell and Alan Dash

12:50 Results of the Plant Show from the Show Judge, plus Prize giving

13:00 Lunch (a brief walk to the HRI Restaurant). Viewing of the Plant Show

14:15 Hardy Orchid Propagation and Cultivation Workshop (part 2)

14:30 Mediterranean Orchids - Michael Lowe

15:15 Off-Colour Orchids - Tony Hughes

15:45 General discussion on any HOS issues

16:00 Tea and informal chat

17:15 Meeting closes. Vacate by 17:30

Autumn Meeting, 2001

A provisional date - Sunday 4th November 2001 has been booked for the Autumn Meeting at Horticulture Research International, Wellesbourne. The Photographic Competition will be a good opportunity to exhibit your latest images in print or slide format – expose some film soon or collect some pixels (if you have converted to digital). There will also be illustrated Talks and Plant Sales to look forward to.

HOS Plant Show, 6th May 2001

Tony Hughes, Show Secretary

As usual, the Annual Plant Show will take place during the HOS Spring Meeting at Wellesbourne. The Show Rules and the Schedule of Classes are printed below, and Norman Heywood has agreed to judge your efforts. All you have to do is turn up **before 10:15 a.m.** with your plants, and we will try to find a class to fit them in. Pot size doesn't matter – provided you can carry it! Photos of winning plants will appear on the HOS website, and the owner of the best entry will be allowed to borrow our "Best in Show" trophy for a year.

If you have any other orchidy odds and ends that you think might interest others, please bring them along to go in our usual non-competitive exhibition.

The Hardy Orchid Society - Show Rules

1. ELIGIBILITY All classes are open to all members of the Hardy Orchid Society.

2. ENTRY FEES No entry fees will be payable.

3. SHOW DETAILS Advance entry is not required. Members will be informed in a Newsletter preceding the Show of the time by which exhibits must be staged, and the earliest time at which exhibits may be removed.

4. OWNERSHIP OF EXHIBITS All exhibits must have been owned by the exhibitor for at least six months.

5. NUMBER OF PLANTS PER POT Unless otherwise stated, each pan may contain more than one plant, provided all plants are of the same variety.

However, when more than one flower spike is present, 'uniformity' will be one of the judging criteria.

6. LABELLING All plants should be correctly and clearly named. However, incorrect or unclear labelling will be considered only in a close competition.

7. JUDGING The judge is empowered to withhold awards where entries are not of adequate standard.

8. PROTESTS Any protest must be made to a member of the Committee within one hour of the opening of the hall after judging. The decision of the Committee will be final.

9. LIABILITY While the Hardy Orchid Society will endeavour to take good care of all exhibits, it will not be liable for compensation for any damage or loss, however caused.

SCHEDULE OF CLASSES

1. Three pots native British orchids, distinct varieties.

2. Three pots native European (non-British) orchids, distinct varieties.

3. Three pots non-European orchids, distinct varieties.

4. One pot native British orchid.

5. One pot native European (non-British) orchid.

6. One pot non-European hardy orchid.

7. One pot *Dactylorhiza.*

8. One pot *Orchis.*

9. One pot *Ophrys.*

10. One pot *Serapias.*

11. One pot *Cypripedium.*

12. One pot, any other genus of hardy orchid.

Hardy Orchid Society Field Meeting

Richard Manuel

An orchid safari has been arranged for Sunday 24th June in the Bristol/Gloucester area, following the route described by Tony Hughes in the October Newsletter. We hope to visit four or five sites where, with any luck, we will see Fragrant, Common Spotted, Pyramidal, Frog, Musk, Lizard, Twayblade, Bee, and Birds-nest Orchids, and maybe White Helleborines. We will have to limit numbers as car-parking will be difficult, so it is first come first served. Those interested in attending should contact me no later than 16th June. Please include either a stamp or email address and I will send further details of meeting place and time. Be prepared to bring your own lunch and other refreshments, good walking shoes (some of the slopes are rather steep) and wellies/waterproofs if the forecast is doubtful, and of course camera gear if you are so inclined. I will try to help people to organise shared travel (to Bristol) when I know who is coming.

Does DNA Reveal All About The Evolution Of Terrestrial Orchids? Part 2

Report of a talk by Richard Bateman

Evolutionary relationships

Richard started this part of the talk by thanking the following for providing material and/or data for the Orchidinae ITS phylogeny (ITS = internal transcribed spacers in the nuclear ribosomal DNA): Allan Anderson, Steven Bungard, Mark Chase, Sid Clarke, Jason Courtis, Salvatore Cozzolino, Ruth Davies, Ian Denholm, Jean-Yves Dubuisson, Derek Turner Ettlinger, Orpah Farrington, Alfred Gössman, Adil Güner, Jeff Hapeman, Mikael Hédren, Tony Hughes, Ken Inoue, Herbert Kurzweil, Yong No Lee, Marilyn Light, David Long, Mike Lowe, Richard Manuel, Henry Noltie, Tom Norman, Ian Phillips, Alec Pridgeon, Walter Rossi, Mark Rowland, Barry Tattersall, Bill Temple & Josie Welsh.

Most papers published on aspects of orchid biology are concerned with either:

(1) The description and identification of individual species,
(2) The arrangement of species into hierarchical classifications, or
(3) The ecology of species including relationships with pollinators or mycorrhizal fungi.

Until the latest techniques became available systematists could use only morphological and anatomical techniques to classify orchid species. During the last 25 years there has been a trend towards greater quantification of morphological characteristics, but in many cases insufficient characteristics and specimens have been measured so the results are of limited value. The last 15 years have seen

techniques of sequencing DNA improve and become much less expensive; consequently, many species have had parts of their DNA sequenced.

Portions of the double helical DNA that are functional are termed genes. Allozymes, which are proteins encoded by DNA, can also be used to help in delimiting species.

There are three reliable sources of DNA in any plant cell:

(1) From within the cell nucleus, where most genes are located on chromosomes. Half the chromosomes are inherited from the father and half from the mother.
(2) From within the chloroplasts, which are involved in photosynthesis. This DNA is inherited from the mother only.
(3) From within the mitochondria, which power respiration. This DNA is also inherited from the mother only. This has proved less useful for studies of plant DNA than for studies of animal DNA.

Delimiting species

When using molecular data to delimit species, the aim is to determine whether there is at least one clear genetic discontinuity among the populations of interest. Ideally, this involves finding a large number of molecular markers, which are the same in all individuals in one group of populations, and different from all the individuals in another group of populations. If this happens then the groups of populations are likely to represent distinct, reproductively isolated species.

Each of the techniques available to investigate differences at the molecular level has advantages and disadvantages.

Allozymes, microsatellites and RFLPs (Restriction Fragment Length Polymorphisms) provide information on allelic variation at an individual locus i.e. on the genes (alleles) at an individual location on a pair of homologous chromosomes. For each locus, a diploid orchid can be either homozygous (identical alleles, with identical DNA sequences), or heterozygous (with different alleles, one from each parent). Allozymes and microsatellites allow the distribution of allelic variation to be assessed at several studied loci, and can be used to estimate the levels of heterozygosity within individual plants, typically 10-20 loci are studied. Multi locus arbitrary fingerprints such as AFLPs (Amplified Fragment Length Polymorphisms) and RAPDs (Randomly Amplified Polymorphic DNAs) provide less detailed information from a substantially larger number of loci (e.g. 50 -300) that are scattered throughout the genome of the plant. They are simply compared by noting the presence or absence of individual bands, and provide no information about homozygosity or heterozygosity.

For any analytical technique, ease and density of sampling and the ability to preserve the samples are crucial. DNA based approaches to species delimitation (AFLPs, RFLPs, RAPDs and microsatellites) all benefit because plant material can be stored in dry silica gel in the field. Allozymes, however, can only be studied on fresh samples or samples that have been rapidly deep-frozen. Allozymes are easy and cheap to screen for when dealing with a large number of samples. On the other hand, AFLPs provide information from a much larger number of loci, but they are expensive to measure. RAPDs are less expensive, but scoring the gels is difficult and time-consuming. Microsatellites and RFLPs are laborious and a development period of several months is often required in order to refine the process, once developed however the screening process is relatively efficient and reliable. There have, however, been reports that varying fractions of AFLP and RAPD markers do not originate from the nuclear genome, but from plastid or mitochondrial genomes, which are inherited from the mother only. This can compromise their use to determine the parentage of a plant. RAPDs have also been reported as suffering from a lack of reproducibility. At least 30 alleles per locus can be investigated using microsatellites, whereas allozymes resolve relatively few loci and relatively few alleles per locus. Studying a limited number of loci can cause two problems – those studied may be unrepresentative of the genome, and result in misleading inferences, and failure to discover any differences. Clearly, the greater the number of loci studied, the greater the chance of finding meaningful differences.

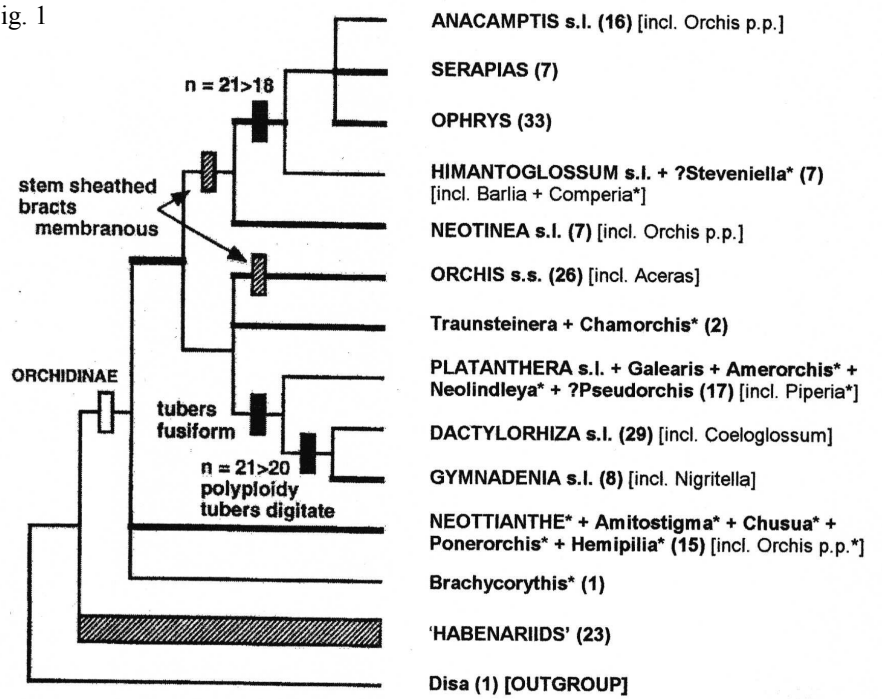
Phylogenic relationships among species

A section of the nuclear DNA, called the ITS sequence, has been used in order to deduce the phylogeny that was the focus of Richard's talk. Although more data will be required before it is possible to fix the date at which the Orchidinae diverged, the available evidence suggests that the divergence started at least 20 –30 million years ago, earlier than expected. Phylograms are drawn with the branch length proportional to the number of differences found (the number of steps). The latest version of the phylogeny of the Orchidinae, constructed using a neighbour-joining algorithm is shown in Fig. 1.

The ITS sequences show that the most highly evolved group of orchids is the *Anacamptis* group, (which now includes some species previously regarded as being *Orchis* species). As a result of these changes we now have three *Anacamptis* species in the UK – *A. pyramidalis* (Pyramidal Orchid), *A. (Orchis) laxiflora* (Lax flowered Orchis) and *A. (Orchis) morio* (Green-winged or Green-veined Orchid). The lengths of the terminal branches (the horizontal lines at the right in the phylogeny below) show that the species in this group are well differentiated.

Anacamptis, Serapias, Ophrys and *Himantoglossum* have lost three chromosomes, as a result of chromosomal fusion, reducing n, the base number of chromosomes, from 21 to 18, and 16 in the case of *A. papilionacea*. *Dactylorhiza* and

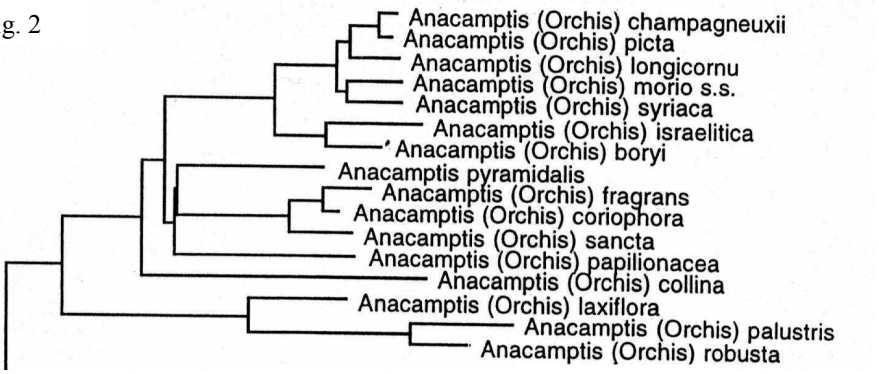
Fig. 1



ITS PHYLOGENY OF THE ORCHIDINAE (28.10.00)

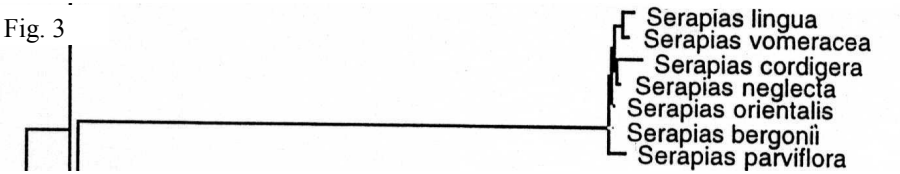
Gymnadenia have lost one chromosome, as a result of chromosomal fusion, reducing the base number of chromosomes, from 21 to 20. The total number of chromosomes present in the plants is of course 2 x n (Fig. 2).

Fig. 2



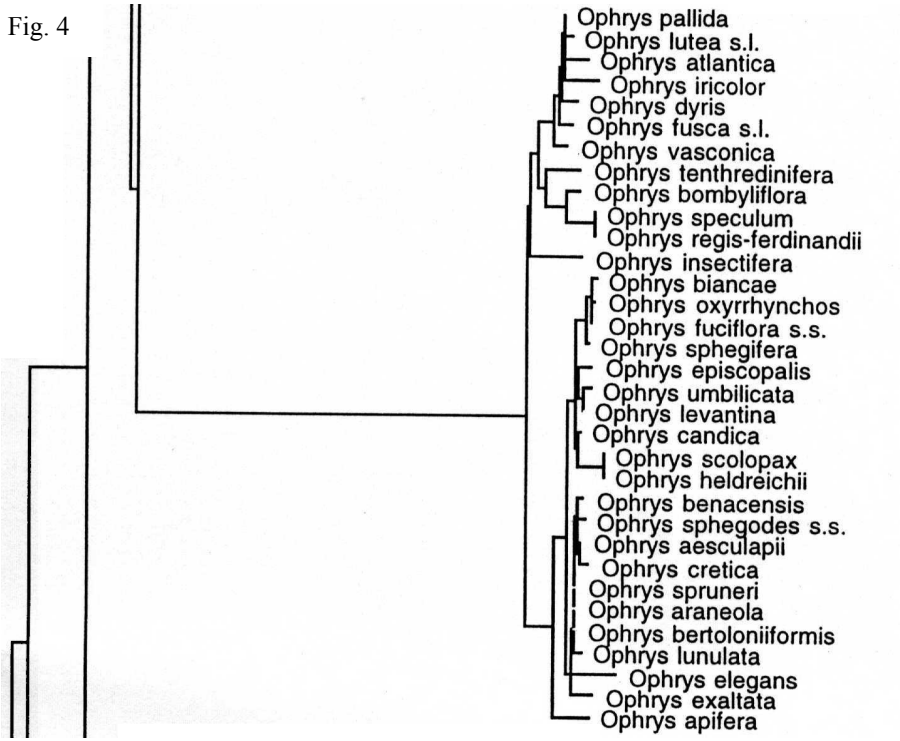
The short terminal branches show that ITS sequencing has not proved to be able to differentiate the *Serapias* species from each other. This means that either they are very recently evolved species or that they are only varieties or hybrids, rather than true species. In order to test these hypotheses other DNA techniques, allozymes and/or morphometrics will have to be used in order to try to differentiate them. (A gene consists of a pair of alleles, which can be either dominant or recessive, the genes encode enzymes, and enzymes encoded by different allelic genes are called allozymes.) (Fig. 3)

Fig. 3



The *Ophrys* group is a nightmare; many species have been named recently, invariably on the basis of subtle differences in physical characteristics.

Fig. 4



The results of Richard's measurements on *Dactylorhizas*, which have already been described (see Newsletter 19), have shown the inherent dangers in this approach. It is common to find a site where two supposed species are present and many specimens with intermediate characteristics are also present. It is therefore probably not too difficult to imagine that this can cause problems in identifying species by ITS or any other technique. (Fig. 4)

The incorporation of *Barlia* into the same group as *Himantoglossum* was probably not a surprise, although the incorporation of *Comperia*, and possibly *Steveniella* probably was for us, although not for Richard.(Fig. 5)

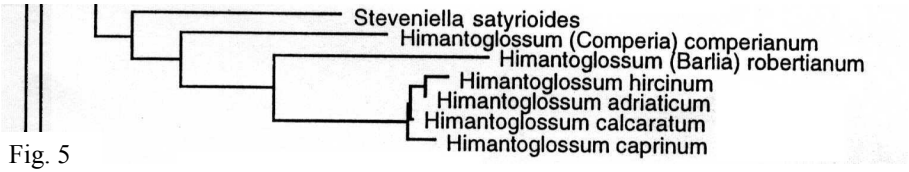


Fig. 5

Note from Ed.
The second half of this part of Richard's talk will be reported in the June Newsletter. The complete evolutionary tree is included as an insert with this Newsletter, but you will need to keep it for June.

Hardy Orchids

Trevor Marks visits Norman Heywood's Nursery

Norman Heywood is a familiar figure in the orchid world. He had notable collections of tropical orchids before being seduced by the lure of the "hardy" varieties. Norman established Hardy Orchids in 1992, one of the first nurseries devoted entirely to hardy orchids. He first specialised in *Calanthes*, *Dactylorhizas*, *Disas* and Australian terrestrials. Today his catalogue boasts an impressive array of *Cypripediums* and native British orchids, and *Pleiones*, a recent addition to Norman's repertoire. He has just set up his web site at http://hardyorchids.supanet.com. Norman was one of the founder members of the Hardy Orchid Society and has served as Secretary to the Society for three years, as well as Membership Secretary. Norman has arranged a number of field trips for the Society in his beloved Dorset, always managing to find something unusual on these. Many of these trips end at Norman's home, some with a barbecue, but always with plenty of home-made cake provided by Norman's wife Audrey.

Norman has an impressive laboratory where much of his seed sowing takes place. Plants are grown in two large polytunnels. He will freely admit to having killed many thousands of seedlings in his quest to wean from orchid seeds to seedlings. Besides producing plants for sale through his nursery, he has produced many plants

ANNUAL SUBSCRIPTION

The annual subscription is due for payment at the time of the AGM. The 2000 AGM agreed to increase subscriptions to the following amounts:

	UK	Overseas
Single:	**£8.00**	**£12.00**
Family:	**£11.00**	**£15.00**

Note: overseas membership takes additional mailing costs for newsletters into account.

Your subscription is due, if your membership number (under your name on the newsletter mailing label) starts with "00" – if it starts with "01","02", etc you have paid to that year already and do not need to renew your subscription this year.

You may pay your subscription by cheque (overseas members please pay by International Money Order (or similar) or add an additional 50% to your subscription to pay for currency conversion in the UK if you wish to pay in your own currency – please do not send cash, this is a very insecure method of payment).

UK members can also pay by Standing Order – this is our preferred method as it reduces our workload! A S/O form can be found overleaf. The HOS bank details have been put on the form, all you need to do is send this to your bank, with your account details and the subscription amount filled in. The reference to quote is your membership number (under your name on the newsletter mailing label).

Don't forget to sign it!

Whether you are paying by cheque or standing order we would like you to fill in the subscription renewal form overleaf and post it to Nick Storer, the HOS Membership Secretary

Please send any cheques for subscriptions with the form.
If you intend to pay your subscription in person at the AGM please bring this form with you.

We have a number of copies of "The Genus Pleione" by Phillip Cribb & Ian Butterfield (2nd Ed) priced at £27 each (publishers price £33).

We also have some very stylish HOS lapel badges for sale £4.50 each.

Contact Nick Storer to purchase either (or both!)

To……Bank

Postal
Address……

STANDING ORDER MANDATE

Please Pay

Bank	Branch Title (not address)	Sorting Code Number
MIDLAND BANK	WELLS BRANCH	40-46-06

For the credit of

Beneficiary's Name	Account Number	Quoting Reference
HARDY ORCHID SOCIETY	2 1 1 8 5 5 2 7	

the sum of

Amount	Amount in Words
£	

commencing

Date of first payment	And thereafter every	Due date and frequency	Until further notice in writing or	Date of last payment	And debit my/our account accordingly
1ST MAY 2001		1ST MAY ANNUALLY		-	

PLEASE CANCEL ALL PREVIOUS STANDING ORDER/DIRECT DEBIT MANDATES IN FAVOUR OF	UNDER REFERENCE NUMBER

Account to be debited	Account Number

Special Instructions

Signature(s)……

Date……..

Banks may decline to accept instructions to charge Standing Orders to certain types of account other than Current Accounts

NOTE: The Bank will not undertake to
a) make any reference to Value Added Tax or pay a stated sum plus V.A.T., or other indeterminate element.
b) advise remitter's address to beneficiary.
c) advise beneficiary of inability to pay.
d) request beneficiary's banker to advise beneficiary of receipt.
e) accept instructions to pay as soon after specified date as there are funds to meet the payment, if funds not available on the specified date.

Payments may take 3 working days or more to reach the beneficiary's account. Your Branch can give you further details.

ANNUAL SUBSCRIPTION – Renewal Form (overleaf)

We are asking all members to complete this form as part of their subscription renewal to:

1. improve the quality of data on our mailing lists (ie getting your address correct!)
2. make the process of logging subscription payments easier (ie reducing our workload!)
3. making it easier for us to contact you in case of problems.

We are asking for additional information about yourself for three reasons:

1. We want to ensure the Society serves all its members as best it can (we're not promising to please everyone, all of the time!) so we want to know what your interests are.
2. We want to be able to contact you at short-notice in order to recruit people to support Society activities (one example of this is getting people to help with plant rescues)
3. Some members have asked to be put in contact with other members in their area. This is a contentious issue, we will not be giving out members addresses without their prior permission. However, we can put people in contact with each other easily by email or telephone. What we propose doing is contacting people in a particular area and giving them the contact details (email address or 'phone number) of the person who wants to make contact – it is then up to you to make contact if you want to.

Providing this additional information is not compulsory – if you don't want to, leave the relevant bits of the form blank.

We would like you to fill the form in and send it to Nick Storer, our Membership Secretary, with your subscription (if applicable). Even if you have pre-paid your subscription for 2001 or beyond, please send the form in.

Send to Nick Storer, Membership Secretary, Hardy Orchid Society,
17, Orchard Road, Lymm, Cheshire, WA13 9HH, UK

ANNUAL SUBSCRIPTION – Renewal Form 2001

Title (Mr/Mrs/Dr/etc)	
First Name (s)	
Surname	
Membership Number	
Address	
Post Code	
Country	
Email address	
Telephone Number	

I would like to renew my HOS subscription for 2001 o

Single Membership o

Family Membership o

I enclose a cheque o for the sum of ……..

I wish to pay by Standing Order o (UK only, please send a completed form to <u>your</u> bank)

Please indicate why you are a member of the HOS by ticking one or more of the following boxes:

o Growing orchids - o Just learning (help!) - o Experienced (willing to share)
o Propagating orchids from seed o Orchid taxonomy o Orchid photography
o Orchid conservation o Field trips
o Other (please state)…….
…….
Do you want to contact other HOS members in your area? o

Would you be willing to
be contacted by other HOS members in your area? o
take part in orchid conservation work? (eg field work) o
organise field trips in your area for Society members? o
write articles for the HOS newsletter? o

for conservation organisations for re-introduction into the wild.

Besides his nursery, Norman has a passionate belief in conservation. He monitors many orchid populations in his locality, and is the driving force behind the conservation activities in his local woodland, Duncliffe Hill, a Woodland Trust site, which not only boasts a population of Violet Helleborine amongst other orchids, but also an impressive variety of butterflies, another of Norman's passions.

Like many in the Society, Norman is always happy to provide advice to those trying to grow hardy orchids. Norman supplies plants by mail order, and visitors are welcome, but by appointment only. As a bonus, a walk around Duncliffe Wood is always an option after visiting the nursery. Norman regularly has a sales table at the HOS meetings, and also attends a number of other shows each year, such as the Spring RHS Orchid Show.

For those interested, Norman can be contacted on: 01747 838368 or fax 01747 838308 or hardyorchids@supanet.com and a copy of his latest catalogue can be obtained by sending a sae to: Hardy Orchids, New Gate Farm, Scotchey Lane, Stour Provost, Gillingham, Dorset SP8 5LT or by visiting http:// hardyorchids.supanet.com.

Some Orchid Forays From Geneva

Leslie Lewis

Over the last few years, I have spent a lot time in Geneva. With the Jura mountains, French Alps and Bernese Oberland all within easy reach, this has provided many opportunities for days out on orchid forays.

One of my favourite sites is Les Baillets which lies about five miles west of Geneva, near the hamlet of Malval in a wine growing area on the eastern foothills of the High Jura mountains. The site is at about 400 metres altitude and consists of areas of grass and scrub on thin limestone gravel, partly fringed by a small area of beech, along the banks of the Allondon river. The Jura, together with the surrounding vineyards, form an attractive backdrop. It is therefore not surprising that, although part of the site is designated as a nature reserve, most people visit it for French-style picnics. Luckily, this use is mainly confined to the summer months after the orchids have retreated safely below ground.

In early May, the grassland is thick with Green-winged Orchids (*Orchis morio*), mainly dark purple but with the usual smattering of pink and white flowers. More interestingly, Monkey Orchids (*O. simia*) are widely scattered throughout the scrub and grassland with the occasional tall, spindly specimen looking uncomfortably out

Aceras anthropophorum
(Photo by Richard Manuel)

of place in dense woodland shade. In the scrub, a single spike of the white flowered form, *O. simia var. alba*, has flowered for several years. This is the only white example that I have found, even though Monkey Orchids are widespread in this region between 400 and 800 metres.

Over the following two or three weeks, Sword-leaved Helleborine (*Cephalanthera longifolia*), Bird's-nest Orchid (*Neottia nidus -avis*) and White Helleborine (*C. damasonium*) appear in the woods. In the grassland and scrub the Green-winged Orchids are quickly superseded by Burnt-tip Orchid (*Orchis ustulata*), Fly Orchid (*Ophrys insectifera*), Man Orchid (*Aceras anthropophorum*), Fragrant Orchid (*Gymnadenia conopsea*) and Twayblade (*Listera ovata*).

However, the real attraction here, growing in areas of thin soil, is the beautiful Late Spider Orchid (*Ophrys fuciflora*). While the majority have pink sepals, some with greenish-white ones are also to be found. These are at their best in late May. This is also the best time for Military Orchids (*Orchis militaris*). These grow very close to a colony of Monkey Orchids which are not quite over by the time that the Militaries come into flower. The result is that the majority of Military Orchids show clear signs of hybridisation with their simian cousins and there are very few pure specimens with their characteristic fat stubby "legs". In his book "*Orchids of Britain and Europe*", Pierre Delforge suggests that such hybrids are not uncommon in France, but this is the only place that I have found them.

Another favourite site is also in the foothills of the Jura, this time behind the rather classy French spa town of Divonne. A metalled forestry road zig-zags up the wooded slopes of the Jura mountains from the hamlet of les Mouilles. A short distance up the road, at an altitude of 617 metres, the road widens out. This is the starting point of several walking tracks into the forest. To the right, a level limestone gravel track runs through a mix of beech and conifers. The woods bordering the first 250 metres or so of this track contain a surprising variety of interesting orchids, albeit only in small numbers. First to appear, in the second week of May, are Sword-leaved Helleborine (*Cephalanthera longifolia*) and Lesser Butterfly Orchid (*Platanthera bifolia*). These are quickly followed by White Helleborine (C. *damasonium*), Bird's-nest Orchid (*Neottia nidus-avis*), Fly Orchid

(*Ophrys insectifera*), Military Orchid (*Orchis militaris*), Twayblade (*Listera ovata*) and Fragrant Orchid (*Gymnadenia conopsea*).

An early, unusually pale, form of Dark Red Helleborine (*Epipactis atrorubens*), which is known to like thin dry calcareous soils, actually grows in the track itself, flowering in the first week of June. Previously, a few spikes of Mueller's Orchid (*Epipactis muelleri*) flowered in a small area of beech scrub, but these have not appeared since this area was disturbed by a tree fall in 1997.

In mid-June, the graceful pink Red Helleborine (*Cephalanthera rubra*) appears under the firs on the bank of the forestry road leading up to the track. Although I have found the occasional spike of this orchid elsewhere in the Jura and French Alps, this far west it seems to be much less common, and to flower in much smaller numbers, than, say, at Lake Bled in Slovenia or Seefeld in Austria.

In 1998, two spikes of Violet Limodore (*Limodorum abortivum*) appeared for the first time growing together in dense shade. This year, these had increased to 11 spikes on four sites. At its best, this is a rather attractive plant with rich violet flowers with a golden-yellow centre. However, it is rarely at its best. Although, at this site, the buds are well developed by mid-May, they do not open until early June. By then, many of the flowers that eventually appeared are rather withered, presumably because pollination has occurred in the bud. This year, only one of the 11 spikes could be considered photogenic and then only for a few days.

The High Jura mountains contain orchids in large numbers. The tall mountain form of Early Purple Orchid (*Orchis mascula*), various Marsh Orchids (*Dactylorhiza ssp*), Fragrant Orchid (*Gymnadenia conopsea*), Lesser Butterfly Orchid (*Platanthera bifolia*), Man Orchid (*Aceras anthropophorum*), Small-white Orchid (*Leuorchis albida*) and Twayblade (*Listera ovata*) are particularly prominent in the meadows. Both green and brownish-purple forms of Frog Orchid (*Coeloglossum viride*),

Limodorum abortivum
(Photo by Simon Tarrant)

Traunsteinera globosa
(Photo by Simon Tarrant)

sometimes growing side-by-side, are also easily found despite their small size. In July, a dark form of Vanilla Orchid (*Nigritella nigra (rhellicani))* and Globe Orchid (*Traunsteinera globosa*) are widely scattered in the meadows along the highest ridges.

Both the yellow, and the much rarer red, forms of Elder-flowered Orchid (*Dactylorhiza sambucina*) flower in early June in the meadows at about 1400 metres altitude above the ski lift terminal at Crozet, south of the French town of Gex. In the mountains, this flowers and withers away within a space of just a few days. It can therefore be difficult to find in those places where there are only a few plants. Also of interest, in the same location, is a small, but apparently healthy, colony of White Helleborine (*Cephalanthera damasonium*), growing in the open on a sunny bank, well away from the dense shade of beech trees that are this woodland orchid's normal habitat.

In early June 2000, I made a long trip to the French nature reserve of le Sabot de Frotey. This lies on the north side of the N19 just east of the town of Vesoul, about 200 kilometres north-west of Geneva. My goal was the Jura Bee Orchid (*Ophrys apifera ssp jurana (botteronii))*. This differs from a normal bee orchid in that the two petals resemble two extra pink sepals instead of the usual "horns". At first glance, le Sabot is a model limestone site with substantial areas of scrub, rough grassland, meadow, beech, pine and steep rock faces. I was therefore both surprised and disappointed when, after more than an hour of searching, I had not found an orchid of any kind.

Eventually, after climbing a bar gate, I came across some fine specimens of Pyramidal Orchid (*Anacamptis pyramidalis*) at the side of a meadow to the east of the reserve. Further up the meadow, a large number of Lizard Orchids (*Himantoglossum hircinum*) blended in with the long grass, with both green and brownish forms growing together. Beyond the meadow, in a area of scrub and short grass on thin soil, I was lucky enough to find two Bee Orchids growing close together. Much to my delight, one was the *jurana ssp*. The other was the normal variety. Apart from the two petals, these orchids were almost identical in both appearance and stature. In particular, the labella were of the same size and shape with the same pattern. These were the only Bee Orchids to be seen. Nearby, Late

Spider Orchid (*Ophrys fuciflora*), Lesser Butterfly Orchid (*Platanthera bifolia*), Fragrant Orchid (*Gymnadenia conopsea*) and a few late spikes of Green-winged Orchid (*Orchis morio*) were also in flower, so perhaps it was still too early for the majority of the Bee Orchids.

Just south of the Jura mountain lies Lac du Bourget. About half way along the corniche road cut into the slopes above the west bank of the lake, there is a signposted parking area for a small chapel. This is situated high above the lake overlooking the spa town of Aix-les-Bains on the opposite shore. It is a popular stopping point for the superb panoramic view of the lake and the Savoy Alps beyond. It is also a particularly good site for orchids. In the small areas of beech wood at the end of the car park and around the chapel there can be found White Helleborine (*Cephalanthera damasonium*), Narrow-lipped Helleborine (*Epipactis leptochila*), Mueller's Helleborine (*E. muellerii*), Small-leaved Helleborine (*E. microphylla*) and Violet Limodore (*Limodorum abortivum*). In addition, Fly Orchid (*Ophrys insectifera*), Monkey Orchid (*Orchis simia*), Military Orchid (*O. militaris*), Sword-leaved Helleborine (*C. longifolia*), Greater Butterfly Orchid (*Platanthera chlorantha*) and Fragrant Orchid (*Gymnadenia conopsea*) grow in the scrubby grass bordering the path to the chapel and a tiny disused orchard beyond.

My favourite place for orchids in the Bernese Oberland is the town of Kandersteg. This lies in a valley south of Lake Thun, about 40 km from Bern, at an altitude of 1200 metres. The town is not that attractive in itself but is the starting point for three interesting walks in different habitats. The highest is on the balcony of the Blümisalp mountain that is reached by cable car. Here a range of high alpine orchids, similar to those growing on the High Jura, are easily found. The second is the wooded Gasterntal valley that is fringed by many hanging waterfalls and feels strangely tranquil after climbing past the thundering torrents of the Kander river to reach it. The third is Lake Oeschinen, a moraine lake that looks as if it has been transported from the Canadian Rockies and is easily reached on foot or by chair-lift.

The main attraction for orchidophiles at Kandersteg is the Lady's Slipper Orchid (*Cypripedium calceolus*) which grows in at least two places. It is at its best in the first week in June, a full three weeks later than the plants growing in the botanic garden in Geneva and a week later than those by the Isar river, south of Munich. Another rare orchid is Short-Spurred Fragrant Orchid (*Gymnadenia odoratissima*). This can be found in early July growing between the river and road running down from Lake Oeschinen. Even from a distance, this plant is distinguished by its pale colour from the deep pink of the mountain form of Fragrant Orchid (*G. conopsea*). Although reportedly widespread, this is the only place I have found it.

In the Valais region, to the west of the road leading from Martigny to the Grand St

Bernard Pass lies the Swiss village of Champex at an altitude of 1465 metres. In late May, Military Orchids grow in large numbers on the banks of the hairpin bends of the narrow road that zig-zags up from the village of les Valettes. These include a specimen of the unusual pure white form, *Orchis militaris var. alba*. Just before the village, a very steep hill on the left leads to an attractive valley with a fast-flowing stream bordered by pinewoods on one side and a meadow on the other side. The soil here is mainly acidic and, in mid-June, this meadow is full of the richly coloured alpine Marsh Orchid (*Dactylorhiza alpestris*). The pinewoods are full of moss which would seem to provide an ideal habit for Creeping Lady's Tresses (*Goodyera repens*) but I have yet to find it here. In Champex itself, there is a delightful lake flanked on one side by woods. Mueller's Orchid (*Epipactis muellerii*) grows here in an area of beech trees. Overlooking the village to the west, is la Breya mountain which is reached by a chair-lift that is rather too steep for comfort, particularly when descending. In July, Small White Orchid (*Leucorchis albida*) grows on the mountain in large numbers, together with Vanilla Orchid (*Nigritella nigra (rhellicani*)).

The village is also home to an attractive, well-maintained, alpine garden, which is open at weekends. This is much better than the alpine garden at Bourg St. Pierre further up the main road to the Grand St. Bernard Pass. White and pink spikes of Heath-spotted Orchid (*Dactylorhiza maculata*) have infiltrated many of the beds. These would seem to be hybrids since some are distinctly trilobed whereas others are not. They are also unusually tall with numerous flowers, not unlike the *ssp. arduennensis* even though the garden is a long way from the Ardennes. Much more exotic, growing in an open bed, are two alien Lady's Slipper Orchids, the showy pink *Cypripedium rosa* and the dainty, white-shoed *C. californicum*.

Although orchids are widespread in the High Savoy mountains, I have not found any sites that I consider as really outstanding. A personal favourite is the ski resort of Flaine, perhaps because, as a family, we spent our first mountain holiday there almost 20 years ago. Although the town is an architectural disaster, it is conveniently set in a natural bowl at 1600 metres altitude and makes a good starting point for a variety of walks on well-marked paths. Again, the orchids to be found are similar to those in the High Jura. Orchids are also to be found by the road up to the resort. For example, in mid-June, the bare floors under the beeches bordering the road are particularly easy places to spot the tiny, normally inconspicuous, Coral Root (*Corallorhiza trifida*). Also in mid-June, the yellow form of Elder-flowered Orchid (*Dactylorhiza sambucina*) can sometimes be found in the road-side grassy banks shortly before the entrance to Flaine golf course.

Inevitably, some sites that I have visited have not lived up to my initial expectations. Immediately south of the Jura chain lies the French National Nature Reserve of Marais de Lavours. This is an area of mixed woodland, marsh and fen,

accessible only by 2.3 kilometres of raised wooden walkway funded by the WWF. Up until 1997, a guidebook to the reserve was available from an information centre that also arranged guided walks. The guidebook identifies with some precision a site, adjacent to the walkway, for Summer Lady's Tresses (*Spiranthes aestivalis*). Unfortunately, the walkway was closed for repair during 1997 and, by the time it reopened in 1998, the information centre had permanently closed and guided walks were no longer available. Despite several visits in both June and July, I have been unable to find this extremely rare orchid myself. It is to be hoped that this is not another site where this endangered species has died out. Although the much more showy Marsh Helleborine (*Epipactis palustris*) and Early Marsh Orchid (*Dactylorhiza incarnata*) grow in a nearby alkaline area, these are clearly poor consolation.

Nigritella nigra
(Photo by Simon Tarrant)

Another site that did not live up to my expectations is le Roc de Chère nature reserve. This is a small, heavily wooded, limestone massif that juts into Lake Annecy between the pretty gourmet village of Talloires and Lake Annecy golf course. It is best known for the views it affords over perhaps the most beautiful lake in France. According to the official guidebook, *À la découverte des Réserves Naturelles de France*, it also contains 28 species of orchids. Despite extensive searches over several years in both spring and summer, I have found only nine species, and then only in small numbers: Early Purple Orchid (*Orchis mascula*), White Helleborine (*Cephalanthera damasonium*), Sword-leaved Helleborine (*C. longifolia*), Red Helleborine (*C. rubra*), Broad-leaved Helleborine (*Epipactis helleborine*), Bird's-nest Orchid (*Neottia nidus-avis*), Fragrant Orchid (*Gymnadenia conopsea*), Pyramidal Orchid (*Anacamptis pyramidalis*) and Twayblade (*Listera ovata*). Clearly, my failure to find other species does not mean that they are not present. Nevertheless, I find it difficult to belief that I have missed as many as 19 different species in such a relatively small reserve.

According to the same guidebook, another small reserve, a few kilometres away at the southern end of Lake Annecy, contains 17 species of orchid, including the rare (and well-camouflaged) Fen Orchid (*Liparis loeselii*) and, rather surprisingly, the mountain-loving Short-Spurred Fragrant Orchid (*Gymnadenia odoratissima*). Here, I have managed to find only Fragrant Orchid (*G. conopsea*), Marsh Helleborine (*Epipactis palustris*), various other Marsh Orchids (*Dactylorhiza ssp.*) and

Twayblade (*Listera ovata*). However, since the Fen Orchid grows at Kenfig not far from my home in S. Wales, and I have found Short-Spurred Fragrant Orchid at Kandersteg, I am not as disappointed as I might otherwise have been.

Lady Orchid (*Orchis purpurea*) is also stated to be common in the Lake Annecy area. However, I have never found it there or, indeed, elsewhere around Geneva. This continues to puzzle me since it is easily found elsewhere in France, for example, on the side of the road from Chambéry into the Chartreuse mountains, south of Lac du Bourget.

I hope to have the opportunity to make further forays in future years to remedy some notable omissions from the orchids listed above. In particular, I have never seen the rare Spitzel's Orchid (*Orchis spitzelii*) and the not-so-rare Pale-Flowered Orchid (*O. pallens*), both of which grow in the Jura mountains. I also still hope to find the tiny, and apparently extremely inconspicuous, Dwarf Alpine Orchid (*Chamorchis alpina*) which grows at high altitudes in both the Bernese Oberland and High Savoy mountains. It would be a bonus to find the elusive Ghost Orchid (*Epipogium aphyllum*), which also grows in the Jura and which I have not seen since June 1986 when it flowered in Buckinghamshire.

Sowing Seed of Hardy Orchids

Ted Weeks

Following on from my previous article on sterilising seed, I hope the following information will be of interest to any member wishing to attempt growing hardy orchids from seed for the first time.

Having sterilised the seed and given them a final rinse in the phial, the bottom bung is removed and, as soon as the top bung is removed, the phial is tilted and slowly rotated. As the water drains out, the seed stick to the insides of the phial, making it easier to remove them for sowing. After the water has drained, the bottom bung is replaced and the phial can be stood in a small heavy container. I use a small heavy glass. This allows excess water to drain from the seed while preparing flasks for sowing, and prevents the phial from falling over. This procedure, of course, is done in the sterile area of the glass tank/cabinet.

Have ready a small plastic bucket containing bleach solution – diluted 1 part bleach to 9 parts water. The flasks are washed in this diluted solution, including the lids. This is yet another precaution against contamination. When everything is ready for sowing, a spatula should be sterilised over a flame. I use a small butane gas burner, which I bought at B & Q. I have used a spirit burner in the past but I find the gas burner just as effective and easily kept at the side of my glass cabinet.

My 'spatula' started life as a stainless steel spoon which, with a bit of cutting and filing fits inside the sterilising phial, just right!

My glass sowing cabinet has an eight-inch opening across the front, covered by soft polythene. This allows hand access, and, sitting close to the tank, it helps; again, to prevent dust etc. finding its way into the sowing area. At the back of the tank I have a glass shelf which has multiple uses: storing washed flasks (on and under), storing small bottles of sterile water under and, if using petri dishes, sowings made under the shelf are protected even more from air borne bacteria etc. Twenty minutes before sowing the inside of the glass cabinet is sprayed with the same diluted bleach solution, using a small hand held garden spray.

Basic Oats media can be used for sowings of *Dactylorhiza* and some other species using A17 – B1 and TM fungi. However, before using media with ingredients that have to be measured, weighed and then made up, I recommend trying TGZ-SL for a first attempt. All that is required, when using TGZ-SL to make up enough for approximately 20 or more flasks, is 1 litre of distilled water. I also use Greenaway sowing and replating media. I find the latter is excellent for all my seedling replatings.

My sowing technique is simple. The flask to be sown is gently shaken, in order that surplus sterile water within the flask is dispersed over the media. This allows the seed to spread over the media. The seed sowing media has been set, in the flasks, at a slight angle, referred to as 'slopes'. The flask is placed, at an angle, on a wide glass tumbler inside the glass cabinet, with the lid placed safely under the glass shelf. The spatula is sterilised by passing it through a flame a few times. Then, holding the phial in one hand, the spatula, which has been cooled, is inserted into the phial and seed is gently gathered half way up the phial. When enough seed for one sowing has been gathered up, the spatula is quickly drawn from the phial, with the seed sticking to the tip. The seed is gently placed on to the media. If the seed is massed in one area, the spatula can be inserted into the sterile water in the flask and used to disperse the seed over the media. The lid is replaced on the flask and the flask is put ready to label. Label it as soon as possible. Name the species, date sown and media used, leaving a space on the label to record germination details.

During the extraction of seed, some will stick to the top edge of the phial and should not be used. This seed should be avoided when drawing subsequent seed from the phial, as there may be contamination on the outside of the phial.

I find this method of sowing seed simple and effective, but there are other methods that are just as effective and productive. For further reading on sterilising, sowing and weaning techniques; 'Orchids from Seed' by P.A. Thompson and many back issues of the Hardy Orchid Society Newsletters contain articles on this subject.

Managing a Raised Bed for Orchids

Simon Tarrant

Back in the very first HOS Newsletter in July 1996 Mike Powell described a method of building a raised bed in the garden to create a suitable habitat for orchid growing. Inspired by Mike's article I built a two-part raised bed in 1997. The physical construction followed Mike's design closely, but divided into two parts to provide a peat-based area and a limestone-based area. I haven't kept detailed notes of the composts used, but both parts include a high proportion of gravel.

Inevitably a project such as this produces some successes and some failures, and with time one's ambitions and expectations change. A general truth of all raised beds in my experience is that the compost compacts or sinks, and despite constant topping-up, the surface level after four years is about six inches lower than it should be. Growing orchids in the garden means that they are at the mercy of garden pests – the most troublesome being our cats who find the gravel surface makes an ideal bed on a sunny day!

As far as the plants are concerned, the peaty side was planted initially with single plants of *Dactylorhiza praetermissa* and what was described as *D*. Bressingham Bonus, which I believe to be a hybrid between *D. maculata* and *D. praetermissa*. Each year these produce additional tubers, and several seedlings have now appeared. Also successful in the peat bed was a *Bletilla striata*, in fact it was so successful that it threatened to swamp the *Dacs*, so I decided to be brutal last year, and dug it up (all 25 or so tubers!).

I have not had so much success in the limestone side of the bed, but it's only in the last couple of years that I have found the right plants for it. The first of these was a Pyramidal Orchid (*Anacamptis pyramidalis*), which has flowered for two summers, and is putting up two spikes in 2001.

Following advice from several articles in subsequent Newsletters, when I was repotting some *Serapias lingua* in 1999 and pondering on what to do with their ever-increasing numbers, I tried some of them in the raised bed. They have now spent two seasons there with no winter protection. The photograph shows the first into flower in May 2000, and also shows how raised the raised bed isn't!

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