

A Report of a horticulturalists time at the Schachen alpine garden.



The Merlin Trust
Grants for Young Horticulturists



Royal
Botanic Garden
Edinburgh

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Introduction

After travelling over from Edinburgh and staying in Munich for a few days to see the Munich Botanic gardens it was time to make our way up the Bavarian Alps to the Schachen garden. We arranged to get a lift from Munich Botanic Garden at 5:45am meeting Jenny Wainwright-Klein at a town local to the Schachen to pick up our provisions for the stay.

The Schachen is an outpost of the Munich Botanic Garden at 1,850m altitude that helps to cultivate and conserve mountain flora that would otherwise struggle with the high summer temperatures experienced in Munich.



The map above shows the alpine gardens of the area with the Schachen garden d1 located in the Bavarian alps.

To access the garden, visitors must park a car near the bottom of the mountain and hike up a forestry road for a couple of hours. As we had met Jenny to gather provisions for our stay at the Schachen, we were able to gain a lift up the mountain in the 4 x 4 that Munich Botanic has permission to drive up to the garden with materials and provisions to enable the garden to function.

The aim of this trip is to gain an intimate understanding of a world-renowned alpine garden at altitude, how it is run and managed. And how it sits in the wider landscape.



The road is a forestry road composed of large grade lime chippings that requires an annual repair after the winter due to landslips and regular maintenance clearing the drains to prevent gullies forming.

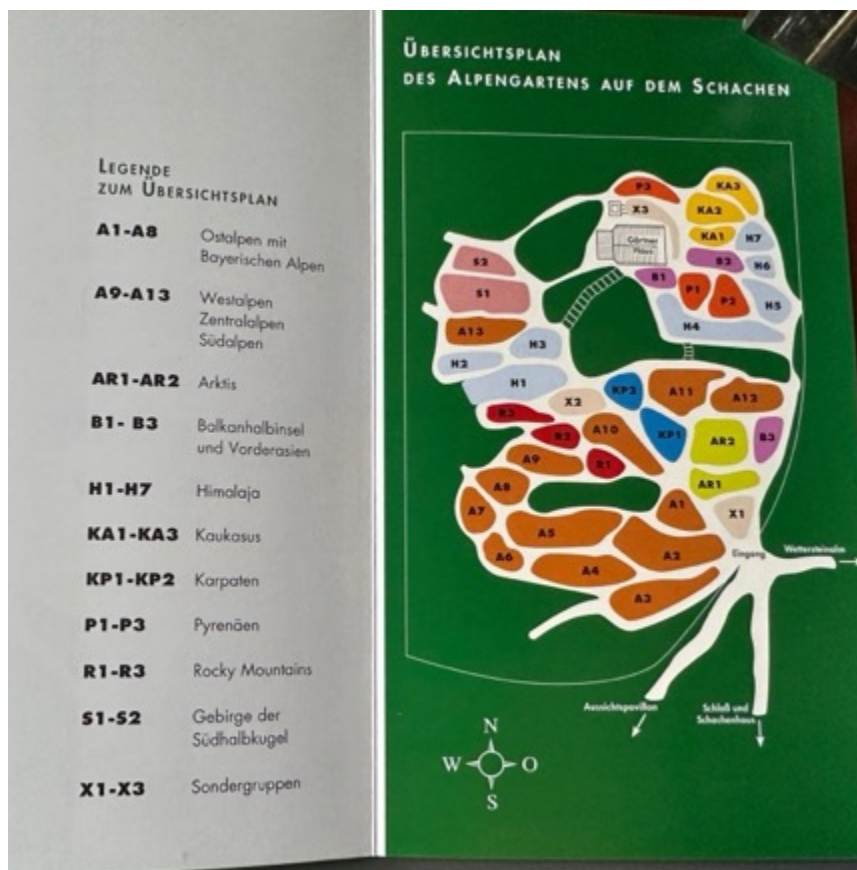


Many make an overnight journey using the Schachenhaus as overnight accommodation to journey up to the Meilerhütte with an exploratory peruse through the Schachen alpine garden on the return descent.

The Alpine Garden is composed of a series of island beds set over the natural incline of the mountain side. The main flora represented are of the European alps, primarily the Bavarian alps. Followed by the Himalaya and Caucasus as seen on the garden map below.



An aerial view of the garden from Google maps.



The garden map from the guidebook.

We arrived to a garden bathed in cool bright light with a shroud of humid air rising from the warm valley below.



Looking out from the garden to the surrounding landscape



Cicerbita alpina

It was nice to see *Cicerbita alpina* in the garden, which has been part of RBGE conservation efforts as a rare Scottish native plant.

It was a privilege to have a look round this garden that we'd heard stories of from plantspeople.



Linum hypericifolium

The star plant at our arrival was the *Lilium monadelphum* standing proud in front of the alpine house and gathering drops of dew as the mist settled.



Lilium monadelphum

The alpine house centrally sited in the Schachen garden provides a focal point for the garden surrounded by an incredible backdrop of mountainous scenery. This was where we would store our provisions and cook our meals with the Munich botanic staff.



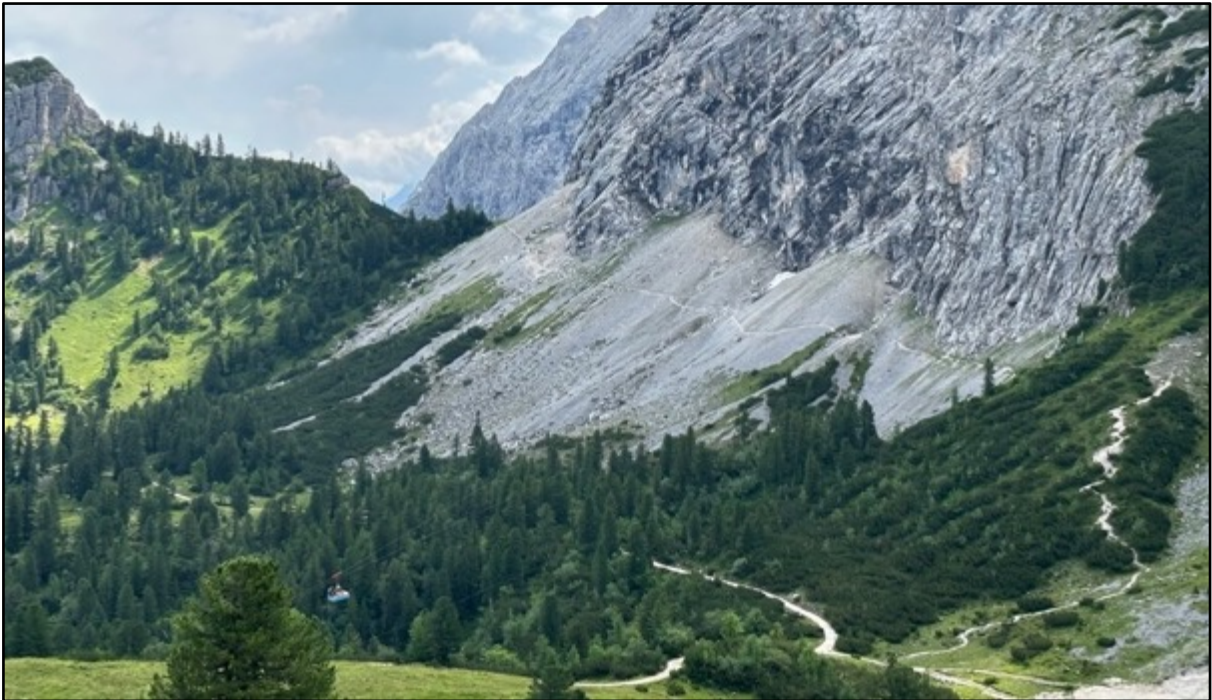
Josh Tranter the AGS sponsored apprentice in front of the gardeners' hut, and inside where many plantspeople have had warming meals after a day's work.

A 5-minute walk away was our sleeping quarters in a converted stable, with cowbells ringing across the valley its was beautiful.



Our sleeping quarters at the Schachenhaus.

Looking out over the valley from the Schachenhaus you gain an appreciation for the rock strata and in the image below can see the Schachentor which we hiked over one weekend.



The cable car taking supplies to the Meilerhütte based higher up the mountain.

Looking round the Schachen garden the primary rock is the local limestone of the surrounding mountains used very effectively to create naturalistic island beds that are used to represent different regional alpine flora.



Crevices and wider planting pockets are created using irregular sized rocks arranged skilfully.



Silene alpestris (the small white flower) is one of the problematic weeds of the garden with a fine root network that spreads readily through the rock work.

With the high mountain setting, it provides ideal conditions for alpine plants of similar climatic habitats.



Meconopsis baileyi enjoying the cool humid conditions.



Meconopsis x setifera

One of our main projects during our time will be the renovation of the Bavarian alpine bed seen below. Cleared previously, we'll be refreshing the soil and bringing in rocks to create new rockwork in the style of the surrounding beds.



The Bavarian bed

Himalayan bed Refresh

An initial project was refreshing a small area of one of the Himalayan beds with an incredible backdrop. With plants responding to the conditions at different rates, it's important to periodically lift and replant to ensure the dominant plants do not engulf the slower ones.



The Himalayan beds with the gate we use afterhours to access the garden for evening meals



Plants lifted and taken for cleaning and splitting.



Primula and Meconopsis well represented in the Himalayan beds.

Care taken to ensure the plants are not left out in the sun, even at this altitude the sun and wind can quickly desiccate plants lifted if there is a break in the clouds for a period.



Primula munroi in the Himalayan bed.



Meconopsis galydiana

Meconopsis used to be tolerate being in full sun here, but now want to shade the roots from 10am to keep cool. Rocks can be used to help keep the root zone cool.



Meconopsis x complexa



Primula alpica

With a strong collection of Himalayan flora and *Meconopsis* well represented this garden provides an increasingly important refuge for mountain flora that are struggling with the increasing heat and drought experienced with climate change.



Meconopsis punicea



Primula sikkimensis

The garden is blanketed under snow through the winter, although this means mice living under the snow can attack the resting buds of plants as a food resource. This clump of *Primula sikkimensis* seem to be a particular favourite. Seed exchanges have been important for the collection with this *Celmisia semicordata* grown from New Zealand Rock Garden Club seed. Jenny makes sure to gather seed from the collection to submit to seed exchanges, coming up to the garden in the autumn after its closure.



Celmisia semicordata



Trollius ranunculoides



Meconopsis x sheldonii (G. Taylor)

This *Meconopsis* is labelled *Meconopsis x sheldonii* (G. Taylor) and has been growing at the garden for over 30 years, showing the longevity of these plants given the right conditions.



The morning view from the accommodation

Surrounding the garden are meadows grazed by cows brought up for an allotted period to ensure the grazing maintains the cultural landscape of alpine meadows.



Rhododendron ferrugineum and *R. hirsutum* in the surrounding meadow



Mixing soil for the Himalayan bed

Just outside the garden is the compost area where waste material is stored until taken down the mountain for composting and sterilisation at Munich Botanic. Then returned to bays where it can then be used for the bed refreshing process. This sits just under the meadow in front of the Kings house. An eccentric architectural treat that is also well worth getting a tour of should you be visiting.



Kings house



Meconopsis betonicifolia, *Primula sikkimensis* var. *pubibunda* and *Gentiana kuroo* replanted.

The Himalayan bed refresh continued, and the sun made a more steady appearance which required the use of parasols to help protect the newly split plants settle into the new planting.



The parasols also provided welcome shade for us to work.



Road maintenance

An important aspect of living as part of a small remote community is helping with communal aspects of life. The forestry road has drainage channels to prevent gulley's forming, in preparation of incoming inclement weather it's important that the channels are kept clear and free flowing. This also provides an opportunity to utilise the washed away chippings as a resource to use in the soil mixtures of the bed refresh. This also provides an opportunity to look at more of the meadows and verge side flora, maintained by the cows.



Chewing the cud

It was beautiful to see plants that we treasure in our gardens back home growing happily along the margins of the forestry track.



Dryas octapetala



Gentiana bavarica



Parnassia palustris

I was particularly drawn to the Parnassia with its crisp clear colour and strong veining on the petals. The stormy conditions provided an opportunity to look at some of the historical photos of the garden, having recently celebrated its 100th anniversary in 1901.



Dressed for its official opening.



The original labelling system was prominent in the beds and the views out to the surrounding landscape have become obscured over time with the growth of self-sown Pinus.



The bench is still in use today, we used it for a sheltered spot to clean and split plants for the Himalayan bed.



Lilium martagon

Two members of the same genus in the garden, *Lilium martagon* is of the local area and spreads readily through the garden. *Lilium monadelphum* is introduced to the garden, however it does not spread readily and is a much showier member of the genus.



Lilium monadelphum



Meconopsis sulphurea



Olsynium biflorum

It was important to take time during a break or after the workday to have a look round the garden as each day brought a new range of plants into flower. Photographing the plants allows us to revisit these places and special moments.



Nomocharis aperta



Campanula sp.

Along with the *Silene alpestris* there were other weeds that needed attention, *Lilium martagon* seeding into the wrong beds, *Gymnadenia* seeding again into the wrong areas and Campanulas that would rapidly spread through the beds.



The cows were inquisitive of the garden and in the past have made intrusions into the garden needing ushered out to prevent further damage.



Alpine salamander

With the rain showers the alpine salamanders would emerge to re-establish territorial boundaries, posturing to neighbours. This one just so happened to live in the floorboards of our sleeping quarters and used the threshold as a stage to increase their visibility. Phenology is recorded each Wednesday over a range of specific plants at different locations with different stages of the plants recorded as a record of when key events are occurring and these records can be used to ascertain changes in plant behaviour over time.

Rhododendron ferrugineum (Rhododendron ferrugineum)

1. Stadium
Erste große Knospenbildung
Nacht nach
Aufbruch
der Knospen
auf das erste Stadium
an der Basis des
Blattes sichtbar

2. Stadium
Erste Knospenbildung
Nacht nach
Aufbruch
der Knospen
auf das zweite Stadium
an der Basis des
Blattes sichtbar

3. Stadium
Erste Blüte
geöffnet
Die erste Blüte
des ersten Stadiums
abblühen ist
geöffnet

4. Stadium
vollständige
Die Blüte ist
vollständig, wenn
alle Blütenblätter
geöffnet sind

5. Stadium
Erste Knospe mit
einer Blüte
geöffnet

W. Bressler & A. Götter (2011)

Phänologie Rhododendron ferrugineum auf dem Buchhorn

Rhododendron ferrugineum *G. P. F.* für das Jahr: 2023

Datum	10.7.	12.08.	14.08.	16.08.	18.08.						
Beobachter	T. L.	SS	SS	SS	SS						
Stadium 1											
Stadium 2											
Stadium 3											
Stadium 4											
Stadium 5											

Anmerkungen:

Phenology recording



Shading the Himalaya bed

The sun was persistent, and a more stable shading system was employed with the parasols not suitable for leaving out in the winds. Below shows the *Gymnadenia* orchid that we were deadheading, as we needed to reduce its spread into beds where it was not wanted.



Gymnadenia conopsea



Salix Helvetica

There were a series of *Salix* planted in the centre of several of the beds that required careful pruning to reduce the canopy spread. In winter the tips are usually grazed by animals that can access the garden over the fence as the snow level rises and the tips of the shrubs are left exposed. The mountain views were exceptional and served as a reminder to look up occasionally to appreciate the wider landscape.





Weeding beds and paths

Any garden requires careful weeding to maintain the plants that we wish to retain and thrive, reducing the competitive pressure from those deemed a weed. A side task towards the end of the day involved harvesting a small number of cones of the *Pinus cembra* for the manager of the Schachenhaus to use in creating Schnapps. The majority of the cones were much higher than our reach, which suited the local nutcracker birds.



Pinus cembra cones



Schnapps

Bavarian Bed Rock Work



Jenny instructed us on the style and method of rock work at the Schachen, aiming for a naturalistic appearance that could be found in the wider landscape. We then sourced rock from margins around the garden and set them across the bed. Stepping back and visualising the finished effect once the soil was returned.



Once the rock placement has been finalised and checked with Jenny, we then set the rocks onto a bed of the washed-out limestone chippings to make them stable in the bed for stepping on a safe foothold when weeding the beds in the future. The soil has been exposed to the elements for over a year with no vegetative cover and has therefore become compacted also with us walking on the bed to place the rocks. Therefore, the soil is forked over, or a pickaxe is frequently used due to the stony nature of the soil.



Rock placement showing the mixture of crevices and wider planting pockets.



The mixture of sterilised soil, organic matter and limestone chippings used to backfill.



Swertia variabilis, *Saussurea pygmaea*, *Aster alpinus*, *Campanula aucheri*, *Caltha scapose*, *Aquilegia pyrenaica*, *Potentilla nivea*, *Senecio incanus* ssp. *Carniolicus* and *Senecio abrotanifolius*.

When Jenny goes to collect provisions, she will sometimes collect plants for the Schachen from Munich. These have been propagated at Munich then for transport are placed in the organic matter of the tray, lined with newspaper and some are in small terracotta pots plunged into the organic matter.



Storm damage that needs repaired before it deepens across the road surface.



Making use of the sheltered bench to clean up plants for the Bavarian bed.

We were told a story of a white striped Campanula that originated from the Schachentor some years ago, there was one flower in the Schachen garden. We did not find any on our hike over the Schachentor.



Campanula sp. (originally from Schachentor)

Sometimes a plant would catch your attention like this *Stachys* growing happily from a slight crevice amongst the limestone rocks.



Stachys pradica

In the Schachen gardeners hut was a wood veneer piece of art showing a Josef Capek illustration of a gardener.



Josef Capek illustration



Planting *Carex baldensis*



Josh planting *Astrantia bavarica*

These were plants that we had lifted and cleaned in the previous days.



Astrantia bavarica



Bavarian bed backfilled with soil.



Saxifraga mutata.

In a small planting pocket of the Bavarian bed, we planted the *Saxifraga mutata* that grows on rock faces further down the mountain.



Spare time was filled with weeding between beds and paths.



The inquisitive cows guarding the entrance.

Emptying buckets in the compost area would sometimes attract the attention of the cows, making for an amusing time getting out to the compost area.



Meconopsis zhongdianensis



Nardostachys grandiflora

Keeping an eye on some of the smaller species around the garden, *Meconopsis zhongdianensis* flowering well, *Nardostachys grandiflora* and *Massonia saniensis* was showing flower buds for the first time grown from seed collected by Jenny in the country of Lesotho within South Africa.



Massonia saniensis



Shading on the Bavarian bed to protect the new plantings from the sun.



Meconopsis pollination isolation

To help prevent hybrids arising amongst the Meconopsis, hand pollination of newly opened flowers is performed, and a fine mesh is secured around the plants which seed is wanted from.

After work walk to Schachensee



Schachensee

A short walk back down a section of the forestry track with a side path leads to the Schachensee, a beautiful body of water that had amazing reflections of the landscape.



Arabis bellidifolia ssp *bellidifolia*, *Veronica bellidioides*, *Dianthus alpinus*, *Ornithogalum juncifolium*, *Gentiana divarica*

Jenny has returned with more plants from Munich, and we get the opportunity to help plant up sections of the crevice bed near the entrance to the garden.



Silene elisabethae newly planted



Silene elisabethae near the alpine house



The light of a supermoon on the mountain top

Well worth getting up at 4am to see the night sky and supermoon.



Alpine salamander returning to their quarters the morning after the supermoon.



Starting to clear the next bed.



Lifted plants placed into crates.

As we reached the end of what we could do on the Bavarian bed, we moved onto lifting and clearing the next bed A7 that was due to be refreshed. Some of the plants lifted included *Alchemilla undulata*, *Carex atrata* ssp *aterrima*, *Alchemilla othmarii*, *Dianthus spiculifolius*, *Aquilegia pyrenaica*, *Oreojuncus monanthos*, *Alchemilla* aggregate.



Clearing bed A7.



Final work at the Schachen lifting plants from bed A7 and clearing the rocks.



Pinus mugo.



Massonia saniensis.

Pinus mugo was lifted from bed A7 and an adjacent bed for transport back to Munich for the rock garden at Munich. A final meal was had at the Schachenhaus where we thanked our hosts for the wonderful stay. We gathered our belongings, packed the trailer with a load of garden waste for Munich, and had a final wander round the garden before heading down the mountain in the early morning to avoid crossing paths with hikers and mountain bikers.



Saxifraga mutata.



Saxifraga caesia.

On our way down the mountain Jenny kindly stopped to allow us a few excursions to see more mountain flora. Of note were the colonies of *Saxifraga mutata* on sections of exposed limestone rock face along the forestry track.



Campanula cochlearifolia



Knautia dipsacifolia



Epipactis sp.

Climbing down into a roadside ditch to get a better angle for a photo of *Epipactis* sp. As was evident from our hike down the Kälbersteig path there was huge variation amongst the *Epipactis* with hybrid swarms across the area.

Flowers round the garden

Some of the photos taken of flowers in the Schachen alpine garden during our time there.



Eryngium alpinum



Heuchera pulchella



Primula ioessa



Delphinium cashmerianum



Cotula socialis



Meconopsis x complexa



Cremanthodium arnicoides



Rhodiola rosea



Saussurea iodostegia



Gentiana lutea



Telekia speciosa



Arnica montana



Saxifraga paniculata



Papaver alpinum



Geum alatum



Saxifraga aizoides



Trollius yunnanensis



Primula optata



Podospermum roseum



Gentiana divarica



Cyananthus macrocalyx



Helichrysum albobrunneum



Primula reptans



Aquilegia pyrenaica with *Dianthus* sp.



Stellera chamaejasme



Leontopodium alpinum



Campanula raineri



Anticlea elegans

Cultural Landscape

The area is deservedly a designated cultural landscape, with protections. This means grazing is controlled, but an important part of the maintenance of the meadows. Attracting visitors' from far and wide to enjoy hiking, the extraordinary landscapes, and the biodiversity of the region.



Mountains



Kings house



Euphrasia agg.



Hydnellum peckii

Reintal Hike after work



Dactylorhiza sp.



Androsace lactea



Orobanche sp.



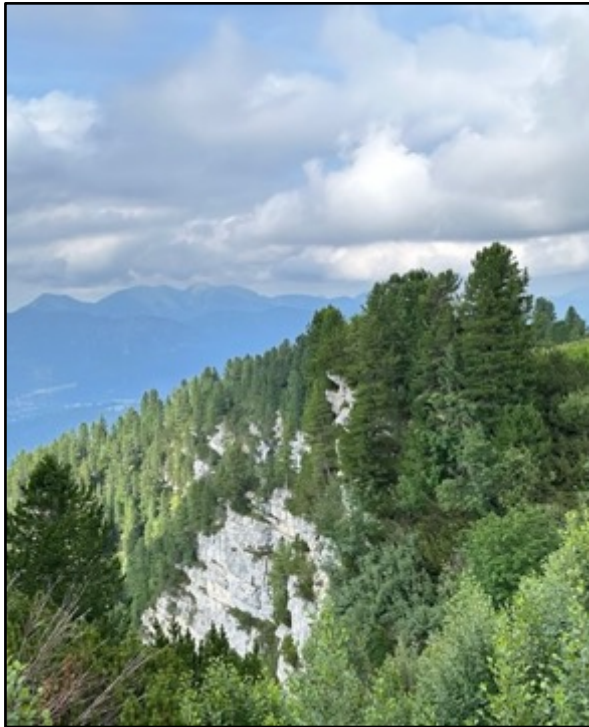
Pyrola and *Neottia*



Gentiana lutea



Aconitum vulparia



Views from the Reintal path

Saturday hike through the Schachentor



Scree path.



Campanula cochlearifolia.



Saxifraga caesia.



Parnassia palustris.

Snow and scree



Summer snow.



Ranunculus alpestris.



Primula minima.



Viola biflora.

Down to Wetterstein Alm



Phyteuma orbiculare.



Path erosion



Saxifraga aizoides.



Dryas octapetala



Gymnadenia sp.



Over the Schachentor



Gentianella germanica agg.



Moneses uniflora



Pinguicula alpina.



Melampyrum sylvaticum



Huperzia selago

Saturday hike to Meilerhutte



Cliff side path.



Gentiana bavarica.



Saxifraga aizoides.



Saxifraga caesia



Gymnadenia albida.



Silene acaulis.



Coeloglossum viride.



Gentiana bavarica



Nigritella nigra.



Mountain backdrop to meadows.



Rocky Outcrops.



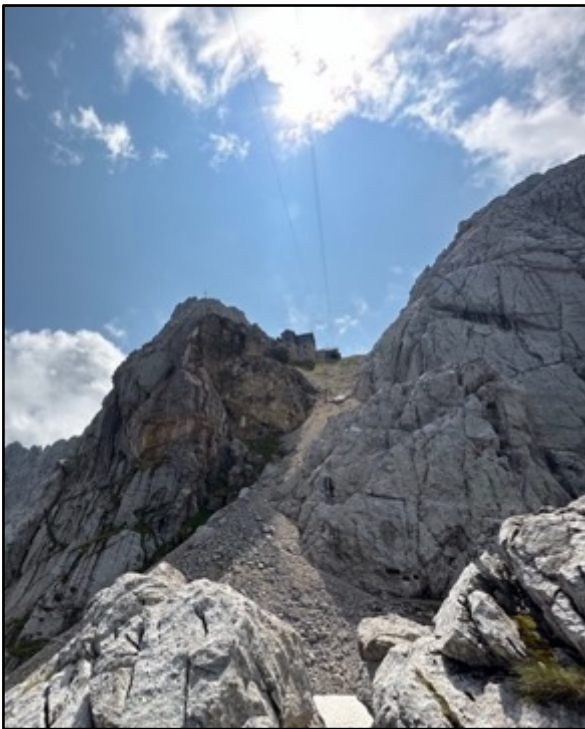
Gentiana bavarica



Huperzia selago.



Androsace chamaejasme



Meillerhutte 2800m.



Cerastium sp.



Silene acaulis.



Oreomecon alpina ssp. *Alpina*



Ranunculus alpestris

Saturday hike to Garmisch via the Kalbersteig



Path erosion.



Neottia ovata.



Gymnadenia conopsea.



Parnassia palustris.



Saxifraga aizoides.



Astrantia bavarica

Down through the woods



Hepatica nobilis.



Epipactis sp.



Epipactis sp.



Epipactis sp.

There are 3 Epipactis that are found in the area and will potentially hybridise, Epipactis atrorubens, E. helleborine, (E. muelleri) hybrid swarms.

Partnach gorge and thunderstorms



Partnach gorge.



Down through the forest.



The river that carved the gorge.



Salvia glutinosa.



A welcome rest near the end of the wet hike.

Hike to Ferchensee



Ferchensee



Paris quadrifolia.



Parnassia palustris.



Orobanche sp.



Rhinanthus sp.

Touring Munich Botaincs

We had the opportunity to visit Munich Botanics which extends to 52 acres before and after our time at the Schachen. We were kindly given a tour of the gardens by Jenny's husband Bert. 60-70% of the garden was closed by storm damage on the tour before the Schachen so we returned after the Schachen to allow time to see the rest.



Rose collection amongst systematic beds.



Carnivorous plant display near the entrance.



Sculptures around the garden.



Kohleria amabilis.

There are 11 greenhouses covering 4,500m² which are beautifully maintained and planted. The houses cover specific groups including Cacti, Fern, Cycad, Bromeliad, Araceli, Orchids etc.



Josh in the cooler house.



Cacti house.



Stanhopea confuse.
Orchid House



Stanhopea x empreei

2 of the beautiful and scented *Stanhopea* of the 2,700 sp in the orchid collection from 270 genera.



Stanhopea hernandezii.



Prosthechea fragrans



Water Lily house



Nymphaea – Hybride 'Albert Greenberg'



Nymphaea – Hybride 'Edward D. Uber'



Nymphaea – Hybride 'Foxfire'

Alpine House



Afternoon shading.



Kelsea uniflora.



Inside the alpine house.



Dionysia tapetodes.



Campanula fragilis.

The alpine house is viewed from the outside, with shading for the summer heat. This means in the summer afternoons the house is not currently visible to the public. Plans for a replacement display house that would allow greater automation and potential public access.



Dionysia aretioides.



Campanula pyramidalis.

The *Campanula pyramidalis* is a self-sown plant behind the scenes, but it is appreciated and therefore has been labelled to avoid it being weeded out.

Alpine Propagation House



Plantago nivalis.



Seedlings.



Cushions.



Primula verticillata



Cyclamen graecum

Rock Garden



View across rock garden.



Crevice trough.



View from top of rock garden across lake.



Schachen information board at Munich.



Sands and grits in bays with labels for different types.



Gentiana asclepiadea.



Orostachys spinosa



Campanula versicolor



Looking over the rock garden.



Platycodon grandiflorum.

Reflecting on this extraordinary trip, it was a privilege to gain an insight into the operations of an alpine garden at altitude. The challenges that are faced, access for materials, short season of work. The incredibly beautiful collection of plants that are thriving in the garden. Future threats of climate change, the importance of a high-altitude garden to maintain these incredible plants in cultivation, how they are already mitigating impacts through careful positioning of rocks and planting pockets. Seeing some of the incredible native flora in the landscape to inspire plantings and conditions that these plants will thrive in.

I wish to primarily thank the Merlin Trust for enabling this trip; RBGE for allowing me time to make this trip possible; Jenny Wainwright-Klein who was generous with her knowledge, guided our work and facilitated our accommodation; Josh Tranter for the team work and hiking companion; members of Munich Botanic staff for the warm welcome, notably Gaby who worked with us at the Schachen; the team at the Schachenhaus for providing us with our accommodation and strong coffee.

I hope to visit again soon.



The Merlin Trust

Grants for Young Horticulturists



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