

Gaultonia

Newsletter of the
Manchester Branch
of the
British Cactus and Succulent Society



Mammillaria duweii

Spring 2009

This Issue:

**The Wythenshawe Park Project
The Manchester University Project
What makes the Plants We Grow Different and Attractive?**



This is us - your new editors - Sylvia & John.

We're not the slightest bit prickly so do feel safe to approach us with anything you can write for the Newsletter, or any ideas of what you'd like to read in future issues.

We've started with lighthearted eye-witness accounts of the Manchester Branch's projects at Wythenshawe and Manchester University, plus a useful, more technical article on what makes succulents tick - but there is scope for much more. If you've been to a Symposium, open greenhouse event, plant sale, the cactus & succulent show, a talk at another branch, or anything else involving cacti and succulents, we would love to include your account of it, so that other members will know what to expect.

Other suggestions for pieces we'd like to see:

- 1. My favourite cactus/succulent - what you like about it and your experience of growing it: tips on cultivation: when it flowers: problems to look out for.**
- 2. What's going on in my greenhouse this month - your battles with what the weather throws at us: pests and diseases: making space: what's in flower.**
- 3. Cacti/succulents I met on holiday. We know there are Mammillarias in Manchester, but what about Gasterias in Great Yarmouth, Parodias in Paignton or Rebutias in Ramsgate? Tell us about any botanical gardens or plant displays you have seen on your travels - here or abroad.**

We can type up hand-written pieces if you hand them to us or post to: S & J Jones, 20 Pennine Way, Brierfield, Nelson, Lancs. BB9 5DT. If you can e-mail it to us (typed in Notepad or Word preferably) even better.

sjones@sjones41.freemove.co.uk

Photos are also very welcome - but make sure you have permission if they're from a private greenhouse or show other people. Digital is preferred but we can scan normal photos and convert to digital.

[The Wythenshawe Project](#) [I Left t'other half in America and went to work in Africa](#)

It's always been my idea of a dream job to work in one of those greenhouses in parks, and t'other half (John) likes to do something different, so we had no hesitation when Peter asked for volunteers to help with the Wythenshawe Park project (detailed in the last magazine). I was a bit worried that, as relatively new members, we wouldn't have enough experience and was told,

"Oh, as long as you can dig a hole and stick a plant in the right way up, you'll be fine. Wear some warm clothes that you don't mind getting mucky. Bring some gloves, a big spade, a packed lunch and anything else that might be useful."

So, on a cold dark morning in January we set off for Manchester with our bag of tools and sandwiches, wearing a few extra layers and a good dollop of industrial strength hand cream. An hour later (it was 52 miles) we had found Wythenshawe Park and the greenhouse complex was signposted near the car park.

Peter, John and Brian were already there, treating a bad case of mealy bug. It was warmer than expected as the new heaters were working - padlocked in cages for security although it beat me how someone could have made off with the last one when they were the size of a fridge.

Each of the beds in the large greenhouse was set out with plants of a particular continent. South America had been done previously (see last two photos) but America (Central) was lying empty, apart from landscaping rocks and the gravel laid out ready for us by the park staff. The first stage of the job was to remove the rocks and fork in the gravel ready for planting.

Pictures 1 & 2 - the Central American section (backdrop previously painted by ?) after digging over but before planting



On a previous visit, the others had already sorted out the plants they'd been able to salvage, and laid them out on benches in a neighbouring greenhouse, but it was sad to see the remains of magnificent specimens which hadn't made it.

We'd been given complete freedom by the park supervisor on the layout of the plants, but there were common sense considerations like placing taller plants at the back and ensuring that cacti with long spines were far enough from the walkways to avoid catching on the clothes of passers by.

Photos 3 & 4 - the Central American zone after we had finished



With such large plants to manoeuvre in a restricted space, it was thought that three people were enough so I left t'other half in America and went to work in Africa along with Peter (see pictures on page 5). Although much work had already been done here, some more succulent plants had been donated to fill the gaps and some tidying up was needed - of plants which had been knocked over or damaged..... and then there was the ongoing battle with the Oxalis weed which was coming up within spreading plants like Stapelia, where it could get established under cover before showing itself. Peter pulled up a barrow load of a spreading succulent which was in danger of taking over.

Photos 5-8 - Some of the cacti put in the American Zone (many Ferocacti with some Mammillaria, Coryphantha, Echinofossulocacti and the odd Opuntia)



We worked steadily and were surprised by how much had been done by the time we stopped for lunch at 12.45 - but with the aim of finishing before the light went, we had to press on. By 2.30 there were just a handful of small cacti to plant in America - so we all took a few and got it done. The landscaping rocks were put back and there was some clearing up of pots and unwanted plant material - but after a sweep of the walkways, it was finished.

Some of the young student gardeners trooped in to have a look and I heard one of them say,

"Oh, isn't that fantastic! I really love cacti," which was very gratifying.

Photos 9-10 - the South African Zone with Oxalis removed, and plants 'freshened up'



Photos 11-12 - the previously done South American Zone - with some large Cereus, Opuntias, Gymnocalyciums etc



Wythenshawe Park is open February to November and is free. Please have a look at it when you're next down there

The Manchester University Project

The Elf & Safety Officer came in to Read Us the Riot Act

Fortunately the snow had gone when, a month after the Wythenshawe trip, we were back to Manchester for the next project - repotting neglected plants at Manchester University's Botanical Experimental Grounds. This time we welcomed four new members to the team - Ken, Muhammad, Harry and (another) John - for a job which looked like a daunting prospect when we were taken to the show greenhouse - which is normally open to the public. Hundreds of plants (see photos 1 & 2) would have to be transported to the potting room (about 20 yards), repotted and then returned.

Photos 1 & 2 (about half the plants needing repotting, though the predominantly cacti on the right will be done next time)



Ken quickly organised us into a human chain to fill the trolley provided for transport, and the first of many lots were on their way. Brian had been making up a compost mix of John Innes no 3 + grit and was depositing shovelfuls of it at points along the bench so that we could all work at the same time. Meanwhile, Peter had found a wheelbarrow to put the spent soil and other debris in and the rest of us investigated the thousands (literally) of pots on shelves around the room and collected a supply of ones of suitable sizes. However there was a shortage of the useful shallow broad pans for the spreading plants.

When the plants arrived and we started knocking them out of the pots, we found they were so dry (supervisor Yvonne told us later that they'd been instructed to never water them!) that clouds of dust were being created, so rather than us all doing this at once, Peter and John depotted subsequent plants and did any necessary surgery before distributing them along the bench - with their labels - to the potters, and this worked better.

The effects of neglect made some interesting photos (3 & 4).

The pot bound aloe had put roots through the hole in the base. At some stage, someone had put a second pot over the root and the original plant and the roots had continued to grow. John had to break the pot to release it.

The *Haworthia cooperii* looks to be setting off to look for its own new home.

Photos 3 & 4 - the rather potbound aloe - and the *Haworthia cooperii*
(see text above)



We'd hardly got started when Yvonne - the centre supervisor - called us down to have coffee in the centre's classroom - what a treat - fresh coffee made with warm milk and lots of biscuits and Mars bars - but there was evidently an ulterior motive. Under University rules, the Elf & Safety Officer came in to read us the riot act - a list of don'ts including:

- a) don't climb ladders unless a member of staff is there to assist
- b) don't drown in the pond
- c) don't trip over the uneven paving
- d) don't pick up glass fragments from vandal attacks
- e) don't handle or ingest plants with corrosive sap such as Euphorbias

the last one caused some consternation as half the first trolley load were species of Euphorbia. Peter put in that we had all handled Euphorbias before and knew the risks so, after a dire warning about the after effects when a staff member had cut the top off one and was gunged with sap, we were allowed to continue.

One problem we noticed early on was that many plants had the wrong labels or had lost their labels, or the label had faded - so Harry was picked as the best person to go to the show greenhouse to check and relabel the repotted plants after they had been wheeled back by Ken who had taken on responsibility for transport.

Photos 5 - Sylvia, John & Brian await the first barrow load.

Photo 6 - Harry & John start the repotting after Brian has put soil on the work benches



It was back to potting for the rest of us but the job had its humorous moments. Overheard fragments:

"I thought the label said RIP '94 and wondered why we were repotting dead plants - and then I realised it said R/P and meant repotted in 1994".

(NB. - In fact we saw no plants that had been repotted since 1994)

"This plant's looking puzzled - I think it was potted in concrete originally and now its wondering what this funny brown stuff I've just put around its roots is."

The shortage of shallow pots reached crisis point and Brian ventured into the cellar where he met a hazzard not on the Elf & Safety list - something small and fast moving with a long tail. It was probably more frightened of someone saying "Stick it in a pot and see how it does" than we were of it, but everyone suddenly had enough pots.



By 12.30 we were all ready for our sandwiches and another hot drink, and Yvonne kept us entertained with the history of the centre and the sort of work that went on there. Out of the window we could see hives for bee keeping and a good variety of birds and there were photographs of wildlife conservation projects on the walls.

When Ken announced that the latest trolley held the last of the succulents, Peter took the decision that it would be best to stop there and do the cacti on another visit, as there was no way we could do them all *and* tidy up before the centre closed. John helped Ken back with the final lot of repotted plants and estimated we had done over 400 succulents. Muhammad set to work with a brush to sweep up; the barrow of debris was taken for recomposting; pots were tidied away and Peter gave Yvonne advice on the watering and care of the repotted succulents.

We were finished (and probably looked it) when Yvonne lined us up for a photo to add to their 'rogues gallery' of projects - but there was another coffee waiting and the rest of the biscuits...

Photo 8 - the (much happier) plants after repotting

**Photo 9 - a very happy Opuntia (and we hadn't even repotted him yet)
[not decorated by us!]**



Photo 10 - the Dream Team - Ken, Peter, Sylvia, John (kneeling), John, Harry, John, Brian and Muhammad



WHAT MAKES THE PLANTS WE GROW DIFFERENT AND ATTRACTIVE?

By Peter Bint

It would seem that the succulent flora of the world represents between three and four percent of the whole known range of species on this earth. They also represent around twelve percent of all recognised families amongst the earth's flora. Cacti and succulents either appeal or cause distaste, even abhorrence amongst the planet's inhabitants. To those of us who grow them there are many qualities which attract us: statuesque nature, tolerance to drought, endless variations of pattern and adornment, texture and colour, strange and captivating caudices, beautiful, though short lasting, flowers and mimicry to name but a few of these qualities.

We are drawn to the greenhouse, conservatory or even windowsill after a wearying day at the treadmill of work. Such is the appeal and soothing nature of these splendid plants that we can immerse ourselves in the pleasure they provide and the stresses of modern life vanish as though they are of no importance. I can certainly state that my plants presented a blessed relief from the stress of the classroom once I reached home. The cares melted away as the charm of the plants worked their soothing balm into my weary system. I can also imagine the awe and wonder felt by those early travellers as they came upon the magnificent giants for the first time as they stood solemnly to attention, guarding the graceful landscape in which they were growing. Exquisite *Espositoas*, charismatic *Carnegias*, impressive *Idrias*, statuesque half-men, *Pachypodium namaquensis* are just a tiny handful of such marvellous plants that somebody saw for the first time in their lives during their travels. Then, of course, there are the small gems that require careful searching as they lay hidden or camouflaged in their stony, sandy or scrub laden habitat, plants such as *Mesemb* gems like *Lithops* and *Conophytum*, tiny *Rebutias* on cliff walls, miniscule *Mammillarias* protected from the scorching sun by grass and scrub, minute *Thelocephalas* pulled down by contractile root stock until they lay below soil level.

Though cacti and succulents have only been documented since the early 17th century people like Cortez and Columbus must have seen them during their journeys of conquest and discovery well before these written recordings. One of the early properties noted by eager plant hunters was the fleshy nature of stem and leaf and the ability of uprooted plants to remain plump long after being removed from the ground. Most plants collected from 'new' lands would shrivel up and die very quickly after being pulled from the soil, but not the succulent plants brought out of the Americas and Africa.

We know our plants have evolved so that stems and leaves hold water, "plants with middle-age spread", as one revered botanist once described them. It is no use having a store for water if there is no door to prevent that water from escaping. Succulent tissue is highly distinctive when viewed from inside the plant. There are large, thin walled cells and significant air spaces reminding one of a sponge. The sap within these large, watery cells is slimy and bitter, far from the mythical tales of being able to cut open large, barrel cacti and collect the cool, flowing water to slake one's thirst. In fact the internal fluids are not cool at all. Rather the inside temperature of a cactus is actually many degrees warmer than the air outside. It is the plants' ability to endure temperatures 15 to 20 degrees Celsius above those that would damage, often fatally, other plants that make them such suitable and enduring specimens to grow in arid conditions. The storage cells also have another interesting and necessary ability. They can collapse gracefully and gently after prolonged drought or water loss and expand again without bursting when water becomes available. We are responsible for this special expansion ability failing in plants grown in glasshouse conditions when we supply too much water too quickly after a prolonged period of water starvation. The result is unsightly splits in the epidermis of the plant. Nature is much gentler and never allows such distress to befall a plant.

As far back in history as the Romans it had been discovered that fleshy herbs, such as the stone-crop, *Sedum acre*, had a more bitter taste in the morning than it did in the evening. This was unusual in plants with most showing the reverse. This knowledge led to the eventual discovery that succulents differ fundamentally from other plants in certain of their life processes, notably building up acid during the night and releasing them over the day, all as part of the process known as *photosynthesis*. All plants manufacture food from air, water and salts in solution in the presence of light and chlorophyll. This process, photosynthesis, takes place in the green surface tissues of leaves and stems during the hours of daylight in most plants, the mesophytes of the world. The chlorophyll is contained in lens shaped bodies scattered throughout the cell sap. Water and salt enter the plants through the root system and air makes its entry via special valves or pores, called stomata, found on the leaf or stem surface. These stomata are rather like automatic doors at the entrance to large buildings, controlling the flow of air by opening and closing as the plants demands. The nitrogen and oxygen present in the air are of no value to plants in gas form but the carbon dioxide is essential and the plant is fully receptive to its presence in the air. Though only present in tiny amounts the plants extracts and uses the carbon dioxide. Explained simply a mesophyte has a daily cycle where the stomata are open by day and remain firmly closed at night. The effect of sunlight on the combination of water and carbon dioxide is to form a carbohydrate, sugar. As a by-product the plant also forms oxygen. This is released back into the air via the stomata. Thus, during the day there is a constant two way flow of air in and out. Added to the outward flow of air is moisture, which is fine so long as more water is present to be absorbed by the roots. Once this supply dries up so does the plant. By night no sunlight means no photosynthesis so the stomata remain closed.

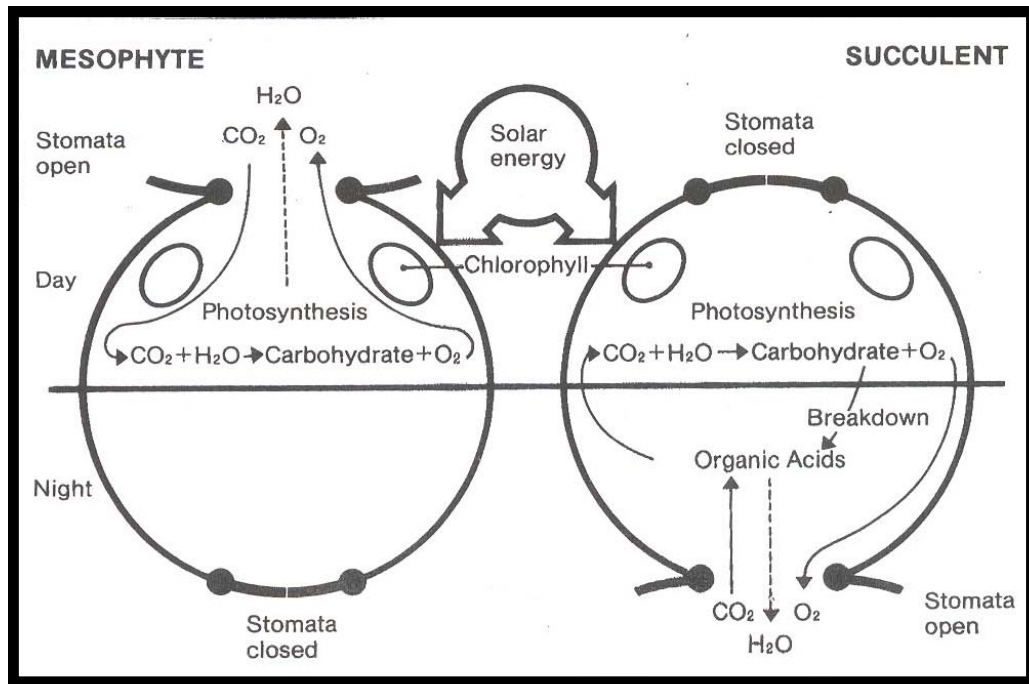
A second vital process is *respiration* without which a plant would die. This reverses the photosynthesis where the sugar formed is broken down again. Part of the sugar produced provides water and carbon dioxide for the plant to use as essential energy for growth. The oxygen produced in this process is used up as in burning of fuel. During the day respiration is masked by photosynthesis but it carries on unabated during the night as it does not require sunlight to effect the process.

A third vital process is *transpiration*. This is the loss of water through the stomata (alluded to earlier) which happens continually during the process of photosynthesis. While a plant has a ready supply of water transpiration is easily accomplished but in the case of water shortage plant fatality is swift.

Having explained all that, we find that succulent plants, the xerophytes of the floral world, whilst carrying out photosynthesis, respiration and transpiration, do not conform to the plan that has just been laid out. They still have a daily cycle but they have evolved to be far more efficient users of water. Transpiration has been reduced dramatically by keeping the stomata closed during daylight hours and only allowing the process to happen under cover of darkness. The number of stomata are also radically reduced and they occur where they are well shaded such as on the underside of leaves, deep into the V of the ribs, overlaid by hairs, spines or other surface appendages or in deep pits on the stem and leaf surface. The intake of air occurs in the absence of sunlight, in the dark that is, so photosynthesis cannot happen at that point. Consequently the carbon dioxide has to be fixed by organic acids present in the plants so that it can be stored for use till the sun rises. As it is cooler in the night much less water is lost by the plant which is a major cause of and reason for succulence.

This altered daily cycle was finally discovered (and put into print) in 1834 in a member of the Crassulaceae family so it bears the name of Crassulacean Acid Metabolism or CAM for short. This process is found in all succulents.

A diagram of the difference in processes is on the next page.



We know that all cacti are succulents but not all succulents are cacti. Cacti are 99.9999% confined to the New World – the Americas – though they have naturalised in many places around the globe where they have found favourable conditions following transportation by early explorers. Succulents (the other succulents that are not cacti) are found somewhere on all the continents (except the Polar Regions). Succulent plants are highly diverse ranging in size from tiny annual weeds to towering trees. They occupy a vast range of habitats. Some species require more heat than others; some prefer partial shade and some are extremely sensitive to overwatering whilst others tolerate plenty of water. Growing seasons vary according to local conditions, to when rain is available, to whether they live north or south of the equator or according to height above sea level. This is something we learn to cope with as we get to know more about the plants through reading, help and guidance from others or learning by experience if we wish to be successful.

.....part II in next edition

North West Cactus Mart

Saturday 4th April 2009

Woolston Leisure Centre

Warrington WA1 4PN

10.00am till 3.00pm

Admission £1.50

Full list of sellers to follow

All enquiries: philip@barker3832.freemove.co.uk