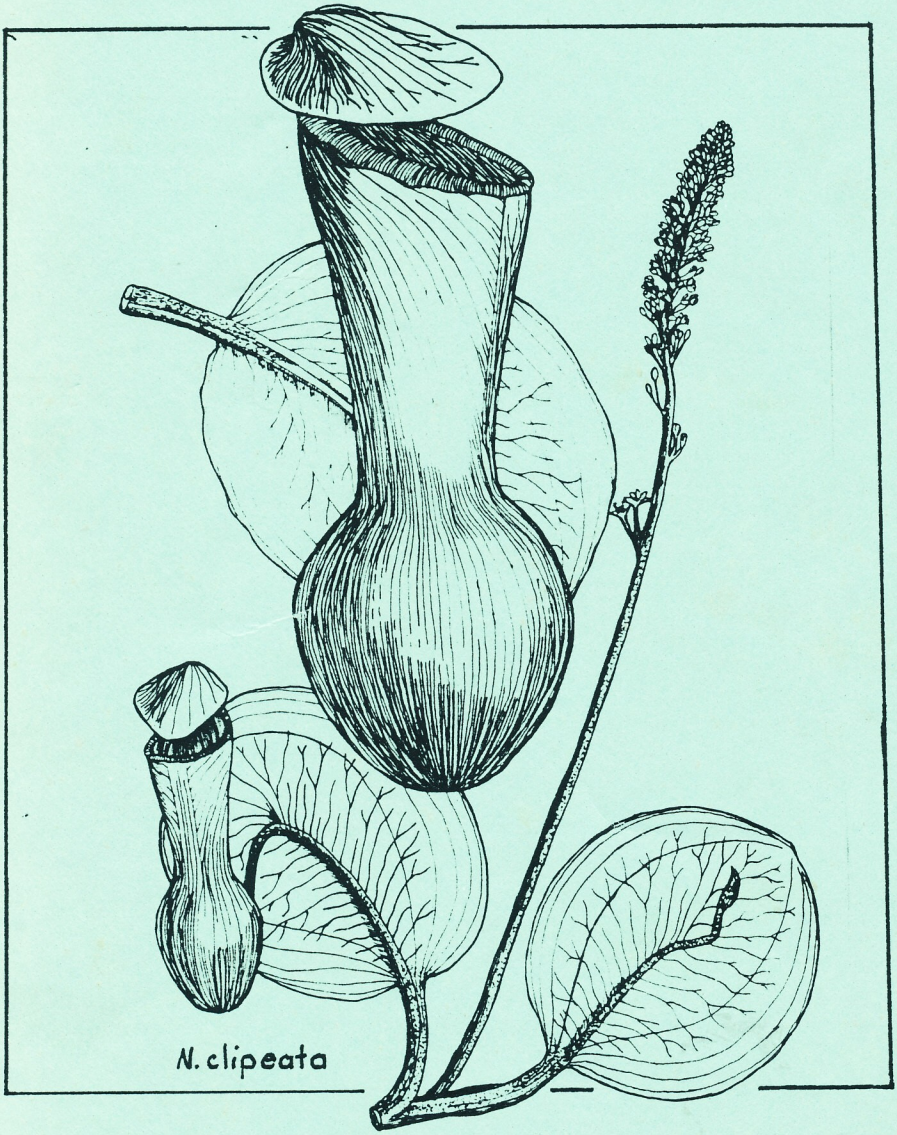
FLYTRAP NEWS

Volume 3, Issue No. 3

JANUARY / FEBRUARY / MARCH

1988



The official newspaper of the
Carnivorous Plant Society of N.S.W.

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Please advise the Secretary of change of your address/phone number etc. for records A.S.A.P. If you have a query or complaint re the Society please also advise the Secretary by phone or writing.

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SEED BANK NEWS

If you wish to purchase seed at the meetings please let Richard Riles know before the meeting date by telephoning (02) 639.8230 (after or before school hours). Seed packets cost $1.00. Put your name, address, list of seeds, payment **and a self adressed, stamped envelope** into an envelope and post to:

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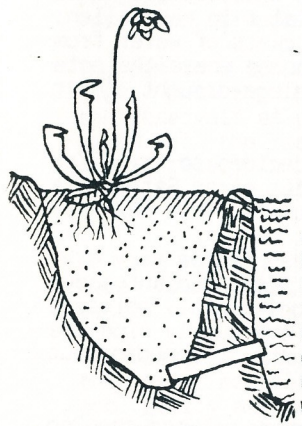
THE MOVE TO MULGOA

by Robert Gibson

In mid-1986 we put our suburban house on the market with the hope of moving to 5 acres in the rural area south of Penrith.

With this in mind I began to envisage a typical farmhouse on a piece of undulating land with a creek flowing through it. With clay soil I began to plan an outdoor bog full of carnivorous plants.



First, I reasoned, I would need to dig out a medium sized dam, just the right size to ensure permanent water. The bog would be situated near the lake edge but in order to stop all the peat washing away a small clay bank, to water level, would be needed, the water for the bog then being supplied by pipes through the clay bank. I considered that a depth of 3 foot of mix would be appropriate as it would not dry out. The mix being of peat moss, sand and clay which would support Sarracenia, Dionea, suitable Drosera, terrestrial Utricularia and Pinguicula. With aquatic bladderworts in the dam itself amongst the waterlilies. However as things worked out we have ended up with 35 acres on Hawkesbury sandstone on the eastern side of the Nepean Gorge at Mulgoa. More than half the property is uncleared bush and we back onto the Blue Mountains National Park.

We moved during May 1987. During the process of moving my collection I was amazed at just how big it really was. I had grown so used to seeing all my plants in a small, multiple shelved greenhouse, so when it came time to empty the greenhouse the collection needed more room than expected when everything was placed on one level. Needless to say we needed to make several trips to transport all my carnivorous plants.

The property had a small shadehouse but I decided not to use it at first, prefering to put most of the plants outside to toughen them up. Also most of them were Sarracenias which were already dormant so they didn't require much water until early spring. I had not given up hope of setting up a bog garden. The property had 3 dams but the soil instead of being clay based was sand based. The area around the dams was unsuitable for the bog garden and I was surprised to see how much the water level changed.

On my initial walks around the property I was disappointed in not finding any CPs. I knew Drosera spathulata occurred only 7km away on a creek bank, yet it did not occur along our 2 intermittent creeks. Before the month was out I discovered a clump of D. auriculata emerging from dormancy. I was delighted! It was only a small clump and I had a suspicion there may be more. During June I found the species to be quite abundant on the property, however I had not seen any D.peltata which annoyed me. Further walks paid off - I found D. peltata to be much less abundant than D. auriculata.

Most of the colonies of D. auriculata occurred under the canopy of a native tea-tree (Leptospermum attenuatum), which both favour free-draining sandy loam. Plants also occurred in shallow, moss/sand/ soils on rock shelfs, where a blue, August flowering, Calendela sp orchid was also found.

As spring approached my collection stirred into growth and needed more water. With each bout of warm weather the pots dried out and the plants wilted. Initially I revived them by hosing, but this was not a popular move as we have to survive on tank water only!! Next I revived the plants by taking a wheel barrow full of pots at a time and keeping them in the dam until they sank. This required a lot of labour so I decided to move the plants into the shade of the greenhouse, this reduced water loss but still the plants wilted when no substantial rain had fallen. So I reversed the pattern of transport and took buckets of water from the dam and wheel-barrowed them over to the greenhouse where the pots were immersed. The weather pattern of drought-deluge-drought didn't help much.

With a more efficient method of watering I decided to try a few experimental plantings. The first one being a medium sized Sarracenia leucophylla amongst a small colony of Drosera auriculata. This was very

successful at first, but with summer the soil has become very dry. Recently I put in a garden spike just behind the pitcher plant above which sits a plastic bottle full of water. The supplementary moisture should encourage the pitcher plant to grow and eventually hide the bottle. However I am not sure of the effect upon the surrounding but dormant D.auriculata.

A more successful planting has been beside the creek between the 2nd and 3rd dams. Here the soil is always moist, the creek flowing for long periods after rain due to seepage from the dams higher up. The soil is a rich loam not really suitable for CPs. Although it has been able to support Sarracenia purpurea ssp venosa, S.leucophylla x willasii, Drosera capensis and Utricularia tricolour thus far without set back. A recent addition of Drosera spathulata is doing well, as expected, and hopefully, given time, will spread along the creek bank.

Daryl and Cecily called around in regards to the Penrith Show and I told them about the problems in maintaining water for the plants and they suggested growing the plants in polystyrene boxes floating on the dams. I had seen this method in Victoria (at Gordon Cheer's nursery). The foam boxes on the water's surface did not look asthetically pleasing, but the plants were growing well so I decided to give it a go.

Daryl supplied the foam boxes, which I then put on the 3rd and lowest dam. Initially I tried 3 boxes which were simply set floating around on the dam with the peat moss in contact with the water. I also tried a few aquatic Utricularia.

The plants did well until a deluge showed me how vulnerable the loose foam boxes were. Fortunately none of the boxes overturned and the highly porous nature of the present dam wall ensured none of the boxes could escape downstream! However I lost most of the aquatic bladderwort.

I added more boxes and secured them together along a length of cord which was secured between 2 trees on opposite sides of the dam. Initially the boxes were arranged on just one side of the cord but this proved to be inefficient. The boxes have now been rearranged and placed alternately on either side of the cord.

There are now 9 foam boxes on the dam, full of thriving plants. The system certainly works well and saves on labour. The water level is kept constant for the plants which helps. They receive bright light for most of the day and are hardened up by the elements. However they are still prone to caterpillars, aphids and mealy bug. Scale and thrip are also present due to inadequately checking and controlling them in effected pots. With this system I have been able to grow D.filiformis var. tracyii successfully for the first time!!

The dam in which the tray system is situated had been washed out in the past, and the hole "mended" by miscellaneous but porous material, so the reservoir at present is only 1/3 of the dam's capacity. The maximum depth of the reservoir is just over 1 metre and can dry out. Also the small reservoir has a small surface area which can only fit 9 foam boxes in a row with maximum capacity.

We are slowly fixing up the dam and when done should allow for many more foam boxes and aquatic Utricularia in the permanent and deeper water.

The larger reservoir should extend back further and reach up towards the experimental planting beside the creek (mentioned earlier). Daryl and Cecily are going to help me shortly in making this planting into a proper bog garden. (now finished - article later issue). Also I have grand plans to maximise the size and capacity of seepage which would result. I'll let you know how both projects go.

CARNIVOROUS PLANTS OF THE BLUE MOUNTAINS

by Robert Gibson

To the west of Sydney lies a low, gently sloping plateau called the Blue Mountains. This plateau rises to 1100 metres in the west and has been greatly reduced in volume by river action. There being two lines of settlement running along either side of the box-canyon of the Grose River.

Geologically the Blue Mountains are part of a large unit called the Sydney Basin, forming part of the western boundary of this unit. It also forms the western edge of the Cumberland Plain, upon which the city of Sydney is located, rising dramatically from 15-30 metres to 100-500 metres. The escarpment being a result of several faults and a single fold called the Lapstone Monocline. The plateau is predominantly jointed sandstone (Hawkesbury and Narabeen groups) which lie upon a layer of softer shale and coal. Upon the sandstone are residuals of Wianamatta shale as well as outcrops of Tertiary basalt. The shale and coal are the weakest rocks in the Blue Mountains and subsequently are eroded most readily. This leaves the harder sandstone without support and leads to failure along the vertical joints, forming the spectacular cliffs for which the Blue Mountains are reknowned.

The sandstone is ideal for the eight species of canivorous plants which inhabit the area. The porous nature of the rock leads to poor, well drained soils on the upper portions as well as soaks and springs at the base of the cliffs. There are seven main types of environment in which the 5 Drosera species and 3 Utricularia species are found and these will be discussed shortly.

Climate is the other main factor in the Blue Mountains in terms of flora. Elevation modifies the climate to some degree so that the Blue Mountains can be split into two areas namely the Upper and Lower Blue Mountains, the cut off being around 600 metres. Rainfall increases and temperature decreases with height due to air masses being deflected up and over the plateau. Average precipitation over the entire plateau exceeds 1000mm with some of this falling as snow on the highest parts of the plateau [>1000 metres generally]. Temperatures average at least 3-5^{o}C lower than the coast. The incidence of frost increases with altitude.

CARNIVOROUS PLANT ENVIRONMENTS:

CREEK BANKS: There are many small streams on top of the plateau flowing only short distances before encountering the escarpment and forming magnificent waterfalls, especially in the Upper Blue Mountains. The creeks usually flow directly over the sandstone or upon derived sand. The creek banks are always moist with a variety of soil dependent upon altitude and stream size.

The larger creeks, found in the Lower Blue Mountains, are shaded by tall trees which grow in rich soil, yet here Drosera spatulata in particular, with D. binata and the occassional D. auriculata are found. The rosettes of D. spatulata often being green due to shading are found immediately next to the creek. Sometimes growing near- perpendicular as well as in shallow moss-derived soil on sandstone blocks and in moist flat areas where the creek bed widens.

LOAM SOILS: In the shallow, infertile, well-drained soil of the plateau top are found two Drosera, D. peltata and D. auriculata, both of which grow amazingly well in this environment, competing for space with tree roots and often growing in dappled shade.

SOAKS: These are small, scarce environments found principally in the Upper Blue Mountains where Narabeen Sandstone has interbedded layers of impervious shale. The porous sandstone above the shale takes in water which percolates downwards until it reaches the impervious shale. The water flows slowly through the sandstone immediately above the shale, emerging at the lowest point of the shale. The size of the catchment determines the duration of flow of the soak into dry weather. The soak I am most familiar with is at Blackheath in the Upper Blue Mountains. It has a large catchment area and flows all year round. The soak itself is only 1m x 2m and is found on a hillslope on top of the plateau. The soak supports D. spatulata, D. peltata and Utricularia dichotomawith Drosera spatulata surviving in the shallow sandy soil below and fed from the soak. The plants are extremely hardy in that this area experiences severe frost and at least one snow fall each winter.

CLIFF BASE: The base of the cliffs corresponds closely with the boundary of the porous sandstone upon the weak but impermeable shale and coal. Here water which has percolated down from the plateau top re-emerges, especially above horizontal shale bands within the sandstone unit. The water drips down to the very bottom of the cliff where it either joins creeks or soaks into the scree slopes.

Here exist ideal conditions for most of the Blue Mountains CPs where D. spatulata, D. binata, D. auriculata, Utricularia dichotoma and U. lateriflora are found. Drosera binata only grows in permanently wet areas, often growing upon verticle sandstone. D. spatulata often grows in very shallow soils derived predominantly by short mosses, sometimes with Utricularia lateriflora, on bare rock.

In many cases the seepage from the cliff base is enough to form a short creek which is able to maintain its identity up to 10 metres from the cliff before disappearing into the scree. These creeks provide ideal conditions for CPs especially in there upper reaches where Drosera binata and D. spatulata proliferate. Thus marginally increasing their range away from the cliffs.

HANGING SWAMPS: These are ideal for CPs and are variable in size. They occur predominantly in the Upper Blue Mountains at the head of many creeks. They form by the accumulation of organic material, upon the sandstone, in wet areas, generally fed by springs and soaks. They are of great importance to the area in that they regulate the water supply of most of the creeks.

The best and largest hanging swamp I have seen occurs at the base of Mt. Hay, a basalt capped mountain in the Upper Blue Mountains. The swamp is approximately 600 meters long by 100 meters wide. The surface is undulating and supporting many knife-edged sedges and grasses. Water flows over the surface of the peaty soil in all but the centre of the bog where it flows through the soil. Around the edge of the main swamp are soaks which support the same vegetation, with water either percolating into the sandy soil between the swamps or flowing over sandstone.

With flat, peaty soil with various moisture levels, the hanging swamps are able to support all CP species except the aquatic Utricularia exoleta. The wetter areas support U. dichotoma and Drosera binata with Utricularia lateriflora, Drosera peltata, D. auriculata and D. pygmaea found in the drier areas, with D. spatulata found throughout.

HILLSIDE BOGS: occur throughout the Upper Blue Mountains and form noticeable grassy areas amongst the trees. Here soils are shallow but moist, presumably formed by water emerging above a shale layer. They support D. spatulata with D. auriculata and/or D. peltata.

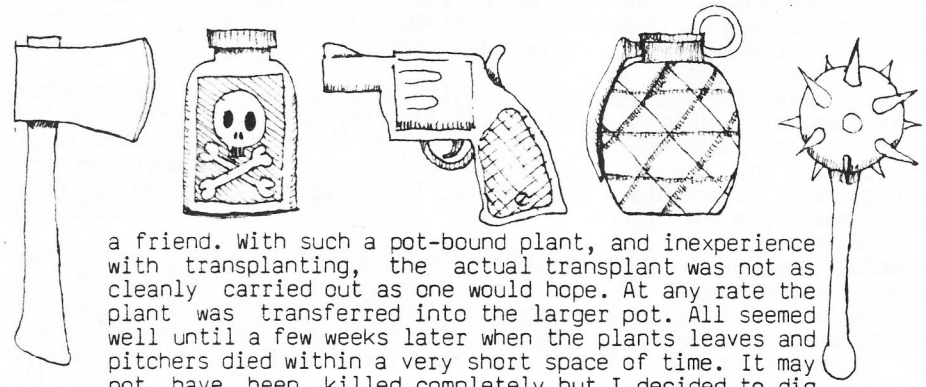
OPEN WATER: There is very little of this in the Blue Mountains and of what there is almost all of the lakes have been man-made and the main river, the Nepean River, has been greatly altered by man. However it is this environment in which we find U. exoleta, an aquatic bladderwort. Its declining range in the Nepean River may be compensated for by the formation of Lake Burragorang, the largest reservoir supplying Sydney with water.

HOW TO KILL CEPHALOTUS FOLLICULARIS

by Robert Gibson

Regrettably this is a very easy thing to do! I have unintentionally killed at least 3 potfuls during the past 6 years. Each time I thought I had learnt from past experience only to have the plant/s die for some new reason.

My first plant was in a small pot, which it was to outgrow. I obtained a larger pot and was given some peat-derived "carnivorous plant mix" by



a friend. With such a pot-bound plant, and inexperience with transplanting, the actual transplant was not as cleanly carried out as one would hope. At any rate the plant was transferred into the larger pot. All seemed well until a few weeks later when the plants leaves and pitchers died within a very short space of time. It may not have been killed completely but I decided to dig about in the pot and check the roots. **This led to its death.**

Next I obtained a small but multi-crowned plant in a 8cm pot. This, I decided, was to be left in its pot. However I made the mistake of keeping it at the base of a north-facing wall (amongst my other plants) with minimal protection. The combination of heat and full sunlight damaged the plant a lot. It was compounded by the fact that the pot was kept in a shallow saucer which was not always filled up each day. Under such conditions the mixture dried out completely, thus killing an already stressed plant.

Most recently I bought a superb plant in a large 15cm pot. This one, I decided, I was going to keep. I bought it in Melbourne from Gordon Cheers, where all his Cephalotus are from tissue-culture and are not kept in permanent water.

The pot was large and with the right mixture so it would not dry out

(at least not in a hurry). However, the plant was such a vigorous grower it had outgrown its pot and needed transplanting. Prior to transplanting I kept the plant in my room which has a window with a north-west aspect. The plant was kept on a stand which got some light in the late morning, filtered through a venetian blind. The plant was very green and wasn't doing very much with itself.

The transplant, this time, was successful!!! There was minimum disturbance to the roots and the mixture was pure peat moss. The plant was moved to the shadehouse in an attempt to encourage well formed

leaves and pitchers which at the time were starting to be produced.

All was going well until after one deluge in late spring the plant became infected with powdery mildew. I kept an eye on it, and hoped that with the return of fine hot weather the fungus would find conditions unsuitable and die off ... however it persisted and was slowly spreading. I took action when some Benlate had been obtained, however it seems my action **killed the plant!**

I applied the Benlate by means of immersing the entire pot and plant in a bucket containing a diluted mixture of the fungicide, leaving it for some 20 minutes; reasoning that there would be spores in the peat and it would take time for the fungicide to work its way through the pot (I would have used a spray gun but they were broken - we all know what fun toys they can be ... don't we).

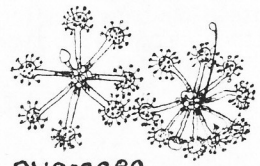
All looked fine for 3 weeks after treatment until one hot afternoon the plant's leaves began to wilt even though the soil was still wet. I moved it into a more shady, protected area but still the leaves wilted. At first the top leaves were affected, but this changed, and within a week **the plant was dead!!**

The roots remained white after the foliage died for a little while, but they turned black in the end.

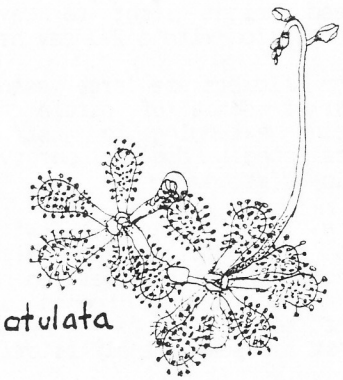
Now all I have left to represent the genus is a 1 year old leaf cutting which is producing small leaves and pitchers.

I have been given conflicting advice on how to grow them, particularly in regards to how wet to keep the soil. Gordon Cheers states that they should never be watered by the tray system, yet this is how Ian English and a great many other growers have them, and obtain fantastic results. Perhaps this is more a function of latitude.

The species seems very temperamental but are easy to grow under the "RIGHT" circumstances. However I have not been able to maintain those conditions for long enough to grow the nice clump of Cephalotus which is an asset to the CP collection.



D. pygmaea



D. spatulata

DROSERA HAMILTONII

by Robert Gibson

This is a delightful rosetted sundew from south-western Western Australia. It is a rare plant in nature, having a similar range with Cephalotus follicularis, with which it is sometimes found.

The species is evergreen, producing distinctive round to blunt end leaves which merge imperceptably into the leaf base. Mature rosettes average 3-4 cm. in diameter, although I have seen them up to 7cm. across. It is one of my most favourite sundews. The fully bedewed rosettes by themselves look superb.

Each plant produces a sparse root system consisting of a few long, occasionally branching roots. However they are thick and probably are a food reserve, being of the Drosera binata, D.capensis etc. type.

Short stems are slowly built up by each plant. In time the growing points are 2-3 cm. above the ground. From my experience they seldom go higher as the growing point usually dies after a few years for no obvious reason, but is replaced by new growing points emerging from the lower parts of the stem and the roots.

Sometimes the leaves don't develop properly, being no more than an

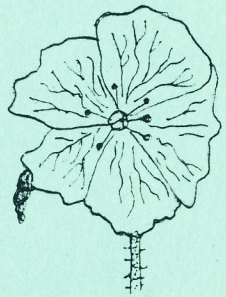
extended leaf base. This is often due to unfavourable weather conditions, especially fierce sun, and/or may be the first indication of the imminent death of the growing point.

In late August - early September, the scape develops on mature plants, initially it emerges as a flat, hairy green projection, which upon first glance looked to be a caterpillar! It grows slowly and it is not until the end of October that the first flower opens. They reach a height of between 40 and 60 cm. tall and carry up to 20 flowers. It is covered in non-glandular hairs along its entire length, the lowest 5 cm. having red hairs which are twice the length of the upper ones.

As with the majority of Drosera species the flowers last one day, they need bright light to develop fully, and once granted they open in succession with a 2-3 day break between adjacent flowers.

The flowers are large measuring up to 3 cm. across. The petals being a darker shade of purple than D.capensis and with a network of darker veins extending to just before the edge of each petal, which is scalloped. From my observations the flowers opened around 9 a.m. and closed around 3 p.m.

The light green ovary, with its purple central, feather-topped style, is surrounded by five white filaments which produced yellow pollen at each point. The flowers do not self-pollinate and even crossing between the flowers which opened together towards the top of the scape did not set seed. Perhaps this is just as well for I found out the hard way that the scape itself is brittle!



This species is very easy to grow in cultivation, happy in most CP soil types and given some light shading they produce beautifully bedewed rosettes.

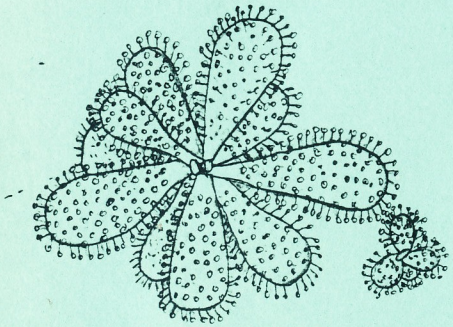
To induce flowering it has been said that the plants need to be exposed to cool, but not freezing conditions in winter, with which I am in agreement. However even if you manage to have plants in which scapes develop they may die before the first flower opens.

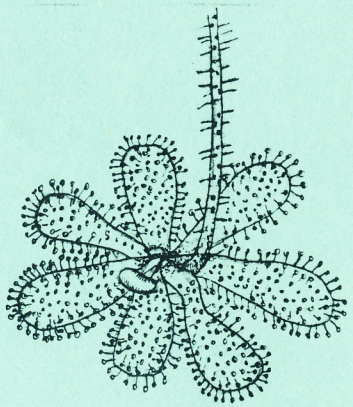
Propagation is best done by root cuttings which generally work year round. Healthy lengths of root, around 2-3 cms long, placed just beneath the soil surface produce rosettes in 1 to 2 months.

Leaf cuttings work but are not as reliable as root cuttings, and plants take longer to reach maturity. I remember one particular leaf cutting two years ago which, when placed glandular side up, produced a single plantlet on the underside of the leaf however it did not survive when placed "right side" up!

Single plants, and I suspect single clones of D.hamiltonii, are unable to set seed. So in order to produce seed you need at least two separate clones flowering simultaneously, one reason to grow the plan en-mass!!, although from seed it would take many years to produce a large sized plant.

All in all this species is easy to grow in cultivation and is very beautiful; I recommend that every collection should have at least one!






N. fusca (male).