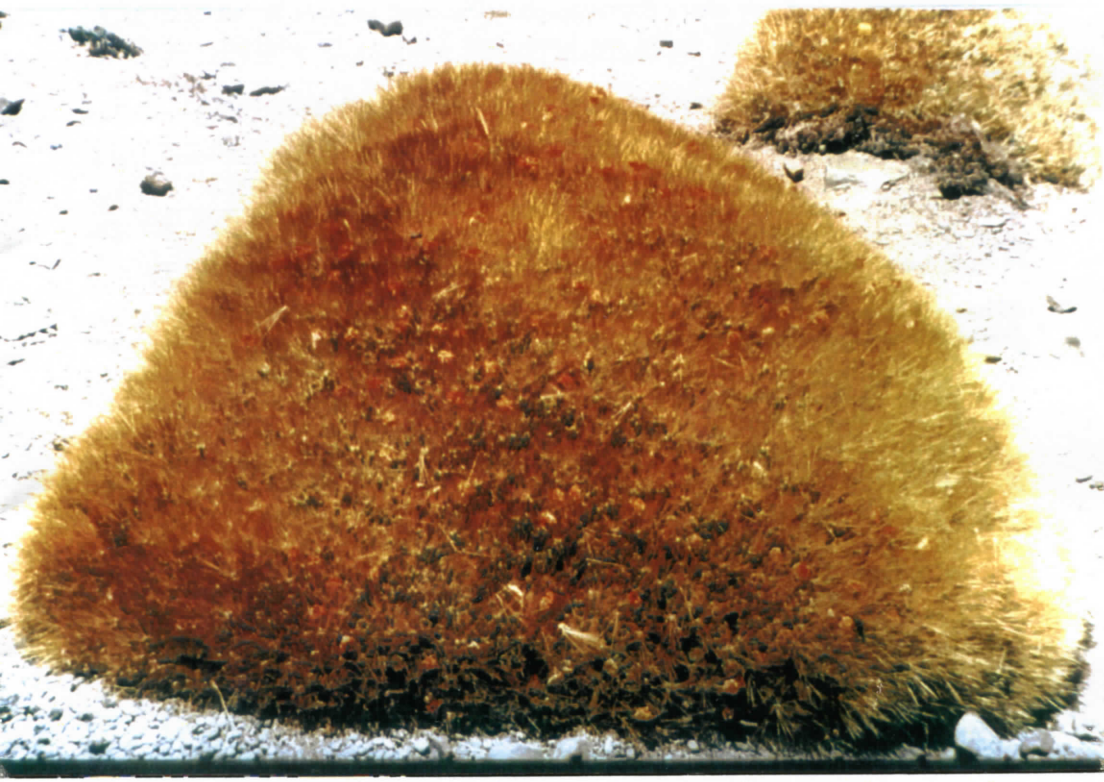
TEPHROCACTUS

Incl. Maihueniopsis, Cumulopuntia and all related genera



O. ignescens (boliviana).
Above 4,000m near San Vicente, Bolivia.
Photograph by T. Marshall.

STUDY GROUP

Vol.8 No.1 March 2002

Secretary's Page

This year our Journal is in its eighth year and it gives me great pleasure to welcome eight new members to our fold! They are: Fernando Gallina from Italy, Mario Kassat from Germany, and Fernando Barcenas, Denis Herbert, Darren Warboys, Michael Ashworth, Peter Arthurs, Barry Crease from the U.K. I bid them a hearty welcome and hope they will soon take part in our activities.

●All articles and comment should be send to the Co-Editors:
●Subscriptions and any other correspondence should be sent to the Secretary. May I remind you please to let me know any changes to address, telephone number and E-mail address.
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The Officers of the TSG:

Chairman and Editor:
Alan Hill, 8, Vicarage Road, Grenoside, Sheffield S35 8RG ☎0114 2462311
e-mail: alan.hill6@virgin.net

Co-Editor:
William (Bill) Jackson, 60, Hardwick Road, Sutton Coldfield,
West Midlands, B74 3DL ☎ 0121 353 5462

Secretary:
René Geissler, "Winsford", Kingston Road, Slimbridge, Glos. GL2 7BW ☎ 01453 890340
e-mail: w.geissler@virgin.net

Representative for France: M. Dawn Nelson, "Passe Renard", Averon-Bergelle, 32290 Aignan

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OPUNTIA/TEPHROCATUS/CUMULOPUNTIA IGNESCENS

In 1913 Vaupel published the name of *O. ignescens* giving the Type locality as South Peru, Dept Arequipa, near Sumbay, by the Arequipa-Puno railway on the road to Dept Puno at altitude 3830m. Backeberg classified the plant as a Tephrocactus and Ritter made it the type species for his new section, Cumulopuntia. Vaupel's original description was repeated in the TSG issue Vol. 4. No. 3. p278 in an article on "O. pentlandii, boliviana and related plants". In Vol. 6. No 1, p369 photographs by Roger Moreton were printed showing plants on the road from Cuesta del Diabolo to Caspana, in northern Chile. On p376 a photograph of an individual segment illustrates the abundant spination, at the tip only, which is a feature of this species. The site photographed by Roger, as shown on the outline map on p367, is close to the Chilean border with Bolivia. In the late 1990s Tim Marshall made a visit to Bolivia and took the photograph that appears on the front cover of this issue of the Journal. Tim sent the photograph to John Cox and we are grateful to John for sending in the photograph. The plant was found on the altiplano, above 4,000m, near San Vicente, Bolivia. Incidentally, San Vicente is where the outlaws Butch Cassidy and the Sundance Kid are supposed to have been killed. Their bodies are buried in an unmarked grave in the local cemetery but the grave has yet to be found.

The name sent with the plant was Tephrocactus ignescens (bolivianus). However, there is a problem with identifying it as ignescens. The CITES Cactaceae Checklist, Second Edition, edited by D. Hunt, on p237 recognises *ignescens* as a species of Opuntia. However, the distribution given is only Peru and Chile. Ritter recognised the species as occurring in Peru and Chile (Kakteen in Sudamerika, Vol. 3 p880-882). In Volume 2 when dealing with plants growing in Bolivia he lists the name ignescens (p493) and states "See under Chile". In Vol. 3, p882, Ritter states that ignescens can be found along the Chilean-Bolivian border and extends eastward a little into the Bolivian area. San Vicente is about 220 km away from the Bolivian border with Chile and roughly 250km from Caspana in Chile. Is San Vicente within the area that Ritter identified? Can the photograph on the front cover be ignescens? If so why does the CITES Checklist not include Bolivia in the distribution of ignescens?

Please will someone help clarify the distribution of ignescens? The three locations mentioned above could give some idea of the distribution. Very rough distances between the triangular points established are Sumbay south east to San Vicente 800km, San Vicente south west to south of Caspana 250km and then north back to Sumbay 810km. The area delineated is only a guide. It does not mean that ignescens is found throughout the area or is restricted to it.

A. Hill, Sheffield.

THE AUGUST MEETING

A reminder that the meeting will be held at Slimbridge on Sunday 4th August commencing at 10 am.

The discussion topic will be the Floccosa group. Confirmation of the Speaker/s will be made in the June issue of this Journal.

Please will you inform Rene if you are coming to the meeting?

O. PLATYACANTHA, DARWINII, HICKENII AND I

When I became interested in Tephrocacti I collected as many forms as possible irrespective of whether they were labelled or not or what was on the label. By this method I acquired a large number of plants out of which I gradually tried to make some sense. I obtained a large number of forms of *T. articulatus* (Pfeiff.ex O.)Backbg. and some forms that looked very similar to my untrained eye. Some of the latter had the name *T. platyacanthus* on the accompanying label. (See Fig 1). Eventually I was able to discern how the *T. platyacanthus* (SD.) Lem plants were different from the *T. articulatus*. The *T. articulatus* had grey segments. The *T. platyacanthus* had green or brown segments. (See Fig. 3). Eventually I found if I cultivated the brown-segmented plants correctly and watered them then they would usually turn green. The *T. articulatus* remained grey. The spines of the two species were similar in that they were a greyish white in colour and were broad and flat. However, although the various forms of *T. articulatus* plants had different angles of the spines to the body, the *T. platyacanthus* plants usually had the same conspicuous reflex spines although not adpressed to the segment. (See Fig 2). There were some plants that had more areflexed spines than others. I could now differentiate between the two species using my "keys" of a greenish rather than greyish body and the "typical" reflexed spine as denoting *T. platyacanthus*.

Whilst differentiating between *T. platyacanthus* and T. *articulatus* it became apparent that I had at least two segmented forms of *T. platyacanthus*. The usual one (most common amongst my acquired plants) had slimmer segments compared to a stockier form of which I had two specimens. This led me to understand why Backeberg (1. Page 484) had listed his various varieties but I came to the conclusion that really what I was observing was just different forms of the same species. I also noted how a slim brown-segmented sprawling plant I had rescued from under the staging of a colleague had developed stouter green upright segments after some years in my coldframe.

In the book by Iliff and Boyce (2) the two discuss the name of *"O. platyacantha"*, its history and the appearance of the plant growth. In this discussion (Pages 58 to 62) the name *O. hickenii* Br &R. appears with mention of Spegazzini's comments on the name linking it to *platyacantha*. Hickenii has also been associated with O. *darwinii* (3. Pages 199 to 201). In 1984 R. Kiesling placed *O. platyacantha* Pfeiffer as a synonym of *T. articulatus var. oligacanthus* (Speg.) Backbg. (3. Page 188) but by 1997 he had changed his database to making O. platyacantha and O. hickenii synonyms of O. darwinii (4. Page 14) and the synonyms were repeated in the CITES Cactaceae Checklist (5. Page 104 & 106). Thus for the TSG August meeting in 2001 we chose the three names for discussion and members were invited to bring plants to help the discussion. The plants were arranged in a pretend geographical layout on the floor with *darwinii* on the east coast (Type locality Argentina, Prov. Santa Cruz, Puerto deseado = Port Desire. Lat. 47°S. The Type locality of *hickenii* is further north, near the sea in Argentina, Prov. Chubut, Puerto Madryn, approx. 43°S) and the reflexed spined *platyacanthus* inland to the north. Discussion on the latter plant started with the statement that these plants share a habitat with the southern distribution of *articulatus*. It was agreed, however, that despite R. Kiesling, in 1984, placing *platyacanthus* as a synonym of a variety of *articulatus* (3. Page 188) we could not accept this and believed that there was no near connection with *articulatus*. The reasoning was dependent not on the reflexed spine (noted above) but on the colour of the segments and the difference in the plant structure (*articulatus* falls to pieces easily

whilst *platyacanthus* doesn't). One contributor summed the difference up in non-technical language as to how to differentiate between the two. If you slam your greenhouse door and the plant falls to pieces its *articulatus*. If it is *platyacanthus* you can kick it round the garden and it will still be in one piece.

If *platyacanthus* is not a synonym of *articulatus* can the name stand alone? According to my personal observations above this might appear to be possible. However, the bringing together of various forms named *darwinii, hickenii* and *platyacanthus* revealed a different picture. One could see a gradual intergrade between the plants from north to south and also east to west. The reflexed spine was a feature of the northern most plants and the spines were broader and flatter than the spines of plants from further south but there was an obvious transition south to the coastal *darwinii* form and from there to the western forms. *Darwinii* is the oldest name and so has priority. Thus the conclusions of the August meeting discussion were in agreement with R. Kiesling's 1997 views and the CITES Cactaceae Checklist. I have lost my identification of *platyacanthus* as the species with the "typical" reflexed spines. However, I can console myself with the apparent knowledgeable statement that such plants are *darwinii* from the northern end of its range.

At the August meeting Graham Hole suggested an outline of the distribution of *darwinii*. The coastal form, on the eastern coast that then extends inland to the north west and ends up in Mendoza, is a small growing form. Further inland there is the bigger headed form. These plants come from the central plateau and end up on the coast at Trelew, Peninsular Valdez (*platyacanthus*). Further west on the foothills of the Andes there is a long straight spined form (growing in Neuquen, with an *ovata* type plant). Graham sees *neuquensis,* on the Andean foothills, as a separate entity. Going north Graham sees a small headed (old *platyacanthus* name) form developing into a much bigger segmented form with the whole distribution of *darwinii* not going further north than Mendoza. The latter northern limit is also apparent on R. Kiesling's distribution map (3. Page 197). Graham also notes two forms of growth of *darwinii* in its east to west range. On the east coast all the plants suffer strong winds and, on the coast, not much rain, so they grow as small hummocks low down behind bushes and rocks. Western forms do not have such strong continuous winds but suffer from stronger sun so longer spines develop. There is the more erect form on the Andean foothills compared to the low growing sprawling form seen in the example of P102 from Choele Choel, Rio Negra at 300m (See Fig. 4). In Neuquen forms of *neuquensis* and *platyacanthus* occur and therefore overlap, however, *darwinii* and *hickenii* do not overlap but meet in north Mendoza.

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It is interesting to note that Ritter also dismissed O. *platyacantha* as a valid name (5 p.398) and his views are translated in this edition of the TSG Journal. However, it appears that he was happy to differentiate between *darwinii* (6. p.389) and *hickenii* (6. p.398) and to even place the first name as a Maihueniopsis whilst the latter a Tephrocactus. However, the way the short comment on the latter is worded, referring only to the literature, suggests to me that he had no personal contact with a "hickenii" plant.

Type Descriptions

Vol. 6. No. 4. Dec. 2000. pages 417 and 418.

Illustrations.

Illustrations of the plants mentioned above can be found in recent issues of the TSG Journal as follows:

***O. darwinii* Henslow. Based on the drawing of the type species. Vol. 6. No. 4 Dec. 2000 Page 418.**

***O. hickenii* Brit. and Rose. Illustration by the authors. Vol. 6. No. 4. Dec. 2000. Page 418.**

***O. platyacantha* Vol. 6. No. 4 Dec. 2000. front cover. Note the green body and the flat wide spines.**

Vol. 7. No. 4 Dec. 2001 Page 474. Note the two different forms.

This issue:

Fig. 3. Please note how the top of the new gowth could be esaily mistaken for *O. articulata.* However, the older segments show the typical O. *platyacantha* orientated spines.

Fig. 4. P 102. G. Piltz listed this plant as *"darwinii/hickenii* in his field List .

Fig. 5. The *hickenii* is Gordon Rowley's interpretation of *hickenii.* The plant is of garden origin ie; habitat origin is not known.

Fig. 6. The two outside plants are accepted as forms of *darwinii* with the central plant being the entirely separate *O. articulata.*

Bibliography.

1. C. Backeberg. Cactus Lexicon. Pub. Blandford Press 1977

2. G. Leighton-Boyce and J. Iliff. The Genus Tephrocactus. Pub. The Succulent Plant Trust 1973.

3. R. Kiesling. Darwiniana. 25 (1-4) p.171-215. Marzo 1984.

4. Cactaceae Consensus Initiatives, Ed. D. Hunt, No 6 Dec. 1998.

5. CITES Cactaceae Checklist. Second Edition. Ed. D. Hunt. Pub. Royal Botanic Gardens Kew & IOS. 1999

6. F. Ritter. Kakteen in Sudamerika Vol. 2. Pub. F.Ritter 1980 .

7. W. Barthlott. Biography and Evolution in Neo and Paleotropical Rhipsalinae (Cactaceae) Pub. 1983. Epiphytes. Nov. 1984.

Postscript.

I do find it strange that the northern form of *darwinii* has spination that has very strong resemblance to the *articulata* forms with which it overlaps. Would any member like to comment on this? Is it due to convergent evolution due to climatic/environmental conditions? However, there is another possibility. W. Barthlott has identified a Rhipsalinae evolutionary centre in eastern Bolivia (7.) If one assumes a similar evolutionary centre for Opuntia it is possible that whilst we note a distinction between two different species in Argentina (*articulata* and *darwinii*) the similarity at this geographical point marks the evolutionary development of the plants from one "species" into another. Thus the *articulata* form becomes the *platyacantha* form which becomes the *hickenii* form which ends (?) as the *darwinii* form in the far south east of the range

A. Hill. Sheffield.

Thanks to G. Hole for checking and adding to his outline of the distribution of *darwinii.*

OPUNTIA PLATYACANTHA S.– D. 1837

O. PLATYACANTHA was placed by Br & R as a synonym of O. ARTICULATA OTTO. (Under the name O. GLOMERATA) which according to the original description has not proved correct. SCHUMANN placed the name PLATYACANTHA likewise as a TEPHROCACTUS s.s.* but his description was not sufficient for identification with a particular species, since flower, fruit and seeds were missing and referring this to the SALM-DYCK species by means of its spine details is not possible. It's habitat information, MENDOZA, is an error, since he took his information from GILLIES and that refers to O. ALPINA GILL (A synonym of P. tuberosus) whereas SCHUMANN placed the name O. ALPINA erroneously in TEPHROCACTUS s.s., since he took it to be O. PLATYACANTHA SALM-DYCK and described it under this name.

BACKEBERG did not clarify this confusion as he took up the name PLATYACANTHA and in his way interpreted it of course as TEPHROCACTUS s.s. (photo in his vol 1 P285). With this species the following data of SALM-DYCK does not agree: joints weakly tuberculate, lowermost spines 3-4, fine, white, adpressed, upper spines 2-3, longer, reed-like, grey. The type very robust with very strong reed-like spines. What BACKEBERG considered and illustrated has (like all TEPHROCACTUS s.s.) strong tubercles with no adpressed spines below and above more than three spines, these not strong, also the segments are not strong: i.e. the interpretation by BACKEBERG is arbitrary.

According to LEMAIRE we can be even more sure that O. PLATYACANTHA cannot be in TEPHROCACTUS s.s. He knew this species in 1839 and he published it in his CACT. GEN. NOV of 1839. In 1868 he erected the genus TEPHROCACTUS and divided it into four groups. In the first group he placed those species in which the segments are placed one upon another, in tiers, that is today TEPHROCACTUS s.s. In the second group LEMAIRE placed those which grow sideways like grass and which sprout at the base. He placed O.PLATYACANTHA there.

It is certainly a characteristic of the genus TEPHROCACTUS s.s. that the joints are placed in tiers, one on another, also have no grass-like growth. O. PLATYACANTHA cannot therefore be in TEPHROCACTUS as Br. & R, SCHUMANN and BACKEBERG have all interpreted it. We cannot from SALM-DYCK's description say with certainty to which other genus this species belongs. One can certainly speculate MAIHUENIOPSIS, as these frequently have flattened spines and fine adpressed spines are found on the lower end of the areoles especially.

It appears that that which BACKEBERG interpreted as O. PLATYACANTHA (S-D) LEM., together with the four varieties which he arbitrarily set up, belong to TEPHROCACTUS HICKENII (Br & R) SPEG from Chubut. (How come he calls this a Tephrocactus? R.M).

HOSSEUS states that O. PLATYACANTHA grows near TALAGAPA in Chubut. When he extended the name to HICKENII it was a mistake to include the old name PLATYACANTHA, on the other hand it could be an acceptance that the incomplete description does not allow a determination.

SALM-DYCK also did not know the origin of his species to publish, while FORSTER in 1846 stated CHILE, but one knows how unreliable the old habitat information is. BACKEBERG was also unable to give habitat information for the plant he called O. PLATYTACANTHA.

The name O.PLATYACANTHA can therefore no longer be used.

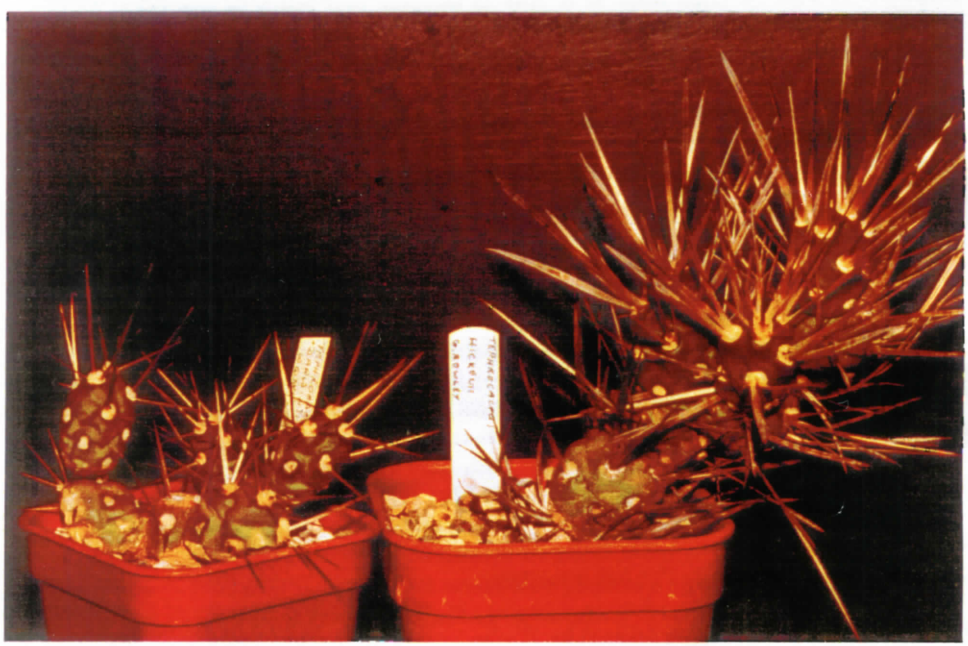
*s.s. = sensu stricta (in the strict sense of the term)

Translated by Roger Moreton from Kakteen in Sudamerika by F. Ritter. p398 - 399

Fig. 1. O. platyacantha at each side of two O. articulata.
Fig. 2. The typical reflexed spines of O. platyacantha.

Fig. 3. O. platyacantha.
Fig. 5. O. darwinii from Yavi and O hickenii

Fig 4. P 102
O. darwinii/hickenii



Flowering Cuttings

Malcolm Birkett draws attention to four of his new cuttings, which flowered almost as soon as they rooted. (Vol. 7. P.455) I have had this as well. It is odd. I have thought of two possible explanations, both speculative and neither completely satisfactory.

Many plants, when starting at a new site, will grow until they are 'mature' and then start to flower and set seed. This is very obvious with fruit trees. Maturity is a very complicated idea. One ingredient in this may simply be the exhaustion of local nutrients by all that vigorous growing. This can be simulated by reducing Nitrogen and increasing Potassium fertiliser inputs. This does then provoke flowering. Other, smaller plants also grow, without flowering until they become pot bound. The idea seems to be that plants set seed when they sense that their site is becoming impoverished. This would be a very useful survival technique and is a very plausible idea. Pursuing this idea it might be argued that a cutting with barely formed roots would have a minimum Nitrogen input, would feel threatened and would flower. But there are weak points in this suggestion. I have not found that pot bound cacti are more likely to flower. In fact, some of them seem to flower better when they are growing well. Moreover, all cuttings are initially short of nitrogen but very few of them flower in their first year.

It might be possible to develop another explanation along the following lines. Plants don't wake up one morning and think, "I'll flower today." There has to be a period of growth for the buds. Before that there must be some sort of chemical/biological preparation. This all takes time. It is easy to imagine that much of this takes place during the preceding season. So perhaps these flowering cuttings were already prepared before they became cuttings.

On the whole I prefer the second explanation but it doesn't tell us how to get flowers. I've had half a dozen different species flower but they hardly amounted to a show. Perhaps I just have to be patient until they are all 'mature', but I wished I knew more about it.

W.L.Jackson, Sutton Coldfield.

LOSSES

Death has visited my greenhouse; six victims in all. One was an anonymous cristate which was already reverting to normal and was going to be a big Platyopuntia. *T. paedophilus* was a tiny cutting and I've a big plant of that. The same applies to *O. fragilis* (WG 273). You can't help but have a lot of that. I'm not too sad about any of those. But, both *invictas* look moribund and that is a shame. One I have kept since it was a seedling supplied by John Henshaw. Both were doing well. They're not now. O. miquellii is a serious loss too. I liked it for it's blue colour. It tended to lose this after one season and it had dawned on me that it was probably less than perfectly happy in my un-heated greenhouse. I was going to return it to Mary who disposes of more kilowatts. It looks as though I've left it too late.

The weather has been different this year. We had a long cold spell before Christmas as well as the usual short snaps after. Round here the temperature has dropped to -9^0C but that has happened before. Was it the pre-Christmas cooling that did it? Possibly,

but I've found another reason. One of my neighbours Leylandii's turned out to have two trunks when the wind split one off. I begged the branches to make shreddings for mulching the soft fruit. My shredder is electric. On visiting the power plugs in Mary's greenhouse I found that the supply to mine was unplugged. I have just 150watts in the form of a cable under one bench. They've had to manage without that this winter. I don't know when it was unplugged or even whether it was me who did it. But there you are. Careless behaviour costs lives.

WL Jackson. Mar. 2002. Sutton Coldfield.

The Perfect Show Plant

Over the years the range of plants entered in the class for Opuntia Group has increased to such an extent that many exhibitors wonder just what to enter. The age of the giant Opuntia is long past. These plants look very nice in a John Wayne Western, but not on the show bench. They are too big and too easy to grow. They can be difficult to transport as well.

If we move to Tephros these can fall to bits in transport. Many people will remember my T. papyracanthus, which was reduced to half its size before leaving the greenhouse, or my Cumulopuntia sphaerica which produced a mountain of heads, all having fallen off the plant in transit.

My choice for the perfect plant is Puna subterranea. It is very compact and doesn't fall apart in transport. It has no dangerous spines, it flowers and grows easily and looks wonderful on the show bench.

I'm sure the T. geometricus phase will soon pass. A plant with three heads, collected in the wild around a year ago, does not beat a P. subterranea with 20 flowers and fifty heads grown to perfection in a clay pot. To all judges, old and new, please look at all the other entries in the class before giving that cutting of T. geometricus first prize. It really doesn't deserve it; and you could make my two hundred headed Puna subterranea very upset.

D. Hutchinson. Leicestershire

WANTS

Piotr Swiatoniowski has said that he wishes to continue to use the electron microscope to study our plants. He has therefore asked for the following material to be sent to him at ul. Krolowej Jadwigi 143, PL-30-212 Krakow, Poland.

1. Cuttings of A. lagopa. If possible, but not necessarily, with habitat locality data.
2. A seed of A. malyana.

3. He has stressed that it is not simple to look for viruses but he hopes to work on the problem of A. malyana. If anyone can send him a piece of a clone that is not doing very well he will be pleased to receive it. In the original clone that came to England there were patches of black tissue at various points in the segment. Samples of a section of this would be very useful.

THE SLOW GROWING CRIPPLES?

These days cacti growers have many different horticultural products, that can be used as a supplement to traditional growing media or they can even replace soil. Usually, these new methods of cultivation in ceramic grit, pure peat or coconut coir should be included among semi-hydroponics ways of cultivation. As there are no nutrients in such substrata it is only a support for roots and all foodstuff have to be delivered with water. It seems that we already have enough generous fertilizers, which contain also all secondary elements, and sometimes they are recommended for hydroponics and semi-hydroponics cultivation.

However, can we be sure that such more or less mineral substrata, with fertilizer dissolved in water, can provide as good conditions for plant roots as a traditional growing medium? Can one be certain that such artificial mediums are not much more weak in biological and chemical transmutations and conversions?

Someone could say, that nobody is able to answer such questions at present and if our plants grow faster in semi-hydroponics cultivation then we should change our customs. But I am not really sure if modern fertilizers are indeed so perfect and can replace nutrients held in common humus. I will be very prudent and simply ask if any of you have ever seen a cactus that has been grown, for example, in pure peat for more than 10 years? Such a plant would be the best answer for the questions asked above. Although, it is true, that most cacti will grow in such substrata much faster at the beginning, a grower will not be able to preserve them for many years in cultivation as is shown with all species of *Ariocarpus* cultivated in the mentioned material.

One can visit large impressive glass-houses with millions of not very easy to grow cacti like *Astrophytum capricorne* for sale and these plants seem to grow excellently in almost pure peat. However, such establishments are very illusionary places. One has to remember that in such productive glass-houses all conditions like temperature and humidity are under strict control and there are applied much more fungicides and insecticides than most growers can imagine.

However, a good grower has to achieve some experiences on his own as it is so attractive to study plants in one's own collection. In connection with this fact, when I received my first cuttings of *Pterocacti,* I decided that I should try to cultivate them in a few different mediums. There is not much information about these plants in the literature so I wanted to choose the best growing medium for my plants basing it on my own experiences.

Up to now I have tried to cultivate *Pterocacti* in the following mediums and now I am able to come to some important conclusions. I tested about seventy different clones of these plants. All of them were very young specimens, obtained from cuttings, so it wasn't possible to check their possibilities of blooming.

1. Pure, mineral grit (ceramic grit)

The plants were watered alternately with plain water and water with fertilizer of standard value to eliminate a risk of over-fertilization.

The growth was very slow and miserable as the water evaporated just after a few days after watering. *P. kuntzei* (syn. *tuberosus* and *decipiens*) and its form *P.kuntzei f. lelongii* faded sometimes when it was very hot during the summer. The most unhappy species turned out *P.australis*, with a few clones almost stopped growing.

In autumn, when I took the plants out of the substratum, the tuberous roots proved to have as poor growth as the stems. Even if the plants were healthy, they didn't look very happy and the annual ring was very miserable.

2. Almost pure peat (peat with addition of sand)

I was watering the plants in similar way as these ones cultivated in ceramic grit.

The growth was very fast and healthy. Most plants formed well looking segments, although not as strong as in case of the traditional method of cultivation.

Unfortunately, in autumn, it turned out, that the roots were rather weak and untypical. There were too many secondary roots instead of well-developed tubers. Only *P.kuntzei* with all its forms and *P.megliolii* developed quite good looking roots. Also, all clones of P. *australis* seemed to grow much better than in case of pure grit, probably due to much higher humidity. However, the most important remark was, that many plants lost two-thirds length of the roots, which simply rotted away and showed mold due to the high moisture of peat in Autumn. Taking into consideration, that the tubers are very significant parts of Pterocactus plants, such way of cultivation cannot be accepted.

3. 35 % of grit, 35 % of sand and 30 % of fresh garden soil.

Watering was similar as in above cases.

The effect was quite poor. The plants grew much the same as those planted in mineral grit. The new segments were developing very slowly and they didn't look very firm. The plants proved a lack of some nutrients even if they were receiving them with water. A few plants seemed even to look as they were slowly wasting away. This referred to most species like *P.australis, P.valentinii* and *P.hickenii*.

When I took the plants out of the medium, the tubers were also very weak, however without any signs of putridity.

4. 25 % of grit, 25 % of sand and 50 % of fresh garden soil.

The plants were watered mostly with plain water, only once a month they received some fertilizer.

All species of *Pterocactus* grew in this medium very well and fast. They formed many new segments with in some cases strong spines and many glochids.

In autumn it turned out that they had also formed very large tubers with well-developed main roots. However, the roots of a few plants had started to decay, as the applied soil seemed to be too moist.

5. 40 % of fresh garden soil, 30 % of grit, 20 % of sand and 10% of loam.

The plants were watered mostly with plain water. Only once a month did they received some fertilizer.

Almost every tested clone was developing many healthy and well-shaped segments with strong spines. All species of *Pterocactus*, which may require a little different conditions (generally speaking they come from two areas, cool Patagonia and warm northern part of Argentina) seems to grow very well in this medium.

While taking the plants out of the soil, during autumn, it was very pleasant to look at large and well developed tubers that didn't tend to decay.

Recapitulating therefore: according to my experiences with *Pterocacti*, it turned out that the more traditional compost for cacti with tuberous roots seems to be a much better solution than any other I have yet tried (Fig.7). Although all species of this genus have more or less tuberous roots they certainly require a great deal of water and nutrients to be able to avail their life potential. In the other ways they become slow growing cripples. This differentiates these plants from most Mexican cacti with bulbiform roots like Lophophora, which need different treatment.

Definition of terms.

"Fresh garden soil" = this soil will have a lot of humus.
"Grit" = granite grit 0.3 – 0.6 mm.
"Sand" =river sand. Large grains.
"Loam" = ordinary soil such as from a field – had very little humus.

Piotr Swiatoniowski (Krakow, Poland)

D. Hutchinson.

PTEROCACTUS AUSTRALIS WP 51.3

A photograph of this plant was published as Fig. 3 in Vol. 7. No. 3 September 2001 and on page 455 of that issue comments were made about the plant. I am grateful to Hakan Sonnermo (in Sweden) for checking his WP field list and also sending me a copy. Haken said that he had WP 51.3 in his collection but could not find the number in the WP Field List. Like Hakan, although I was able to find the name *Pterocactus australis,* I was unable to find the number 51.3. Fortunately Brian Bates (in Bolivia) has kindly sent the following information.

"The field number WP 51.3 does not exist. The collection numbers are of the form such as WP 95-242/513 (*Gymnocalycium capillaense*) where WP is the acronym for Wolfgang Papsch, 95 the year, 242 the number of the locality and 513 is normally the field number, i.e. the number of the specific plant.

The following are all the *Pterocactus australis* of Wolfgang Papsch up to 1995.

P. australis WP 89-039/051 Rio Negro, between Minas Goetechnicas and Los Berros, 250-400m
P. australis WP 89-041/051a Rio Negro, between Los Berros & Arroya de la Ventana, 350m

WP 51.3 suggests to me CLONE 3 of WP 89-039/051."

Editor.

As indicated in the last issue of our Journal we will stage

THE VERY FIRST TSG SHOW

In conjunction with the Oxford Branch of the BCSS

Sunday 14th July 2002

at Langdale Hall, Whitney

There will be 21 classes to show off your plants of Tephrocactus and other Opuntia

Make a note in your diary now and enter as many plants as possible to make this show a real success!

With the June Journal all U.K. members will receive a schedule and entry form. So start sprucing up your plants now!

(Overseas and European members may obtain a schedule, on request, from the Secretary)

Members will also have the opportunity to sell plants at the Oxford Branch Sales Table. – Only Opuntia plants please, as space is limited!
20%Commission will be go to show funds
(Please advises the Secretary, René Geissler, if you wish to sell plants.)

Fig. 6. O. platyacantha O. articulata O. hickenii

Fig. 7. Mostly two-year-old plants from single cuttings in traditional cactus medium. Photo by P. Swiatopiowski

TEPHROCACTUS

Incl. Maihueniopsis, Cumulopuntia and all related genera

Maihueniopsis minuta.
Photograph by R. Geissler.

STUDY GROUP

Vol.8 No.2 June 2002

SECRETARY'S PAGE.

It gives me great pleasure to welcome three new members to our fold! They are : Cerra Cesare in Italy and Karl Prentice and Richard Prentice in the U.K. I hope that they wil soon take part in our activities.

●All articles and comment should be send to the Co-Editors.
●Subscriptions and any other correspondence should be sent to the Secretary. May I remind you please to let me know any changes to address, telephone number and E-mail address.
If you write to one of our Officers and expect an answer, please include a S.A.E.

●Subs. are now due for 2002 and remain at £10.00 per annum for the UK and Europe (European members please note: "no Euro-cheques are accepted by our Banks – Please send £ Notes") Overseas members £14.00 or $25 - USA (in $ bills only). Please make all cheques payable in sterling to: "Tephrocactus Study Group" (not individuals).
(If members from Europe have difficulty paying subscriptions please contact the Secretary)

●Please remember: members may advertise their "WANTS" and "SURPLUS PLANTS", free in the Journal, in no more than 30 words

The Officers of the TSG:

Chairman and Editor:
Alan Hill, 8, Vicarage Road, Grenoside, Sheffield S35 8RG ☎0114 2462311
e-mail: alan.hill6@virgin.net

Co-Editor:
William (Bill) Jackson, 60, Hardwick Road, Sutton Coldfield,
West Midlands, B74 3DL ☎ 0121 353 5462 E-mail: wljackson@supanet.com

Secretary:
René Geissler, "Winsford", Kingston Road, Slimbridge, Glos. GL2 7BW ☎ 01453 890340
E-mail: geissler.w@virgin.net (Please note new E-mail address)

Representative for France: M. Dawn Nelson, "Passe Renard", Averon-Bergelle, 32290 Aignan

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IMPORTANT NOTICE.

Please make sure that you have a schedule for our show at at Langdale Hall, Whitney

Sunday 14th July 2002

If you don't have a schedule by now please contact the Secretary.

Please make an effort to enter some plants or at least attend the show. Plants will be on sale, you will meet fellow members of the TSG and see some cracking plants.

This is our first show so please help to make it a great success. There are 21 classes to show off your plants.

Members will be able to sell plants at the Oxford Branch Sales Table but please only bring Opuntia plants as space is limited. 20%Commission will be go to show funds
(Please advises the Secretary, René Geissler, if you wish to sell plants.)

THE MEETING ON SUNDAY AUGUST 4TH.

The meeting will again be held at the Slimbridge Village Hall, commencing at 10am. After a short business meeting there will be a discussion on the floccosa group. Please bring along any examples of these plants or those you consider to be closely related. The latter can be a much wider interpretation than the normal Backeberg interpretation e.g. Austrocylindropuntia vestita/teres can be included. Also please bring any other plant you think will be of interest or which you would like identified (we will try to help). You are also welcome to bring plants for sale. We ask for 10% of sales to be donated to Group Funds. There is no charge for the Meeting. All members of the TSG are welcome and you may bring guests who are not members. Light refreshments will be available at the meeting. We shall be going to a nearby pub, which supplies good food, for lunch. After lunch we are to have a talk by Brian Bates who will be on a visit to England. Brian made several visits to South America before deciding to go and live in Bolivia. Since he went to live there he has travelled widely through the various cactus habitats. Please will you inform Rene if you intend to come to the meeting?

CUMULOPUNTIA IGNESCENS.

I have just had another look at the Vol. 8 No. 1 March 2002 TSG issue and am prompted to add some data to the cover photograph.
The plant shown on the cover is TM 117.01 (=BLMT 117.01) from the second BLMT trip in December 1997/January 1998. This time only B, L & M were present. Myself "B", Brian Bates, "L", Martin Lowry and "M", Tim Marshall. The site was visited on 15/12/97 after we had become a little lost in the pampa area. It was actually 18 km north of San Vicente. There were the two plants that can be seen. The larger one was over 1m across and the smaller 60 cm across (approx. 3 feet and 2 feet). These were the only plants of this type seen, although there were many straight Cumulopuntia boliviana. The C. boliviana were much smaller, being up to about 30 cm (1 foot) diameter. They did not have the golden colour of the "ignescens", but were more "white" and more open in their form of growth.
Alas my slides are in England, so I can't supply other pictures.

Brian Bates. Bolivia

We thank Brian for his information that raises other queries than those made on Page 483 in the last issue. At this site there are only two C. ignescens growing with "straight" C. boliviana. Why are there only two plants of C. ignescens? Is it because they are really only a variation, in form, of C. boliviana? If so it appears rather strange that the form should only appear in two plants close together. Why are there no intermediate forms? If the plants are really a different species from C. boliviana then why are there no hybrids? What mechanism prevents the two from cross-pollinating and what does this tell us about the relationship, if any, between the two? Ed.

AUSTROCYLINDROPUNTIA MALYANA

Bill Jackson had a grafted malyana. When the rootstock succumbed to the cold he gave me a couple of the resulting offsets. These were planted, in my standard Tephrocactus mix, in 6.5 x 6.5cm square pots, on January 17th. The pots were placed in saucers full of water and kept in a small bedroom about two feet from a Southwest-facing window. The room has a radiator and is over the central heating boiler so the temperature never falls below 12^0C. I keep all my seedlings in there over the winter.

I gave the pots a light spray every day until Feb. 21st and then started watering from the bottom just until the surface became damp. I then left them until the pots appeared to have dried out completely before watering again. By March 8th the apex of the larger offset began to show signs of small green leaves. By the 12th there were six definite leaves and the body of the segment had turned green; just visible through the pure white wool. Now, Mar 18th, the plant has 12 bright green leaves, right at the apex, and appears to have grown

The second, smaller offset has done nothing at all but I shall carry on watering. We shall see how both progress through the season but it does begin to look like another success in propagating *A. malyana* from offsets.

My Tephrocactus mix is, by volume...

John Innes No. 3	3 measures	Sharp sand	3
Washed potting grit	2	Perlite	1

A.V.James. Birmingham.

I am glad to hear the good news because I think I should give my bad experience. We know that A. malyana is a winter grower. It therefore needs water in winter whilst keeping it free from frost. I have brought my two grafted plants of *A. malyana* safely through several winters by giving them the aforesaid treatment. This winter I did water them but apparently not enough. The result is that one plant is now showing no leaves and I suspect that it is dead or is dying. The other has a few leaves on two stems and none on the other two. I shall give them a little water through the summer months and hope to see some growth in autumn/winter. The point my experience must emphasise is that the plants need a reasonable amount of water in winter so that they can grow. Looking back I realise that this year I treated them like some of the Other Succulents where one gives a very little water at odd intervals during winter in order to stop the plants shrivelling too much. Ed.

COMMENTS ON RECENT ISSUES.

Flowering Cuttings (Vol.8 page 490)

I have also heard that many people are surprised when cuttings start to flower almost as soon as they are rooted. Unfortunately, cuttings do not always flower and there are good reasons why it does or does not occur.

I happen to know about the cuttings that Malcolm Birkett has received from Germany and also that the plants from which the cuttings were obtained. The nursery is situated on the foothills of the Alps. The plants grow in very favourable conditions with maximum sunshine and flower regularly year in, year out. Therefore, when the cuttings were taken the urge to flower was already built in when he received them in the early autumn. However, there may also have been other contributing factors.

It is quite usual, if the conditions are good, e.g. a long, sunny late summer and autumn, for Cacti to develop the onset of flower buds in the autumn of one year that enables them to flower the next. The buds may already be visible by then if the plant were to be cut open. Conversely if it is cool with little sunshine one year, or the plants were put under the bench, the onset of buds can not occur and the plants will not flower the following year. If a plant does not flower it could also mean that it has not yet recovered from the cutting stage and has not yet attained flowering size. So if you have placed your plants in the lightest possible position and we have a good year there is every chance that you will have some flowers the following year. That is if the plants were not overfed and over watered so that all the energy has gone into growing bigger and fatter at the expense of forming the onset of buds.

We should always remember where each plant comes from and emulate the conditions in habitat as far as possible, although this may not always be achievable and often is a challenge. It means fresh air all year round and maximum exposure to the sun. If you are shading your greenhouse or have overhanging trees and don't ventilate enough, even during the winter, this may be bad news. There are lots of other reasons why plants are not flowering: such as growing the plants in too small a pot or one not deep enough for a tap root to extend so it curls round the bottom of the pot instead. Apart from not producing the flowers you hope for, an unventilated house will make plants susceptible to mould and other fungal diseases. Fresh air is even much more important than temperature, providing the plants are kept absolutely dry from mid autumn and winter. That is of course with the exception of all the Austrocylindropuntia that require to be kept moist during their growing season in winter.

I have grown plants of the Opuntia group now for almost sixteen years, and made a lot of mistakes on the way. There is always more to learn. I had to find out that the Tephrocactus (sensu stricta) and Austrocylindropuntia require temperatures no lower than +1° to +2° C although winter temperatures above about 10°C inhibit flowering. However, Puna, Maihueniopsis, Puna, Cumulopuntia and Pterocactus are quite happy at lower temperatures down to -2O° if kept absolutely dry during late autumn and winter. One other point is that no members of the above groups require grafting unless you really want to increase a lot of plants quickly. In fact if they are grafted, plants will grow out of character, Cuttings root very quickly, without much difficulty, if taken during the growing season in May or June. Perhaps this will help to answer some of the points W.L. Jackson made on the same page-

<u>About "SERAMIS" again (vol.7. p.475-476)</u>
Very expensive - yes, but very useful for rooting cuttings that are normally extremely difficult to strike! I use it for *Dorstenia gigas* that is normally classed as impossible to root cuttings. I was extremely lucky when I visited a local Garden Centre that wanted to discontinue this product from their range so 1 bought the remaining stock at 50% discount. The product is entirely sterile and feeding is necessary as soon as the cuttings root but, if always used pure, it is re-usable providing it is kept clean. A fantastic product when used for the right purpose!

Rene Geissler

THE NORTHERN WEEKEND.

This festival of mixed eating and cactus study is held annually at Alston Hall near Preston. It really is a good do. This year we heard from David Rushforth who described two trips, twenty years apart, to Mexico. Although habitats had been damaged he did find that there were still many beautiful plants about, including, wait for it, Ariocarpi. Terry Smales dealt with Conophyti (Conophytums?) in clear and comprehensive terms and provided a new view of Bushman Land. Barry Miller, from Stranraer, was new to me. He likes Aloes, knows about them and has enormous, and growing, greenhouses full of them. (Yes, he lifts the roof and welds extra bits in.) A 'one species' lecture might have become a bit monotonous, but he just stuck in a few slides of the four of them hand feeding these forty wild hyenas in the dark. As well as the king hyena taking the meat off the stick you could just make out the eyes of some of the others gleaming in the dark, behind the meat holders. Graham Charles talked about Peru and then about Copiapoas. Some of these are very beautiful; or, at least, his pictures are.

None of them had much to say about any form of Opuntia although the number of times the old Indian Fig cropped up in slides of Africa was noteworthy. Graham Charles did make a brief mention. He showed a couple of slides of A. floccosa. He was kind enough lend me these and three others.

Figure 1 shows an almost naked Austrocylindropuntia.	GC 243.02
Figure 2 shows a single segment.	GC 243.02
Figure 3 shows the fruit and seeds	GC 248.02
Figure 4 shows the flowers.	GC 321.01
Figure 5 shows a hillside covered with A. floccosa	GC 320

These are his comments.

"At the habitat of *Oroya borchersii*, near lake Conococha at the southern end of the Cordillera Negra, Peru, altitude about 4000m (GC243), there were hairy and naked plants (Figs.1, 2 &3) of *Opuntia floccosa* growing together. The low mats were no more than 25cm or so across here. I was very tempted to give them different names like *O. crispicrinitus* for the hairy one and *O. puntacaillan* for the naked one but common sense tells me that they are really the same. (Notice the hairy buds in Figure 1, and that the single 'naked' segment, Figure 2, does show a few rudimentary hairs.) The picture of the hillside covered with the same species (Fig. 5) is much further south on the main road from Chincheros to Andalhuaylas (GC320) but at the same altitude. At some places the stems can be tall, up to 15cm or more, and they look very much like small plants of *Oreocereus trollii*. An example of this was at my habitat GC 321 on the road from Andalhuaylas to Abancay at 3460m. It is a very widespread plant at high altitude and often grows with Oroyas."

'Wool' versus 'No Wool' is quite a substantial variation. Our small Opuntias show dozens of examples of this. Why are they so variable? We don't see it in our native plants. One dandelion is very much like another. Is South America radioactive? Or is it just that our local flora is unusually stable?

W.L. Jackson. Sutton Coldfield.

THE PERFECT SHOW PLANT

Knowing, as we do, just how much was paid for that, er, big, large, very large, enormous *Puna subterranea* it is easy for us to understand the new owner's enthusiasm but trying to bully any future judges into giving it a prize is going a bit far. It is, after all, just a heap of rather dull, brown marbles; no proper spines or tubercles or any other interesting features.

Nor is he justified in knocking the Platyopuntias. These are what the public expects to see. One of the objectives in running a show is to put the hobby before the public. We don't want to disappoint them. As well as the *Aztekiums* we should have Showy plants and things that they expect to see. This includes the platy's. Nor is it true that all platy's are easy to grow. For many of the smaller ones it is easy to get a messy pile of mixed live and dead vegetation but quite difficult to produce an attractive specimen. And what about the British Standard Glomerata? It grows like a weed and yet I have seen a small, etiolated potfull of this junk beat a beautiful *O. pycnantha*. Fashions that declare one thing better than another are wrong. Let the judge decide on the basis of our national criteria while remembering that it is a SHOW.

For the same reasons we should stop knocking *O. geometricus*. There's no doubt that this plant is Showy. Intelligent, lay visitors notice it and make comments. I am no expert but, in my greenhouse, *Puna subterranea* grows a good bit faster than *geometricus*, and faster does, automatically, imply less difficult. So, without wishing to pretend that it is the bee's knees I am sure that *geometricus* is a good show plant deserving serious consideration.

So, to all judges, old and new, take David Hutchinson, who is entitled to his opinion, with a pinch of salt. And I do have this very nice *Pteroca*...

W. L. Jackson. Sutton Coldfield.

STUDIES IN THE OPUNTIODEAE (CACTACEAE)
Edited by D. Hunt & N. Taylor.

Members who attended last year's August meeting of the TSG will recall that the publication date of the above book was queried. The good news is that it is now published. Areas covered are as follows. Editorial. Systematic implications of chloroplast DNA sequence variation in the Opuntioideae (Wallace & Dickie). Seed characters and the classification of the Opuntioideae (Stuppy). On the evolution of the continental North American Opuntioideae (Pinkava). Realignment and revision of the Opuntioideae of Eastern Brazil (Taylor, Stuppy & Barthlott). The Andean opuntias: An annotated checklist of the indigenous non-platyopuntioid opuntias of South America (Iliff). That's Opuntia, that was (Hunt). Alphabetical list of currently accepted species (Hunt).
The book is available by post from D. Hunt, The Manse, Chapel Lane, Milborne Port, Sherborne, DT9 5DL, England. The cost is £20 + £3 p/p (UK only)(c.$29.95 US + mailing). It is also possible to subscribe to "Cactaceae Systematics Initiatives" which is the Bulletin of the International Cactaceae Systematics Group and will consist of probably five issues 2002 – 03. No.13 – 17. The cost is £18, Europe £20 and the rest of the world £25 (remittances to the above address in sterling only please). Subscribers to the CSI may order Studies in the Opuntiodeae at the discount price of £15 plus postage (UK £3, Europe £4, rest of world (airmail) £7)

Austrocylindropuntia floccosa GC 243.02

A. floccosa GC 321.01 **Segment of GC 243.02**

A. floccosa fruit & seeds. GC 248.02

A. floccosa GC 320 All photos by G. Charles.

GRIT

Most cactophiles use a mixture of John Innes and grit. Most seem to get pretty good results. Most of them know more about growing cacti than I do. But they do get a bit woolly if you ask them why. Shorn of this fleece these replies appear to mean... "Well, it improves drainage". It doesn't. I've measured it. Now that I'm dry again I am prepared to share the results with all interested parties.

Grit % (by vol.)	0	20	40	60	80	100
Drainage ml/min.	390	167	197	1900	5300	6000

Adding 20% grit to a mixture reduces the rate to less than half the value for pure JI. Adding 40% gives a slightly higher rate but still only half that of the grit free mix. Above this the drainage rates soar to what are best described as unmanageable levels. Unmanageable by the experimenter I mean. Just use your imagination. Measuring 6 litre per minute implies a jug full every 10 seconds. When you learn that the tap controlling the flow is under the sink, which is under the apparatus, which is overflowing, you will, I'm sure, feel a wave of sympathetic understanding. How many times did I have to tell myself, "Come on Bill. You're doing this for the members."?

I do think that these results are reasonably accurate. They are from the second attempt using fresh samples (and a more experienced, if wetter, operator). The first set was scruffy and full of errors. Even so they showed the same relative changes; Down to half, still low, up a lot and so on. If accurate, they require some explanation. This is easiest for the high values.

Consider the difference between 100% and 80% grit. A pot full of pure 5mm grit contains thousands of interconnecting channels. Water can pour through these. The 80% mixture has enough JI. (20%) to block a few of these. But the water can still run through the rest, and find its way round any blockages. So, the relatively small difference between 80% and 100% grit seems reasonable.

Round about 40% grit it is reasonable to assume that the majority of these channels is blocked so that the big difference between 40% and 60% is also easily explained.

But why does the addition of small quantities of grit reduce the rate? It is noticeable that watering tends to consolidate JI. During repeated waterings it settles lower in the pot. This effect was very much more noticeable in the 20% and 40% samples. So, perhaps the explanation is something along the following lines. The weight of the grit tends to accelerate, and exaggerate, the settling process caused by watering. As a result the JI in these mixtures becomes more compacted which reduces the rate of water flow.

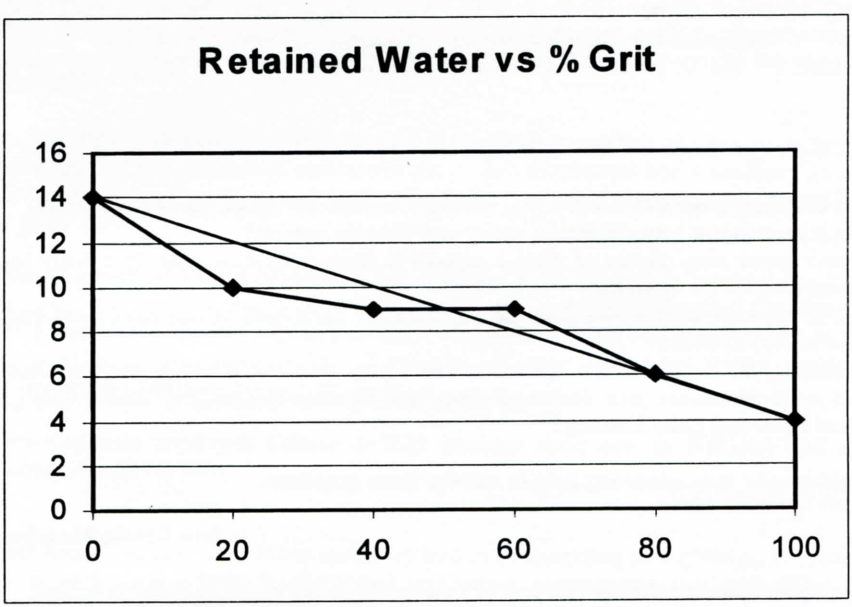
I don't know. I have no other evidence, yet, to support these explanations. But, whatever the explanation, these results do now raise the question...
"Why do plants grow well in mixtures of John Innes and grit?"
Surely not because grit reduces the drainage?

W.L.Jackson. Sutton Coldfield.

RETENTION OF WATER.

Given the six samples of wet mixture described in 'Grit' it would have been a waste not to weigh them and subtract their dry weights to find out how much water was retained in the compost. This was done but without taking any special precautions (such as equalising drainage time) so the results cannot be seen as the last word on this subject. Nevertheless they do show features which may have practical relevance and which can be explained.

If 100% JI. retains 14 units of water and 100% Grit retains 4 units it would be reasonable to expect the values for the intermediate mixtures to lie on the straight line between these extremes. The values for 20% and 40% Grit lie below this line. The flow results have already suggested that the grit may be squeezing the JI. in these two samples. If they are being squeezed then the mixture would be expected to retain less water. So, although these results were an afterthought taken without much care, they do seem to be consistent with the explanation of the flow results.



Future Work

If this had been a serious piece of research these results would have been seen as just a preliminary skirmish offering pointers as to the direction of a more careful study. The work is full of weak spots that deserve more attention.

For example...

1. The sample holders should have a wire mesh (~ 2mm) bottom and top.
2. The proportions of JI. should be calculated from the weights of plant pots that had been filled using different, known degrees of compression.
3. Different sizes and shapes of grit should be used.
4. A peat-based compost could be used in place of JI.

5. A lower water pressure might be more realistic.
6. The samples could all be drained for a standard, and longer, time before measuring retained water.
And so on...
But the results do seem to be definite and self consistent. Do they have any implications for succulent cultivation?

W.L.Jackson. Sutton Coldfield.

PLEASE CAN YOU HELP WITH INFORMATION?

In advance of my first excursion to South America this Autumn I am trying to build a set of distribution maps for Tephrocacti (in the broadest sense) we may encounter in Southern Peru. (Lima to Oroya and south to the Bolivian/Chilean border).

I am having difficulty with the north, north-east and eastern limits of *Cumulopuntia spherica*. Classical teaching states the northern most limit to be latitude 16 deg. south, about 40km north of Arequipa. However the Chileans Field List Compendium lists several Graham Charles numbers in the Nazca valley, some 430 kilometres further northwest. *Tephrocactus kuehnrichianus* (synonym *O spherica* CITES Cactaceae Checklist. 2nd Ed. D. Hunt. P242) is listed even further north in Tinajas canyon near Lima.

I have some questions.

1. Has *C. spherica* been found growing between latitude 16° S and the Nazca valley?
2. Has it been found between Nazca valley and Tinajas canyon?
3. I have never seen photos of what I assume is *form kuehnrichianus*. Is it truly just a different form of *C.. spherica*?
4. Has *C. spherica* been found growing significantly north-east of the road from Puquio (Nazca valley) to Cuzco?
5. Where is the north-eastern limit between Cuzco and the Bolivian border? Does it extend up to Macusani (like *Austrocylindropuntia floccosa/malyana*) or does it only grow south of Puno and Lake Titicaca?

I would greatly appreciate any help to answer these questions.

Ivor Crook, Manchester

Will members please send information or comments on the above to either co-editor.

Ed

BILL GREENAWAY HAS MOVED.

Bill has moved to West Halabezack Farm, Porkellis, Helston, Cornwall, TR 13 0LD. He is busy propagating documented Opuntia plants but also has a great deal of work to do in setting up his new nursery. Therefore, although he will welcome visitors, he will not be publishing a list this year of plants for sale. However, he expects to publish a list next year. He will be bringing documented Opuntias for sale at the Oxford Show.

CUMULOPUNTIA RECURVATA

TSG members may know this plant under its former name of *Tephrocactus curvispinus*. An article by Klaus Gilmer appeared in the Vol. 5 No. 2 June 1999 TSG Journal. In 1963 Backeberg invalidly described the species. Recent work by Gilmer and Hans-Peter Thomas has shown the species' affiliation to the genus Cumulopuntia and has consequently renamed the plant *Cumulopuntia recurvata. In habitat it can be found in the San Juan province of Argentina between San Juan and Calingasta to the west, and northward to Iglesia.**

After seeing a photograph in Backeberg's Lexicon I first purchased the plant in the early 1970's from the extensive Opuntia sales list of the Van Donkelar Nursery in the Netherlands. I remember the plant was grafted onto *Opuntia subulata*. A few years later it died – probably through neglect.

I did not see the plant around again until the mid 1990's when I spotted it in the private collection of Jan Biesheuvel at Lexmond in the Netherlands. He was persuaded to propagate the plant and two years later sold a few on grafts – again on *Opuntia subulata* stocks. For me this species has always proved difficult to root cuttings. Single and double – segmented offcuts appear to dry out too quickly, and I had never seen the plant on its own roots.

On this year's trip to the same nursery I purchased another plant – as a safeguard against loss of the previously mentioned plant. Jan Biesheuvel has a tendency to sell the more difficult cacti on concealed grafts, where the surface of the compost is dressed above the graft union.

When I tapped my recent acquisition out of its pot I was pleasantly surprised to find this four – headed segment was on its own roots. Jan appeared to have sealed the exposed cut with a hard horticultural wax to prevent transpiration. This had enabled him to root it down without too much delay. I wonder if this technique would work with *Austrocylindropuntia malyana*. I live in hope.

***Cumulopuntia recurvata Gilmer & H.P. Thomas spec. nov. in Kakteen und andere Sukkulenten 52 (4) 2001.**

John Betteley. Newark.

What success, if any, have other members had in propagating and growing *C. recurvata*? Has anyone used a hard horticultural wax when propagating cuttings? What is the technique for using it? Is the wax easily available? I have never noticed it for sale

The front cover of TSG Vol. 5 No. 1 March 1999 shows a photograph, taken by Zlatko Janeba, of "T. curvispinus" in habitat. Zlatko wrote an article that was published in the same issue, Page 315/6 and there is a close up habitat photograph of the plant on Page 316. K. Gilmer wrote an article for the German Opuntia Study Group in 1997 and this was published, on Page 321 and 322 with photographs on Page 323 and 324, in the TSG Journal Vol. 5 No. 2 June 1999, mentioned above by John. The Fig. 1 photograph is the same one that appears on Page 85 of the KUAS Journal.

Ed.

Because my collection is very small there is still plenty of space in the new greenhouse. I can put a plank across the lower benches and sit on it to do the repotting. The clay granules, potting compost, limestone, waste bucket, soil, insecticide, grit, etc. are all within easy reach under the adjacent benches and the user is warm and out of the weather. The tools are neatly laid out on a tray just behind my right side. Perfect I used to think

Three years ago we went on the Scottish Trip making extravagant purchases all over this side of Europe. Europe is all right for that sort of thing. Cok Grootscholten had this little Opuntia on a high shell. It had gorgeous 75mm (3") yellow spines and the sun was behind it. It glowed. I said so. C.G. immediately clambered up, whipped off a cutting and gave it to me. I'm not sure what to call it, perhaps *0. kleiniae,* but it has thin (10mm), pale stems branching at odd angles and quite pronounced tubercles. Anyway, it rooted and grew well in Mary's greenhouse but the spines were only half' the size. Since putting it the new house it's got going again but it did seem about time to repot

I started by making a small, conical pile of mixed compost in the bottom of the new pot. A conical pile under the plant allows you to bed it down at a slightly different angle if you want. I put the pot aside ready for the plant. Going back to the old pot I tipped off the surface grit into the waste bucket, tapped and squeezed the pot to loosen the root ball, selected the barbecue sausage tongs and gripped the plant gently by the spines. It came out of the pot quite easily and was soon bedded down in its new home. Then I poured new compost mixture round it. The next stage was to consolidate the new compost by packing it down, again quite gently. With the half-potted plant on my knee the obvious, and accessible, tool for this was the label. I worked my way round the pot gaining confidence as the whole arrangement became firmer. I'm not sure that confidence is a good thing. I am sure that the label wasn't long enough. I gave a fairly definite shove and impaled the side of my thumb. It was only a pinprick so I moved my thumb away. The plant came with it and it hurt. Until you've tried to pull one of these things out you don't know how much it hurt. Anyway we now had a bit of a dilemma. My right hand still held the label (I was trying to be brave.) There were no hammers or machetes near my left hand and the right thumb was fastened to the bloo... to the plant. I reached over the thing, got the label in my left hand and used it to try and push the plant away. It simply dragged my skin into a small conical pyramid and it hurt some more. I didn't say anything. I Just threw the label at the door. Out of the corner of my eye I could see a small pair of long nosed pliers. They were just behind me and to my right. So, balancing the G.. D....d plant on my knee I sort of twisted round and picked up the pliers at the third attempt. Then, gritting what still remained of my teeth; I gripped the spine and pulled. It still didn't come out and this really hurt. I felt like that Captain Hornblower who amputated his own leg or something in that book. In the end I used the base of my thumb as a fulcrum and levered out the spine. It was interesting in that the 2mm or so that had been embedded in my thumb was now much thinner than when it went in. I guess I robbed it of a bit of its spine sheath. I expect my system will reject this bit eventually. But I don't know how long the stiff neck and bad back will persist One thing, no matter how long this is I shall not try acupuncture.

All of this did tend to confirm a theory of mine. People say that these plants have spines to protect their water supply. Well they do of course. But I think that some of the

Opuntias really set out to kill small animals. Once embedded real force is needed to remove the spines and the local wildlife does not come equipped with pliers. Also think of the advantage of sending your cuttings out into the big world with a supply of water, nitrogen and bonemeal all wrapped up in a furry skin. I bet, if they looked, the plant explorers would find a small, pathetic skeleton at the base of every cholla. One of these wild life programmes on telly showed a seagull that had wandered into some sort of Opuntia. It had picked up about twenty segments and was completely immobilised. The camera crew were sorry for it and spent about two hours setting it free. Evolution can be red in tooth and claw.

Finally the plant. I didn't jump on it. I thought the spines might penetrate shoes. I just finished repotting it, told it that it was my entire fault, that I was sorry and that it wouldn't happen again. It looks gorgeous and now it has a bit of fresh fertiliser to go at. People talk about growing these things hard. I don't know how mine will fare this winter but I do seem to be getting more typical, as well as faster, growth and better spines now that they are getting plenty of heat, light, water and a little bit of Osmacote

W.L. Jackson. Sutton Coldfield

DISEASES OF TEPHROCACTI

Having now cultivated Tephrocacti and other small Opuntias for a number of years, it has become apparent that as a group, these plants seem to be prone to a disproportionate number of diseases and viruses when compared to the cactus family as a whole. Apart from losing several Echinocerii some years ago with a corkiness that spread over the whole plant, my "other cacti" have been remarkably disease free. Not so the small Opuntias, especially the Tephrocacti (sensu Ritter). My plants have over the years developed grey scaly patches or periodically lost offsets completely, which just shrivelled up for no apparent reason (I discount here sooty mould and the "natural" shedding of healthy offsets). Particularly annoyingly, early this winter several of my plants of T. alexanderi v. geometricus which have been growing trouble free for 5 or 6 years lost their offsets. I have heard using a fertiliser with high nitrogen content could be a cause, but why would it only occur after many years?

In his book "Tephrocactus and other Prickly Pears" Michael Keissling devotes several pages to plant diseases and T.S.G. members are recommended to refer to this book. He mentions a particular disease "bacteriosis", which is described as "Small black mottles quickly turn into large, bursting swellings that liberate a black, glutinous mucilage". I had this occur on two of my seed raised plants a couple of years ago
(When it happens it cannot be mistaken for any other disease or rot !!). Keissling states that affected plants should be destroyed but it is possible to save the plant. Quick action is required to cut away the infected part (usually the top of the plant). The plants (a T. aoracanthus & T. alexanderi) then did nothing for two years but have now produced healthy offsets (see photo. in Fig 7).

I had thought that many of these problems were due to clones being continually propagated and passed around, but as some of my seed raised plants are showing signs of these diseases (as mentioned above) this disproves that theory. As usual other members experiences would be welcomed.

M. Collinson. Chichester.

Fig. 6. Cumulopuntia recurvata Gilmer &Thomas. Photo. by J. Betteley.
Fig. 7. T. aoracanthus & T. alexanderi. Photo. by M. Collinson.

TEPHROCACTUS

Incl. Maihueniopsis, Cumulopuntia and all related genera

Opuntia zehnderi.
Photograph by Ray Weeks.

STUDY GROUP

Vol.8 No.3 September 2002

Secretary's Page

It gives me great pleasure to welcome seven new members to our fold since the last issue! They are Karl Stapleton, Geoff Hanson, Nick Evens, Red Smith, Richard Newton, Gillian Evison and Brendan Burke. I do hope they will soon take part in all our activities.

- **All articles and comment should be sent to the Co-Editors:**
- **Subscriptions and any other correspondence should be sent to the Secretary**

May I remind you please to let me know any changes to your address. telephone number and E-mail address?
If you write to one of our Officers and expect an answer, please to include a S.AE.

- **Subs. are now due for 2002 and remain at £10.00 per annum for the UK and Europe (European members please note that no Euro-cheques are accepted by our Banks - Please send £ Notes) Overseas members £14.00 or $25. - USA (in $ bills only). Please make all cheques payable in sterling to: "Tephrocactus Study Group (not individuals).**
  (If members from Europe have difficulty paying subscriptions please contact the Secretary)

- **Members may advertise their "WANTS" and "SURPLUS PLANTS" free in the Journal, in no more than 30 words**

The Officers of the TSG:

Chairman and Editor:
Alan Hill, 8. Vicarage Road, Grenoside, Sheffield S35 8RG -Tel. 01142 462311 E-Mail: alan.hill6@virgin.net

Co-Editor:
William (Bill) Jackson, 60, Hardwick Road, Sutton Coldfield, West Midlands, B74 3DL -Tel 0121 353 5462 E-Mail: wljackson@supanet.com

Secretary:
Rene Geissler, "Winsford". Kingston Road, Slimbridge, Glos. Gl2 7BW - Tel 01453 890340
E-Mail: geissler.w@virgin.net (Please note new e-mail address.

Representative for France: M. Dawn Nelson, "Passe Renard", Averon-Blergelle, 32290 Aignan

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THE AUGUST 2002 MEETING.

We began the meeting with a short AGM at which all the Officers were re-elected. However, the Editor suggested that it would help future development of the Journal to have another member join the editorial team. Will any volunteer please contact the Editor?

The plants for discussion were plants of the floccosa group. Plants used to spark debate were plants labelled floccosa, floccosa v. udonis, crispicrinatus, malyana and vestita. In the afternoon Brian Bates, on a visit to England from Bolivia where he now lives, gave a very interesting and informative illustrated talk on plants that he has seen.

Discussion took place on next year's meeting. It was agreed that it would be better to hold the meeting earlier in the year at a much less busy time in the cactus world than August. It was also suggested that it would be better to have the meeting at the start of the growing season to facilitate the activity chosen for discussion the following year. The 2003 meeting will therefore be held at Slimbridge on Sunday April 27th. The topic chosen for discussion is the drawing up of a Show Schedule for our plants.

On behalf of the members who attended I thank Rene for arranging the meeting. I also thank his wife for preparing and serving the welcome refreshments in the hall. Thanks are also given to all who attended the meeting.

A. Hill Chairman TSG.

SHOWING TEPHROCACTI

Although there has been a little discussion on the "ideal show plant" there has been no discussion in our group about a show schedule for the plants we study. Thus when Oxford Branch of the BCSS kindly invited the TSG to stage a show alongside their Show we were pleased to accept but faced some problems that we had to attempt to solve. In a show it is usual to have just a class for "Opuntia" or to have two classes for different pot sizes. We had to split the genus up into a reasonable number of classes. Thus decisions had to be made on which plants to place in different classes or, to be more exact, to decide which plants would fit together to be judged alongside each other. Certain groups immediately came to mind such as, for example, "The bolivianus group", "The sphaerica group", etc. However, although members of the TSG would know what was meant by these terms one had to remember that this was to be an Open Show to TSG members and to BCSS members. The latter might have problems in knowing which plants were required under such group headings. One only needs to look at the mixture of plants entered in a class for "Tephrocacti", if a BCSS Branch is so unwise as to have such a class in their show, to see the mistakes people can make in identifying their plants. I have been asked to judge such a named class at a Branch table show and found that there was not a Tephrocactus, in any sense of the word, in the class. The solution adopted for the Oxford Show was to indicate the group and list some names that might appear on the plant labels. This approach raised another perceived problem in that some names on plant labels might be now regarded as synonymous or even be not accepted (unidentifiable from an inadequate description, nomen nudum, etc.). Thus in trying to be helpful to the inexperienced grower of the plants the TSG might be thought, by the more knowledgeable growers, to be showing abysmal ignorance. In order to avoid the latter the disclaimer was inserted that "Names given below are the ones often found in common usage and are therefore to be used as a guide. It does not follow that the TSG recognise all of them as valid". One could not do anything special about the possible

problem of an inexperienced grower entering a plant in the bolivianus group class, for example, because the plant had an incorrect label and yet belonged to another group. Such an error, if it were to occur, would be covered by the usual prejudge check by stewards who could quietly point out the mistake and have the plant transferred to the correct class and so avoid the plant being disregarded by the Judge as "Not as schedule".

The question of whether a plant was a Tephrocactus (by various definitions), a Puna, Cumulopuntia etc. was easily solved by using the wider term of "Opuntia". The suggested class for Maihuenia was left in because, although not an Opuntia, certain members grow this uncommon plant. I accept this is not a very convincing reason and the matter needs to be discussed.

Did we manage to draw up a perfect schedule? Obviously not and one could not expect to do so the first time of holding a show. One can argue that perfection can never be obtained although improvement can be made. Although certain plants obviously fit together into the same class there are some plants which are not easily placed with other species. We cannot have many classes devoted to one species so where can such "problem" plants be placed? It has also been remarked that it is unfair to place a species, which is a good plant at a small size, in the same class against a species that quickly grows to a large size. Some doubt has been expressed about the chosen pot size limitations. What should these be in the future? It is hoped that some questions can be resolved by the proposed discussion at next year's TSG meeting in Slimbridge. Please bring plants to help illustrate a discussion on contents of classes, pot sizes etc. when drawing up a schedule for our plants.

All UK members should have received a schedule for the Show. If you no longer have a copy and would like another one so that you can make some contribution to the forthcoming discussion on showing then please inform me. For obvious reasons a copy of the show schedule was not sent out automatically to overseas members. However, a loose sheet for overseas members, showing the TSG classes at Oxford, will be found in this issue of the Journal. I hope that even if they are unable to show plants in the UK some overseas members will send in comments about showing.

It would appear appropriate to add here some comments, as Chairman of the TSG, about aspects of the show. Some comment has been made that with over sixty TSG members in the UK we could have hoped for more members to enter the classes. Perhaps some more members could have entered their plants but on the other hand it is clear that with our membership spread across the country some members would find it difficult to travel to Oxford. It is also possible that some of the BCSS members who could have shown their Opuntias at Oxford did not do so because they might have made the mistake of thinking their plants could not easily compete against the plants of members of our specialist group. In fact the question can be put as to whether the type of plants we grow do, in general, make good show plants. There is also the problem of transporting the plants e.g. forms of T. articulatus are difficult to transport as they easily fall to pieces.

I would like to thank Oxford Branch for inviting us to take part in their Show and their generous donation of £25 to the TSG from the proceeds of their Show. Also very many thanks to the TSG members who did enter plants.

A. Hill, Chairman. TSG.

OXFORD BRANCH SHOW 14th JULY 2002.

Oxford Branch was pleased to host the first competitive show for members of the TSG. The inclusion of 21 classes within the concept of an *all cactus* show seemed to work and was well received by all those who attended. We were able to attract 27 exhibitors and over 450 entries. Although the Tephrocactus Section was a little under supported totalling 88 entries, the recent illness of Rene Geissler contributing to most of the short fall, there were still some good examples of those prickly things that grab hold of you at every opportunity. It was a good effort and lessons were learned for any future show. The lecture, after the show, by Franz Kuhhas had some superb photography of plants in the wild, some of which I have never seen before.

Any show relies On the exhibitors and I am grateful to all those that came to support us from Coventry, Leicester, North Wilts, Birmingham, Swindon, Brighton, Derby Southampton, Sheffield, Gloucester, an Ex Branch member from Lincoln, and the former Chairman from Swindon, Mike Blake and his wife, now living near York. The ladies in the kitchen worked extremely hard to provide the usual Bacon Rolls, and an excellent lunch. Bill Greenaway from Cornwall and Stuart Riley from Brighton provided visitors with a good variety of sales plants on which to spend their pocket money.

Best Cactus	**Mammillaria saboae v. haudeana**	**John Betteley**
Best Opuntia	**Opuntia zehnderi**	**Bill Jackson**
Ron Ginns Medal	**Most points in Show**	**John Warwick**
Awards of Merit.	**Ariocarpus furfuraceus**	**Dr Gillian Evison**
	Austrocactus patagonicus	**Dave Porter.**
	Escorbaria leei	**Dr Gillian Evison**
	Neolloydia grandiflora	**Dr Gillian Evison.**
	Puna subterranea	**David Neville**
	Thematic Exhibit (Ariocarpus)	**David Neville.**

Bill Darbon. Show Secretary

PLANTS AT THE SHOW.

Front page. Winner of class 48, maximum pot size 18cm. In the Judge's words "The best plant in the whole show section – a perfect multiheaded O. zehnderi."

Fig. 1 Some plants in class 49: boliviana group, 18 cm max. pot size. The class was dominated by six entries of O. rossiana v. fauxiana.

Fig 2. Puna bonieae and subterranea in class 52, max. pot size 18 cm. The species make nice compact show plants.

Fig. 3. Some plants in class 61, three plants of the Opuntia group, max. pot size 13cm.

Fig 4. A compact specimen of Puna clavarioides in class 61 showing no sign of monstrose segments. Is this because the plant was on its own roots?

Fig 6. Two Pterocacti in Class 58. One labelled "sp" and the more upright one "fischeri". Is the plant labelled correctly? **A. Hill**

WHAT TAKES COVER IN THE OLD CLONE OF A. MALYANA?

Not so long ago there appeared in our Journal (Vol.7, No.4 December 2001 P. 469-470) a very interesting article, written by Dale Speirs, about silent viruses. As it was some kind of reply for my hypothesis on problems with vegetative propagation of A. malyana I felt obligated to investigate the question more carefully.

I decided to check if there are any viruses, bacteria or fungi in two available clones of A. malyana. The old clone, collected probably in 1971 by W. Rausch, and HNSO 043, collected just in 2000, by H. Sonnermo. The first is known to be almost impossible to cultivate without grafting. The second one is very willing to form roots from cuttings.

In connection with my idea I prepared two containers with a layer of sterile gelatin in each. I inspected samples of plant tissue and juice under the light and electron microscopes and prepared small samples of tissues. I used one sample of the tissue of a clone to brush several times across the flat surface of the gelatin in one container. I then repeated the process with the other clone in the other container. It is a standard method of breeding bacteria and fungi. Generally speaking, viruses can breed only in live cells, because out of them they are not able to multiply. In this case, the electron microscope is the most important research instrument as it gives the possibility of looking for virus colonies. However, professional study of virus diseases is very difficult.

In the meantime, I paid attention also to the well-known black spots, which appear on the old clone (inside the tissue or on the peel), by looking at very small samples under the light and later under the electron microscopes. However, if someone examines infected tissue, it is usually possible to state if there are any colony of fungi, which are quite characteristic. Bacteria are very difficult to find among plant cells.

The black spots turned out to be a round agglomeration of destroyed tissue, certainly without any signs of a fungus colony and, under the electron microscope, the examined sample didn't look as though a virus infected it. Please look at Scan No.1.

Two weeks later I was able to inspected what had grown in the above mentioned containers. On the first gelatin base, infected by HNSO 043, there appeared only some common fungus like mould, which probably came from the fresh air. But on the second one, infected by the W. Rausch's clone, grew a very large colony, whose structure was similar to pale pink pudding which almost always indicats bacterium Please look at Scan No. 2.

Under the light microscope it turned out that the colony consisted of round cells. Please look at Scan No.3.

Finally, I prepared a small sample of the colony and looked at it under the electron microscope to take more precise photographs and consulted about my materials with somebody who is engaged in the study of plant diseases. Please look at Scans No.4 and No.5.

Container A (HNSO 043)
No colony of bacterium or pathological fungi were found.

Container B (W. Rausch's clone)
Large, pudding-like colony of round, pale pink spots.

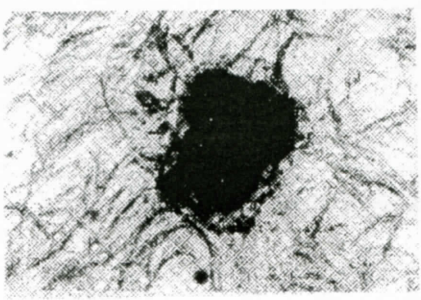
Light microscope: single cells, which do not form any series or chains.

Electron microscope: globular cells typical for bacterium (Coccus type).

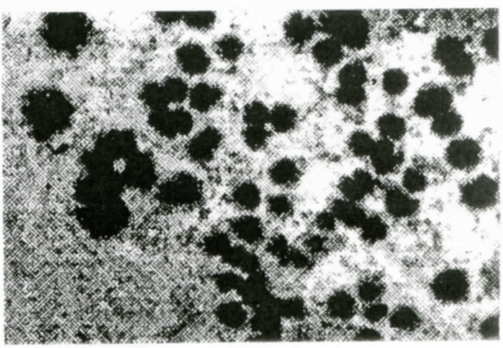
Unfortunately, at this stage of study, it is not possible to identify what specific bacterium I was able to find in the old clone of A. malyana collected by W. Rausch. I will have to contact somebody who specializes in bacterial plant diseases, and who will be able to

recognize the disease by visible to the naked eye symptoms and my pictures, as the second ones are not enough evidence to identify the sickness. Most bacteria look similar under the microscope and it is probably some already described disease.
There are still more very important problems to solve. Although I found no viruses or fungi in the mentioned clone, and only one type of bacterium, two types of investigations are still necessary. It is necessary to be absolutely sure that the bacterium caused the black spots and/or difficulties with vegetative propagation. I have to infect a healthy specimen of A. malyana, or a single cutting, by growing a colony of bacterium and check if, after some period of time, there appear signs of disease. I must also check if the plant is still capable of forming roots from cuttings. However, such an experiment will take some time, because first I have to propagate, by grafting, the indispensable clones, which are very small at present.

Piotr Swiatoniowski, Krakow, Poland.



Scan 1
Scan 3



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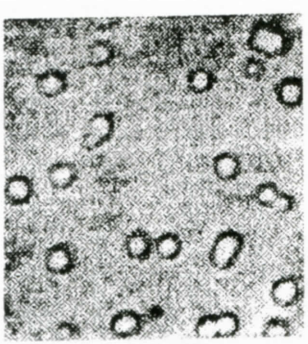

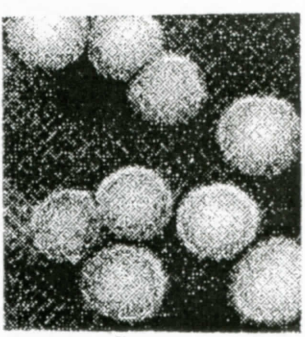

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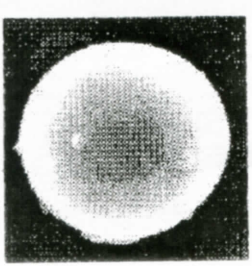

Scan 5.

The images have been reduced to fit the page. Larger copies of the images can be provided on request to me. Ed.

Fig 1. The boliviana group
Fig. 2. Puna bonieae and subterranea.
Photographs by Ray Weeks

Fig. 3. Class 61 "Three plants of the Opuntia group".
Fig 4. Puna clavarioides
Photographs by Ray Weeks.

"NIL DESPERANDUM."

In July of 1999 I was lucky enough to visit the collection of a fellow collector. I was even more fortunate to come away with a single segment of a plant labelled Tephrocactus hickenii. The segment was left on the bench for three days to allow the wound to callus over and then it was placed on a pot of wet compost (equal parts of John Innes No. 2 and horticultural grit). Despite regular attention with the watering can I could not persuade this single segment to produce any roots. By the winter I had begun to lose hope and interest so the pot was consigned to a remote corner of the greenhouse.

During cleaning and reorganisation of my plants in June 2001, some two years after the segment was originally cut from the parent plant, this pot resurfaced. By now the segment was shrivelled and a dull brown in colour with the exception of a small area about 5-6 mm in diameter surrounding one of the upper areoles. This area was a dirty shade of olive green. Convinced it was beyond salvage I was about to consign it to the compost heap when to my surprise I realised that despite its colour and shrunken appearance it remained quite firm. One last chance, I thought.

The segment was plunged in a beaker of warm water for one hour and then placed in the warmest part of the greenhouse on a pot of wet compost. Over the next few weeks it changed colour almost completely with most of the segment returning to something between olive green and the plant's normal colour. It also became quite firm in the soil and finally rooted! As the plant has dried off for the winter it remains the same colour and has remained firmly attached to the soil in the pot. This year, it has even managed to produce a new segment. I am quite amazed by this plant's power of survival and ability to set root so long after separation from the parent plant.

I Crook. Manchester.

COMMENT ON Vol. 7 No3 p460 – SOWING SEEDS.

It is also my experience that damping off soon after germination is a problem with Tephrocactus seed. I have developed a different technique to counter this problem. First I shave off a small sliver of the seed coat with a scalpel blade. I sow seed individually or in two's in round two inch pots in April or May. I then fill my propagation frame with these pots. The propagator is set to 26 degrees Centigrade and runs twenty-four hours a day. I check the propagator at least once each day and after about two weeks germination commences. As soon has seed has germinated I remove the pot from the frame to the bench in the greenhouse. Germination continues for about two weeks. Once a week has gone by and no further seed has germinated I turn off the propagator and place the rest of the pots under the bench to dry out until August or September when I try again. I find germination rates the first time around are comparable with what other people tell me they achieve. When the pots go back in the propagator six months later about one in fifteen will germinate the second time. The big advantage is not losing seedlings to damping off. I usually lose less than one in twenty seedlings with this method.

I. Crook. Manchester

NUMBERS.

All of you will have seen plant labels with numbers on them. Some of you will know all about numbers (more than I do). Others will perhaps know less. Some growers, when they acquire a plant copy out all the numbers and some even add numbers. Other people discard the numbers when writing out the new label. I would suggest, however, that you make the effort to retain the number as it gives some information about the plant.

One sees several types of numbers on labels although it is not always easy to work out they mean. Also some of the terms to describe the numbers are confusing. For example a Field Number is sometimes referred to as the collection number and an Accession Number is also referred to as a collection number. In these cases the word "collection" is used for two different meanings. Field Numbers are the numbers given to plants as they are collected in habitat. Hence LAU 401 signifies that Alfred Lau collected the plant and one can trace the geographical place from where it was collected. It should be pointed out that if, as is usual, more than one plant is collected from a site then plants bearing the same correct Field number may look different, as they are separate clones. This is where clone numbering might come in useful. However, although I have seen clone numbers used by a nurseryman selling habitat propagations I suspect that would be the nurseryman's number and not the collector's. Thus there could be duplication of clone numbers if more than one nurseryman uses his own clone numbering.

To simply have a Field Number is not adequate. To appreciate the plant one needs to know what the number indicates. This is where it is useful to have a copy of the Collector's Field List. Field List's appear in various publications (e.g. FR numbers In Ritter's Kakteen in Sudamerika), sometimes sold in Compendiums (e.g. as by the Chileans), and sometimes they can be obtained from the collector. A useful site for viewing Field Numbers is http://ralph.cs.cf.ac.uk **on the internet.**

It is useful to have some knowledge of under what circumstances the Field List has been compiled. In the past some collectors have, at some later date, returned to the area of a previous site, again collected plants and distributed them under the same previous collection number. This can lead to problems of identification because there is no way to differentiate between the two collections. If the two sets of plants come from exactly the same site then perhaps it does not matter but how can one be sure that it was the case? One should be also aware that whilst a Field List gives information about where the plants were seen it does not necessarily mean that the habitat plants are in cultivation. Field Lists rarely state whether the vegetative material collected was a whole plant, cuttings or seed. There is never an indication whether the plant material survived the journey back to the collector's home. In at least one case the Field List contains plants which were not in fact collected but simply photographed.

To have a Field Number on the label is very useful and, it could be argued, it is almost essential for serious study of the plants but there are certain pitfalls about which one should be aware. The obvious one is that the numbers might be misread when making out a new label especially if the old label is faded. A check of the number against a Field List sometimes shows the plant is wrongly numbered e.g. a Tephrocactus is carrying a Lobivia number. Some detective work might be able to correct such an

error e.g. has a 3 been misread as 8 or vice versa. If on the old label there is a habitat listed as well as a number then that can aid correction. However, when checking the number please do not be over zealous. There is something wrong if a Tephrocactus is carrying a Lobivia number but the collector sometimes changes names from the original listing. Obviously "Tephrocactus sp." might be later identified and given a specific name. An original specific name might later have to be changed due to a more correct identification. Changing of names due to new publication/synonymy of names is a different issue. However, it is useful to know which naming authority the plant collector is using e.g. Tom Jerkins followed Ritter and distributed "Tephrocactus berteri".

Another problem is the question of propagation. If one can propagate vegetatively from a field numbered plant then obviously the Field Number is appropriate on the label. Several years ago The Chileans began the custom of inserting (H) on the label to indicate that the plant came from an original authentic documented habitat plant. However, what is the position about seed produced on habitat plants in cultivation? It would be unscrupulous to simple pass on such propagated seedlings with the mother plant's Field Number (Even if you think the Father has the same field Number). Some indication is therefore required on the name label to identify the link to the Field Number but no claim should be made that the seedlings are fully habitat material and numbered as such. A worse scenario is a practice, which was carried out in the 1970s and possibly the 1980s that arose from the labelling of a plant by a Field number instead of a name. Thus, for example, for many years Rebutia heliosa v. cajasenis was simply passed around as "LAU 405". The original LAU 405s would be habitat plants but it would be highly inappropriate to believe that any plant now seen with LAU 405 on the label is definitely a habitat plant because Rebutias are easily propagated from seed. Fortunately the above practice should cause no problems with Tephrocacti!

Collectors in the past have given a completely different Field Numbers to different species at the same geographical location. In recent years a new way of listing Field Numbers has been used by some collectors. in that the Field number refers to a site as well as the plants. For example BLMT 001.01 is Opuntia boliviana whilst BLMT 001.02 is Lobivia pentlandii at the same site.

A completely separate type of numbers is Accession Numbers. These are the numbers one gives to plants as they enter one's collection. Thus WRG 01 will be the number of the first plant Rene listed when making a list of plants in his collection. When vegetative propagation takes place from a plant in one's collection then the propagation should carry the same number as the parent plant. When someone buys a WRG 01 they can add the name of the plant onto the list of plants they own and give the new plant their corresponding new entry number e.g. WRG 01 can also be my AH 26 and can then be passed on to have some one else's new number. There are advantages in having Accession Numbers (e.g. one knows the origin of the plant and its clone number) but the importance of the numbers can be debated. They cannot carry the same weight as Field Numbers. One also needs to be aware that they are Accession Numbers, not Field Numbers e.g. Klaus Gilmer plants are in circulation with his Accession Number on them and these numbers are completely different from the numbers on plants from his Field Number list. One must also be aware of possible letter confusion. If I used AH with an Accession Number for my plants there could be confusion with Andreas Hofacker's Field List numbered plants as he uses the initials AH for his Field Numbered plants.

TSG members need to be aware of possible confusion over LB numbers. If one looks at the 1994 supplement to the Chilean's Field Number Compendium one can see the Field List of Ludvig Bercht. LB 2 is Opuntia wentiana, LB 3 is O. curassavica and LB 4 is O. elatior with LB 6 being O. sp. The next Opuntia on the list is LB25. Several years ago at the Chileans weekend Opuntia plants for disposal were brought from the collection of the late Gilbert Leighton-Boyce. There was great interest in the plants and people wanted cuttings. With the very best of intentions, with the aim of keeping track of the resultant plants, the plants were therefore numbered LB 1, LB 2 etc. and cuttings were distributed with those numbers. There were not twenty-five plants but there were more than six. Hence there is the possibility for two areas of confusion. LB could refer to one of at least two people. Also the Leighton Boyce numbers are simply convenience numbers and not related to any number the plants may have carried in his collection.

The previously mentioned Chileans' activity is reflected in our own TSG when we started TSG numbers. The intention was to number the plants so we all knew what plants we were growing and knew in discussion that we were all referring to the same plant by being able to quote its TSG number. The discussion has still to take place but at least the plants are out there still (hopefully) numbered for identification.

Having read the possible pitfalls with the use of numbers one might ask the questions "Do numbers matter? Are they worth perpetuating on labels?" In my opinion the answer is definitely "Yes". Numbers give a plant's history. They provide documentation to a plant. Habitat source is important for (I hope) obvious reasons. Accession Numbers are less important than Field Numbers but are useful for a number of reasons. It is useful to know from where the plant was obtained and by the Accession Number know that you have that particular clone rather than another clone of the same species from the particular grower. Incidentally, when correctly used, the Accession Number of the mother plant is passed on to the labels of vegetative propagations from that plant, rather than a new accession number generated for the same clone in a different pot. Seedlings will obviously earn their own Accession Numbers.

A. Hill. Sheffield.

"TEPHROCACTUS CACTACANTHUS."

I wonder if anyone can help me solve a question that was put to me by someone via a recent email. In the Cactus Lexicon by Backeberg on page 772 is a photograph of a plant called "Tephrocactus cactacanthus". Does any one know this plant? Does it exist? If it does exist what is its current name? Please email me if you can give any information on the plant, as I am sure other TSG members would also like to know the answer.

Rene Geissler.

OPUNTIA FROM MENDOZA.

On P470 Vol. 7 No 4 December 2001 the question was asked as to the identity of RH666. The plant was illustrated on P473 of the same Journal. Brian Bates has kindly reported that RH666is identified as Maihueniopsis ovata in a recent field List of Ralf Hillman. Any comments? Ed.

CUMULOPUNTIA RECURVATA.

Having just potted up some of my plants of the Opuntia family I have to say there can be some pain and pulling to get unstuck from those 'wonderful' plants. You might say that I lived W. L. Jackson's 'Pain and Suffering' as told in vol. 8 #2 June 2002 In the same Journal the question was asked about Cumulopuntia recurvata and what success have members had in propagating and growing the said plant. In 1995 I was given a single head cutting. It has now grown into a 4.5-inch cluster of heads (Fig. 5). I was visiting a friend when given the head. Like I do with all cuttings I allowed it to dry for a week to ten days. I do not remember now just how long it was before it showed offsets. I remember thinking at the time that it was slow growing any new offsets. It has grown new heads every year since. It is still not a fast growing plant. Two years ago I obtained two more clones, these also being single head cuts. After allowing the cuts to dry for about a week I potted the heads. All they did for the rest of the year was just sit there. That is all that could be seen. In fact they were growing a very nice root system. This year both plants threw heads. In Fig. 5 can be seen this year's growth on them. One has three new heads and the other had one new head.

I advise planting cuttings on their sides because the new roots grow out from the areoles. I had no problems with the heads drying up too soon. I would think that here, in the northern San Joaquin Valley of California, we have much lower humidity than England: 10% to 25% most of the summer. With this in mind I have to wonder why my cuttings didn't dry out. The cuttings of two years ago were sent to me from 1200 miles away and spent at least three days in the post. With that time they were drying for at least ten days before I potted them. Their cut surfaces were about 3/8 inch across and this was the reason for the seven days I allowed them to dry.

When I pot cuttings that show no sign of roots starting I pot into very lightly damp soil. The cuttings receive no water, except for a light spray, until they are down solid in the soil. Then they are given a few light waterings around the edge of the pot only. That is to encourage them to grow roots out and away from the plant. After about a month and a half then they are treated like any plant that has been growing for years.

Elton Roberts, Ripon, California

WANTED.

Please can any member provide any of the following to Mr David Parker, 60, Ownall Rd, Shard End, Birmingham, B34 7AJ who has sent in the following "wants list"? Please contact him directly.

Austrocylindropuntia floccosa f. monstrosa, A. machacana, A. crispicrininitus.
Maihueniopsis ovata, M. ovata cv "Gnom", M. archiconoidea.
Micropuntia pygmaea, M. gracilicylindrica, M. wiegandii.
Tephrocactus alexanderi v. halophilus, T. catacanthus, T. kuehnrichianus, T. melanacanthus.
TSG Reference plants 1 –4 &6 –16.

KILLING MEALIE BUG.

Over the past few years there has been a gradual withdrawal of the types of pesticides that amateur growers can purchase. Obviously some of the ones we used to use have been proven to be very toxic to humans whilst others have damaged the environment. There has also been various regulations controlling the marketing of some products with the result it has ceased to be commercially viable for the former producer to continue to market the product. It is also possible that the move to combine, by take-overs, with other companies has reduced the range of pesticides available. The result is that all the well-known insecticides for eradicating mealie bugs have disappeared and I know of only one new product that has become available. The insecticide Provado, designed to kill vine weevil, is said to kill mealie bug by contact and also by a systemic process. I use the phrase "is said to kill" because whilst some people have reported great success others have said that it appears to have had little effect. (What is your experience?). Does anyone know of any other insecticide, deadly to mealie bugs, which is available for purhase by the amateur grower?

I have begun to make my own mealie bug destroyer based upon an old herbal remedy. The materials consist of metholated spirit, very hot chili powder and pyrethrum. I use a cleaned four-pint plastic milk container and pour in the contents of a forty five gram drum of Lyons Foods' "Hot Chili Powder" and the seventy five grams contents of a puffer pack of Vitax "Py" powder. I then add one hundred and eighty millilitres of metholated spirits, screw on the cap of the plastic container and shake well. I place the container by the door of the greenhouse and over the next week or so I thoroughly shake the container whenever I remember to do so. The solid material accumulates in the bottom of the container and the dark brown liquid above becomes free of sediment. I pour off this liquid into bottles and have my homemade mealie bug destroyer. The liquid can either be applied with an artist's paintbrush or by a dropper. It certainly kills my mealie bugs. Apparently the logic of the mix is that the metholated spirits washes away the wool of the nest and the wax on the bug's body, the chili then splits the epidermis or egg shell and the pyrethrum then kills the bug and/or egg which has now no defences to resist it.

One has to be careful when using the liquid on plants such as white woolly haired Mammillarias as the brown liquid can stain the wool. However, I have not had any problems on Opuntias although I have rarely used the killer on them as I find mealie bugs prefer to take up residence on other plants. I find the liquid kills root mealie bug as well as top growth mealie bug. This is not to say that I can market the product and stay within the stringent regulations governing sales of insecticides. Does anyone else make a similar mixture or even a totally different mixture that kills the bugs?

I noted that the makers of Armillatox claim that their product can be used to break the cycle of the Vine Weevil life cycle by destroying the eggs of the weevil. No mention is made in armillatox literature or on the web about mealie bug. However, a telephone conversation with a member of the company confirmed that the product could be used for mealie bug on cacti. The spokesman said that the solution will not harm the plants if applied at under 200:1. The spokesman recommended a solution of 400:1 not only because it is effective but also because it is easy to measure being 25 millilitres in two gallons of water. The solution can be used as a drench on the soil round the collar of the plant or poured over the plant. Obviously a stronger solution of armillatox can also be used to wash empty pots. I shall try the product. Please let me know of your experiences with it. The spokesman said that he always welcomes feedback.

A. Hill Sheffield.

Fig. 5 Cumulopuntia recurvata. Photo by E. Roberts.
Fig. 6 Two Pterocactii in Class 58. Photo by Ray Weeks.

TEPHROCACTUS

Incl. Maihueniopsis, Cumulopuntia and all related genera

Pterocactus hickenii (Britton & Rose)
Photograph by John Betteley.

STUDY GROUP

Vol.8 No.4 December 2002

Secretary's Page

It gives me great pleasure to welcome another new member to our fold since the last issue! He is Alan Archer from Derby and I do hope he will soon take part in all our activities.

☐All articles and comment should be sent to the Co-Editors:

☐Subscriptions and any other correspondence should be sent to the Secretary

May I remind you please to let me know any changes to address, telephone number and E-mail address?

If you write to one of our Officers and expect an answer, please to include a S.A.E.

☐Subs. are now due for 2003 and remain at £10.00 per annum for the UK and Europe (European members please note: "no Euro-cheques are accepted by our Banks – Please send £ Notes") Overseas members £14.00 or $25.- USA (in $ bills only). Please make all cheques payable in sterling to: "Tephrocactus Study Group (not individuals).

(If members from Europe have difficulty paying subscriptions please contact the Secretary)

☐ Members may advertise their "WANTS" and "SURPLUS PLANTS" free in the Journal, in no more than 30 words

The Officers of the TSG:

Chairman and Editor:

Alan Hill, 8, Vicarage Road, Grenoside, Sheffield S35 8RG -Tel. 01142 462311
E-Mail: alan.hill6@virgin.net

Co-Editor:

William (Bill) Jackson, 60, Hardwick Road, Sutton Coldfield, West Midlands, B74 3DL – Tel. 0121 353 5462 E-Mail: wljackso@supanet.com

Secretary:

René Geissler, "Winsford", Kingston Road, Slimbridge, Glos. GL2 7BW - Tel. 01453 890340
E-Mail: geissler.w@virgin.net (please note new e-mail address)

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THE MEETING ON SUNDAY APRIL 27TH.

This notice is in this Journal because there will be only few weeks between the next Journal appearing and the meeting. For reasons stated in Vol. 8 No 3 September 2002 the usual month of the meeting has been changed. The meeting will, however, still be held at the Slimbridge Village Hall, commencing at 10 am. After a short business meeting there will be discussion on the drawing up of a Show Schedule for our plants. The intention is not to hold the discussion in an abstract form but to relate the discussion to actual plants. Will members, therefore, please bring as wide a range of plants as possible to aid the discussion? The plants do not have to be show plants but will be used to help form classes. It is hoped that the plants will eventually form what looks like a mini show. Also please bring any other plants you think will be of interest or you would like identified. You are also welcome to bring plants for sale. We ask for 10% of sales to be donated to group funds. There is no charge for the meeting. All members of the TSG are welcome and you can bring guests who are not members. Light refreshments will be available at the meeting. We shall be going to a nearby pub, which supplies good food, for lunch. Three of our members, John Arnold, Ivor Crook and Martin Lowry, have visited Peru in October this year. After lunch we are to have a talk on the visit. Please will you inform Rene if you intend to come to the meeting?

Will members please note the request, on the bottom of page 536, for information about inter-member contact. There is a space for your reply on the membership renewal slip.

Notice to Members in France.

Unfortunately, our Representative in France has had to give up representing the Tephrocactus Study Group. Members will therefore have to pay their membership fee direct to the Secretary in £ "Sterling". If any member has difficulty please e-mail, or write, to the Secretary to make arrangements to pay in € (Euro) to an account in Germany.

We would like to thank Dawn Nelson for the sterling work she has done for the TSG in the past and wish her all the very best in the future. We also hope that she will still remain in our midst as a member.

PTEROCACTUS HICKENII (BRITTON & ROSE).

There are between six and nine species of Pterocactus depending upon which botanist you follow. I grow them all and, in my opinion, by far the most attractive, in segment shape, colour and spination is P. hickenii. Some botanists subscribe to the theory that the species is synonymous with P. skottsbergii but I am not so sure. P. skottsbergii also has chunky stems but has strong long spines and a more laxly branching habit than P. hickenii.

Whilst most species of Pterocactus have slender stems those of P. hickenii are spherical. The stems have a shiny dark brown epidermis tainted with deep purple in some clones. The blackish spines are between 3mm and 7mm in length. The 3 – 5 cm diameter stems arise from a thickened tuber or rootstock that is typical of the genus.

The terminal flower, which is also a generic trait, varies in colour from yellowish-pink to deep orange, again depending upon the clone. The dark purple stigma lobes of the flower also occur in most of the other species of Pterocacti.

It is my long-standing belief that the habitat of all cacti and succulents dictates the optimum growing conditions of the plants. Species of cacti from the regions of Southern Argentina/Patagonia require a cooler summer environment than plants growing further north at the same altitude. The former plants often suffer in the excessive temperatures experienced inside a greenhouse during the summer. In fact, examination of the isotherms on a climatic map of the region reveals the need for lower temperatures. The metabolism of Pterocacti function most efficiently at temperatures of 65°F or lower. For this reason I grow them on an outside window ledge until the frosts arrive.

I grow all my Pterocacti in a loam based compost with added chicken grit (fine material), Cornish grit, finely ground oyster shells (for calcium) and Fish, Blood and Bone Meal as a low (4%) nitrogen base. Frequent repotting will accommodate the expanding rootstock. With the exception of. fischeri, most species will flower in cultivation.

The illustrated Pterocactus hickenii on the front cover is a native of the Comodora Rivadavia region of south Argentina. It is grafted onto Opuntia subulata but this implies no specific difficulty in cultivation on its own roots.

John Betteley, Newark.

MEALY BUG

First of all I would like to thank Alan Hill for his information on the use of Armillatox. (Vol. 8 No. 3) I had bought a bottle in early Spring and 'mislaid' the instructions. My problems had started in Spring when I removed the top quarter panels in both greenhouses replacing them with open mesh to prevent cats and squirrels getting in. In early September I started to find large numbers of bugs, on staging and plants, under one of these panels. The odd one or two I can handle but not this large an amount. I am against using synthetic insecticides. So I decided to try Armillatox. Suitably clothed I made up a 1/200 wash, emptied both greenhouses, vacuumed from top to bottom and then washed all staging and floors thoroughly. I then made a 1/400 solution and drenched all pots and plants. Both houses now have a strange smell, like stale cigarettes, but, so far, the mealies have not returned. Remembering that we have had a mild September and October this is a good result. Perhaps this one Autumn wash, possibly supported by a second in Spring, will do the trick?

A.James. Birmingham.

One of the problems with mealy bug is that one kills the bugs but more hatch from the eggs. Armillatox will kill both. An additional bonus is that, unlike with some insecticides, there is no chance of the mealies developing a resistance to the product. Apparently it covers the bugs and eggs with a thin coating which stops the bugs from breathing through their skin and so kills them. Eggs have a semi-permeable membrane and will not be able to develop when deprived of the oxygèn. I assume that it is possible that some bugs/ggs might have not been sprayed. A spray in Spring would be an added precaution. Personally I would want to have the plants growing again before giving another spray. One assumes the suggested strength for spraying plants is sufficient to cover an insect to stop it breathing but not to give such a coating as to stop the epidermis of the plant operating correctly. I wonder whether it is safe to spray on young seedlings? I have my doubts.

A. Hill. Sheffield.

THE GENUS QUIABENTIA (BRITTON & ROSE).

When the TSG Journal Editor tells you that any Opuntia related article is better than a blank page then its time to pen an article on a small genus of cylindrical stemmed plants native to South America.

Quiabentias are tree like or bushy plants with fleshy stems and oval to spathulate leaves, depending upon the species. The areoles are large, with whitish wool and the spines are slender and often numerous. Some are reduced in size so that they almost resemble glochids.

In some ways the plants look like thick stemmed Pereskiopsis but the absence of true glochids and the lack of a distinctive mid-rib on the leaves distinguishes them from that genus.

Backeberg lists five valid species: chacoensis, pereziensis, pflanzii, verticillata and zehntneri. The various species are distributed in isolated regions of the Brazilian catinga and in areas from eastern Bolivia to northern Argentina

All species are uncommon in European cultivation but I have managed to acquire and grow two species during my thirty-year association with Opuntias.

The only species that I presently grow is Q. chacoensis. This is now three feet (91cm) tall with a one and a quarter inch (3 cm) diameter main stem and several horizontal side branches.

The succulent leaves, which arise from the base of large white areoles, are spathulate shaped and one and three-quarter inches (4.5cm) long by three-quarter inches (2cm) wide. As winter approaches the plant loses its lower leaves from both the main stem and side branches. Each areole has between one and three white spines of variable length, the longest being one and a quarter inch (3cm) wide.

According to Backeberg the flower is red, narrow throated and arises close to the apex of the stems. Little is known of the flowering characteristics of all the species, either in habitat or cultivation. Q. chacoensis is native to the Jujuy province of Northern Argentina.

In cultivation Quiabentia need a rich compost and plenty of water in summer otherwise the leaves and stems wither. A minimum temperature of 50°F (10° C) is recommended. Do other members grow these fascinating plants?

John Betteley. Newark.

When Royston Hughes came into my greenhouse and saw my six inch (15cm) Q. chacoensis he began to laugh. When I asked him what was so amusing he said that it was the contrast between my plant and the tree-like specimens that he had seen in habitat. I was rather hurt because I had struggled for years to manage to persuade it to attain that size. One of my problems was that it had, in the past gone black at the base and dried up. Hence I was constantly, each year, re-rooting it. I finally realised that it needed warmer conditions than the 40°F that it had been suffering out on the bench in the greenhouse. It had, therefore, been transferred to my hotbox where it has survived. Reading John's article has made me realise how I can make it happier. I need to put it in a larger pot, give it a richer soil and much more water than it has been receiving in summer. I suppose that I will then need a larger hot box to accommodate the plant.

To repeat John's question. Does anyone else grow Quiabentia? If so please do let me know. Perhaps we can spread some cuttings around and so increase the occurrence of the different species in cultivation. However, at present my plant has only one small branch.

Ed.|

MAIHUENIOPSIS OVATA (PFEIFFER) RITTER.

Figure 2 shows a plant owned by Royston Hughes which came labelled "T. ovata". It was growing in a four and a half inch (11.5cm) square pot and is shown in flower in 2000. The plant had flowered the previous year and Royston had managed to fertilise the flower by using the pollen of a plant labelled "T. russellii". Both plants set seed as a result of this cross. One might expect cross pollination between different species (if these plants were in fact different species) to produce seeds that would produce hybrid plants. Hoever, the external features of the seed pods and the exterrnal features of the seeds themselves would not be affected. The seedpods and seed will look the same whether the seed is of pure origin or hybrid as it is the genetic makeup of the mother, not the father, which decides these features.

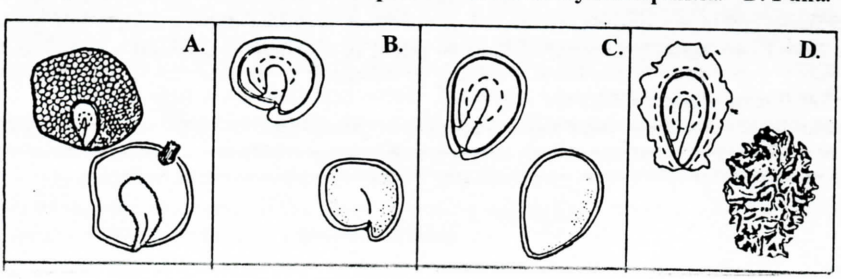
Figure 3 shows the fruit of the T. ovata when it was removed from the plant on 5th November 1999. When the fruit was sectioned Royston states that the seeds were revealed to be in an extremely viscous translucent pulp (Fig. 4). The seeds were removed from the fruit and given a chance to dry out. (Fig. 5).

In 1925 Spegazzini, in Anales de Sociedad Cientifica Argentina 99:86, erected the new genus of Maihueniopsis for one species, M. molfinoi, and Ritter, in Kakteen in Sudamerika Vol. 2 Pages 384 – 386, extended the genus in 1980. Work by Roberto Kiesling on some of the Opuntia of Argentina was published in 1984 in Darwiniana 25(1 – 4) 171-215. On P175 a diagram shows the seed and other characteristics of four of the Opuntioideae sections recognised by Dr Kiesling. Fig. 1 below is extracted from that diagram. If one compares the photographs with the diagram below one can see a correspondence between the photographs and the drawings of the seed in the Maihueniopsis column. Ritter described the fruit of Maihueniopsis as being inverted cone shaped to egg shaped. The fruit is slightly turberculed, green to yellow with white felted areoles, usually with glochids and frequently with fine spines. The ovary has a thick wall and is filled with a sour, jelly-like pulp, as opposed to Cumulopuntia which has dry seed (See above citation for Maihueniopsis and Ibid. 399 – 400, translated in TSG Vol. 5. No 4 Dec 1999 p351-355, for Cumulopuntia). R. Kiesling states that the fruit is fleshy with thick walls. All these statements correspond with Figs 3 & 4 and the description of the contents of the fruit given above by Royston. It can therefore be said that Figs 2 – 5 illustrate material from a Maihueniopsis. Royston's plant was labelled "ovata". Ritter included "ovata" in his list of Maihueniopsis so it would appear that the identification is probably correct.

A. Hill. Sheffield.

Fig. 1. From Darwiniana 25 (1 – 4) P175 by R. Kiesling.

A. Tephrocactus. B. Maihueniopsis. C. Austrocylindropuntia. D. Puna.



THE STORY OF THE SEED.

In 1999 five of my Tephrocacti (sensu Backeberg) flowered. Two of these were a spiny T. ovata ex Chris Hall (Fig 2.) that produced two buds and a T. ovata form from Ray Allcock, labelled T. russellii, which produced one bud. These two ovata forms flowered close together and I was able to cross-pollinate them. The pollination resulted in one good fruit forming on each plant. The second ovata flower had flowered later than the other two and in order to pollinate it I had to take pollen from the russellii flower when the latter had started to wither.

One ovata plant fruit was quite fat, similar to the segments on the plant. The second fruit on the ovata, the result of the late pollination, did not fatten up in the same manner and I expected that there would be no seed inside it. The russellii plant had a slimmer fruit than the good ovate fruit and was a little cylindrical in shape, similar to the segments of that plant.

On the 5th October the fruit on the russellii plant appeared to have ripened and dried up so I removed it from the plant. Cutting it open I found seventy-four of the lenticular seeds, which were dry and loosely clumped together. They had obviously grown tight against each other as the lenticular shape of each seed had little facets on the face of each, where they had been touching each other

The good ovata fruit was the same age as the russellii fruit but showed no sign of ripening or drying up. It did colour up slightly with a hint of yellow and red on the green skin. On 5th November I decided it needed to come off the plant so I removed it(Fig.3). On cutting through the thick wall of the fruit I found the seeds were in a very glutinous, translucent pulp (Fig. 4). It took quite some time to extract and clean the seed from this pulp. Even when the pulp had been washed clear of the seed, the seeds each had a slippery skin, just like tomato seeds, that prevented them from being gripped. Eventually even this covering was removed (Fig. 5) and I had forty-one seeds. Fewer seeds in a larger fruit, compared to the russellii, meant that they were all lenticular with no faceting and slightly larger than in the russellii fruit. I also removed the second fruit of the ovata and cut it open. I expected to find no seeds at all but in fact there were two. They were in a pulp similar to the ones in the other ovata fruit.

There were a number of the ovata seed where the seed case had not fully formed. This lack of development was always in the hylum area (See Fig 7 where the incomplete development of the outer seed wall in some seeds can be clearly seen). The kernel inside was apparently well developed and could be clearly seen through the hole.

Although it was late in the year, I decided to sow some seed with some heat below. I was using the idea that cactus seed, straight off the plant often germinates well. I planted twelve russellii and nine ovata seeds. The ovata seeds included those with the under-developed seed cases explained above. To control the heating I used a time switch that switched off overnight. Within a fortnight the seed started to germinate and within another fortnight I had nine russellii and eight ovata seeds germinate. However, I then needed to switch off the heat to prevent the etiolation that was starting. When I checked the plants at the New Year I was surprised to find that there were germinations of twelve and nine meaning one hundred per cent germination success.

I put some more seed in on the 12th April under similar conditions but so far, fourteen days later, only two have germinated. The choice of date was because I was aiming at a fourteen-hour daylight length.

Royston Hughes. Liverpool. 26 April 2000.

Has anyone any comments on the above two articles? Ed.

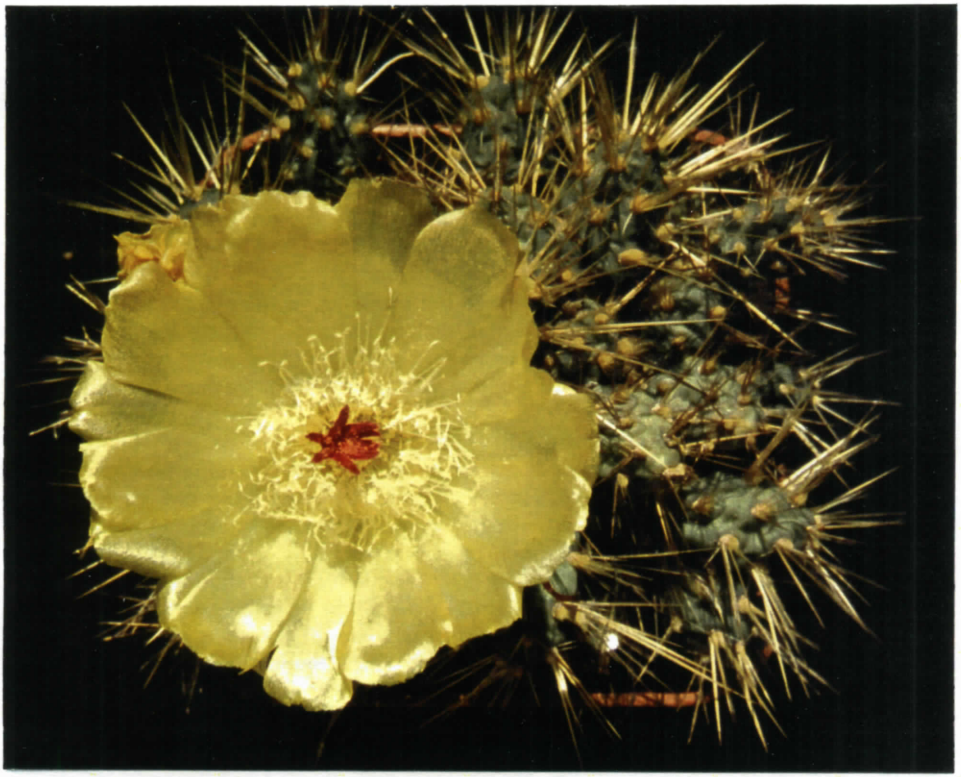
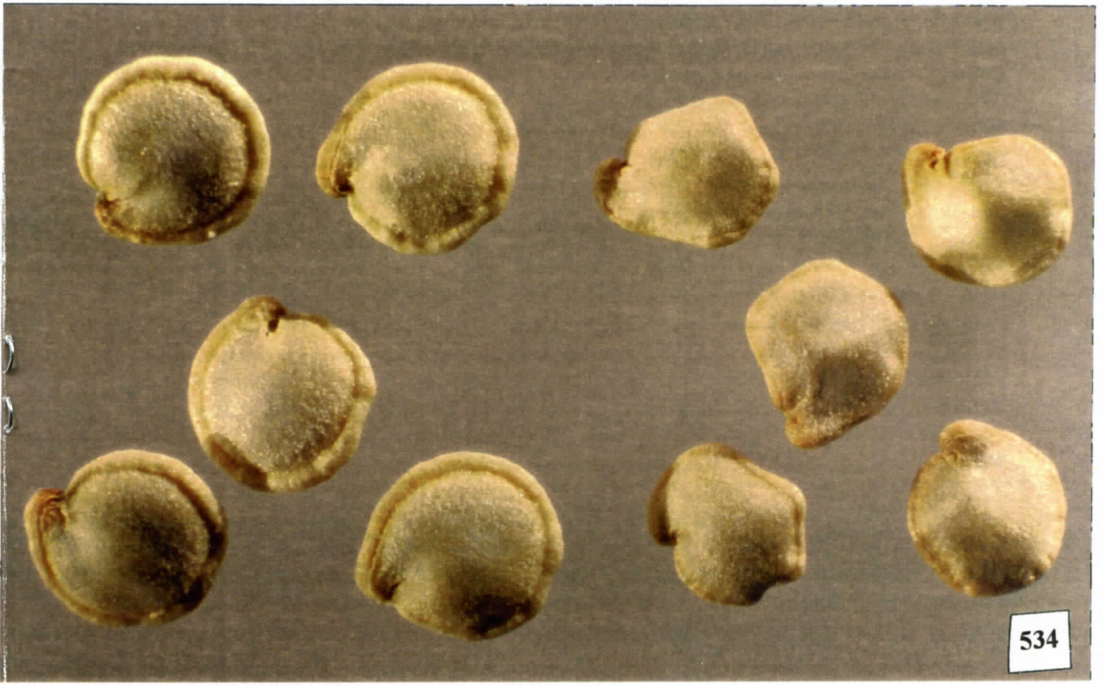


Fig 2. Maihueniopsis ovata in flower.

Fig. 3. Maihueniopsis ovata seed pod.

Fig. 4. Maihueniopsis ovata seed pod.

Fig. 5 Maihueniopsis ovata seed. All photos by R. Hughes.



COMMENTS FROM A RECENT NEW MEMBER.

I became a member during 2001 and decided recently to purchase the past Journals, mainly because so many new articles referred back to ones published earlier. Now, having read them, I write a few thoughts.

I was really surprised to read that Tephrocactus recurvatus (T. curvispinus) was hard to root from cuttings. My cutting from Graham Hole was planted in September last year, was just kept moist and above freezing. It was treated as a plant during the summer and has developed a good root system. I sometime think that cuttings are given too much time to "heal over" before planting. My cutting was potted the following day that it was taken.

My greenhouse is twenty-five feet (7.5m) by sixteen feet (4.8m) and fitted with double glazed polycarbonate sheets, which I have found keeps the heat more in winter and also my plants flower better. I use a "Parwin" electric heater to keep the temperature just above freezing and a fan to run all through the year.

It was good to read of other member's seed troubles having only had success with four types of seed in my first tray, in which I used cat-litter mix. The hard seed coated treatment advice from Mr Elton Roberts, USA, with seed left in bottles in the high summer heat for a couple of years would appear worth trying. A lady in central Belgium, Julienne Jacobs, leaves hard seeds in sugar water overnight. She says, "Something which can make holes in our teeth should weaken a hard seed testa as well". Something else to try!

Reading the articles about the floccosa group wanting a summer rest and then growing in autumn was a great help. I had observed this with my own material that appeared to slow down in summer. Now, in September, they are putting on new growth again.

I am still left with much confusion as to which "name-groups" to follow officially. With the new publication, "Studies in the Opuntioideae", the name "Puna" disappears, just when I had become used to it. Is the TSG going, one day, to publish an "advice list" for its members to follow? At least then we would be writing to each other with the same plant name! I am still left with O. sphaerica and related material left under the Cumulopuntia group.

The published letters of Dr Roberto Kiesling, Mr James Iliff, Mr Klaus Gilmer etc. have added importance to the Journals and made them a reference work in themselves.

I end with recommending all new members, who have not yet done so, to purchase the Journals from Volume 1, 1995.

David Parker, Birmingham.

David makes an interesting point about the TSG giving an "advice list" one day about names. The various names used might confuse members but they also provide problems for the editor. Editorial policy is to print the name used by the author of a submitted article. The reason for this is that there is no "official " "name-groups". Any one is able to publish a name and as long as the publication is done in the correct manner according to the accepted code of nomenclature then that name is valid. Whether it is accepted is a matter of personal choice. Puna will not disappear even if it simply ceases to be used. It is a valid name published by Dr Kiesling. Later publications making it a synonym of a new name, or even a previous name, are valid but do not have to be accepted by everyone. People (members) can use the name "Puna". In fact Dr Kiesling has said (in a personal communication) that he still believes that he was correct to erect the name for the specific plants he listed because

he sees them as worthy of being segregated from others. As individuals are legitimately entitled to use any valid name they wish then, in an article, one should cite the author after every name mentioned. This would indicate whose divisions are being followed. However, this could be off-putting to members submitting an article for publication and there is no intention of making it mandatory.

If, as is the case, members are free to use whichever name system they wish then it would be arrogant for the Editors to alter the submitted name, by the author of an article, to a system in the Editors' minds. Several times there has been a request in the Journal for members to start a debate in the Journal about the various nomenclaturral divisions of the plants we study. So far no one has had the nerve to do so. Instead members simply use the names with which they are familiar, some which suit their particular interpretation or simply follow the system they have read in the most recently published book. The latter must use a great many labels as they alter the name of their plants.

There is an editorial policy to define what an author means when an article is submitted and includes the words "True Tephrocactus". This term needs clarification. Usually the phrase means the plants listed as such under Roberto Kiesling's system of division. Therefore the words are altered to "Tephrocactus sensu Kiesling". Sometimes there is reference to Tephrocactus as an "umbrella" term. This usually means "Tephrocactus sensu Backeberg".

The above comments deal only with the genus or sub-genus name. There are similar problems with species names. Some of the above comments apply to species names. One should cite the author so others know to what plant is referred. David above clarifies his meaning by putting a synonym in brackets.

There can, therefore, never be an "official" list of names to use. By debate we could try to come to some form of TSG consensus as to what names we will use in our discussions. However, we are a long way away from that because we have not even begun the debate. Please will someone start it? However, even if it is started and some consensus is reached it does not prevent any member from following his or her own inclination about classification. Members will not be forced to accept a consensus. It would be nice to find out what members think and try to come to some conclusions. Please will someone be brave enough to start the discussion even if it is simply by stating his or her preference and that is to call them all Opuntias.

Ed.

David also mentioned something else which is not included in the above article. He mentioned the help he had received from various members and referred to a members' list. When we started the TSG it was as a "Round Robin" so members' names and addresses were listed. As we progressed to a Journal the practice of giving out the information on members ceased. There is no suggestion that we should divulge the information now without the permission of the member concerned. There is merit, however, in members knowing if there are other TSG members within travelling distance who would welcome contact. It would also be useful to members to know of other members who would welcome postal or email contact. Such contact will help individual members and might even result in a Journal article for the information of us all. If you are willing to have your name and address details published please will you inform Rene when you renew your membership? We can then see how many members are willing to be publicised. If there are only a few we will have to consult with them if they are prepared to continue to approve their details being published.

COMPOST THEORY.

Everyone who grows things tends to form opinions about their plants' needs. They know when to water them, what sort of fertilizers they like and, especially, what sort of compost they prefer. (In these notes 'compost' means 'potting compost'.) The best opinions are those based on experience. If you don't have much experience you have to rely on what you are told, or on reason. Some of the commonest things you are told are part of a sort of regular circulation. Things like 'sharp sand' and 'add grit for drainage' become built into the common background and crop up in books, magazines and conversation. They probably had a sound enough foundation when they started but, after years of use their context is gone. For example, adding grit to clay soils helps to make sure they break up easily into clods and therefore improves drainage, but adding grit, up to about 50%, to a potting compost like John Innes, makes the drainage slower. Above 50% grit it does speed up, but only because the water simply runs round the JI. So, how can we tell whether any particular advice is plausible? There are some things that can be accepted because it is possible to see good reasons why they might work. In other words there is a bit of theory. I outline my ideas, and their reasons, below.

Sterility

I imagine we can all agree that the medium should be free of weed seeds, fungi and all forms of tiny animal life. Well, most of us. There will be some who will insist that nature's way is best. I shall listen politely. You have to watch it though. I have bought sterilized JI, only to find live mesembryanthemum seedlings in it. You can imagine a hard pressed nursery man saying to his staff. " We've finished with those 50 seed boxes. Pull the last few plants out and put the compost in those spare bags." I have bought a sealed bag of "Washed Gravel" only to find it full of mud when I got it home. But most of the big names are pretty reliable so I guess we all have access to sterile growing media.

Colour

Compost should be dirt coloured. I don't like Perlite because it looks like mealy bugs. I don't like Seramis because it's too bright and artificial looking. I tend to be a bit puritanical about coloured surface dressings too but I suppose it's just a matter of taste.

Density

Use a heavy material for tall plants in small pots. This avoids that rain of Aeonium cuttings from the high shelf that occurs as they dry out and fall over. If you value your back then vice versa. Put big heavy plants in light mixtures. Not too light, I don't like Perlite, or Seramis, this time because the material floats.

Cost

Before choosing your favourite ingredients check the cost per litre. Grit, for example, often comes in 25kg bags costing about £3.00. 25kg is about 10 litres. So the price is about 30p per litre. Asda general purpose potting compost in big bags is about 4p per litre. So, adding grit to compost inflates its cost. Prices depend very heavily on the size of package. Big bags of Perlite from a wholesaler run around 8p per litre. Smaller bags from a garden centre can cost two or three times this. It is worth while doing the sums; just divide the bag price by its size in litres.

Surface Area

I bought a book on soil science from a church sale. (10p) It's not very interesting but one feature caught my attention. All of the different soil types contained some clay. Clay is a very finely ground mixture of rocks. Soil bacteria live on the surface of rock particles and extract plant nutrients. Finely ground materials have a much bigger surface area. A 1cm cube has six faces of 1 sq. cm each, 6 sqcm total. If you divide this into eight half

centimetre cubes then each face would have an area of 0.5 x 0.5 = 0.25 so that the new total area becomes 8 x 0.25 x 6 = 12 sqcm. Every time you divide the sides by two the total area doubles. One cc of clay has a surface area measured in square metres. This has to be an advantage, but there is a disadvantage which renders pure clay useless. (See 'Particle Size' below.)

Oxygen

Most plant roots need oxygen. Waterlogged plants die. Normally water drains downwards out of plant pots and air is sucked in to replace it.

Water

All plants need water. Advice for succulent growers often suggests leaving the plant to dry out between waterings. This is probably better than overwatering but there is a risk of root hairs dying. The plant can replace dead root hairs but it is an extra stress.

Particle Size

A plant pot full of glass marbles, of any size, has about 26% air space. The spaces are connected so that water can run through, sucking in air as it does so. Some water remains trapped inside. It is held by capillary attraction just round the points where the marbles touch each other. The balance between trapped air and water is determined by the size of the marbles. Small particles hold more water and less air due to more contact points. Irregular particles give denser media, less than 26% air space, but the same principle applies, fine particles hold a lot of water and relatively little air, and vice versa. Clay is very easily water logged and, because the spaces are so fine, the water can hardly move. It is practically waterproof.

Humus

One of our members has said "There's no peat in the desert". It's true, but there must be some accumulation of dead material. Most cacti grow with some other plants. Some of these have leaves and drop them every time it stops raining. They have flowers that are pollinated by animals of one sort or another. There must be dead animals and other animal wastes even if it's only ant droppings. There may be less than there is in the garden but there must be some humus. The cellulose in dead plant material can hold up to one third its weight of water. It does this without excluding air. This water is available for maintaining humidity in the soil.

Variety

In cultivation it is possible to use hydroponic methods and the fertilizers for this are now claimed to include all relevant nutrients. I still cling to a tiny, residual scepticism. I like the idea of including some sort of humus just in case science has missed some minor, but essential, item of the plants' diet. The same argument applies to clay that is often a mixture of minerals. There are problems in choosing the right form of humus and deciding where it is to fit in the structure and clay is too waterproof to be used directly.

Peat

Peat provides a good balance between air and water. It is springy and stays open and airy. The fibres are fine and trap water by capillary action. They also absorb water. There are disadvantages. It is acid. If it becomes water logged it can become very acid. Repeated wetting and drying, together with the weight of the plant gradually force it to settle down becoming compacted and losing the ability to hold large amounts of air.

Peat Free Composts

These have been improved. Many other ingredients are used. Coir and composted bark are common. It seems possible to me that these mixtures could contribute something to plant nutrition whereas peat is sterile and contributes very little. Some of them are better at resisting compaction.

Mechanical Stability

Cacti and other succulents tend to stay in the same pots for long periods. The arguments so far suggest that there is a need for humus but that this has poor long-term stability. For this reason most composts for long-term potting include a large proportion of some rigid mineral, the idea being that this will support the weight of the plant and keep the material open.

Chemical Stability

There is also a need for chemical stabilty. We don't want the pH, for example, to drift towards either extreme. But I don't know enough about this to comment further.

John Innes

I have reservations about this. At the time it was first developed it was brilliant. Firstly it used 'loam'. Most nurseries would interpret this as soil; readily available and cheap. Sand was included to offset any stickiness in the loam. Peat made sure there was adequate humus. Bonemeal coped with the high nitrogen demand that followed sterilization. Steam was used to sterilise this mixture. The nursery next door to us had such a boiler. I think it doubled as a greenhouse heater. There was a box, about 8 x 4 x 1 ft, over the top. A man could stand in it stirring with a spade while the steam seeped through. I guess it sterilized his boots as well. These materials and this technology were available, cheap and familiar. Nowadays I think we can do better. There is, too, the question of 'Loam'. Does every supplier use an equally good source of this?

The Perfect Compost

So it seems that we could do better by using some form of sterilized humus mixed with a large proportion of some mineral. The humus should be a mixture of materials to reduce the risk of missing nutrients. The mineral should have fairly large particles to provide air space but should also have the large surface area associated with tiny particles. This sounds contradictory but can be achieved. Like the humus it should be a mixture of materials.

Some Minerals

Some types of grit, for examples, Cornish and Lavalite, have very rough surfaces so that quite large particles, 4mm, can have a much bigger surface area than normal grits.

The two expanded minerals are well known. Naturally occuring rocks are heated and internal gases blow them up to provide a very large surface area. I don't like Perlite because it is not mechanically strong and cannot provide any nutrients. Vermiculite is soft and probably not able to provide long term stability. It does have useful chemical properties which I don't understand but which I think help to retain nutrients while making sure they are available to the plant.

Many people use sand. They obtain good results but to me sand seems to be too fine; good at retaining water, but not as free draining as coarser materials. One can imagine that, a few years ago, it did provide an easy way of creating a sterile, damp environment for seeds.

LECA

Light Weight Expanded Clay Aggregates are made by heating damp clay balls. These expand and the clay particles fuse together. They must provide one of the best ways of meeting these contradictory requirements. The particles can be large leading to a free flow of water and a well aerated compost while, at the same time, the fact that the granules are porous means that the mixture can retain plenty of water. Because they are made from clay, which is only partially fused, the surface area of the granules is large providing plenty of room for useful soil bacteria. They are available under a variety of names. Hortag, Hydroleca, Seramis, Cat Litter etc.

Brick

At one time many Succulent growers used broken brick. It can have all the virtues of clay together with the large particle size needed for good drainage. I don't know why it became unfashionable. It may need soaking to get rid of excess alkalinity. There may be other undesirable chemicals in modern bricks. Or it may be that it is difficult to find a reliable supply at a reasonable price. Big garden centres like to attract customers but there are other things on their agendas.

Grog

Much the same applies to refractory aggregate. This was called 'Grog' by some and was the subject of a short paper by R.Mottram in the BCSS Journal. It doesn't seem to be widely used and I don't know why.

Experience

I bought a big bag of some smallish clay granules from Warren Withers. I mixed this 50/50 with Asda peat based potting compost. I added a small amount of 'Summerlong' slow release fertilizer because I don't like messing with liquid feeds. All repotted plants and cuttings went into this. I am no expert but they did seem to me to do very well; much better than some others I've seen. They grew big, with big spines. They are not soft or etiolated and quite a few of them have flowered. Needless to say Murphy's law was invoked and when my big bag was empty I found that Warren couldn't get any more. I am currently trying to set up a supply of Claytek. The catch is the minimum quantity they will deliver, 40 x 50 ltr. bags. I may have to start eating it.

References:

1. An Introduction to the Scientific Study of the Soil. W.N.Townsend
2. Growing Succulent Plants in Captivity. (Booklet) R. Mottram
3. The Theory of Composts. (Paper) R. Mottram

W.L. Jackson.

AUSTROCYLINDROPUNTIA MALYANA.

In Volume 8, No. 2 page I reported attempts to root two offsets from Bill Jackson's plant which had lost its rootstock during the winter. They were growing and all seemed to be going well but, in late July, the larger offset stopped growing. In fact it started to shrink and, by the middle of August, appeared to be dead. By early September it was in a sorry state. I removed it from the pot and found that it had put out a small root but had started turning black from the bottom upwards. The soil in the pot was slightly damp, had it been overwatered? The second offset had started growing so I changed tactics, watering from the bottom just once a month but maintaining the regular mist spray. This one seems to be still alive.

These results set me thinking. In the wild do these plants use their roots just for anchorage and rely on wind blown dust for nutrition and mist for moisture? Certainly they throw up plenty of challenges. I would like to keep on trying if I can acquire more offsets. In the meantime I have gone against my principles and purchased a *grafted* plant from Rene Geissler. This will spend the winter in the small bedroom alongside the surviving offset.

A.James. Birmingham.

Fig. 6. Quiabentia chacoensis.
Photos by J. Betteley.

Fig. 7. Seed comparison
Photo by R. Hughes

ovata

russellii