

BROMELIACEAE

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Canistrum aurantiacum

BROMELIACEAE

JULY-AUGUST, 1992

THE BROMELIAD SOCIETY OF QUEENSLAND INC.

General Meetings are held on the third Thursday of each month except December at the Uniting Church Hall, 52 Merthyr Road, New Farm, commencing at 7.30 pm.

POSTAL ADDRESS: P O Box 565,
Fortitude Valley
AUSTRALIA Q 4006

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PATRON: Mr. Harold Caulfield

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SHOW ORGANIZER: Mr. Don Hobbs Ph. 286 4156

COMMITTEE: Mr. Neville Ryan, Mr. Bob Paulsen, Mr. Bob Cross, Mr. Michael O'Dea, Mrs. Patricia O'Dea, Mr. Paul Bird, Mr. Barry Genn, Mrs. Olive Trevor.

PROGRAMMES: July - Commentary - Lorraine Wilton
Beginners' Class - Cultivars - John Higgins
Item - Mini Show

August - Commentary - Olive Trevor
Beginners' Class - Removing difficult pups
- Don Hobbs & Paul Bird
Item - To be determined

A DATE TO REMEMBER: 25th Anniversary Dinner - Friday 28th August at Carindale Motel from 7.00 pm to 12.00 pm
Cost \$25.00 - 3 courses including coffee & mints. Table service for drinks if required.
Drink prices extra.

FIELD DAY: Saturday 12th September - 1.30 pm. to 4.00 pm.
To be held at Mr. & Mrs. Hobbs' residence, 2 Blake Street, Cleveland. No plant sales.

TILLANDSIA RAFFLE generously donated by R. Keilly and G. Stewart will be drawn at 25th Anniversary Dinner on 28th August. The proceeds for 1993 Bromeliad Conference. First prize - 50 Tillandsias; Second prize - 30 Tillandsias; Third prize - 20 Tillandsias. Tickets \$1.00 each.

WALL TAPESTRY RAFFLE Beautiful bromeliad tapestry valued at \$800.00 donated by Grace Goode will be drawn at the Conference on 10th April, 1993. Proceeds for 1993 Conference. Tickets are \$1.00 each and raffle books available and can be obtained by contacting Len Butt 848 3515 or Secretary, Val Urquhart 8240627.

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EDITORIAL In this our Silver Anniversary year, time should be taken to reflect on just where we are going and indeed what achievements there have been to promote the cultivation and educate the gardener on the genus Bromeliaceae, here in Queensland, and further to assess what real dangers there may be in the extinction of jungle species by the constant clearing of South American rainforest, which for the most part is where a great diversity of species grow. Worldwide, is the concern that logging is putting a death knell on forests and much is now being addressed to stop it. However the plants like our bromeliaceae which use trees as hosts are so far not considered. The time is now here to do more than just think about this question.

Enclosed in this issue is a list of B.S. of Q. officers who in their time have played their part in endeavouring to promote the cultivation and educate the gardener in the beauty of growing bromeliads.

Let us all of us, go forward with friendship as our aim, biodiversity as our cause and the love of these plants always foremost.

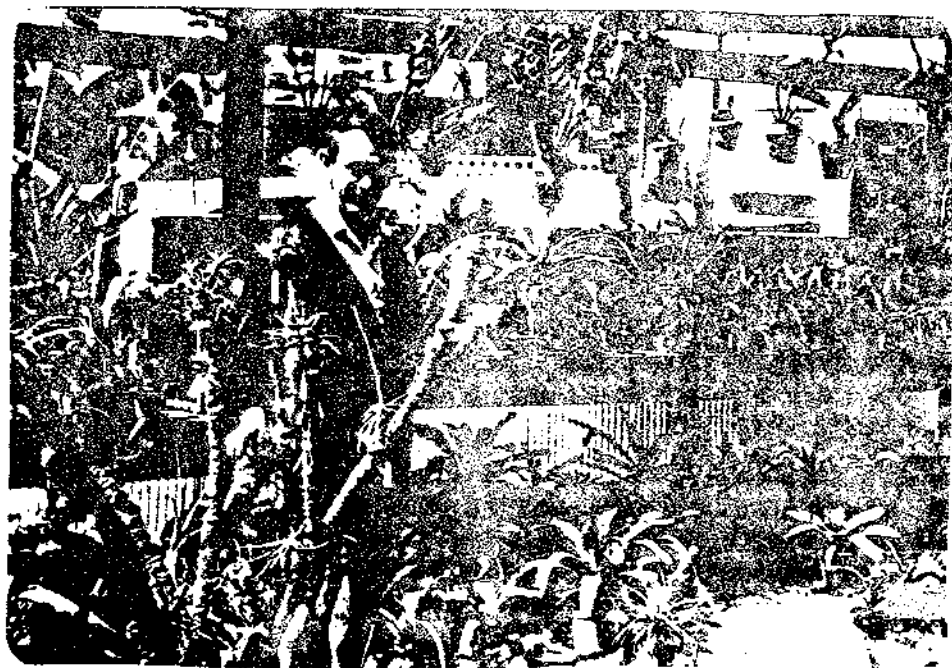
The Editor

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COMBINED SHOW REPORT -JUNE 1992 - Number of entries - 38.
 Classes having most entries - 1 - Tillandsia; 5 - Cryptanthus
 8 - Neoregelia
Winners - Best Tillandsioideae *Vriesea elata* P. Hobbs
 Best Bromelioideae *Neo. cruenta* Broad Leaf
 Red gold P. Hobbs

Best Cryptanthus	<i>Cr. bivattatus</i>	D. Reilly
Best Pitcairnioideae	<i>Abrometiella brevifolia</i>	G. Lawson
Reserve Champion	<i>Vr. elata</i>	P. Hobbs
Champion	<i>Abrometiella brevifolia</i>	G. Lawson
Tom Schofield Trophy	<i>Vriesea</i> Paĥoa Beauty	O. Trevor
Special Awards	<i>Vr. Deutscherzweg</i>	O. Trevor
	Neo. Red Apple cv.	
	Golden Delicious	L. Muller
	Neo. Fostperior	
	Perfection	L. Muller
Miniature Display	Stricta Display	R. Wilson

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Neslie Misso amongst his Bromels - 1969



Bromeliad Society of Queensland 1968 R.N.A. Display

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B.S. of QLD. INC. MINI SHOW - 16th July, 1992

SCHEDULE

- Class 1 Vriesea in Flower
- Class 2 Vriesea Foliage
- Class 3 Any other Tillandsioideae
- Class 4 Aechmea in Flower
- Class 5 Billbergia
- Class 6 Any other Bromeliad

Entry forms for the Mini Show available on the night.

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CONFERENCE - EASTER 1993 List of plants donated by R. Reilly and G. Stewart to be raffled to raise money for the Easter 1993 Bromeliad Conference. Thanks to Greg and Roley. There will be 2 of each plant. It is proposed that 50 plants will be First prize

(one of each will be included in 1st prize), 30 plants for Second prize and 20 plants for Third prize.

T. STRICTA	T. CONCOLOR	T. STRICTA var.
I. BAILEYI cv. HALLEYS COMET	T. GRAEBENERI	LATIFOLIA
T. BERGERI	T. AERANTHOS	T. FLORIDIANA
I. FASCICULATA var.	T. FASCICULATA	T. IONANTHA
I. GEMINIFLORA	T. GARDNERI	T. FASCICULATA var.
T. JUNCEA X	T. JUNCEA	T. GEMINIFLORA var.
T. SCHIEDEANA	T. PRUINOSA	INCANA
T. RECURVIFOLIA	T. SCHIEDEANA	T. CROCATA
T. POLITA	T. XSMALLIANA	T. STREPTOPHYLLIA
T. XEROGRAPHICA	T. SETACEA	T. COMPRESS
T. DIDISTICHA	T. MYOSURA	T. XROTHII
T. JUCUNDA	T. IXIODES	T. MIMA
T. VARIABILIS	T. BARTRAMII	T. UTRICULATA
T. PAUCIFOLIA	T. BALBISIANA	T. DURATII
T. CAPITATA	T. FLABELLATA	T. PAUCIFOLIA var.
T. MERIDIONALIS	T. FRASERI	PROLIFERA
T. POLYSTACHIA	T. COMPLANATA	T. VERNICOSA
T. FLORABUNDA	T. TENUIFOLIA	T. BUTZII
	T. TRICOLOR	

All plants mounted on cork.

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AIR & THE POTTED BROMELIADS ... N.T. Catlan

The plants we love to grow love air. Epiphytic bromeliads have both their roots and foliage exposed to air movement. Tillandsias, growing in wave-like clumps on the desert sands, receive moisture laden in-shore breezes.

The terrestrial bromelia, ananas, dyckia and hectia are exposed to the elements. The puya of the mountains have their share of strong winds. Bromeliads growing on cliff faces and steep mountains are subject to updraughts. The catchy phrase "air plants" does not seem far from the truth.

The emphasis of this article will be on the air content of the soil mix used in pot culture. But remember that it should not be considered in isolation as all the physical properties interact to produce an optimum mix. A potting medium must supply air, water, and nutrients and these are referred to as physical properties.

Segmented bromeliad
and pollinator



Once a plant has been potted, the physical properties are stable, except for decomposition and settling of the mix - both reduce the air content in the mix.

The following summary of different nursery soils encountered when purchasing plants will give you a rough understanding of the air

content in the pot.

Potting mix which has 0 - 5% air.. suitable for plants that like water logged conditions, is very heavy especially when wet, and has a tendency for water to pool on top of the mix when watering. Rarely encountered now from production nurseries, but regularly observed in flea market "amateur potted" plants.

Potting mix which has 5 - 15% air... this is the minimum aimed for in nursery mixes, and is used for trees and shrubs destined to be planted in the garden.

Potting mix which has 15 - 20% air... an ideal indoor plant mix but leads to difficulties for trees and shrubs which when planted in the garden need more watering than most people realise. This level of air is the minimum required for terrestrial bromeliads.

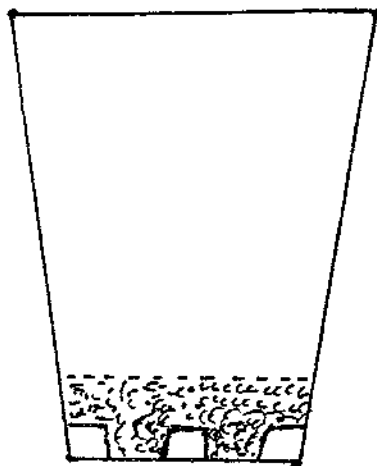
Potting mix which has more than 20% air... this is a mix that requires frequent watering and is used for indoor plants, cymbidium orchids, and is the minimum required for epiphytic bromeliads.

After watering a plant container and the water has finished draining, the residual water content is described as "container capacity" i.e. the amount of water that the soil in that container will hold.

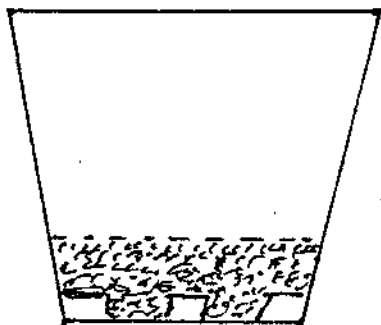
The medium at the bottom of the pot remains saturated even after the excess water has drained away. This saturation level remains constant for each of the soil types shown above, and is not altered by pot size or shape (see Fig.1.).

Brom growers like to use squat pots for stability of the plants but this results in a decrease in the air content %, as the height of the pot is reduced. Placing drainage in the bottom of pots eliminate this problem, but has gone out of vogue with increased labour costs and the use of potting machines. For amateurs interested in the quality and survival of irreplaceable plants, the extra time taken is worth the effort. Broken clay pots are now at a premium for use as a drainage medium, and the only real choices freely available are gravel and chopped up styrene foam. For more stable pots use more gravel than styrene foam. River washed stones (round ones) are preferred to crushed gravel, as the latter has a tendency to pack down. Drainage has the disadvantage that it provides an excellent home for slugs and snails.

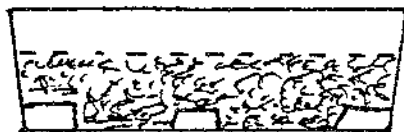
FIGURE 1
(Air & The Potted Bromeliads)



standard pot



squat pot



bonsai style pot

BILLBERGIAS - FLOWERING PROBLEMS - Bromletter, Mar/Apr. 1970

Let a fairly well developed plant dry out even to the point of leaf curl to the centre, from dehydration. The plant can even be taken out of its pot for this period. Then soak the plant well, repot, and water in the normal way and watch the results. For the grower who doesn't want to use chemicals, this may help a stubborn plant to flower.

BUSH TUCKER - FRUITS OF BROMELIADS - Anonymous

The common pineapple as we all know is a bromeliad. Have you ever wondered if there are any others which are edible? Yes there are many - here are a few. Seed is required for hybridisation, so don't eat them all!!

<i>Ananas bracteatus</i>	red pineapple, sweet, not too acid
<i>Bromela balansae</i>	fruit has waxy skin, sweet tropical tasting
<i>Bromelo</i> - others	juice can be used too
<i>Aechmea bracteata</i>	sweet, pleasant tasting berries
<i>Portea petropolitana</i>	fruit requires stewing (no sugar required)
<i>Tillandsias</i>	seeds can be chewed as gum

TIPS FROM MEMBERS - Anonymous

Marking plants - Have you had problems with names fading on plant tags? Here are a few suggested pencils that have been found satisfactory. Colombia Formative 13512B Chinagraph
Swan Stabilo No.7 (made in Germany)
Datr HP pencil (Taiwan)

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25 YEARS OF SERVICE - Office bearers of the Bromeliad Society of Queensland:-

1967	Patron	Harold Caulfield	President	Nez Misso
	V.President	Peter Paroz	Secretary	Len Butt
	Treasurer	Mary Grasselli	Editor	Len Butt
1968	Patron	Harold Caulfield	President	Nez Misso
	V.President	Morris Jones	Secretary	Len Butt
	Treasurer	Mary Grasselli	Editor	Len Butt
1969	Patron	Harold Caulfield	President	Peter Paroz
	V.President	Morris Jones	Secretary	Len Butt
	Treasurer	Mary Grasselli	Editor	Len Butt
1970	Patron	Harold Caulfield	President	Peter Paroz
	V.President	Barclay Binnie	Secretary	Nick Kemp
	Treasurer	Mary Grasselli	Editor	Len Butt
1971	Patron	Harold Caulfield	President	Len Butt
	V.President	Barclay Binnie	Secretary	Nick Kemp
	Treasurer	Mary Grasselli	Editor	Len Butt
1972	Patron	Harold Caulfield	President	Ken West
	V.President	Barclay Binne	Secretary	Nick Kemp
	Treasurer	Mary Grasselli	Editor	Nez Misso
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	V.President	Len Butt	Secretary	R. Nicol
	Treasurer	May Nicol	Editor	Mary Grasselli
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	V.President	Len Butt	Secretary	Audrey Coley
	Treasurer	May Nichol	Editor	Audrey Coley
1975	Patron	Harold Caulfield	President	Peter Paroz
	V.President	Barclay Binnie	Secretary	Audrey Coley
	Treasurer	Carlo Grasselli	Editor	Audrey Coley

1976	Patron V.President Treasurer	Harold Caulfield Michael O'Dea Carlo Grasselli	President Secretary Editor	Mary Grasselli Audrey Coley Audrey Coley
1977	Patron V.President Treasurer	Harold Caulfield Len Butt Carlo Grasselli	President Secretary Editor	Mary Grasselli John Higgins John Higgins
1978	Patron V.President Treasurer	Harold Caulfield Len Butt Carlo Grasselli	President Secretary Editor	Mary Grasselli ? ?
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1982	Patron V.President Treasurer	Harold Caulfield ? Ruth Higgins	President Secretary Editor	Michael O'Dea Verna Hudson Peter Paroz
1983	Patron V.President Treasurer	Harold Caulfield Lorraine Wilton Ruth Higgins	President Secretary Editor	Michael O'Dea Greg Stewart Peter Paroz
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1987	Patron V.President Treasurer	Harold Caulfield Joan Imray Greg Stewart	President Secretary Editor	Bob Paulsen Marge Marshall Len Butt

1988	Patron	Harold Caulfield	President	Bob Paulsen
	V. President	Michael O'Dea	Secretary	Michael O'Dea
	Treasurer	Greg Stewart	Editor	Len Butt
1989	Patron	Harold Caulfield	President	John Higgins
	V. President	Doug Upton	Secretary	Greg Stewart
	Treasurer	Lorraine Wilton	Editor	?
1990	Patron	Harold Caulfield	President	John Higgins
	V. President	Doug Upton	Secretary	Michael O'Dea
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	Treasurer	Lorraine Wilton	Editor	Len Butt
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	V. President	Phyllis Hobbs	Secretary	Val Urquhart
	Treasurer	Bob Paulsen	Editor	Len Butt

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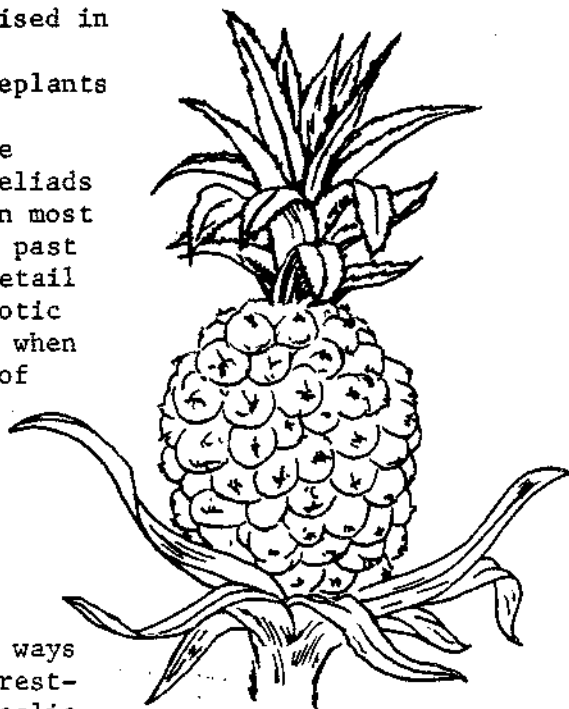
SHORT COURSE ON BROMELIAD GROWING UNDER LIGHTS by Dr. George Milstein

What is a Bromeliad? "Let us play the old guessing game of 'Twenty Questions', only we shall not need that many answers to locate the Bromeliaceae. First, it is a plant, a member of the vegetable kingdom. Second, it is a seed plant and not one reproducing by spores. Third, it is an Angio-sperm, or plant with seeds enclosed in an ovary, and not a Conifer. Fourth, it is a Monocotyledon with one leaf on the sprout, like corn, instead of a pair like the bean. With this goes a character that is much easier to see, namely leaves with parallel veins like those of grass. Fifth, it has showy flowers with real petals, and not a lot of dry scales, like grass. Sixth, its petals are all alike as in a lily, but there are only three of them, while there appear to be six in a lily.

Finally, flowers are scarcely necessary (for identification), for if you see parallel-veined leaves with scales on them somewhere, there is little else the plant can be but a bromeliad. However, within these limits, you can find such tremendous diversity as that between the pineapple and the Spanish moss."

Lyman B. Smith, Ph.D.
Senior Botanist, Smithsonian
Institution

Just as a prophet is rarely recognised in his own country, so the beauty of bromeliads and their value as houseplants is relatively unknown in American horticulture. This is all the more amazing since many species of bromeliads have become increasingly popular in most western European countries for the past fifty years. Even many American retail florists know little about this exotic plant family. The mystery deepens when one learns that the entire family of the Bromeliaceae is indigenous to the Western Hemisphere, ranging from Virginia to middle Argentina. The most common and wide-spread species, *Tillandsia usneoides*, or "Spanish moss", is found from Florida to northern Argentina.



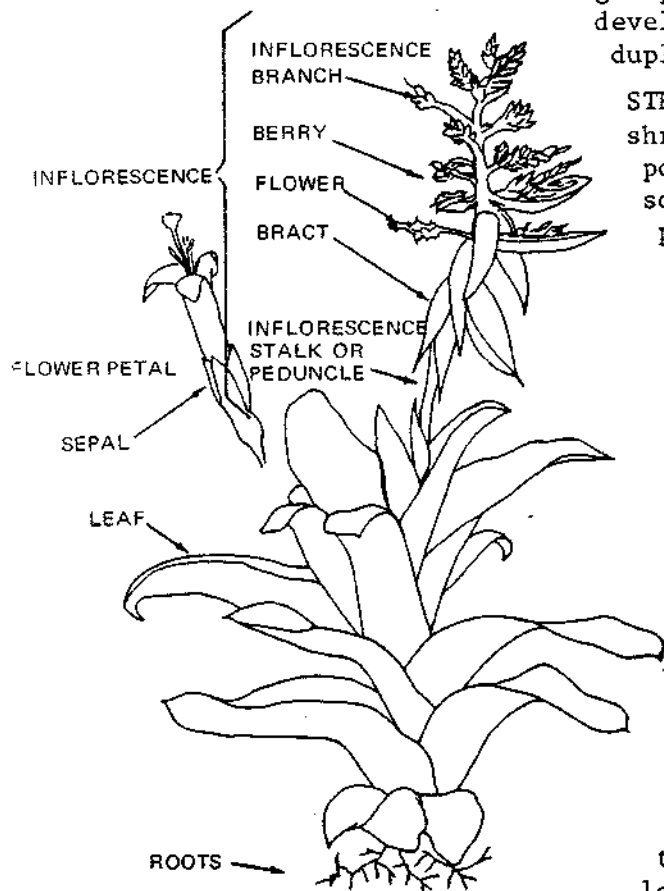
Bromeliads grow in nature in three ways (1) epiphytic (on trees); (2) terrestrial (on the ground); and (3) saxicolis (on rocky surfaces). As is seen in the sketch of a schematic bromeliad, the plant is made up of the following parts:

LEAVES: These range in character from hard and stiff to soft, thin and delicate. The surfaces of the leaves range from shiny smoothness to a woolly fuzzy scurf. This scurf is made up of modified scale cells (see Fig.1) which help the plant to absorb water from its surroundings. In most cases, the leaves are arranged in a rosette with the bases overlapping to form a tank or reservoir that can hold a comparatively large amount of water. These leaf bases also are rich in scale cells which enable the plant to absorb water and dissolved food material from the tanks.

Leaves of bromeliads usually display brilliant patterns and colours. Very often, they are of "discolor: variety, which means that one surface, usually the upper, is green, while the other, the lower, is red or maroon. The patterns, as a rule, are made up of an arrangement of scales in mottled designs, spots and horizontal or vertical striped or bars. Often a condition occurs that causes

"variegation" or striping along the length of the leaf. This is thought to be caused by a harmless virus. The stripes are usually alternately green with white or ivory. Frequently, under the proper lighting conditions, the white or ivory turns a bright pink or red, producing what is called a "tricolor" variety. Generally, this tricolor variation is not passed on to future generations by means of seed but only through the asexual or offset method of bromeliad reproduction.

(Bromeliads reproduce both sexually, by means of seeds, and asexually, through the production of offsets. These latter usually arise at the bases of the plant but also, frequently, from leaf axils. There can be great variations in plants produced from the seeds of a single plant but, except if a sport develops, all offsets are exact duplicates of the mother plant).



PARTS OF A BROMELIAD

STEMS: Bromeliads are true shrubs and while they all possess stems these are often so short as to be almost imperceptible. However, there are some species, especially in the genus *Tillandsia*, where a stem is formed and this may be rather long.

ROOTS: Since the majority of bromeliads is epiphytic, two different types of roots are developed. One, which becomes very tough and almost as strong as steel, is developed to attach and hold the plant to a tree trunk or branch, or the surface of a stone cliff. The other type is much softer and serves in food and moisture absorption. Since most bromeliads feed almost entirely through the scales on their leaves, many thrive with few or no roots. In fact, in some species,

the plants have evolved to such a high state that roots are no longer necessary for food intake or support purposes. This may be seen in species of *Tillandsia*, such as Spanish moss (*T. usneoides*) where the plant is held on to trees by a sort of tangled drapery, and *T. purpurea*, which is tumbled about by the wind on a stony ground. Both these plants feed entirely through scale cells.

INFLORESCENCE The parts of the plant described above are those usually visible to the grower most of the time. However, when the plant reaches maturity and when all growing conditions have been favourable and in proper balance, the plant will finally flower and create seeds to be scattered to develop new plantlets in other locations.

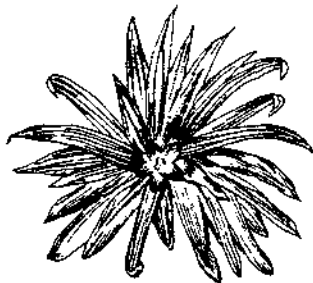
Bromeliads produce an enormous variety of inflorescences or flower clusters. It is the inflorescence that laymen think of as the "flower" in many genera. Often the inflorescence is extremely long-lasting and may even retain its color for weeks or months. However, the flowers themselves actually only last from a few hours to two days. In some species, the inflorescence is so simple as to consist of a single stalk or peduncle. In yet others, it may be a multi-branched complex structure bearing tens of thousands of flowers. In still others, no peduncle is visible.

As seen in the illustration, the inflorescence consists of the following parts:-

PEDUNCLE OR STALK: In some cases, as in the genus *Neoregelia* (see Fig. XI), the inflorescence is sunk deep in the cup of the leaf rosette and, while there is a peduncle, it is so short that the bracts and the berries of the inflorescence conceal it completely.

In other species, the stalk is long and erect and may be single or multi-branched. There are bromeliads which have limp, pendant inflorescences. In the case of *Aechmea filicaulis*, the inflorescence can hang down as much as six feet. There are also inflorescences that begin as hanging stalks and then recurve and grow upwards at a 45° angle to the ground.

BRACTS: Most peduncles have bracts growing along their entire lengths. Bracts are protective sheaths from which the branches may emerge; flowers are produced on the branches.



XI

The bracts are usually brilliantly coloured, and these may stay long after the flowers have faded.

FLOWERS: In some genera, the beginning of the flower is berry-like in appearance. This is seen in the subfamily Bromelioideae. In the subfamily, Tillandsia, the flowers emerge from bracts that are often arranged in a feather or spear shape.

BERRIES: After the Bromelioideae flowers are pollinated, the ovaries with attached calyxes develop into beautifully-coloured berries. It is these berries that are usually seen and remain on the inflorescence for a very long time. In many species, the leaves in the center of the plant that surround the inflorescence turn a dazzling red. It is the bright colour which attracts insects and birds to aid in pollination. It is the same brilliantly-coloured leaves, bracts and berries that attract the attention of birds and animals to use the berries as food.

In the berries, the seeds are covered by a hard indigestible husk and are enveloped by a sticky jelly-like substance that is the "meat" of the berry. After the berry is ingested, the seeds pass through the alimentary canal of the animal or bird without being digested. They are then deposited by the creature in the droppings either on the ground or the branches of trees. A fascinating bit of information about berries, particularly those formed by the Aechmeas, is that those berries which become fertile (develop viable seed) change colour, usually a very bright blue or yellow, while those that are sterile never put on colour. This another method whereby nature ensures that animals and birds are only attracted to eat the fertile berries to insure live seed distribution.

SEED CAPSULES: Those bromeliads which do not develop berries as described above bear their seed in capsules. These capsules are not brightly coloured since it is not necessary for them to be spread by living creatures. When the seeds ripen, the capsules split open into three sections and the seeds, which are plumed like dandelions, are expelled and are carried by the wind to new areas where they germinate.

The botanical name for the family of bromeliads is Bromeliaceae. The family is divided into three subfamilies.

1. **PITCAIRNIOIDEAE:** In this subfamily are found the most primitive members of the family. They are mainly terrestrial plants with heavy spines on their leaf edges. As a rule, they can tolerate

extremely dry conditions and so are frequently mistaken for succulents, and so are often erroneously included in cacti and succulent collections. They have very beautiful inflorescences. The seeds of this subfamily have two or three wings attached to their surfaces. The leaves are very fibrous. The genera belonging to this subfamily often found in indoor horticulture, are *Dyckia*, *Hechtia* and *Pitcairnia*.

2. TILLANDSIOIDEAE: Members of this group all have smooth or entire leaf edges and are almost entirely epiphytic. This is by far the biggest subfamily. These are highly evolved plants and have been able to adapt themselves to many varieties of environment over a greater area than all the rest of the family. They have developed bizarre foliage markings and colours. Their inflorescences are beautiful in form and colour and some of the species have a lovely fragrance to attract insects. The seeds are borne in capsules and are plumed. The genera belonging to this subfamily often found in indoor horticulture are *Guzmania*, *Tillandsia* and *Vriesea*.

3. BROMELIOIDEAE: Most of the bromeliads grown indoors and as windowsill plants are members of this subfamily and are mostly epiphytic, though there are many terrestrial members. The leaf edges are almost all spiny. The leaves are usually arranged in rosettes which may be cup-shaped or tall and tubular or vase-shaped. These plants have foliage with the most attractive markings and patterns in many striking colours.

"Discolors" are often seen as are "variegations" and "barrings". The inflorescences show a greater variation in form, size, colour and arrangement of flowers than the other two subfamilies. In this group the flowers develop into berries filled with a sweet sticky jelly which surrounds the seed. The bracts on the inflorescences are also brilliantly coloured as are the peduncles and are often long-lasting. The genera of this subfamily usually found in indoor horticulture are: *Aechmea*, *Billbergia*, *Cryptanthus*, *Neoregelia* and *Nidularium*.

It may be well to give brief descriptions of the eight most popular genera that may be grown indoors. After each generic description is a brief listing of those species and hybrids which are adaptable to conditions found in the average metropolitan home or apartment.

GENERA OF THE BROMELIACEAE: *Aechmea* (see Fig.III): Probably the most popular of all bromeliads. The plants have foliage so attractive that growers are content to raise them for this alone though the shapes and colourings of the inflorescences are spectacular. The leaf edges are spined. Most of the species are epiphytic, and most have deep cups to hold water. Desirable species and hybrids: (1) Zebra-like chocolate markings against a pale green background *Ae. orlandiana*, *Ae. fisteriana* and their hybrid offspring. *Ae. X 'Bert'*; (2) Discolor foliage with blue flowers on red berries carried on long-lasting inflorescences. *Ae. miniata* var. *discolor*, *Ae. fulgens* var. *discolor* and their hybrid offspring *Ae. X 'Maginalli'*; (3) Dark, almost black, bars on a pale green or white background *Ae. fasciata*, the most popular bromeliad in the world, and *Ae. chantimi*; (4) Plants that turn a brilliant red in their center leaves before and during flowering *Ae. recurvata* var. *benrathii* and *Ae. recurvata* var. *ortgiesii*; (5) Plants with hanging inflorescences *Ae. racinae*, *Ae. victoriana* and their hybrid offspring *Ae. X 'Foster's Favorite'*, the first bromeliad granted a U.S. patent.



III

Billbergia (see Fig.VII): These plants are usually tall and tubular or urn-shaped. They are usually epiphytic with spiny-edged leaves. The foliage of some is among the most gorgeous in the entire bromeliad family. These plants are easily hybridized. The one so-called short-coming of this genus is their short-lived inflorescences. But, when they do bloom with fantastic colour combinations, the effect is well worth waiting for. In a single inflorescence, it is not uncommon to see red, yellows, oranges, greens, blues, purples and even other colours. Usually the inflorescences arch over gracefully, although a few have upright peduncles. Most *Billbergias* mature in a short time and some species may flower more than once a year. Desirable species and hybrids: *B. nutans* (easiest of all bromeliads to grow and flower); *B. pyramid-alis*; *B. venezuelana*; *B. amoena*; *B. horrida*; *B. X 'Fantasia'*; *B. X 'Santa Barbara'*; *B. X 'Catherine Wilson'*; *B. X Muriel Waterman*; and *B. saundersii* hybrids.



VII

Cryptanthus (see Fig. XII): The plants of this genus are commonly called "Earth Stars", and when one sees them this is easy to understand. They are terrestrial and, because their usual habitat is the floor of the jungle, they require less light than most other genera. Their leaves are hard and stiff, and usually the edges are wavy with a "pie-crust" effect and spined. The patterns and markings of the foliage are strange; the leaves of some species resemble an exotic snake-skin.



XII

The leaves are flat and grow low and parallel to the ground in a many-pointed star shape. They are grown mainly as foliage plants but their pretty white flowers, emerging low in the cups, add to the attraction of this plant. Desirable species and hybrids: *C. fosterianus*; *C. bivittatus*; *C. beuckerii*; *C. bromelioides* var. *tricolor*; *C. X 'It'*; *C. X 'Racinae'*.

Guzmania (see Fig. XVI): This genus is characterized by thin, strap-like, smooth-edged leaves often patterned and figured. Frequently, a delicate tracery of thin red "pencil marks" run in parallel lines along the length of the leaves. The inflorescences are generally upright with red, white or yellow flowers peeping out in clusters from behind orange, yellow or red bracts which are sometimes striped. Often these bracts are arranged in a tulip or lily shape at the end of the peduncle. Desirable species and hybrids: *G. lingulata* (all varieties); *G. zahii* and *G. X Magnifica*.



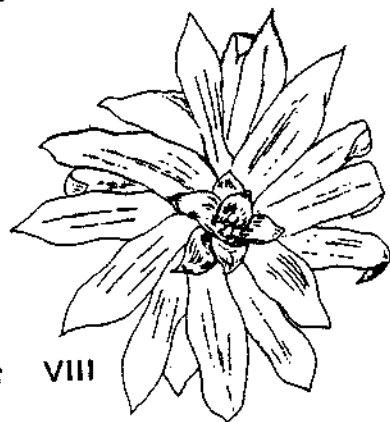
XVI

Neoregelia (see Fig. XI): There are two lovely phenomena associated with this genus. One is that some of the species develop brilliant red leaf tips, earning the nickname of "Painted Ladies' Fingernail".

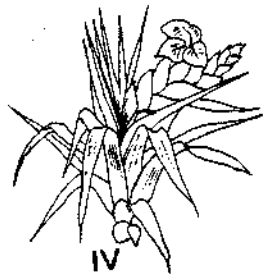
Also, in many species, the central portion of the leaves surrounding the inflorescence turn a dazzling crimson. The spiny-edged leaves may also have red spots and markings. The plants are epiphytic and since the inflorescences are developed so low in the cups, they are usually overlooked. The flowers are blue or white. This genus is easily adapted to indoor horticulture. Desirable species and hybrids: *N. carolinae*; *N. carolinae* var. *tricolor*, *N. spectabilis*

hybrids; *N. tristis*; *N. marmorata* hybrids; *B. ampullaceae*.

Nidularium (see Fig.VIII): These plants are products of the tropical rain forests. Like the *Neoregelias*, which they resemble superficially, they are also epiphytic and have spiny edges on their leaves. A simple way to differentiate *Neoregelias* from *Nidulariums* is to examine their inflorescences. The *Nidularium* inflorescence shows the bracts rather distinctly while the inflorescence rises above the cup. The foliage of many of the species is purplish, and in some species stripes run along the length of the leaves. Desirable species and hybrids: *N. innocentii*; *N. innocentii* var. *lineatum*; *N. procera*; *N. fulgens*.



Tillandsia (see Fig.IV): More bromeliads belong to this genus than any other. It includes species that have adapted themselves to varying conditions and in so doing have managed to take on an amazing number of forms. Some of the tiniest bromeliads are included, as well as species with the most spectacular flowers, even more beautiful than orchids. The leaves show a great variation; some are tough and string-like; others soft, thin and strap-like; while in still others the lower part of the leaf is of a spoon-like shape which gives the plant a pseudo-bulbous appearance. In many cases the leaves are covered with a gray fuzz of scales. Desirable species: *T. lindenii*, *T. cyanea*, *T. ionantha*.



Vriesea (see Fig.XV): This genus includes members that seldom fail to evoke comments from viewers. Both the foliage and inflorescences are spectacular. The leaves are smooth and complete. Like the *Tillandsias*, most *Vrieseas* are epiphytic. The leaves are generally heavy and may be covered with spots, bars, irregular patterns or odd-shaped markings. The inflorescences, usually brilliant and of one or more colours, may be upright like a sword or spear, or pendulous or even curved. The colourful bracts are large and may be triangular or boat-shaped. These plants are usually quite sensitive to cold. Desirable species

and hybrids: *V. splendens* (after *Ae. fasciata* the second most popular bromeliad); *V. X 'Mariae'*; *V. carinata*; *V. hieroglyphica*.

BROMELIADS AS HOUSEPLANTS: The following basic factors must be observed in growing bromeliads successfully in the house: Light, Moisture (this includes water and humidity), Temperature, Ventilation, Nutrients and Growing Media. Naturally, for optimum results, all must be in near perfect balance to ensure healthy blooming plants.

LIGHT: Light has been the factor which, up to now, has been the most difficult to achieve in the home growing of bromeliads or any other houseplants. In the temperate climate zone, those who could afford to do so have built greenhouses in which to grow the beautiful exotics from the tropics. Persons with lesser means had to depend on their windowsills for sufficient light to grow their plants, only to discover that smog and air pollutants diminished the quality and quantity of light received by the plants. Even the panes of windowglass soon become coated with an oily sooty deposit which actually deletes as much as 50% of the light passing through them.

To overcome these handicaps, many indoor horticulturists have been forced to depend upon various types of incandescent and fluorescent lights. Unfortunately, even the so-called "daylite" fluorescent tubes have given only a fraction of true life-giving light to the plant surfaces. This good light is necessary for most houseplants and especially bromeliads to develop their full potential of bloom.

How fortunate, therefore, are we that certain industrial concerns have expended great effort to produce a light which could give off a true natural light. The most successful of these has been the Duro-Test Corporation, of north Bergen, N.J., whose research has developed the "Optima" and "Naturescent" fluorescent tubes.

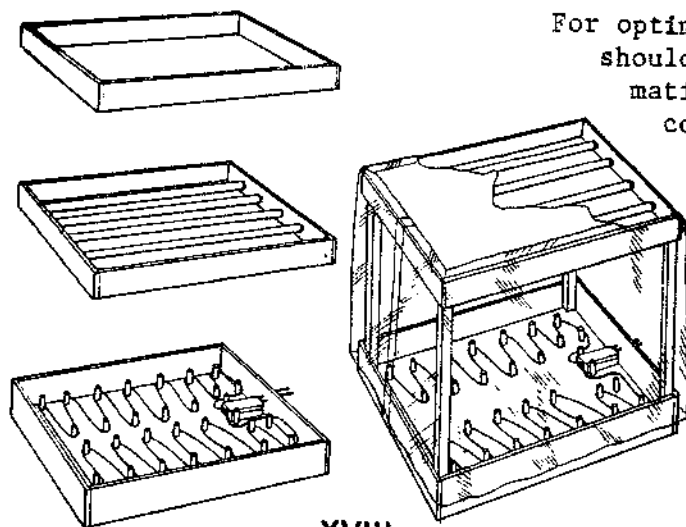
These bulbs emanate rays that are 91% true daylight, by actual test. I have been using these tubes since their introduction and have found them superior to all others. These Optima lights have produced fantastic results for me. In many cases, the plants grown indoors under these lights have developed in an even better fashion than many similar species seen growing out-of-doors in tropical areas. "Optima" now also come in a fluted twisted tube which



XV

actually delivers 10% - 15% more light from the same wattage and space covered.

It is best to mount the fluorescent lights in fixtures that contain a minimum of 4 parallel tubes. These fixtures should be so situated that bromeliads may be placed from 6 to 24 inches from the light source. Shorter plants can be set upon upside-down flower pots to raise them closer to the light. Aechmeas, Billbergias and Neoregelias should be grown nearest to the fixture, Cryptanthus, Nidulariums and some Guzmanias placed furthest away and Tillandsias, Vrieseas and the majority of Guzmanias set at a medium distance.



XVIII

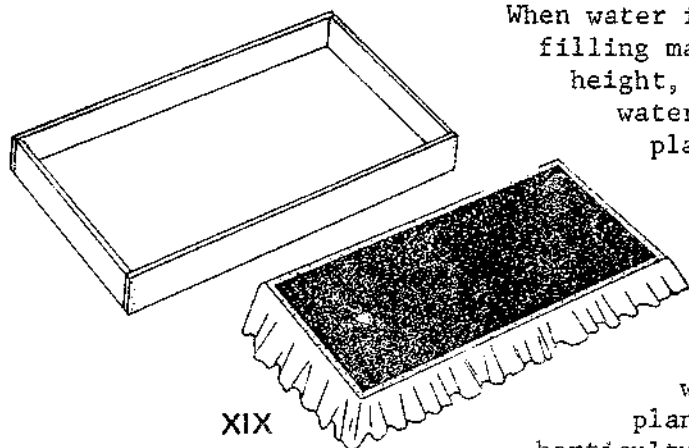
For optimum results, the fixtures should be connected to an automatic timing device that can control the lights so that they function for 15-hour periods each day.

It has been my experience that once the all-important factor of lighting is solved, everything else in indoor horticulture is simple. It is then possible to have your Bromeliads reach their fullest potential of gorgeous, exotic beauty.

MOISTURE: In considering the effects of moisture, one should remember how the plants grow in nature. All bromeliads feed either entirely or partially through their modified stomata, the scales. Since so many of them are epiphytic, the roots are specialized either for support or for feeding.

Many Bromeliads grow in locales where they receive a heavy bath of dew at night. Because of the heating conditions in homes, the air quickly becomes dry and dehumidified. This may be rectified in two ways. (Examine Figs. XVIII and XIX). A simple device can be constructed of four pieces of scrap limber (boards 1" x 3" to 1" x 6" may be used). The dimensions depend upon the size of the windowsill or the area to be covered. Cover the frame with a piece of heavy

plastic large enough to overlap in all directions. Push the plastic down to fit inside the frame, and fill the trough-like plastic depression with coarse builder's sand, vermiculite, perlite, pebbles or very coarse crushed stone or gravel. Tack the plastic to the top of all sides of the frame, and tuck all the excess plastic under the edges of the frame to conceal the crude lumber.



When water is poured into this tray of filling material for 3/4ths of the height, the natural evaporation of water will supply humidity to plants.

Another helpful and important adjunct is a cold mist humidifier. If this is used nightly, the resultant raising of the moisture content of the air will not only benefit the plants, but the family of the horticulturist and its possessions as

well! Besides this humidifying it is necessary to keep the plant cups filled with water. The potting mixture needs to be watered only when dry. Too frequent watering of the planting media may cause bromeliads to rot and spoil. One of the great benefits of growing bromeliads is that they are almost self-watering and may safely be left for two or three weeks as long as their natural reservoirs are filled to capacity. For those who wish to grow their plants epiphytically (methods given below) it is very necessary to spray these plants once or twice daily so that they may thrive in a natural manner.

TEMPERATURE: Since most bromeliads come from tropical and subtropical regions, they will not thrive under cold conditions in the home, even though many of them will not be damaged too severely by short freezing spells in their natural habitat. Most seem to thrive under the same house conditions as their owners. In fact, too high a temperature over a long period will cause severe damage due to excessive transpiration from the leaves. A maximum of 70° during the day and between 55° and 65° at night is the best temperature range. If the plants are grown on windowsills, it would be wise to seal the edges of the window to prevent chilling drafts.

VENTILATION: Most growers ignore this most important factor in indoor horticulture. They forget that plants, like all growing things, must breathe in order to live. Plants require a constant supply of carbon dioxide to survive, and when windows are kept shut or sealed all winter, circulation of air is not possible, and no fresh supply of gases is available. This condition may be corrected in many ways. The simplest is to open a window in another room on days that are not too frigid. Another is to keep a slow-moving electric fan going most of the day. This induces air circulation. If one uses the cold mist humidifier mentioned in the section on moisture, the fan that sprays the mist into the air will also circulate it.

NUTRIENTS: It is not necessary to feed Bromeliads very often. A weak solution of an all-purpose fertilizer may be used every two or three weeks if all other growing factors are favourable. It is wise to ensure that the fertilizer does not precipitate and leave a residue in the cups of the plants, as this can accumulate and eventually clog the feeding scale cells of the leaves. It is not necessary to feed the roots as frequently as the cups; probably every other time is sufficient.

GROWING MEDIA: Writings about the horticultural requirements of other plant families place a great deal of stress on the proper formulae, with exact measurements to make up a correct potting mixture. Bromeliads are demanding in one factor alone. They must be grown in media that permit quick drainage of water and sufficient circulation of air around the roots. Since we are dealing with plants that are largely epiphytic, it must be remembered that in nature the roots are fastened to tree bark that is quite acid. This gives us a hint as to the type and consistency of the growing medium. It should be made up of non-alkaline materials that supply moisture without getting too soggy. It should be porous enough to enable the water to drain off readily while allowing air to reach the roots.

As a rule, pure soil gets too muddy and prevents efficient air circulation. A good mix is based on coarse German peat moss. To this is added leaf mold, humus, perlite, bark chips, lava rocks and/or chopped osmunda or tree fern fibre. The peat moss should make up at least $\frac{1}{2}$ of the mixture, while any one or a few of the other ingredients may be added to make up the balance. The mixture should be placed loosely around the roots without packing.

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