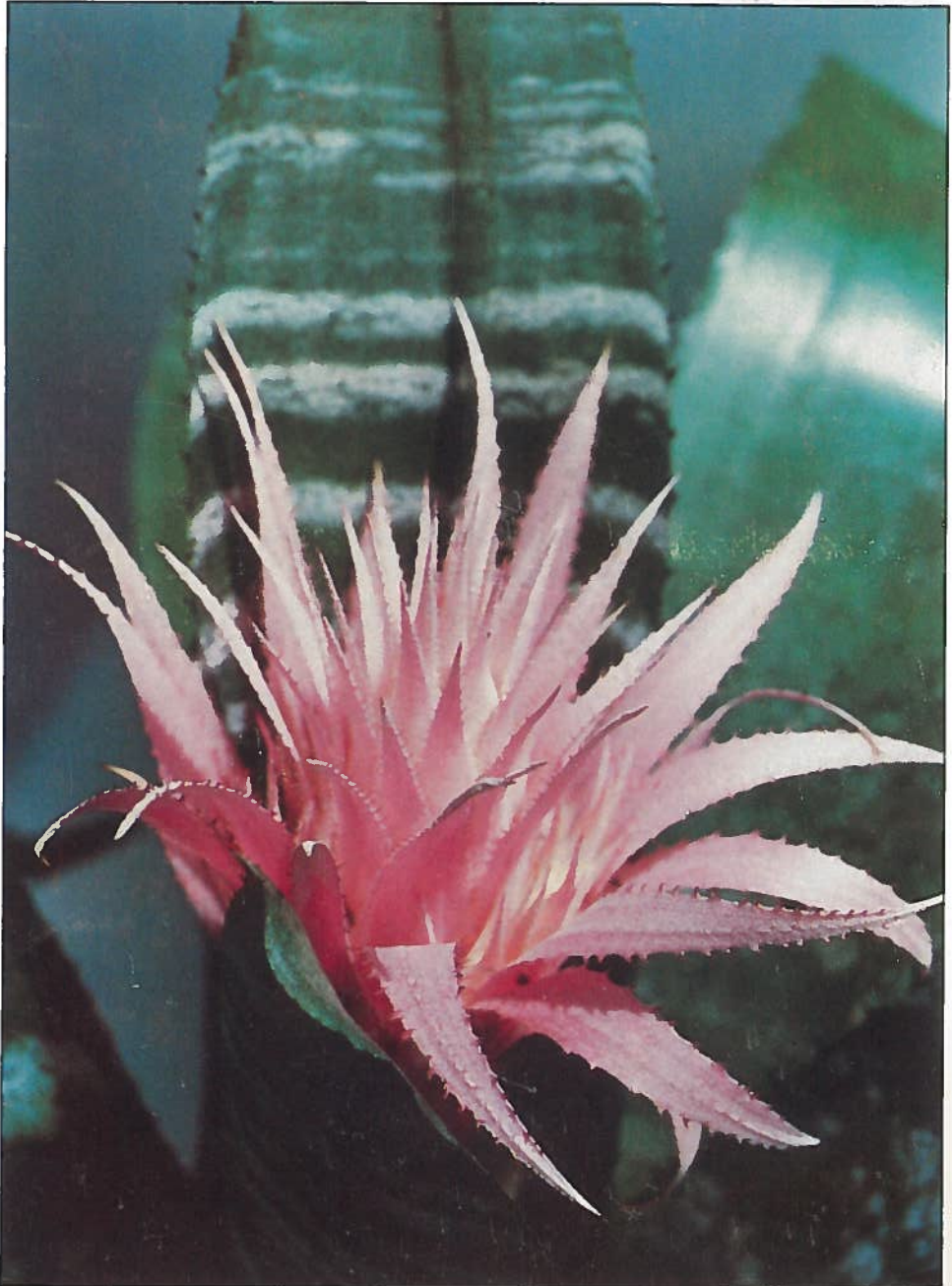


Journal of The Bromeliad Society



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Cover photographs. Front: *Aechmea fasciata* 'Silver King' nearing full bloom. Suggestions for cultivating this species and its varieties and cultivars are given on pages 55-57. Photo by T.U. Lineham. Back: A beautiful specimen of *Neoregelia concentrica*. This and other favorite *Neoregelia* species are described by Don Woods on page 69. Photo by Don Woods.

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Additional Remarks on *Tillandsia rauhii* and Description of a New Variety

Werner Rauh

Photographs by the author

In 1958, L.B. Smith described *Tillandsia rauhii* that I collected in 1956 in northern Peru in the valley of the Río Saña below the Hacienda Florida, Dptm. Lambayeque.¹ I found it growing there on steep rock walls at an altitude of about 800 m. Although during the years up to 1988 we visited all of the Andean cross valleys north and south of the Río Saña, we found the typical *T. rauhii* (var. *rauhii*, see page 79) only in the type locality. Then, in 1987, we found a new variety of *T. rauhii* with long spikes growing alone in the Río Chancay valley, west of Piura and north of the Saña valley. This variety, which we shall describe on page 79, also has a very restricted area.

Three of the plants of *Tillandsia rauhii* collected in 1956 began to develop their inflorescences in late 1989 and reached full bloom in January 1990. Only one flower, rarely two, per spike opened for one day. These plants, which we brought in 1956 to the Botanical Garden at the University of Heidelberg, needed 33 years to produce inflorescences. Since they did not change their growth form and their flowering rhythm in comparison to the wild-growing plants, it is now possible to add some additional remarks to the description by L. B. Smith. The following description is based on these three flowering plants.

First, we must mention that the young plants are quite different from the adults: their blades are lepidote and mostly red-violet. With age, the blades become more and more glabrous and the trichomes are replaced by a thick, white waxy layer so that all of the organs except the flowers take on a white, chalky color. M. Wolter and W. Barthlott have prepared a separate report on this phenomenon.²

Tillandsia rauhii (L.B. Smith) W. Rauh.

Flowering plant (with erected inflorescence) up to 2.5 m tall with a short, thick, rhizome-like base. *Leaves* numerous, forming a funnellform rosette 1.2 m high and 2 m wide. In cultivation all leaves are nearly erect, in nature the old leaves hang down. *Sheaths* inconspicuous, to 20 cm long and 15 cm wide, concolorous with the *blades*; these are broad-ligulate, to 15 cm wide above the sheath, 1.2-1.5 m long, narrowing to a short, red-violet, recurved tip, gray-green, white waxy, only laxly lepidote. *Scape* to 80 cm long, 2 cm thick, erect or slightly curved. *Scape bracts* densely imbricate, the basal ones subfoliate, the upper ones smaller. *Inflorescence* curved, to 2 m long, laxly bipinnate with +/- 14 spreading, curved lateral spikes, to 35 cm long, 3.5-4 cm wide and 1-1.5 cm thick and a long



Fig. 1

Tillandsia rauhii var. *rauhii* in the type locality, valley of the Río Saña, northwest Peru.



Fig. 2

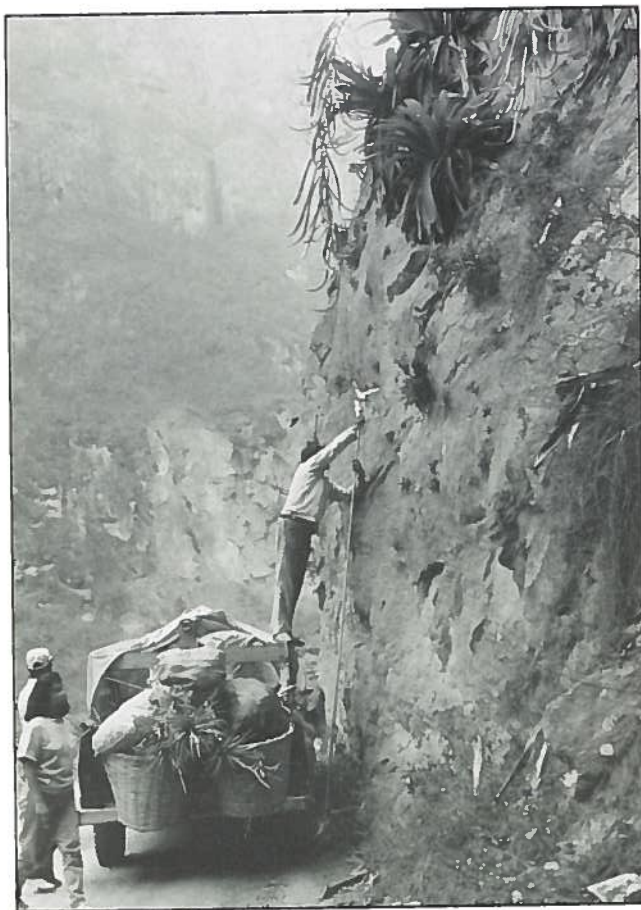
T. rauhii var. *rauhii*. Spike with two flowers, the lower flower is just starting to open, the style is already long exserted, the anthers are still included. In the upper flower, the filaments are beginning to stretch and the petals to spread.

Fig. 3
Tillandsia rauhii var. *longispica*
in the type locality, Río Chancay,
northern Peru.



Fig. 4

T. rauhii var. *longispica* with one open flower.



W. Rauh

Fig. 5
Collecting *Tillandsia rauhii* var. *longispica* in the Río Chancay valley. Here, with the clouds hanging on the hillsides, the collector is perched on the frame of his truck bed getting his long-handled pole saw ready to pry another specimen loose. Note the very large size of the plants and especially the inflorescences.

petiolated terminal spike. *Inflorescence rachis* +/- 1 cm thick, angled; internodes 3–4 cm long, glabrous, but white waxy. *Primary bracts* broad-ovate, enveloping the base of the spike, shorter than the sterile part, which is 5–10 cm long, foliaged; 1 cm above the base an adaxial, bicarinate prophyll, to 5 cm long and 3.5 cm wide, waxy, violet-tipped; the upwards-following sterile bracts are also carinate. Fertile *floral bracts* ecarinate, obtuse, to 5 cm long and 3 cm wide, distichous, densely imbricate, half overlapping; the visible part white waxy; the concealed part green, glabrous; only the upper side laxly lepidote, much longer than the sepals. *Rachis* not visible, angled, flattened, excavate, glabrous, green, 1 cm across. *Flowers* with a short, broad petiole, up to 10 cm long. *Sepals* lanceolate, 2.8–3 cm long, 1 cm wide, obtuse, the posterior subcarinate to carinate, free, green, glabrous beneath, on the upper side laxly brown lepidote. *Petals* ligulate, obtuse, 10 cm long, 1 cm wide, blue-violet, white at the base; first forming a narrow tube but soon flaccid and hanging down, drying off blackish. *Stamens* and *style* not visible; the latter 1.5 cm longer than the anthers. *Ovary* 1 cm long.

(continued on page 79)

Bromeliad Culture, No. 3: *Aechmea fasciata*

Two years ago we were surprised to find in *Southern Living* magazine an article by Steve Bender in praise of bromeliads. The photographs by Van Chaplin were beautiful enough to make even the most blasé reader rush out to buy. Some 1600 readers responded to the editor (whose address was provided) and as recently as two days ago someone wrote asking for information, "if it is not too late."

Most of the letter writers asked for information about where to buy bromeliads and how to take care of them. Some said that they had a few bromeliads but "tell me more." One-third or more of the writers knew that their first bromeliad (purchased) (gift) was an *Aechmea fasciata* and that fact speaks well for the retailers. And then came the questions: Will it bloom again? what should I feed it? how can I keep it alive? Linda Harbert, our membership secretary, fielded most of the questions, provided answers, sent out hundreds of copies of our folder "Bromeliad Culture" (see ad on page 93). Editor also answered letters and neither of us managed to put together a standard answer to: "How do I care for my *Aechmea fasciata*," so here we go.

General information.

Next to the pineapple and the Spanish moss there is no bromeliad better known than *Aechmea fasciata*. Found growing natively in the areas around Rio de Janeiro and the Distrito Federal, this aechmea with its enchanting inflorescence of pink and its florets of periwinkle blue became early the object of search on the part of botanists and plant explorers. It was introduced into Europe in 1828 and by the middle of the century had gained much popularity, particularly in Belgium. For the past one hundred years it has been a favorite house plant all over the Continent of Europe and in recent years has become available readily as you can see in supermarkets and shopping centers.¹

Aechmea fasciata when at home is found growing on trees in mountain forests at elevations of 1,800 to 4,000 feet. Some collectors may have specimens of the species but most of us have cultivated plants, derived from variety *fasciata*, notable for a tall vase shape, heavily silvered leaves, very tall and wide inflorescence, called 'Silver King'.

This is a hardy plant. It can take temperatures as low as the middle 30s for a short time if overhead protection is provided. It looks best when grown in bright light (but not full sun).

Varieties.

The Luther List of bromeliad binomials includes four varieties: *fasciata*, *purpurea*, *flavi-vittata*, and *pruinosa*. The latter two varieties are uncommon



Marcel Lecouffle

Fig. 6

Aechmea fasciata includes four varieties and the most common, var. *fasciata* sometimes appears with creamy longitudinal stripes on wide, bluish green leaves.

so we shall concentrate on the other two. *Aechmea fasciata* var. *purpurea* is a very attractive plant having the same appearance as var. *fasciata* except that the foliage is a deep, purplish maroon with silver banding. It is not as commonly seen as *fasciata* but it is available, at least from bromeliad nurseries. There are also forms of *fasciata* that are variegated, as shown in figure 6.

Culture.

Last year after spending several hundreds of dollars on tooth repair, the editor seized a declining *Aechmea fasciata* 'Silver King' from the dentist's receptionist saying that anything that unhealthy looking was bad advertising. Most plants don't cost that much. The starting point for most new *fasciata* owners is with a fully mature, blooming plant. I began with this plant when it was less than fresh looking but had well-developed offspring. The next steps are explained in the following questions and answers as follows:

Q. How can I keep the plant alive? A. If it hasn't yet started to grow pups it probably will soon and they will replace the mother plant. They will grow from the base of the old plant, but you already know that. You may leave everything just as you got it in the pot and hope for a cluster of plants. The old leaves will wither and you may cut them off as the pups continue to grow. If you want to try for individual plants, take the old plant out of the pot and cut the pups off when they are nearly as tall as the mother and have begun to grow tough little roots at their own bases. Use a serrated knife or sharp pruning shears. cut close to the base of the old plant.

Q. How do I pot the plants? A. Use an acid (not alkaline) mix that drains well and does not become soggy. Commercial potting mix is usually too heavy and should be combined with perlite, tree fern fiber, orchid mix, or other materials that promote aeration. You will find these materials at nurseries and garden supply stores. You may have to experiment.

A four- to six-inch plastic or clay pot will serve. Put pebbles or crocks in the bottom to promote drainage and cover the bottom of the pot with some of the mix. Then put the new plant in the center of the pot and cover its base with enough mix to hold it firmly in place.

Water the entire plant and keep water in the vase. Watering is tricky. Water thoroughly when the surface of the mix feels dry. Flush the plant regularly. If water is added continually and the plant is not flushed, the salts contained in the water in most areas will build up, coat the leaf bases, and cause problems.

Q. Do I need to fertilize the plant? A. Yes. Use a water-soluble fertilizer regularly but mix it at half strength. Once the new plant has started to grow on its own I give it Osmocote 14-14-14 time-release fertilizer to urge it along until it nears maturity and then change to low nitrogen plant food such as 10-15-10 or 10-30-20.

Q. How long must I wait for the new plant to flower? A. A very good question. My dentist plants (there were two pups) grew rapidly, but then they were outdoors most of the time. I potted them in September and they bloomed the next June or July—my record keeping is not reliable. Sometimes it seems as if they will never bloom and the causes could be that the pups were taken off the old plant too soon, they were not fed adequately, or they were just stubborn. In such cases, the best solution may be to buy a replacement or to hope for another gift plant, but then you would not have the pleasant experience of growing your own.

We tell all of the *Southern Living* letter writers to join a local bromeliad society and send them the address of the nearest. Many times there is not only no nearby bromeliad society but nobody else either. I just bought the new National Geographic atlas hoping to locate some of those places. We can't all live in Florida although the new population count makes this the fourth largest state, but we can join the BSI and read the *Journal* and write to the editor and expect reasonably reliable information.—TUL²

1. Padilla, Victoria. Popular bromeliads around the world, no. 4—Europe: *Aechmea fasciata* Bromeliad Society Bulletin 7:8-84.

2. Kathy Dorr and Carol Johnson helped with this article but I did the cutting, pasting, and filling so any errors are mine.

In Memoriam: Father Raulino Reitz, 1920–1990

We are sorry to report that Father Raulino Reitz, one of our three honorary trustees from Brazil, died at the age of 71 on the 20th of November 1990 at Florianopolis, Santa Catarina.

Father Reitz was elected honorary trustee of this society in 1954 in recognition of his extensive achievements in the study of bromeliads. From 1938 until last year he traveled throughout his native state of Santa Catarina, the other 25 states of Brazil, and many other countries while engaged in his botanical and ecological studies. He founded the Herbario "Barbosa Rodrigues" in Itajai in 1942 and was president until his death. He was credited with cataloging some 60 thousand species of plants. In 1952 he collaborated with Dr. Lyman B. Smith in a campaign against malaria sponsored by the Rockefeller Foundation and the Brazilian government. During that work he added significantly to the number of known, native bromeliads. In 1954, with Dr. Smith's sponsorship, Father Reitz held a Guggenheim Fellowship for forestry study in the United States. He served as director of the Botanical Garden of Rio de Janeiro from 1971–1975.

Father Reitz edited and wrote for the journal *Anais Botânicos do Herbario "Barbosa Rodrigues"* (called *Sellowia*). A self-taught taxonomist, proficient in several languages, he had many plant collections and descriptions to his credit. He contributed frequently to this journal, he sponsored two major symposia bringing together bromeliad specialists to share available information. His last and perhaps best-known work is *Bromeliáceas e a Malária-Bromélia Endêmica*, published in 1983, containing his descriptions and notes on several hundreds of bromeliads, notes on ecology and local conditions by his collaborator R.M. Klein, and 118 remarkable, colored plates by the artist Domingos Fossari.

Elton Leme wrote the sad news of Father Reitz's death but included the note that the previous week, "I had an unforgettable meeting with Fr. Reitz, where we talked about plants, people, and places. He was very well and seemed happy."—TUL



A Generous Donation to the Victoria Padilla Memorial Bromeliad Research Fund

The Bromeliad Society of South Florida has donated \$10,000 to the Victoria Padilla Memorial Bromeliad Research Fund with the request that The Bromeliad Society, Inc. establish two endowment funds of \$5,000 each for grants and scholarships to be administered by the Bromeliad Research Grant Committee. The earnings of one fund will be used for scholarships or grants to graduate students at the masters or doctorate level to assist with their bromeliad research studies. Any qualified student may apply for this assistance. The earnings of the other fund will be used to support any appropriate bromeliad research.

On behalf of The Bromeliad Society, Inc. Board of Directors I thank the members of the Bromeliad Society of South Florida, Inc. for their most generous gift. It is the hope of all of us that this gift will encourage others to contribute to this fund for the better support of bromeliad research.

Jack Burton Grubb, President

Inquiries concerning bromeliad research grants may be addressed to the chairman of the Bromeliad Research Grant Committee, Dr. David H. Benzing, Dept. of Biology, Oberlin College, Oberlin, Ohio 44074.

Editorial: How Many Kinds of Bromeliad Research?

It may seem that we are trying to support three kinds of research and that we are always asking for money for those purposes. In fact, we are.

The Victoria Padilla Memorial Bromeliad Research Fund was established by the Board of Directors in 1987 to honor the memory of Miss Padilla who served the society as secretary and as editor for thirty-one years. The fund is administered by the Research Grant Committee. It is entirely separate from funds designated for the Bromeliad Identification Center at the Marie Selby Botanical Gardens, which are controlled by BIC Director Harry Luther. The administration of separate accounts within the Padilla Fund such as specified in the BSSF donation should present no problem, according to the treasurer.

The board has made annual appropriations for research and members have donated to the Padilla Fund. A notable contribution of \$2,500 was made in 1990 as the result of the decision by the planners of the Houston World Bromeliad Conference to mark some of the rare plant auction proceeds for that purpose. The BSSF gift will add noticeably to the money available for awards by the Grants Committee. The idea of marking some of the funds for students is

something we can now put into effect since in the past there just has been enough only for small research projects such as those conducted by students who were working with faculty guidance.

There is a major need to encourage biology students to become interested in bromeliad research. We must be able to attract the attention of undergraduates as well as graduates by giving money to help with their studies. There are pitifully few now interested in this research.

Another need is to help with the expenses of studies to promote knowledge of detailed aspects of this plant family. Such studies need not be limited to scholarly activities since special projects by horticulturists and capable amateurs might be worthy of support.

If all that we did was to have monthly meetings, shows, and competitions from time to time we would find ourselves looking at more of the same species or hybrids of hybrids. Our mission statement says that we promote and maintain public and scientific interest in the research, development, preservation, and distribution of bromeliads but we must begin with research.

The third kind of research is that carried on by Harry Luther at the Mulford B. Foster Bromeliad Identification Center with his studies, the ever-developing bromeliad reference collection, the photographic, literature, and herbaria records, and the intern program. The Marie Selby Botanical Gardens in Sarasota, Florida, is the home of BIC and provides its primary support. Our society, affiliates, and individuals contribute to the support of BIC. Our money provides a portion of the director's salary, travel costs, highly specialized equipment, time spent identifying specimens, and research.

We also appropriate funds for the BIC intern program that benefits us by providing practical experience as well as study opportunities to individuals selected for this program.

For several years there were interns for the full 12-week terms but none for the last three years. People who would like to intern just have not had enough money for travel and expenses, even with the stipend provided, for the 12 weeks. Instead, BIC has had applicants for three- to four-week courses. As a result, the Board of Directors may have to consider authorizing BIC to divide the intern appropriation among several applicants, a case of dividing too little among several for shorter periods instead of having enough to attract and maintain a few for an adequate course.

Here are the kinds of research that we promote and support and here is a description of some of the problems. Perhaps by repeating these facts the need will become more and more obvious to the extent that the BSSF seed money will, in fact, attract additional gifts.—TUL

Bromeliads Threatened by Trade

Mike Read

The article reprinted below appeared in The Kew Magazine, February 1989. Some description of the bromeliad family has been omitted because it is well known to most of our members and also to conserve space. Any omission of the author's basic material is unintentional. The spelling is unchanged. The author is identified in the magazine as one who "worked at Kew for the Flora and Fauna Preservation Society, and is now a free-lance plant conservationist."

The trade in wild-collected plants has been a contentious issue for many decades. Within recent years, however, the effect on wild populations of many species has become so severe that international legislation has been required to reduce the likelihood of further extinctions. Individual species, genera, or whole families have come under the control of the Convention on International Trade in Endangered Species of Flora and Fauna (CITES). However, horticultural tastes can change more quickly than the international legislative processes. Consequently, as new groups of plants become fashionable, there is always a danger that commercial exploitation of wild populations will develop unchecked. Trade in species of the Bromeliaceae is expanding rapidly and investigations by the Fauna and Flora Preservation Society have shown that many of the plants on sale are of wild origin. This is of considerable concern, especially as a significant number of the species to be found in the trade have a very limited natural distribution...

Over the years, several genera have become popular as house plants, in particular, varieties of the urn plant, *Aechmea fasciata* (Lindl.) Baker, *Tillandsia lindenii* Regel, *Billbergia nutans* H. Wendl. ex Regel, *Vriesia splendens* (Brongn.) Lem. and several species of earth stars, *Cryptanthus*, as well as variegated forms of the pineapple, *Ananas comosus*. Most recently there has been considerable interest in a wide variety of species of *Tillandsia*.

The genus *Tillandsia* alone contains well over 400 species, and is the largest single genus of bromeliads. The grey-leaved *Tillandsia* species form the larger part of the genus, and it is these plants which are considered most at risk from the horticultural trade Rauh, (pers. com.)...

Members of the genus *Tillandsia* are now being marketed as plants suitable for modern interior decor and requiring relatively little cultural expertise. The market in the United Kingdom is largely restricted at present to half a dozen species available at most garden centres and some high street shops. Specialist outlets are offering over 70 species of *Tillandsia*, as well as species of a number

of other genera new to the horticultural trade. Furthermore, it appears that the trade in bromeliad species in the USA may well be considerably larger than in the UK. Advertisements in a specialist US journal offer around 200 species of *Tillandsia* and bulk lots of up to 10,000 *Tillandsia* plants at a time. The extent of trade in western Europe has still to be established, in particular from the Netherlands, Denmark and Germany, where dealers now list almost 200 species, varieties and forms. How many truly distinguishable species this represents, however, remains open to doubt. On the basis of previous experience, it is likely that the level of trade in these countries, and others such as Japan, will be as high or even higher than in the United Kingdom. *Tillandsia* species are relatively difficult to propagate, slow-growing, and take several years to flower from seed. Propagation by the offshoots, which form after flowering, is possible in only limited numbers. Unfortunately, this makes collection of mature specimens from the wild an economically attractive proposition to traders, thereby endangering the survival in the wild of a great many species.

In many places where bromeliads grow they densely clothe tree-trunks and branches. Here it appears quite possible that they play an important part in the ecosystem by trapping precipitation and moisture from mists, thus preventing its loss from the system. It may be suggested that collecting of such epiphytic species is only secondary to forest destruction. However, it is eminently possible that trees are being cut down with the express purpose of stripping them of their bromeliads. Elsewhere, for example near Peru's capital Lima, terrestrial bromeliads may play a significant part in soil stabilization and even dune formation. Removal of such plants could have considerable adverse effects in terms of erosion and the loss of nutrients and the water-holding capacity of the soil. . .

Whilst some nurseries claim that all stock is artificially propagated, the true level of artificial propagation in "consumer" countries remains to be established. . .

Indications are that *Tillandsia* plants are being collected from the wild in at least Paraguay, Panama, Guatemala and Mexico. It is also believed that plants are exported from Honduras and it is to be expected that evidence will come to light of exploitation of wild populations in many other Central and South American countries. Nursery production of bromeliads in the countries of origin is not known to the author outside Argentina, Belize, Brazil and Guatemala. In these countries it probably occurs in tandem with wild collecting. Professor Werner Rauh of Heidelberg University. . . has recorded the collecting of *Tillandsia* from the wild on a huge scale in both Mexico and Guatemala (pers. comm.), lorry-loads of plants being transported to the USA. He considers a number of species to be thus endangered with imminent extinction. Among these are: [abbreviated and tabulated by the editor]

<i>T. argentea</i>	<i>T. ignesia</i>	<i>T. atroviridipetala</i>
<i>T. butzii</i>	<i>T. ionantha</i>	<i>T. pruinosa</i>
<i>T. cacticola</i>	<i>T. magnusiana</i>	<i>T. streptophylla</i>
<i>T. caput-medusae</i>	<i>T. mauryana</i>	<i>T. tectorum</i>
<i>T. filifolia</i>	<i>T. plumosa</i>	<i>T. xerographica</i>

and all the small species of the Organ Mountains of Brazil. Rauh further suggests that *Dyckia marnier-lapostollei* L.B. Smith and *Cryptanthus warasii* P. Pereira may be approaching extinction.

For many of those species in the trade, the status in the wild is still poorly known. However, the majority of *Tillandsia* species have a limited distribution, and can be considered extremely vulnerable to commercial exploitation. For this reason the Fauna and Flora Preservation Society is recommending that research into the nature, volume and pathways of trade should be undertaken as soon as possible, along with investigations into which species are most vulnerable, or already endangered. Furthermore, the trade should be monitored as far as possible while such research is under way. As ever, funds are required for such work. It is also suggested that a proposal for "Appendix 2" listing for all Bromeliaceae (with the exception of *Ananas comosus*) together with "Appendix 1" listing for all grey-leaved *Tillandsia* species should be submitted to the parties to CITES at the earliest possible date.

The government of those countries from which bromeliads are exported should be encouraged to take steps on a national level to ensure that their natural heritage is not damaged by the bromeliad trade. Encouragement should also be given to nurseries in both exporting and importing countries to develop the propagation of bromeliads by seed or by offsets.

Without rapid action as described here the prospects for survival of wild populations of bromeliads, especially of *Tillandsia*, look very poor. [References omitted.]

Responses to the Read article by Harry Luther, Director of the Bromeliad Identification Center, and Mark Dimmitt, chairman of the BSI Conservation Committee, as well as a statement by Noel McGough, Conservation Officer, Economic and Conservation Section, Royal Botanic Gardens, Kew, appeared in the November 1989 issue of The Kew Magazine.

Dr. Dimmitt suggests that it is never too late to publish information for the record. Accordingly, here are summaries of the Luther and Dimmitt letters prepared by those authors and the concluding paragraph of the McGough statement. The editor recognizes the danger of printing summaries and extracts but pleads lack of space for the complete statements.

Harry Luther:

The following statements sum up my view of the state and effects of commercial exploitation of bromeliads.

1. The taxa most exploited are the most abundant and wide ranging taxa.

2. Rare (or apparently rare) taxa have rarely entered horticulture in large quantities.

3. The actual status of most taxa is incompletely known. At least some of the "rare", highly endemic and "lost" taxa will be (or already have been) found to have much more extensive ranges and populations.

4. Due to consumer demand for higher quality plants free from damage and defects, an increasing percentage of tillandsias are being propagated and grown in nurseries in the United States, Mexico and Guatemala.

5. With the exception of the genus *Tillandsia*, the important bromeliads of horticulture are highly selected cultivars (e.g. *Aechmea fasciata*, *Neoregelia caroliniae*) or hybrids (many vrieseas and guzmanias), the commercialization of which has no effect on any wild population.

6. No bromeliad taxa known to me are at present in danger of extirpation by commercial exploitation.

7. Habitat destruction is the single greatest threat to ALL tropical organisms including bromeliads.

The Conservation Committee of The Bromeliad Society, Inc. offers the following response to the serious inaccuracies in Mike Read's article "Bromeliads threatened by trade:"

Summary.

1. Most of the bromeliads in large-scale commercial trade are extremely abundant species and are in no immediate danger from collecting.

2. There is virtually no information available on the true status of most species which are reportedly rare.

3. The import figures used as nearly the sole basis for listing the family under CITES are of little value because they are not itemized by taxon. Even if they were detailed, they would still be worthless without data on wild population sizes against which to compare the imports. Much more research is needed here.

4. There is more artificial propagation of bromeliads taking place than most conservationists are aware of. There is already a substantial movement away from wild plants in the trade. Nursery-grown plants are much more attractive than recent wild imports, and are thus much more marketable.

5. Listing of entire families of plants under CITES is a very poor strategy which causes far more harm than good. CITES status greatly hinders both research and conservation efforts in developing countries (where virtually all bromeliads occur). Identifying and listing individual endangered taxa will be much more effective.

Recommendations

Rather than move hastily to list an entire family of plants, the Conservation Committee urges the following studies be undertaken; they will fill in the great void of information and enable intelligent decisions based on facts:

1. Compile total bromeliad import figures for Europe, the United States, and Japan.

a. Assess the percentage which are nursery-produced.

b. Identify the imports of wild plants by taxon. (This is absolutely essential to the acquisition of useful data.)

2. Conduct field studies to estimate the ranges and population densities of those species which are common in the trade. Such estimates are not very difficult to make. A rough estimate obtained by multiplying the number of tillandsias in a tree by the number of such trees per hectare times the number of hectares of suitable habitat would provide usable information.

3. Conduct field studies to assess the status of putatively rare taxa in the trade.

4. Determine whether any taxa or populations *which are protected from habitat destruction* are being depleted by collection. (It doesn't matter what happens to plants on land which is about to be destroyed!)

5. List those taxa which are in need of protection *from excessive commercial trade*, not the entire family or all rare taxa.

Noel McGough:

... At present there are insufficient data available to make sound scientific recommendations. We await a promised report from TRAFFIC (Trade Records Analysis of Fauna and Flora in Commerce) Germany. In addition the Conservation Unit at Kew has initiated a research project on bromeliads in trade in an attempt to clarify the position. We would appeal to all interested parties to make available any information that they may have. We hope that such a project will assist in the scientific assessment of the trade and any possible threats posed by it to the long term survival of the plants in the wild.

Hohenbergia leopoldo-horstii; a New Species from Brazil

Werner Rauh

Hohenbergia leopoldo-horstii propinqua affinis *H. vestita* L.B. Smith sed ab ea differt foliis minoribus et inflorescentia bipinnata, parvis spicis paucis floribus occupatis, bracteis floribus, quae longiores sunt quam sepala.

Holotypus: B.G.H. 56715, leg. Leopoldo Horst HU1147, in herb. inst. bot. system. univ. heidelb. (HEID)

Patria et distributio: Brasilia, Estado Bahia, Gran Mogul.

Hohenbergia leopoldo-horstii E. Gross, Rauh & E.M.C. Leme is related to *H. vestita* L.B. Smith, but differs from it in the following characteristics: Leaves smaller. Inflorescence bipinnate with smaller, few-flowering spikes. Floral bracts longer than the sepals.

Holotype: B.G.H. 56715, leg. Leopoldo Horst HU1147, in Herb. Inst. System. Bot. Univ. Heidelberg (HEID).

Locality and distribution: terrestrial on sandstone rocks, near Gran Mogul, Bahia, Brazil.

Plant stemless, flowering (with erect inflorescence) +/- 1 m high. *Leaves* numerous, forming a rosette 30 cm high and 30 cm wide. *Sheaths* +/- conspicuous, lanceolate-ovate, 14 cm long, 12 cm wide, green, light-brown at the base, with violet spots and stripes, lepidote on both sides; scales with a brown center. *Blades* ligulate, with 1-cm long, violet apex, 15–20 cm long, above the sheath 8 cm wide, the outer blades recurved, the inner erect-spreading, green with some violet spots, lepidote on both sides, at the margin with very coarse, retrorse, brown-violet teeth 3–5 mm long; these 1 cm distant from each other. *Scape* curved, +/- 70 cm long, round, 6 mm thick, red, sparsely white floccose. *Scape bracts* erect, soon drying off light brown, nerved, white floccose beneath, lanceolate, acuminate, brown-violet, shorter than the internodes (only the basal ones somewhat longer), 4.5 cm long, 1.5 cm wide, even, not serrulate. *Inflorescence* cylindric, loosely bipinnate, up to 20 cm long, with 10–15 spikes; these subsessile, few-flowering, fasciculate, 2 cm long, 1.5 cm wide. *Primary bracts* lanceolate, long acuminate, 2.7 cm long, 7 mm wide, soon drying off brown, nerved, sparsely lepidote on both sides, even, the basal ones longer, the apical ones +/- as long as the spikes. *Floral bracts* suborbicular, 1.3 cm long (inclusive of a 5-mm long, brown mucro), green, nerved when dry, becoming glabrous, ecarinate. *Flowers* subsessile, 2 cm long, erect. *Sepals* shorter than the floral bracts, asymmetric, with a hyaline wing, green, densely white floccose, +/- 8 mm long,



Fig. 7
Hohenbergia leopoldo-horstii (habit view), collected in north-west Brazil, is a large plant as wide as it is high (30 cm) with a long inflorescence bearing few flower spikes. It was first thought to be a variety of *H. vestita*. At left, upper portion of the inflorescence; below, habit.

Photographs by the author



Fig. 8

ecarinate. *Petals* ligulate, erect, violet, white to the base, 1.3 cm long, at anthesis not recurved, at the base with a 4-mm high adnate ligule. *Stamens* and *style* enclosed. *Ovary* light green; *epigynous tube* conspicuous. *Ovules* few, almost obtuse.

Hohenbergia leopoldo-horstii was also collected by E.M.C. Leme (Rio de Janeiro) some years ago in the region of Diamantina¹ but was considered a variable *H. vestita* L.B. Smith. After examining the material, E. Leme is of the opinion that it is a new species (personal communication) and I offer him many thanks for the collaboration.

Heidelberg, Federal Republic of Germany

1. J. Brom. Soc. 38:5, fig. 3; 1988.

Slide and Video Programs

Our new slide librarian Weston Furukawa has reconstructed five slide programs and has added one video tape for the slide library. These materials may be rented by affiliated societies and individual members. The slide programs are not new, but Weston has reviewed all of them and kept only the best slides. The programs include:

1. Tillandsias
2. Costa Rican Bromeliad Adventure
3. Aechmea Jewels
4. Brazilian Bromeliads: Habitats and Homelands
5. Other Genera
6. A Garden of Grace (video)

Programs may be rented to 30-day periods at a cost of \$40.00 each and \$20.00 will be refunded upon return of the program. For more information send a SASE to: BSI Slide Library, Weston Furukawa, 3763 Monteith Drive, Los Angeles, CA 90043-1713, telephone 213-294-4435. These rental rates are subject to review and possible change by the Board of Directors at the June 1991 meeting. The cost includes one-way postage and insurance and will provide funds for maintaining and developing the library.

WE REGRET TO ANNOUNCE THE DEATH OF STAN OLESON on 15 January 1991. Stan was a leader of the South Bay [California] Bromeliad Associates and co-editor of their newsletter until recently. He was a contributor to the *Journal*, he had served as chairman of the Affiliated Societies Committee and as director of this society. We offer our deep sympathy to his wife Val.—TUL

My Favourite Neoregelias

Don Woods

Neoregelia—now, here is my favourite genus of bromeliads, commonly referred to as the “blushing bromeliads.” I can think of no better phrase to describe these plants, but alas, not all neoregelias blush at their blooming stage. The nonblushing ones compensate by displaying their mottled, sometimes full-coloured leaves in shades from orange, pink, or red to purple for their entire life cycle. Some even have longitudinal stripes.

• *Neoregelia* ‘Flandria’ is a superb white-margined *carolinae* cultivar. The white margins of the short, stubby, green leaves are faithfully reproduced in each generation of offsets. The stiff-textured leaves retain the blushing heart of this plant for twelve to fifteen months after reaching maturity.

• *N. Dexter’s Pride*. A large, bold hybrid that responds to a large pot of well-drained, humus-rich potting mix. When grown in optimum light, the leaves colour to a deep maroon throughout but will revert to green in the shade.

• *N. Don Wendland*. Again, a large plant that likes a big pot. In bright light the leaves turn almost black with spots like those of *N. chlorosticta* but deep green. With its rather leathery leaves, this plant retains its handsome good looks for twelve to fifteen months after flowering.

• *N. Takemura Grande*.¹ As the name suggests, we have a hybrid of grand proportions. This plant is thought to be the product of *N. carcharodon* × *concentrica*. Thirty to forty leaves form a large, full rosette. The broad leaves are purple, heavily frosted on both sides with silvery peltate scales.

• *N. “Meyendorffii”* (a cultivar of *N. carolinae*) has longitudinal white stripes of varying widths on its green leaves. This plant blushes a rich red in the centre of the rosette when it blooms. I have found that the offsets of this plant are somewhat variable with the odd offset showing white leaf margins.

• *N. carolinae* forma *tricolor* is a well-known plant² that is stunning when exposed to maximum light, good culture, and low morning temperatures. The tender leaves have longitudinal, cream colored stripes. If this plant is exposed gradually to strong light, the leaves become suffused with red for their entire length. When flowering, the centre of the rosette colours a brilliant red.

(Adapted from Bromeletter, March/April 1986, *Bromeliad Society of Australia, Inc.* with the author’s permission.)

[1. James V. Elmore reported his research on these plants in “A Tale of the Fabled Takemuras” in *Grande* 1 (1):18–20; 1978.]

[2. Please see “The origins of three variegated *Neoregelia carolinae* clones” by M.P. McMahon, *J. Brom. Soc.* 35:197–199; 1985.]

1992 World Bromeliad Conference Notes

Tom Wolfe, General Chairman

The Bromeliad Guild of Tampa Bay is excited about hosting the World Bromeliad Conference, June 11-14, 1992.

The natural Florida setting at the Saddlebrook luxury resort and conference facility will make this conference especially noteworthy. The judged show will be presented in a pavilion surrounded by a beautifully landscaped lagoon with fountains, palms, and natural stone. From the time you are greeted by our friendly hostess committee you will feel a sense of adventure.

The room rates at Saddlebrook are:

Deluxe guest room (single or double occupancy)	\$ 70.00
One-bedroom suite (single or double occupancy)	\$ 85.00
Two-bedroom suite (single, double, triple or quadruple occupancy)	\$120.00

The deluxe guest room accommodates one or two persons. The one-bedroom, one-bath suite has a beautifully furnished living room and fully furnished kitchen. A fold-out couch can accommodate additional persons in the suite at an additional \$15.00 per person.

The two-bedroom, two-bath suite can accommodate up to four persons. One of the bedrooms has a queen-size bed and the second bedroom has two executive twin beds. Each bedroom has its own full bath and shares a mutual living room and fully furnished kitchen. It also has a fold-out couch in the living room for additional guests at the rate of \$15.00 for each person per day. Each room has a patio or balcony overlooking a beautiful expanse of landscape.

Children under 13 years of age may stay with their parents without charge. The fee for older children is \$15.00 per day.

Some of Saddlebrook's amenities for our conference will be: free transportation to and from the Tampa International Airport; health club rates at \$4.00 per day (50% discount); golf rates for either of the two 18-hole courses at \$19.00 greens fees, \$16.00 per 1/2 cart, \$35.00 full cart; tennis rates for any of the 37 tennis courts are \$12.00 per court per hour of singles play and \$16.00 per court per hour for doubles play.

The Tampa Bay area offers shopping and night life, beautiful Gulf of Mexico beaches, excellent fishing, jai alai, greyhound racing, horse racing, and world-famous attractions including Busch Gardens. Fresh-water bass and bream abound in Saddlebrook's many lakes, and chartered deep-sea and fresh-water excursions and sailing outings can be arranged. Walt Disney World and EPCOT Center in Orlando are 60 minutes away. Rental cars will be available on location at Saddlebrook.

(continued on page 73)

Batiks Botanicos

Selby Botanical Gardens recently presented an exhibit of batik work on botanical subjects by Colombian artist, Angela Maria Isaza. Miss Isaza was born in 1958 in Bogotá. She studied fine arts at Marymount College in Washington, D.C. and later received a degree in architecture from the University of Virginia. Today, she has an active art and architecture studio in Bogotá. She has exhibited her works in various galleries in the United States and in Colombia. This was her third exhibit at Selby Gardens.



Selby Gardens

Fig. 9
Guzmania vanvolxemii, a batik print approximately 36" x 48" by Colombian artist Angela Maria Isaza. It is one of many of her prints on botanical subjects in the medium shown in a recent exhibit at Selby Gardens.

Batik is a thousand-year-old art technique developed in Java. It is a step-by-step process of painting textiles using fabric, paraffin, wax, and dyes.

Wax is used for coating parts of the fabric not to be colored in the dye bath. After one color is obtained from dyeing the fabric, more wax is applied to cover the color. This process is repeated until completion. While going through these several steps the hard wax breaks and cracks, producing an effect characteristic

(continued on page 72)

Misnamed Bromeliads, No. 7

Harry E. Luther

For many years, Florida bromeliad growers have cultivated a large, gray-green and red mottled plant under the name *Neoregelia carcharodon*. About 1978 or 1980, a very different plant with softer, red-flushed leaves was introduced as *Neoregelia carcharodon* 'Rubra'. This latter plant has remained fairly uncommon and highly desirable and is also somewhat reluctant to flower. The positive side of this situation was that *Neoregelia carcharodon* 'Rubra' has escaped from being lost in the mire of poorly documented neo hybrids that mimic their parents, the fate of *N. farinosa*, *macrosepala*, and *pineliana*. The lack of fertile material has also handicapped positive identification and study of variation between clones.

After a decade, I have finally have been able to examine a reasonable number of flowering plants of the 'Rubra' and can state that most of these are *Neoregelia carcharodon* (Baker) L.B. Smith. The 'Rubra' should be dropped as this is not a legal cultivar name and, at any rate, all the plants that I have seen are reddish so this distinguishing name is superfluous.

If *Neoregelia carcharodon* 'Rubra' is REAL *Neoregelia carcharodon* what is the old horticultural plant long known as plain *Neoregelia carcharodon*? Except for smaller marginal teeth and slightly longer sepals it is a very good match for *Neoregelia pascoaliana* L.B. Smith and I consider this to be the correct name for it.

*The Bromeliad Identification Center
Marie Selby Botanical Gardens, Sarasota, Florida*

Batiks Botanicos (continued from page 71)

of batik. When completed, the wax is removed by ironing the fabric with sheets of newsprint.

Miss Isaza has developed a very personal and definite style in representing the botanical subjects and rich vegetation that surround her in the tropical mountains of Colombia.

ACKNOWLEDGMENT:

This text was prepared by Marie Selby Botanical Gardens, Sarasota, Florida.

The **Bromeliad Society of Broward County, Inc.** [Florida] and the **Gold Coast Succulent and Bromeliad Society** [New South Wales] have contributed generously to the *Journal* color fund and we are grateful. The January-February 1991 issue had already gone to press when the checks were received so this is the first opportunity to acknowledge those gifts. We are always grateful for such evidence of interest and support.—TUL

1992 World Bromeliad Conference Notes (continued from page 70)

Reservation forms are enclosed. Room reservations will be made on a first-come, first-served basis. As an added inducement, the Florida Council of Bromeliad Societies will present a rare bromeliad seedling to all registrants who stay at Saddlebrook. The address of Saddlebrook is 100 Saddlebrook Way, Wesley Chapel, FL 33543-4499; telephones: 800-729-8383, 813-973-1111; FAX 813-973-1312.

Registration rates for the conference are:

Early – until November 1, 1991	\$ 95.00
Regular – November 1, 1991 to April 1, 1992	\$120.00
Late – after April 1, 1992	\$145.00
Social: reception, show, banquet, rare plant auction	\$ 85.00

Early, regular and late registrants are entitled to attend all functions including early entrance to the sales area.

Please make checks payable to: B.G.T.B. World Conference and mail to: Mrs. Gwen Carnegie, 1734 Magnolia Road, Belleair, FL 34616; telephone 813-584-7749.

Please complete the enclosed conference registration form and take this opportunity to experience the most stimulating bromeliad vacation you have ever had.

*5211 Lake LeClaire Road, Lutz, Florida 33549
Telephone: 813-961-1457*

Notice of Annual Meetings

The annual meeting of the membership of The Bromeliad Society, Inc. will be held at 9:00 a.m., 15 June 1991, at the New Orleans Marriott Hotel, 555 Canal Street, New Orleans, Louisiana 70140, telephone 504-581-1000. It will be followed immediately by the annual Board of Directors' meeting.

Members are invited to forward matters for consideration at either meeting to the president before the meeting date. The president will communicate the agenda and due date of annual reports to directors and committee chairmen. Matters of especial importance to be resolved are membership and finances. The election of the president and vice-president, as well as the annual election of officers and committee chairmen, will take place at this meeting.

The Pots from Syracuse

Nathaniel Tripp

Surrounded by cattail swamps, its walls shrouded with ivy, Syracuse Pottery, Incorporated, lies atop what was once a vast pool of glacial meltwater. Ten thousand years before Gordon Britcher's grandfather would found the company, in 1874, the glaciers that covered what is now central New York were gradually retreating. As the glaciers melted, minute particles of clay remained suspended in the turbid, milky waters each summer. When the waters froze in the winter, the particles gradually precipitated and settled into annual layers known as varves. Exceptionally fine-grained and uniform, the deposit provides the material for three thousand tons of flowerpots a year.

Clay flowerpots have been around for at least five thousand years. They are more than simply decorative; there is something controlled and civilized about them, which perhaps explains their popularity in the courts of the Pharaohs, who favored potting full-size fruit trees, and of Nebuchadnezzar, who built a mountainous, four-hundred-foot container garden for his queen. Within the walls of medieval castles, and later in the intricate gardens of the Italian Renaissance, potted plants lent a sense of order, of the human being's divinely ordained authority over nature's "chaos." Recently, however, it is the flowerpot industry itself that has been facing chaos. Seven millennia of terra-cotta have given way to a new age of terra incognita. Commercial growers, the largest consumers of flowerpots, have switched almost entirely to plastic. In the past twenty years, a discouraging 90 percent of the local potteries manufacturing flowerpots in the United States have gone out of business.

Gordon Britcher's grandfather was already a potter by trade when he arrived from Germany in the mid-nineteenth century. He began making hand-thrown pots, bean pots, and such, in Syracuse, but as the business expanded he began to specialize in flowerpots. Their tapered shape facilitated mass production, using spinning male and female dies on a pot press, and local growers provided a steady market. The design, known as the American standard pot, is virtually unchanged today. The pot's height is the same as its diameter. It has a thick cylindrical collar at the top, then tapers to a base perforated by a drainage hole. The collar does more than add strength and provide a convenient handle: it makes the pots easy to stack.

The costs of handling and labor account for nearly all the expense of pots manufacturing. In the old days, farmers dug clay from outlying pits near Syracuse and brought it to a railroad siding in horse carts. Laborers then shoveled the clay into cars, which were unloaded in like manner when they arrived near

the pottery. The clay was trundled uphill, shoveled into storage piles, and shoveled one final time into barrows as it was needed. Perhaps one reason Syracuse Pottery is in operation today is that, in the early 1900s, one of its employees happened to slip and fall while hunting in a swamp on the outskirts of town. He reported back that he had slipped on some particularly fine-grained clay, and Gordon's father had the foresight to move the factory to that spot.

Clay, then, has an advantage over plastic in that it is virtually free to begin with. One need only dig it up. Plastics, on the other hand, are dependent on the petrochemical industry. But clay is also heavy, very heavy. Moving the stuff around gets expensive quickly. A more significant advantage of clay over plastic, from a botanical standpoint, is that it is porous—it breathes. A plant responds differently to a clay pot than to a nonporous plastic pot. Remove a good-sized plant from a clay pot and the roots will frequently keep a perfect mold of the pot's inside surface. This is because the roots tend to follow the lateral movement of moisture and nutrients toward the outside of a clay pot, where two-thirds of the evaporation takes place. In a plastic pot the roots tend to bunch toward the center of the soil mass. The only practical consequence of this curiosity is that plants in clay pots must be watered twice as often, but, more important, there is less danger of damage from overwatering. . .

Within the industry as a whole, there is still much demand for clay pots. But the market has shifted from the cost-conscious commercial grower toward the individual hobbyist. Here the advantages of clay are triumphant. First, a clay pot is a form of insurance against inexperience. Not only is there less chance of damage from overwatering, but excessive fertilizer and soil salts are leached out, too, ending up as crusty white deposits on the outside of the pot. Also, the very weight of a clay pot, a disadvantage in a commercial greenhouse, where plants have to be moved frequently, makes a plant in the home more stable, less likely to be knocked over by a child or a sudden breeze. Finally, and most significant of all, a clay pot is attractive. Like a frame around a picture, it complements a plant. Some people may argue that plastic is cleaner, but many others like the green algae and mosses that frequently grow on the outside of a well-watered clay pot. . .

The flowerpot business has always been countercyclical: when the economy slacks off, people buy more clay pots. This may be because they take fewer vacations, which are often the nemesis of houseplants, and take more interest in making their homes attractive. [For several recent years the popularity of clay pots increased.] But then business suddenly got even better. Perhaps it was the energy crisis. Perhaps it was part of the movement "back to the natural." At any rate, clay pots were put on sale everywhere—in shopping malls, supermarkets, and department stores. For days the telephone would ring endlessly with orders.

Alas, the orders became increasingly difficult to fill. The company simply could not make the pots fast enough, and almost overnight the telephone fell silent. This is what had happened. While commercial growers were switching to plastic over the years, the market for clay pots among homeowners was gradually growing from a mere 10 percent to a whopping 75 percent of sales. Most Syracuse pots were now retailed through garden-supply stores in wealthy New England suburbs, frequently three hundred miles or more distant, and near the limits of cost-effective trucking. Since many suburban customers were more interested in decorative pots than standard ones, many stores began importing these from Italy. When the clay-pot fad struck and the few domestic potteries could no longer keep up with the surge in demand for standard pots, it was easy for importers to start bringing those over by the shipload too, since ocean freighters are a very cost-efficient means of shipping heavy flower-pots. The European pot industry was healthy; Europeans own an average of nine houseplants per capita, as opposed to one and a half for Americans. Most of the imports came from Italy, but pots from Korea and Germany also began to flood the market.

There were some dark days at Syracuse Pottery, but [the owners] struck back vigorously. They began to import their own decorative pots and ceramic ware from Italy and the Dominican Republic, although they also bought from various domestic makers. Fifty percent of the pots they sell now are manufactured elsewhere, and they act as distributor for items as diverse as birdbaths and dog dishes. They hung on to the commercial trade, too, by offering greenhouse supplies such as peat and, yes, plastic pots. High-quality plastic pots, not the cheap ones that crack at the collar when you pick them up, or deteriorate overnight when exposed to sunshine. This move was a wise one also in terms of transportation costs. You simply cannot load a truck to the top with clay pots, so why not fill the empty space above the pots with lightweight greenhouse supplies? They ride virtually for free.

Not just surviving but competing fiercely, Syracuse Pottery's thirty-two employees are still pressing out the pots. In the spring of each year the clay pit is pumped free of water, and when it has dried sufficiently Gordon perambulates the area, selected the sections of the deposit that should be dug in order to give a good, even mix. A year's supply of the gooey purplish-brown clay is dug and hauled by a contractor in about three days and stored in huge piles in a shed at the factory. The semi-dried clay is then taken as needed and run through what is known as a pug mill. This mill kneads, moistens, and blends the varves into a proper plastic consistency. Calcareous nodules—little hard knots of lime deposited by water seeping through the varves—are crushed as the clay is sent through a roller mill. The clay is then extruded into cylindrical plugs, big plugs for big pots, little plugs for little pots. Next, the oiled plugs are trundled over to the pot presses, each of which looks like a large drill press except that both the platform

which houses the female die, and the descending male die are spinning. Several small pots can be made on one press simultaneously. Pots closer to twelve inches in diameter can only be made one at a time and must be smoothed and finished by hand. Those larger than twelve inches in diameter are imported from Italy. For some reason the Italians have the edge when it comes to large pots.

Standard pots, whose height is the same as their diameter; azalea pots, whose height is three-fourths of their diameter; bulb pans, half as tall as their diameter; and an assortment of saucers and cactus dishes (textured with a kitchen fork) are then taken to the drying room, where they are carefully stacked on shelves. After the employees have left, steam heats the room to about 120 degrees Fahrenheit while huge fans circulate the air. After one to three days, depending on the size of the pot, the clay has dried to a grayish color and is ready to be fired.

One of the first things Gordon Britcher did when he joined his father in the business in 1945 was to replace the ancient hand-fired beehive ovens with what is known as a tunnel kiln. Formerly, individual batches of pots were carefully stacked in the beehive ovens, then fired over a period of several days. The tunnel kiln operates continuously, an endless line of pots traveling through it on small railroad cars. A hydraulic ram gently nudges the entire line of cars along, an inch or so every thirty seconds. It takes seventeen hours for a car to pass through the kiln, gradually warming to 1,800 degrees Fahrenheit near the center, then gradually cooling again as it nears the exit.

An important man in this operation is the one who stacks pots on the cars. Of course, the collars on standard pots make them easy to stack. But now there is a great demand for more awkward shapes, such as bowls. That's one consequence of the shift toward the consumer market. Another consequence is that consumers are more picky about gray stains on their pots. These stains are caused by insufficient air circulation during the firing. Without enough air, carbonaceous material present in all clay tends to reduce rather than oxidize. Instead of a healthy brick-red, parts of the pot may have a metallic look. These problems never much bothered anybody before, but they do now. So the stacks have to be looser. Awkward shapes, looser stacks, and the ever-present threat of a wreck in the kiln can drive a stacker to distraction.

Envision a long line of cars heavily laden with clay pots, pans, and dishes as it travels through a square tunnel, out of sight, with only a foot or so of clearance on all sides. If one stack of pots should happen to tumble, it makes no difference to the hydraulic ram. Its inexorable thrust continues. Very slowly, very devastatingly, stack after stack that follows will also tumble and be crushed into shards. If the problem is discovered soon enough, the solution is to open the kiln doors down at the exit end and shoot at the offending stack with a .22 rifle,

a job that adds a little levity to upper management's work day. But sometimes a wreck goes undetected, and as luck would have it this seems to happen just when a big order is being rushed out. In such a case the kiln has to be shut down to cool for several days before a worker, wearing an asbestos suit and tied by rope to fellow workers at the kiln door, can go in.

All pots, clay or plastic, will crack from root pressure if plants go too long without repotting. Freezing or improper stacking can crack a pot, too. Cracks in clay pots usually start as hairline fractures at the collar, and a valuable pot can be saved by a tight metal band. Drop a clay pot, however, and the damage is both instant and irrevocable.

One result of the pot wars is that there are a lot of pots on the market of widely divergent price and quality. With many decorative pots costing a hundred dollars or more, it pays to be as careful when purchasing a pot as when handling it. An expensive pot should be strong, its price reflecting the weight of the clay, as well as any artwork. It pays to shop around. Some retailers mark their prices up 50 percent over wholesale. Some mark them up 500 percent.

The garden-store outlet is still a new and volatile market for Syracuse Pottery, and wide pricing discrepancies are yet one more thorn in the side. As Gordon Britcher prepares to step down, leaving Jim Butler at the helm, the pot wars are still going on. There is the occasional wreck in the kiln to contend with. Through it all, the company has become the largest manufacturer of clay pots in the northeastern United States, and it is among the very last.

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Corrections

- v. 40:200–202. “*wülfinghoffii*” should read “*wuelfinghoffii*.”
v. 40:258–Fig. 6. Harry Luther, director of BIC suggests that the illustration is of *Aechmea penduliflora* and not *A. leucocarpa*.
v. 41:8. Additions to the Key to the Genus *Guzmania*
Insert immediately below the title as line 1:
109. Floral bracts all acute. Ecuador, Peru 75 *G. conifera*
line 2. “108” should be “109”
lines 13 and 16. 111... “bracts” should read “floral bracts”
v. 41:23–Fig. 14. “*Canistrum fosterianum*” should read “*Canistrum seidelianum*”

Additional Remarks on *Tillandsia rauhii* and Description of a New Variety (continued from page 54)

Tillandsia rauhii has a remarkable flower-biological behaviour. The flowers on horizontally arranged spikes are located only on the underside; those on vertical spikes are located on the side that receives full sun until midday only.

The flowers are proterogynous as they are in many species of the subgenus *Tillandsia*. Before the anthers become visible, the style with the stigma lobes exceeds the petal blades by 1.5 cm. Even in young flower buds, in which the petals are as long as the sepals, the style is longer than the still-closed anthers. In older flower buds, which are just starting to open, the anthers, the filaments, and the longer style are still folded. But then the style begins quickly to stretch and surpass the petals, the petals begin to unfold, the filaments begin to stretch. With the flower open, the filaments of the two stamen whorls have different lengths, the shorter have one basal fold while the longer are even.

Tillandsia rauhii is pollinated in nature by colibris [hummingbirds]. Capsules appear in cultivation also without cross-pollination, but rarely. After the seeds ripen the whole plant begins to die slowly, as is the case with many other big rock tillandsias. Vegetative propagation takes place before flowering with the help of the many basal adventitious offsets; postfloral offsets do not occur.

As already mentioned, we found in the valley of the Río Chancay, north of the Saña valley, a new variety with very long and flat spikes that we call var. *longispica*. There are then two varieties to be distinguished:

var. *rauhii*.

The description and location appear above.

var. *longispica* Rauh.

The Latin diagnosis was published in Bromelienstudien 21. Mitteilung, Trop. subtrop. Pflanzenwelt, 1990.

Tillandsia rauhii var. *longispica* differs from the type in the following characteristics:

Rosette leaves up to 1.3 m long, narrower, only to 10 cm wide, green not purple, white waxy. *Inflorescence* to 2.5 m long, curved down, with narrow-linear, flat spikes; these 60–100 cm long, 2–4 cm wide, bent strongly upwards in the upper third. *Flowers* only to 5 cm long. *Petals* deep dark violet (not blue-violet as in the type), not hanging straight down. *Stamens* and *style* as long as the petals.³

Holotype: Rauh 69431, March 1987, in Herb. Inst. System. Bot. Univ. Heidelberg (HEID).

Locality and distribution: Frequent on the very steep grandiorite rock walls of the Río Chancay, 700 m above sea level, east of Piura, Dptm. Lambayeque.

Both varieties grow under the same ecological conditions, namely, on steep rock walls. Both valleys, the Saña and the Chancay, are deeply incised cross valleys of the west Andes. They receive little precipitation and bear xerophytic vegetation. The valleys are separated from each other by a 2,000-meter high plateau so that an exchange of plants by seed is difficult. In the Río Saña valley besides *Tillandsia rauhii* var. *rauhii*, we found numerous specimens of the big *T. extensa*, also growing on rocks, but no other bromeliads. The Chancay valley, however, is very rich in bromeliads, especially in tillandsias. In addition to the big *T. rauhii* var. *longispica*, we found *T. lymanii* Rauh, *T. latifolia* E. Meyen var. *leucophylla* (both endemic to this valley), and the very variable *T. heteromorpha* Mez that A. Weberbauer collected in the inner-Andean region in the valley of the Río Pucchu (Dptm. Ancash). In addition, there were gray vrieseas such as *V. cereicola* (Mez) L.B. Smith and *V. cylindrica* L.B. Smith. At the entrance of the valley, where plant exchange is easier, grow species that are widespread in Peru: *T. multiflora* Benth. var. *multiflora*, *T. latifolia* E. Meyen var. *divaricata* (Benth.) Mez, *T. juncea* (Ruiz & Pavon) Poir., *T. floribunda* H.B.K.

All in all, the valley of the Río Chancay is in the phytogeographical sense a very interesting valley and it seems that the famous German-Peruvian botanist A. Weberbauer did not visit it.

Heidelberg, Federal Republic of Germany

1. Bromeliad Society Bulletin 8:44-45; 1958.

2. Wolter, M.; Barthlott, W. REM-Untersuchungen der Blattoberfläche von *Tillandsia rauhii* L.B. Smith (Bromeliaceae) vom Jugend- bis zum Altersstadium mit einen Wechsel der Lebensform. Flora (in press).

3. We had only a small amount of flower material at hand because the flowering period had already passed and bigger flowering plants were very difficult to get.

Don Beadle is continuing to add to and refine the long-awaited list of hybrids and cultivars. He now estimates that he will be able to publish it in May 1991. He is also revising registration procedures and will publish them in the *Journal* as soon as possible.



Regional Reflections

Letter From Japan

Dear Sirs:

Received your invoice calling for renewal of your membership, but I am very sorry that I have to withdraw myself from your society. The reason is my old age.

I am a 19th century man. Was born in 1900 and now my back is bent and my ears have stopped to function. To make the matter worse, a typhoon in this September blew off my old, half rotten greenhouse. I took it as a revelation that I had better give up my greenhouse works and started to distribute my collection to interested botanical gardens. Your old Bulletins and Journals were delivered to my friend, Mr. H. Shimizu of Atagawa Tropical & Alligator Garden, where you will find the largest collection of broms in Japan consisting of about 300 species, varieties and cultivars of tillandsias and 400 species, varieties and cultivars of other broms.

The later Journals went to Mr. Y. Tsuchihashi of Kyoto Botanical Garden, where they have newly constructed a bromelia house of 400 sq. meters. The Nanboh Paradise of Tateyama (near Tokyo) where my friend is working allocated 200 sq. meters for bromeliads in their new conservatories. Mr. T. Mori of Amagasaki Greening Society is also my friend. These young enthusiasts are my successors, and they are already your members. The remaining Journals will be given to my new successor, Mr. S. Ohyama, a student of the University in Kyoto, and he will apply for your membership.

In 1975, I wrote an article in a Japanese magazine *Garden Life* introducing tillandsias, and in 1987, neoregelias. In the latter case, I quoted your name and address as the world-wide society of bromelia lovers.

I obtained all the knowledge I have about bromeliads from your Bulletins and Journals. They made the rest of my life so happy and fruitful. I cannot thank you too much for it.



Thank you over again. Hoping your Society will prosper forever, and with my best regards to the editor of the *Journal*.

Yours sincerely,

Kiyo-o Yamaguchi
637-4 Yoriki, Kounan-shi
Aichiken 483, Japan

Damned If You Do: Damned If You Don't

After the October Mini-show, there was some lively discussion regarding trimmed leaves and the use of leaf shine for plants on a competition table. B.S.Q. follows the judging standards of the B.S.I. and the current situation is that leaf trim is allowed, and leaf shine is not. As with most instances where a value judgement is made, there are pros and cons, and there is bound to be some dissension with the decision.

While leaf trimming is allowed, it is a *cultural defect* and is penalised according to the effect on the plant. A small trim on one leaf which is not readily apparent suffers only a minor penalty, while several leaves cut to a knife point (with two cuts of the scissors) attracts a greater demerit. If the trim affects the conformation, then the plant will be downgraded in this category also.

Leaf trimming is optional, and the exhibitor must decide whether to trim or not to trim. A little "out of season practice" on grooming plants will let a grower understand under what circumstances the point score of a plant will be upgraded by *judicious* leaf trimming.

Effectively, leaf trimming is limited to removing small defects (mostly from leaves with entire margins). Leaf trim on a spiny leaf (e.g. *Aechmea bracteata*) would leave an obvious clue, but this may still be preferable to leaving a badly marked leaf as is.

When trimming leaves, I prefer to use a razor blade or a very sharp craft knife. I run the knife along the edge of the leaf, taking a fine cut each time, preserving the shape of the leaf until the defect is removed.

Peter Paroz

*Reprinted from Bromeliaceae,
Bromeliad Society of Queensland, Nov.-Dec. 1989.*

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THE BROMELIAD SOCIETY, INC. FINANCIAL REPORT

1/1/89 through 12/31/89

December 17, 1990

As current treasurer of The Bromeliad Society, Inc. I herewith submit a tentative financial report for period 1/1/89 thru 12/31/89, which has been reconstructed from figures obtained from Coast Savings, Laguna Hills, Calif. for period 1/1/89 thru 5/31/89 and actual income and expenditures as reflected by my records for period 6/1/89 thru 12/31/89.

This report cannot be considered certified as there are no substantiating papers to support amounts in notes B, C, & D.

Balance Sheet has been reconstructed from figures obtained from various Board members and Committee chairpersons.

C. P. Jackson

GENERAL ACCOUNT

Cash on Hand 12/31/88 (Note A) 12,038.11

INCOME:

Unidentified (Note B)	25,767.88	
Interest (Note C)	609.36	
Advertising - Journal	3,740.33	
Advertising - Roster	420.00	
Back Issues - Journal	1,684.35	
Publications	2,601.85	
Color Fund	558.00	
Cultural Sheets	342.56	
Dividends	3.00	
Medallions & Trophies	1,407.42	
Memberships	23,668.50	
Postage Refund	36.15	
Seed Fund	547.00	
Donations	269.50	61,655.90

DISBURSEMENTS:

Unidentified (Note D)	19,879.22	
Affiliate Newsletter	38.12	
Bank Charges	6.50	
Publications	372.45	
BSI Meetings	118.65	
Grants	200.00	
Journal - Printing & Photos	10,575.84	
Journal - Mail Service	3,252.91	
Journal - Typesetting	4,900.00	
Journal - Misc. Expense	746.37	
Journal - Allowance	1,800.00	21,275.12
Medallions & Trophies		2,585.15
Membership - Contract	3,150.00	
Membership - Expenses	1,382.90	4,532.90
Seed Fund		613.89
Treasurers Expense		28.05
Roster		2,804.91

Contingency:		
Grant - Padilla Research Fund	<u>167.50</u>	<u>52,622.46</u>
Gain - Year 1989		9,033.44
Advance Refund - TL		350.00
To be transferred to BIC account		<u>5,180.02</u>
		26,601.57
Retained by Greg Reid (Note D)		<u>8,536.13</u>
Cash in bank 12/31/89		<u>18,065.44</u>

SPECIAL ACCOUNTS

	General Account	Life Membership
Balances 12/31/88 Note A	36,170.46	9,186.04
Unidentified transactions 1/1/89 thru 1/2/90 Presumed to be interest Note C	3,352.73	850.85
Balances received by current treasurer	39,523.19	10,036.89

TENTATIVE BALANCE SHEET 12/31/89

	12/31/88 Note A	12/31/89
CURRENT ASSETS:		
Cash - Coast Savings	12,038.11	8,536.13
Cash - Texas Commerce		18,065.44
Cash - BIC Account Spec.	9,165.78	—
Cash - General Account Spec.	36,170.46	39,523.19
Cash - Life Mbr Acct. Spec.	9,186.04	10,036.89
TOTAL CASH:	66,560.39	76,161.65
ADVANCES:		
Lineham	350.00	—
Whitman	100.00	—
Steckler	200.00	200.00
Musleh	375.00	375.00
Oleson	84.29	—
Navetta	100.00	100.00
Beltz	200.00	200.00
BSSF WBC 1988	1,000.00	—
TOTAL ADVANCES:	2,409.29	875.00
FIXED ASSETS:		
Library and Equipment	4,348.39	4,348.39
Less Depreciation	2,089.54	2,089.54
TOTAL DEPRECIATED VALUE:	2,258.85	2,258.85

Inventory	53,988.28	52,497.00
Investment - Unisys	200.00	200.00
TOTAL ASSETS:	<u>125,416.91</u>	<u>131,992.50</u>
TOTAL NET WORTH:	125,416.91	131,992.50

NET WORTH RECONCILIATION

Balance at 12/31/88 (Note A)	125,416.91
Error in addition	.10-
Remove BIC to Special Account	<u>9,165.78-</u>
Corrected Total	116,251.03
Net Gain - Year 1989	13,237.02
Changes in Inventory	1,491.28-
Changes in Advances	<u>1,184.29-</u>
	126,812.48
To be Transferred to BIC Special Account	<u>5,180.02</u>
Balance at 12/31/89	<u>131,992.50</u>

NOTES:

- Taken from Greg Reid's report submitted to BSI Board at May 1989 meeting in Los Angeles, Calif.
- No records of any kind received from predecessor, Greg Reid. Taken from figures obtained from Coast Savings, depository used by Greg Reid, Account No. 105704050.
- Presumed to be interest. Also taken from figures obtained from Coast Savings.
- These amounts received in January 1990.

BROMELIAD IDENTIFICATION CENTER FINANCIAL REPORT - 1/1/89 THRU 12/31/89

Balance 12/21/88 (Note A)	9,165.78
Unidentified transactions 1/1/89 thru 1/2/90	
Presumed to be interest (Note C)	849.53
Balances received by Current Treasurer (Note D)	10,015.31





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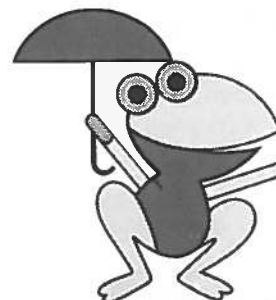
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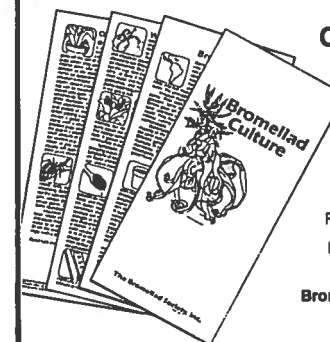
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Don Woods

A beautiful specimen of *Neoregelia concentrica*. This and other favorite *Neoregelia* species are described by Don Woods on page 69.

Calendar of Shows

- 8-17 March The New York Flower Show will be held at Pier 92 between 51st and 52nd Streets and the Hudson River. Sundays 10 a.m. to 6 p.m.; Monday-Saturday 10 a.m. to 8 p.m. The New York Bromeliad Society, Inc. will participate. Theresa Begley, 130 Vanderbilt Ave., Staten Island, NY 10304.

- 20-21 April Shreveport Regional Bromeliad Society 11th Annual Show and Sale. Barnwell Garden and Art Center, 501 Clyde Fant Parkway, Shreveport, LA. Saturday 1 p.m. to 5 p.m.; Sunday 1 p.m. to 5 p.m. Free admission. Harvey C. Beltz 318-635-4980.

- 4-5 May La Ballona Valley Bromeliad Society Annual Show and Sale. Veterans Memorial Auditorium, 4117 Overland Ave. at Culver Blvd., Culver City, CA. Saturday, noon to 4:30 p.m.; Sunday, 10 a.m. to 4 p.m. Richard Fleg 213-830-8346.

- 4-7 April 1991 3rd International Cryptanthus Show and Plant Sale held in conjunction with the 2nd Annual Festival des Fleurs de Louisiane. Lafayette, Louisiana. Michael Young 504-355-5408.

- 11-14 June 1992 1992 World Bromeliad Conference sponsored by The Bromeliad Guild of Tampa Bay, Inc., The Florida Council of Bromeliad Societies, Inc., and The Bromeliad Society, Inc. Saddlebrook, Tampa, Florida. Tom Wolfe, General Chairman, 813-961-1475