

PLANT LIFE



1950

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The American Plant Life Society
Box 2398, Stanford, California

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[Nos. 1-4, Jan., Apr., Jul. & Oct.]

1950

EDITED BY

HAMILTON P. TRAUB

HAROLD N. MOLDENKE

THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

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HERBERTIA

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HYBRID AMARYLLIS EDITION

EDITED BY

HAMILTON P. TRAUB

HAROLD N. MOLDENKE

THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

[IN MEMORIAM—J. MARION SHULL, CONTINUED FROM PAGE 30.]

He received two medals from the AMERICAN IRIS SOCIETY for his iris work, which included his book on iris, illustrated by his own paintings.

The members of the SOCIETY know him best for his hemerocallis breeding and for important contributions to daylily knowledge, including the data card for *Hemerocallis* description, but his skill with pencil and brush covers a wide field. Over 1,700 paintings and drawings of plant subjects alone are credited to him while he was an artist for the U. S. DEPARTMENT OF AGRICULTURE.

His many stimulating papers on hemerocallis, published in *Hortia*, as well as the beautiful cover designs in color, and the DESCRIPTIONS of his daylily clones, critically selected for garden value and beauty, will be his best memorial from which all flower lovers now and in the years to come will benefit.

To those who knew him, no further monument is needed than the memory of a fine character devoted to sincere work for the appreciation of beauty and contributions to the improvement of ornamental gardening.

Hyattsville, Maryland

—J. B. S. Norton

IN MEMORIAM—WILLIAM REYNOLDS DICKINSON,
1875—1949

It is with the deepest regret that we record the death of William Reynolds Dickinson who passed to his reward on April 28, 1948. He was noted for his conspicuous services as a civic leader, and for his pomological and floricultural activities. Mr. Dickinson was born on Sept. 14, 1875 at Chicago, Illinois, and resided on his estate, Hope Ranch, in Santa Barbara, California, for the last 25 years of his life.

He was a charter member of the Society, and he introduced many plants from various parts of the world, and these he tested at Hope Ranch. One of the outstanding achievements concern the colony of *Worsleya Rayneri* (Blue *Amaryllis*) at Hope Ranch. This is the first successful attempt to grow this species out of doors outside its native habitat on the Organ Mountains near Rio de Janeiro, Brazil.

Mr. Dickinson will be greatly missed by all who had the good fortune to know him.

P R E F A C E

The 1950 WILLIAM HERBERT MEDAL was awarded to Mrs. Mary G. Henry of Gladwyne, Pennsylvania, a noted plant explorer, lecturer and Research Associate of the ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, for her outstanding achievements toward the advancement of the Amaryllids. Her contributions are particularly notable for (a) *xCyr-tanthus* breeding, a field in which she is the only important worker; (b) the collection of the species of *Hymenocallis* native to the United States and Mexico; (b) bringing to the attention of the public of the PINK BELLADONNA LILY, *Amaryllis belladonna* var. *Haywardii*; as well as other outstanding accomplishments in the field of the Amaryllids. Mrs. Henry contributes a very interesting autobiography to this HYBRID AMARYLLIS EDITION of HERBERTIA, which is appropriately dedicated to her.

The charming cover design featuring the PINK BELLADONNA LILY, *Amaryllis belladonna* var. *Haywardii*, from Bolivia, is a contribution from Miss Josephine deN. Henry.

We regret to record the recent deaths of Mr. E. A. McIlhenny, Mrs. Sarah V. Coombs and Mr. Frank J. McCoy. Mr. McIlhenny, a noted naturalist of Avery Island, Louisiana, was a charter member of the Society, and served as Regional Vice-President for the SOUTH MIDLAND until his death. The members have had the privilege of reading Mrs. Coombs' interesting articles on South African Amaryllids as house plants in past issues of HERBERTIA. The concluding part of the last series appears in the present issue. At the time of her death, Mrs. Coombs was working on another series which was not far enough along for publication. Mr. McCoy was a great humanitarian, a Director, and Vice-President of the AMERICAN PLANT LIFE SOCIETY. These stimulating personalities will be keenly missed. In Memoriam notices for all three will be included in future issues of HERBERTIA.

This HYBRID AMARYLLIS EDITION of HERBERTIA contains some valuable articles on this subject. Mr. Hayward brings us up-to-date on the preparation of *Amaryllis* blooms for show purposes. Mr. Mulford B. Foster contributes a fine drawing showing the eight *Amaryllis* flower types for exhibition purposes. This fills a long felt need, and Mr. Foster is to be congratulated on his very fine contribution. There is also a revision of the *Amaryllis* flower types, exhibition classes and score card. Hermon Brown, the Chairman of the *Amaryllis* Committee, reports on his breeding activities; E. J. McCann writes about the McCann double *Amaryllis*, the only double hybrid clones in the trade; Mrs. Armstrong writes about *Amaryllis* breeding in Illinois; Mr. Alders records the history of the Van Meeuwen SUPERIORA and GRACEFUL clones of hybrid *Amaryllis*; Prof. Ballard informs us on the growing of *Amaryllis* in Maryland; the Misses Meadows and Brackenridge write about the BLUE AMARYLLIS, and Mr. Lytel on the BLUE AND IMMACULATE *Amaryllis*. Last, but not least, Mr. Hayward writes about the *Amaryllis* of tomorrow.

In addition, there is a wealth of contributions on the other amaryllids. Mr. Claar, Chairman of the *Hemerocallis* Committee, contributes a very interesting report for 1949; Mr. Voight reports on the *Hemerocallis*

trials at Whitnall Park; Mr. Gilmer on daylily evaluation and a corrective for poor daylily foliage; Dr. Corliss on photographing *Hemerocallis* in color, and on daylily adaptability; Mrs. Henry on a sectorial mutation in *xHemerocallis*, and Mr. Kennell on some observations of a daylily hobbyist.

Mr. Foster contributes important articles on collecting amaryllids, bomareas and alstroemerias in South America. Dr. Dyer contributes the first part of the long needed review of the genus *Brunsvigia*. Mr. Allgeyer writes of Amaryllid culture in Michigan; Dr. Cooley on *Narcissus* in Maryland, and Mrs. Coombs on *Haemanthus* as house plants.

The 1951 issue of HERBERTIA will be dedicated to Mr. Mulford B. Foster, the outstanding contemporary plant explorer for Bromeliads and Amaryllids in South America, who has enriched our Amaryllid collections by the introduction of new species, and the re-introduction of fine species which had been lost to culture.

Hamilton P. Traub
Harold N. Moldenke

January 12, 1950

POSTSCRIPT.—A red letter day. 1—17—50. Today Mrs. Mary G. Henry showed the writer a flowering plant of the first cross involving THE PINK BELLADONNA LILY, *Amaryllis belladonna* var. *Haywardii*, made in 1948. The other parent was a form tentatively referred to *Amaryllis elegans* with medium red-colored flowers. The offspring is an outstandingly graceful plant with the most beautiful carmine (RHS 21/1) flowers. Mrs. Henry's outstanding results, which will be published in more detail in 1951 HERBERTIA, give an indication of the great value of THE PINK BELLADONNA LILY, *Amaryllis belladonna* var. *Haywardii*, itself an ideal pot plant, as a parent in *Amaryllis* breeding.

—H. P. T.

DEDICATED TO
MARY G. HENRY



Herbert Medalist—Mary Gibson Henry

Plate 1

MARY GIBSON HENRY

An Autobiography

Little did I know of the influence over my life a little flower would have, when at the age of seven, I first saw and fell in love with that gem of gems, the tiny but utterly precious *Linnaea borealis americana*. It was at Moosehead Lake, Maine, and to this day I never see the *Linnaea* without a thrill. It awoke in me not only a love for and an appreciation of the absolute perfection of the flower itself, but also for the dark silent forest that shelters such treasures.

Must I admit it? I was a "city girl," although I was born in my grandmother Pepper's home in Jenkintown, Pennsylvania. Truly time flies and the years since the day of my birth, August 15, 1884, have passed all too quickly. My esteemed parents were Susan Worrell Pepper and John Howard Gibson. My mother was of Quaker descent. Some of our forefathers came from England with William Penn to help found the City of Philadelphia. George Pepper, my great grandfather, was a member of the first Council of the PENNSYLVANIA HORTICULTURAL SOCIETY in 1828 and had the first greenhouse in Philadelphia. Lawrence Seckel, his brother-in-law, of Seckel Pear fame, was my great, great uncle. My grandfather Gibson was of Scottish descent. He, too, had a greenhouse and was deeply interested in horticulture.

My home was in the center of Philadelphia. We had no garden. In the summer my brother Henry, my sister Adeline and I spent a few weeks in the country with our grandmother and sometimes our parents took us to the mountains or to the seashore.

As a young child I enjoyed nothing more than listening to my father tell of his hunting and camping trips, and too, to stand beside him when he was target shooting. Often I was allowed a few shots. Helping to clean his rifle afterward was a cherished chore. So much so that even today I like no perfume better than the aroma of a humble tube of gun grease from which nostalgia just seems to ooze.

When I was nine my father died, but his influence, that of a man who loved the outdoors and who was gentle, strong and kind, remains with me. Gradually dreams evolved from his stories, but it was many, many years before these dreams turned to realities.

After six years' attendance at Agnes Irwin School, I graduated in 1902. During this period I studied the piano. After my graduation I took up the harp. That summer I had my first glimpse of the Rocky Mountains, when I accompanied my aunt May Gibson to the Colorado Rockies and the Grand Canyon, Arizona. The magnificence of the country thrilled me beyond words.

In 1908 my mother took us to Europe. The "high spot" of the trip, in more ways than one, was a climb with my brother and three guides to the summit of Mont Blanc, altitude 15,781 feet. We were roped together and it was a tremendously exciting experience.

In 1909 I married Dr. John Norman Henry. My husband loved the outdoors even as I did and a tent and a canoe were important factors of our wedding trip. In a few years we became the happy parents of five

children, Mary (now Mrs. Edward M. Davis, 3d), Josephine deNancrede, John Norman, Jr., Howard Gibson and Frederick Porteous.

Norman's profession necessitated our living in Philadelphia, but we had a nice back yard, where grew several Lilacs, some Iris and Narcissus. Best of all, I had a tiny greenhouse.

Our holidays were often camping trips and our children usually accompanied us.

When World War I came, Norman served overseas as Major, Chief of Medical Division, Base Hospital 38. He was Director of Public Health of Philadelphia 1931-1935. He was also President of the Alumni of the University of Pennsylvania.

In 1926 we purchased 95 acres of unimproved land at Gladwyne and built our home, with a small greenhouse attached.

Great grief came to us in 1927, when we lost our youngest son, aged six. I craved solitude and working with my plants was all I cared to do.

During the years in town, some botanical books were acquired and I owe an enormous debt to the botanists who wrote them. "The Travels of William Bartram" proved to be an unending source of inspiration and, when I obtained some contemporary maps, formed the basis for planning many trips. Especially, too, do I owe much to Dr. J. K. Small for his monumental and invaluable "Manual of the Southeastern Flora."

Though I dig long and deeply in the earth these days, most of my digging those long years in the city, was "in the clouds." But it was digging into books that showed me how to dig "in the clouds" and it was digging in "the clouds" that taught me to dig into the good brown earth.

In those days in order to obtain rare American plants, it was necessary to import them from abroad. Few were available.

Here let me say that it was 19 years after I was married before I had a whole "day off" by myself without a member of my family. Our children were now grown up. No one appreciated this long term of home duty more than my husband did and he showed his appreciation by saying, "Go to it and go to all the places and do all the things you want to do and I believe are well fitted to do. You have earned it all I will help in every way I can." He was even better than his word. Sometimes he took trips with me but usually he was too busy to go. He supplied me with a car and a chauffeur, Ernest Perks, who is now gardener, and who, after 21 years, continues to drive me on my trips. My car is outfitted with an "attic," an electrically lit desk and a bookcase. The rear compartment is insulated and ventilated so that newly collected plants travel comfortably. Three plant presses, numerous buckets, spades, etc., are part of the equipment.

My first real plant collecting trip was taken in order to obtain a few specimens of *Rhododendron speciosum*, described so glowingly in Bartram's "Travels." It was unobtainable from either botanical or commercial collections in America or in Europe. My journey of approximately 2500 miles in a car, and many on foot, was eminently successful.

For some years I traveled down and up the Atlantic Coastal Plain at various seasons, always of course in the less frequented areas, usually as far as Florida. I soon learned that rare and beautiful plants can only

be found in places that are difficult of access. Hogs and cattle as well as man are the depredators. Often one has to shove one's self through or wriggle under briars, with awkward results to clothing and many and deep cuts and scratches. Tramps through lonely, pathless forests are often the means to an end. Wading, usually barelegged, through countless rattlesnake-infested swamps add immensely to the interest of the day's work. On several occasions I have been so deeply mired I had to be pulled out. Wearing hip boots in the summer in states bordering the Gulf of Mexico is not practical. It is too hot and the swamps are often deeper than the boots are high.



Fig. 1. Mary Gibson Henry at the age of 15 years.

After a few seasons on the Coastal Plain, the Piedmont Plateau came next. Subsequently my trips were to the Appalachian Mountains. The eastern slopes of these mountains were so beautiful and so enormously interesting that I spent numerous seasons among them. In this wild and rugged country I had many adventures. Usually I was alone, but one day, when Josephine happened to be with me, we were held up by three men with three rifles, who threatend us roughly. It all took place so quickly we felt as though we were at the movies. I had often wondered how it would feel to be held up and really it was not bad at all.

Finally I crossed the "Divide," so well marked by the Appalachian Trail, and spent several more seasons in the mountains of Eastern Tennessee and Alabama.

The last two springs, 1948 and 1949, have been spent in Mississippi, Northern Louisiana and the Ozark region in Oklahoma and Arkansas.

I have kept diaries of all these trips and made herbarium specimens of all the living plants I have collected and many others and have given them, some 6000, all annotated, to the ACADEMY OF NATURAL SCIENCES, Philadelphia. Over a period of years I have made about 20 plant collecting trips to the Northeastern States and over 60 trips to our Southern States. Counting the Rocky Mountain trips they amount to over ninety. I have many more already planned.

As I learned to know and to love the beautiful flora of our Southeastern States, I realized the tragedy that is going on slowly but only too surely. Repeated visits to certain localities show the dire need for a greater conservation than is now practiced. Virgin swamps are filled with wondrous red Lilies and unbelievably beautiful *Hymenocallis*. These latter are like great exotic butterflies, snow-white and marvelously fragrant, alas that I must call them rare! The swamps are being used as water holes for cattle. Azaleas and other precious shrubs along the edges of the swamps and rivers are also thus relentlessly destroyed. Just as bad, or worse yet, others are being filled in and used as dumps. Streams and rivers, too, are being changed, all in a mad rush to alter the face of the earth.

Nor are our hills and mountains safe. Even in the so-called "State Forests" men are flagrantly burning out what they call "brush," so that grass and weeds may grow to feed the cattle which are allowed to roam freely. Often the "brush" consists of fine ages-old Azaleas.

As new American shrubs and flowers are acquired at Gladwyne, most of the foreigners are being discarded. It has been a surprising but unalloyed joy to see these plants from the wild making themselves at home. To be sure, I always try to give them a comfortable spot and a suitable soil mixture and spare no effort on their behalf. Beautiful as they are in their native home, when given room to spread freely in the sunshine, with no neighbors to elbow them out of shape, they are handsomer if possible than when growing in the wild and far more adaptable to our climate than those from foreign shores.

Magnolias, Halesias, Rhododendrons, Liliurs, *Hymenocallis*, Trilliums, Alliums, Phlox, *Liatris*, Penstemons and Yuccas are my special favorites.

After I had lived in Gladwyne five years, the list of shrubs and trees numbered about 850. A few years later there were over 1000 different species of woody plants.

Botanical friends have been most kind and generous with gifts of plants. I am especially grateful to: Dr. E. T. Wherry, Dr. F. W. Pennell, Sir W. W. Smith, Dr. C. Hodge, Mrs. C. Hodge (Dr. Ruth Patrick), Dr. E. Anderson, Dr. H. P. Traub, Dr. C. Wood, Dr. H. E. Moore, Supt. R. H. Huey and Dr. R. Pohl.

Because I am a great lover of Nature, my place is planted as a Wild Garden. A garden club member once paid me a compliment. She asked if she could come and see the garden. She came and after awhile said

with disappointment in her voice that she had hunted all around for the garden but could not find it.

And now about my Western Trips.

I have spent eleven seasons in the Rocky Mountains from southern New Mexico to northern British Columbia, where I could look across the



Fig. 2. Mary Gibson Henry in Northern British Columbia, 1931. Photo by Josephine deN. Henry; courtesy Nat. Hort. Mag.

Liard River into the Yukon and have covered thousands of miles on horse and on foot.

The first time I went west, like many tourists, I did not leave the well beaten highways. My next six trips took me far into the mountains,

I always travel on horseback with tents and a pack outfit, for this is the only worthwhile way to see the mountains.

The last four expeditions, all in Northern British Columbia, have taken me off the map into unexplored territory and we have been able, on each of these trips, to add new mountains and other features to Canada's map. In 1931 we explored a so-called "Tropical Valley." My husband and I had much correspondence with the Canadian Department of the Interior and they sent us many maps, but the very spot we wanted to go to was almost a blank on every one. The Canadian officials tried to discourage us from going and told us that travel by water was impossible owing to rapids and waterfalls on the rivers, and that by land the distance was great and the country was a pathless wilderness of uncharted mountains and vast bottomless bogs. "muskegs" they are called in the North. We learned that this region was called the "Blind Spot of North America." We were told of the attempts of men who set out to find a short cut to the Yukon district during the gold rush of 1898. Of thousands who started, the Sikanni Indians said only a few, and these half dead, ever reached there. Frozen, drowned or starved, no one knows just how they died, but now and then, later on, we found a rough stone that marked a lonely grave.

The more difficulties and obstacles that arose, the more we wanted to go. After nine months' planning we left Philadelphia on June 25th, 1931, and arrived at Pouce Coupé, Peace River Block, the end of the railroad, on July 1st. Our two daughters and two sons accompanied us. The eldest was 21 and the youngest was 14. Pouce Coupé is about 250 miles northwest of Jasper. We motored to Fort St. John, the last outpost of civilization, where our "outfit" of nine men, fifty-eight horses, tents, etc., was waiting for us.

The Topographical Survey of Canada released one of their topographers, K. F. McCusker, to accompany us and map the country.

After a night of four hours' rest, we mounted our horses and started on our long ride. For the first few weeks we rode along rivers and through meadows. The flowers were simply marvelous. Polemoniums, Delphiniums, Mertensias and Penstemons grew in undreamed of profusion. We rode for miles and miles through meadows so blue they looked like bits of fallen sky.

Later on we came to higher country. There were four attractive species of *Campanula*, an enchanting dwarf *Polemonium* and myriads of *Myosotis*, these, too, in shades of blue. *Oxytropis*, dwarf tufted plants like large headed clovers, came in yellows, blues, pinks and white. We forded innumerable rivers and swam on our horses over the deepest. Our horses and we, too, usually on foot, floundered, struggled and got stuck in the countless muskegs. One horse lost his life and another had to be abandoned. We swam daily in the rivers or lakes and loved the ice cold water. The temperature mostly fell to below freezing at nights but when the sun shone the mid-days were often deliciously warm. Our shoes were scarcely dry all summer except at night when they usually froze. Twice we were snowed in and once we were caught in such a violent blizzard I wondered if we could weather the gale. Each day we rode

as far as our horses could comfortably carry us and about once a week rested them for a day. On each of these occasions I climbed a mountain. It took us thirty-nine days to reach the Valley we were looking for. Numerous hot springs gave the valley its name. Unfortunately the Indians had burned it over but there was a rank luxurious growth of *Amelanchier*, *Rubus*, *Delphinium*, *Viburnum*, *Rosa* and *Cornus*.

On the way home we loitered in the mountains on several occasions to hunt. On September 17th, after about 1000 miles on horse and foot in 80 thrilling days, we returned to the "everyday" life of civilization again.

Maj. Aitkin, Chief Geographer of British Columbia, did me the honor to say the name given by McCusker to a beautiful mountain, Mt. Mary Henry, should remain.



Fig. 3. The Henry Home at Gladwyne, Pennsylvania.

I made a collection of herbarium specimens for the ROYAL BOTANIC GARDEN of Edinburgh and another for the ACADEMY OF NATURAL SCIENCES, Philadelphia.

In June 1932 I felt a longing to revisit the wonderful unmapped mountain wilderness of the North. Several telegrams to McCusker and a trip was hastily arranged. July 14th Josephine and I were once again standing beside the mighty Peace River, each of us armed with a free miner's hunting license. In addition to McCusker, we had three men and twenty-one horses. This year's trip could only be a short one. I remembered in 1931, seeing a vast jumble of rugged uncharted mountains west of Redfern Lake and I knew I would find what I wanted there. When I saw Chum, my horse, saddled and waiting for me I was thrilled to the core. Luckily Chum was a big horse and luckily I am small, but 5 ft. 1 in.

and weigh about 112, because besides myself, his load included plant press, rifle, camera, fishing equipment, my precious spade, cans of living plants, etc. One day Jo called to Smoky, "Do you see Mother?" "No" was the reply, "but her horse is coming with a lot of shrubbery and I suppose she is behind it."

Day after day we rode through mountains and valleys that were breath taking in their beauty. Each day brought its own adventures, but our Guardian Angels took good care of us.

On this trip we covered 460 miles on horseback and climbed seven mountains on foot, another 100 miles, in five weeks. Again I made plant collections for the ROYAL BOTANIC GARDEN, Edinburgh, and the ACADEMY OF NATURAL SCIENCES, while Josephine made a collection of insects for the Academy.

Spring of 1933 came and with it a yearning for the great mountainous wilderness of Northern British Columbia where the sky is the only ceiling, the ground is strewn with sparkling flowers and the seasons of spring, summer and autumn are crowded into a few grand and glorious weeks.

With my expedition already planned, I crossed to the north side of the Peace River on June 28th and again Josephine was my companion.

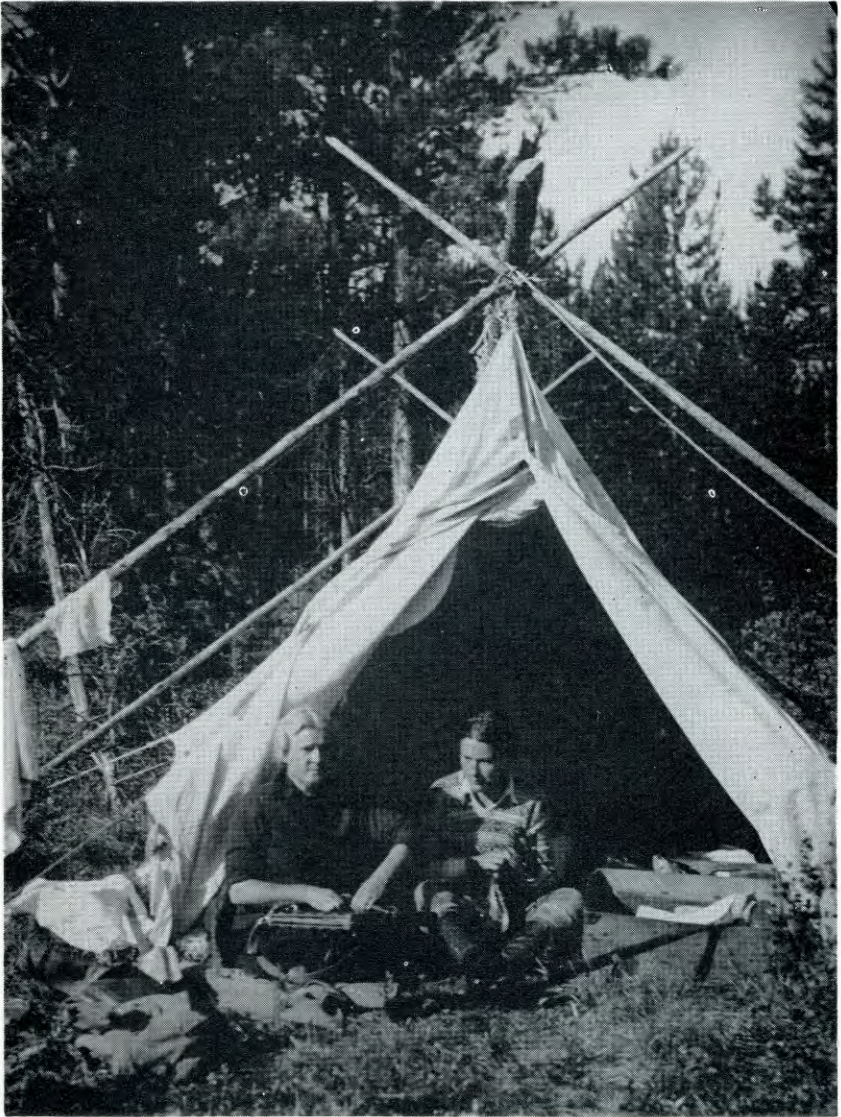
On the steep dry slope above the river a stunning small cactus *Opuntia fragilis* was growing. Among them the blue *Linum Lewisii* swayed side by side with the lovely pale yellow *Lithospermum incisum*. *Allium cernuum* with its pretty drooping cluster of pale pink flowers and *Oxytropis saximontana*, fragrant yellow, were here too. *Campanula rotundifolia* clad in deep blue purple was abundant in the meadow above the bank.

After a couple of days' ride in a little open boat up the river, we reached the tiny town of Hudson Hope. McCusker, four men and twenty-four horses formed our "outfit" and awaited our coming. The rivers were very high this year and the muskegs deeper and wetter than ever. July 1st we started north on our third exploratory expedition, and that night I slept as I love to sleep, with Mother Earth for my bed and only a strip of canvas between the stars above and me.

The great and gorgeous meadows seemed bluer than ever and my heart sang for joy as day after day we rode through the lovely flowers.

Before many days passed, misfortune befell us and we lost 450 pounds of food when we rafted a raging torrential river. The rafts were merely a few logs tied together with ropes. Although some of the men had very narrow escapes, all came through safely. We lived that season on slim rations.

In a few days we came to the mountains, and as we rode up and over the passes, the scenery seemed more magnificent than ever. Occasionally we found the tender green spears of *Allium schoenoprasum sibiricum* and their pleasant flavor gave variety to our meals. Once we got lost when we were overtaken by a snowstorm at nightfall. That season we were caught in four snowstorms and once we were snowed in on a high pass. Maybe there were some rough spots but we had an exciting and successful trip



“Home”—Mary Gibson Henry and Josephine. Photo by K. McCusker; courtesy Nat. Hort. Mag.
Plate 2

and a perfectly wonderful time. That year we mapped a section of the country west of Akie Pass. After 491 miles on horse and foot in forty-one days, we reached again the little town of Hudson Hope on August 7th. That night from a high bank above the Peace River, I watched the moon rise slowly from behind the distant jet black mountains and somehow I knew that one day I would return.

Long before the advent of the spring of 1935, all the old longings for the Northland returned a hundredfold. Truly it must be a long trip this time, Peace River northward up through the Rocky Mountains, then westward across the mountains to Alaska. This was the trip my husband and I had originally planned in 1931. Talks with Indians in 1933 convinced me it could be done. McCusker agreed to go and map the country once more.

July 1st I reached Edmonton and again Josephine was by my side. We took the little twice-a-week train for Pouce Coupé and awoke next morning in a motionless car only to learn the bridges ahead had been washed out during the night. We got off the train.

A man with an open truck offered to take us north. For two days we rode on the floor of the truck, along a rough, scarcely passable road. Then we crossed a river in a little open boat that almost swamped before reaching the far side. A freight train from Pouce Coupé came down and picked us up. Pleased to get a lift, we were not dismayed when told we must sit up all night and could get nothing to eat. The trainmen invited Josephine and me to the rear of the train and for the first time in our lives we saw the sunrise from the high window of a caboose. We thoroughly enjoyed the experience.

The night of July 6th found us sleeping in our tent near Fort St. John and so our trip began. This season we took with us twelve carrier pigeons so I could send messages to my husband and as we carried a receiving set, arrangements were made to have messages from home sent to us every two weeks.

The man in charge of the radio station in Edmonton said my party was the most remote one of any on the North American continent and gave me the most favorable time for receiving, 12.55 A. M. The message always began, "Calling Mrs. Henry somewhere in the Northwest Territory"—the most exciting address I ever had and always thrilled me to the core.

We had a long trip ahead and as usual we travelled snow, rain or sunshine. Mid-day when the sun shone, it was warm and pleasant. On dull days it was about 45° at noon. Evening temperatures dropped rapidly and it usually froze at night. I often wondered how beautiful and fragile looking flowers could stand such extremes of temperature. The lowest I ever saw the thermometer was 12° F.

Daily we rode along rivers and through forests and over the marvelous blue meadows and sometimes when the wind blew they appeared like the waves of the sea.

One day while riding on a steep slippery mountainside, Sunny, my horse, fell over sideways. Jo said I just managed to keep half a somer-



Allium Cuthbertii naturalized at Gladwyne. Photo by Josephine deN. Henry.
Plate 3

sault ahead of him, as he hollered down the steep slope. He was terrified of mud, muskeg and slippery places and before our trip was over he threw me five times. Once, Jo's horse stumbled on a high rocky ridge and my heart nearly stood still as together they fell and disappeared out of sight. They landed about 20 ft. below on deep lichen covered rocks. Mercifully she was none the worse. The men too were thrown at various times.

We traversed Laurier Pass and crossed the upper Halfway River July 23d. July 30th we forded the Prophet River. We usually travelled along game trails and by the footprints we saw they were used by bear, moose, deer, sheep, goat, elk, wolves and caribou. Sometimes we rode above timberline but frequently we had to hack our way through the forest. Often at night the wolves howled about our tents, truly the "call of the wild" and I loved these eerie sounds.

August 4th we rafted the Musqua and crossing a mountain river was always an exciting event.

The evening of August 17th was a memorable one. While fishing, my line suddenly tightened. Having lost my reel I ran back to keep the line taut. Finally I bent down a willow to which I tied the line, waded beyond the hooked fish and soon landed him with my hands. He measured thirty-two and a half inches long and according to Mr. Fowler, Curator of Fishes, ACADEMY OF NATURAL SCIENCES, is a species of lake trout and it has the largest teeth of any trout he had ever seen. I caught two of these big fish. As time wore on our food ran low, due largely to the fact that several Indians joined our party for some days.

Owing to the great distance we had to cover we were rarely able to leave the trail to hunt, but Jo and I shot all the game we used as food—bear, sheep, deer, goat and grouse. These latter we killed with pistols.

August 25th I took a three day back-packing trip on foot over the mountains, to see Mt. Mary Henry more closely. Two of the men accompanied me. We had no tent and it was fun sleeping under the sky even though it was blackened by an approaching storm and the snow soon came down on my face. The topographer fell ill here and had to remain where he was, while Glen, the other man, and I went on. I tramped over sixty miles and twice climbed to 8,000 feet in the three days, saw sheep and caribou and faced a pack of wolves and had a perfectly marvelous time.

Near the Toad River we found our friends of former trips, a tribe of Sikanni Indians. Three of them joined us for the remainder of the season. The Indians remonstrated with our men saying they should carry the guns and that Jo and I should wield the pots and pans!

September 3d we passed near Muncho Lake and we tarried a day in the magnificent Gundahoo Pass to climb a mountain.

September 13th I left camp early to hunt and before long I saw a bear which I was lucky enough to kill with one shot. That day Jo, too, killed a bear, evidently Friday the 13th is an unlucky day for bears.

September 16th we were caught again in a blizzard, as we climbed the Pass between Deadwood Lake and Rapid River. At first sleet and



Stenomesson variegatum (Ruíz & Pav.) Lindl., at Gladwyne; photo by Mary G. Henry.
Plate 4

then snow drove in our faces with a force that hurt, as hour after hour we rode into the gale.

September 22d we reached McDame. The first three towns we came to were womenless towns and the men looked at us as if we had fallen out of the clouds. We spent a couple of days in a little open Hudson Bay boat. At night we tied up and slept on the snow covered ground. The water kettle in our tent was nearly frozen solid. September 30th we reached Telegraph Creek, British Columbia and Wrangell, Alaska October 2d.

After covering some 1,200 miles on horse and foot in about 90 days in the wildest and most beautiful section of the North American continent, our trip was over. What joy it was to rise at break of day and watch the rising sun paint the mountain tops with splendor. What joy to ride or tramp over country that for beauty defies description and then at close of day to watch the mountains cast their purple shadows down the valleys and the setting sun flash its crimson glory over the evening sky.

The happy days in the wilderness had passed all too quickly. The difficulties and hazardous places that lay in our way all smoothed over as step by step we wended our way toward our destination.

To one who loves the Northland there are few hardships and any discomfort just goes to show that the best in life is only to be had by contrast and we enjoy good times a hundredfold when hard work brings them to us.

On October 6th we arrived in Vancouver. Next day Major Aitkin, Chief Geographer of British Columbia, came from Victoria to see me and then at his request, with pleasure and pride I drew a map of the vicinity of Mt. Mary Henry, the part the topographer missed when he became ill.

In 1937 and again in 1938 my husband and I went to Scotland where on both of these occasions he made the annual address before the Scottish-American War Memorial in Edinburgh.

On October 4th, 1938 I became a widow.

World War II came to pass and I was a four-star mother. The United States Army used the men I took north and according to the topographer, my 1935 Expedition formed the basis for the planning of the ALCAN HIGHWAY.

As a field botanist, duty calls me to those fertile areas of our southern states where so many treasures still lurk in out-of-the-way corners, but to anyone who loves the Northland, with its rugged mountains and blooming valleys, it is needless to say that I want, hope and plan to return. The fact must be faced, however, that for adaptability to our climate, the plants from the Southeastern States succeed probably 90% while comparatively few of those from the far north seem able to survive our long hot growing seasons.

However, when my thoughts dwell on that far, far Northland, when those miles and miles of great blue meadows come to mind and above them all the mountains clear cut against a dazzling sky, almost I can see my little tent snugly nestled on a mountain side and catch a whiff

of campfire smoke and I would rather go there than anywhere else in the world.

Responsibilities at home are great now, my gardens are a permanent fixture endowed by me and known as the HENRY FOUNDATION FOR BOTANICAL RESEARCH.

In addition to my interest in the out-of-doors, winters have found me enmeshed deeply in the routine work of my tiny greenhouse and six cold frames. There are about 600 pots and flats to be repotted and taken care of and that duty devolves entirely on me. Most of the pots contain Amaryllids and what began as "winter fun" has turned into a serious breeding program, especially with that charming family of plants, *Cyrtanthus*, particular favorites of mine.

Other interests and problems that have engaged much of my time concern the genus *Lilium*. One of the happiest occasions in my life



Fig. 4. (Center background) MT. MARY HENRY, Northern British Columbia. Photo by Josephine deN. Henry.

was when I had the privilege and pleasure of describing my new species of Lily, *Lilium iridollae* in "Bartonia" No. 24, 1946.

Deciduous Rhododendrons are another interest and I have collected over 60 native species and natural varieties of them. I described many of these in the 1946 Rhododendron Year Book of the ROYAL HORTICULTURAL SOCIETY. Perhaps my most useful work in this genus is the raising of a new race of summer blooming Azaleas that flower the end of July and early August. These are the result of reciprocal crosses between the rich scarlet *Rhododendron prunifolium* and the pure white *Rhododendron serrulatum* and are, indeed, a beautiful series of mid-summer flowering shrubs in shades of pink.

Josephine has taken over 500 colored photographs (kodachromes) of my rarest and most beautiful plants. These pictures were all taken in my gardens after the plants became established. She has mounted them in glass and I use them in my lectures.

Many of new plants have "stepped out" in the world, for I have placed over 100 in the hands of propagators and commercial growers.

In 1947, at the invitation of Sir William Wright Smith, I gave two lectures at the ROYAL BOTANIC GARDEN, EDINBURGH, entitled "Uncommon American Shrubs and Plants," and "Beyond the Frontier in Northern British Columbia." After that I gave a lecture on March 18th before the ROYAL HORTICULTURAL SOCIETY, LONDON, entitled "Uncommon American Shrubs and Plants." This lecture was published in entirety in the Journal of the ROYAL HORTICULTURAL SOCIETY, October 1947.

In 1948 I was invited to give a series of lectures on my trips into Northern British Columbia before the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY. I sailed for Great Britain October 22nd. I was also asked to give a lecture at the ROYAL BOTANIC GARDEN in Edinburgh. This was done on November 11th. It was, "More Rare Shrubs and Plants at Gladwyne."

The lectures before the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY were as follows: Dundee, November 10th, Aberdeen November 16th and Glasgow November 17th. The title of the lecture was "Beyond the Frontier in Northern British Columbia." My fourth lecture was in Usher Hall, Edinburgh on November 18th, when the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY awarded me their "Mungo Park Medal" for "Explorations in Northern British Columbia." They gave me a wonderful welcome and someone said that there were over 1,500 in the audience, the largest crowd they had ever had.

1949. Three of my children are married and there are eleven grandchildren.

I spent an extremely worthwhile spring in the swamps of Louisiana, Mississippi and Texas and the mountains of Oklahoma and Arkansas. *Hymenocallis* were one of the main objectives.

In Oklahoma I had the great good fortune to find the first *Lilium* ever found in the state.

The summer nearly brought disaster to my gardens. My own state, Pennsylvania, Department of Forests and Waters, in collaboration with U. S. Army Engineers, tried to use my place as a dump for dirt and sewage in the so-called "Clean-up" of the Schuylkill River. Fortunately I was home at the time or I would have lost it all. After a six-weeks' battle, I won the fight, or rather I should say, my friends from both sides of the Atlantic won it for me with their generously worded letters, on my behalf, to the Governor.

Now my beautiful little valley is serene, with its sparkling creeks and virgin woodland and lovely sloping hillsides so grandly crowned by the rugged rocks which form the rock garden.

This little autobiography cannot be ended without a few words of appreciation of the great blessings that have been mine. A beloved family and cherished friends have made my life a supremely happy one.

As for the flowers, although many and many a time I risked my life for them, the flowers have done far more for me than I have done for them.

Most heartily I thank Dr. Traub and the members of the AMERICAN PLANT LIFE SOCIETY for the great honor they have conferred on me by

awarding me the WILLIAM HERBERT MEDAL for 1950, and also for the pleasure and the privilege of writing this little story of my life.

AMONG MY AFFILIATIONS ARE THE FOLLOWING:

Research Associate, Department of Botany, ACADEMY OF NATURAL SCIENCES, PHILA.
 Vice President, PHILADELPHIA BOTANICAL CLUB.
 Honorary Fellow, BOTANICAL SOCIETY OF EDINBURGH.
 Director, THE AMERICAN HORTICULTURAL SOCIETY.
 Member of Council, THE PENNSYLVANIA HORTICULTURAL SOCIETY.
 Director, THE NORTH AMERICAN LILY SOCIETY.
 Correspondent of Lily Committee, ROYAL HORTICULTURAL SOCIETY, LONDON.
 Member of Executive Committee JOHN BARTRAM ASSOCIATION.
 Honorary Member, FOUR COUNTIES GARDEN CLUB, GARDEN CLUB OF AMERICA.
 Member Executive Committee, BOWMAN HILL WILDFLOWER PRESERVE.
 Member of Natural Science Board of MARIA MITCHELL ASSOCIATION.
 Associate Editor, Bulletin, AMERICAN ROCK GARDEN SOCIETY.

AWARDS:

Mountain named Mt. MARY HENRY, 1931, by DEPARTMENT OF LANDS OF BRITISH COLUMBIA.
 SCHAFER GOLD MEDAL, 1941, PENNSYLVANIA HORTICULTURAL SOCIETY, for "notable contributions to horticulture."
 SILVER MEDAL, 1946, MASSACHUSETTS HORTICULTURAL SOCIETY, Six Plants of "*Lilium philadelphicum* showing color variations."
 MUNGO PARK MEDAL, 1948, ROYAL SCOTTISH GEOGRAPHICAL SOCIETY, for "Explorations in Northern British Columbia."
 HERBERT MEDAL, 1950, AMERICAN PLANT LIFE SOCIETY.

ARTICLES ON HORTICULTURE AND GENERAL BOTANY

1. Orchids All My Own—The Orchid Review, Great Britain, September 1924.
2. Collecting Plants Beyond the Frontier in Northern British Columbia—Nat. Hort. Mag. 1931 Expedition 4 parts Jan. Apr. July Oct. 1934; 1932 Expedition 2 parts Apr. July 1935; 1933 Expedition 2 parts Apr. July 1949.
3. Rare Southern Shrubs—Bulletin Garden Club of America, November 1935.
4. Native Plants that Should be Better Known—Bulletin Garden Club of America, Nov. 1937.
5. New and Old *Hemerocallis*—Little Gardens, Seattle, Washington, 1937.
6. *Lilium Grayi* at Home—R. H. S. Lily Year Book, Great Britain, 1938.
7. A Yellow *Lilium Superbum* and a Few Other Liliiums—American Lily Year Book, 1939.

8. Some Eastern Penstemons—National Horticultural Magazine, January, 1940.
9. Uncommon Foreign Shrubs that should be Common—Bulletin Garden Club of America, May, 1940.
10. Trilliums Bring Spring—House & Garden, March, 1941.
11. *Lilium Bakerianum*—American Lily Year Book, 1942.
12. *Cyrtanthus* in the Little Greenhouse—Herbertia, 1942.
13. A Rock Garden of Natives—Bulletin American Rock Garden Society, Year Book, 1942-1943.
14. Our Splendid Eastern Gentians—National Horticultural Magazine, April, 1943.
15. Some Amsonias at Gladwyne—Bulletin, American Rock Garden Society, Mar. Apr., 1944.
16. *Lilium Superbum* Variations—American Lily Year Book, 1946.
17. A New Lily from Southern Alabama and Northern Florida—Bartonia No. 24, Phila. Bot. Soc., 1946.
18. *Penstemon dissectus*—Bulletin American Rock Garden Society, July Aug. 1946.
19. Deciduous Rhododendrons at Gladwyne—Rhododendron Year Book R.H.S. Great Britain, 1946.
20. Uncommon American Shrubs and Plants—Journal of R.H.S. Great Britain, Oct., 1947.
21. Four Little Known Native Violets—Bulletin, American Rock Garden Society Year Book, 1947-1948.
22. A Pink *Amaryllis*—Herbertia, 1949.
23. *Lilium Michauxii* at Gladwyne—R.H.S. Lily Year Book, Great Britain, 1949.
24. *Iris verna* at Gladwyne—Bulletin American Rock Garden Society, May June 1949.
25. *Lilium Iridollae* at Gladwyne—Year Book North American Lily Society, 1949.

[Various other articles on plants are not listed.]

AMARYLLIDS AT GLADWYNE

Agapanthus africanus var. *Mooreanus*. Outside.

Allium acuminatum, large flowered form; outside. *Allium albopilosum*. Outside. *Allium atropurpureum*. Outside. *Allium cernuum*. New var. Undescribed. Outside; Col. by M.G.H. *Allium cernuum*. Deep purple var. Outside. Col. M.G.H., outside. *Allium Cuthbertii*. Collected by M.G.H. western Georgia. Outside. *Allium flavum*. Outside. *Allium glandulosum*. From Dr. Emery Moore. Frame. *Allium Nuttallii*. Outside. *Allium oxyphilum*. Outside. *Allium pedemontanum*. Outside. *Allium stellatum*. Deep variety; from Dr. Edgar Anderson. Outside. *Allium yunnanense*. Pink form; outside. R.B.G. Edinburgh. *Allium* (2 species collected in Missouri by Dr. Edgar Anderson 1949); outside. *Allium* (4 species collected by M.G.H. in Oklahoma 1949); outside. *Allium* (1 species collected by M.G.H. in Missouri 1949); outside. *Allium* (2 species collected by Dr. E. T. Wherry 1948).

Amaryllis ambigua: Dr. Stoutmeyer. Lift for winter; outside. *Amaryllis advena rosea*. Greenhouse. *Amaryllis belladonna* var. *Haywardii*. Greenhouse. *Amaryllis immaculata*. Dr. Stoutmeyer. Lift for winter; outside. *Amaryllis organensis*. Greenhouse; from Mr. Foster. *Amaryllis reticulata* var. *striatifolia*. Collected and given to me by Mr. Foster; greenhouse. *Amaryllis reticulata striatifolia* hybrid. Greenhouse. *Amaryllis striata*. Sent me from Assam by Josephine Henry. Greenhouse. *Amaryllis* sp. Sent me from Assam by Josephine Henry. Greenhouse. *Amaryllis*. (75 seedlings). Greenhouse. *Amaryllis* sp. Greenflowered, red tips. Greenhouse. Mr. Foster. *Amaryllis* (2 unidentified species collected by Mr. Foster). Greenhouse.

Androstegium coeruleum. Collected by Dr. E. T. Wherry. Outside.

Cooperia Drummondii. Dr. Richard Pohl. Outdoors. *Cooperia brasiliensis*. Collected and given to me by Mr. Foster. Greenhouse.

Crinum bulbispermum. Outside. *Crinum* sp. (from The Everglades, Fla.); Col. by Dr. Carroll Wood. Greenhouse. *Crinum Powellii album*. Outside; lift for winter. *Crinum* sp. (or hybrid), brought from Mexico by Dr. Chas. Hodge and Dr. Ruth Patrick. Outside, mulch.

Crocopsis fulgens. Sent me by Mr. Huey. Greenhouse.

Cyrtanthus obliquus. Greenhouse. FROM AMERICAN PLANT LIFE SOCIETY. *Cyrtanthus Mackenii*. Greenhouse. *Cyrtanthus Mackenii* var. *lutescens*. Greenhouse. *Cyrtanthus parviflorus*. Greenhouse. *Cyrtanthus sanguineus*. Greenhouse. *xCyrtanthus Josephinae*. Greenhouse. *xCyrtanthus Henryae*. (6 clones). Greenhouse. *Cyrtanthus* (also over 150 hybrids); some 15 named and some unbloomed. Greenhouse. [See under "Registration of Amaryllid Clones" elsewhere in this issue for the named clones—PEKING, DINJAN, NEHENTA BAY, METIVIER, and GLADWYNE.]

Galanthus nivalis viridi-apice. Outside. *Galanthus nivalis fl. pl.* Outside. *Galanthus nivalis* var. *octobrensis*, from ROYAL HORTICULTURAL SOCIETY. Outside. *Galanthus nivalis* var. *Sharlockii*. Outside. *Galanthus Olgaе*, from ROYAL HORT. SOC. Outside.

Habranthus juncifolius, greenhouse, from Dr. Traub. *Habranthus robustus*, greenhouse. *Habranthus texanus*, greenhouse.

Haemanthus cinnabarinus, from Mr. Robert Huey, greenhouse. *Haemanthus hirsutus*, greenhouse.

Hemerocallis. In 1937 I wrote a piece for "Little Gardens," Seattle, Wash., describing 34 clones of *Hemerocallis*. Few have been added since then, but some beautiful seedlings have been raised between the pinks and reds.

Hymenocallis sps. are growing here from N. Carolina, S. Carolina, Ga., Fla., Ala., Miss., La., Tex., Okla., Ark. and Mo. They are from 23 localities. Three of these were gifts, the remaining 20 I collected. *Hymenocallis amancaes*. Outside; lift for winter. *xHymenocallis* SULPHUR QUEEN. Outside; lift for winter.

Leucojum aestivum, outside. *Leucojum autumnale*, frame. *Leucojum hyemale*, Col. F. C. Stern; frame. *Leucojum roseum*, frame. *Leucojum vernalis*, outside.

Lycoris aurea. Greenhouse. *Lycoris incarnata*. Outside, mulch. *Lycoris radiata*. Outside, mulch. *Lycoris Sprengeri*. Outside. *Lycoris squamigera*. From Mr. John Wallace. Outside. *Lycoris* (2 sps. sent me from China by Josephine Henry.)

Narcissus. Among dozens of varieties, a few of my favorites are: Among the species: *N. triandrus albus*; Among older hybrids: *N. Johnstoni* "Queen of Spain"; Among the comparatively new hybrids: *N. "Cushendall," N. "Hunters Moon," N. "Foggy Dew," N. "Pink Rim," N. "Chinese White," N. "Angeline";* For something magnificent: *N. "Broughshane";* For something gorgeous: *N. "Dunkeld," N. "Chungking";* For picking: *N. "Cheerfulness," N. "Yellow Cheerfulness";* Looking forward to, next spring: *N. "Green Island," N. "Moon Dance," N. "Frigid," N. "Clockface."*

Nerine angustifolia, greenhouse. *Nerine filifolia*, greenhouse. *Nerine* LADY STERLING, from Sir William Wright Smith; greenhouse. *Nerine flexuosa alba*, from Sir William Wright Smith; greenhouse. *Nerine sp.*, unidentified, sent me from China by Josephine Henry; greenhouse.

Pharium elegans, collected in Mexico by Dr. Carroll Wood; frost excluded porch.

Sprekelia formosissima, greenhouse.

Stenomesson coccineum, greenhouse. *Stenomesson flavum*, greenhouse. *Stenomesson flavum*, *S. variegatum*, etc., col. by Dr. Francis Pennell in the Andes; greenhouse.

Tulbaghia violacea, greenhouse.

Vallota purpurea, greenhouse.

Zephyranthes atamasco. Col. by my daughter, Mrs. Edward M. Davis, 3d in Va. Outside. *Zephyranthes Fosteri*. From Mr. Foster; greenhouse. *Zephyranthes grandiflora*. Greenhouse. *Zephyranthes minuta*. Col. in Mexico by Dr. Carroll Wood. Greenhouse. *Zephyranthes macrosiphon*. From Mrs. Diddell. Greenhouse. *Zephyranthes rosea*. Greenhouse. *Zephyranthes tubiflora*. Mr. Robert Huey. Greenhouse. *Zephyranthes* (6 species unidentified.) Col. in Mexico by Dr. Chas. Hodge and Dr. Ruth Patrick and Dr. Carroll Wood. Greenhouse.

IN MEMORIAM—J. MARION SHULL, 1872—1948

Mr. Shull's life and work is well treated in his autobiographical sketch in *HERBERTIA*, vol. 10. 1943. The following short appreciation may be considered as an addendum to the above.

The life of J. Marion Shull was ended September 1, 1948. A few days before he was busy with his drawing, and was enjoying his garden at Chevy Chase, Maryland, a place of floral beauty, adorned especially with fine daylilies and iris, many of which were his own creations.

Mr. Shull was well known in the iris breeding field for many years.

I. REGIONAL ACTIVITY AND EXHIBITIONS

PRIMPING AMARYLLIS BLOOMS FOR SHOWING

WYNDHAM HAYWARD, *Florida*

No pampered beauty of the social set receives more care and attention than the choice *Amaryllis* from its grower just before show time. Growing *Amaryllis* is an interesting hobby, but not one which is satisfied by self-indulgence alone. The *Amaryllis* fan is not completely happy until at least a few hundred or a few thousand other flower lovers have seen his finest specimens at their prime and pristine best.

All of which involves as much care and preparation as the displaying of a debutante heiress before the "Four Hundred" in any large American metropolis.

At all major spring flower shows there are classes for Hybrid *Amaryllis*, and special exhibitions or groups of these wonderful spring flowering bulbs are always welcomed as extra attractions whether previously provided in the show schedule or not.

The *Amaryllis*, being the greenhouse bulb supreme for spring flowering, and of course the same for sub-tropical outdoor gardens, is a bulb of character and temperament. It blooms in the spring . . . but just when, cannot be foretold precisely.

Give an expert florist bulb forcer a few hyacinths and tulips and he can tell you to a day when they will come into full flower and he can plan ahead just how many pots of daffodils he will have for the grand display date. But the *Amaryllis* is different. If the grower pots up 100 bulbs January 1st, he cannot be sure just how many bulbs he will have in bloom for an early March show, or a mid-April display, for that matter. The response of the 100 bulbs will be varied and disconcerting. Grown under similar conditions, all bulbs being 2½ inches in diameter and up (the usually regarded blooming size), some of the bulbs may come into bloom by late February. Others may wait until late April or May and some will not bloom at all. This is of course due to the mixed parentage of the bulbs which may have included spring, fall and winter blooming species. With named clones, it will be possible to obtain greater precision in timing for blooms.

Thus the complex hybrid character of the bulbs genetically is responsible for this uneven forcing situation. Possibly in the years to come, as named clones become available in quantity from Holland and in this country, schedules of forcing dates can be worked out so that the grower can know what to expect if he pots up 10 to 100 bulbs of PINK BEAUTY or SCARLET LEADER on a given date, and grows them along under the most approved methods.

At present, the only thing that can be done is to pot up bulbs of the greatest possible uniformity as to maturity, date of digging, curing and storage, and bring these on as uniformly as may be with bottom heat and a heated greenhouse, so as to have the largest possible number in bloom at a given period. If the show date is early or late, the bulbs

should be grown with more warmth or less warmth, accordingly. When well established and growing vigorously, the bulbs may be retarded like Easter Lilies by placing in a cold house or at least growing them under cooler conditions.

The Dutch growers recommend a certain "hot water treatment" of the bulbs at slightly more than 100 degrees, F., before potting up, to stimulate root growth. They also recommend a bottom heat under the pots of at least 77 degrees F., and an air temperature in the forcing greenhouse of 70 to 80 degrees. These may be taken as optimum for quick forcing, as warmer temperatures will result in soft, sappy growth and weak stems. Grown slightly cooler, the plants will come into bloom slower but the stems will be firmer and stronger.

Accompanying this article is the photograph of a group of five "separate shade" seedlings of the Ludwig Strain, one of the better Dutch *Amaryllis* strains, which the writer displayed at the Winter Park (Fla.) Flower show in early March, 1949 (Figure 5). These were part of some 50 seedling bulbs of the "separate shade" type which bloomed for the writer in pots over a period of several weeks, but the "pink" shade bulbs happened to show more uniformity in growth response than the other shades for some unknown reason, as they are not, to the writer's best knowledge, members of a clone.

Just what the growth response under forcing conditions of the bulbs of a single clone would be, is unknown on this side of the Atlantic, although there would undoubtedly be more or less uniformity, whether as much as in the case of hyacinths, tulips and narcissus remains to be seen. Such experimenting is possible at this time only in Holland where named clones have been developed and are grown in large quantities under carefully observed and controlled conditions.

The question often arises from an *Amaryllis* fancier: "What bulbs should I buy and how many to assure a good showing at the so-and-so spring flower show." Of course the larger and more important the show the larger and more significant will be the showing of the *Amaryllis* that the fancier wishes to present. Sometimes money is no object in this matter. In that case, a wide selection of special strains and even named varieties is available, which can be forced in the greenhouse from bulbs potted as early as they may be obtained in regular trade channels.

Too early potting may result in too early blooms if the weather is warm through the winter months. In other words, the peak of bloom in a planting may be past by the middle of March, if the grower does not exercise care in reducing the temperatures and "holding back" his more advanced bulbs. Several seasons of practice and experimentation will be necessary before a grower can become well versed in the technique. It is easier with potted bulbs which have been established for a season or two. The bulbs may then be dried off uniformly and forcing started with greater expectation of a common growth response.

Once the bud has cleared the neck of the bulb in its course to blooming stage, the final result is only a matter of a few weeks, three or four, under conditions of adequate warmth in the greenhouse. In the South a warm spell in February will bring many bulbs into bloom which in a

normal year would not be in flower before late March or early April.

During the hey-day of big time *Amaryllis* shows in Central Florida, from 1934 to 1940, the peak of the season's bloom was selected several weeks in advance by a study of temperature conditions and the appearance and behavior of the bulbs in various field plantings. Sometimes a sudden cold spell would damage bloom scapes which were almost ready to open in the fields before a show. Sometimes a warm spell would occur which would bring the peak of the blooming season early in March to mid-March instead of at the end of March to mid-April where it usually



Fig. 5. *xAmaryllis*; prize-winning exhibit of Ludwig pink clones, shown by Wyndham Hayward at Winter Park, Fla., Flower Show, 1949.

came. These were the vicissitudes of growing complex *Amaryllis* hybrids.

The only method for the grower to have a large and successful showing at a given exhibit date was to have ten times as many bulbs as he would need under special care and attention, and then with good luck he would have half as many as he would like to see in bloom on the date. Scarcely 10 per cent of the growers' best blooms were ever open at full bloom on the date of a flower show in the writer's opinion. Sometimes a bulb which bloomed for a show one year would not be in bloom for an

Amaryllis show date until several years later through the vagaries of nature.

Only continued research with clones of known origin and response will give a proper course of procedure for the *Amaryllis* forcer of the future. It will be a long and difficult test, and it is to be hoped that some leading research foundation, as the Boyce Thompson Institute, will interest itself in the problem and undertake to solve some of the difficulties now facing the *Amaryllis* grower who desires to present a fine display at his local flower show in the spring.

At present the only advice that can be given him is to pot up and force the largest number of the most uniform bulbs available, to give them the most uniform forcing treatment under approved techniques possible, and to regulate growth response by temperature control as required.

xHEMEROCALLIS TRIALS AT WHITNALL PARK BOTANICAL GARDENS

JOHN E. VOIGHT, *Supervisor*
Hales Corners, Wisconsin

More and more flower lovers and garden enthusiasts of our community are recognizing the hybrid *Hemerocallis* as among the more popular hardy perennials of today. *xHemerocallis*, as displayed here at the trial gardens, have definitely provided an excellent means of acquainting the general public with the advances that are being made and also the versatility and beauty which this plant possesses.

There are at present 146 different clones in the trial collection. Some of the newer ones were added this year and include the following: RED KNIGHT, RED LADY, CATHAY, MING, CHALLENGER, and ELFIN. Due to relocating and reorganizing the trial garden in 1948, all plants have not matured equally, making it inadvisable to present any conclusions for publication at this date. Detailed results will be included in future issues of *HERBERTIA*.

The trial gardens are located at the south end of Milwaukee County, east of U. S. HIGHWAY #100, and west of U. S. HIGHWAY #41.

The gardens are open to the public at all times.

DAYLILY REPORT, 1949

ELMER A. CLAAR, *Chairman, Hemerocallis Committee*

I wish to congratulate Dr. Norton, Mr. Stuntz, Prof. Ballard, the AMERICAN PLANT LIFE SOCIETY and the HEMEROCALLIS SOCIETY for compiling and publishing the DESCRIPTIVE CATALOG OF HEMEROCALLIS CLONES, 1893 to 1948. This is a tremendous job well done and everyone who is interested in daylilies is most grateful to these gentlemen and organiza-

tions. When I first became interested in daylilies there were thirty-three recorded hybridizers and less than a hundred named varieties. I saw the need for this type of work and so I started to compile a card index, with dates, etc., of all the named varieties. So many new hybridizers started working on daylilies that it involved a job I did not feel I could possibly find the time to do well, so I was most happy and relieved to send my lists to these good gentlemen. Congratulations and sincere appreciation for this work.

Singing the praises of our favorite flower and exchanging information and experiences, in addition to the good work of the AMERICAN PLANT LIFE SOCIETY, the HEMEROCALLIS SOCIETY and the Round Robins, are more than a hundred clubs of the MEN'S GARDEN CLUBS OF AMERICA, who have appointed Head Hemerocalliarans, who are enthusiastically working on daylilies. Joined with these is an ever increasing number of hybridizers, introducers, commercial nurserymen and amateurs. There are at present few iris catalogs that do not have an offering of daylilies.

Many nurseries report that they sell more daylilies than any other flower. This is as it should be for daylilies can be grown in every state of the Union, in most of the countries of the world, in nearly any kind of soil, and under almost every kind of condition, with a minimum amount of care. Some apparently do well everywhere, some do better in one part of the country than in another, and all of them respond to kind treatment rather than neglect. Last year on a trip through Europe, I saw daylilies in every country and was thrilled to spend a day with that 80-some-years-young daylily enthusiast, Amos Perry.

In April and May of 1949, Mrs. Claar and I went to the American Iris Society Meeting in Portland, Oregon. On the way we stopped over in Los Angeles and visited various flower friends. First we stopped at Thomas Craig's lovely home and gardens. I had exchanged a number of daylilies with Tom, who has been really bitten by the daylily bug and is assembling a fine collection and also is hybridizing. With his enthusiasm and knowledge, I predict you will be seeing some fine Craig hybrids in the not too distant future. I recently received word that lovely Mrs. Craig had been stricken with polio. We are all hoping for a speedy recovery. Things like this should not happen to such fine people.

We arrived in Los Angeles on April 30, a bit too early to see any but the very early blooming daylilies.

While at the Craigs', we met that grand lady Mrs. Douglas Pattison, the Regional Director of the Hemerocallis Society for Region No. 7. I believe that Mrs. Pattison's Quality Garden at Rockford, Illinois, was one of the first places where daylilies made me conscious of their existence. At any rate, my records show that in 1935 I bought AJAX from Mrs. Pattison.

Also present were the Lyons, who have a fine and growing list of daylilies in their garden and catalog, Eric E. Nies, and many other enthusiastic daylily fans.

We called at the Milliken gardens and I took pictures of Mr. Milli-

ken, Miss Joan Salisbury, his efficient and congenial secretary, and of his gardens and some irises. I have been growing in my garden most of Mr. Milliken's introductions and I am eagerly awaiting the blooming in 1950 of such famous plants as GARNET ROBE, of which Dr. Corliss, after 20,000 miles of travel to most of the daylily hybridizers and growers in America, said, "I still found no variety to top GARNET ROBE." I also am anxious to see in bloom his CATHEDRAL TOWERS, COLONIAL DAME, PARTY GOWN, REDROCK CANYON, RUFFLED PINAFORE, TAMARA, and his latest introduction, HIGH NOON.

Eric Nies specializes in hybridizing spuria irises and he has some that are out of this world. We were lucky enough to be in his garden at the height of their bloom. Mr. Nies made a delightful corsage for Mrs. Claar from some of his spurias. We are growing all of his introduced varieties and some of his seedlings and look forward with a great deal of pleasure to seeing them bloom in our garden. While in Los Angeles, a large group of daylily fans met at the Nies home to see my Kodachrome pictures.

After a stay of a few days at Yosemite, we arrived in San Francisco. We visited the gardens and home of Prof. Sydney B. Mitchell, with whom I had traded daylilies some years ago, and I took Kodachrome pictures of him, Mrs. Mitchell, and their gardens and iris seedlings. I was especially impressed with his broom hybrids and his *Iris Douglasiana*. Next, we had lunch with Carl Salbach and enjoyed his garden and iris introductions. One evening a large group met at Mr. and Mrs. Stafford Jory's home and again I showed my Kodachrome movies of daylilies.

From San Francisco, we went through the redwood forests, on to Seattle, and back to Portland for the Iris Society Convention.

Those attending the Iris Convention visited the home and gardens of the Schreiners, Robert, Constance and Bob. Robert Schreiner is a member of our Plant Life Society Daylily Committee. He has a fine list of daylilies in his catalog and many that are on trial. It also was too early while we were there for daylilies but I am growing his introductions MY OWNE, BESS VESTAL, SALADIN, BROWNEYED SUSAN and JEAN.

One of the highlights for us of this convention was a trip to Corvallis to see Dr. Kraus, with whom we had spent many happy hours at our home, at his place at Lake Geneva, Wisconsin, and at the University of Chicago. The Doctor had shipped about 500 named varieties of daylilies (out of over 1,000 that he was growing) and several thousand seedlings to Oregon and had them growing on about an acre of land. He was not happy with this land and since then has moved them to the Oregon State College's farm. He is sure we are going to have white daylilies and has since written that some of his seedlings are white. He had at Chicago the finest dwarf daylilies that I have seen, and some of the finest reds and pinks. I shall describe some of these later.

We visited the gardens of Dr. R. E. Kleinsorge, Fred DeForest, the National Iris Gardens, the Oregon Bulb Farms, and Walter E. Marx, who has a large collection of various types of plants and who offers a fine lot of daylilies in his catalog.

Our next trip was to the Men's Garden Clubs of America Conven-

tion in Minneapolis, where I met many of the Head Hemerocalliarions of the various clubs and exchanged experiences and had a royal time.

I went out to the Jacob Sass home, near Omaha, on July 10. Hans Sass, Henry Sass, with the other Sass brothers were there, as were Fern Irving (Mrs. E. J.), and Marie Anderson. We also ran over to Bennington, to the home of Hans.

At the Sass gardens I saw many new things for the first time but Henry said they had just had a severe hailstorm and that the bloom was not typical. I liked Mrs. F. D. Armstrong's HOWDY, a good bicolor, and sent for it. Dave Hall's NORTH STAR was wonderful. It is paler than MOONBEAM. Incidentally, Henry Sass said, "You can buy any daylily that Dave Hall introduces and be sure you are getting a good one." I agree, and will also say the same thing about the Sass introductions.

Among the new things, a plant of GRETCHEN was particularly impressive. It is more like ROYALTY than any other plant I know but ROYALTY has a darker eye zone, while GRETCHEN has larger flowers, is unusually well branched and is a very well balanced plant. Some people have said they thought it the finest daylily that we have. ELSA is a lovely peach color.

Vestal's MYONNE impressed me as better than NABOB and MARY GUENTHER. Her GRACE was very good.

I am growing about all of the Sass introductions. Among the named varieties that I did not have but have acquired this year are EVENING GLORY, a later APRICOT QUEEN, and MIDWEST CAVALIER, a fall bloomer, cream color, with a dark eye zone. I also have acquired the following seedlings: Seedling 46-150—A big orange, was very impressive. Seedling 23-43—A pink bicolor. Henry said it blooms for two months. Seedling 46-125—A yellow. Henry said it is a later, bigger DOROTHY McDADE. It was not in bloom. Seedling 49-67—A pink. The best pink that I saw. Good color; star-shaped. A KILLARNEY LASS seedling. Seedling 49-66—A velvety-sheen red. I thought this was their best red seedling. HONEY REDHEAD × QUEEN ESTHER.

I am especially fond of CHIEF FONTENELLE, APTICOT QUEEN, and COPPER COLONEL, and their yellows are tops.

I have rather complete notes on a considerable number of daylilies that I saw there but I fear they would not be helpful as the hailstorm did not leave the flowers as typical.

I feel particularly happy about going to the Sass home this year because I had a chance to visit with that grand gentleman, Hans, to whom all daylily fans owe so much. I was shocked, upon receipt of a note from Henry a short while after my visit, to hear that his Uncle Hans had passed away. He was my kind of hero and one of God's noblemen.

On July 17 I went to New England to attend the regional meeting of the Hemerocallis Society at Lowell, Mass. I stayed at Mr. and Mrs. Nesmith's lovely home and visited the gardens of Dr. Irving W. Frain, Harold W. Knowlton, Percy F. Merry at Needham, and Olin R. Howe, Jr., at Holliston. Visitors from nine states were represented at the

meeting. Mr. Robert Allen and I talked daylilies with Mrs. Nesmith until two o'clock in the morning.

HER GRACE in the Knowlton garden was so good that I immediately ordered it. In the spring I had added MME. RECAMIER, a lovely pink, and WINDSOR TAN, which is a standout. I liked PINK PRELUDE very much. This year I bought BANDANA, CHIANTI, GLOWING GOLD, ROSE UNIQUE, ROYAL GUEST, TALLYHO, TA MING, and PINK PRELUDE.

We are grateful to Mrs. Nesmith for some of the finest daylilies that we have. Her PINK CHARM, PIQUANTE, VESPER, ROYAL RUBY, SWEETBRIAR, POTENTATE, BLACK FALCON, DEBUTANTE, SU-LIN, BOLD COURTIER, HONEY REDHEAD, FAR NORTH and HER GRACE are outstanding.

ROYAL RUBY still is the standard but its leaves spotted badly for me this year and I noticed the same thing happening in other gardens, so that this red will be challenged by GARNET ROBE, PIMENTO, FLANDERS, SEMINOLE CHIEF, NOEN, BILL WOOD, CRIMSON STAR, RED PERFECTION, PAPAGAITO, THE DOCTOR, FLAME FAGOT, RED BIRD, SAN JUAN, VERMILION CLIFFS, TRAIL BLAZER, FLAMBEAU, SCARLET SUNSET and FLAMING VELVET.

SWEETBRIAR still is standard, challenged by PINK PRELUDE, MARION WOOD, Kraus' EVELYN CLAAR, PINK ANGEL, and LAUREL.

In the purples, POTENTATE and BLACK FALCON are standard. BLACK FALCON is wonderful at times and sometimes it is terrible. It is challenged by AMHERST, PLUM MIST, and others.

Mrs. Claar and I were terribly shocked to receive a note from Mrs. Nesmith to the effect that her husband, genial and always smiling Tom Nesmith, had passed away while looking at some plants in their garden. That's the way I should like to go but it is a terrible shock to those who remain. It is hard to imagine Fairmount Gardens without Tom. All daylily fans will join in sympathy for Mrs. Nesmith.

Mr. Stanley E. Saxton gave a talk about the Wheeler daylilies. I am growing or have ordered nearly all of Mr. Wheeler's introductions. I have had some for years. RUBY SUPREME is the best of the older varieties. The ones I secured this year obviously were not typical, but I wrote Mr. Wheeler about CELLINI as follows: "It is impossible for me to exaggerate about CELLINI. This is a perfectly gorgeous lemon yellow and the shape is all that anybody could ask for in a daylily. In my opinion, this flower will be a standard for a long, long time. I would say that if you never gave the daylily enthusiasts anything but CELLINI, that they could not help being most grateful to you for the work you have done." At times CELLINI does fade, as do most of the yellows and oranges, but what a shape this old boy has! BOBOLINK was with me for years and finally bloomed this year. It is very interesting but very small. EASTER MORN is another good variety. I do not care for BRACKEL, but it is big.

I am growing four of Mr. Saxton's introductions, but they have not bloomed for me as yet.

In the fall, a meeting of the Iris Society directors was held in Chicago. I again met such daylily enthusiasts as Harold Knowlton, Geddes Douglas, Robert Allen, Dave Hall and Orville Fay.

I now am growing about 500 named varieties of daylilies (after having lost or discarded about 150) and about 10,000 seedlings. It really is very silly to have so many varieties of daylilies but I want them for comparative purposes, and, anyway, there are a lot of silly people in this world! So what?

Due to my trips and by exchanging information and experiences with other daylily enthusiasts, I acquired the following this year in addition to those already mentioned. I have not seen any of them in bloom.

Ida Norton McClure's PINK ANGEL, a lavender pink.

J. W. House's LIBBY FINCH and CARMEN CORLISS.

LeMoine J. Bechtold's FLAME FAGOT.

Dr. Stout's six introductions this year, ELFIN, RED KNIGHT, RED LADY, CATHAY, MING and CHALLENGER.

Charles H. Dennett, Jr.'s ULYSSES.

H. M. Russell's MRS. HUGH JOHNSON and MICHAEL ROBINSON.

W. T. Wood's BILL WOOD and MARION WOOD.

Dr. Watkin's ALLAPATTAH, JACK AND JILL, and TAMIAMI.

Mrs. Bright Taylor's BRULEÉ and OLIVE BALDWIN.

Miss Vivian Christenson's DAWN GLOW, LUMINOUS, TWILIGHT TIME, ROSE REVERIE and INDIAN HEAD.

Hubert Fischer's TWILIGHT FLOW, ESCIMILLO and some seedlings.

Clint McDade's introductions, AU REVOIR, BRIGHT MORNING, CHICKAMAUGA, DAINTY GIRL, DANNY BOY, GOLDEN PHEASANT, HAROLD PATTERSON, HIAWASSEE, MARIE FAWCETT, MARTIE EVEREST, MERRYMAKER, NORMAN HAMILTON, PEPPERMINT STICK, REGINALD STEED, SHEILA, SPANISH CAVALIER, SONATA, SOUTHERN QUEEN, STRIPEY, WELCOME, WHIPPOORWILL.

And the following of Mr. Amos Perry's recent introductions: ANNE ROSSE, BALLERINE, BATTERSEA, BETTY STEWART, CECELIA, CONSPICUA, DIANA THOMPSON, EDITH SHEWRING, EILEEN, GLADIATOR, GLAMOUR, HELEN LINDSAY SMITH, KATHERINE HARDY-SMITH, MARY BALLARD, PAT, PINK LADY, RUGBY, RUTH, ST. AGNES, and W. B. CRANFIELD.

A word about some of the recent acquisitions in my garden. Last year I secured from Miss Vivian Christenson the daylilies MY VALENTINE and MAGNOLIA. This lady liked MAGNOLIA but said little about MY VALENTINE. MAGNOLIA did not bloom for me but MY VALENTINE was one of the most impressive of the daylilies I am growing. I made up my mind to get more of Miss Christenson's introductions, and I did.

Of Geddes Douglas' introductions, I like FLAMBOYANT best. It is similar in color to Dr. Kraus' MRS. DAVID HALL but is a better proportioned flower relative to the height of the scape. I have heard that his CRIMSON STAR is tops but haven't seen it. RED PERFECTION is similar to and a bit bigger than ROYAL RUBY. DAILY DOUBLE is only occasionally double.

Some of the most outstanding seedlings that I have are those of Mrs. Hugh W. Lester. I am growing her DOROTHEA, EARLY BIRD, FLANDERS, FLORIDA GOLD, LADY BOUNTIFUL, LAUREL, MAID MARIAN, PHOEBUS, seedling No. 6, and SEMINOLE CHIEF, which is a very good red. Not all of

these bloomed but those that did were outstanding. EARLY BIRD is very superior, the color of WINSOME but very large and star-shaped. DOROTHEA I believe I like better than any other eyed variety that I have seen. FLANDERS is a bit bigger and better than ROYAL RUBY or Geddes Douglas' RED PERFECTION. Mrs. Lester is most enthusiastic about LAUREL, but unfortunately it did not bloom for me.

I have heard many favorable comments about Ralph Schreiner's KNIGHTHOOD but it did not bloom for me nor have I seen it in bloom. Schreiner-McDade's bicolor JEAN is very good.

Of Dr. Traub's older introductions, I like DR. STOUT the best. GENERAL MACARTHUR and INDIAN CHIEF I cannot get to bloom. SAN JUAN is a fine red and DUCHESS OF WINDSOR is good.

Of the sixteen varieties that I have on trial for the United States Government (Dr. Traub's hybrids) I like best MITRA, GOLDEN TRIANGLE and LEMON TULIP. However, Dr. Corliss said that PAPAGAIO was very good, so I shall look at it more carefully next year.

Daylilies certainly do vary a great deal, from hour to hour, and from day to day. Mr. Hayward's SALMON ROSE is always very good, but his MINNIE is very poor at times and very good at other times. Another flower that I have had for many years and with which I had not been particularly impressed until this year is IRENE, but this year I had two clumps of it that were as good as any of the orange varieties that I grow. However, these were established plants and some of the others were not.

Dr. Kraus' EVELYN CLAAR is the best lavender-pink that I have seen. His JOANNA HUTCHINS is a good orange. VERMILION CLIFFS and FLAMBEAU are good reds.

Among Dr. Norton's daylilies, MONGOL is one of the largest yellows that I grow and is very much worthwhile as is.

In Bechtold's things, GOLIATH is huge and outstanding. GARDEN CHARM is a delightful yellow. I just secured FLAME FAGOT this year. BRONZE GLOW's name describes this nice flower. I can't share Mr. Bechtold's enthusiasm for KINDLY LIGHT, which is a large flower but is spider-like in shape. I prefer the overlapping type. LOVELINESS is a wonderful eyed variety.

Fewkes' FLAVINA continues to be the best early lemon yellow.

Among the Russell varieties that have impressed me are QUEEN OF GONZALES, although it has so much substance that it tends to be coarse. PAINTED LADY is my choice as standard in the polychrome types. BETTY SLICK is a huge and fine flower. I do not seem to be able to keep MARY GUENTHER and MISS HOUSTON alive in my garden. ATHLONE is a fine bicolor. METEOR is an eyed variety, with a huge flower, nice, but it doesn't seem to stand up well for me. MONTE, also, is fine. FRANCES RUSSELL, LILLIAN RUSSELL, JEWEL RUSSELL, and GUEST STAR are all good.

I am growing everything that Dr. Stout has introduced with the exception of JUBILEE, which is of doubtful hardiness in this climate. I am growing all of his 1949 introductions but haven't seen them in bloom, and

also I have not seen BLANCHE HOOKER or FIREBRAND in bloom. Among his introductions I like ROSE GEM the best. AFTERGLOW is a beautiful flower. DOMINION, ALADDIN, TARUGA are good. BICOLOR and CABALLERO are good bicolors. PORT, SACHEM and RED BIRD are good reds, and ZOUAVE and WAUBUN are interesting. I also like CIRCE, GEORGIA and BERTRAND FARR. PATRICIA has the form of flower which pleases me most in a daylily but it is a sparse bloomer.

I phoned Dr. Stout from my home prior to going to New England this year and he told me that he did not have anything in bloom that would be worth a trip to his home from New York City.

While I was down at the Farr Nursery last year, Mr. Seyler pointed out to me several rows of plants which Dr. Stout describes in an article in the 1949 *Herbertia* as a new race of double flowered daylilies. They were not in bloom while I was there. The best double that I have seen in bloom is a seedling of Dr. Kraus'.

After hybridizing for twelve years, with thousands of seedlings, I had named but a few and had not introduced any plants until Clint McDade persuaded me to introduce some of my seedlings through the Parry Nurseries, Signal Mountain, Tenn. This year, they introduced CHAMELEON, a red which fades to pink; JEAN LAFITTE, a big flower that has received a lot of "Oh's" and "Ah's" from visitors in our garden; and PLUM MIST, a purple toned red which I believe is worthwhile.

After reading this article, I can see that I am getting verbose in my old age.

Yours for more and better daylilies!

[COOMBS—S. AFR. AMARYLLIDS, CONTINUED FROM PAGE 128.]

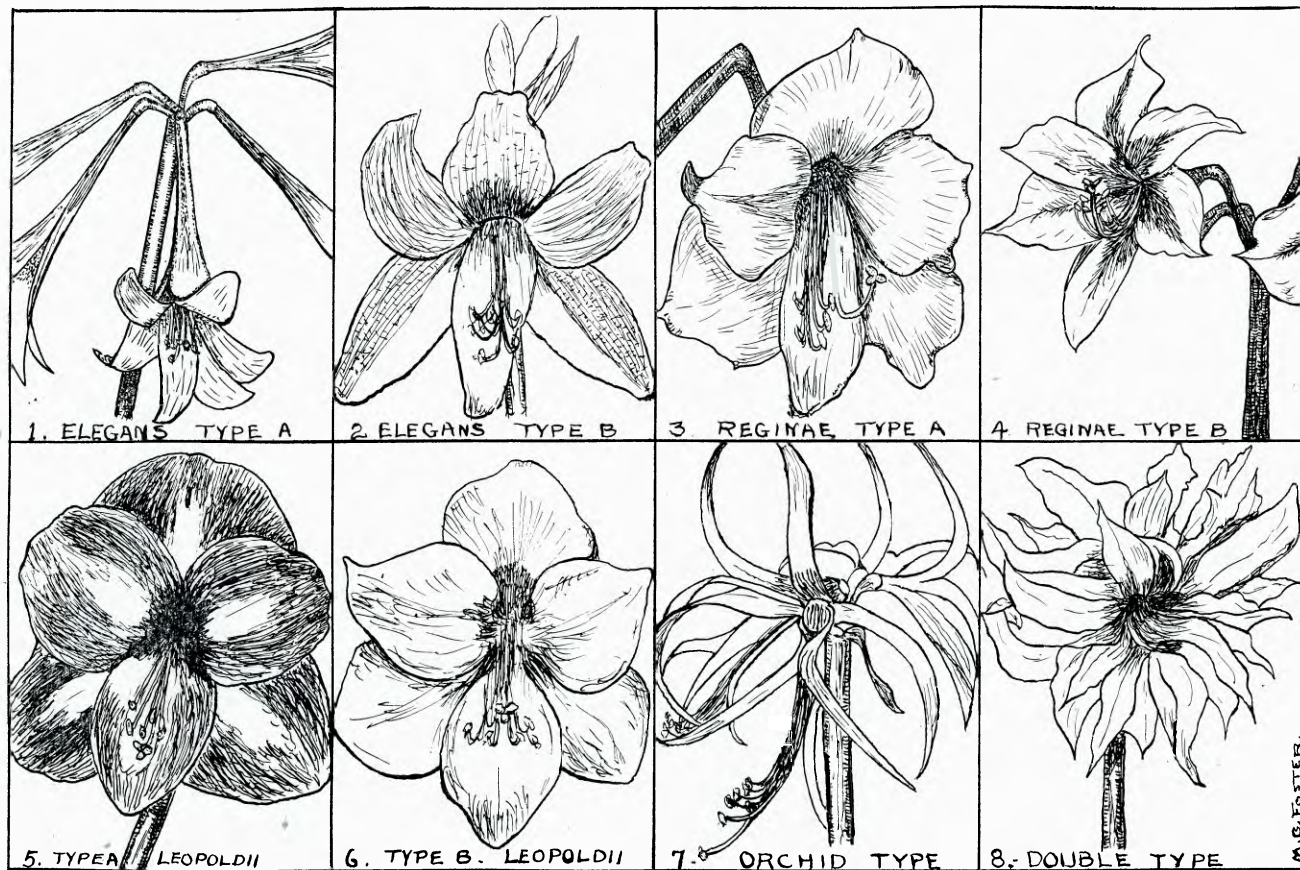
flowers. It needs much the same treatment as *H. Katherinae*. The umbel includes up to 100 coral-red flowers, with red long-exserted filaments with prominent yellow anthers. It has been cultivated for a long time in England.

Haemanthus natalensis Pappe, with red flowers, very dense clusters and *H. puniceus*, with pale scarlet, almost pink flowers, rarely white are other species, the latter one obtainable in the U. S.

Haemanthus albiflos Jacq., from the eastern divisions of the Cape Province is not so beautiful as *Katherinae* but is rather interesting. Also it may be obtained, like *coccineus*, *Katherinae* and *puniceus*. It grows from 2-4 leaves, strongly waved and veined, soft deep-green above and paler below and covered with fine white hairs, especially at the margins. The flowers are creamy white and form dense, rounded umbels with red berries following the flowers. The white stamens protrude with bright yellow anthers. There is a collar of green striped white bracts. It is said to resemble a "small dish mop"! Light moist humus and partial shade.

The illustration of *Haemanthus tigrinus* [Fig. 26] was obtained through the courtesy of the South African Railways and Harbours.

[COOMBS— S. AFR. AMARYLLIDS, CONTINUED ON PAGE 147.]



Amaryllis Flower Types for exhibition purposes; drawing by Mulford B. Foster

2. SPECIOLOGY

[EVOLUTION, DESCRIPTION, CLASSIFICATION AND PHYLOGENY]

AMARYLLIS FLOWER TYPES, EXHIBITION CLASSES AND SCORE CARD

HAMILTON P. TRAUB, *Maryland*

The following revisions of the classification of *Amaryllis* flower types, exhibition classes (Table 1) and score card (Table 2) have been adapted from HERBERTIA 5: 141-143. 1938. This adaptation is tentative and subject to further changes as shown to be necessary under actual exhibition conditions.

CLASSIFICATION OF FLOWER TYPES

Amaryllis shall be subdivided tentatively into the following flower types on the basis of the characters indicated—

1a. LARGE-FLOWERING GROUP:

2a. Flowers single:

3a. Flowers distinctly drooping; trumpet- or somewhat funnel-shaped:

4a. Tepaltube very long.....ELEGANS TYPE A.

4b. Tepaltube short.....ELEGANS TYPE B.

3b. Flowers distinctly upright, horizontal, or only very slightly declined; tepaltube short:

5a. Flower somewhat funnel-shaped at throat:

6a. Flower compact, tepalsegs rounded
or pointed.....REGINAE TYPE A.

6b. Flower not compact, tepalsegs
pointed.....REGINAE TYPE B.

5b. Flower wide open, almost flat:

7a. Flower fairly regular, compact,
tepalsegs rounded.....LEOPOLDII TYPE A.

7b. Flower fairly regular, compact,
tepalsegs acute or pointed.....LEOPOLDII TYPE B.

7c. Flower irregular, spidery.....ORCHID TYPE

2b. Flowers semi-double or double.....DOUBLE TYPE

1b. SMALL-FLOWERING GROUP:

(There are no subdivisions on the basis of flower type at present.)

The fine generalized illustrations of these eight flower types, shown in Plate 5, were made by the well-known artist, and explorer for bromeliads and amaryllids, Mr. Mulford B. Foster, of Orlando, Florida. This first rate contribution will be appreciated by all interested in *Amaryllis*.

ABBREVIATIONS FOR FLOWER TYPES

When referring to the eight flower types, the following abbreviations may be used:

E—A = Elegans Type A

E—B = Elegans Type B

R—A = Reginae Type A

R—B = Reginae Type B

L—A = Leopoldii Type A

L—B = Leopoldii Type B

OR = Orchid Type

D = Double Type

EXHIBITION SECTIONS AND CLASSES

The small-flowering group (Miniature) is not subdivided for show purposes at present, and these are to be exhibited under Section A, Class 1, below. (See TRAUB & MOLDENKE—AMARYLLIDACEAE: TRIBE AMARYLLEAE, 1949, pages 87-107, for detailed descriptions.)

The large-flowering group of hybrid *Amaryllis* shall be divided for exhibition purposes into three major sub-groups—(1) SHOW CLASSES in which flower form and size standards are the important considerations and other plant characters are subordinate; (2) DECORATIVE CLASSES in which the use of the plant—window garden, conservatory, forcing, landscape, rock-garden, etc., value are most important and (3) DOUBLE-FLOWERING CLASSES.

All subjects in the three Grandiflora sub-groups are to be exhibited under the appropriate classes in Section A, classes 2 and 3, and Sections B, C, D, and E, below.

CLASSES AND AWARDS (PRIZE SCHEDULE)

Each species or hybrid exhibit may consist of one or more potted flowering plants, or one or more cut flower scapes; but it is recommended that three or more potted flowering plants or three or more cut flower scapes for each entry be required whenever practicable.

Prizes and other awards are to be made by a panel of competent local judges, or judges invited from other regions.

SECTION A. Genus *Amaryllis*—botanical species (Amateur and professional)

Class 1. Single species entires—MINIATURE GROUP. (See TRAUB & MOLDENKE—AMARYLLIDACEAE: TRIBE AMARYLLEAE, 1949, pages 87-107, for detailed descriptions.)

Class 2. Single species entries, GRANDIFLORA GROUP. (See TRAUB & MOLDENKE—AMARYLLIDACEAE: TRIBE AMARYLLEAE, 1949, pages 107-134, for detailed descriptions.)

Class 3. Best collection of *Amaryllis* species.

SECTION B. Hybrid *Amaryllis*—Collections and Displays (Amateur Classes)

Class 11. Best Amateur collection of less than 10 grandiflora clones.

Class 12. Best amateur collection of 10 or more grandiflora clones.

Class 13. Best amateur collection of Decorative clones.

Class 14. Best amateur collection of double clones.

Class 15. Best amateur display.

SECTION C. Hybrid *Amaryllis*—Collections and Displays (Professional Classes)

Class 21. Best collection of less than 10 grandiflora clones.

Class 22. Best collection of 10 or more grandiflora clones.

Class 23. Best collection of Decorative clones.

Class 24. Best collection of double clones.

Class 25. Best display of grandiflora clones.

SECTION D. *Amaryllis* Floral Arrangements (Amateur and Professional)

Class 31. Best *Amaryllis* floral arrangement (Amateur)

Class 32. Best *Amaryllis* floral arrangement (Professional)

SECTION E. Hybrid *Amaryllis*—Entries for named clones (Elegans, Reginae, Leopoldii, Orchid and Double types).

The classes for named clones are indicated in Table 1. At the right in column one is indicated the predominant color value of the flower, and in the succeeding columns are the classes for the eight flower types under the abbreviations—E-A, E-B, R-A, etc. It should be noted that for each color class there are eight possible flower types. Only entries with the same number compete with each other. At present only some of the classes will be used because there are no yellows, lilacs and blues.

TABLE 1. Section E: Entry classes for Hybrid *Amaryllis*, Elegans, Reginae, Leopoldii, Orchid and Double Classes.

Predominant color value	Eight flower types, (abbreviations)							
	E-A	E-B	R-A	R-B	L-A	L-B	OR	D
White	50	75	100	125	150	175	200	225
Near white (with slight markings)	51	76	101	126	151	176	201	226
Yellow	52	77	102	127	152	177	202	227
Bronze	53	78	103	128	153	178	203	228
Light orange	54	79	104	129	154	179	204	229
Orange	55	80	105	130	155	180	205	230
Pale red (pink)	56	81	106	131	156	181	206	231
Medium red	57	82	107	132	157	182	207	232
Dark red	58	83	108	133	158	183	208	233
Violet red	59	84	109	134	159	184	209	234
Lilac and blue	60	85	110	135	160	185	210	235
Polychrome (more than two colors)	61	86	111	136	161	186	211	236
Any other color	74	99	124	149	174	199	224	249

SCORE CARD

The score card for grandiflora hybrids is given in Table 2.

TABLE 2. Score Card: Hybrid *Amaryllis*—Large flowering group (Grandiflora Classes—Elegans, Reginae, Leopoldii, Orchid and Double).

Note.—All flowers are to be expanded in 1/2 or more direct sunlight. No entry is to receive first prize unless a rating of at least 86 points is merited; second and third prizes may be awarded to entries rating from 76 points up. A score card for the decorative sub-group (Decorative classes) is in preparation.

Color class name or number	Exhibitor's No.	
Flower Type		
Character scored:	Method of Rating:	Possible score:
Color & texture	No flower of inferior color to be considered; the full 50 points to be deducted for major color defects; dark green in combination with medium and dark red is especially objectionable.	50
Form	Rating should be based on conformity to one of the eight recognized types	15
Size	Except in the case of Elegans types A and B, the following shall rule (diameter across face): 6" to 7", allow 10 points; above 7" to 9", allow 13 points; above 9" allow 15 points.	15

Habit	For Elegans types A and B the drooping habit is normal and should not be penalized; but for Reginae, Leopoldii, Orchid and Double types the horizontal, and slightly erect carriage are to be favored, although very slight drooping is allowable.	5
Number of flowers to scape	For less than 3 or more than 5 allow 3 points; for 3 to 5 allow 5 points.	5
Length of scape	The length of scape should be considered in relation to size of flower; scapes too short or too long should be penalized.	5
Character of scape	Scapes should not be too coarse as to be conspicuous, but should be sturdy enough to hold up flower well.	3
Fragrance	Should not be too faint or too strong.	2
		TOTAL 100

DOUBLE AMARYLLIS

HAMILTON P. TRAUB, *Maryland*

There has been renewed interest in double *Amaryllis* in recent years which makes it desirable to use the correct names for these forms. Unfortunately the identity of the double form of *Amaryllis Reginae* L.—*Amaryllis Alberti* Lem.—has been somewhat confused in horticultural catalogs. The subordinate status of this double form has been indicated on page 121, AMARYLLIDACEAE: TRIBE AMARYLLEAE, by Traub & Moldenke, 1949. Now that this double form will be frequently referred to, it is in order to make the appropriate new combination—

***Amaryllis Reginae* L. var. *Alberti* (Lem.) Traub, comb. nov.** Syn.—*Amaryllis Alberti* Lem., in L'Illus. Hort. 13: pl. 498. 1866; Traub & Moldenke, Tribe Amaryll. p. 121. 1949. It is illustrated as a double scarlet-flowered form, but the absence of a long narrow tepaltube indicates that it is not closely allied with *Amaryllis belladonna* L., and apparently belongs with *Amaryllis Reginae* as indicated by Baker (Amaryll. 49. 1888). It was obtained from the Finca Esperanza, near Matanzas, Cuba in the early 1860's. (Figure 19)

In 1846 Morren figured *Amaryllis Lowii* (= **x***Amaryllis Lowii* Morren, in Ann. Soc. Agr. et Bot. Gand. Jour. D'Hort. 2: 141, pl. 62. 1846; Traub & Moldenke, Tribe Amaryll. p. 137. 1949). It is described as a beautiful semi-double hybrid clone of unknown parentage obtained from the West Indies. The perigone is illustrated as pink, slightly tinged purplish, with yellowish center; the pistil is shown as fully formed with capitate stigma. This is by far the finest illustration of a double *Amaryllis* yet seen by the writer. The umbel is indicated as 1-flowered. It was introduced into Belgium in 1844.

Another double *Amaryllis*, now known as *Amaryllis belladonna* var. *semiplena* (Herb.) Traub & Moldenke, Tribe Amaryll. p. 124. 1949, is apparently not in cultivation today. The flowers are described as semi-double, and its range is indicated as Cuba and the Bahama Islands.

The reader is referred to the article on the McCann double *Amaryllis* by E. J. McCann which appears elsewhere in this issue. This is the only double strain available in the trade today.

COLLECTING AMARYLLIDS IN SOUTH AMERICA

MULFORD B. FOSTER, *Florida*

I often wish that Amaryllids did not interest me so much. I go to collect bromeliads and come back with bromeliads, amaryllids and aroids in spite of my resolution to collect the bromels only.



Fig. 6. *Amaryllis Blumenavia* in its native habitat, Santa Catharina, Brazil, Oct. 1948. Photo by M. B. Foster.

On my most recent trip, the last three months of 1948, I brought back more amaryllids than ever, most of them from Brazil.

One amaryllis which I have always wanted to possess was the white form of *Amaryllis belladonna* Linn., which has now received its final name, I hope, *A. belladonna* var. *barbata* (Figure 15), as listed by Traub and Moldenke in the latest on Amaryllidaceae. My wish came true when I found it growing in Dutch Guiana. It is still a rare *Amaryllis*,



Fig. 7. *Amaryllis Muesseriana* in its native habitat, Bahia, Brazil, 1948. Photo by M. B. Foster.

but so beautiful that much effort should be made to have it in every collection.

I also found three different phases of the red *A. belladonna* there and when I discovered them growing in old shell mounds I was quite surprised.

The variations are quite worth while and all of them, I think, surpass the form (var. *major*) so common everywhere in Florida. One advantage, too, is that these collected bulbs will set seed, in fact, I already



Fig. 8. Dr. Rietman holding plant of *Amaryllis Muesseriana*, showing height. Photo by M. B. Foster.

have seeds from some of them that flowered six months after they were planted in our garden.

While in Bahia, Brazil, I found the tallest *Amaryllis* that I have ever seen, the peduncle being 36 to 48 inches high (Figure 6). Dr. Traub

has identified this as the long lost *Amaryllis Muesseriana*. It was growing in the caatinga along with the bromeliads and cacti in a wild, harsa section with acid soil. As shown in the photo (Figure 7) the stamens are exceptionally long. The head of six salmon colored flowers with slightly greenish-yellow corona made quite a show.

Here also, I found two more *Habranthus* that were new to me.

In southern Brazil, down in Santa Catarina, I was rewarded with the great thrill of finding the rare *Amaryllis blumenavia* (Figure 8). Years ago it was classed as *Griffinia*. It was in a rather rich, moist section both in the forest and on the meadow edging the forest. Evidently it prefers rather moist conditions. With an umbel of 6 to 8 flowers, white, streaked with pale rose, this cheerful *Amaryllis* surely must come back to our collections. It is a small plant, only 6 to 8 inches high, but nevertheless a very worth while subject. It has already flowered and seeded since my return. The seeds are considerably fuller than most of the *Amaryllis* species but not round and succulent as those of *A. reticulata* var. *striatifolia*. The seeds of this latter species do not have any appendage or wing at all.

Once again, in Brazil, I saw *Amaryllis* growing in the trees, just as I found them in 1939 and 1940. These same species will grow in the ground but seem quite as happy in the crotches of a tree in the jungle. This rich red flower with the clear transparent green throat makes a beautiful *Amaryllis*, I think.

In Bolivia, I collected several species of Amaryllids but the only one so far that has been identified is *Lepidopharynx deflexa*. I must have taken this interesting species just at the time Dr. Traub's new book was on the press, and he was then making the statement that someone should collect it again so that we might have fresh specimens. That wish has been realized; also I have living material in my collection. One could hardly call *Lepidopharynx* a beautiful flower. At first I thought it might be another species of *Sprekelia* as it does somewhat resemble that genus. A reproduced drawing of *L. deflexa* appears in Traub and Moldenke's book *Amaryllidaceae*, p. 16.

My quest took me to Ecuador, after a very short stay in Peru, and as in Colombia, I found there *Phaedranasa*. While the flowers are not large their drooping crimson red blossoms are really enchanting. The pistil and stamens extend an inch or more below the tubular flowers giving them an almost fuchsia-like appearance.

In 1946, when in Colombia, I had found *P. Lehmanni* on the western slopes of the Andes in the southern regions of that beautiful country. Incidentally, I met both son and grandson of the old collector, F. C. Lehmann, who lived in Popyan. There we had the privilege of seeing much of his old herbarium and collection of botanical books still owned by Lehmann's son.

In the Popyan and Pasto region it is not uncommon to find rather large colonies of *Eucharis subendadata*. This is a very lovely small white *Eucharis*, apparently excellent for commercial use, and certainly a little gem for the amaryllid enthusiast. It has stood the test of over

two years in our garden without special care along with the "garden run" of amaryllids.

There are, of course, many more interesting oddities in this large family to be found in South America, some that have much merit, species that were first collected almost a century ago and many that have not yet been discovered by the collector who is willing to take the thrilling inconveniences for those who wait patiently at home hoping to have one of the first ones in their collection.

ZEPHYRANTHES ALBIELLA

HAMILTON P. TRAUB, *Maryland*

In 1945, Dr. Paul Epple, of Bogota, Colombia, sent bulbs of a *Zephyranthes* species for the Society's trial collection. When the plant flowered in 1949, it proved to be new to science.

Zephyranthes albiella Traub, *sp. nov.* [Plate 6]

Herba bulbosa; bulba parva; foliis linearibus usque ad 8 cm. longis cum floribus a vere usque ad auctumnum exhibentibus; pedunculo sub anthesin 8 cm. longo, in statu fructifero usque ad 20 cm. longo; dimidio inferiore spathae 1.7—2.1 cm. longae connato; dimidio superiore bifido; pedicelo sub anthesin 1.6—2.7 cm. longo, in statu fructifero 4 cm. longo; flore leviter declinato; perigonio 3—3.5 cm. longo; tubo tepalorum 3 mm. longo, segmentis lanceolatis 2.8—2.9 cm. longis, 6.5—7.5 mm. latis, praeter basim subviridem albis; staminibus 3 longioribus ca. 2.1 cm. longis, 3 brevioribus ca. 1.4 cm. longis; stylo quam segmentis tepalorum leviter brevioribus; stigmatibus trifido, lobis 2—3 mm. longis; seminibus per loculo 1—3. Exemplum typicum: Traub Herb. 41; tabula typica Pl. 6.

Bulb small; leaves contemporary with the flowers (evergreen under greenhouse culture), green, linear, channeled down the face, up to 8 cm. long; peduncle at anthesis 8 cm. tall, elongating up to 20 cm. in fruit, somewhat flattened, about 3—4 mm. in diam.; spathe united in lower half, whitish and changing to dry-papery in fruit, 1.7—2.1 cm. long, the bifid segments opposite or to one side; pedicel 1.6—2.7 cm. long, 1.5—2 mm. wide, elongating up to 4 cm. in fruit, whitish at first, changing to light green on following day; flower held slightly declinate as shown in the type illustration (Plate 6); ovary 3-celled, 1.5—2 mm. in diam., greenish-whitish, changing to green in fruit; perigone 3—3.5 cm. long, wide open as shown in the type illustration (Plate 6) by the middle of the first day (2.5 cm. long, 4.3 cm. in diam. across face), thereafter the six tepalsegs are somewhat connivent; tepaltube greenish, 3 mm. long; paraperigone apparently absent; tepalsegs lanceolate, 2.8—2.9 cm. long, 6.5—7.5 mm. broad, greenish at the base, otherwise pure white; stamens attached at the mouth of the tepaltube, white, the three longer about $\frac{3}{4}$, and the three shorter $\frac{1}{2}$ as long as the tepalsegs; anthers versatile, yel-



Zephyranthes albiella Traub, *sp. nov.*

Plate 6

low; style white, slightly shorter than the tepalsegs; stigma trifid, lobes about 2—3 mm. long; stamens and style exserted when perigone is wide open as shown in the type illustration (Plate 6); fruit a 3-celled loculicidally dehiscent capsule, 8 x 8 mm.; seeds 1—3 per locule, 7 x 5 mm., black. Type specimen: TRAUB HERBARIUM no. 41.

RANGE.—Colombia: Bogota, intermediate region.

NOTES.—This is a little fairy-like species as shown in the type illustration (Plate 6), which springs into flower rapidly at intervals from spring to autumn to gladden the beholder. Its name appropriately signifies "little whitey." Under culture the plant thrives in neutral and acid soils, but lingers on without flowering in alkaline soils. *Zephyranthes albiella* apparently belongs in the section which includes *Zephyranthes rosea* (Cuba), but it is quite distinct.

×CYRTANTHUS HENRYAE

HAMILTON P. TRAUB, *Maryland*

Elsewhere in this issue Mrs. Henry records the history of a number of *Cyrtanthus* hybrids. The type description of one of these hybrids which is of scientific interest from the standpoint of experimental biosystematics, and also as a worthy addition to our window gardens in the north, and outdoor gardens in the subtropics. It has been named in honor of the originator, Mrs. J. Norman Henry, Research Associate in Botany, The Academy of Natural Sciences of Philadelphia, and recipient of the 1950 HERBERT MEDAL.

×*Cyrtanthus Henryae* Traub hybr. nov. [Fig. 9]

Planta inter [(*C. MacKenii* × *C. MacKenii* var. *Cooperi*) × *C. "flammeus"*] (parens foemina) et *C. sanguineus* (parens masculus) hybrida; foliis 3—5, 3.8—5.5 dm. longis, ad mediam 1.7 cm. latis, ad basim usque ad 6 mm. angustatis, apicem praeacutum versus 7 mm. angustatis; pedunculo 3.3—4 dm. alto, ad basim 1.2 cm. diametro, ad apicem 8 mm. diametro; spatha bivalvata, valvis lanceopatis 4—9 cm. longis; umbella 6—9-flora; pedicellis 2.5—7 cm. longis; perigonio 6—6.5 cm. longo puniceo (sicut *Cancer pagurus* L. exhibens), ad corallinipuniceo denique commutente; tubo tepalorum 4.5 cm. longo, segmentis ovali-obtusis 2 cm. longis, 1.2 cm. latis; staminibus tribus 6 mm. tribus 9 mm. infra apicem tubi tepalorum insertis; filamentis 3—4 mm. longis; stylo quam limbo perigonii brevior; stigmatibus trifido. Exemplus typicum: Traub Herb. 83; tabula typica Fig. 9.

TYPE DESCRIPTION.—A hybrid, [(*C. MacKenii* (white) × *C. MacKenii* var. *Cooperi* R. A. Dyer (yellow)) × *C. "flammeus"*], (seed parent) × *C. sanguineus* (Lindl.) Hook. (pollen parent). Rootstock a tunicated bulb; leaves 5, nearly petiolate but not exactly so, 3.8—5.5 dm.

long, 6 mm. wide at base, enlarging to 1.7 cm. at widest part, narrowing to 7 mm. near the pointed apex, near to but not exactly spinach green



Fig. 9. *xCyrtanthus Henryae* Traub, *hybr. nov.* Photo by Josephine deN. Henry.

(RHS-0960/1) in color, with very slight bloom; peduncle 3.3—4 dm. tall, flattened, edges rounded, 1.2 cm. in diam. at base, narrowed to 8 mm. at

apex, light green with prominent bloom; spathe 2-valved, valves lanceolate, 1 cm. wide at base, 4—9 cm. long; bracteoles much smaller; umbel 3—10 flowered, pedicels 2.5—7 cm. long; ovary 7 mm. long; flowers long lasting; perigone of typical *Cyrtanthus* shape, 6—6.7 cm. long, 3.5—4 cm. in diam. at apex of perigone limb, shrimp red (RHS-616) on opening, changing to a clear coral pink (RHS-0619/1) after a few days, and thus there may be flowers of at least three distinct color shades on the plant at the same time; telaptube 4.5 cm. long, 3 mm. at base, enlarging to 12 mm. at apex; tepalsegs 2 cm. long, 1.1—1.2 cm. wide, oval-obtuse, sometimes somewhat spatulate; stamens attached in two rows, one 6 mm. and the other 9 mm. below apex of tepaltube, filaments 3 mm. long; style shorter than the perigone limb, stigma trifid. Type specimen: Traub Herbarium no. 83, *xCyrtanthus Henryae* clone WILLIAM PENN (described elsewhere in this issue); type illustration, Figure 9.

NOTES.—This fine plant is easily grown as a pot plant, and increases rapidly by offsets. It blooms at intervals throughout the year. The 6—9-flowered clone represented by the type specimen, Traub Herbarium no. 83, has been named WILLIAM PENN.

GOOD DAYLILIES

GEORGE GILMER, *Virginia*

Each year I now try to add some forty to fifty new daylilies to my collection. About half of these are current introductions and the other half recent introductions that are highly recommended. Few men have either the money or land or labor to test some three hundred new introductions annually.

C. W. Culpepper has introduced four and these are all excellent. Russell has introduced over seven hundred varieties and Mrs. Nesmith is runner-up. I have only tried a small proportion of their introductions. I have grown nearly all of some fifty varieties of Stout's, practically all of Traub's and some from many other hybridizers.

To make room for new varieties I try annually to discontinue at least as many as the new ones acquired, but the number being grown gradually increases. Most of them are so good it is hard to let them go. If half of those acquired any year are good enough to displace older ones I am well pleased with that year's selections. After a careful test of at least two years, about half the new ones are discontinued. The others are divided and replanted. I try to grow a solid bed of each of the one hundred best. It is very difficult to keep the list down to the one hundred. There are introductions from more than a score of hybridizers in my garden so the work of the different growers can be compared. If blooms fade in the afternoon plants are generally discontinued except in pink and purplish shades. Most plants that do not have good foliage throughout the entire growing season are discontinued.

There have been nearly three thousand named varieties introduced, so that there is little use to mention those I have discontinued. It would

be a too small a proportion of the whole. My list of varieties changes considerably from year to year. My 1949 list is as follows:

OLD VARIETIES

Most of the old varieties have been superseded by recent introductions. There are some that are still good even in comparison with the latest. They are generally cheap and abundant.

Gold Dust,—fair, very early yellow; Apricot,—fair, early yellow; Semperflorens,—rather early, excellent; Waubun,—early midseason, with long twisted petals, yellow, excellent; Patricia,—midseason, excellent; Dauntless,—yellow, with touch of red, excellent; Rajah and Macaulata,—good midseason, red and yellow; Dorothy McDade and August Pioneer,—good, late yellows; Chengtu,—good, late red and yellow; Hankow,—good, late yellow and red; and Autumn Prince,—fair, very late yellow, small and not as good as the early ones.

EARLY VARIETIES

All the good early ones I have are yellow, or some shade of yellow. Earlyanna; Early Bird; Elizabeth; Betty; and Judge Orr.

MIDSEASON VARIETIES—YELLOW

Adventure,—excellent; Albedo; Annis Victoria Russell; Big Glory; Chrome Orange,—Sungold is similar and a little better; Gold Empire; Gold Orchid; Golden Triangle,—a distinctly different shape; Havilah; Herkimer Johnson; Hesperides; Hesperus; Iowa; Johanna Hutchins; John Blazer,—does best on mature plants; Lidice,—small orange, one of my favorites; Manchu; Moon Goddess; Patricia; Purity; Queen of Conzales; Revolute,—excellent; Sungold; and Susanna.

REDS

Acceptor; Berwyn; Black Falcon,—excellent in the morning, but fades badly; Black Prince and Mykewa,—both good dark reds but are so similar only one should be grown; Blanche Hooker; Fire Red; General McArthur,—brilliant; Granada; Indian Chief; Kinglet; Krishna,—purple in the morning, fades to red; Matador; Mrs. John J. Tigert; Papagaio; Peony Red,—unusual shade, fades a little; Red Bird; Ruby Supreme; San Juan; Seminole Chief; Stephen Foster; Warpath; and Wekiwa,—beautiful in the setting sun.

NEAR PURPLES

Krishna,—fades, but attractive after fading; Potentate,—fades much; Purple Water, and The Sultan,—fades.

PINKS

Bertrand Farr,—fades some; Clarion,—one of the best; Georgia,—large, late, excellent bloom, poor foliage; Helen Wheeler,—my favorite pink; Lustrious,—fades; Pink Charm,—fades; Pink Luster,—fades; Rosalind,—fades some; and Sweetbriar,—fades.

BLENDS AND BICOLORS

Aladdin; Am,—very tall, bicolor; Anna Zenger; Aurantiaca; Ballet Girl,—striped; Bicolor; Bright Eye; Carnival; Clarice; Dauntless; Decoration; Dr. Stout,—excellent, never hurt by sun; Emberglow; Garden Lady; George Kelso,—grows in full sun; Glowing Embers; Inca Gold; Mayor Starzynski; Meteor; Mikado; Miss Jennie; Mitra; Queen Wilhelmina; Rajah; Reba Cooper; Reinbeck,—fades a little; Santa Maria; Stalwart; and Victory Montevideo.

LATE

August Pioneer; August Orange; Aztec Gold; Chengtu; Dorothy McDade; Hankow; Sulin; Autumn Prince,—latest but not good.

LONG TWISTED PETALS

Fantasia; Silver Stars; Taruga; Theodore Mead; and Wau Bun.

TRIANGULAR SHAPE BLOOMS

Golden Triangle,—excellent.

TALL

Massaoit; Plume Rouge; and Am.

SMALL

Mignon; and Autumn Prince.

PHOTOGRAPHING HEMEROCALLIS IN COLOR

PHILIP G. CORLISS, *Somerton, Arizona*

There is, to my knowledge, no flower which lends itself so well to color photography as the *Hemerocallis*. At the outset, let me say that all of my remarks henceforth are based on the use of Kodachrome, as I have found it superior, at least in my hands, to any other color emulsion.

With correct lighting and exposure, the colors of the daylily are faithfully reproduced in color photography. No delicacy of shading is lost, and the reflected and transmitted light which is so wonderful in this flower, actually tends perhaps to exaggerate the beauty of the color.

The nature of the growth of the *Hemerocallis* makes it an ideal flower to work with in the garden. It normally tries to face directly into the sun. It grows on a long bloom stalk which may easily be bent to the desired position and held with a plant prop. It is noted for its tidiness in droppig its old blooms, which means that usually only the attractive buds will accompany the flower in the picture. Except with varieties of *H. multiflora* parentage, there is normally only one open bloom on the stalk, thus assuring a clear portrait.

Kodachrome movies, and stills taken at medium distance are excellent, and if you haven't tried them, by all means do so. But flower por-

traiture is especially easy with this flower. The portraits may be taken with any of the cameras using the 35 mm. film, but great practice may be necessary to assure both perfect focus and centering, unless a camera with a ground glass focus is used. I recommend for this purpose either the Kodak "precision Enlarger" or a Recomar "18" with a 35 mm., Back Adapter. Of course, the larger cameras, such as the Graphics, also have ground glass focus, but they use cut film which will run your expense much higher, although the resultant 35 mm., slides made from the larger film may be of better quality, and may be masked to suit your wishes.

For a portable background, easily rolled up and stored in the trunk of the car, I use what I call my "invention." I have fastened onto a common yardstick (handy for measuring distance) a piece of an old dark blue "carriage robe" which is backed with some gold cloth that came off of our sofa when it was recovered. The gold side is used only for flowers not contrasting with the blue background. A brass rod, for weight, is sewed into the bottom of this cloth. The whole contraption is supported in the field on a collapsible music stand.

A tip: Carry a good notebook, and record each picture in numerical sequence. When I start a new roll of film, I number it by the day of the month. Thus, if I start a roll on the 12th, that film is number 12-1. If I finish it and start another that day, the new roll is 12-2, even though I do not finish it that day. When the films are sent in for processing, I put the number before or after my name on the yellow label which the laboratory uses to mail back your film. Incidentally, be sure to write your name and address in your notebook, in case it is mislaid!

Occasionally the laboratory sends back the mounted slides with the numbers wrong or entirely missing, so it's a good idea to write a short description of each shot, as you record it in your notebook. This is also helpful if you make some mistakes yourself, such as double exposures, accidental exposure to light, etc. . . . Mr. Eastman, where's my bonus?

OBSERVATIONS OF A DAYLILY HOBBYIST

EVERETT H. KENNEL, *New York*

I have grown *Hemerocallis* some twelve years. My first daylilies included APRICOT, GOLDENI, ESTMERE, WINSOME, J. A. CRAWFORD, HYPERION, and MARGARET PERRY. Each year I have added others to total more than one hundred varieties. These have been chosen with the thought of producing new daylilies in my garden. Early crosses produced mostly yellows and an occasional fulvous type. Some found to be good parents are HYPERION, LADY HESKETH, WAU-BUN, SERENADE, PERSIAN PRINCESS, THERON and SOUDAN. Many of the new reds including RUBY SUPREME are now being used.

Each amateur and breeder has a definite ideal in choosing daylilies to be crossed. It is best to observe hundreds of daylilies before making

selections. To me the choice of parent stock is a very personal problem. Seedlings of most daylilies will produce something appealing to the imagination of breeders.

In my breeding the three categories of crosses are—named varieties are crossed, named varieties are crossed with my choice seedlings, my best seedlings are crossed. Seedlings from 1948 crosses, now growing in my garden are mostly crosses between my own hybrids. This spring seed was planted in the open April 4, and observation some eight weeks later would indicate the possibility of some bloom from these crosses in 1950.

It may be of interest to indicate here just a few seedlings which merit mentioning, and also to note a few crosses which have produced excellent progeny for further breeding.

Seedling No. 46-16. A clear lemon yellow self much the color of *MODESTY*. Produces up to 47 blooms on a well branched scape, above excellent dark green foliage. Blooms over a period of six weeks. Seedling No. 46-16.5. A sister seedling to the above, having like characteristics. Blossom clear orange yellow self. As large or larger than *MONGOL*. Seedling No. 46-1. A very unusual pastel. Petals have wavy margins. Many blossoms on scape similar to *SERENADE*. Many visitors have indicated this as a very unusual daylily. Seedling No. 45-182. A very lovely huge pale lemon trumpet. Complex parentage includes *HYPERION*, *LADY HESKETH*, and *SUNNY WEST*. Seedling No. 48-3. Rather complex parentage. This is a much better *THERON*. Larger, broader petals, better substance. Seedling No. 49-3. First bloom small but much the best pink I have yet seen. Pollen parent was *ROSALIND*. Seedling No. 46-64. A cross between *SOUDAN* and *SERENADE*. A pastel bicolor which blooms from mid-June to late August by continuously sending up new scapes. I am using this one for further breeding.

A number of crosses using *H. flava* as pollen parent have been made in hopes of getting better fragrant early daylilies. A cross between *FLORHAM* and *H. flava* produced some twenty-three seedlings, all lemon or orange in color and all fragrant. These are being used for further breeding.

A cross between *MARGARET PERRY* and *HYPERION* produced only three seed and only one plant. This was a definite apricot in color and very late blooming. This does not set seed and pollen seems somewhat sterile. I did get a cross using this pollen on a recurrent bloom of *MIKADO*. This produced only four seed and but one plant. This bloomed first in late June 1949. A gorgeous sunburst of *HYPERION* type, worthy of very careful observation. This may emphasize the wisdom of observing the unusual in plant breeding.

This little article is indicative of my enthusiasm for daylilies.

AMARYLLID NOTES

HAMILTON P. TRAUB, *Maryland*

Amaryllis lateritia Dietrich, Allg. Gartenz. 18: 65—66. 1850; Traub & Moldenke, Tribe Amaryll. 1949, p. 137.

Description.—Rootstock a bulb; leaves bright green, beginning to form when flowers are at anthesis, judging from their shape at the immature height of about 2.5 cm., they will apparently be strap-shaped to lanceolate (lanceolate-lorate) when fully developed; scape 6.1 dm. tall, bluish-green, round, tubular, about the thickness of a little (weak) finger, not perceptibly narrowed toward the apex; umbel 2-flowered; spathe 2-valved, valves 2.5 cm. long, turned back, green, tinged reddish, oblong, torn at the apex, and membranous; bracteoles greenish-white, filiform; petioles 2.5 cm. long or slightly longer, green, slightly tinged reddish; ovary 8—9 mm. long, three-lobed, green; flowers held horizontally; perigone tubular-funnel-shaped, light to bright brick-red; tepaltube very narrow, 3-sided, 3.8 cm. long, slightly arched and incurved [gekruemmt] toward the apex; limb 7.6 cm. long, 6-parted; the 3 setepalsegs broadest, oblong, 3.8 cm. broad, whitish at the tips; petepalsegs narrower, lanceolate, 1.7 cm. broad, obtuse or blunt at the tips; all tepalsegs somewhat undulate at the margins, and greenish-white at the base at the union with the tepaltube; throat naked [paraperigone absent]; stamens upright, shorter than the tepalsegs; anthers reddish-whitish-yellow; pistil brick-red, as long as the stamens, stigma small, obscurely trilobed, lobes rounded; capsule and seeds unknown.

Range.—Upper Guinea.

Notes.—Brought back to Germany in November 1849 from Upper Guinea by Dr. Halleur, a missionary. Flowered in April-March 1950. Dietrich (1850) was not certain as to its affinities, stating that apparently it was intermediate between the *Vallotae* and *Amaryllides*, but might belong to either one of them.

This plant was overlooked by Baker (1888) and subsequent workers. It is hoped that new material can be collected for further study.

Zephyranthes Hassleriana (Chodat et Lendner) Traub, **comb. nov.** Syn.—*Amaryllis Hassleriana* Chodat et Lendner, in Bull. L'Herb. Boiss. Ser. II, 1: 422. 1901. (Paraguay); Traub & Moldenke, Tribe Amaryll. 137. 1949; Moldenke, Plant Life 5: 84. 1949.

Habranthus caeruleus (Grisebach) Traub, **comb. nov.** Syn.—*Amaryllis caerulea* Grisebach, Goett. Abh. Wiss. Ges. 24: 320. 1879; Traub & Moldenke, Tribe Amaryll. 137. 1949; Moldenke, Plant Life 5: 84-85. 1949; *Zephyranthes caerulea* (Grisebach) Baker, Amaryll. 37. 1888; *Habranthus caeruleus* Baker, Amaryll. 211 (Index). 1888, nomen.

xAmaryllis Johnsonii Lodd., Bot. Cab. 159; Sweet, Hort. Brit. 402. 1827; Herb. Amaryll. 142. 1837; Traub & Moldenke, Tribe Amaryll. 136. 1949. Syn.—*xAmaryllis brasiliensis* Red. Lil. 8. 469; *xAmaryllis Carnarvonii* de Candolle, Pl. Rar. Hort. Genev. pl. 9. (This bibliography is given for the benefit of those who may wish to follow up this subject.)

Eustephia yuyuyensis Hort. (err. *yuyuensis*). The editor has received an article on the above subject and has been attempting to trace its history. Any information as to place of first publication will be appreciated. The name is apparently derived from the name of the Province of Yuyuy in Argentina.

With reference to this plant, Mr. Th. Hoog, Haarlem, Holland, writes under date of Jan. 9, 1950, that it was distributed by the son of Mr. Harry Blossfeld, of Potsdam, Germany, at the same time as *Amaryllis immaculata* Traub & Moldenke (syn.—*Hippeastrum candidum* Stapf).

Hymenocallis narcissiflora (Jacq.) Macbride, in Publ. Field. Mus. Nat. Hist. Chicago, Bot. Ser. XI. 1931, p. 11. (Syn.—*Pancratium narcissiflorum* Jacq., Fragm. Bot. 68. 1809; *Pancratium calathiforme* Red. Lil. 59: pl. 352. 1812; *Pancratium calathinum* Ker-Gawl. in Bot. Reg. pl. 215.; *Ismene calathina* Herb. Append. Bot. Reg. 46. 1821; *Ismene calathiformis* M. Roem. Syn. Ens. 186. 1847; *Ismene Tagliabuei* M. Roem. Syn. Ens. 186. 1847; *Ismene narcissiflora* M. Roem. Syn. Ens. 186. 1847; *Hymenocallis calathina* Nichols., Dict. Gard. 2: 165.)

This widely cultivated plant is usually listed incorrectly as either *Ismene calathina* Herb. or *Hymenocallis calathina* Nichols. It is hoped that the correct name, *Hymenocallis narcissiflora* (Jacq.) McBride, may be standardized in usage as soon as practicable.

Brunsvigia rosea var. **longipetala** (Lem.) Traub, **comb. nov.** Syn.—*Amaryllis longipetala* Lem., L'Illus. Hort. 13: 78—79. 1866; Traub & Moldenke, Tribe Amaryll. 137. 1949.

This is a tri-colored variety—flowers yellowish at the throat and exterior base, changing to white and delicate rose toward the apex—with relatively long tepalsegs. It was discovered in South Africa by the Dutch botanist, Vroom, and was described by Lemaire in 1866.

Eustephia coccinea Cav., Ramon Ferreyra no. 3775, collected between Tarma and Carpapata, Province of Tarma, Dept. Junin, Peru, in stony ground, at alt. 2600—2800 m., June 28, 1948, is apparently a more robust 8—12-flowered form with longer pedicels, slightly shorter perigone, and filaments petaloid in lower 2/3—pedicels variable up to 6 cm. long; ovary 3—6 mm. long; perigone above ovary, 2.5—3 cm. long, “red with green apex”; tepaltube 5 mm. long; tepalsegs 2.5—3 cm. long; filaments free, petaloid in lower 2/3, toothed on each side; style exserted, stigma capitate (obscurely trilobed).

Hymenocallis amancaes (Ruiz et Pav.) Nichols.; Ramon Ferreyra no. 6153, collected at Atocongo, about 25 km. south of Lima, Dept. Lima, Peru, on stony soil, alt. 250—300 m., July 17, 1949.

Amaryllis Ferreyrae Traub, *sp. nov.* Hera bulbosa; cervice bulbi brevi 2 cm. longa; foliis 3 vel 4 cum floribus mensi septembri (in Peruvia) productis usque ad 55 cm. longis, medio 3 cm. latis, ad apicem lorato-lanceolato-acutis, usque ad 6 mm. ad basin angustatis; pedunculo 15—19 cm. alto, ad basin ca. 1.5 cm. diametro, ad apicem 4—5 mm. diametro; umbella biflora; spatha 2-valvata, valvis usque ad basin distinctis lanceolatis 6 cm. longis; pedicellis 8—9.5 cm. longis; ovario 10 mm. longo, 6 mm. lato; perigonio valde patenti rubro; tubo tepalorum gracili 2.5 cm. longi; paraperigonio nullo; limbo perigonii 6-segmentato, segmentis 9 cm. longis, medio 3—4 cm. latis, ad apicem acutis; staminibus ad oram tubi tepalorum adnatis ca. 6.5 cm. longis sed longitudine inter se series 4 gerentibus, stylo brevioribus declinato-adscendentibus; stylo declinato-adscendenti segmentis tepalorum brevioribus; antheris 7 mm. longis; stigmatibus planis summitate triangulari. Exemplar typicum: Ferreyra 4997, herb. Traubi access. nos. 111 et 112.

Bulb with a short neck, 2 cm. long; leaves 3—4, contemporary with the flowers in September (Peru), to 55 cm. long, 3 cm. at the middle, lorate-lanceolate-acute above, narrowed to 6 mm. at the base; peduncle 15—19 cm. tall, about 1.5 cm. in diameter at the base, 4—5 mm. at the apex; umbel 2-flowered; spathe 2-valved, valves free to the base, lanceolate, 6 cm. long; pedicels 8—9.5 cm. long; ovary 10 mm. long, 6 mm. wide; perigone wide open, red; tepaltube slender, 2.5 cm. long; paraperigone absent; the perigone-limb of 6 tepalsegs 9 cm. long, tepalsegs 3—4 cm. wide at the middle, pointed at the apex; the 6 stamens of 4 sets of lengths, attached at the mouth of the tepaltube, 6.5 cm. long, slightly shorter than the style which is shorter than the tepalsegs; stamens and style declinate-ascending; anthers 7 mm. long; stigma flat, triangular on top. Type specimen Ferreyra 4997, accession in Traub Herbarium nos. 111—112. Collected by Dr. Ramón Ferreyra on the Isla Santa Maria, near Yurimaguas, Huallaga Valley, Dept. Loreto, Peru, alt. 150—200 m. in the forest, Sept. 16, 1948.

Notes.—This fine species belongs in the Subgenus *Aschamia*. It differs from *Amaryllis Leopoldii* in color pattern of the flower, and in having less regular tepalsegs, and shorter stamens and style, and from *Amaryllis Reginae* in having leaves fully developed with the flowers, spathe-valves shorter than the pedicels, a longer tepaltube, and a style shorter than the tepalsegs. *Amaryllis Ferreyrae* will represent a fine addition to the germ plasm collection of the *Amaryllis* breeder. It is named in honor of Dr. Ramón Ferreyra.

A REVIEW OF THE GENUS **BRUNSVIGIA**

R. A. DYER

INTRODUCTION

As in the case of my account of the genus *Cyrtanthus* in *Herbertia*, 1939, this work on the genus *Brunsvigia* is given the status of a Review. It does not merit the title of Monograph. The work has suffered many interruptions and there is wide scope for further research and study of living material, especially in the field. But for all the defects a considerable amount of new information has come to light, which justifies publication.

I wish to thank various collaborators and members of the staff of the Division of Botany and Plant Pathology for assistance both in the herbarium and in the field. Their names appear in the text without further thanks. I am very grateful also to the Curators of the various Herbaria in the Union of South Africa for the generous loan of herbarium material, without which it would not have been possible to carry out the work. From Kew I had the loan of a few important specimens.

The plant which Heister gave the name *Brunsvigia* in 1753 [Fig. 10], in honour of the Duke of Brunswick, a German general, has an interesting history. The bulb was sent from the Cape by Governor Ryk van Tulbagh, in 1748, to von Imhoff in Germany, Director of Mines and a promoter of science. The plant was 7 months on its journey via Holland, but survived to flower for the first time in 1750. Heister regarded it as a miracle of the plant kingdom and described it in great detail, without, however, giving it a specific name.

A plant, now regarded as conspecific with Heister's specimen, was described, also in 1753, by Linnaeus, who used the binomial *Amaryllis orientalis*. For a considerable period Heister's publication was either overlooked or ignored.

As will be seen from the little synonymy which is cited, species now classified under *Brunsvigia* have had a checkered career. For instance Thunberg, in 1795 and 1823, had them in the genus *Haemanthus*. Jacquin, in 1797, followed Linnaeus by including the 3 species he figured in the genus *Amaryllis* (His illustrations are botanical works of art.)

Aiton, in 1811, adopted Heister's genus *Brunsvigia* and transferred to it the species figured by Jacquin as *Amaryllis multiflora*, *A. marginata*, *A. radula*, and *A. striata*. *A. marginata*, however, has since then generally been placed under *Nerine*, but it certainly shows a strong affinity with *Brunsvigia* and gives the impression of being a connecting link between the two genera. For this reason Jacquin's illustration is reproduced with a description. The capsule is more like that of typical *Brunsvigia* than *Nerine*, whereas the perianth has differences which are not readily put into words, since there is already considerable variation among the recognised species of *Brunsvigia*.

In 1822 Herbert, in an article on the culture of the Guernsey Lily

and other bulbs of the genera *Nerine*, *Coburgia* [Herb. 1819], and *Brunsvigia*, misapplied the name *Brunsvigia* and incorrectly placed the typical species under *Coburgia* [Herb. 1819]. Later Herbert, 1837, while recognising the typical *Brunsvigia* correctly, excluded the species now known as *B. josephinae* and *B. grandiflora*.

In attempting to classify the species of *Brunsvigia* according to their interspecific relationship, two main alternatives present themselves as a basis for initial subdivision. Either the character of the leaves and capsules may be used, or that of the flowers, whether fairly regular or zygomorphic. If one follows the latter course, the 2 outstanding species *B. orientalis* and *B. josephinae* come near together, whereas they are well separated if one relies on the characters of the leaves and capsules. In essence this was the question Herbert put to himself in 1837 and answered it by keeping the two species in different genera, *Brunsvigia* and *Amaryllis* [= *Coburgia* Herb. 1819] respectively, saying that he relied for his distinction mainly on the broad recumbent leaves with a cartilaginous margin and the almost winged, triangular capsule of the species he placed in *Brunsvigia*.

Baker in *Flora Capensis*, 1896, has cited most of the earlier literature of the genus. His monograph contained 11 species, most of which have been retained, although it is considered that his citations of specimens erred in several instances. Species have been added since, Miss Leighton 3, and the total is in the neighbourhood of 20, but still our knowledge of at least half this number is regretfully scanty.

THE CAPE BELLADONNA is not dealt with in this review, since South African botanists with whom the question has been raised, agree that it cannot be included with *Brunsvigia* if reliance is placed on the criteria accepted by them and the writer for generic distinctions.¹

A feature, which has been mis-interpreted before, is the question of the production of the leaves, whether "contemporary with" or "after" the inflorescence. In the summer rainfall areas of the Transvaal and Natal the inflorescence is more or less contemporary with the leaves; that is, the leaves develop in spring or summer and before they mature the inflorescence arises on the *outside* of the new leaf crown, from the axil of a leaf-base of the previous season. As the distribution of the genus extends westwards into the winter rainfall area of the Cape and the dry Karoo, the leaves arise later in the summer or in the winter, while the inflorescences of most species are produced during January to March.

¹EDITORIAL NOTE.—Scientific research cannot be regulated in any manner whatever, and Dr. Dyer is privileged to exclude the CAPE BELLADONNA from *Brunsvigia* Heist., on the basis of the criteria accepted by him. Dr. Gouws of the UNIVERSITY OF PRETORIA holds a similar view, and he has proposed the name, *Coburgia rosea* (Lamarck) Gouws (PLANT LIFE 5: 64. 1949) which is the valid name of this species under the International Rules of BOTANICAL NOMENCLATURE if it is maintained as the type of a separate nomenclatural genus (See Traub & Moldenke, TRIBE AMARYLL. 56, 59—60; 64—67, 1949).

Thus to cite a specific example, the inflorescence of *B. orientalis* is produced about March and the leaves follow later and persist almost throughout the South African winter. In such cases the leaves are said to be produced "after" the inflorescence. But as stated the inflorescence

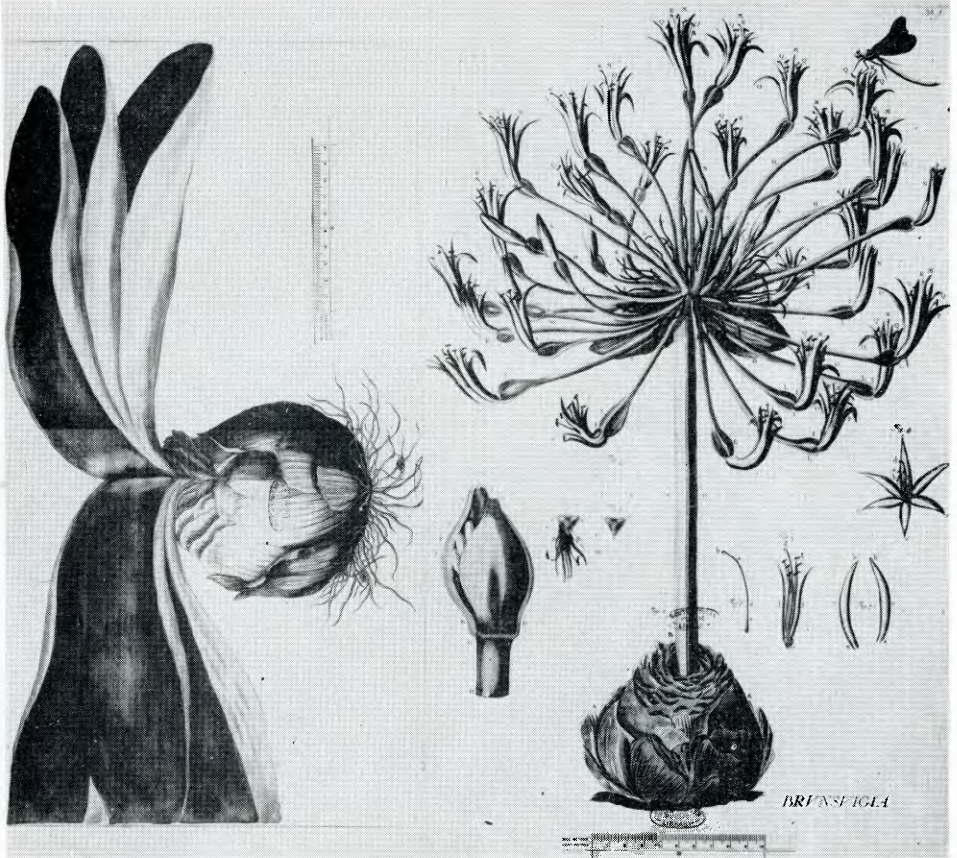


Fig. 10. *Brunsvigia* Heist. (type) = *B. orientalis* (L.) ex Eckl. Photo copy by H. King.

is produced in the axil of the previous season's leaf, and it is the inflorescence which is always after the leaf from whose axil it is produced. The leaves, whether contemporary or "after" the inflorescence, build up reserves for the production of an inflorescence in the season following. In only one single case has an inflorescence been observed to be produced from the axil of a current season's leaf and because of its unique nature

is reproduced in Plate 10. This production of flowers and leaves at different times of the year is one of the main causes of confusion and uncertainty in classification—so few specimens are complete in herbarium collections and collectors' records are hopelessly inadequate.

The *age* of the inflorescence has an important bearing on its appearance. The young inflorescence has the pedicels suberect and as the inflorescence matures the pedicels usually spread more and elongate gradually until the fruiting stage. When the capsules mature, the pedicels become dry and rigid and the peduncle rots away from the bulb at ground level. A light wind at this stage is sufficient to roll the inflorescence over the ground and scatter the seeds. This character is not restricted to *Brunsvigia*, however, for it is seen also in species of *Boophone*. If an inflorescence is picked in the bud stage the flowers are liable to open without the perianth and pedicels developing to their normal size. Such a specimen is very misleading if not fully documented in the herbarium.

The texture of the bulb tunic of different species is also diagnostic. In some species the tunic is built up of thin membranous units, particularly in the group with many leaves per season, whereas in the group with a few spreading leaves per season the tunic is usually hard and cartilaginous. In some of the latter, the cartilaginous thickening is present below the neck of the bulb in the young leaves and sometimes extends in a thin band on the sides of the neck, forming bristles with age. The drying out of the leaf bases with cartilaginous thickening is most irregular and some areas of individual scales become hard and other areas dry-membranous, but the whole effect is a hard brown tunic.

GENERIC DESCRIPTION

Bulb more or less oval, 2—20 cm. in diameter, subterranean or occasionally mainly above ground level, with a membranous or cartilaginous tunic. *Leaves* produced at the same time or "after" the flowers, distichous from the bulb, lorate or ligulate, spreading closely on the ground or at first suberect and only falling to the ground with age, with or without cartilaginous thickening near the neck of the bulb, with close parallel air passages within. *Peduncle* compressed, solid. *Umbel* of 5—75 flowers, spathe-valves 2. *Perianth* zygomorphic or fairly regular, cut down nearly or occasionally quite to the base, usually with a short cylindrical tube; lobes subequal, linear-lanceolate, oblanceolate or oblanceolate-oblong. *Stamens* more or less declinate, inserted in the perianth tube; filaments filiform, often in 2 series; anthers oblong, dorsifixed, versatile. *Style* filiform, declinate, with a subcapitate stigma. *Ovary* more or less turbinate, 3-celled; ovules numerous, superposed; capsule turbinate and acutely triquetrous or more or less oval-oblong and not acutely angled, narrowed into the pedicel, loculicidally 3-valved; opening along sutures but sometimes breaking unevenly, seeds subglobose, with a conspicuous funicle.

Distribution: Spreading from the Cape Peninsula into all parts of

Southern Africa, with the greatest concentration in the south and fading out towards the tropics.

SPECIES UNPLACED IN KEY

B. RAUTANENII Baker in Bull. Herb. Boiss. ser. II, 3:667 (1902).

Description: *Bulb* unknown. *Leaves* unknown. *Peduncle* 2.5—3 cm. diam. at the apex. *Umbel* 20—30-flowered.

Distribution: South West Africa; Amboland, fr. 5.1.1899, Rautanen.

Notes: With the scanty information supplied it is impossible to place the species in the key. The record, however, will allow future collectors to keep a look out for further specimens in the type locality.

UNCLASSIFIED SPECIMENS

In the key and descriptions which follow an effort has been made to classify the specimens which have come under review, but there are several about which no final decision has been taken. Some are referred to in the notes on their nearest allies, while a few deserve special mention here.

(a) *Riversdale Division*: There are at least 2 species in this area, neither of which is fully collected. One is allied to *B. striata*; and the other (Muir, 4011) is related to *B. grandiflora*.

(b) Drakensberg, Keiber Pass, near Harrismith, O. F. S. This specimen in the National Herbarium, Pretoria, consists merely of two detached leaves and three detached flowers, but the leaf is so much narrower and attenuate (40—50 cm. long, 2—3 cm. broad) that a search in its locality would probably reveal another undescribed species.

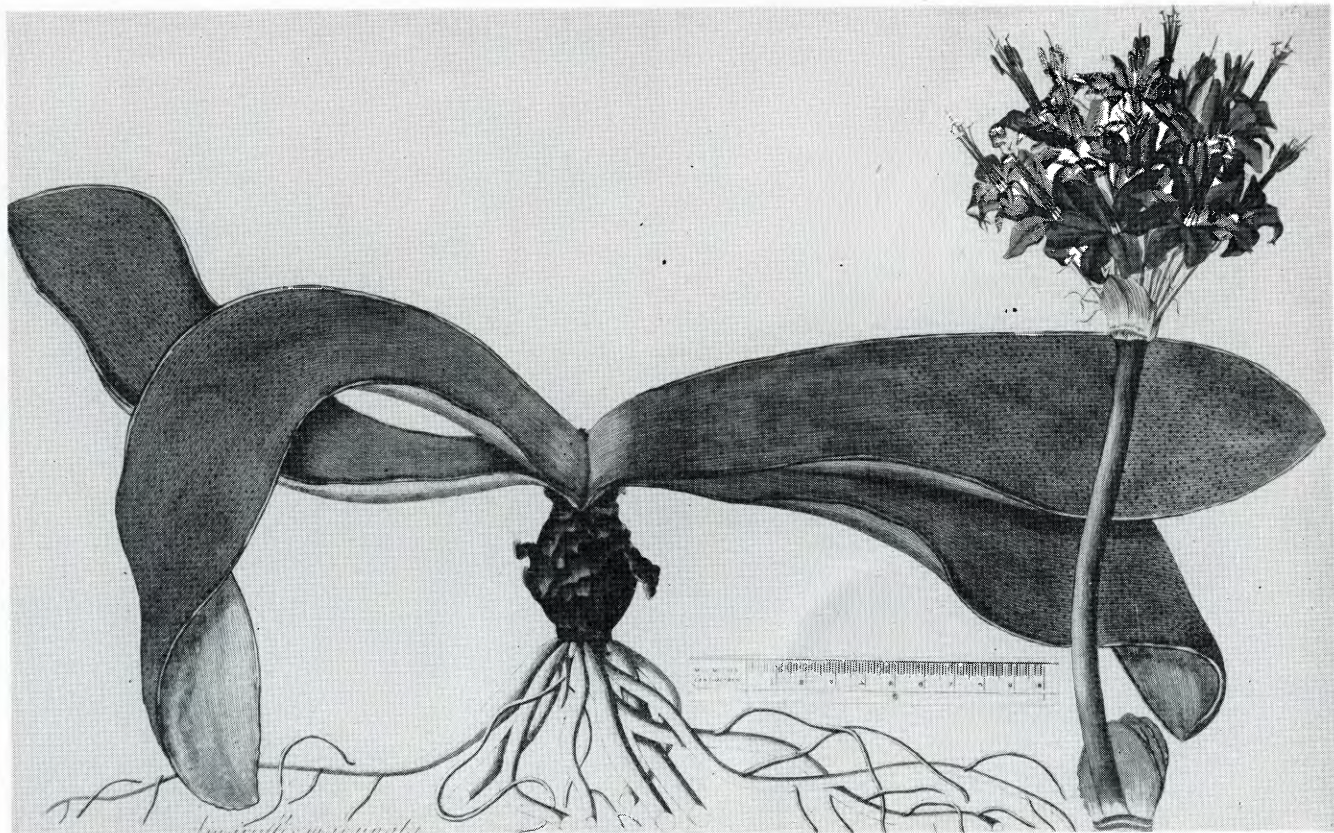
There are other specimens in South African herbaria which it has not been possible to identify with certainty, but the impression is that, had fuller information been available, it would have been possible to identify them specifically.

NERINE MARGINATA [PLATE 7]

The mention of this plant in a review of the genus *Brunsvigia* may be questioned, but it exhibits some most interesting characters, which are not typical of *Nerine* and show an affinity with *Brunsvigia*. McOwan, writing a note on a duplicate of his 1552 (= 2994) which he named *Brunsvigia marginata* Ait. (and which Baker placed under *Nerine*) stated that the half-mature capsule was as typically triquetro-turbinate as the most exacting systematist could desire.

The bulb and leaves suggest a *Brunsvigia*, rather than a *Nerine*, while the flowers are not typical of either.

It is a plant which might well repay a careful cytological study. Its nomenclatural history goes to show how arbitrary our decisions are, and how careful we should be before insisting on changes to our presently



Nerine marginata Herb. (= *Brunsvigia marginata* (Jacq.) Ait.) Photocopy by H. King.

Plate 7

formidable synonymy.

accepted classifications. Each change means an increase in the already

NERINE MARGINATA Herb. Amaryllid. 283(1837); *Amaryllis marginata* Jacq. Hort. Schoenbr. 1:34, t.65(1797); *Brunsvigia marginata* Ait. Hort. Kew ed. 2,2:230(1811); *Imhofia marginata* Herb. App. Bot. Reg. 18(1821); *Elisena marginata* Roem. Amaryllid. 63.

Description:—[Plate 7] *Bulb* 4—5 cm. long, about 4 cm. in diameter with a dark brown tunic. *Leaves* 4, produced "after" the flowers, spreading on ground, obovate-oblong or long ligulate, obtuse, up to about 25 cm. long, 6—7 cm. broad, with a reddish crisped cartilaginous margin. *Peduncle* compressed, about 12—20 cm. tall and 1 cm. thick. *Spathe-valves* 2, deltoid, 2—3 cm. long. *Umbel* with 10—20 flowers. *Pedicels* somewhat spreading, 5—7 cm. long, 2—3 cm. thick, not much tapered. *Perianth* more or less regular, bright scarlet, 3—3.5 cm. long; tube 5—7 mm. long; lobes lanceolate, spreading recurved, slightly undulate. *Stamens* longer than the perianth, nearly straight, anthers oblong, 6—8 mm. long. *Style* straight, slightly longer than stamens. *Ovary* moderately 3-angled, turbinate, 1—1.5 cm. long, 5.8 mm. broad across the angles; capsule up to 2 cm. long, 1.5 cm. broad.

Distribution:—Cape Province: Tulbagh, Wellington, Ceres Paarl.

KEY TO THE SPECIES OF *BRUNSVIGIA*

The following key to the species of *Brunsvigia* is, like most of its kind, merely a guide to correct identification and must be used in this spirit. The distribution records and notes should be consulted also, before coming to final decisions in specific identifications.

- 1a. Leaves 2—6 (rarely up to 8), soon spreading prostrate on ground:
 - 2a. Perianth with a slight bend near the base and the upper 3 lobes more recurved than the 3 lower ones; leaves up to 45 cm. long and 12 cm. broad, velvety 11. *orientalis*.
 - 2b. Perianth with the lobes spreading fairly regularly from the tube:
 - 3a. Leaves and inflorescence not present at the same time:
 - 4a. Peduncle up to about 6 cm. and rarely 10 cm. long, pedicels rarely up to 5 cm. long:
 - 5a. Leaves with papillae or long bristles on upper surface.....1. *radula*.
 - 5b. Leaves without papillae or bristles on upper surface..... 2. *comptonii*.
 - 4b. Peduncles generally more than 10 cm. long and pedicels more than 5 cm. long:
 - 6a. Filaments and style becoming appreciably longer than the perianth, flowers sweetly scented 3. *bosmaniae*.
 - 6b. Filaments sometimes equalling but rarely much longer than the perianth:
 - 7a. Filaments of at least 3 of the stamens with appendages near the base 4. *appendiculata*.
 - 7b. Filaments without appendages:
 - 8a. Umbel up to about 20-flowered, peduncles rarely up to 20 cm. tall and 1 cm. diam.:
 - 9a. Leaves about 2.5 cm. broad 5. *minor*.
 - 9b. Leaves 5—7 cm. broad 6. *striata*.
 - 8b. Umbel 20—40 flowered, occasionally up to 80-flowered, peduncle up to 50 cm. when mature, only occasionally less than 15 cm. and 1.5 cm. in diam.:

- 10a. Leaves smooth on upper surface, up to 18 cm. long and 8 cm. broad 7. *gregaria*.
 10b. Leaves generally rough, at least on upper surface, and leaves 25—50 cm. long and 10—20 cm. broad 10. *radulosa*
- 3b. Leaves and inflorescence developing at the same time:
 11a. Leaves generally rough, at least on upper surface, tough:
 12a. Peduncle 18—25 cm. tall, produced November or early December; pedicels 10—12 cm. long 8. *natalensis*.
 12b. Peduncle 30—50 cm. tall, produced February—March, rarely earlier, pedicels 20—30 cm. long 10. *radulosa*.
 11b. Leaves generally smooth on both surfaces, rather soft and soon becoming flabby on drying 9. *sp.*
- 1b. Leaves 8—20, ascending when young and only spreading on ground with age, usually somewhat glaucous:
 13a. Perianth pink to claret-coloured with all the lobes spreading fairly regularly, 4.5—7 cm. long:
 14a. Perianth pink, 5—7 cm. long:
 15a. Bulb below ground except perhaps for the neck, with membranous tunic 12. *grandiflora*.
 15b. Bulb mainly above ground, the tunic partly cartilaginous thickened 13. *sp.*
 14b. Perianth claret-coloured, 4.5—5.5 cm long, bulb below ground, with membranous tunic 14. *undulata*.
- 13b. Perianth mainly red, 7—9 cm. long, with the upper lobes strongly recurving, the lower three spreading:
 16a. Bulbs up to 20 cm. diam., mainly or entirely above ground, largest leaves up to 90 cm. long 15. *josephinae*.
 16b. Bulbs up to 10 cm. diam., below ground, largest leaves up to about 40 cm. long 16. *litoral*
- 1c. Leaves less than 8, ascending, bulb partly exposed above ground 17. *sp.*

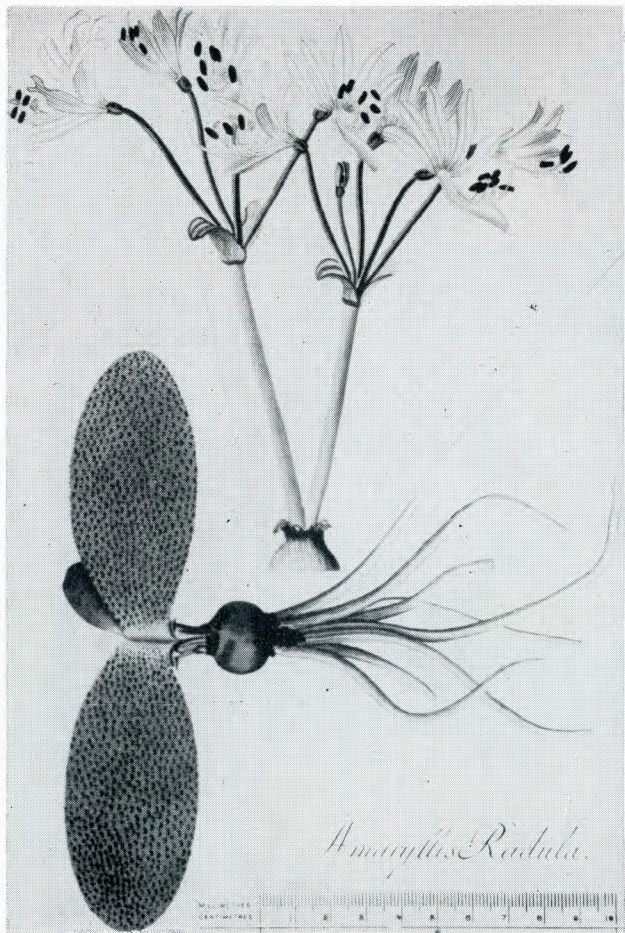
DESCRIPTION OF SPECIES

1. *B. RADULA* Ait. Hort. Kew, ed. 2:230(1811); Baker in Fl. Cap. 6:208 (1896); *Amaryllis radula* Jacq. Hort. Schoenbr. 1:35,t. 68 (1797).

Description: [Plate 8, left] *Bulb* globose with a short neck, 2—2.5 cm. diam. covered with a tunic of old leaf bases. *Leaves* 2—3, spreading on ground, developed "after" the inflorescence, oblong or lingulate up to about 8 cm. long and 3.5 cm. broad, obtuse, thick, covered on the upper surface and margin with rough papillae with enlarged bases, smooth and light green on under surface. *Peduncle* 1 or 2 produced at the same time, up to 10 cm. long and 5 cm. thick, compressed, with 2 ovate-oblong, reddish bracts, about 2 cm. long. *Umbel* 3—5-flowered, somewhat spreading. *Pedicels* up to 5 cm. long, 2—3 mm. thick, angled, not much tapered. *Perianth* often unsymmetrical, flesh-coloured-pink, 2.5—3 cm. long, with a very short tube; lobes linear-lanceolate, spreading, recurved, undulate, often the lowest subtending the stamens and style. *Stamens* declinate, about equalling the perianth. *Style* slightly longer than the stamens. *Ovary* roundish and obtusely angled; capsule 3-angled.

Distribution: There is no exact record for the type.

Notes: The type specimen figured by Jacquin was almost certainly collected by Boos and Scholl for the Royal Schoenbrunn gardens in Vienna. Specimens aligned with it by Baker were recorded from near the Olifants River and it would seem that its distribution is from about



(Left), *Brunsvigia radula* (Jacq.) Ait., Photo copy by H. King; (right), *Brunsvigia bosmaniae* Leighton (type), photo by Prof. R. H. Compton.

Calvinia and Clanwilliam into Little Namaqualand round Steinkopf, while a specimen in Bolus Herbarium from Swellendam division may be a form of it. The bristles or papillae on enlarged bases on the leaves are a most interesting feature of this small species, and distinguish it readily from all other species recognised in this review. Specimens without leaves, are very similar to the recently described *B. comptonii*.

2. *B. COMPTONII* Barker in Journ. S. Afr. Bot. 14:29 (1948).

Description: *Bulb* oblong-globose, 3—4 cm. long, 2.5—3 cm. in diam., covered with a chestnut-coloured cartilaginous tunic, produced into a neck 2—7 cm. long. *Leaves* 3—5, absent at time of flowering, adpressed to the ground, ovate, subacute or obtuse, closely veined, glabrous, 3—4 cm. long, 2—3 cm. broad. *Peduncle* purplish-brown, flattened, 3—6 cm. long, 5—8 mm. diam. *Umbel* small, 6—16 cm. diam. 6—13-flowered. *Pedicels* greenish, tinged purple-brown, 1.5—3.5 cm. long, lengthening slightly in the fruiting stage, 3-angled. *Spathe-valves* 2, papery, reddish or purplish, as long as or a little longer than the pedicels, rarely shorter. *Perianth* pale to dark pink, cut nearly to the base; segments 2—2.7 cm. long, 4—5 mm. broad, curved upwards or one remaining at the base subtending stamens and style, the margins sometimes distinctly undulate. *Stamens* declinate, biseriate; the 3 long ones equalling the perianth; the others slightly shorter; filaments pale to deep pink, sometimes with 2 minute appendages near base. *Style* pink, somewhat longer than filaments. *Ovary* green, tinged with purple-brown, 3-angled. *Capsule* up to 1.5 cm. long, 1 cm. diam. turbinate; seeds pinkish, up to 5 mm. long.

Distribution: Cape Province, Laingsburg district. It is sometimes locally common in this district. A collection by R. du Toit near Sutherland and another by Leipoldt near the Orange River in the Kenhart district may belong to this species.

Notes: The flowering of this small species is irregular in abundance, depending no doubt largely on seasonal conditions. In a good season plants may flower in profusion according to Professor R. H. Compton, after whom the species is named. It is found wedged in the crevices of hard Dwyka shale, sometimes on steep slopes, the bulbs in many cases being compressed due to rock pressure.

Miss Barker points out that the affinity of the plant is with *B. striata* Ait. and *B. radula* Ait. It differs from the former by being less robust with shorter pedicels and the leaves smaller, and from the latter by having leaves without raised papillae. A line drawing, accompanying the original description shows a complete plant and a series of flowers with the segments variously spreading. As the inflorescence and leaves appear at different times it will generally be necessary to have the complete life story if one wishes to distinguish specimens from *B. radula*, where the leaf distinctions are more evident than floral ones.

3. *B. BOSMANIAE* Leighton in S. Afr. Gard. 22:137, 143 (1932).

Description: [Plate 8, right] *Leaves* 6, produced "after" the inflorescence, up to about 15—20 cm. long and 4—8 cm. broad. *Peduncle* 19

cm. long. *Pedicels* 4—4.5 cm. long, developing up to about 10 cm., comparatively stout. *Perianth* shell-pink with veining in a darker shade, sweetly scented; lobes about 4 cm. long, obtuse; the upper 3 somewhat recurved; the lower 3 spreading, leaving the intermediate space free for the declinate stamens. *Stamens* exerted from perianth; anthers 6 mm. long. *Style* up to 6 cm. long. *Ovary* ovate, acutely angled, 1.2 cm. long, 1 cm. in diameter.

Distribution: Cape Province; type said to be from Stellenbosch district, Kuils River. Similar specimens have been collected from Worcester, Laingsburg, Clanwilliam and van Rhynsdorp districts.

Notes: It is unfortunate that the leaves of this species are not recorded in detail. They were not fully developed when the original description was published and it has not been possible so far to obtain further material from the type locality, if in fact the wild habitat of the type is actually Kuils River. The author observed that the plants flowered in March, and that it was the first scented *Brunsvigia* which had come under her notice. She also pointed out that the rather densely-flowered umbel of about 20 flowers had about 15 open at one time. The perianth is recorded as shell pink, with veining in a darker shade and the lower lobes diverge leaving the intermediate space entirely free for the declinate stamens and style as often occurs in *Nerine*. The long filaments exerted from the perianth seem of diagnostic value.

The fact that the author drew special attention to the presence of a sweet scent points to the identity with it of a plant collected further inland near Touwsriver by van Breda, 1160. The flowers of this were recorded as strongly scented and the flowers were very pale pink to almost white. Other specimens which agree closely have been collected in the Laingsburg, Clanwilliam and Van Rhynsdorp districts by van Breda, Compton and Smith.

4. *B. APPENDICULATA* Leighton in S. Afr. Gard. 22: 137, 143 (1932).

Description: *Bulb* globose, up to 8 cm. in diameter. *Leaves* 6, produced "after" the flowers, procumbent, often up to 15 cm. long, and 4.5 cm. broad, with a crisped cartilaginous margin. *Peduncle* about 8—10 cm. long and 1 cm. diameter. *Spathe-valves* 5 cm. long and 1.8 cm. broad. *Umbel* 20—75-flowered, 20—30 cm. in diameter. *Pedicels* 7—10 cm. long. *Perianth* about 3.5—4 cm. long, with a short tube but the margins of the lobes free to the base in the typical form; tube occasionally 3—4 mm. long; lobes linear-lanceolate, 3.5—3.8 cm. long, somewhat recurved, 8—9 mm. broad; the outer generally broader. *Stamens* with filaments declinate incurved above; the outer 3.8 cm. long and the inner 2.8 cm. long; those opposite the outer perianth lobes conspicuously appendiculate with suberect side lobes; those opposite the inner perianth segments more shouldered than appendiculate. *Ovary* 1.7 cm. long, ovules few in each cell; capsule cuneate, 3-angled, up to 4 cm. long and 3 cm. broad across the apex.

Distribution: The type is recorded from Vredenberg in the Malmes-

bury distr. and other specimens agreeing with it have been collected in the districts of Belville, Ceres, Piquetberg and Clanwilliam.

Notes: The following observations were made by L. Bolus when the species was first described: "In general habit and size it would rank among the less conspicuous in the genus; but it is, nevertheless, very attractive with its reddish-green peduncle, purplish-grey spathe-leaves and deep pink perianth with darker veining. The flowers attain a length

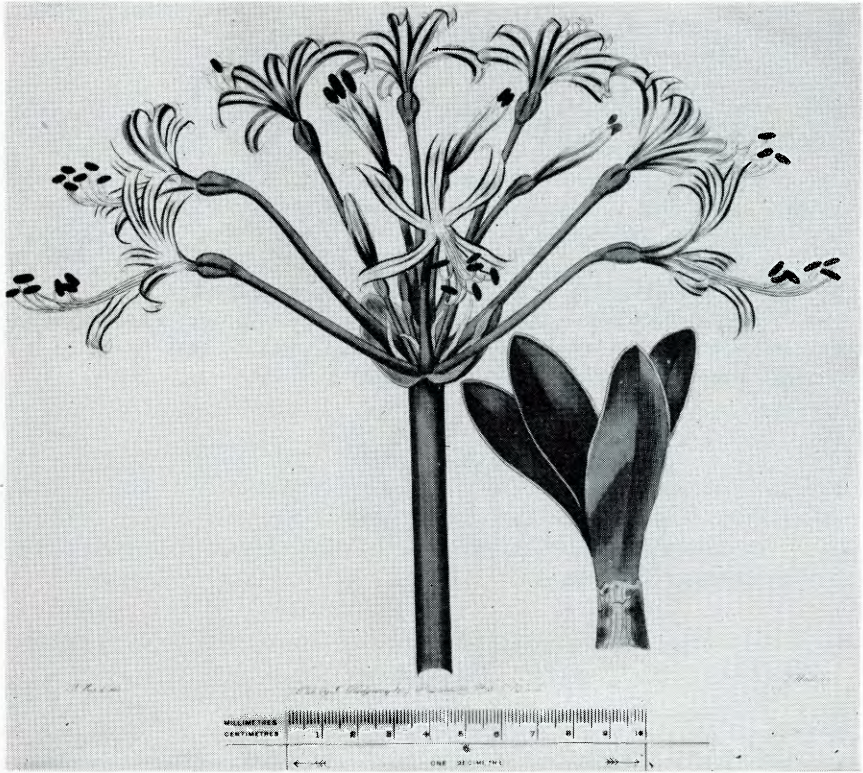


Fig. 11. *Brunsvigia minor* Lindl., photo copy from Bot. Reg. pl. 954 (1826) by H. King.

of 3.8 cm. and the six leaves produced after the flowers, are 15 cm. long and up to 4.5 cm. broad, arranged in two ranks and lying flat on ground and, seen from above, are slightly falcate. Three characteristics are to be specially noticed—the absence of a perianth tube, the stamens not exerted beyond the perianth, and the presence of appendages at the base of the filaments—because in *B. striata* Ait., to which *B. appendiculata* is most nearly allied, there is a tube of about 6 mm., the stamens are described as being 'distinctly exerted,' and no mention is made

of any appendages on the filaments, a feature which has not hitherto been recorded in the genus.”

The statements about the length of the tube and the exerted stamens in *B. striata* were evidently taken from Baker's description of *B. striata* and not from Jacquin's original. The original refers to slightly connate perianth segments and stamens about equal to the perianth in length, which agrees with his figure.

The presence of appendages to the filaments of this species is certainly of particular interest and is a character repeated in some species of the allied genus *Nerine*. Although the typical form has practically no perianth tube, some specimens with appendiculate stamens have tubes and are classified together. Another feature of interest, judged from herbarium specimens, is the opening of a large number of flowers almost at the same time and the comparative density of the heads.

In my notes on *B. striata*, I have mentioned the possibility that appendiculate filaments may well have been overlooked, and that both *B. striata* and even *B. minor* might have been forms of what is now recorded as *B. appendiculata*. Unless the figured type specimens of the first two species are discovered, however, there will be no means of checking this suggestion.

5. *B. MINOR* Lindl. in Bot. Reg. 11: t.954 (1826); Baker in Fl. Cap. 6:206 (1996) in part, not as to the majority of citations.

Description: [Fig. 11] The following is a free translation of the original description: *Leaves* 3—4, oblong, spreading on the ground, shorter than the scape, with the scape longer than the peduncles of the umbel, spathe valves erect, fleshy, with the perianth 6-parted.

Distribution: There is no exact information about the type: Possibly from van Rhynsdorp district.

Notes: We read in the original account that the plant described was cultivated by James H. Slater of Newick Park “a gentleman whose valuable communications have often been gratefully acknowledged in this publication.” Slater noted that the leaves of his plant were rather broad for their length, *about 6 in. long and rather more than 1 in. broad*. Lindley follows this up by saying that the leaves in his figure were different from the description but that Slater's observations were made the year before the inflorescence appeared.

The original description and illustration of *B. minor* is inadequate for certain identification with material from the wild and it poses another difficult question for the reviewer. Baker has identified with it a well collected plant from the eastern Cape Province and also plants from the very different region of Namaqualand. The eastern Cape plants are generally more robust and have broader leaves than shown in the illustration of the type. They cannot therefore be regarded as typical, nor is it likely that they are specifically equal to the specimen from Namaqualand cited by Baker.

A specimen in the National Herbarium, Pretoria, Marloth 13339,

from van Rhynsdorp, and identified by Marloth as *B. minor* Lindl. could very well represent the typical form as also specimens collected in the same region by G. G. Smith 6421, 6423, in the National Botanical Gardens, Kirstenbosch herbarium. These specimens show no appendages on the filaments of the stamens.

The eastern Cape specimens, which are generally considerably more robust, have exhibited great variability in an abundance of fresh material received from several collectors. On the resulting herbarium specimens, without a knowledge of their history, one might well suspect the presence of several species. They are referred to under the new name *B. gregaria*.

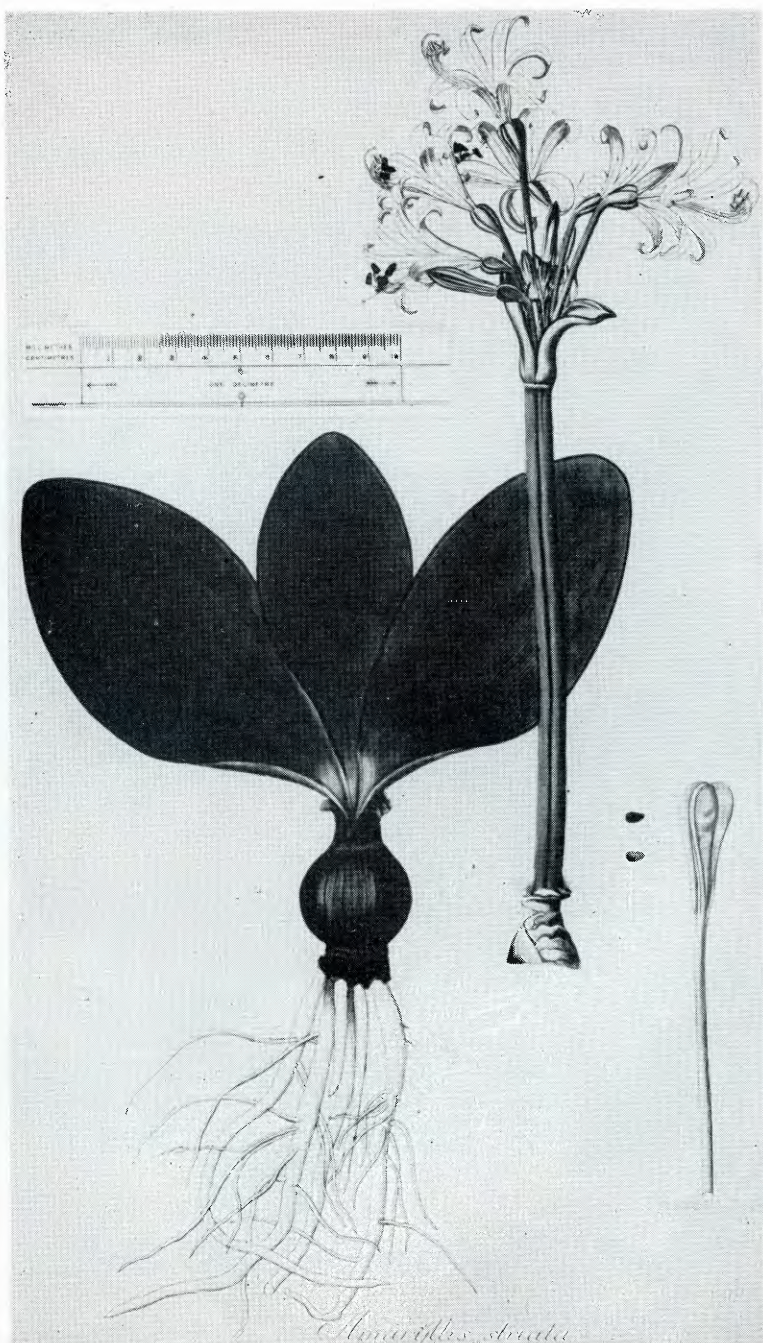
6. *B. STRIATA* Ait. Hort. Kew ed. 2, 2:231 (1811); Baker in F. Cap. 6:207 (1896); *Amaryllis striata* Jacq. Hort. Schoenbrunn 1:36, t. 70 (1797).

Description: [Plate 9] *Bulb* ovoid, about 3—4 cm. in diam., covered with a dark brown tunic. *Leaves* usually 3, produced "after" the flowers spreading horizontally on maturing, oblong, 10—15 cm. long, 5—7 cm. broad, smooth, with an entire thickened scabrous margin and closely ribbed on under surface. *Peduncle* 15—20 cm. long, 1 cm. broad, erect, compressed, green suffused with pink and with 2 oblong subacute bracts. *Umbel* with up to about 20 flowers. *Pedicels* up to about 7 cm. long, 3—4 mm. thick, slightly longer in fruit and fairly uniform throughout. *Perianth* red to rose, 3.5—4 cm. long, with a short tube about 3.5 mm. long; lobes about equal, linear-lanceolate, 3—3.5 cm. long, 5 mm. broad, slightly undulate, spreading recurved. *Stamens* with the filaments about equal in length to perianth, pink, anthers, oblong, dark red. *Style* elongated slightly more than stamens. *Ovary* moderately 3-angled, about 1 cm. long, and 6—8 mm. broad; capsule 3-angled, somewhat cuneate, obtuse, about 1.5 cm. across the angles near the top, with a few seeds.

Distribution: The type specimen was from the Cape of Good Hope without more precise locality.

Notes: The type was probably collected by Boos and Scholl and sent to Austria for the Royal Schoenbrunn gardens. It was there described and painted by Jacquin before 1797, after flowering in its European surroundings in September and fruiting in October. There is no character mentioned in the description which identifies this species with certainty. It seems a close relative of *B. minor* Lindl., the type of which is also vaguely localized as the Cape. A specimen collected by Marloth near Piquetberg and identified by him as *B. striata* may well be correctly named, although the inflorescence is rather dense. On the other hand alternate filaments have appendages on the filaments near the position of the insertion on the perianth as in the case of *B. appendiculata* and thus is classified under that species.

The possibility arises that *B. striata* and *B. minor* were based on specimens which would now be placed under *B. appendiculata*. The original descriptions of the two first mentioned species make no mention of



Brunsvigia striata (Jacq.) Ait., photo copy by H. King, from
Jacquin.
Plate 9



Brunsvigia gregaria R. A. Dyer, *sp. nov.* (See opposite page for legend.)
Plate 10

appendages on the filaments but they may have been present. The degree of reliability of appendages on filaments as a basis of specific separation requires careful attention.

7. **B. gregaria** R. A. Dyer, *sp. nov.*, affinis *B. striatae* Ait. et *B. minori* Lindl. habitu robustiore umbella densiore differt.

Bulbus subglobosus, 4—6 cm. diam. *Folia* hysterrantha, usque 18 cm. longa, 5—8 cm. lata, plana, margine scabrida. *Pedunculus* compressus 12—25 cm. longus, 1—2.5 cm. diam. *Umbella* 30—50-flora. *Pedicelli* 7—15 cm. longi. *Perianthium* roseum vel rubrum, 3—5 cm. longum tubo 4—5 mm. longo, lobis lineari-lanceolatis. *Ovarium* 3-angulatum. [Plate 10]

Cape Province: Uniondale Div.; Fourcade 2090. Port Elizabeth—Uitenhage Divs.; Holland, Cruden 406, Paterson 507, Long 558, Ecklon and Zeyher, Story 3355, 3356, 3361, 3357, 3358, 3359. Alexandria Div.; Story 3362, 3363, 3460, 3461, 3462, Galpin 10657. Bathurst Div.; Sidey, Davies, Story and Britten 3351. Albany Div.; outskirts northwest of Grahamstown, Britten in National Herbarium, Preoria 28397 (flowers) and 28398 (leaves) types, Dyer 416, Story 3350, 3352, 3364, 3365, Erens 2194, MacOwan 507 (also Somerset East Div.). Kingwilliamstown Div.; Story 3453, Erens 2235. Ft. Beaufort Div.; Moore. Adelaide Div.; Story 3368. Bedford Div.; Stent, Erens 2212.

Description: [Plate 10] *Bulb* subglobose, 3—6 cm. diam. with short neck and cartilaginous tunic and sometimes with bristles; the young scales with a band of cartilaginous thickening below the neck of the bulb. *Leaves* 4—6, rarely 8, appearing soon “after” the inflorescence, spreading on ground, up to 18 cm. long and 8 cm. broad, smooth on both surfaces but sometimes puberulous on the upper surface when young, with scabrous and slightly viscid margin. *Peduncle* compressed, 12—25 cm. tall, rarely less, 1—2.5 cm. diam. *Spathe-valves* deltoid, 4—5 cm. long, 3—3.5 cm. broad. *Umbel* 30—50-flowered, occasionally more. *Pedicels* reddish-brown, 7—15 cm. long, very rarely less than 7 cm., 6-ribbed. *Perianth* pink to crimson, 3—5 cm. long, with tube about 4—5 mm. long; lobes linear-lanceolate, undulate or nearly flat. *Stamens* more or less biseriate, about equal or shorter than the perianth. *Ovary* 3-angled; capsules in robust specimens up to 3 cm. long and 2.2 cm. broad, but generally less.

Plate 10. *Brunsvigia gregaria* R. A. Dyer, *sp. nov.* [See opposite page for illustrations]. (Left), exceptional example with inflorescence from axil of current season's leaf; collected near Alexandria in Eastern Cape Province by H. King, after all normal flowering had ceased; photo by J. Reyburn. (Right), normal examples showing large difference in size of plants growing together in Eastern Cape Province; collected by R. Story; photo by H. King. (Center inset), an example (Story #3366) growing in its native habitat, Eastern Cape Province; photo by R. Story.



Brunsvigia natalensis Baker (left); with young inflorescence; collected near type locality, Dist. Estcourt, by Acocks; leaves flat on ground in nature; (right), type number; photos by H. King.
Plate 11

Notes: The variations in nearly all characters of this group of plants, particularly floral and capsule size, is so wide that the group has defied clear classification. A general tendency is for the western plants from Port Elizabeth and Uitenhage divisions, possibly Humansdorp too, to be smaller than those from further west and inland. Examples collected in Uitenhage Divisions by *Ecklon* and *Zeyher* were given the manuscript name "*humulis*" and, except for the considerably denser umbel, could have been identified with *B. striata*, and in other cases where the *very young* leaves are narrow, there is some cause to think that *B. minor* could be nearly matched among them, as Baker did, but the leaves broaden appreciably as they mature. Story collected abundant fresh material in 1948 in the eastern Cape, but instead of clarifying the position, it only confirmed the complexity of the problem of correct classification. The following notes from R. Story are valuable in this connection:

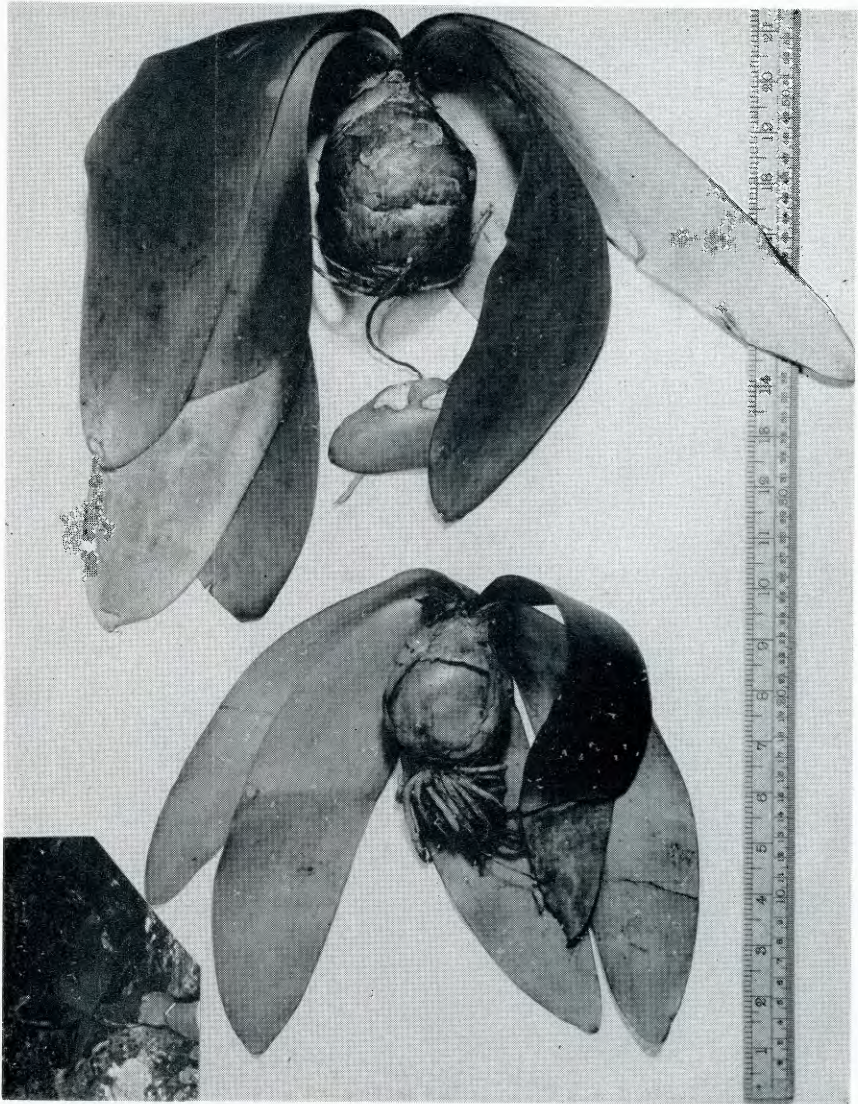
Story 3364. "Larger flowers than usual, otherwise similar to 3350. Perianth lobes vary from linear to almost obovate, some with slightly undulate margins, others without. With reference to your query about differences noted in the field between the coastal and inland (Grahams-town) forms, I have found the differences in size and colour to be so numerous that I fail to draw a hard and fast line between them. If most of the head is eaten off (by stock) (I noted several such plants) the remaining flowers grow much bigger. If I note any so to speak tangible differences I shall let you know, but so far they seem to be all one species to me."

The selection of the Britten specimens as the types was due to the fact that together they give, as near as possible in herbarium material, a complete picture and they come from an area where the plants are possibly more uniform than elsewhere. The Ecklon and Zeyher specimens mentioned above are immature and incomplete and there seems to be the greatest variation in characters in plants from the Uitenhage—Alexandria area. In identifying plants from that area one will be obliged to use the qualifying term "form" rather freely until a more exact understanding is reached.

8. *B. NATALENSIS* Baker in This.-Dyer Fl. Cap. 6:208 (1896).

Description: [Plate 11] *Bulb* subglobose, about 5 cm. in diameter with a short neck and covered by a cartilaginous tunic. *Leaves* appearing with the inflorescence, oblong, obtuse, 15—25 cm. long, 10—12 cm. broad, more or less scabrous on upper surface, occasionally smooth on margin and mainly smooth on lower surface, fairly tough. *Peduncle* 18—25 cm. tall, 1.5—2 cm. broad, compressed. *Umbel* densely 30-60-flowered. *Spathelvalves* ovate, 3—6 cm. long. *Pedicels* 10—12 cm. long in flower and sometimes developing longer in fruit. *Perianth* about 4 cm. long with the tube about 5 mm. long; lobes deep pink, narrowly oblong-lanceolate. *Stamens* about as long as the perianth. *Ovary* turbinate; *capsule* 2.5—3 cm. long and 2—5 cm. broad.

Distribution: Type from Weenen country in the mountainous midlands of Natal. Further research is required to establish the limits of



Brunsvigia sp. ?, referred to under No. 9 in text; (inset at lower left), plant in native habitat (rock crevice—note J. Erens' hand to indicate relative size); (main subjects), plants, collected by L. E. Codd & J. Erens, showing leaf and bulb characters for comparison with *B. natalensis* Baker. Photos by L. E. Codd.
Plate 12

distribution as is mentioned in the following notes.

Notes: The statement in the description of the type that the leaves are glaucous on both surfaces cannot be verified, as there is no such statement on the label. It seems unlikely to be true.

B. natalensis is very closely related to the plants classified as *B. radulosa* and there will be times when there may be no clear distinction. The time of flowering is generally different, *B. natalensis* appearing in November or early December whereas *B. radulosa* is rarely earlier than February and often only comes into flower in March or even as late as April. *B. natalensis* is normally smaller in all respects, but size alone is not an infallible distinction.

At one time similar plants from the Waterberg and other parts of the Transvaal were considered conspecific with *B. natalensis* because of a general similarity and a similar early flowering period. The leaves, however, are less advanced at flowering, are longer, narrower and less rigid than in *B. natalensis*, and until it can be shown that the differences in these characters are due entirely to some reaction to the environment, it is thought better to exclude the plants from *B. natalensis* and attention is further drawn to the problem of the specific limits between them under no. 9 which follows.

9. *B. sp.* [Plate 12]

Description: *Bulb* more or less globose, up to 9 cm. diam., but usually less; neck short or up to 3.5 cm. long, covered by a cartilaginous tunic. *Leaves* 4—6, prostrate, young at time of flowering (December) elongating to about 30 cm. and 10 cm. broad, but in sheltered places may be up to 35 cm. long and only 6 cm. broad, more or less flaccid, moderately covered on the upper surface with minute asperities but not rough to the touch, glabrous below. *Peduncle* 20—30 cm. long, compressed, 2—3 cm. broad, glabrous. *Spathe-valves* 2, tinged with red, membranous, about 4 cm. long and about the same in width across the base. *Umbel* 30—50-flowered. *Pedicels* 10—20 cm. long, slightly 3-angled. *Perianth* pale to deep pink; tube about 4 mm. long; lobes linear-lanceolate, 3—4.5 cm. long, 5—7 mm. broad. *Stamens* about equalling the perianth in length. *Ovary* 3-angled, about 1 cm. long; capsule 3-angled, inflated, about 2.5 cm. long and 2 cm. broad.

Distribution: Transvaal; Waterberg mountains.

Notes: The specimens collected in the above locality look very distinct in leaf from typical *B. natalensis* but at various places in the Transvaal nearer Natal there are recorded plants which indicate that they bridge the gap between the two main groups. Specimens from the Drakensberg, Natal, have the narrow leaf of the Waterberg plants, but they are tougher, and rougher on the upper surface. By including all the forms under one species one would have another rather heterogeneous collection. The position is left open pending further observations.

[To be continued in PLANT LIFE, vol. 7, HERBERTIA EDITION 1951.]



Plate 13

Foster's fragrant *Alstroemeria caryophyllaea* Hybrids

BOMAREAS AND ALSTROEMERIAS

MULFORD B. FOSTER, *Florida*

Almost anywhere in the Andes of Colombia, Ecuador or Bolivia, after you have reached an altitude of 10,000 feet, you may expect to see Bomareas. They grow profusely just above Bogotá, Colombia, vining their way through great masses of undergrowth with their lovely cylindrical heads of flowers pushing up to great heavily laden clouds. They present a beautiful picture but they were certainly not destined for Florida gardens because they cannot tolerate the low altitudes as a habitat. Occasionally we find plants that are indigenous to the higher altitudes and yet have the ability to adapt themselves to great changes in altitudes but not these Bomareas.

In Bolivia, 2,500 feet above La Paz, and La Paz is 12,000 feet above sea level, quite a different type of *Bomarea* may be found, one whose stiff upright stems support leaves which point towards the sky hoping for a bit of sunlight in those high cloud forests. The nodding heads of bell-shaped flowers, light green and pink were indeed retiring in their simple, quiet beauty. They had tubers three quarters of an inch in diameter and an inch and a half long that looked good enough to eat. These tubers were securely fastened between the rocks embedded in a bit of pure peat. They were strange amaryllids, but then, every plant in that queer clammy, cloudy, raw, cool climate was strange.

Growing with that *Bomarea* (not yet identified) were great mounds of cacti completely embedded in this same wet moss. Just about as "impossible" a condition as I've ever seen cacti growing in.

In Santa Catarina, southern part of Brazil, I found vining *Bomareas* at low altitudes not far from the sea and while they are not as colorful as the high altitude ones in Colombia and Ecuador, I do believe that they will succeed in Florida.

The first Bomareas I ever found growing natively, were in Colombia on South America's oldest mountain Sierra Nevada de Santa Marta. That was in 1946 when I found *B. gloriosa* and *B. moritziana*. They were vining types at fairly low altitudes, 3,500 to 4,000 feet. Interesting but not especially beautiful as their flowers are rather sparse and in loose open clusters. Pink sepals almost hiding the green petals would hardly have suggested the name "gloriosa" to me, at least not after having seen the glorious flower heads on the high altitude species, in the rain forests.

In Bahia, October, 1948, I found an *Alstroemeria* which reminded me so much of the low altitude bomareas that at first look I was confused. It nodding flowers of delicate pink and apple green were quite different from the alstroemerias with which I am familiar. It did not vine and the fruit was definitely that of an *Alstroemeria*.

As yet I have not been able to get a determination of this species although I have already crossed it with my other Brazilian alstroemerias

and have hybrid seedlings as a result. This species has bloomed for four months and shows no sign of letting up even at this late date, August 1, 1949.



Fig. 12. Corsage made from Foster's fragrant *Alstroemeria caryophyllaea* hybrids. Photo by B. M. Foster.

My *Alstroemeria* hybrids which have carried the perfume and shape of *A. caryophyllaea* are proving to be more and more interesting [Plate 13]. The range of colors and variations seem to be endless for they

range from almost pure white to deep crimson. Tints of yellow and a rich salmon, pink and even chartreuse are in the color spectrum of these lovely flowers; they bloom from May through July.

Following the suggestion of Mr. Stinson in 1942 *Herbertia*, the flowers of the new *Caryophyllaea* hybrids have been utilized in an unique corsage arrangement as shown in Figure 12.

Continued selection and careful breeding for the next few years will result, I am sure, in colorful alstroemerias that will take their place with the finest of the Pacific Coast hybrids and yet be different enough to have their own distinctive characters and colors.

AMARYLLID GENERA AND SPECIES

[In this department the descriptions of amaryllid genera and species, particularly recent ones, translated from foreign languages, will be published from time to time so that these will be available to American and British readers.—*Harold N. Moldenke.*]

Amaryllis biflora Sesse & Moncino, Fl. Mex. ed. 2. p. 87. 1894; Traub & Moldenke, Tribe Amaryll. 137. 1949.

“*Amaryllis* with a 2-flowered umbel, tepalsegs equal, perigone campanulate, stamens and pistil declined (Illustrated in Nov. Hisp.). Rootstock a tunicated bulb, root-fibers below; peduncle terete, hollow, glabrous, 1½ times as long as the leaves; leaves oblong, canaliculate; spathe 2-valved, oblong, membranous, compressed, pale-reddish; umbel 2-flowered, rarely 3-flowered; pedicels terete, slightly shorter than the spathe, divergent, bent at the apex; perigone campanulate, the three setepalsegs broader, mucronate at the apex, the mucro inflexed.

“Growing near the town of Toa Alta, where it is commonly called ‘Amapola.’ It flowers in April. The tepals are coalesced at their base into an obtusely trigonous tepaltube, as is well shown in a funnel-form gamopetalous corolla.”

Amaryllis cernua Sesse & Moncino, Fl. Mex. ed. 2. p. 85. 1894; Traub & Moldenke, Tribe Amaryll. 137. 1949.

“*Amaryllis* with the common spathe [umbel] many-flowered, the individual ones [pedicels] 1-flowered, alternate; perigones nodding; leaves ensiform. Flor. Mex. Rootstock a tunicated bulb; scape foliose [at base?], terete, glabrous, 6.1 dm. tall; leaves ensiform, sheathed, sub-equaling the scape; spathe-valves concave, keeled, very long, acuminate, entire, membranous, becoming purplish, subtending the pedicellate, drooping flowers, the three setepalsegs keeled, the three petepalsegs plane, slightly shorter and narrower; nectariferous scals none; stamens half as long as the perigone; anthers ovate, erect, drooping due to the inverse position of the flower; ovary inferior, triangular; style very short, stigma trifid, the lobes acute, spreading-reflexed.

“It grows at the very apex of the summit of the mountain Santo Heremo. It is a perennial and blooms in July.”

Sprekelia ringens Morren, in Ann. Soc. D'Agr. et Bot., Gand, Jour. D'Hort. 2:133—138, pl. 60. 1846.

“Leaves radical, broadly lanceolate, glaucescent; flowers solitary, tepalsegs subequal, uniformly colored, the upper ones yellow-striped at the base and middle, and spreading, the three lower ones replicate-conjugate.”

CRINUM INODORUM Tausch in Flora 19: 422. 1836. Bulb pyramidal, leaves loriform, broadly lanceolate, denticulate along the margin; umbel many-flowered, sessile; the segments of the limb erect, linear, shorter than the tube; stamens erect, longer than the style. Cultivated in gardens at Prague under the name *C. americanum*. Scape compressed, with a single, 2-leaved, subequal, membranous, purplish spathe; umbel 9- or 10-flowered; corolla white, inodorous, the divisions of the limb erect, linear, channeled, surpassing the stamens, the base and fructification remaining completely erect; tube of the corolla obtusely 3-sided, slightly purplish at the base, one and a half times as long as the divisions of the limb; stamens erect, longer than the style.

CRINUM ODORATISSIMUM Tausch in Flora 19: 422. 1836. Bulb cylindrical; leaves loriform, broadly lanceolate, denticulate along the margin; umbel sessile, many-flowered; the divisions of the limb broadly lanceolate, shorter than the tube; style shorter than the declinate stamens. Cultivated in gardens at Prague under the name *C. erubescens*, from which it differs in its greater size, the broadly lanceolate instead of linear-lanceolate divisions of the limb, and the style being shorter than the stamens.

ZEPHYRANTHES BRIQUETHI Macbride, in Field Mus. Nat. Hist. Publ. 288, Bot. Ser. 11: 9. 1931. Plant dwarf, prostrate, 5—8 cm. long in all; bulb narrowly ovate-oblong, 8 mm. in diameter, attenuated into a neck about 1—2 cm. long; leaves 2 or 3, linear, 3—6 cm. long, about 1 mm. wide, subulate-acuminate at the apex; scape 1—3 cm. long, 1-flowered; spathe membranous, bifid almost to the base, about 1.5 cm. long; pedicel 3—4 mm. long; ovary 6 mm. long; perigone white (sometimes violet-spotted), about 2 cm. long, the tube slender, about 5 mm. long, rather abruptly widened at the throat, the divisions subequal, apparently rather rounded and connate to each other; filaments free, dilated toward the base, about 3 mm. long; inserted at the apex of the tube; style equaling or surpassing the stamens; stigma 3-foliose-lobed. Peru: with cushion and rosette plants, Carumas, Prov. Moquequa, Feb. 27, 1925, Weberbauer 7322 (type, Field Museum.)

CRINUM DARIENENSE Woodson in Ann. Missouri Bot. Gard. 25: 824. 1938. Bulb not well developed, ovate-oblongoid, 1.2—1.7 cm. in diameter, stoloniferous; leaves clasping at the base, produced into a sheath, 20—32 cm. long, the blade oblong-elliptic, abruptly subcaudate-acuminate at the

apex, flat, delicately subsucculent-membranaceous, 3.5—5.5 cm. broad, obtuse at the base, produced into a petiole 0.6—1 cm. long, erose-denticulate along the subcartilaginous margin, the sheath 3—5 cm. long, 0.8—1.5 cm. wide; peduncles 9—14 cm. long, 2—4-flowered; spathe at anthesis 2-parted to the base, each part ensiform, to 7 cm. long; flowers sessile; tube of the perianth very slender, 21—25 cm. long, about 0.15 cm. in diameter at the base, slightly widened near the throat, apparently whitish, the lobes oblong-elliptic, ecuminate at the apex, white, 7.5—8 cm. long, 1.2—1.5 cm. wide; filaments of the stamens subulate, red, about 4 cm. long, anthers oblong, arcuate, 1.2 cm. long; ovary ellipsoid, 1.2—1.5 cm. long, about 0.4 cm. in diameter; style red, 4.5 cm. long; stigma punctiform.—DARIEN: trail between Pinogana and Yavisa, alt. ca. 15 m., March 17, 1937, P. H. Allen 264 (Herb. Missouri Bot. Garden, Type).

CRINUM FILIFOLIUM Perrier, in Bull. Soc. Bot. France, 86: 90—91. 1939. Glabrous, 25—35 cm. tall; bulb 1—2 cm. wide; leaves 5—7, grass-like, linear-setiform, 15—20 cm. long, 1.5—2 mm. wide; scape equalling the leaves; peduncle short, 5—7 cm. long slender, 1.5—2 mm. in diameter, finely striate; bracts filiform, 2—4 cm. long; flower solitary, sessile; perigone white, the tube elongate, 14—16 cm. long, slender, 1.5—2 mm. in diameter; segments lanceolate, 5—5.5 cm. long, 8—10 mm. wide, subacute, lightly 7-nerved, at anthesis erect-connivent; stamens inserted at the mouth of the tube, subequal, slightly shorter than the segments; filaments slender, recurved toward the apex; anthers linear, 14—15 mm. long, medifixed; ovary sessile, 5 mm. tall; style very slender, 18—20 cm. long, 4.5—5 cm. longer than the perigone tube; stigma capitate. West [Madagascar]: sunny limestone rocks, Tsingy de Namoroka, near Andranomavo (Ambongo), Perrier 1646, November 1903.

CRINUM (STENASTER) BIFLORUM Baker, in Warb. Kunene-Sambesi Exped. 565. 1903. Bulb unknown; leaves linear, 61 cm. long, 1.6—1.9 cm. wide toward the base, at the apex noticeably attenuated, smooth along the margin; peduncle 61—91 cm. long, 1.2 cm. in diameter toward the base; umbel 2-flowered; pedicels very short; valves of the spathe lanceolate; ovary cylindric; perianth-tube straight, 12.7 cm. long, the segments lanceolate, 6 mm. wide, half as long as the tube; stamens distinctly shorter than the segments; anthers linear, 10—12 mm. long. Kuito; Longa, 1150 meters altitude (no. 543, 1899). Approaching *C. americanum* L.

CRINUM (PLATYASTER) HARMSII Baker, in Warb. Kunene-Sambesi Exped. 565. 1903. Bulb unknown; leaves 5.1 cm. wide, distinctly denticulate and ciliate along the margin; peduncle 1.2—1.4 cm. in diameter; umbel 3-flowered; pedicels short; spathe valves lanceolate, ascending, 10—12.7 cm. long; ovary cylindric; perianth-tube straight, 10 cm. long, the segments of the limb oblong-lanceolate, equaling the tube, 1.2—1.4 cm. wide at the mid-point, attenuate at the apex and base, red-tinted on the back; stamens much shorter than the segments; anthers yellow, 8 mm. long. Kuebe, Malanque, 1250 meters altitude (no. 406, 1899). Closely approaching *C. americanum* L. and *C. erubescens* Ait.

CRINUM (CODONOCRINUM) STENOPHYLLUM Baker, in Warb. Kunene-Sambesi Exped. 566. 1903. Bulb ovoid, 2.5 cm. in diameter, the neck elongated; leaves 4 or 5, erect, 30 cm. long, linear, flaccid, 2—4 mm. wide, smooth at the margin; peduncle 30 cm. or more long, 4 mm. in diameter; umbel sessile, 2-flowered, spathe-valves lanceolate, 5.1 cm. long; perigone white, the tube curved, 10 cm. long, the segments of the limb oblong, 1.8—2 cm. wide, attenuate at the base, concolorous on the back; stamens declined, much shorter than the limb; anthers linear, 8 mm. long. Kubango, near Karonga, 1100 meters altitude (no. 406, 1899). Approaching *C. pauciflorum* Baker.

CRINUM ALGOENSE [Herb. Amaryll. 272 1837].—of my Appendix. Sweet Hort. Brit. Not yet flowering, from southern Africa near Algoa Bay, with leaves similar to those of *C. revolutum*, but narrower and very much channelled. Perhaps a variety of *C. revolutum*.

CRINUM ALBUM [Herb. Amaryll. 272. 1837].—*Amaryllis alba* Forsk., Fl. Aegypt-Arab. 209.—with linear-lanceolate leaves, white flower, spathe 10-flowered, the flowers declinate. Kurma, Arabia.

CRINUM CAFFRUM [Herb. Amaryll. 272 1837].—of my Appendix, Sweet, Hort. Brit. Not yet flowering, similar to *C. campanulatum* and is hardly distinct.—*Caffrum* and *Formosum* Herb. App. are to be deleted. *Formosum* is *C. arenarium* var. *blandum*.

(Doubtful species. *Lanceanum* of myself in Sweet, Hort. Brit., from Surinam. Not yet flowering and perhaps to be reduced to a variety of *C. Broussonetianum* from Africa. *Formosum* Herb. Append., is the same as *Arenarium blandum* var. *falsum* said to have been brought from Brazil.) *C. Osbeckii* Desf. Cat. Hort. Paris, whose native habitat is unknown, is not among those received; a hybrid similar to my *hortense*, perhaps *scabrum* × *capense*? To be rejected for the same reason is *multiflorum* Desf.

CRINUM ESQUIROLII Lévl., Mem. Pont. Accad. Romana, 1906, p. 343. Bulbous, stem 5—8 dm. tall; leaves few, very thin (with the cells conspicuous), about 12 mm. wide; flowers 7-12, very large; ovaries sessile, the tube 10 cm. long, the limb 8 cm. long, the segments narrow (1 cm.), narrowly lanceolate, nerved, acuminate; stamens included; style very slender, 10—12 cm. long; stigma very small.

This plant, says the collector, is used by the natives for sprains and bruises; they soften the leaves over fire and apply them to the painful spot; because of this it is called "beau Ronn." Kouy-Tochéou, June 18, 1904, Jos. Esquirol 134.

USDA DAYLILIES

[CONTINUED FROM PAGE 86, PLANT LIFE, VOL. 5, HERBERTIA EDITION, 1949]

Editorial Note.—As indicated in 1949 HERBERTIA, these have recently been distributed to nurserymen for propagation, and the U. S. Department of Agriculture does not have any stock on hand for further dissemination. Those interested may obtain them a little later

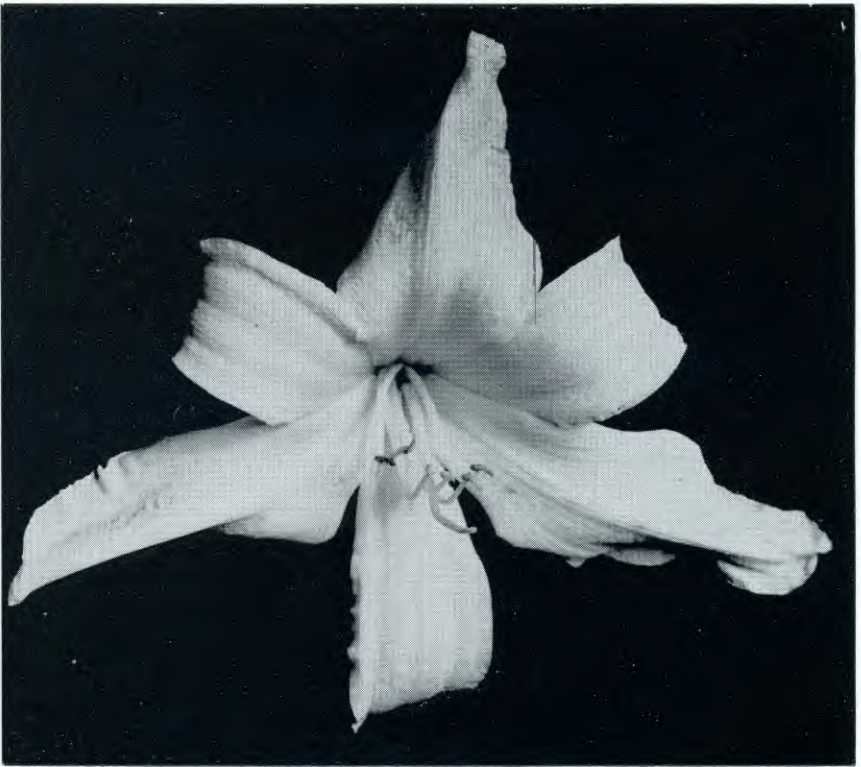


Fig. 13. *xHemerocallis* clone GOLDEN TRIANGLE
USDA Photo

when the nurserymen have had time to increase their stock sufficiently to offer these clones to the public.

GOLDEN TRIANGLE. [Clone #69; see Fig. 13.] Plant vigorous, 3 $\frac{2}{3}$ inches tall; notable for the large, flat, triangular-shaped flowers of heavy substance, 6 inches or more across, and for full sun-resistance; sepals 1 $\frac{1}{4}$ inches broad, reflexed, Buttercup Yellow (RHS 5), lighter on edges;

petsegs $1\frac{3}{4}$ inches broad, not reflexed but pinched, main body of petseg Lemon Yellow (RHS 4), tip Buttercup Yellow (RHS 5); delightfully fragrant; midseason.

PURITY. [Clone #245; see Fig. 14.] Plant $3\frac{3}{4}$ feet tall; notable for fragrant, clearest Lemon Yellow self (RHS 4) flowers, $5\frac{1}{4}$ inches across; petsegs $1\frac{1}{4}$ inches, sepsegs $\frac{5}{8}$ inch broad; late midseason; excellent for cut flowers.

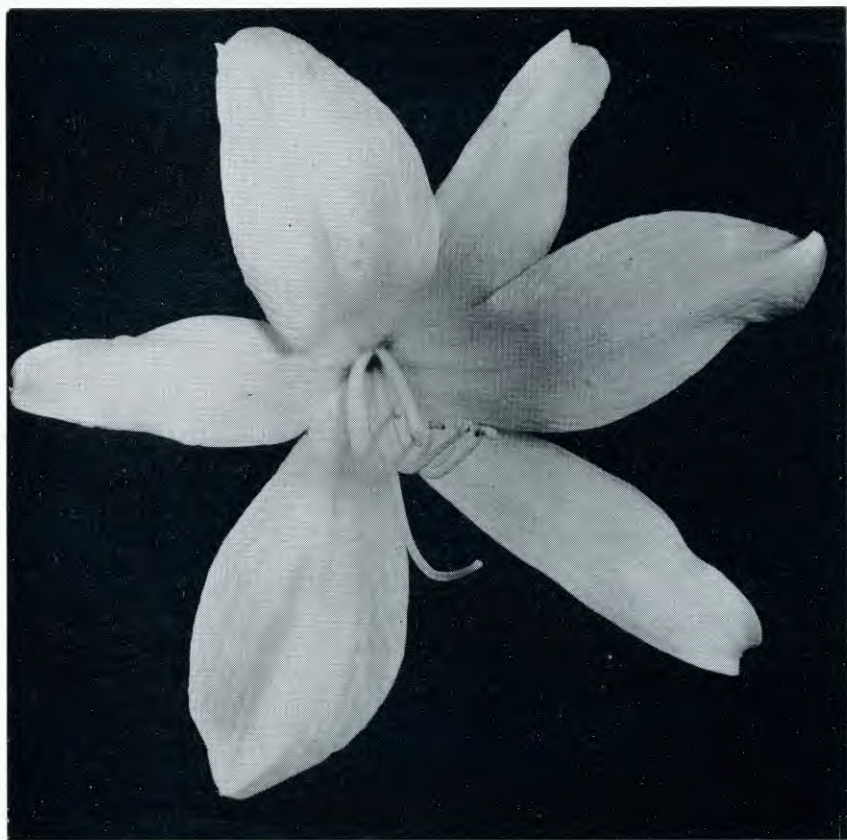


Fig. 14. *xHemerocallis* clone PURITY -
USDA Photo

SUSANNA. [Clone #210.] Plant $3\frac{1}{3}$ feet tall; notable for clear Cadmium Orange self (RHS 8) flowers, 5 inches across; petsegs $1\frac{1}{4}$ inches and sepsegs $\frac{3}{4}$ inch broad; slightly fragrant; late midseason.

LEMON TULIP. [Clone #84] Plant vigorous and floriferous, $3\frac{2}{3}$ feet tall; notable for the very long clear Lemon Yellow self (RHS 4) flowers; petsegs $1\frac{1}{2}$ inches and sepsegs $\frac{3}{4}$ inch broad; late midseason; excellent for forcing.

GITA. [Clone #952] Plant 3 feet tall; notable for long Aureolin self (RHS 3/1) flowers, 4 inches across; petsege 1½ inches and sepsege ½ inch broad; late midseason.

[To be continued in 1951 HERBERTIA]

REGISTRATION OF NEW AMARYLLID CLONES

Registrars: Dr. J. B. S. Norton and Prof. W. R. Ballard

This information is published to avoid duplication of names, and to provide a space for recording brief descriptions of new Amaryllid clones. Names should be as short as possible—one word is sufficient. It is suggested that in no case should more than two words be used. *The descriptions must be prepared in the form as shown in the entries below, and must be typewritten and double-spaced.* The descriptive terms used should be in harmony with those given in the "Descriptive Catalog of Hemerocallis Clones, 1893-1948" by Norton, Stuntz and Ballard.

There is close liaison between the AMERICAN PLANT LIFE SOCIETY and the HEMEROCALLIS SOCIETY regarding the registration of new *xHemerocallis* clones. By cooperative arrangement with the HEMEROCALLIS SOCIETY, beginning with the 1951 HERBERTIA edition, descriptions of only such *xHemerocallis* clones for which the 50c registration fee has been paid to Registrar, Mr. Earl A. Holl, 3520 North Grant Ave., Indianapolis 18, Ind., will be registered, and numbered (example: 3322-R). The number "3322" indicating the number of the clone and the "R," the information that it is registered. The registration fee is required *only* in the case of *xHemerocallis* clones, and *not* for other amaryllids which are registered free of charge by the AMERICAN PLANT LIFE SOCIETY.

Correspondence regarding new amaryllid clones, including *Hemerocallis*, to appear in HERBERTIA should be addressed to Prof. J. B. S. Norton, 4922 40th Place, Hyattsville, Maryland, *enclosing self-addressed, stamped envelope, if reply is expected.*

For obvious reasons, there is a limit to the number of descriptions included from any one member in any one issue. Not more than six brief descriptions of clones under each generic heading will be published from any one member in any one issue of HERBERTIA. Descriptions of clones in excess of five brief descriptions, up to a total of 25, will be entered if the space required for each is limited to one line. In this case use should be made of the standard abbreviations already mentioned.

HYBRID CYRTANTHUS CLONES

Introduced by Mrs. Mary G. Henry, Gladwyne, Penna.

WILLIAM PENN. A 6—10-flowered clone of *xCyrtanthus Henryae* with shrimp red (RHS-616) flowers on opening, changing to a clear

coral pink (RHS-0619/1) after a few days. There may be flowers of at least three distinct color shades on the plant at the same time. For full description the reader is referred to the description of *xCyrtanthus Henryae* elsewhere in this issue. This clone is represented by specimen no. 83, in the Traub Herbarium. This clone is the type of *xCyrtanthus Henryae*.

In connection with the naming of the following *Cyrtanthus* hybrids, Mrs. Henry writes as follows: "During the war I was a four-star mother and Josephine was stationed in PEKING about a year and so that flower is named for her. She was also a year in DINJAN near the Burma Road in India. One of my sons, Norman, Jr., was on the Carrier NEHENTA BAY in the Pacific. My daughter Mary's husband, Edward Davis, was on the Landing Ship METIVIER. My other son, Howard, already has one named for his Carrier the BUNKER HILL, which was introduced a few years ago."

PEKING. Light jasper red (Ridgeway); center of each tepalseg has a comparatively wide cream stripe; tepalsegs are broad and well recurved. Very handsome flower.

DINJAN. This is nearest to "Rose Dore" color in Ridgway, but it has a hint of carmine which gives the flower a sort of luminous glow that is very attractive. Unusual and striking color, near crushed raspberry.

NEHENTA BAY. Delightful shade of coral pink (Ridgway). The edges of the perigone are deeper in color; the pedicels too are pink, giving a very pleasing effect. Fine, large, well shaped flower.

METIVIER. The color of the perigone is "Pinard yellow" (Ridgway); the flowers are the largest so far in these *Cyrtanthus* hybrids, the diameter of the perigone measuring 2.8 cm. Exceptionally vigorous, fast growing plant.

GLADWYNE. A self of an exquisite shade of true pale pink (Jasper pink, Ridgway). Fair sized flowers of perfect form. A very lovely flower.

HYBRID xHEMEROCALLIS CLONES

TRIAL GARDENS. Cooperative daylily trial gardens have been established at (1) *Cornell University, Dept. of Floriculture, Ithaca, N. N.*; (2) *University of Florida, Dept. of Horticulture, Gainesville, Fla.* (3) *Southerwestern Louisiana Institute, Dept. of Horticulture, Lafayette, La.*; (4) *Whitnall Park Arboretum, Milwaukee City and County Park Board, Milwaukee, Wisc.*; (5) *Texas A. & M. College, Dept. of Horticulture, College Station, Texas*; (6) *Des Moines Park Board, Des Moines, Iowa*; (7) *Div. Ornamental Hort., Univ. of Calif., at Los Angeles.* [Complete addresses are given under *Officers and Committees, below.*]

Introducers should send complete collection of hybrids to these cooperating agencies in order that the new daylily clones may be impartially evaluated.

The following information was sent in during 1949 :

Introduced by Hubert A. Fischer, Hinsdale, Ill.

- CARILLON. 40"; M; OM1; de; fr. (2749)
 ESCAMILLO. 30"; MLa; OMYL3; de. (2750)
 SCARF DANCE. 40"; M; YOD2-P; de. (2751)
 SMILING THRU. 30"; MLa; OM1; de. (2752)
 TINY TOT. 36"; MLa; ROM YL3; de. (2753)
 TWILIGHT GLOW. 40"; MLa; RL2; de. (2754)
 WHITE SHADOWS. 30"; MLa; RL2; de. (2755)

Introduced by Mrs. H. W. Lester, Brookhaven, Ga.

- DRAGONETTE. 36"; M-La; ORM1. (2756)
 LEMON LUSTRE. 40"; La; YM1; de; fr.; ext. (2757)
 MARIONETTE. 36"; M-La; YD2-S; de. (2758)
 SPRING FANTASY. 30"; EE; RLYL3; de. (2759)

Introduced by W. T. Wood, Macon, Ga.

- BILL WOOD. 44"; MRe; RM1; de. (2760)
 MARIE WOOD. 36"; M; RLI; de. (2761)
 ORANGE ICE. 36"; M; OM1; de. (2762)

Introduced by Stanley E. Saxton, Saratoga Springs, N. Y.

- UNCLE JOE. 36"; MLa; RO1. (2763)

[TRAUB— AMARYALLID NOTES, CONTINUED FROM PAGE 62.]

Stenomesson Ferreyrae Traub *sp. nov.* Planta bulbosa, collo longissimo; foliis linearibus acutis 8—17 cm. longis coetaneis; pedunculo sub anthesi 6—14.5 cm. alto; umbella uniflora; spatha infra connata, deinde ad partem unicum fissa, supra denuo connata, cacumine ipso acuta; flore 7 cm. longo; tubo tepalorum gracili, parte tertia superiora dilatata; segmentis tepalorum 18 mm. longis, 6 mm. latis, acutis; poculo staminorum 2 mm. longo, aliquando inter filamenta obscure dentato; filamentis 6 mm. longis. Exemplar typicum: Ferreyra 5296, Herb. Traubi access. 106.

TYPE DESCRIPTION.—Rootstock a tunicated bulb, to 3 cm. in diam. to 4.5 cm. long, with very long neck, 8—17 cm. long; 3—4, linear, acute, 4.5 mm. wide, contemporary with the flowers January (Peru); peduncle 6—14.5 cm. tall at anthesis; umbel 1-flowered; flower red suberect or pendulous above ovary; spathe to 6.5 cm. long, united below to 3.6 cm., then slit open on one side for 1.7 cm., and again united for 1.2 cm. to the pointed apex; pedicel to 3.6 cm. long; perigone to 7 cm. long; ovary 1.2 cm. long; tepaltube to 4 cm. long; tepalsegs to 1.8 cm. long, to 6 mm. wide, apex acute; parandroecium (staminal cup) 2 mm. long, sometimes obscurely toothed between the filaments; stamens slightly shorter than the tepalsegs, filaments attached at the edge of the staminal cup 6 mm. long, anthers 9 mm. long, with median attachment, versatile; style filiform, exerted 3 mm., stigma capitate. Type specimen: Ferreyra no. 5296, in the Traub Herbarium, acc. no. 106.

RANGE.—Peru; Infiernillo, between San Mateo and Oroya, Dept. Lima. Alt. 3300—3400 m., on stony soil.

NOTES.—Collected by Ramón Ferreyra on January 17, 1949 for whom the species is named. It differs from *Stenomesson humile* (Herb.) Baker in having a bulb with a very long neck, leaves contemporary with the flowers, relatively longer peduncle and spathe that is connate below and above the slit from which the flower extends. According to Baker the flower of *S. humile* is orange red. Ferreyra indicates the flower of *S. Ferreyrae* as “red.”

Stenomesson humile (Herb.) Baker. Recently this little known plant was again collected by Dr. Ramón Ferreyra [Ferreyra no 5263; accession no. 123 in the TRAUB HERBARIUM; Peru, between Junín and Oroya, Dept. Junín, (habitat) “steppe of grasses (plateau),” alt. 4100—4200 m.; flowers “red”; 1-10-1949.]

Pax [Engler, Bot. Jahrb. 11: 324, pl. 7, f. 1—4. 1890] apparently was not familiar with the extreme variations in the genus *Stenomesson* Herb., and again described our plant as a new species, *Crocopsis fulgens* Pax, the type of the monotypic genus *Crocopsis* Pax, not knowing that this species is con-specific with *Stenomesson humile* (Herb.) Baker. *Crocopsis* Pax is therefore a synonym of *Stenomesson* Herb.

It should also be mentioned that the habitat of *Crocopsis fulgens* was erroneously given as “Reg. Argent.” in the Index Kewensis, suppl. 1 page 116. 1901—1906, and that the name *Crocopsis argentinum* Kew Index (l.c.), non Pax (1890), was published by mistake, and that this name is a synonym of *Crinum argentinum* Pax.

Kraenzlin (Engler, Bot. Jahrb. 40: 237. 1908) again described our species as new, under the name *Stenomesson acaule* Kraenzl., which is also a synonym of *Stenomesson humile* (Herb.) Baker.

3. GENETICS AND BREEDING

AMARYLLIS OF TOMORROW

WYNDHAM HAYWARD, *Florida*

In no field of ornamental horticulture today is there a greater need for scientific breeding experiments than in the case of Hybrid *Amaryllis*. In spite of the wonderful results achieved to date by the *Amaryllis* hybridizers of the world, the improvement of strains and quality and character of flowers may be said to have reached almost a standstill, having attained a high degree of perfection through old-fashioned "natural" methods.



Fig. 15. *Amaryllis belladonna* var. *barbata*, white. Photo by Wyndham Hayward.

In the early 1800's, there were primitive hybridizing attempts, using the species material then available, the scope of which may be judged by the writings of such pioneer plantsmen as Dean William Herbert in his *AMARYLLIDACEAE*, of 1837.

In the beginning, it was the custom to name every new hybrid, but for one reason or another, usually the failure to maintain a good stock of the new hybrid, or to increase the same adequately, the bulbs were lost.

The so-called "Johnsonii" is possibly one major exception. Whether the bulb now grown by thousands in Southern gardens of Louisiana, Texas and Mississippi is a true descendant of the original "Johnsonii" would require considerable research and more time for study than this writer has been able to give the subject recently.

"Johnsonii," the original hybrid, however, was pictured in some of the early literature, and according to the best reports, the "St. Joseph's Lily" of the lower Mississippi valley area is "at least" a sixth or seventh generation seedling of same.

"Johnsonii" as we know it today, has at least three major advantages which all hybrids should have to last. Reasonable vigor, good color and form, and ability to maintain itself by seed or natural offsets. The "St. Joseph's Lily," beloved to the hearts of the Louisianians, has a bright crimson flower, with distinct white striping part way down the keel of each petal, and grows well in the sandy to clay type soils of its favored area. Some thousands are growing in beds on the State House lawn in Baton Rouge.

In cultivation, "Johnsonii" grows slowly, and multiplies gradually, but thrives and survives. That is the main thing, and with its dependable blooming character, once it is well established, and its bright coloring, accounts for the wide popularity of the bulbs. The ordinary hybrid *Amaryllis* would not perform as well under such conditions. Fancy European stock, from the leading English or Dutch hybridizing firms, would die out, for the most part, in a year or two in the open in Florida, Louisiana or Texas under the hot summer sun.

The Mead strain of Florida would do better, and so might the bulbs of the Howard & Smith and the Rice strains of California origin. These are all outdoor-grown stock, brought to maturity in the open air under the hot summer sun of Southern latitudes which most of the imported greenhouse stock cannot withstand.

As can be seen from the use of thousands of the bulbs of *xAmaryllis Johnsonii* on the state house lawn in Baton Rouge, the possibilities for outdoor garden planting of *Amaryllis* surpass all imagination in the South and similar warm climate areas, if vigorous and thrifty varieties could be obtained which would "stand the gaff" as well as "Johnsonii" does in Louisiana. In Florida the "Johnsonii" does not seem to be as popular nor does it perform so well in garden culture, possibly due to some liking for a heavier soil than the usual light Norfolk sands of the peninsula.

However, here in Central and South Florida we have *Amaryllis belladonna* var. *maior*. a sand-loving bulb which is to be found by the thousands, maybe millions, over the state, nowhere cultivated carefully, but "thriving with neglect" as it were, and producing its lovely orange-red blossoms near Easter in springtime year after year, with no feeding or watering and often no cultivation beyond a weeding now and then. The WHITE BELLADONNA LILY, *A. belladonna* var. *barbata* (Fig. 15) has not maintained itself outdoors.

Now here are two chances for the start of some good *Amaryllis* hybridizing. *xAmaryllis Johnsonii* in the form which is available in Louisiana gardens (it is only occasionally found on bulb lists) will set seed. The writer determined this definitely in spring of 1949 with some bulbs at Lakemont Gardens, Winter Park, Fla., crossing the flowers of "Johnsonii" with Mead strain pollen parents. The seed pods of "Johnsonii" were ribbed and dark green in color. "Johnsonii" is supposed to be a cross of *A. vittata* and *A. reginae*.



Fig. 16. *xAmaryllis* scape with seven flowers; grown by a friend of Maj. Pam in England, 1941.

Amaryllis belladonna var. *major*, is a shy seeder, but can be made to set a few seed, and the pollen is fertile on plants of the hybrid *Amaryllis* of the Mead strain. The writer has grown several seedlings of *A. belladonna* var. *major* parentage crossed with hybrids. The flowers were interesting but no improvement on either of the parents in quality of flower, and at the time, that was all the writer was interested in determining, and so the bulbs were subsequently lost, through neglect. However, it would have been a valuable thing to have tried the bulbs in a

sandy loam culture such as suits the *A. belladonna* var. *major* parent so successfully with no feeding or watering beyond the gift of nature.

So far as known, *Johnsonii*, *belladonna* var. *major* and a few types of *A. striata* (syn.—*A. rutila* and its varieties) are the only “species” or “large-flowered” types which have maintained themselves over a period of many generations in gardens in the United States. It should be determined whether in Latin America there are other species which have similarly become established in gardens. The blooms of these three are by no means “large flowered” in the sense of comparison with the showy greenhouse hybrids, but are much larger than the miniature-flowered species of Chile, as *A. advena*. These latter, so far as known will not hybridize with the large flowered types, but this also needs more study.

From the preceding it will appear how poverty-stricken American horticulture remains in the matter of species material for use in hybridizing experiments. There are at least 75 species and varieties growing in the wild of Latin America, Brazil, Peru, etc., which might prove of value to modern hybridizers working with the Hybrid *Amaryllis* now that the craze for “larger and larger” flowers of a flat pansy shape seems to be passing. Now we also want miniature types, small-flowered *Amaryllis* as well as the large, rounded petal types, star-pointed flowers, trumpet shapes, and all the other possibilities.

Among Hybrid *Amaryllis* there exists the possibility of numerous flowers on a stem. This is shown in the accompanying photograph which was kindly supplied to the American Plant Life Society some years ago by Maj. Albert Pam, of England, one of Britain’s great amateur Amaryllid enthusiasts, who has carried on the tradition of William Herbert and Arthington Worsley into the horticulture of today. The multiple blooms [Fig. 16] in Maj. Pam’s photograph (which shows a plant bloomed by one of his horticultural friends) would be out of place on a giant-flowered hybrid of the fabulous greenhouse types, which are jammed to the limit atop the scape with a mere four flowers. There would be no room for more on such a plant. But in the case of trumpet shaped flowers as *Johnsonii*, *A. elegans* (the *A. solandriflorum* of years back) and *A. ambigua*, a very attractive but dubious species from Brazil and Peru, there is certainly room for more than the usual four blooms. On such plants seven to nine might be interesting and effective, opening a few at a time.

The umbel of *A. elegans* is described as 2—4-flowered, so it could be improved in this regard by judicious crossings. Occasionally in the Mead strain there will be found bulbs with upwards of four to nine flowers occurring in large plantings at rare times. Whether this factor of multiple bloom is inherent in certain hybrid strains or clones remains to be seen.

The small-flowered *Amaryllis* development offers the possibility of rich rewards for the successful hybridizer both in fame and monetary return, as the Dutch growers who are already offering some “Rutila Hybrids,” are holding their limited stocks for high prices, \$5.00 to \$75 per bulb according to the quality and types, as the writer understands.

The species [Fig. 17] *A. striata* (syn.—*A. rutila*), offers the noteworthy character of easy propagation by either seed or offsets. *A. striata*



Fig. 17. *Amaryllis striata*, light red, two bulbs in 6" pot, grown by Frank Vasku, Winter Park, Fla.

bulbs of several varieties as found in American homes and gardens (these are very seldom found in the trade) make a great increase by bulbils or

offsets when well grown, and seed well, in addition. Their growth is slow, but steady. Flowers of *A. striata* in some varieties are small, the writer having one type of *A. striata* (var. *crocata*) which blooms from a bulb no bigger than a large hickory nut, say 1½ inches in diameter [Fig. 18]. This plant and its congeners offer tremendous possibilities for the development of "Baby" *Amaryllis*.

The latest developments of the Dutch growers in the "Rutila Hybrids" reportedly include self reds and salmon pinks, etc., quite com-



Fig. 18. *Amaryllis striata* var. *crocata*. Photo by Wyndham Hayward.

parable in form and color to the large flowered hybrids, but of less than half size, eminently suitable for table decorations and vase use. Here the possibilities are almost without limit. The bulb purchasing public would undoubtedly take to its arms anything worth while in this line which might become available in quantity, with thrifty growth character and good quality of the miniature flowers. The *A. striata* bulbs have the added advantage of blooming naturally in January and February in conditions of moderate warmth as during a normal Florida winter or in the greenhouse. This would advance the natural blooming period of the new hybrids similarly, in all probability.

A glance at the plates of *Amaryllis Leopoldii* show a striking possibility for the development of large star-shaped flat-faced *Amaryllis* flowers which would be a decided novelty in the horticultural world. The tendency for many years has been toward flowers as round as a dinner plate or super—giant pansy, and almost as monotonously similar, one to another. This discussion is to point out again the need for reintroduction of old time and later *Amaryllis* species so that the modern hybridizers may have this valuable plant “germ plasm” in variety to use in their efforts, guided this time with all the advantages of modern knowledge of plant physiology and genetics.

Genetics may also come in handy in the development of better things



Fig. 19. *Amaryllis Reginae* var. *Alberti*.
Photo by Wyndham Hayward.

in the ordinary Hybrid *Amaryllis*. Possibly the “Hybrid Corn” breeding plan could be done with Hybrid *Amaryllis*, using an inbred strain of “reds” from one grower, say an English strain, and crossing with an inbred strain of “reds” or some other set color, from a Dutch stock, or at least one quite distinct in parentage for many generations back. This would be eminently possible in Europe where breeding of the *Amaryllis* in “separate shades” has arrived at a high degree of success, 90 per cent or more of separate shade seedlings apparently coming true to color in the stocks of leading Dutch growers.

We need to know more about the factor of inbreeding of hybrid

Amaryllis, why it does, if it does, make the strain weaker. It might be that certain types would come admirably true from self-pollinated seed. Apparently *A. striata* var. *fulgida* and other varieties of *A. striata* do, in the writer's personal experience, although experiments are still too young to have brought any final considerations.

The ideal of the large-flowered Hybrid *Amaryllis* would be a multiplicity of forms, including double-flowered forms [Fig. 19], thrifty root growth and handsome foliage, hardiness to cold and ability to stand more or less abuse in cultivation, either outdoors or under glass, adaptability to various soils and conditions, free-blooming qualities and at least four flowers to the scape. The ideal Hybrid *Amaryllis* of the future may be large or small, but should make abundant offsets naturally, in the course of time, which can be grown on to maturity in their turn with reasonable speed and facility. This would assure increase of stock without bulb-cuttage, and maintenance of a commercial supply of desirable types when obtained.

The Hybrid *Amaryllis* of the future should have a blooming period from January to May, with possibility of forcing in November and December. Possibly the fall-blooming species *A. reticulata* and *A. aulica* will have something to offer in this regard. Certainly *A. striata* will advance the bloom period some weeks over normal. Types should be developed especially for growing in pots, which adapt themselves easily and successfully to this culture as do the *A. striata* species and its varieties. Some of these have been known to have been maintained in old families in Eastern United States for more than 75 years as treasured pot plants for the house, with bulbs being removed from the pots and given to neighbors and relatives as they multiplied to overflowing.

Tougher garden types should be found which will accept the same garden conditions as "Johnsonii" in the middle South and *A. belladonna* var. *major* in Florida. A strain of pure whites of thrifty growth would be a highly desirable factor in every project to increase the popularity and use of Hybrid *Amaryllis*. At the present time the pure whites are rather weak and un-thrifty, and last only a season or two with their new owners. *Amaryllis* bulbs are not like tulips and hyacinths, which "run out" after a few years in the garden . . . with good care the life of a thrifty *Amaryllis* bulb has almost no limits but those of time and fortune.

The day is gone when one or more growers can dictate to the world of *Amaryllis* lovers what they shall grow and the types of flowers and plants they should have. The garden and flower enthusiast of the future will desire all kinds and will cherish them for their artistic merits and decorative charm, whether flat and flaring flowers or trumpet-shaped, round- or star-shaped in form. There is room for the admixture of every type of *Amaryllis* flower form found in nature in the *Amaryllis* of tomorrow. The greater the variety the better. From increased variations will come a greater field for the future fixation of new kinds in every way.

AMARYLLIS REPORT, 1948—1949

HERMON BROWN, *Chairman, Amaryllis Committee*

In January 1949, we had some of the coldest weather that I have experienced in California. The ground remained frozen from one day into the next. I had thrown a furrow over my *Amaryllis* bulb rows, but



Fig. 20. Hermon Brown *x* *Amaryllis*; (upper left), light red; (upper right), pure white, with greenish throat, and pink picotee edges and spots; (lower left), light red; (lower right) very dark red—consider only flower shape because kodachrome gave incorrect color value.

many of the larger bulbs had the bulb-necks exposed and were killed. A smaller proportion of the field grown bulbs which were more deeply covered did survive. My breeding stock was in the greenhouse and were all saved.

The blooms in the greenhouse in many cases were not up to the usual high standard, but I had some very fine ones in the field. The consistent breeding program of crossing only the very best is bringing outstanding results. In most cases I cross like on like which intensifies the desired characters, but I also supplement this by following the recommendation of Dr. Traub of mixing the pollens from various high quality plants in order to obtain a maximum of new combinations with which to work in the intensification program. I rate my bulbs on a scale of 100



Fig. 21. Double Hybrid *Amaryllis* clone HELEN HULL; brilliant orange red with white keeling. Photo McCann Nursery, Punta Gorda, Fla.

points, and do not save seeds from any that rate less than 90, unless I wish to bring in some new character, from any rating lower, not found in the best selections. The refining process then proceeds according to the regular program.

I wish there were more growers near here so that we could get together on a rating program, and also to standardize the descriptions of the best selected clones.

The illustrations (Fig. 20) are from kodachrome prints and I hope that they will serve to show at least the form of some of the recent selections.

McCANN DOUBLE AMARYLLIS

E. J. McCANN, *Florida*

The strain of double *Amaryllis* here discussed was originated by my father, the late Captain J. J. McCann, some years ago by crossing the double *Amaryllis Alberti*, of Cuban origin, with single-flowered hybrid *Amaryllis*. From the original cross six double-flowered clones were obtained, four of which were discarded as inferior. Since the double clones



Fig. 22. Field of McCann double *xAmaryllis*.

do not set seeds, pollen from them was transferred to single hybrid *Amaryllis* to obtain the second and succeeding generations of hybrids.

The two original clones were very beautiful, and are still among the favorites today. One, a delicate shade of pink, veined white, has been named,—Mary McCann. Another, a solid brick red with ruffled edges, has been named.—Madira Bickel, Past President of the Florida Garden Clubs. The outstanding clone of the second generation has been named, Helen Hull (Figure 21) in honor of the popular officer of the National Council of State Garden Clubs. The flower is a beautiful orange-red, delicately shaded, with white keeling. It is also the largest-flowered clone, the flowers measuring up to nine inches in diameter. It is a prolific grower and multiplier.

Another second generation clone has been named,—Capt. McCann. It is dark red, with white keeling, and is also very prolific.

The best of the third generation has been named,—Edlena. This is a small-flowered clone with pink and white tepalsegs, keeled white.

The above are the clones that will be offered to the trade. A mixture of un-named clones will also be offered. I have others of the fourth generation that have reached blooming size. The fifth generation is in the small seedling stage. I have selected fifteen clones in all, but hope to reduce the number to about six or eight for extensive propagation. I have about 50,000 bulbs, both large and small, including about 10,000 blooming-size bulbs to be offered to the trade this season (Figure 22).

[EDITORIAL NOTE.—See also article on McCann double *Amaryllis* by the late J. J. McCann, father of E. J. McCann, and Plate 65, in 1937 HERBERTIA, pages 185—186.]

HYBRID AMARYLLIS IN ILLINOIS

CARRIE M. ARMSTRONG, *Illinois*

Although I have grown *Amaryllis belladonna* Linn. (syn.—*Hippeastrum equestre* Herb.) as pot plants ever since I can remember, it was not until 1937 when I became a member of the AMERICAN AMARYLLIS SOCIETY (now the AMERICAN PLANT LIFE SOCIETY), and they sent me some seed to try out that my real interest began. On July 10, 1937, I received 130 *Amaryllis* seeds from the Secretary. I planted them immediately in a flat. I put a layer of charcoal and oyster shell in the bottom of the flat and covered with good garden soil, then a layer of sandy soil was added to lay the seeds on. I placed the seeds flat on this soil close together, almost touching each other. I then put a thin covering of this sandy soil over them and sprinkled some fine coal dust over all. I placed the flat on a north porch and covered the flat with a damp cloth. When the cloth would get dry I would dampen it again and put back on or sometimes I would merely sprinkle the flat without removing the cloth. Any way, I kept a close watch that the soil did not become too dry and on the other hand I watched that I did not get it too wet.

Before the first of August the seedlings began to put in an appearance and I removed the cloth for good. I did not transplant these seedlings until November 22. This time I put a layer of crushed rock, peat moss, sand and some charcoal in the bottom of the flat and used a deeper flat. The soil I transplanted them into was made up of 2 parts garden soil, 1 part well rotted cow manure, 1 part sand, with some crushed oyster shell and a few crushed egg shells mixed through the soil. At this transplanting I had 92 seedlings averaging about one half inch in diameter. I let them grow in this flat on the porch as long as possible and by December 10 these seedlings had 3 leaves about one foot tall. But as I had no room for them in the living room I had to put them in the basement until spring. In the spring I transplanted them into a cold frame using much the same soil I had used in the flat.

This summer in the cold frame these seedlings grew an enormous amount of offsets, much to my apprehension, for I felt it would retard their blooming, which I suppose it did. They made a very thrifty growth this summer and I left them in the frame as long as the weather would permit but dug them before their foliage had been touched with frost. This second winter I stored them bare rooted in the basement.

In the spring their third year I planted them in the open ground. Our soil is a clay soil on which we use lime rock as needed and fertilize with cow manure. This year I began to reap the rewards of my labor for I had quite a few blooms and my enthusiasm grew by leaps and bounds. I only wish the men who donated these seeds could know the joy and pleasure they have given me. Each year it seems I see new beauty in them. My 92 seedlings have increased to hundreds. Many of the blooms measure eight inches across the face of the flower and some even up to 9 and 9½ inches and of course there are plenty of the smaller ones too. It is so interesting to try to guess the parentage of these bulbs for I have long necked bulbs, short necked ones, twin bulbs, large bulbs and small bulbs and apparently no two exactly alike of the original 92 seedlings. I kept a record of how I took care of these seeds but it seems I've been too busy taking care of these *Amaryllis* to find time to write about them. None of the credit for these *Amaryllis* belongs to me but rather to the AMERICAN PLANT LIFE SOCIETY. I have been doing some crossing of my own but have yet to see what my own efforts will amount to.

HYBRID AMARYLLIS—VAN MEEUWEN SUPERIORA AND GRACEFUL CLONES

GEORGE ALDERS, *Pennsylvania*

Amaryllis are gaining considerable popularity. We believe that the new so-called Dutch Hybrids have done much to help this magnificent bulbous plant to gradually gain its rightful place among the plants cherished in American homes.

G. C. VAN MEEUWEN & SONS, of Holland, for many years cultivated, besides their large selection of miscellaneous bulbs and plants, a fine collection of Hybrid *Amaryllis*. Although they did extensive selecting under the old method of propagating from seeds, it was very difficult to produce and maintain true colors in such a strain.

Therefore, when Dr. Ida Luyten, connected with the DUTCH LABORATORY FOR PLANT PHYSIOLOGICAL RESEARCH at Wageningen, Holland, and American workers, developed methods by which *Amaryllis* can be propagated successfully by vegetative means, VAN MEEUWEN seized the opportunity and adopted the new method for the propagation of superior hybrid *Amaryllis* clones. The method was especially valuable because they possessed a large stock of good hybrid *Amaryllis* clones. A modern range of greenhouses was built and the breeding, propagation and cultivation of hybrid *Amaryllis* was undertaken under the most favorable conditions.

Extensive cross-breeding and selection had developed a stock of hybrids which were named the van Meeuwen SUPERIORA Hybrid *Amaryllis* clones. These clones are very free-flowering, two or three scapes per bulb, usually each scape with four flowers. They are known for the very large and beautifully shaped flowers, and the extreme ease with which they can be forced into bloom, both in the living room and in the conservatory.

Although the efforts to produce newer and better hybrid *Amaryllis* by breeding methods is still being continued, VAN MEEUWEN is making available the highest quality clones produced to date by propagating these in quantity by vegetative means. The outstanding advantage of this is at once apparent because the purchaser gets exactly the clone described and ordered. This could not be guaranteed by the method of reproducing mixed strains from seeds.

These quality Hybrid *Amaryllis* clones can also be offered to the public pre-treated so as to flower earlier. Mindful of the fact that Hyacinths, which normally could not be forced into bloom until the middle of February, but which by a special treatment could be forced into flower by Christmas, they figured that the flowering season of *Amaryllis* could be advanced in a similar way. Therefore, following the instructions of the DUTCH LABORATORY OF PLANT PHYSIOLOGY, they developed a method by which *Amaryllis* can be treated so that they may be had in bloom by Christmas also. The treated *Amaryllis* are known as the "Hearld Brand." This early-flowering brand of *Amaryllis* has enlarged the usefulness of *Amaryllis* to a very marked degree. Around Christmas time especially, the potted blooming plants of the red clones are very welcome and are very much in demand. Because of these outstanding qualities and features, these clones have gained world-wide renown.

The following is a list of clones available, with color descriptions:

FABIOLA, light red.	ROSE QUEEN, pink with white center.
LUCIFER, orange red.	
DR. FAUSTUS, brilliant red.	PURPLE QUEEN, purple-red.
SNOW KING, pure white	QUEEN SUPERIORA, dark red.

In order to add variety, VAN MEEUWEN intends to offer the flower loving public a new strain of hybrid *Amaryllis* in the near future. These are vegetatively propagated and have been named the GRACEFUL hybrid *Amaryllis* clones. This strain has the same qualities as the SUPERIORA clones, it is very free-flowering and has small velvety red flowers. The whole plant is a small replica of the larger SUPERIORA clones,—everything in the right proportions. They will be suitable as cut flowers and for decoration, and because of their size, as house plants.

The series of GRACEFUL hybrid *Amaryllis* clones was originated by Mr. H. Boegschoten, a private gardener for Mr. J. C. Bunge, one of Holland's leading industrialists and merchants. Several years ago Mr. Boegschoten decorated the tables of his employer for a dinner party with *Amaryllis striata* (syn.—*Amaryllis rutila*). When the decorations were finished, Mr. Bunge complimented his gardener on their beauty, but remarked that they would have been still more outstanding if the flowers



Amaryllis Van Meeuwen's Superiora
Diameter of the flower \pm 10 inches

had been altogether red without any green in the throat of the flowers. This chance remark stimulated Mr. Boegschoten to make the attempt to develop hybrids with these qualities. After 25 years of cross-breeding and selection, he succeeded in developing a small flowering series of *Amaryllis* clones that has pure red flowers. In several shows in which this strain was exhibited, the judges as well as the public were enthused about these beautiful flowers. THE WEEKBLAD VOOR DE BLOEMISTERIJ (WEEKLY FOR FLORICULTURE) reporting on the Flower Show of the ROYAL DUTCH AGRICULTURAL SOCIETY held in March 1946 at Artis, Amsterdam, Holland, stated with reference to the exhibit of the GRACEFUL hybrid *Amaryllis* clones by Mr. Boegschoten:

“It is regrettable that no bulbs of this new series of hybrid of *Amaryllis* clones are for sale. Undoubtedly several cut flower growers would be pleased if they could purchase some of these new *Amaryllis* clones which would make a fine addition to the existing assortment of cut flowers. The only way out for those interested in this type of *Amaryllis* will be to develop a similar strain by cross breeding. It is a long way, but there is no other.”

To make a long story short, VAN MEEUWEN finally succeeded in changing Mr. Boegschoten's mind, and purchased the entire stock of the GRACEFUL hybrid *Amaryllis* clones which will be introduced in the near future.

A SECTORIAL MUTATION IN *xHEMEROCALLIS*

MARY G. HENRY, *Pennsylvania*

On an old farm adjoining my home there is a great mass of *Hemerocallis fulva* over 60 ft. in diameter. It is on a gently sloping hillside and for many, many years, when in bloom, it has provided a sight not easily forgotten. The owner of the farm, aged 94, died 13 years ago. Her husband's great grandfather lies peacefully beneath the *Hemerocallis*, undisturbed, let us hope, forever.

When I came to Gladwyne 22 years ago and saw this grand display of flowers, I learned to love, admire and respect the Daylily with enthusiasm.

Dr. Stout's marvellous new creations began to appear about this time. I acquired his wonderfully enlightening book "Daylilies," so necessary and inspiring to a Daylily lover. As soon as available I purchased a number of his superb new varieties.

A few years later, in 1939, knowing of my interest in *Hemerocallis*, Dr. Stout invited me to inspect his garden of Daylilies in New York. He then gave me the bright and beautiful little red Daylily, which I named "Port," in memory of the youngest of my three sons. It was his favorite nickname.

The colors of these new Daylilies, especially the warm velvety reds and entrancingly lovely pinks, simply thrilled me.

During the years that followed, I had the fun of crossing a number of them and I raised some beautiful seedlings.

One morning this past summer I was amazed to see on a stalk of one of these seedlings a flower that was half red and half yellow. Another flower colored similarly expanded a few days later.

My great surprise came when two perfect flowers opened on the



Fig. 23. Sectorial mutation in *xHemerocallis*; one flower red; and one flower yellow on same scape. Photo by Josephine Henry.

same stalk, one a fulvous red and the other an even shade of pure butter yellow! The flowers were well formed, of a nice size and the coloring of each was unsullied by even a hint of any other color [Figure 23].

There were a number of other scapes on this plant but only the one showed this sectorial mutation. It will be interesting to see if this break in color will be repeated another year. It gave such a pretty and unusual effect and the flowers made me think of huge red and yellow butterflies hovering over the green leaves.

4. AMARYLLID CULTURE

[REGIONAL ADAPTATION, SOILS, FERTILIZATION, IRRIGATION, USE IN
LANDSCAPE, DISEASE AND INSECT CONTROL, ETC.]

GROWING AMARYLLIS IN MARYLAND

W. R. BALLARD, *Maryland*

The *Amaryllis* seem to be one of the most satisfactory flowering plants for winter blooming in the house. At various times the writer has bought a few of the better hybrid strains and a considerable number of seedlings have been raised. Since space in the house is not available for handling many plants in bloom at any one time, a system has gradually been evolved which works very satisfactorily.

In the spring all bulbs are planted out in the garden in well prepared and heavily fertilized soil. Pulverized sheep manure with additions of some phosphate has been used rather liberally. Bulbs are kept growing throughout the season until the frost period when they are dug and dried off. After the bulbs have been cleaned, they are put into flats and placed in the furnace room where the temperature is fairly high. In a few weeks the flower stalks begin to make an appearance and only those bulbs which show indications of blooming are potted up. These are kept in a cool basement for rooting and as the flower stalks begin to develop, a few at a time are brought into a sunny window where the temperature stays at 70 degrees or slightly higher. Under these conditions the flowers come quickly into bloom. When the bulbs finish blooming they are again returned to the basement and others are brought in for flowering.

This winter (1948-49) 58 bulbs developed flower stalks, some producing as many as two. The number of flowers per stalk ranged from two to four although one bulb had five flowers on one stalk. An attempt was made to keep an accurate count of the number of flowers but after more than 100 had appeared the count was lost but it is quite probable that the total was close to twice that number. The season of bloom started the last of December and ranged well into March.

One strain, of which a number of seedlings have been raised and which has been identified by Dr. Traub as *Amaryllis striata* hybrids, has multiplied very freely, and is almost a sure-fire bloomer. Many bulbs only an inch in diameter produce flowering stalks. Some of the highly bred sorts purchased have not been very good performers. They seem to be temperamental when it comes to blooming and, even when given good cultural treatment, many bulbs seem to deteriorate. It is understood that some types require more lime in the soil than others, and it has been suggested that some forms may be subject to attacks of nematodes.

Some crosses have been made between the other better flowered hybrid forms and the more vigorous *Amaryllis striata* hybrid strain which

propagates so readily. It would seem that if these characteristics could be worked into those with the more beautiful flowers, a great impetus could be given to a wider acceptance of the *Amaryllis* as a blooming house plant for the winter season.

After the once bloomed *Amaryllis* bulbs are returned to the basement, they are kept growing as well as possible until time to set them into the garden. It would seem that this method might readily be adapted to the commercial production of *Amaryllis* bulbs in the north.

THE BLUE AMARYLLIS—WORSLEYA RAYNERI

ALTA H. MEADOWS AND ELAINE BRACKENRIDGE, *Texas*

Since we are very interested in specie *Amaryllis* we are constantly adding to our collections of these and are always on the alert for new species and sources. We were first inspired to try locating and growing *Worsleya Rayneri* [Plate 15] from an article in the 1940 *Herbertia*. Mrs. Meadows belonged to an *Amaryllis* Round Robin at the time directed by Mrs. R. S. Strout of Kentfield, California. Since Mrs. Strout was busy with other importations for the entire group of *Amaryllis* Robins, she turned over to Mrs. Meadows, who had assumed directorship of one of the Robins, all the information and possible sources of *Worsleya Rayneri*. Having written and located bulbs which could be obtained in Brazil, Mrs. Meadows and Miss Elaine Brackenridge placed an order and the bulbs were delivered in San Antonio in August 1948. They were then sent to the various ones interested in trying to grow these seemingly difficult bulbs.

The fact that they may be grown and brought to flowering without greenhouse treatment has been established by this importation and we feel that the following reports on the treatment given these bulbs may be of benefit to others interested in growing them. We understand that *Worsleya Rayneri* is the type of a monotypic genus, and that the species has never been known to cross with hybrid *Amaryllis*. With the faint hope that an exception may be made we have tried and will continue to try all possible crosses both with hybrids and species.

Mrs. R. W. Coulson, Chickasaw, Ala., reports—"I planted my *Worsleya Rayneri* bulb in a 10 inch pot using a mixture of leaf mold and black sandy loam—very rich, about a third of the bulb was left above soil. It was kept outdoors the rest of the summer and fall under a large oak where it got full sun only a part of the day, was watered frequently and about every two weeks was given liquid fertilizer—sometimes hyponex, or chemical, but usually pulverized sheep manure. Of the latter a strong solution from which fertilizer was left on the soil. The pot is kept on a sunny south porch during winter and on December 21st, a bud was discovered. The flowers opened in January but unfortunately we were away at the time that they opened and they were almost past their prime when we returned. The color was definitely not blue. Ours was lavender and one had to use a lot of imagination to see any blue at all. There were 4 large blossoms and all four were closed within a week.



Worsleya Rayneri; reproduced from Plate 177, page 93, HERBERTIA, vol. 7. 1940.

Plate 15

The pollen was saved and on February 23, 1949, some of it was used on a Dutch white *Amaryllis* which opened."

Miss Willie Mae Kell reports from Wichita Falls, Texas — "The *Worsleya Rayneri* I have was sent to me by Mrs. Stout, October 9, 1948, after it had started growth for her so had some set-back to be disturbed at that time. It shows no flower bud as yet (Feb. 9, 1949) but it is growing, has 9 leaves, the top measurement being 27 inches. The potting mixture was leaf mold, sand, top soil, fertilizer and some charcoal."

Mrs. K. B. Anderson, La Canada, California reports — "I tried my *Worsleya Rayneri* for quite a while in a very sandy mixture and it did get some knobby looking roots but in the area of each root was soft rotting root plate which had to be scraped away frequently and each time the root seemed to be rotted too, so I finally soaked overnight and peeled away the whole corky part of root plate and re-planted in pure quartz sand in my hydroponics set up. Altho I haven't fed it chemicals yet until it gets roots nevertheless it has a nice top growth, 4 leaves, one dies when next one comes."

Mrs. R. S. Strout, Kentfield, California reports — "One of my *Worsleya Rayneri* bulbs has not rooted, started to rot so I scraped all the old part away, dusted with Semesan and planted surrounded with Vermiculite. The other also does not look as if it had rooted for it only has 2 medium sized leaves and the tips of the others are just putting out and it has never grown."

Mr. H. D. Hieronymus, San Antonio, Texas reports — "I planted my *Worsleya Rayneri* bulbs in a mixture of leaf mold, top soil, Colorado River (Texas) sand, a small amount of clay and broken pieces of sand stone mixed throughout. The pots were then placed outdoors under a large willow tree where the bulbs received morning sun. When the weather turned cold in October they were brought indoors and placed in a cool room. Shortly before Christmas one of these bulbs showed a bud but I made the mistake of bringing it to a warm room and the bud blasted. The other bulbs show no sign of buds but they have apparently rooted well and made healthy leaf growth. The leaves grow until they become long enough to droop over and touch the ground and then wither as a new leaf is coming from the center.

Miss Elaine Brackenridge, San Antonio, Texas, reports — "The three *Worsleya Rayneri* bulbs were about nine inches in circumference and 15 inches long, including the length of the long necks. All roots had been removed. The bulbs were immediately potted in 8 inch pots. A mixture of half sand and half leaf mold was used. Small pieces of charcoal were placed in the bottom of the pot to insure proper drainage. The pots were then placed in the deepest shade until considerable top growth had been made. They were then placed in light shade until late September. During this period they were watered as often as needed but no fertilizer was used. During October, November and December they remained in a deep box half submerged in the ground. During the day when weather permitted the top was left open, being tightly closed at night.

The three buds were first discovered during the Christmas holidays. One had already pushed up sufficiently from the center of the leaves for the entire bud and part of the stalk to be seen. Before many days passed, extreme cold weather set in. I was afraid they would freeze in the box outdoors so I moved them into a gas heated room in the house. The first scape of five buds did not open properly, but some pollen was saved and tried without success on several Dutch hybrid *Amaryllis* including a white and a pink. The *Worsleya Rayneri* pollen on PINK FAVORITE, a named variety from the Ludwig firm in Holland, formed a large pod about an inch in diameter. I returned home one afternoon to find the stalk bent over and badly damaged. Before long it began to die at the break. Upon examination of the partly formed seeds they were found to have been developing.

The second bulb that budded had six buds which slowly dried up and withered away. The third pot was placed again in the outdoor box where it produced four buds opening almost simultaneously March 13, 1949. They were a distinct cobalt blue-violet in color, with the throat white and flecked with the same shade, and the edges slightly ruffled. The buds remained open from Sunday until Wednesday when they began to close. The stigma was not receptive to self-pollination on any of them.

Next season I expect to leave the pots in the box outdoors all winter since they grew best there and withstood many nights of freezing weather. They seem to dislike the dryness of gas heat. At the present time I am giving weekly waterings and a weak solution of steamed bat guana.

Mr. R. Wade Vliet of Oklahoma City, one of our Robin members also received several of these bulbs and in turn distributed them to other growers in other localities. We understand that Mr. Vliet successfully brought his to perfect flowering but have been unable to obtain any other information about who received the other bulbs or the conditions under which they were grown.

Mrs. G. O. Meadows, San Antonio, Texas, reports — One of my *Worsleya Rayneri* bulbs was planted about 4 inches deep in pure leaf mold from live oak trees and the other was planted about half its depth in a rich black mucky sand from a sub-tropical soil area near San Antonio. Both had good drainage. They were then placed outdoors under oak trees where they received filtered sun light.

The one planted in the sub-tropical soil was watered more generously and although it never stood in water the soil was kept very wet. When the leaves, which grew quickly, were about 8 or 9 inches long, the bulb began to show signs of rotting at the top of the neck. The bulb was taken up but there was no sign of rotting on the bulb itself. It had short thick roots coming from the edge of the bulb plate. The top brown layers of the neck were peeled away to clean substance and the bulb re-planted scarcely 2 inches deep in leaf mold. Both were brought indoors late in October and placed in an un-heated room and in December a bud tip began to show on the re-potted bulb. The bud growth was slow but it had cleared the short leaves and was large and well formed with a

reddish lavender tinge beginning to show at the tip. Severe weather with the temperature dropping to below zero forced me to bring my plants to warmer quarters. The bud ceased to grow and for weeks was at a standstill. Though taken back to the un-heated room and regardless of any treatment given it eventually dried up completely. This change of temperature causing the bud to blast. Leaf growth on this bulb was slow although it was well rooted, evidence of the vigor lost through budding and it has not fully recovered yet, there are only 4 leaves measuring 3 to 10 inches.

The bulb originally planted in leaf mold rooted more quickly and has made a more vigorous leaf growth. The leaves average 22 to 24 inches in length with the outer leaves dying away as a new leaf takes its place, leaving a continuation of 8 to 9 leaves. There is no sign of a bud on this bulb although the neck has a swelled appearance.

Fertilizer used for both was liquid bat guano (steamed and processed) at the rate of 2 tablespoons to a gallon of water and applied about once a month.

Miss Brackenridge gave me some of the pollen from the first *Worsleya Rayneri* she had to flower and I used this on a pure white Dutch hybrid *Amaryllis* but the cross was unsuccessful. Of another cross made the *Worsleya Rayneri* pollen was mixed with pollen from PINK FAVORITE and applied to the Dutch white hybrid. The seed pod will be matured within a week (March 20) but what results will eventually be obtained from this remains to be seen. I doubt that any *Worsleya Rayneri* blood will be in the seedlings.

In closing we submit the following summary of our conclusions thus far in our experience with the *Worsleya Rayneri*. We will continue our attempts to cross them with *Amaryllis* species, in hopes that one will be successful. As Robin members we hope that this brief report will be of interest to *Amaryllis* fans everywhere and stimulate the cultivation and development of this lovely flower.

- (1) Best rooting medium to be a mixture of leaf mold and sand.
- (2) The bulbs will stand considerable cold. They did flourish in a cold frame type box during freezing weather.
- (3) The bulbs dislike gas heat and dry atmosphere, preferring some moisture in the air.
- (4) In all other respects including watering they have responded to the kind of care given to other *Amaryllis* including the Dutch hybrids.

THE BLUE AND IMMACULATE AMARYLLIS

A. B. LYTEL, *Manager,*
Las Positas Nursery, Santa Barbara, Calif.

In the 1942 and 1943 Herbertias reports appeared about the Blue Amaryllis, *Worsleya Rayneri* (syn.—*Amaryllis procera*, *Worsleya procera*) at Hope Ranch. It is of interest to note how this colony was affected by the low temperature of the past season (1948—1949).

Three of the bulbs bloomed in the fall of 1948. The frost during the winter (January 1949) damaged the foliage of most of them and killed a few. About twelve survived, and these were transplanted to another location. It will not be known for at least a few months how they will take to their new location.

In 1940 Herbertia, mention was made of *Amaryllis immaculata* (syn.—*Amaryllis candida*), when there were only a few bulbs at Hope Ranch. Now there are many blooming sized bulbs produced from seeds. This summer (1949) the older bulbs as well as the seedlings produced a fine show.

GROWING AMARYLLIDS IN MICHIGAN

WALTER ALLGEYER, *Michigan*

Here in Southwest Michigan we have both good soil, and a fair climate for growing of amaryllids. My interest in these various bulbs came some years ago, first in *Amaryllis* [Fig. 24, left], and some of its smaller cousins; then *Crinum*, *Hymenocallis*, *Clivia*, and the lovely *Haemanthus*.

There are several necessary requirements for growing these bulbs, and having them bloom freely. First, Patience; second, good soil; and third, care in planting, and growing. One must not force growth—give your bulb a chance, and let nature do its part. I plant bulbs in pots, and out in open soil, both are very satisfactory, and about equal in results.

The large blossoms can be hand pollinated, and the seed grows very easily in seed pans. In this the seedlings can be grown for the first year, and then planted out in open soil in summer, where they soon make fine bulbs. I have over 400 seedlings of all sizes, a few had bloom this year. In fall they are stored in the basement, with the larger bulbs.

For blooming size bulbs I always use a large pot, 7 or 8 inches, in which they will bloom and grow to good size, with plenty of root room. In pots they do best if set outside in summer in part shade, as the hot sun dries out the pot too quickly. I like to set them where they get only the morning sun. I do not let them dry out while growing, and in fall when the first light frosts come, I set them down in the basement to rest and keep them dry during storage. After they have rested

several months I take out part of the top soil, add fresh soil, and set them in a warmer place until the bulbs show signs of growth. Then I give some water, but just enough to moisten soil. When the bud stem has shown good growth, they will require more moisture, but after blooming, when the leaves are growing water is applied more often.

In pots bulbs should be set so that the upper half of bulbs is not covered, but in planting out in the open soil they can be fully covered. For larger quantities I plant them out in the open soil about the first week in May, and by mid-June they are in bloom—a good show. After blooming they are kept growing, irrigated if it gets too dry, and by fall they are plump, and ready for the next year's bloom. When the first light frosts come I take them up, and place them in large flats, in which



Fig. 24. (Left), pink *xAmaryllis*, flower 8" diam.; (center), *Hymenocallis caribaea*; (right), *xCrinum* clone LOUIS BOSANQUET. Photos by Walter Allgeyer.

I have about an inch of dry sand. The roots are spread carefully, and are covered with more sand. They are then ready to be stored in basement for the winter's rest. By spring the leaves will have dried, but the roots will be fresh, and ready for growth. In bulbs newly purchased, in most cases, you will find that all of the roots are trimmed short, or no roots at all. Such bulbs are harder to manage, and need time to start. Here one must have patience, and wait until the bulb shows signs of new life.

For *Crinum*s we use a much larger pot, as they have a larger root system; so I use old discarded 8 or 10 quart enameled kettles, with holes in bottom for drainage. In such a kettle *C. CECIL HOUDYSHEL* had its first bloom July 21, and a second Aug. 14. *C. LOUIS BOSANQUET* [Fig. 24, right] had the first bloom July 16, a second July 30, and a third Aug. 16, making a new flower stem about every two weeks.

Crinum asiaticum, in a larger wooden tub has at this time, Oct. 24, its first bloom. Rather late, but safe from frosts, for it can be taken inside on cold nights.

Cooperia, *Chlidanthus*, *Habranthus*, and *Zephyranthes*, the smaller Amaryllids, are lovely during the summer and fall, and are planted out in the open soil, where they can grow and multiply. These are not hardy, and are taken up in late fall, and put in pans of sand, where they can rest for the winter.

I plant *Hymenocallis* in large pots, or also in the 8 or 10 qt. enameled kettles, and they grow and bloom wonderfully. I have three varieties—*H. tenuiflora*, *H. caribaea* [Fig. 24, center], and *H. narcissiflora*. I find them easy to grow and bloom. I use the same soil as for *Amaryllis* and *Crinum*s, and the same care.

Clivia and *Haemanthus* are new to me, and as they are strictly indoor plants, I have them in pots, where they will be cared for until they too put on their show in blossom.

Now a word as to soils is in order. I have a good supply of soil mixtures from which I can make up almost any mixture needed. First, barnyard strawy manure is placed in a large pile and left all winter. In the spring it is placed in a compost rack, about a five inch layer alternating with a one inch layer of soil until the rack is full. It is then left to rot into humus until the following spring when it is removed and stored for use. Second, a large truck load of leaves is brought in and left in a pile over winter, and is then placed in the rack in a similar manner, leaves alternating with soil layers. It too is left until it has turned into a dark leaf humus. Third, grass sod, about four feet square, grass side down, is left until all is well disintegrated into a nice sod loam. Fourth, a load of black muck is brought in. This gives me four soil mixtures to choose from, or to mix in any way desired. The four original mixtures are always available in barrels near at hand so that the mixtures can be conveniently made. I also have a supply of medium sand which is used to make the potting medium porous and soft.

My favorite mixture is as follows: 2 parts leaf humus, 1 part rotted sod, 1 part barnyard humus, and 1 part sand. This I mix up in a tub, and then store for later use.

I do not use any other fertilizer. Bone meal could be added to this mixture, but this is not necessary.

In general I find that good bulbs, good soil, with reasonable care will give fine results with any of these interesting subjects. I use large pots to give the roots plenty of room, and bulbs grow larger every year. In storing always remember that *Crinum*, and *Hymenocallis* must have a dry warm place, but *Amaryllis* will stand a cooler storing place.

My next year's adventure will be with a new bed 25 ft. by 30 ft. sloping gently toward the back. On this I will place some of the black muck, barnyard humus, and sand, spade deeply, and expect good results.

NARCISSUS NOTES, 1949

J. S. COOLEY, *Maryland*

It is a real thrill to see the first *Narcissus* flowers opening in the spring. This year they bloomed at least a month earlier than usual. The *Narcissus* tops were emerging early in December. On account of the mild weather the soil was frozen for a relatively short proportion of the winter and root growth probably took place during most of the season. FEBRUARY GOLD for once bloomed in February. It opened a few flowers several days before the early variety, THE FIRST. FEBRUARY GOLD is very satisfactory here in this region. Although it is a small flower, it is early, a good rich color, a free bloomer and a good "doer." It has the added advantage of opening out full flowers in frosty weather when some other varieties have the stems frozen to death or do not open out full flowers. We need an early *Narcissus* having a flower as rich in color as FORE-RUNNER and blooming as early as and having as much resistance to cold as FEBRUARY GOLD. FORERUNNER does not have as smooth a perianth as one would like, but it has other good qualities for an early variety. Any breeding program should have for one of its objectives the production of early bloomers.

This year was a good time to get information on the effect of cold weather on the opening of *Narcissus* flowers. This year's observation also indicated that the flowers of some varieties freeze to death while others in a similar location are not killed. On February 27 and 28 there was a snowfall of about 3 inches and the temperature was as low as 22 degrees F. Buds of FEBRUARY GOLD and of THE FIRST that were well above the snow and showing color bloomed out good flowers. Only a few buds blasted. This temperature was possibly close to the lower limit for the tolerance of these varieties. The weather was cold up to March 22, the temperature going as low as 20 to 22 degrees several times since the blooming started. In any attempt, however, to state a minimum temperature one must always keep in mind the importance of the duration of the chilling condition. The flowers that opened under these cold conditions have been lacking in sheen and brilliance and the stems were very droopy. The stems of ADA FINCH were so flaccid that the flowers drooped to the ground but when a warm day came (March 21 and 22) they straightened up. WHITELY GEM bloomed in this cold period. It was not as sparkling as usual but the intensity of the red in the cup was much greater than in some other years when it happened to bloom in a warm spell of weather. WHITELY GEM was in the early group this year. It is a free bloomer and a good "doer" here.

The little JONQUILLA hybrids were as entrancing this season as ever. It seems strange that more gardeners do not use this group of *Narcissus* to enhance their pleasure in gardening. Some of this group such as the *jonquilla simplex* are very exacting in their cultural requirements and often pass out from one season to the next. The *jonquilla* hybrid, ORANGE QUEEN, is also in the class of poor "doers" and under my conditions

does not persist well. Some others in this group however are splendid "doers." I like very much a jonquil that was found growing in an old colonial garden in Maryland. It has persisted there for many years with little or no care. It multiplies fast so that it soon forms a thick clump but in spite of that it continues to bloom freely every year. It begins blooming as early as WHITELEY GEM and continues at least a month. The jonquil hybrids may have small flowers, but they are usually a rich golden color and often very fragrant. They are useful both for prolonged garden effect and also for cut flowers for small arrangements. Flowers of jonquilla hybrids such as GENERAL PERSHING were injured by cold this year more than some other groups of *Narcissus*.

The red cup varieties have been unusually fine this year. This is perhaps due to the cool weather and an abundance of moisture. The weather was also favorable for the persistence of the red color of the cups. Warm sunny weather during the blooming time of red cup varieties may fade the red in the cups very soon after the flower unfolds. When the varieties that soon fade are to be used for cut flowers it is advisable to cut the flowers as soon as they open. Some of the red cup varieties fade much more quickly than others. This is therefore a consideration to keep in mind in evaluating promising seedlings.

This year has been very favorable for the development of fine foliage and one should expect fine bulbs for next year.

DAYLILY ADAPTABILITY

PHILIP G. CORLISS, *M.D.*, *Somerton, Arizona*

All that I am going to say here, has been said many times before; but from remarks I heard on visiting gardens of Hemerocallis growers from coast to coast last year, I feel that we cannot lay too much stress on the fact that the performance of daylilies varies greatly in different climates.

Too often, growers in one location of the country scoff at the high prices or touted varieties offered by hybridizers of a different climate. It is true, however, that our hybridizers introduce varieties which truly are improvements IN THEIR GROWING CONDITIONS, over other varieties. Some such introductions will indeed prove to be inferior to older varieties WHEN GROWN UNDER DIFFERENT CONDITIONS.

There are many exceptions, but in general, it is agreed that varieties that are deciduous or dormant in winter do better in the north, while the evergreen varieties do best in the south. Some evergreen varieties do splendidly in the north if they are given protection; while some dormant types perform ably in the south.

Other facts to remember: (1) Varieties with Aurantiaca parentage are tender. They perform better in mild climates, and are often killed in the north; (2) The "species" perform poorly in mild climates, although there are many exceptions among their descendants.

If you are disappointed in the performance of some kinds of daylilies, see if they won't improve in a different location in your garden.

Many varieties fade badly in strong sun, while almost as many others are greatly improved in color by being in full sun. Consult the recommendations of your dealer, or the originator. Remember, too, that "full sun" in New England, where the percentage of available sunshine is less than 50%, is quite different from that in, let us say, Arizona, where over 90% of available sunshine occurs.

It is also a mistake to try to take too much advantage of the hardiness of *Hemerocallis*. Certain varieties will multiply and bloom in unfavorable positions under complete neglect, but tender fancy hybrids actually demand the best of food and drink for good performance. We hear frequently of the failure of some kinds to flower until they are relieved of neighboring shrubs or trees.

It is true that the modern *Hemerocallis* makes it possible to have a garden full of glorious color for almost all growing seasons. The color range is large; the height, size, pattern, and form of the flowers is varied. The requirements of the plant are simple, and its enemies and diseases are few. But it is still necessary to exercise intelligence in selecting and planting your *Hemerocallis*. Use plants that are suitable for your climate; give them a good bed, with proper sun, shade, food, and water. They will be happy with you, and you will be happy with them!

CORRECTIVE FOR POOR FOLIAGE IN HEMEROCALLIS

GEORGE GILMER, *Virginia*

I have discarded some daylilies for poor foliage. I had reduced my plants of SATURN and THERON on account of poor foliage in August and later. This year at the end of July I put some sulphate of ammonia around my plants. SATURN this year had as bright, nice green foliage as any one could want. The foliage on THERON is better than in any previous year. I kept the fertilizer at least four inches from the plants to avoid burning. I am going to try this in other years and hope it works as well.

SOUTH AFRICAN AMARYLLIDS AS HOUSE PLANTS

[CONTINUED FROM PAGE 130, PLANT LIFE, VOL. 5, HERBERTIA EDITION. 1949.]

SARAH V. COOMBS, *New York*

HAEMANTHUS (BLOOD LILY; SNAKESHEAD LILY)

There is an interesting quality about this genus. Some of its members, such as *Haemanthus Katherinae* [Plate 16] and the *H. multiflorus* [Fig. 25, from Tropical Africa], are quite beautiful. Others, with some beauty, have an odd attraction because of the way they grow. In South Africa, it always is intriguing to come on the thick, shining leaves of *H. coccineus*, lying spread out flat on the ground. They might be on an open sandy cliff among shrubs, and perhaps one looked across open ocean with only Antarctica as an unseen boundary. In somewhat deep woods they were equally happy but there was always something rather exciting about them, to this observer, at least. Just why, in another case, the one rather thick erect paddle-shaped leaf of *H. northieri* solemnly flapping back and forth in the wind should be amusing, I cannot tell. This species has a compact reddish tuft of flowers on a red stalk. In the Rain Forest at Victoria Falls one would come suddenly on a group of red-orange flowers in a little glade, flowers suggesting snakes with heads upraised in fright or menace. Perhaps the half-tame baboons playing around, with tricks put on for one's benefit, helped the feeling of strangeness.

There is a head of many flowers, usually red or white, crowded on the end of a stalk and surrounded by bracts which are often bright in color as are the stigma and the usually prominent stamens. Not many of this genus are available in the United States. One owner speaks of his twelve species but only four are found commonly in the trade. The *Haemanthus* have been cultivated in England for many years, from the 18th Century. It is grown there as a greenhouse plant.

Haemanthus coccineus Linn., MAARTBLOM (MARCH FLOWER), PAINT BRUSH. This species grows freely in the southwestern part of the Cape Province. It flowers before the leaves, which come in South Africa with the winter rains in June and July. The flower stalk with its cluster of flowers blooms there in February and March. The stalk is stout, sometimes spotted with minute dots of purplish-brown and about 6-9 inches in height, occasionally a foot tall. The flowers grow in an umbel about 3 inches across with 6-8 crimson bracts about 2 inches in length. The individual flowers on pedicels about $\frac{1}{2}$ inch in length, have a short tube and are bright crimson with linear segments and prominent stamens with yellow anthers. The flower is bright, though not so attractive as *H. Katherinae*. There are usually only two leaves, thick, tongue-shaped and shining, up to 2 feet long and 3-6 inches broad. The berries which follow the flowers are pinkish. This bulb must have a long rest. The soil should be light and sandy or gravelly with good drainage. It will like some peatmoss or humus but drainage is most important.

These bulbs, when planted in a pot, should be covered only to half



Haemanthus Katherinae, photo courtesy New York Botanical Garden.
Plate 16

their depth in one just large enough to hold the roots without overcrowding. A cool temperature, 55°-60° F. is recommended, even cooler if possible, when blooming, to make the flowers last longer. Plenty of water is needed when growing, less at first and when drying off. In



Fig. 25. *Haemanthus multiflorus*; photo Sarah V. Coombs.

growing from seed, germination is quick but only one seed leaf appears at first and the second leaf is very slow in coming. With *H. Katherineae*, the growth is different, germination is under the ground and a small bulb is formed there first, the seed leaf taking six months or more to appear thereafter.

Haemanthus Katherinae Baker [Plate 16]. This is the handsomest of these bulbs. It comes from Natal and the Trasvaal in the northern part of the Union of South Africa, nearer to the equator, and therefore needs rather more heat than the ones like *H. coccineus* from the Cape Province. It does not like strong sunlight or heavy winds. Its height is about 18 inches but it grows taller under cultivation. Leaves are 4-9 on each stalk, light apple green, 6-9 inches broad and perhaps as much as 3 feet long, pointed and deeply veined. The flower stalk is spotted and sheathing. This species blooms with the leaves on a different stem. The flower cluster is globose, 4-6 or in cultivation 8-9 inches in diameter. Spathe-valves 5-6, lance-shaped, soon withering. The filaments ascending,



Fig. 26. *Haemanthus tigrinus*; photo courtesy South African Railways and Harbours.

bright red, anthers yellow from pollen. The flowers are a lovely color, blood-red to salmon. The berry is bright red. The color of the flower has been described as "sunset pink." This bulb may be a valuable addition to house plants. It grows for a long time of the year being dormant for a time but never really losing its leaves. It should not be dried out entirely. It is a summer bloomer in the United States but may bloom later if water is withheld before starting. It needs more humus in the soil than other species except *multiflorus*.

Haemanthus multiflorus Martyn [Fig. 25], is included here, though it comes from Tropical Africa because it is one of the finest of these

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GENERAL EDITION

EDITED BY

HAMILTON P. TRAUB

HAROLD N. MOLDENKE

THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

P R E F A C E

The GENERAL EDITION of 1950 PLANT LIFE is devoted chiefly to the Fancy-Leaved Caladiums. Mr. Hayward contributes an important article on the subject in which he considers the plant habit, cultural directions, the history of *Caladium* breeding, propagation, and exhibition procedure. The Caladiums have been receiving renewed attention in recent years and Mr. Hayward's article comes at an opportune time.

Dr. Norton contributes an interesting article on the winter forcing of excised Jasmine twigs. This practice will serve to bring added cheer into the living room during the winter months. We are grateful to Dr. Norton for sharing his experience with us.

Mr. Hayward reports on the rediscovery in North Florida in the early 1930's of BARTRAM'S IXIA, a fine subject that had been lost to culture for over a century and a quarter. BARTRAM'S IXIA lends itself well to pot culture, and should be offered in the trade. This would be an insurance against its total loss since it is native to only a small area and is fast disappearing due to the inroads of civilization.

The attention of the reader is also directed to the PLANT LIFE LIBRARY, where some recent outstanding books on plants are briefly reviewed.

January 12, 1950

Hamilton P. Traub
Harold N. Moldenke

C O R R I G E N D A

PLANT LIFE, VOL. 6, 1949

Page 25, title, for "CESNERIACEAE" read "GESNERIACEAE"

Page 31 5th paragraph, 8th line, for "Mittsch" read "Mitsch".

Page 50, 3rd line from bottom, for "Obh." read "Abh."

Page 133, under II. Other Committees, for "GESNERIACEA" read "GESNERIACEAE".

Page 134, 5th line, for "1950" read "1951".

FANCY-LEAVED CALADIUMS

WYNDHAM HAYWARD, *Florida*

The Fancy Leaved Caladium, popular summer foliage plant for pots and garden beds both North and South, is receiving a new recognition by the American public which promises to send this colorful and decorative Aroid, lesser member of the group of tuberous rooted plants called "Elephant Ears," well on the way to leading popularity in the horticultural field to which it is adapted.

The caladium is related to such genera as *Colocasia*, *Alocasia* and *Xanthosoma*, and one of its best known cousins is the Taro of Hawaiian gardens. The name "Caladium" is reputedly of Indian origin and of doubtful meaning. The plants are grown for the beauty and high color of the well developed leaves, which rival the most brilliant flowers. The actual flower of the *Caladium* is rather inconspicuous, being a small calla-like affair, with a hood-like spathe, enclosing a spadix, of which the upper portion is covered with stamens, and the lower with the female flowers.

The plants grow from a tuber or corm underground, and bear a profusion of handsome leaves on relatively long, straight petioles. The leaves are more or less heart-shaped like the well known giant "Elephant Ear" types, used in bedding for many years in the North, often in the center of a bed of cannas. This giant Elephant Ear is usually described as *Caladium esculentum*. Various other related genera are grown for similar effects in the tropics and sub-tropics.

Caladiums are of easy culture, growing in spring from the dormant tubers in proper conditions of warmth and moisture, in rich soil, to perfection. The tubers are perennial and increase from year to year with good care. The original species, from which have sprung our modern showy hybrids in green, red, purple, maroon, pink, rose and white, are natives of South America, mainly Brazil and Peru. In the last 90 years they have been developed to a wonderful collection of highly colored varieties which are attracting an ever-increasing share of the horticultural interest accorded to bulbous things.

They have a personality, charm and appeal that is rarely met in garden material. One comes to know them like old friends, and to recognize familiar varieties without fail from year to year in the garden. There is the greatest variety and profusion of color and rich shades, all with backgrounds, borders or veinings of various tones of restful green.

Two of Florida's pioneer horticulturists were among the leading hybridizers of the modern caladium until their passing 10 to 20 years ago. The late Henry Nehrling, of Gotha, Fla., and Theodore L. Mead of Oviedo, Fla., contributed in a material way to the popularization and development of the choice varieties we know today. A number of their originations are still colorful standbys in our Southern gardens and the florists trade could scarcely get along without them.

Forty years ago at Gotha, Nehrling, who died in 1929, grew some 200,000 of the bulbs each summer in large ground beds under lath shade, with more than 2,000 named and separate varieties included among them as well as a varied crop of new seedlings under study. Besides his work with the large-leaved caladiums, Theodore L. Mead is remembered particularly for his contribution of "Arrow and Lance" varieties, as he called them, which are the pride and joy of fanciers of caladiums today, but still little known in the general trade.

These Arrow and Lance varieties [Plate 17] were obtained by crossing with narrow-leaved species such as *C. albanense* and *C. venosum speciosum*, which he received from English growers. They have come to be one of the great novelties of popular plants today and the trade has not been able to produce a fraction of the stock which will likely be required in years to come. They are slow growing and more delicately constitutioned than the large leaved types, for the most part, and tend to make smaller bulbs. But when better known and more abundantly available, they will undoubtedly prove to be a sensationally popular novelty. Active work in the hybridizing of new Arrow and Lance leaved types is being conducted in Florida at this time by several growers, including two Tampa women, Mrs. T. S. Freeman and Mrs. A. J. Weir, whose efforts have brought most interesting and attractive results.

One early Arrow and Lance leaved type, E. O. Orpet, credited to Nehrling, has attained a wide distribution among fanciers, and is believed to have been a major aid in producing some of the latest "breaks" for new forms and colors. E. O. Orpet was the first of the showy red-centered Arrow and Lance types, the other previous varieties in this group being largely marbled and veined in tones of green, creamy-grey and dark red. Hedwig Else Nehrling (Mead) is one of the early types, green with red spots on lance shaped leaves.

In the summer of 1949, an exhibit of the newer types of pink, crimson and wine colored Arrow and Lance caladium foliage received a Vote of Commendation from the Prize Committee of the Massachusetts Horticultural Society at their first showing in Boston. These were grown by the writer at Lakemont Gardens in Winter Park and shipped to Boston by parcel post. The Prize Committee suggested that some of the bulbs be grown another season at Boston by a pot plant specialist to exhibit them in top condition for further consideration for higher awards.

The familiar large-leaved types of fancy leaved caladiums will grow two or three feet tall, at best, usually about a foot to two feet in height when well grown, depending on care and varietal differences. The Arrow and Lance types are low growing, usually not more than a foot tall and some of the smaller kinds only a few inches.

With abundant food some caladiums will make a tuber up to two or three pounds in weight. The customary "bulb" as sold in the trade is an inch or two in diameter. Some varieties do not make large bulbs and have to be marketed with an explanation to the customer for this reason.

These small-bulb types include some of the best, most highly colored varieties, and showy window-pane varieties in some cases, which has caused them to be dropped from cultivation by the commercial growers in

favor of showy but less artistic types which readily make large bulbs, such as Sorocaba, Lord Derby, Keystone, Mme. Truall, etc., as found in the trade today. These are all effective, brilliant types at their best, however, and should not be neglected in any collection.

The matter of nomenclature in caladiums is highly confused as is



Fig. 27. *Caladium Humboldtii* (*C. argyrites*); original photo by Wyndham Hayward; reproduced courtesy Nat. Hort. Mag.

the case with so many other popular plants today. Only a few varieties have become fixed in the growers stocks under their definite and original name, as John Peed, Triomphe de l'Exposition, Candidum, D. M. Cook, Mrs. W. B. Haldeman, Marie Moir, Hortulania, Rio de Janeiro, Poecil Anglais, Thomas Tomlinson, Mrs. Fannie Munson [Plate 18], Sorocaba, Lord Derby, Marie Moir, Rising Sun, Scarlet Pimpernel, Mary Queen of

Scots, and such, which are sufficiently characteristic in their coloring and markings to have made them readily recognizable in the greenhouse and garden even when found under some other name.

Of the species, only *Caladium Humboldtii* [Fig. 27], the darling miniature jewel from Brazil with white spots and blotches on tiny green leaves, is at all available today and it remains a rarity because of the difficulty of propagation and storage over winter. It grows well in a four inch pot.

Caladiums as now grown in Florida are a mass production affair, produced by the thousands for the florists and seed and department store trade. The bulbs are planted in the spring, cut up like potatoes, and harvested in the late Fall, dried off and shipped before cold weather in January and February if possible, as most of the caladium storage sheds are not provided with heat, and frost will seriously injure the tubers.

The tubers grow readily in any soil which is moist, fertile and reasonably well drained, usually raised beds of muck and drained peat bogs are used.

Any good vegetable fertilizer may be used in the beds before planting and the bulbs will need careful weeding and an occasional side dressing of commercial fertilizer when in growth. The root knot nematode is their greatest enemy and the *Sclerotia* fungi cause trouble in excessively wet soils, especially in the hot part of the summer.

As pot plants or for bedding purposes the bulbs may be started under glass over a brisk bottom heat in flats of mixed peat and sand, and potted up into five or six inch pots when starting to root and sprout. Bulbs may be started from January to July with good results. In the winter care will have to be taken to prevent the started bulbs from decaying if allowed to become chilled or if too much water is given them at first.

A particularly effective demonstration of the use of fancy leaved caladiums as a mass tropical display was included in the Massachusetts Horticultural Society's Spring Flower Show in Boston in March, 1949, when Secretary Arno H. Nehrling directed the forcing of a large number of the tubers especially for the tropical garden which was a feature of the Society's main exhibit. It was years since any important use of fancy leaved caladiums had been made at any major Northern flower show and many favorable comments were reported from the sophisticated show-goers. A decided uptrend in interest in fancy leaved caladiums in the New England area followed the show, florists reported.

Secretary Nehrling of the MHS is, interestingly enough, a son of the late Henry Nehrling of Florida who played such an important part in the development of modern hybrid caladiums.

Caladiums want a warm, moist atmosphere, and can use a potting soil composed of one-third rotted manure and the rest a clean sandy loam or peaty soil for good results. They like an acid soil reaction, the same as callas (*Zantedeschia*). Drainage must be good in the pots or the bulbs may rot. Once in good leaf the plants will require an abundance of

water, and never should be allowed to dry out. Under glass they should be given light shade at all times to prevent burning of the delicate colors in the leaves. In the open they are often grown in the full sun or half shade in Florida and the lower South generally, but require protection from hot, dry conditions, wind, and storms. As bedding plants the tubers can be planted directly in the ground in the South, but are better started inside under glass in pots when wanted for this purpose farther North.

In pot culture, the tubers can be dried off in their pots in the fall, and stored all winter under a bench in the greenhouse or root cellar where they will remain cool but be subject to no moisture or cold. Below 50 degrees F. would be injurious to vitality in all probability. The stronger growing varieties should be selected for growing in the garden in the full sun. The summer of 1949 saw a garden in Houston, Texas decorated luxuriantly with numerous plantings of the famous white variety *Candidum*, especially for a wedding of note, with outstanding success.

The hybridizing of fancy leaved caladiums is an art in itself, as the female flowers ripen on the spadix before the male anthers shed their pollen in the same flower. As a result, the female flowers do not receive pollen from the same plant. This condition therefore leads to a virtual complete self-sterility, so far as known. The writer, in thousands of plants in bloom, has never observed seed to set on a caladium from self pollination, and as the flower spathe does not open until the pollen is ready to dehiscence (and the female flowers are already by that time past the receptive stage) it would be almost impossible for seed to set in nature.

When mature, the female flowers are sticky to the touch, and can be pollinated by hand with a small artist's brush used to remove the pollen from flowers on other plants then at a slightly later stage of flowering. The spathe is best cut away with a small pocket knife to reveal the spadix, before the pollination. Setting of seed may be light or abundant. Many pollination efforts fail completely. The resulting fruit is a one or two-celled berry with several seeds as a rule.

Seed is difficult to set without long practice and careful attention to detail, and if the ripening berries or capsules are not watched carefully, they will "explode" at maturity in all directions from the plant and ants will carry them off in a few hours. Some of the famous hybridizers are reported to have grown 25,000 seedlings a year, although this may have been an enthusiastic horticultural exaggeration. Theodore L. Mead said he did his best hybridizing of caladiums by flashlight at 3 o'clock in the morning and there may be something to this factor of special nocturnal receptiveness.

Most of the resulting seedlings, unless a great many are grown, as the writer can vouch from personal experience, are mediocre and of no horticultural value. In fact, probably no other plant produces so few desirable types among hybrid seedlings. Only one out of thousands will be worth preserving for future study, and less than that for ultimate naming.

The seed may be sown in pots of sterilized soil, sandy loam, with some leaf mold added, and grown a season without a change. Then the tubers should be repotted in the spring and forced into their best growth. The initial season will produce little seedling tubers the size of a pea and slightly larger. Good culture will make them full size in the second year. Then the grower can determine whether he "has something." It is a task of many pains and few rewards as scarcely a hundred or so of the thousands of fancy leaved caladium varieties which have been introduced in the past 80 years remain under their true names in the trade and in collections today.

Caladiums have always been a popular plant in the greenhouses of England and the continent, as well as in America. The firm of John Peed and others were famous for their caladium showings of huge specimen plants in giant pots at the Chelsea show of the Royal Horticultural Society between World War I and II.

In America the first caladium hybridizer was reputedly Adolph Jaenicke, at the Missouri Botanical Garden in St. Louis. He introduced a number of good varieties which are still remembered, as Torchlight, White Flag, Ivory, etc. Few or none of these are still available, so far as known.

Mead's varieties, for which he is best remembered today, although his work with orchids brought him most fame in his lifetime (he died in 1936), include Mrs. Theodore L. Mead (usually known today as Edith Mead), Pliny W. Reasoner, Charles T. Simpson, Osceola, Hildegard Nehrling, Berthold Nehrling, D. M. Cook, Bertha S. Eisele, and Blanche Wise. Several of these are still outstanding varieties in the trade and in collections. Edith Mead and D. M. Cook are standard varieties everywhere.

Nehrling's best variety and masterpiece of caladium glory was undoubtedly Mrs. W. B. Haldeman, a gorgeous pink and rose-centered leaf with white shadings and dots and darker veins against a deep sage green border. It is outstanding in every showing of the caladiums. Among others Nehrling introduced were A. H. Andrews, Dr. George Tyrrell, Mrs. Sophie Nehrling, Mrs. Fannie Munson, Caloosahatchie, Mrs. Ano H. Nehrling, etc. A search of old horticultural records is being made at this time to obtain a complete list of his originations.

The first caladium hybridizer was Louis Van Houtte of France, closely followed by a fellow countryman Alfred Bleu, who displayed their first creations in the new field at a Paris exposition in 1867. Some ten years before, a number of new caladium species had been introduced into Europe through the efforts of two French plant explorers, Petit and Baraquin by name, including *C. Chantinii*, *C. Humboldtii*, *C. Baraquinii* and *C. Verschaffeltii*.

Caladium bicolor, a plain green type with small red and white spots had been known to horticulture since 1789. One of these Van Houtte caladiums shown at the Paris fair in 1867 was named Triomphe de l'Exposition and it remains today one of the sturdy, lovable and trustworthy varieties in the trade everywhere. It is a good red with green border, not

as brilliant as Nehrling's later John Peed, but still a fine bedding and pot plant subject.

Caladium Humboldtii is doubtful as a parent of any of the modern hybrids. It is a delightful dwarf species and in the writer's experience of many years has never been known to bloom in cultivation.

Bleu's collection of caladiums grew to more than 250 varieties by the turn of the century. His masterpiece is regarded as *Candidum*, the showy white variety widely grown today and still unapproached in its class.

The introduction of *Triomphe de l'Exposition* marked the beginning of the great "Age of Caladiums" which lasted down into the 1920's, when the caladiums went into a horticultural depression for a few years. Nehrling in the 1920's sold his stock of varieties to the Royal Palm Nurseries, at Oneco, Fla., which no longer grows caladiums, and the firm of Reuters in New Orleans, formerly large scale propagators of caladium bulbs, has also withdrawn from major production in the field.

After Van Houtte and Bleu came C. J. Bause, of England, who started hybridizing caladiums in 1875. He was noted for the introduction of yellow types, such as *Prin e of Wales*, *Golden Queen*, *Princess Royal*, etc., which seem to have been lost completely in America. The yellow types proved to be more delicate in constitution and are shade-loving.

Bause's son-in-law, Johann Luther, continued the caladium tradition of the firm, and another European breeder who was well known in his time was Jacob Weiss, a German.

The real "Caladium King" of the period, however, was Adolph Lietze, a transplanted German who first went to Brazil as an orchid collector and then took up the hybridizing of fancy leaved caladiums about 1880, with a hundred varieties of Alfred Bleu at his disposal. He had a magic in his hybridizing touch which brought forth an outpouring of distinguished new varieties from year to year up to the time of his death in 1907. Among his finest productions were *Hortulania* and *Rio de Janeiro*, which are still favorites in their class today. They have been the parents of many named varieties in the succeeding years.

Lietze produced some 400 named varieties from his Rio de Janeiro gardens in the first ten years. His exhibit at the Chicago World's Fair in 1893 of more than 100 named varieties of fancy leaved caladiums may be said to have started the "caladium fever" in the United States. Nehrling tells in his writings how he was stimulated to take up the growing and hybridizing of caladiums as the result of seeing Lietzes remarkable displays at Chicago.

Old time caladium growers claim that the Lietze varieties, having been originated in open air gardens in Brazil, do better outdoors in the Southern states and similar climates of the world than the greenhouse-grown originations of European breeders. Certainly that is true of many kinds.

Because of his multiplicity of productions and the unusual and odd Brazilian names that Lietze gave many of his varieties, there came a great confusion in the caladium world in his varieties, as growers in the



xCaladium, new white centered Arrow and Lance type, grown by Wyndham Hayward.
Plate 17

United States and Europe soon gave his caladiums new titles, easier to use and remember than such titles as Guaratingueta or Memorio de Vigario Joa Procopio. The confusion has lasted to this day and out of the hundreds and thousands of Lietze's varieties, only a few are available definitely today under their correct names in the trade.

We can still identify Rio de Janeiro, Hortulania; Mrs. John Laing is still available in Europe and India; Aguape, Putomayo, Bahia, Itapocu are still met in collections and catalogues.

Richard Hoffman was the most recent of the great European hybridizers. His English home was at Stretham, near London where he maintained a marvelous collection of the best hybrids in the early 1900's and grew thousands of fancy leaved caladium seedlings from which he selected a few every year for introduction. Hoffman was a wealthy plantation owner in the Far East and spent much of his time there. His greenhouses were under the tender care of a famous gardener, Thomas Tomlinson, after whom he named one of his best caladiums, still extant, a fine rich dark red with green border.

Hoffman merchandized his caladiums through James Veitch & Sons of England and the horticultural firm of C. L. Klissing in Barth, Pomerania. Other caladium firms in Europe included the Chantrier Nursery establishment in France and John Peed in London.

Hoffman was one of the most remarkably gifted of modern hybridizers. His varieties were numerous and spectacular, although only a few survive in common growth, but these include the distinctive Marie Moir, a red speckled Candidum type, for which he received 20 pounds in 1906. Also of his creation are Rising Sun, Admiral Togo, Scarlet Pimpernel, Ace of Hearts, Red Ensign and others which may still be found on dealers lists today.

Candidum, the sterling old-time favorite of Alfred Pleu, certainly rates a pioneer and cherished place in the "Hall of Caladium Fame" along with Van Houtte's Triomphe de l'Exposition. Candidum is a lovely thing, sometimes unfortunately found mixed with Lietze's less desirable Ernst Schmidt, which lacks a fine black striping on the stem which identifies the true Candidum. Candidum and Mrs. W. B. Haldeman are possibly the best all-around caladiums still available in quantity. The writer has been unable to ascertain the exact years of introduction and would appreciate information on this matter.

The most delicate tones and shades of the caladium foliage coloring develop best under lath shade or in a shaded greenhouse. A collection of caladiums in full leaf at their most gorgeous best is not to be surpassed in sheer beauty by any other bulb or tuberous plant. There is such an infinite variety and evolution of forms and colorings, and as every new leaf develops the plant seems more decorative than ever.

Caladiums are dormant in winter under Florida conditions although in warmer climates they may retain some foliage through the entire 12 months. In warm, well-drained gardens the bulbs may be left in the soil all winter, but there is danger of loss from rotting if the weather turns cold and wet at the same time. As soon as the weather dries off the plantings in late fall, the growers dig and store their bulbs.

It takes a mastery and skill which are only to be acquired with the years in order to bring the largest possible number of caladium tubers through the cold months to spring in good condition. If the bulbs are stored in an open shed, as often happens, a sharp frost in the winter may "touch" a large number of the bulbs, starting the dreaded "chalky dry rot," or sometimes a soft decay sets in, to the detriment of the tuber stock. Then the grower must cut out the chalky or soft spots and dust with sulphur or lime to save them.

Some growers dry the bulbs a few days in the sun before storing. This is satisfactory if the bulbs are not exposed long enough to cause sunburn injury, and if they are not allowed to be wet by a sudden rain. Old time growers tell of their panic at seeing rain clouds suddenly develop out of a clear sky when they had 50,000 caladiums drying out in the sun on trays. The trays are usually provided with wire bottoms or lath slats.

A few growers store planting stock not for sale in ground pits of well drained soil. They usually keep well this way unless heavy rains occur in the colder part of the winter which may cause the dormant tubers to rot or suddenly to sprout into growth before their owner is prepared to plant them back. In replanting, the tubers are cut into pieces with eyes, just as one would slice a potato for planting. Even tiny chunks with an "eye" gouged out of the side of a small caladium tuber will make fair sized "bulbs" in a season.

The writer has obtained good propagation of fancy leaved caladiums in the case of new and rare varieties by cutting the tubers up into extremely small parts, planting shallowly in flats of vermiculite, horticultural grade, and growing them in the shade for several months with plenty of water and some complete soluble fertilizer applied in water every few weeks. They will make firm, sound bulblets this way, and a larger increase can be obtained than when the tubes are cut up normally and grown on in the ground, when a percentage of loss always occurs. New varieties as received from hybridizers and horticultural firms in Europe are usually small tubers, half an inch or so in diameter, and it takes several years to work up a stock for commercial sale.

A number of wholesale growers of fancy leaved caladiums are listed among the advertisers in the classified columns of the florists' trade papers in winter. Most of these growers are in Florida, some of them in the Sebring area. A few retail bulb specialists offer named varieties, but by and large the trade is mostly in mixed tubers, as a well-selected assortment of colorful and vigorous types meets the need of almost all amateur fanciers until they come to the stage of collecting named varieties.

Unfortunately as yet for the budding caladium fancier there are only a few growers and dealers who supply stock with any real assurance of conscientious effort at proper identification of their varieties. But this will come. The caladium is on the way up again. As Nehrling once said: "I love them better than flowers," and the writer of these notes is one of many thousands of present-day caladium lovers who agrees with the pioneer Florida plantsman.



xCaladium clone FANNIE MUNSON ; grown in granulated peat alone.
Photo by Wyndham Hayward.
Plate 18

The following is a preliminary list of a few Fancy Leaved *Caladium* varieties originated by Henry Nehrling, from data supplied by his stepson Robert D. Mitchell of Orlando, Fla.—E. O. Orpet, arrow and lance variety, Mrs. W. B. Haldeman, Fannie Munson [Plate 19], Zoe Munson, Fanny Reba, Mrs. Henry Nehrling, Mrs. Arno H. Nehrling, Betty Nehrling, Mrs. F. H. Pooler, Dr. George Tyrrell, Jesse M. Thayer, Stuart H. Anderson, Gertrude Hollick, Peter P. Schutt, Marion A. Meadow, and Richard F. Deckert.

WINTER JASMINE

J. B. S. NORTON, *Maryland*

That out door flowers in the winter time are something you go to Florida or California to see is the general thought of northern people. But there are a number of plants that flower outside between Dec. 1 and March 1 in the Middle Atlantic States, where there are often days or sometimes weeks of growing weather in the winter time. The outstanding winter flower, of those we have grown, is the common pansy. A few years ago we had pansies in bloom on the south side of the house every day in the winter; and this year, we have only missed a week when snow covered them.

The next thing to outside flowers is flowering cut twigs inside in winter or early spring. This charming art is practised by many gardeners. One of the best plants for cutting and flowering quickly and easily is the Winter Jasmine (*Jasminum nudiflorum* Lindl.). It is usually overlooked by writers on the forcing of flowers of trees and shrubs, as it is considered too tender for gardens north of Washington. I have had a special regard for this beautiful shrub here in Maryland for nearly fifty years, and have seen it blooming every month in the winter. Usually the flowers are rather scanty, even in spring, as the flower buds develop so easily that freezing weather kills all that are in flower or nearly ready to bloom; then when more dormant buds have advanced enough for another blooming spell a few weeks later, the same thing happens again, so that when spring comes there are not enough flower buds left for a show.

When the winter is continuously cold there is a fine display when all the flower buds open at the same time. *Spiraea Thunbergii* has a similar habit.

This jasmine is thought of as a rather stiff twigged shrub by northern growers, their plants having shorter growth killed back at the ends by the winter cold. Here it is one of the most beautiful bushes in form and color. Though we have had -25°F . twice in fifty years, and 15° - 20° below several times, I do not recall any noteworthy winter injury. The profuse, long branches grow up and arch over until the ends touch the ground and soon take root like a raspberry. In a few years we have a great, dense hemispherical mound three to five feet high and six to eight feet across, or further south 8 by 14 feet, and as years go by the

rooted branches extend the colony until there is an ideal cover for a sunny bank or open hillside. The slender branches are dark green and beautiful all the year round.

On a cold day this February I went out to see what the jasmines were doing. There were a few flowers open, though the ground was covered with snow and the midday temperature near freezing. The twigs



Fig. 28. *Jasminum nudiflorum* Lindl., forced into flower in winter.

were covered with buds ready to open, and some that were brought in and put in water in a vase looked like they would unfold tomorrow and give us plenty of color in two or three days. [Figure 28.]

This is the ideal shrub for cutting and flowering inside. There is a profusion of green twigs with pairs of light yellow 4 to 7 parted at the joints which are only an inch or so apart. In late winter when many buds are ready to bloom, they can be brought into flower in a day or two

at room temperature. The individual flowers are up to an inch long and wide and in water last several days, and with the succession of buds in different stages of development for a week or more.

With a large enough planting, pruned for many well developed branches of the desired length for cut flowers, and a cool greenhouse for flowering them, it would be possible to develop a demand for Winter Jasmine bouquets that might be commercially profitable from December to April.

This jasmine is sometimes mistaken for a *Forsythia* but is distinguished by its salver-form corolla from the bell-shaped *Forsythia* flowers.

BARTRAM'S IXIA

WYNDHAM HAYWARD, *Florida*

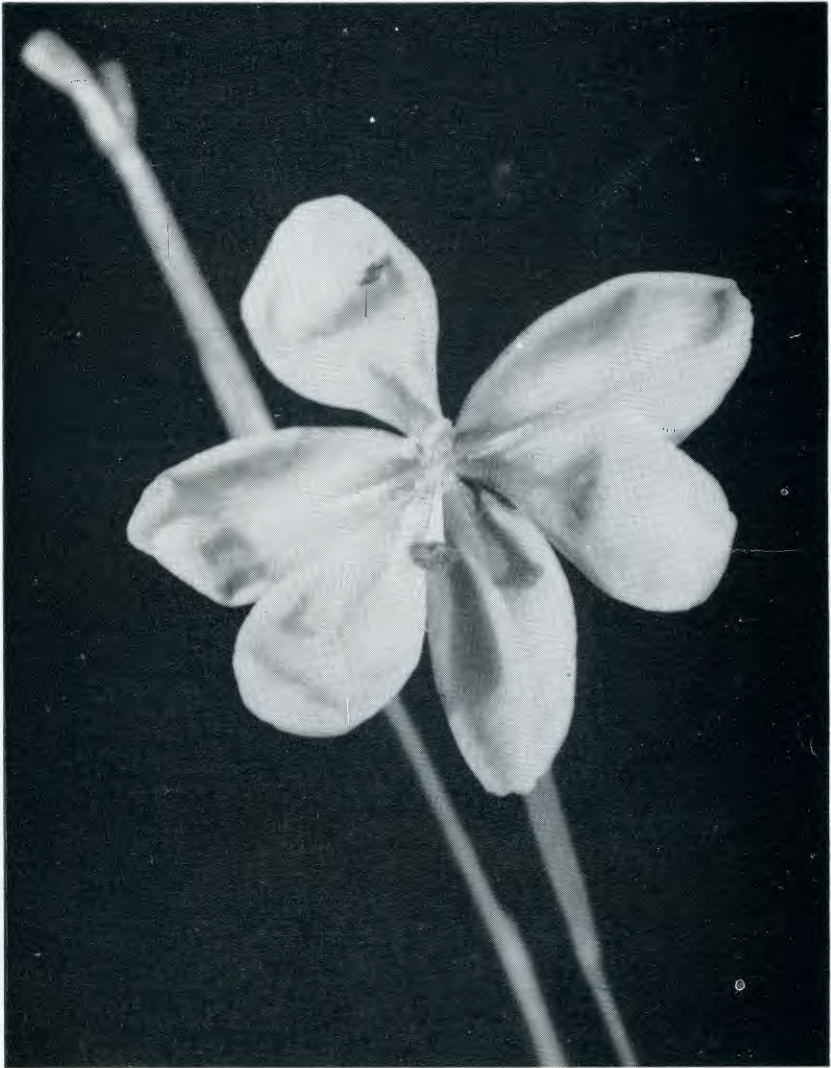
It is always difficult to speak of horticultural and botanical "finds" with the proper reserve due the more wonderful works of nature. Too often enthusiastic outbursts regarding plant novelties are none too altruistic, and garden lovers of long standing tend to take them with a grain of salt.

The above is a prelude to this formal introduction in popular horticultural literature of a remarkable Iridaceous plant, native of Florida, and found nowhere else in the world outside of a few square miles in the northeastern part of the Peninsular State. The plant is *Salpingostylis coelestina*, or BARTRAM'S IXIA, formerly known botanically as *Nemastylis coelestina* and *Ixia coelestina*.

Strangely enough, although the new generic name *Salpingostylis*, (which I do not admire) was published in July 1931 in the Journal of the New York Botanical Garden, by the late Dr. John K. Small, following the interesting and historic "re-discovery" of the plant after a century and a half of oblivion, the plant is still referred to as *Ixia* by some European botanists of high authority, although there are of course no true native *Ixias* known in the Americas.

Salpingostylis coelestina is a monotypic genus, closely related to *Nemastylis*, but distinguished by the long, drooping, trumpet-like style, which is the basis for the Latin generic name. It was first observed and recorded in scientific literature by the pioneer American botanist, William Bartram, who published an interesting and authentic account and a remarkably accurate illustration of the plant in 1791, in his "Travels through North and South Carolina, Georgia, East and West Florida."

"Behold the azure fields of cerulean Ixea!" exclaims Bartram in his famous book, recounting the beauties of the North Florida landscape. Despite his account of the plant and his excellent illustration, for a very particular reason the plant was lost to sight botanically for well over a century, until 1931, to be exact. During this long period, various studies of the plant, based on Bartram's records, were made by American botanists, and in view of the failure of anyone to find the plant as reported by Bartram, some botanists even came to the conclusion that it was a



BARTRAM'S IXIA, *Salpingostylis coelestina*; photo by Wyndham Hayward.

Plate 19

myth, or extinct. This perhaps was not too exaggerated, when one considers the fact that to this day no one has ever re-discovered the *Franklinia* tree in nature, since the 18th century, although Bartram found it in South Georgia in 1765. Presumably Bartram's discovery of *Ixia caelestina* was made about the same time, possibly on the same trip.

Real credit for the re-discovery of the plant goes to Prof. E. L. Lord, of Orlando, Florida, who informed Dr. Small of the presence in north Florida of an iridaceous plant similar to or identical with a Louisiana *Nemastylis* species which Dr. Small had showed him in the form of a painting. This occurred at the New York Botanical Garden in June, 1931. Dr. Small expressed doubt as to the existence of such a plant in the area specified by Professor Lord, and a few days later came South with Prof. and Mrs. Lord to check the report.

On the evening of June 9th, 1931, they reached the locality near Starke, Florida, where the supposed *Nemastylis* was known to grow, and the next morning a considerable party of botanically minded plant hunters set out for the field before dawn. It was found that the flowers [Plate 19] were just opening at daybreak, and faded by nine or ten o'clock in the morning.

Thus was the secret of Bartram's "Ixias" long disappearance solved. Dr. Small at once realized the plant was not a *Nemastylis*, and publication of the new genus *Salpingostylis* followed at once.

Bartram's *Ixia* has a corm one-half to three-quarters of an inch in diameter, and responds admirably to cultivation, being easy to grow and bloom in an ordinary flower pot or can in some good, rich, well-drained flatwoods type of soil. This kind of soil is usually rather acid and contains considerable humus and fine sand. The individual flowers are two to three inches across the face, on stems up to a foot in height, or more.

The finding of the plant after so many years caused many a humorous comment on the "rising hours" of botanists, facetious persons remarking that the failure to observe the flowers indicated that earlier morning habits would have been a valuable virtue for plant students.

Bartram's plate of "*Ixia caelestina*," showing the flower scape, bulb, anther, style and seed pod, is remarkably true except for the very center of the flower. Dr. Small reproduced this plate (No. 3 of the Philadelphia edition of Bartram's "Travels") in his account of *Salpingostylis* in the NYBG Journal.

The wide, spreading, somewhat loose (even "floppy") petals are violet or lavender-violet to purple in color, and the anthers are golden yellow. Small describes the flower as having a white "eye," which I have not seen in any specimens which have come under my observation. Small also adds "rarely white," indicating that pure white forms have been found.

The flowers are easily among the most beautiful of the small "bulb" group in the entire country as well as in the Southeast, and are worth growing for their extraordinary charm and interesting botanical history.

They can be raised to blooming size with good culture in a year from seed. In culture they can be handled like a *Freesia* or *Cypella*, except that they remain dormant all winter and start into growth in the spring. Whether they are hardy in northern gardens is doubtful, but this should be investigated more fully.

The flowers come in pairs on a scape, opening on separate mornings. The seed pods ripen in a few weeks and the seeds are a brick red in color and quite small, slightly smaller than *Freesia* seeds and about the same as *Cypella Herberti* seeds. A few "bulbs" in a pot will provide a long succession of flowers in the spring and summer, some producing more than one bloom scape.

The leaves of *Salpingostylis* are "pleated," as in the cases of *Tigridia* and *Cypella*. The foliage of BARTRAM'S IXIA is not conspicuous, however, and unless the plants were in bloom it is doubtful if they would be noticed in a field of flatwoods grasses. Its natural habitat is usually rather moist land.

Owing to increasing farm cultivation of natural habitats of *Salpingostylis coelestina*, the plant is regarded as becoming very rare, and should have some form of protection before its eradication by the plough and harrow is complete. More widespread cultivation of the plants in suitable areas would save the plant for future generations to admire. It spreads mainly by seed, and according to the best authorities, is found only in the region from Green Cove Springs to Starke, and to Glen St. Mary on the North. This area is to the Southwest of Jacksonville, Florida.

[COOMBS—S. AFR. AMARYLLIDS, CONTINUED FROM PAGE 41.]

CULTIVATION (See also *H. coccineus*, above). These bulbs like a light sandy soil, well-drained and with leaf mold or humus and some well-rotted manure, though they do not need a very rich soil. A little broken charcoal will be good. Blooming time may be changed to some extent by delay in watering, though some bulbs may insist on starting. As the time for house plants is generally the time they may be blooming in Africa, it may be quite possible to use them. I have found them most amenable to pleasing us.

Do not cover bulbs entirely. Crowd in a pot and do not transplant till necessary. Water sparingly till growth begins, then more water till foliage begins to dry, when water should be withheld almost entirely till growth begins again. Long rest is necessary. Burning the tops does have some favorable effect in their native habitat. Weak liquid manure during growing season and when ripening is helpful. They may be grown from seed quite easily but will take several years to reach maturity.

PLANT LIFE LIBRARY

BAILEY'S MANUAL OF CULTIVATED PLANTS,
REV. EDITION, 1949¹HAMILTON P. TRAUB, *Maryland*

The readers will welcome this revised edition of the Manual of Cultivated Plants "most commonly grown in the continental United States and Canada." The first edition, publ. in 1924, had made a place for itself on the garden library shelf, and this large new edition of 1,116 pages is of first importance to all who are interested in growing plants. The purpose of the work is "to provide a ready means for the identification of the species in the usual domestic flora of the United States and Canada." It includes 194 natural families, 1,523 genera, and 5,347 species, and "many incidental references to species." The study of varieties for obvious reasons is left to the specialists. In addition to the species most commonly cultivated, three classes of species are included (1) plants common in gardens although not listed in commercial catalogs, (2) species of recent introduction that show promise of becoming permanent acquisitions, and (3) species of historic interest.

The book contains explanatory sections on plant names, glossary of terms, authorities, and the vegetable community. There is a key to the families represented in the Manual, and excellent keys under the genera where the number of species is more than a few. The manual is copiously illustrated with excellent drawings.

With reference to the content, the specialist is most apt to feel that plants, clearly coming into the classes of common garden plants not listed in commercial catalogs, and species of recent introduction that show promise of becoming permanent acquisitions, have been omitted. It is easy to see that a general reference book cannot include all such plants. However, the writer lists some of those which he thinks should be included in future editions:

Plants common in cultivation: *Zephyranthes citrina*, *Zephyranthes rosea*, *Habranthus brachyandrus*, *Cyrtanthus sanguineus*, *Amaryllis advena*, *Amaryllis aulica*, *Amaryllis striata* (three or four varieties), *Tulbaghia violacea*, *Tulbaghia fragrans*, *Nothoscordum inodorum*.

Plants of recent introduction that show promise of becoming permanent acquisitions: *Zephyranthes macrosiphon*, *Amaryllis immaculata*, *Worsleya Rayneri*, *Lycoris incarnata*, *Lycoris Sprengeri*, *Lycoris abli-flora*, *Cooperia Smallii*, *Cooperia brasiliensis*, *Eucharis subindentata*, *Hymenocallis Harrisiana*, *Hymenocallis amancaes*, *Phaedranassa Carmioli*, *Calostemma purpureum*, *Stenomesson variegatum*.

It should be noted that the *Amaryllidaceae*, sensu Hutchinson (1934) is recognized, except that *Alstroemeria*, *Bomarea*, *Hypoxis*, and *Curcu-*

¹Macmillan Company, New York, \$17.50.

ligo are still retained in the family. Also it should be noted that the Family *Agavaceae*, as a separate family, including *Yucca* is recognized, but *Hosta*, $n = 30$, which has a similar chromosome complement, and similar gross morphology, allowing for its evolution in a mesophytic habitat, is still retained in the *Liliaceae*.

Hemerocallis, $n = 11$, which apparently belongs with the amaryllids, having a chromosome complement similar to the typical amaryllids and also a similar gross morphology, is retained in the *Liliaceae*.

The listing of these shortcomings according to one reviewer are however not to be taken as a criticism of the work as a whole which is wholeheartedly recommended to all who are interested in the culture of plants. It is a book that should be handy for ready reference at all times.

STANFORD'S A GARDEN OF SOUTH AFRICAN FLOWERS¹

HAMILTON P. TRAUB, *Maryland*

This is an important book that all gardeners will enjoy reading for it is written in Miss Stanford's usual charming style. It is not a long book but the lack of excess verbiage makes for such economy in the presentation that it includes more than one would at first expect.

In the foreword, L. Bolus points out that "There are delightful accounts of happy plant-hunting expeditions, with glimpses of the flowers in their natural haunts whence many were transplanted to join the company already established on that sunny bird-land slope at Banhoek. Their chief claim for admission has been, of course, that they should have some horticultural value."

In her introduction, Miss Stanford writes that "In the first place, this book was written for my own satisfaction, for the joy of passing on to gardeners the world over the happiness I have had in growing these treasures from the veld and mountain and stream-side. If these rambling notes have the power to stir one South African to grow and develop any of our flowers, the book will have achieved some measure of success. . . . As to plantsmen in Europe, the United States of America, Australia and New Zealand, their cry has always been 'Give us more seeds and more bulbs, and tell us how to grow them.' I hope the book may be useful to them."

The main body of the text is in the nature of a conducted tour of Miss Stanford's garden through the entire year, beginning on a fine spring day (Sunday, 10th of September), and ending on the following August. With such a wealth of native material to choose from it was of course necessary to make a selection but in spite of this the list of plants included is impressive. The reviewer must confess that many were new to him so that he looks forward to the day when he can also have these in his garden.

The book also includes brief sections on the cultivation of bulbous plants, the cultivation of composites, the cultivation of proteas, as well as

¹K. C. Stanford, *A Garden of South African Flowers*. Maskew Miller Ltd., Cape Town, South Africa. 63 pages and 14 plates.

an index, and most important, fourteen fine full page plates to delight the reader.

The book cannot be recommended too highly to all keen gardeners who are interested in the best that the world affords for their own gardens.

MOLDENKE'S AMERICAN WILD FLOWERS¹

HAMILTON P. TRAUB, *Maryland*

This is a very important book that is long overdue. As pointed out by the author, "There seems . . . to be a definite need for a single book, popularly written and copiously illustrated, dealing with the showiest and most interesting plants of the continent—those most likely to attract the traveler. It is in an attempt to fill this gap in botanical literature that the present volume has been undertaken." The field is restricted "as far as practicable, to the herbaceous flowering plants occurring without cultivation in the United States, Canada, . . . St. Pierre, Miquelon, Alaska and Greenland." The plants included were selected in part on the basis of a questionnaire returned from naturalists and botanists residing in this area. The book includes 2,050 species, varieties and named forms, and many others are mentioned incidentally. Not only native plants, but also naturalized exotics that are now a characteristic feature of our wild vegetation, are included. The species are discussed within botanical families. The well-written text, and the many colored plates and gravure illustrations make this one of the outstanding works in the much neglected field of plant popularization.

In addition to the text there is an interesting introduction by the author, an illustrated glossary, a selected bibliography, and an index. The author is to be congratulated on this fine book which will add greatly to the happiness of all interested in American wild flowers.

ANDERSON'S INTROGRESSIVE HYBRIDIZATION²

HAMILTON P. TRAUB, *Maryland*

This book is classed as "one of the first books in the Wiley Biological Research Series, which consists of a group of small volumes covering various topics in biology. In this series, contributing authors discuss their

¹Harold N. Moldenke, *American Wild Flowers*. D. Van Nostrand Co., New York, Toronto and London. 1949. pp. 1—xxv; 1—453. 32 colored illustr., and 32 gravure illustr. \$6.95.

²Edgar Anderson, *INTROGRESSIVE HYBRIDIZATION*. John Wiley & Sons, 440 4th Ave., New York 16; Chapman & Hall, Ltd., London. 1949. pp. I—IX; 1—109. \$3.00.

PLANT LIFE

Volume 6

[Number 3, July]

1950

THE AMERICAN PLANT LIFE SOCIETY

THE AMERICAN PLANT LIFE SOCIETY

Box 2398, Stanford, California

THE AMERICAN PLANT LIFE SOCIETY

For the roster of the general officers of the Society, the reader is referred to the inside front cover of this volume.

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[An integral branch of the APLS, and functions as a comprehensive Committee for the advancement of the Amaryllids.]

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Registrars: Dr. J. B. S. Norton, and Prof. W. R. Ballard.

Correspondence about the registration of plant names should be sent directly to Dr. Norton, 4922 40th Place, Hyattsville, Maryland, and a self-addressed, stamped envelope should be enclosed if a reply is expected.

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[Correspondence about priority of Daylily names should be sent directly to Prof. Norton, but a self-addressed, stamped envelope should be enclosed if a reply is expected.]

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| Mr. W. Quinn Buck, in charge of Daylily Trial Garden, Div. of Ornamental Horticulture, University of California at Los Angeles. | |

Note: Introducers of new daylily clones should send plants directly to the Trial Gardens for testing. As soon as practical each trial garden will publish, in *HERBERTIA*, lists of the 10, 25, 50 and 100 best daylilies, on the basis of the clones tested, for the climatic region in which it is located.

DATA CARD FOR HEMEROCALLIS

When describing daylily clones, all breeders and growers are requested to use the Official Data Card for Hemerocallis, devised by the eminent artist and horticulturist, J. Marion Shull, and full described in *HERBERTIA*, Vol. 7, 1940, and Vol. 14, 1947. These cards should not only be used in describing new clones but also for the description of all older clones grown in the various climatic regions.

For information write to—

Mr. E. Frederick Smith, Membership Secretary,
The American Plant Life Society,
Box 2398, Stanford, Cal.

SCORE CARD FOR HEMEROCALLIS

For the official score card for Hemerocallis see *HERBERTIA*, Volume 7, page 126, 1940. Reprinted in Vol. 14 (1947), page 37.

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FLOWER TYPES AND SCORE CARD FOR HYBRID AMARYLLIS

For classification of flower types and score card for Hybrid Amaryllis see *PLANT LIFE* 6: 43-46. 1950.

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III. PUBLICATIONS OF THE AMERICAN PLANT LIFE SOCIETY

BOOKS

1. AMARYLLIDACEAE: TRIBE AMARYLLEAE, by Traub & Moldenke (including the genera *Amaryllis*, *Lycoris*, *Worsleya*, *Lepidopharynx*, *Placea*, *Griffinia*, and *Ungernia*; Manila covers; 194 pages, incl. 18 illustrations. \$4.00 postpaid.

This is required reading for every amaryllid enthusiast.

2. DESCRIPTIVE CATALOG OF HEMEROCALLIS CLONES, 1893—1948, by Norton, Stuntz, and Ballard. A total of 2695 *Hemerocallis* clones are included and also an interesting foreword, and explanatory section about naming daylilies. Manila covers; 100 pages (I—X; 1—90), including a portrait of George Yeld. \$1.50 postpaid.

PERIODICALS

1. HERBERTIA, vols. 1—15 (Devoted to the *Amaryllidaceae*)
 Vols. 1—5 (1934—1938), \$17.50 Vols. 6—10 (1939—1943), \$17.50
 Vols. 11—15 (1944—1948), \$18.50 Vols. 1—15 (1934—1948), \$52.50

Single copies of vols. 1 to 15, when available, are \$3.50 each, except vol. 11, \$4.50.

2. PLANT LIFE, vols. 1—6 (Beginning in 1949, vol. 5, PLANT LIFE includes the annual HERBERTIA edition as one of the numbers.)

Vol. 1 (1945), *Narcissus* symposium and *Bromeliaceae* edition, 104 pages, incl. 25 illustrations, \$2.50.

Vol. 2 (1946), *Verbenaceae* edition, 100 pages, incl. 9 illustrations, \$2.50.

Vol. 3 (1947), Winter and Spring *Gladiolus*, and the History of the Dutch Bulb Industry, 1940—1945; 42 pages, incl. 10 illustrations, \$1.50.

Vol. 4 (1948), AROID LILY (*Calla*) edition, 48 pages, incl. 11 illustrations, \$1.50.

Vol. 5 (1949), *Gesneriaceae* edition, and 1949 HERBERTIA (Australian edition), 134 pages incl. 34 illustrations, \$5.00.

Vol. 6 (1950), 1950 HERBERTIA (Hybrid *Amaryllis* edition), and GENERAL PLANT LIFE edition, 162 pages, incl. 47 illustrations, \$5.00.

Vol. 7 (1951), 1951 HERBERTIA, and GENERAL PLANT LIFE edition (In preparation, 1950, and scheduled for publication early in 1951.), \$5.00.

Vols. 1—5 (1945—1949), \$13.00.

Single volumes, 1—7, when available, at the prices quoted above.

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 The American Plant Life Society,
 Box 2398, Stanford, Calif.*

IV. PLANTS RECEIVING APLS AWARDS IN 1950

The following awards were made during January 1950. Similar awards for the remainder of the year will be reported in 1951 PLANT LIFE.

Amaryllis belladonna var. *Haywardii*; Award of Merit (A. M.), January 12, 1950. Presented to the Society's Trial Garden by Mrs. Mary

G. Henry, Gladwyne, Penna. Illustrated in Plate 8, page 85, 1949 *PLANT LIFE*. A most satisfactory pot plant.

Amaryllis striata var. *fulgida*; A. M., January 12, 1950. Presented to the Society's Trial Garden by Mr. Wyndham Hayward, Winter Park, Florida. An excellent pot plant.

xCyranthus Henryae clone WILLIAM PENN; A. M., January 12, 1950. Presented by Mrs. Mary G. Henry, Gladwyne, Penna. An excellent pot plant.

xCyranthus clone METIVIER; A. M., January 12, 1950. Presented by Mrs. Mary G. Henry, Gladwyne, Penna. An excellent pot plant.

[ANDERSON'S INTROGRESSIVE HYBRIDIZATION, CONTINUED FROM PAGE 150.]

particular fields and stress their personal ideas. . . ."

First of all, the publishers are to be congratulated on their keen and refreshing appreciation of the scientist's need to express himself unhampered by professional editors who as a rule are backward looking. And secondly, they are to be congratulated on choosing Dr. Anderson's book as one of this series.

This book contains only 109 pages, but a work of this kind is not to be judged by its length, but rather on its content, which in this case is of high quality, and well worth the price asked. Dr. Anderson brings together important knowledge on the subject of introgressive hybridization. Although he expresses his viewpoint frankly, he is careful to do so with proper reservations as to the importance of introgressive hybridization in the evolution of living organisms.

The book includes a foreword, six text chapters, an epilogue, a selected bibliography, and an index.

Chapter 1 summarizes information on introgression by hybridization in the case of the Louisiana irises; chapter 2, the ecological basis of introgression; chapter 3, the genetic basis of introgression; chapter 4, introgression in finite populations; chapter 5, introgression and evolution; chapter 6, special techniques for the study of introgression; and the epilogue, the importance of introgressive hybridization.

It should be noted that Dr. Anderson makes no reference to the difficult problem of criteria for species and generic distinctions, but such works as this and similar contributions will help to lay a sound foundation for the delimitation of such biologic units. Since groups on the species level, and in the case of higher categories, have been proposed in the past by workers with varying educational backgrounds, there is lack of consistency in this field, and this is an important problem which has to be faced by any serious worker in systematics. Dr. Anderson's book is therefore obligatory reading for all interested in systematics, and also for all interested in evolution, genetics, and practical plant breeding.

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Volume 6

[Number 4, October]

1950

SEEDS AND PLANTS DIRECTORY

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