

PLANT LIFE

AMARYLLIS
YEAR BOOK

1966



*Amaryllis
leopoldii*

Hoffm.

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HAMILTON P. TRAUB

HAROLD N. MOLDENKE

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Box 150, La Jolla, California 92038

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ADDENDUM TO TRAUB'S "LINEAGICS"

Published in 1964

Change "Mauterpuis" to "Maupertuis": Page 18, lines 12 and 16; Page 35, middle of page; Page 36, lines 3 and 7 from bottom; Page 37, line 10; and Page 46, lines 2 and 12.

Page 60, after the second paragraph defining the term, *lineagics*, add:

For those who might have difficulty in pronouncing the term, *lineagics*, and variations thereof, it is suggested that the pronunciation is analogous to that of *genetics*:

the discipline:

the practitioner:

genetics (ge-net'-ics)
lineagics (lin-e-ag'-ics)

geneticist (ge-net'-i-cist)
lineagicist (lin-e-ag'-i-cist)

PLANT LIFE LIBRARY—continued from page 128.

NORTH AMERICAN SPECIES OF CREPIDOTUS, by L. R. Hesler and A. H. Smith. Hafner Publ. Co., 31 E. 10th St., New York, N. Y. 10003. 1965. Pp. 168 + duplicate set of figures. Illus. \$12.50. The purpose of this attractive text is to provide an adequate means for identifying the species of *Crepidotus*, a group of fungi which performs an important role in nature, that of reducing dead tops of trees back to humus. The text is presented on the basis of morphological and anatomical characters. Highly recommended.

MONOGRAPH ON THE GENUS GALERINA EARLE, by A. H. Smith and R. Singer. Hafner Publ. Co., 31 E. 10th St., New York, N. Y. 10003. 1964. Pp. 357 + 20 plates. Illus. \$23.50. This outstanding monograph on the genus *Galerina* places this group in its proper perspective in regard to other genera of the gill fungi; and elucidates evolutionary tendencies in the group. This information should be helpful in correlating future discoveries among these fungi. No less than 199 species of *Galerina* are described. Highly recommended.

A GARDENER'S BOOK OF PLANT NAMES, by A. W. Smith. Harper & Row, 49 E. 33rd St., New York, 16, N. Y. 1963. Pp. 428. \$5.95. Sub-titled "A Handbook of the Meaning and Origins of Plant Names", this book is a worth while addition to the gardener's library. In the introductory section, the author briefly discusses the subject of plant classification and nomenclature. This is followed by (1) a list of botanical terms with definitions; (2) alphabetical list of plant names with meanings and origins; in each case the author indicates the root words in Greek and Latin together with the accepted definitions which derive from them, and the preferred English pronunciation; and (3) common name—scientific name index. Highly recommended.

CHEMOTAXONOMIE DER PFLANZEN, Band 3. Dicotyledonae. 1. Teil (from Acanthaceae to Cyrillaceae). (German), by R. Hegnauer. Birkaeuser Verlag, Basel 10, Switzerland. 1964. Pp. 743. Illus. \$ sFr. 123. Volume 2 (Monocotyledonae) of this work was reviewed in the 1965 PLANT LIFE, and Volume 3 of the same work, concerned with Dicotyledones, 79 families from *Acanthaceae* to *Cyrillaceae*, is the subject of the present review. In the introduction, the grouping of the Dicotyledones according to Wettstein, Hutchinson and Takhtaian are considered, and the chemical characters of the Dicotyledones are discussed. The rest of the text is devoted to a detailed consideration of the chemical compounds found in the families from *Acanthaceae* to *Cyrillaceae*. This reference volume belongs in the library of every taxonomist.

TAXONOMIC BIOCHEMISTRY AND SEROLOGY, by Charles A. Leone (editor). Ronald Press, 15 E. 26th St., New York 10 N. Y. 1964. Pp. 728. Illus. \$16.50. The forty-seven papers presented at the International Conference of Taxonomic Biochemistry, physiology and Serology in 1962, are included in this volume. The papers are grouped under seven headings: (1) principles of systematics; (2) perspectives in molecular taxonomy; (3) taxonomic biochemistry of plants; (4) taxonomic serology; (5) comparative biochemistry of animals; (6) taxonomic serology of animals, and (7) molecular taxonomy of microorganisms. This stimulating book is required reading for all taxonomists.

A HISTORY OF SCIENCE: HELLENISTIC SCIENCE & CULTURE IN THE LAST THREE CENTURIES B. C., by George Sarton. (Paperback reprint of the 1959 text); John Wiley & Son, 605 3rd Av., New York, N. Y. 10016. 1965. Pp. 554. Illus. \$2.65. The publication of this fine paperback edition of Sarton's 1959 text, places this standard work on the history of western science and culture in the last three centuries B. C., within the reach of all biologists. Very highly recommended.

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AMARYLLIS

YEAR BOOK

1966

Year Book of
The American Amaryllis Society
32nd Issue

GENERAL AMARYLLID EDITION

EDITED BY
HAMILTON P. TRAUB
HAROLD N. MOLDENKE

THE AMERICAN PLANT LIFE SOCIETY
Box 150, La Jolla, California 92038

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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[THE AMERICAN AMARYLLIS SOCIETY—continued on page 129.]

P R E F A C E

In the 1965 issue, the extreme of irregularity in *Amaryllis* flower form—*Amaryllis cybister*—was featured on the cover. On the 1966 cover, the other extreme, the most regular *Amaryllis* flower form—*Amaryllis leopoldi*—is displayed; for which the members are greatly indebted to Prof. Penrith Goff, of the Modern Language Department, University of Kentucky, Lexington, Ky.

The 1966 issue is dedicated to Mr. Leon Boshoff-Mostert of Klein-skuur, Balfour, South Africa, who received the 1966 WILLIAM HERBERT MEDAL AWARD for his outstanding contributions in the fields of *Amaryllis* breeding and culture over the past two decades. Mr. Boshoff-Mostert contributed informative articles on *Amaryllis* breeding in past, and two reports on vegetative propagation of *Amaryllis* in the 1965 issue. In the present edition, he contributes an interesting autobiography, and *Amaryllis* reminiscences. For these contributions all of the members are grateful, and congratulate him on the receipt of the HERBERT MEDAL.

The Blossfelds of Brasil contribute brief biographical sketches; and Mr. Blossfeld writes of *Worsleya rayneri* in its native habitat.

In addition to the articles just indicated, Dr. Joseph C. Smith reports on a new dwarf *Amaryllis*, and also a new *Rhodophiala* species, collected by Dr. Rueppel in Argentina; Mr. Buck writes about additional *Amaryllis calyptrata* hybrids; Mrs. Herold on the rediscovery of *Amaryllis vittata*; Mr. Latapie on a new near-white double *Amaryllis*; Mr. Fesmire on breeding *Amaryllis* that bloom the year 'round; Mrs. Tebben on *Amaryllis* in Florida; Mr. Grubbs on *Amaryllis* in the Pacific Northwest; Mr. Schafer on *Amaryllis* in the North; Mr. Sudd on growing *Amaryllis* from seeds under artificial light; Dr. Corliss on germinating *Amaryllis* seeds in water; and Mr. Goedert on the 1964-1965 *Amaryllis* season.

Mr. Hannibal writes about *Crinum* clone 'Cecil Houdyshel'; *Crinum* clone 'Gulf Pride'; and the Santa Catarina Island *Crinum moorei*; Mr. Clouette on the growing of *Worsleya rayneri* from seeds; Mr. Beckwith D. Smith on growing amaryllis in North Florida; Dr. Jackson on cell division in *Haemanthus*; Mrs. Menninger on her *Nerine* breeding project; Mr. Gallagher on *Nerines* in England; Mr. Hannibal on *Nerine undulata*; Mr. Buck on *Hemerocallis*; Dr. Flory on the chromosomes of *Rauhia peruviana*; and Dr. Wilsenach on chromosomes of South African amaryllids.

Dr. Howard reports on his 1965 Mexican plant exploration trip; Mr. Authement explains the details for arranging *Amaryllis* exhibitions; Mrs. Pickard writes about judging *Amaryllis*; and there are reports on the 1965 *Amaryllis* shows.

There are descriptions of the new large white-flowering *Crinum brasilense*; and the new light primrose yellow *Crinum luteolum*. And there are other contributions as shown by the table of contents.

Contributors to the 1967 issue of the AMARYLLIS YEAR BOOK are requested to send in their articles by August 1, 1966, in order to insure

earlier publication of this edition. Unless articles are received on time, publication will again be delayed to June or July or even later as with some issues in the past. Your cooperation toward earlier publication will be greatly appreciated.

*December 15, 1965,
5804 Camino de la Costa,
La Jolla, California 92037*

*Hamilton P. Traub
Harold N. Moldenke*

PLANT LIFE LIBRARY—continued from page (vi).

INTRODUCTION TO PALEOECOLOGY, by R. F. Hecker (English translation from the Russian), edited by M. K. Elias and R. C. Moore. American Elsevier Publ. Co., 52 Vanderbilt Av., New York, N. Y. 10017. 1965. Pp. 166. Illus. \$7.50. This enlarged and updated edition of Dr. Hecker's outstanding text on paleoecology will be welcomed by American students and specialists in paleontology and geology. The topics discussed include (1) the history, objectives and methods of paleoecology; (2) field observations; (3) field collecting; (4) preparation of materials; (5) graphic illustrations; (6) photographic documentation of field observations; and (7) paleoecological exhibits. Highly recommended.

THE EVOLUTION OF BIOLOGY, by M. J. Sirks and Conway Zirkle. Ronald Press, 15 E. 26th St., New York 10, N. Y. 1964. Pp. 376. Illus. \$6.00. The objective of the twelve chapters of this book is "to survey the developmental phases through which biology has passed" from prehistoric times, to the first civilizations, the Greco-Roman period, the Middle Ages, early and later Modern times and on up to the attempts to break the genetic code in our own day. This fascinating book is highly recommended.

PLANT ANATOMY, 2nd edition, by Katherine Esau. John Wiley & Sons, 605 3rd Av., New York, N. Y. 10016. 1965. Pp. 767. Illus. \$14.50. In this timely second edition of a standard text by an outstanding authority, the objective indicated in the first edition, to bring together "in a comprehensive form, the substance of a course in the anatomy of plants" is maintained. However, due to the great expansion of biological research, the revision is needed in recognition of "the change in emphasis and in the direction of interest." The topics discussed include the plant body, the protoplast, the cell wall, meristems and differentiation, apical meristems, vascular cambium, epidermis, parenchyma, collenchyma, sclerenchyma, xylem, phloem, secondary structures, the periderm, the stem, the leaf, the root, the flower, the fruit and the seed. This book belongs in the library of all interested in plants.

THE CYTOPLASM IN HEREDITY, by D. Wilkie. John Wiley & Sons, 605 3rd Av., New York, N. Y. 10016. 1964. Pp. 115. Illus. \$3.50. In this book by an outstanding authority, a concise account of the cytoplasmic factors in heredity are discussed. The author evaluates the evidence from biochemistry, cytology and genetics for the functioning of genetic systems outside the chromosomal apparatus, particularly the cellular organelles. This stimulating book belongs in the library of every biologist.

A HISTORY OF SCIENCE; ANCIENT SCIENCE THROUGH THE GOLDEN AGE OF GREECE, by George Sarton. (Paperback reprint of the 1952 text); John Wiley & Sons, 605 3rd Av. New York, N. Y. 10016. 1964. Pp. 646. Illus. \$2.65. The appearance of this excellent paperback edition of Sarton's 1952 text, places this standard work on the early history of western science through the 4th century B. C. within reach of all biologists. Very highly recommended.

PLANT LIFE LIBRARY—continued on page 24.

DEDICATED TO
LEONARD HELDENMCCED BOSHOFF-MOSTERT

TRAUB—AMARYLLID NOTES, 1966, continued from page 62.

Urceolina urceolata var. *fulva* (Herb.) Traub, *comb. nov.* Syn.—*Urceolina fulva* Herb., Amaryll. 194. 1837; *Urceolina pendula* var. *fulva* (Herb.) Bak., Amaryll. 109. 1888.

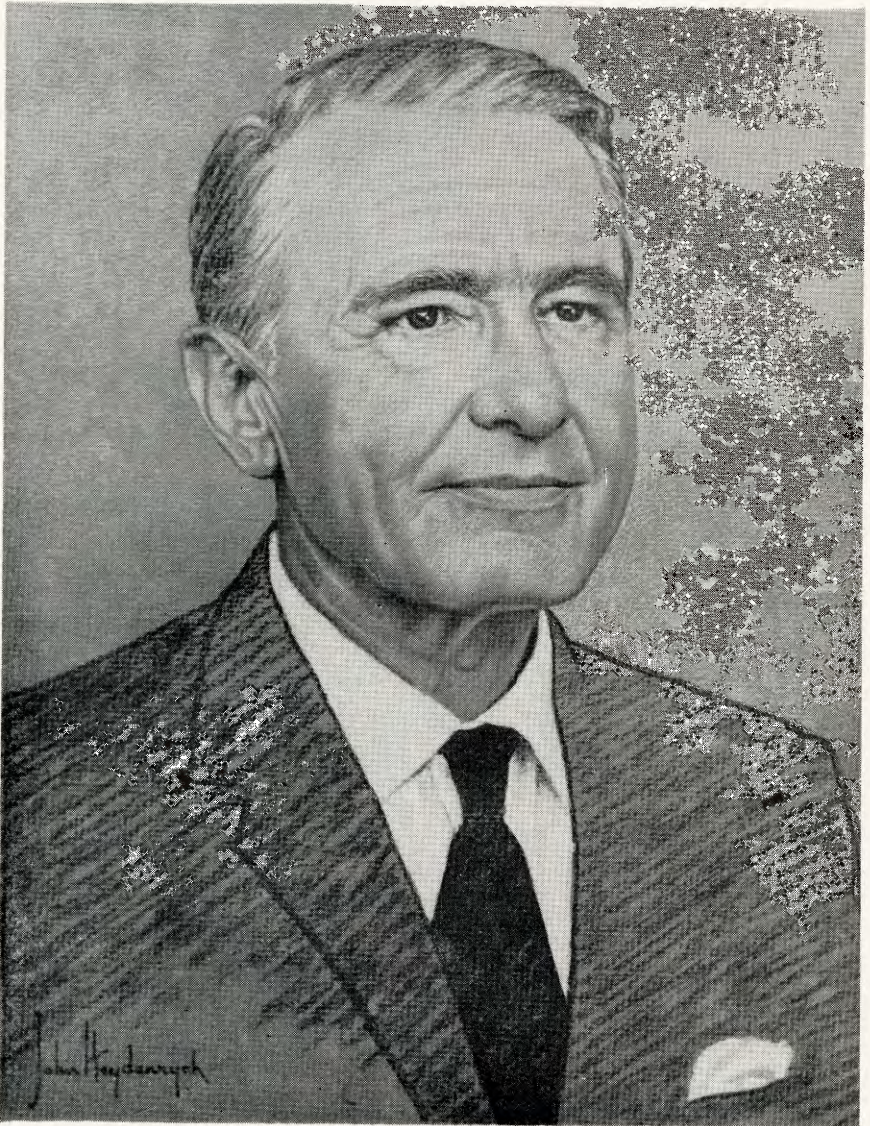
Raubia megistophylla (Kraenzl.) Traub, *comb. nov.* Syn.—*Phaedranassa megistophylla* Kraenzl., in Engl. Bot. Jahrb. 54, Beibl. 17: 2—3. 1916; Plant Life 21: 101. 1965; *Raubia peruviana* Traub, Plant Life 13: 73—75. 1957.

Notes.—Herbert, in Amaryll. 1837, *numbered* the genera which he accepted (see "Introduction" to facsimile 1966 Reprint, Herbert's "Amaryllidaceae", 1837). The generic name, "Callithauma? Herb.", Amaryll. 225. 1837, "not sufficiently known to enable a perfect generic character", was not numbered, and was thus not accepted by him as of that date (Code, Art. 34-1). Under it he listed "Callithauma? viridiflorum Herb." Amaryll. 225. 1837, based on *Pancratium viridiflorum* R. & P., with the notation that "It is barely possible that it may be an *Ismene*, but very improbable." This was later recognized as the type of a validated *Callithauma* Herb. Herbert also listed "Callithauma?/?spatulatum Herb." Amaryll. 225. 1837, with the notation, "It is probably of a separate genus." Of this he had seen only the bulb and leaves (no specimens preserved), and he could make only a guess (incorrect) as to the flowers; thus listing it in anticipation of its future acceptance as a group, and also of a particular circumscription and rank (Code, Art. 34-2). Thus it was not validly published. *Phaedranassa megistophylla* Kraenzl. (1916) was the first description based on the bulb, leaves and flowers of a plant with similar leaves, and this is the validly published epithet of the species.

EMEND. ET CORRIG.

"Genus *Lepidopharynx* Rusby" and "*L. deflexa* Rusby" in Mem. N. Y. Bot. Gard. 7: 214—216 (*pessime*), Fig. 1 (*pessime*). 1927, are hereby reduced to *Amaryllis* L. 1753, and *A. cybister* (Herb.) T. & U., respectively (see Traub, Gen. Amaryll. 77. 1963).

Rusby's description and figure were based on a distorted conception of *A. cybister*, particularly (a) the shape and disposition of the tepalsegs, and (b) the stamens and style. The former should have been indicated as quite irregular (zygomorphic), and the latter as fasciculate, declinate-ascending.



HERBERT MEDALIST—LEONARD HELDENMOED BOSHOFF-MOSTERT

LEONARD HELDENMOED BOSHOF-MOSTERT

AN AUTOBIOGRAPHY

My interests in life have always been and, to some extent, still are many and varied. In the field of sport, athletics and rugby gave way to golf and, ultimately, this game was ousted by the first sport and recreation which has been entrenched since my childhood—angling. I still take part in all facets of angling and regularly represent my Province in the annual South African Angling Championships. It was, however, in deep sea game-fishing that, in 1962, I was elected to the three-man team to represent South Africa at the International Contest at the Bahamas. As a dog breeder, I can boast of a few South African Champions and my name appears on the South African Kennel Union's schedule of accredited S. A. Championship judges. I am Past President of the Transvaal Anglers Union, Honorary Life Member of the Witwatersrand Kennel Union, of the Iscor Recreation and Social Club of which I was a founder and of the Iris Society of Southern Africa of which I was also a founder and first Secretary. In the cultural sphere, I am the holder of seven medals for elocution and a couple for singing—all awarded in open competition at our National Eistedfodd. As far as civic honours are concerned, these were not earned, but purely fortuitous, when I was awarded the Honorary Citizenship of New Orleans and also the Keys of the Cities of Corpus Christi (Texas) and Sacramento (California).

But of all I have ever realized, including the thrill at the sight of a new break amongst a batch of *Amaryllis* seedlings coming into bloom, the crowning glory of my life was the news that I had been awarded the William Herbert Medal for 1966.

It was under the British flag, during the reign of Edward VII, that I first saw the light of day. The date was December 28, 1909, seven-and-a-half years after the conclusion of the Anglo-Boer war and five months before self-government was granted to the four Provinces at the tip of South Africa, then under British rule. The place of my birth was the farm Manana in the district of Lichtenburg, at the time still a small rural town in the Western region of Transvaal, which is the most Northern of the four Provinces of the Republic of South Africa.

Little could anyone have known that, as a toddler, I played and romped with bare feet on ground which, within two decades, was to become a segment of the world's most fabulous alluvial diamond digging complex. Even less could I have dreamed that, seventeen years later, as a school champion miler, I would run in seven of the many diamond rushes, in one of which, with burning chest and aching limbs, I found myself in the company of international athletes imported to lead a field of just over 27,000 exhausted peg-bearing runners.

I was the third son to be born to a young couple, barely four years previously wedded. My eldest brother, who holds a high executive post

in Barclays Bank, was named after my paternal grandfather, whilst the middle brother, one of South Africa's leading poultry breeders, was given the name of my maternal grand-father. There being no more grand-fathers to honour, I was named for a stranger held in high esteem by my father, but whom I have never met. He was a Hollander, not even naturalized, who fought against Britain in then the costliest of all her wars, on the side of a hand-full of unprepared and ill-equipped Boers. This man shared a tent with my father during their enforced furlough as prisoners of war in Burmuda. His name was Leonard Heldenmoed and, although I have been called Leon from my babyhood, those are the names that my parents caused to be inscribed on my baptismal certificate. I have often wondered whether, in naming me thus, the deep affection towards a friend was tempered with a father's challenge to his last born, for the names imply "Heart of a Lion" and "Courage of a Hero". I am proud of the names and their origin, but I regretfully have to admit that I cannot lay claim to either of the qualities they convey!

My father was a school teacher who successfully devoted as much time and energy to his manifold gardening activities, as to his academic profession. Wherever we lived, the Boshoff garden, in which we all had a share, was always an object of family pride and a subject of envy on the part of neighbours. My mother was a woman of high intellect and dynamic personality with a forceful and ambitious character and was known throughout our country. She was an authoress and a writer for several newspapers and journals. As a leader of her sex, she served on executive committees, often as chairwoman or secretary, of various charitable, church, political and other commendable women's organisations. Even at the time of her death in 1954, after a widowhood of ten years, she held office as Honorary President of the Women's Nationalist Party of the Witwatersrand.

Four years before I finished high school, thought had to be given to the provision for University training of three sons, a somewhat futile endeavour on the salary of a primary school teacher. My father, with a view to better financial prospects, decided to retire from teaching and to commute his pension in order to start up a coal business. In this he was encouraged by his wife and three sons, none of whom, no more than he, was aware of his lack of business acumen. The undertaking was a failure.

In my final examinations, my school led the field in the Transvaal with four first class matriculation passes. University for me, however, in spite of my scholastic success and the offer of three minor burseries, was not to be. After leaving school at the age of seventeen, I embarked upon a banking career in 1927 in the footsteps of my two brothers.

In 1932, after not having seen or heard of each other for five years, I met an erstwhile school friend. During our school years we had nothing in common, other than that we were of the same age and in the same form where she was regularly first in the girls' class, whilst I invariably maintained a similar position in the boys' class. She was

then reading medicine at the University of the Witwatersrand in Johannesburg, where I worked in the Bank.

Her father, the late A. M. Mostert, was a farmer in the corn belt on a 19,000 acre estate, a few miles from the little town of Balfour which is situated 50 miles South-East of Johannesburg. I was often invited to spend week-ends on the farm and Frieda and I soon found that we had so much in common that we decided to become formally engaged. Among his many financial and industrial interests, such as being on the South African Board of Directors of Barclays Bank, Mr. Mostert was also Vice-Chairman of ISCOR (South African Iron and Steel Corporation), then in the course of erection at Pretoria, the administrative Capital of South Africa.

Frieda Mostert, the fourth of a family of seven children, sacrificed her medical career and we were married in May, 1933. I then resigned from the Bank in spite of rapid advancement and a promising future, to fill a "ground-floor" post at ISCOR as personal assistant to the first General Manager, at the age of twenty-three-and-a-half years. The commercial experience gained in the Bank, combined with the knowledge acquired through my studies to pass my Bankers' examinations, stood me in good stead in the new job. In addition, I was a proficient shorthand-typist, having attended night classes at the Johannesburg Business College for that training, after passing the final Bankers' examination. During my years at ISCOR, where I had the advantage of being one of the "early starters", I held various senior posts, including that of Assistant Secretary.

My wife's father died in 1939 and in his will left us a portion of his estate, measuring about 2,500 acres. Provision was made for the erection of a suitable home for us on our portion which we have named "Kleinskuur", meaning "Small Barn". We were left a modest but secure cash income for life. Provision was also made for all costs involved in the high school and university education, including overseas studies, for our children of whom there are three. Magda was born in 1934, Ida in 1936 and our son Andries in 1940. The girls are both married and we are the proud grand-parents of five girls and four boys.

Mr. Mostert stipulated in his will that we had to occupy the farm left to us "permanently and beneficially" within a specified period, which entailed my abandoning yet another promising career. I gladly and proudly reacted to his wish, legally to assume his name, which was added to my own as a suffix. This I interpreted as a singular compliment coming from one of South Africa's great men. At the end of 1940 I left ISCOR and we settled on the farm.

During the ensuing year and the few years following, all manner of war-time legislation, emergency measures and control regulations came off the government press in regular flow. The Chairman of ISCOR, the late Dr. H. J. van der Byl, was appointed Director-General of Supplies and strict measures of control were instituted over all industries and essential commodities, strategic as well as civilian. At the instance of Dr. van der Byl, the "permanent occupancy" clause of the will was

waived and I was temporarily recalled to service in Johannesburg in February, 1942 to assist in the establishment of the Iron and Steel control office, on the understanding that I would be released towards the end of that year. For nine years, apart from an occasional vacation, I was to see my family only during week-ends.

As the months rolled on, I became progressively more involved in the ramifications of the Supplies Organisation and it soon became evident that my commission was developing into anything but a "temporary expedient", as was originally envisaged. As regards Kleinskuur, suitable arrangements were made, under the able direction of my wife, for two farmers to work the land on a share basis, whilst she personally took charge of our herd of Aberdeen Angus cattle and the many farming side-lines. In addition to those multiple responsibilities, my wife found time and energy to add to the nucleus of her imported *Iris* collection which, within the following ten years, developed into not only the first, but also the largest commercial undertaking of its kind in the country. At the same time, she built up a substantial collection of *Hemerocallis*.

Meanwhile, I had interested myself actively, whenever time permitted, in my wife's horticultural endeavours. The sight of about a thousand different named varieties of imported *Iris* in bloom was an impelling inspiration. I required little, if any, encouragement to take part, under her guidance, in my wife's annual "operation pollination". I made time, even by artificial light in the evenings, to prepare seed-pans and to plant seeds as they matured. It was, indeed, a proud day when my own creative efforts, some years later, unfolded the beauty of their first blooms.

Whilst during week-ends and the odd spell of vacation, I was thus paving my way towards an ultimate partnership in my wife's *Iris* and *Hemerocallis* nursery, I lost my heart to *Amaryllis*, of which my mother-in-law had a small but attractive collection. She gave me some clones which I cherished, nurtured and admired above all flowers. I obstinately closed my ears to the persistent little voice of conscience reproving me for my divided loyalty. There was, however, no rebuke forthcoming from my *Iris* breeding wife and *Amaryllis* tenaciously prevailed over conscience!

Fate played into my hands in 1947 when my wife received an order for her newest and best *Iris* from the late Mr. A. C. Buller of Stellenbosch in the Cape, then generously acknowledged as the *Amaryllis* King of South Africa. His cheque was returned and in lieu of payment for the *Iris*, my wife arranged with Mr. Buller to send her some *Amaryllis*, a substantial parcel of which arrived in August of the following year. This was the first of many consignments, of what Mr. Buller termed the cream of his collection, to come to Kleinskuur.

Reams can be written on the close association that subsequently developed between Mr. Buller and myself, on our reciprocal visits to each other over a distance of almost a thousand miles and on the knowledge I gained through his instruction. His wish was that I should

carry on with the breeding of *Amaryllis* where he had decided to retire, after having worked on the Buller strain over a span of fifty years. My own breeding efforts started with my first crosses in 1948.

By the end of 1950, when I was finally released from the Supplies Organisation to join my family, I had held office at one time or other, as Controller of Iron and Steel, Secretary of the Controllers' Executive Committee (the co-ordinating body of the 16 Commodity Controllers), Secretary of the Board of Supply (which formulated policy), Member of the Cabinet Building Advisory Council, Assistant Secretary to the Director-General of Supplies, Assistant Director of Imports and Exports, and Secretary to the American Lend-Lease Mission during its stay in South Africa for final settlement of accounts.

When the news of my retirement became known, I had various offers of attractive and lucrative posts. I succumbed to temptation and accepted one of these offers, being a directorship at a salary of 50% higher than that which applied to the post I relinquished. In the new office, I had infinitely more time and freedom to devote to the development and improvement of my *Amaryllis* collection which grew to such proportions that, by the end of 1954, it demanded my undivided attention. It was then that I finally came to Kleinskuur, permanently to join forces with my wife. Our son who studied agriculture, with a brilliant College record, later became the third member of the Kleinskuur team and has taken charge of the general farming operations, which he manages most adequately and efficiently.

With gratitude and humility I must record that my wife, who knows more about my *Amaryllis* than I do about her *Iris* and *Hemerocallis*, has been my inspiration in all that I have ever achieved. But this notwithstanding, I want to believe that, by my own efforts in some measure, I have done justice to the confidence which Mr. Buller had placed in me and, more important still, to the great honour bestowed upon me by the Board of Directors of the American Plant Life Society.

THE BLOSSFELDS

BIOGRAPHICAL SKETCHES

On request of Dr. Hamilton P. Traub, I am submitting a short report on our life and work in South America, to the readers of the *Amaryllis Year Book*.

Born in 1913 in Potsdam, Germany, the writer is descended from a horticultural family; both his grandfathers were growers and his father was an orchid specialist before he started his seed business. He introduced, among others, *Kalanchoe blossfeldiana*. After my horticultural apprenticeship, I entered the Botanical Institute of Berlin-Dahlem as a student of botany. After a few years, I interrupted studies for a planned six-months expedition to South America. Seven months

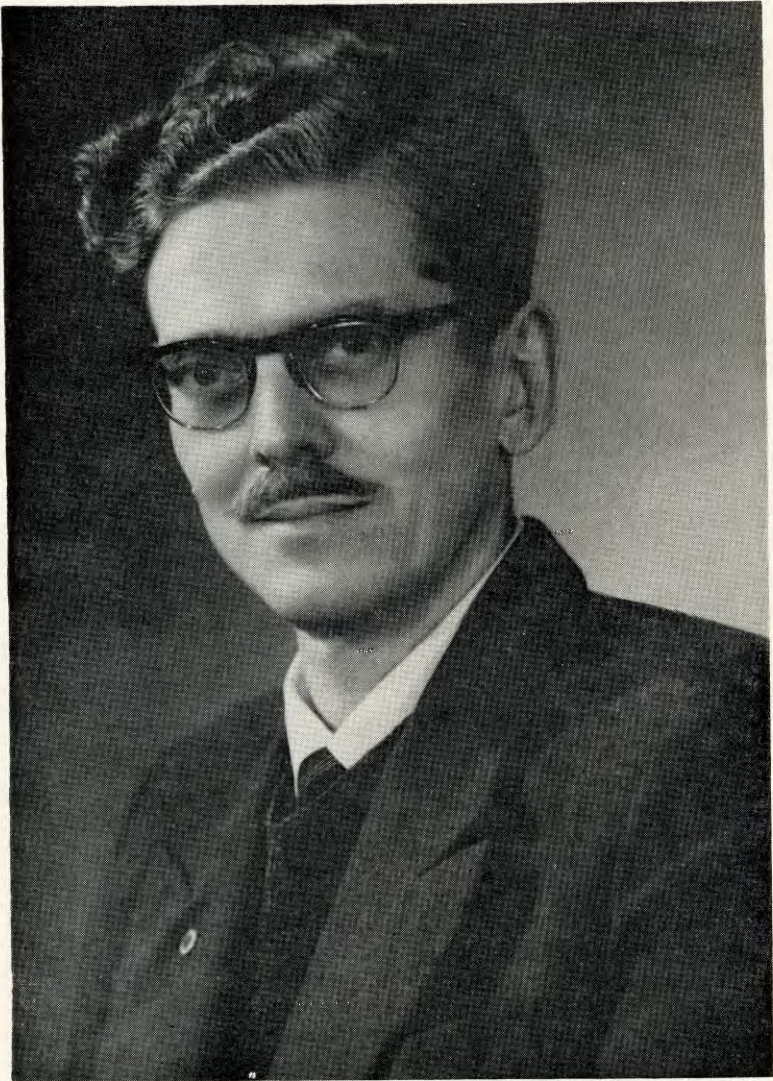


Fig. 2. Harry Blossfeld in 1964

were spent in the Andes Mountains of Argentina, mostly in search of cacti. The plants shipped back proved very valuable—many new species were among them—so that funds were offered from private col-



Fig. 3. Mrs. Anita Blossfeld

Engaged in field work near Sao Paulo, Brasil, she holds a bouquet of ***Neomarica caerulea***.

lectors and commercial growers, for more material. A year was spent in Bolivia, Peru and Chile and a third collecting trip led through Uruguay, Paraguay and Brazil.

Since my return to Germany seemed unadvisable due to the imminence of war, and having contracts for collecting orchids in Brasil, I decided to establish myself as a plantsman in São Paulo, Brasil, where I have lived for the past 27 years.

Here I met my wife, Mrs. Anita Blossfeld. Her family came from the Baltic States. My father-in-law had been a collector of medicinal herbs in the Caucasus, so that my wife got her inclination for botany early in life. We started collecting orchid species and grew them for sale to local amateurs. Most of the money earned was spent in collecting trips; we never had any official subsidy, though we sold and exchanged plants and seeds with many official institutions all over the world. Besides orchids, we always brought home from our travels, many other plants, including Gesneriads, Bromeliads, Begonias and Amaryllids.

After my last trip through Peru, Ecuador and Colombia, I returned seriously ill and have suffered from bad health for about twenty years. Forced to stay home, I started writing for Brazilian agricultural periodicals, and I also wrote a few books on horticulture. My wife began to make trips and made several large and very successful plant collecting trips to Argentina, Peru, Bolivia, Ecuador and Columbia. She developed a special interest in Aroids and brought home a fine assortment of *Philodendron* and *Anthurium* species. For her collecting work, she was awarded the SESQUICENTENNIAL SILVER MEDAL of the Rio de Janeiro Botanical Garden.

With regard to *Amaryllis*, my first field contact was during my work in northern Argentina, where I discovered a wild colony of *Amaryllis immaculata* and shipped a consignment of the bulbs to Holland. This species had disappeared from cultivation. During our collecting trips in Brazil, both my wife and I have gathered a number of species, including *Amaryllis aulica*, *A. psittacina*, *A. calyptrata*, *A. striata* and its varieties, *A. morelinana* and *A. reticulata*. We distributed seeds of these, until a severe freeze and a caterpillar pest (*Xanthopastis timais* Kr.) eliminated our stock. We also localized a colony of *Worsleya rayneri* in the Organ Mountains and have been distributing seeds of this species which is the famous and rare "Blue Amaryllis". Some observations on this subject will follow.

Harry Blossfeld

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NOTES ON WORSLEYA

HARRY BLOSSFELD, *Tremembé, São Paulo, Brasil*

HISTORY—The famous “Blue Amaryllis” was discovered by the French horticultural collector Joseph Libon, in the Organ Mountains, west of Rio de Janeiro, Brasil, about a hundred years ago. Libon was pretty sure that he had found a new plant and showed it to Glaziou, director of the National Museum, who sent herbarium material to France.

Tradition is, that Glaziou also arranged an audience for Libon, with her majesty, the Empress of Brasil, at which opportunity the collector offered a few freshly gathered flower stems of the “Blue Amaryllis”. The plant, from that time on, became known in Brazil by the popular name “Flor da Imperatriz”.

A little later, 1863, the new plant also got its first scientific name from the french botanist Duchartre: *Amaryllis gigantea Duch.* Though certainly an appropriate name for an *Amaryllis* five feet high with bulbs up to ten pounds in weight, it proved to be void, because another plant, which we now know as *Brunsvigia Josephine* Ker Gawl. had previously been described by it. The author himself recognized this fact and in the same year, changed the name of the “Blue Amaryllis” to *Amaryllis procera* Duch.

Libon had shipped a consignment of these bulbs to his patrons, the horticultural establishment of De Jonghe, of Brussels, Belgium, who showed the first flowering specimens at a horticultural exhibition, creating quite a sensation at that time. More plants were ordered, but Joseph Libon had perished in the jungles of Minas Gerais, during an orchid collecting trip. The “Blue Amaryllis” had been one of his last discoveries, and certainly not the least. As early collectors generally did, Libon had kept secret the place where he had found the plant and consequently, it disappeared from cultivation for some time.

It was found again by Pedro Maria Binet, a horticulturist established in Brazil. On each of his numerous travels to Europe, he carried a few bulbs of the “Amaryllis Imperatrice du Brésil” with him, selling them at fancy prices in France or Belgium. But always these bulbs flowered but once and then dwindled away, no matter how careful the treatment given to them. They were treated as other *Amaryllis* and forced to compete dormancy in winter in spite of the fact that the species is naturally evergreen. Trials to cross it with other *Amaryllis* species failed, and thus the plant remained a rare curiosity for a long time.

On a botanical excursion through the Organ Mountains, the writer and his wife met with the “Blue Amaryllis” and we gathered bulbs and seeds. Also we have grown about one hundred bulbs in our garden for a few years and thus had the opportunity of observing them. We have visited the natural stands frequently and at various seasons of the year. Some facts that seem to have escaped previous students will be exposed here.



Fig. 4. *Worsleya rayneri* in its native habitat—the Organ Mountains in Brasil. Left, natural stand, with immature seed pods on flattened scapes. In the foreground, a dwarf *Vellozia* shrub. Right, Natural stand as it grows in the Organ Mountains. Note the steepness of the rocky ground and the prevailing fog during the morning hours when this photo was taken.

HABITAT CONDITIONS.—*Worsleya rayneri* (Hook.) Traub & Moldenke grows within the tropic belt, but at elevations between 3000 and 4000 feet above sea level. (Fig. 4) The latter fact reduces considerably the theoretical average temperature for the habitat in that latitude. On the other side, it causes the plant to be exposed to accentuated extremes of heat, during exposure to intense sun rays, and of cold, due to heat radiation by night and exposure to cold winds. During some of the coldest nights of our mid-winter (July) temperature may approach the freezing point.

The plants grow on almost bare rocks, that have an inclination of about 30 to the horizon, sometimes up to 60, facing a northern direction, that is in the Southern Hemisphere, fully exposed to the sun. They do not receive shade from other vegetation, which is extremely scant. But they are cooled by an incessant air movement at their lofty place. Where this is lacking, the plants will require some shade.

Worsleya grows in patches, sometimes of several dozen specimens in a dense stand, but mostly in narrow rows in a natural crevice of the granite boulders that otherwise have very smooth surfaces. The summits of these enormous rocks are mostly clad with a crown of trees and shrubs that act as condensers of the air humidity. The accumulated vegetable mould of this forest patch therefore oozes out a little water that trickles over the rock surface below, drenching the *Worsleya* roots. During heavy rains, some soil and dead leaves are washed down and accumulate along the rows of the bulbs, thus creating a turfy soil layer, sometimes ten inches thick. On these, seeds of *Worsleya* germinate and form increasing clusters of plants.

On sunny days, the water supply from above stops and the rock surface during the afternoon gets so hot, that one cannot touch it; the air trembles and the rock steams. Even during the night, the accumulated heat radiates from below, so that the *Worsleya* roots stay always moist and warm, even while their leaves may be exposed to temperatures between 40 and 50 F.

Such extreme conditions of heat and cold, scorching sun and water-soaked soil, cannot be endured by many plants. Companions are few and odd; A small terrestrial orchid with cinnabar red flowers, *Laelia cinnabarina* Batem. with narrow, succulent bulbs and thick perpendicular leaves, and another rare orchid, *Phragmopedilum vittatum* Rolfe, are noteworthy, A. Vellozia species with triangular stems and narrow leaves arranged in vertical rows, thus shading mutually, is rather common. A giant Bromeliad, *Vriesia imperialis* Carr. withstands the conditions because it has a proper cooling system; it stores five gallons of water between its sheathing leaves, which are covered by a glaucous wax coat above. The *Worsleya* leaves withstand the fierce sun, because they hang vertically and they too have a pruinous wax cover. On limbs of the forest trees on the top of the stone mountains, and epiphythical cactus is found: *Schlumbergera Russelliana* (Lam.) Br. & R. All these mentioned companion plants are considered by botanists as outsiders within their respective families or remnants of primitive evolutionary

stages. To such strange plants, *Worsleya* is a worthy companion, a sort of "living fossil" of the *Amaryllis* family, unique in some respects.

TAXONOMY.—as above mentioned, the "Blue *Amaryllis*" was first named *Amaryllis gigantea Duchartre*, soon changed to *Amaryllis procera Duchartre*. But this name too could not be maintained, because there existed a plant previously named so by Salisbury; this is now known as *Crinum erubescens* Ait. The next following description of the "Blue *Amaryllis*" appeared in 1771 when J. D. Hooker named it *Amaryllis rayneri* J. D. Hook. In 1943, Traub and Moldenke created a new genus to accommodate this plant, separating it from the genus *Amaryllis*. Hence its name became *Worsleya rayneri* (J. D. Hook) Traub & Moldenke.

The reasons for the establishment of a new genus "*Worsleya*" were as follows:

(a) The existence of four spathe-valves enveloping the flower buds of *Worsleya*, while all *Amaryllis* have only two spathe-valves; (b) Seeds D-shaped, with unequal thickness of inner (straight) and outer (curved) edges; (c) Gestation period relatively long—up to five months, and (d) Leaves sickle-shaped.

And to these should now be added the fact that *Worsleya* has a basic chromosome number of $X=21$ (somatic $2n=42$) as contrasted with a basic number of $X=11$ (somatic numbers $2n=22, 44, 66$) in *Amaryllis* L. (see Flory & Schmidhauser, *Plant Life* 19: 56057. 1963.)

DISCUSSION.—(1) Spathe valves four. This argument is unquestionably valid, it has been interpreted as evidence of a primitive stage of evolution.

(2) "Seeds D-shaped, the inner edge 0.5mm thick, the outer about 1 mm thick, somewhat sunken and wrinkled between the margins and the side walls."—This argument is equally valid, but may be extended.

Fig. 5 (1) shows a fully ripe pod of *Worsleya rayneri* seen from the side. Fig. 5 (2) and Fig. 5 (3) show the form of the seed. At "C" is visible the reinforced, wrinkled dorsal wall. Fig 5 (3) shows a cut through a normal seed, showing that the embryo occupies practically the whole volume of the seed. This is an important criterion since most other *Amaryllid* seeds have a small embryo surrounded by a large, sometimes almost hyaline or papery wing. Fig. 5 (5) shows a *Worsleya* pod, seen from above, fully ripe, but still closed. At "D" are the points where it will start splitting. The three locules contain each two dense rows of closely packed, rather thick seeds, forced to shape into the typical D-form because they will not interpenetrate the divisionary line of their sector. Attention is called to the thick, fleshy walls of the pod.

When by imperfect fertilization, only few seeds are developed in a *Worsleya* locule, these sometimes occupy the whole space of the locule and then become perfectly orbicular. Also the uppermost and lowermost seed of each locule have a partial orbicular form, one side convex and the opposite side plane.

For comparison, in Fig. 5 (6) is shown a pod of *Amaryllis aurilica* Ker Gawler shortly before ripeness. At "D" are the points where it will

split. The seeds of each locule here are equally set in two rows, but they have papery thin wings which overlap mutually. This can happen, because the embryos occupy only the center. In most *Amaryllis* pods, seeds therefore have an oval or oblong shape. Attention is called to the thin walls of the typical *Amaryllis* pod.

(3) "Gestation period relatively long, up to five months." The above observation certainly has been made under conditions of the Northern Temperate Zone, but will not yet come true in the tropics. Normal gestation period of *Worsleya* is about ten weeks. The writer has observed in Brasil, an almost perfect coincidence of flowering and seed ripening between *Worsleya rayneri* and *Amaryllis aulica*. But there is a decided difference between the two genera in the delay normally occurring before the pods empty all the seed they contain. Due to the thick walls of the capsule, as shown in Fig. 5 (5), and owing to a strong reinforcement of the bottom, shown in Fig. 5 (1) at "A", *Worsleya* pods open slowly and only to an angle of 30°. This delays dropping out of the seeds. In nature, they are mostly withdrawn by birds. When the *Worsleya* pod cracks, all its seeds are already perfectly ripe and jet black, but it may take two months, before the pod is empty.

As shown in Fig. 5 (6), the foliaceous seeded *Amaryllis* species have pods with thin walls which become quietly and completely dry on ripening. The locules then rapidly fold back to an angle of 90°, exposing the winged seed to the wind. As they are interleaved, each seed detached is likely to unfasten its opposite neighbor, so that the process of emptying a pod is a matter of a few days only.

Worsleya seeds are much too heavy for wind dispersal. Their average weight is about 7.5 grams per hundred, so that approximately 400 seeds weigh one ounce. A large part of the seeds simply drop out of the pods by gravity, but the lower parts of the rocks, where they finally might germinate, is clad with dense vegetation, so that *Worsleya* has very little chance of survival there.

A small sort of parrot, that lives in bands, can frequently be observed withdrawing *Worsleya* seeds from the ripe pods. On the least disturbance, the whole band bursts upon wing, each bird carrying a seed in its beak, which is eventually dropped during the flight. This fact explains, how *Worsleya* may grow high up on the cliffs, where they are completely out of reach, clustering at quite inaccessible spots.

(4) "Bulbs with an extremely long aerial neck." This feature is conspicuous in *Worsleya*; some of the largest specimens are five feet high, of which three feet belong to the neck. As to the taxonomic importance, the matter is of subordinate value, because it refers to the vegetative organs of the plant and not to its reproductive parts. It may be mentioned, that *Crinum Moorei* Hook. f. has an equally conspicuous long aerial neck and nobody would think of separating it for that from its genus. However, when taken in connection with the other features, it helps to characterize the genus.

(5) "Leaves sickle-shaped". This again is a fine distinguishing feature of *Worsleya*, unique in the whole family, but for the reasons above mentioned, its taxonomic value is of a collateral order. It may

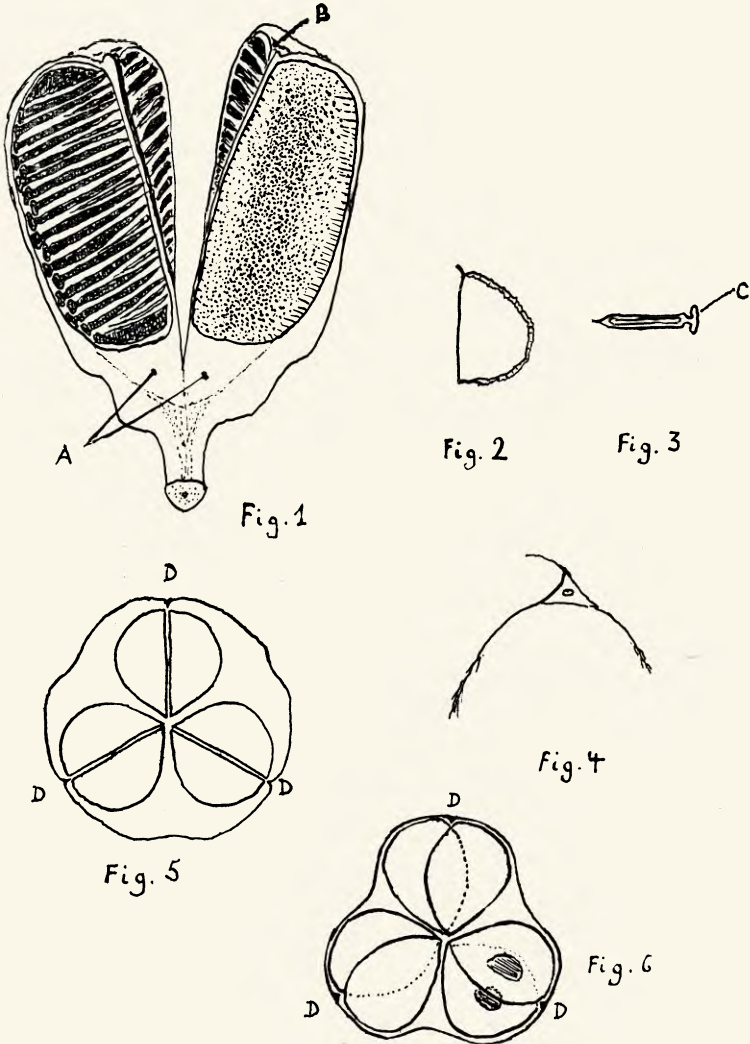


Fig. 5. *Worsleya rayneri* capsule and seeds. See text for explanations.

be added, that by the normally inclined position of the aerial neck of *Worsleya* bulbs and by the sickle-shape of their leaves, the blades are kept in a vertical position throughout their length, which is an efficient



Fig. 6. The Blue Amaryllis, *Worsleya rayneri*, in flower. Left, in the Organ Mountains, Brasil. Right, under cultivation in the Blossfeld garden in Sao Paulo, Brasil.

protection against sun-burn. Furthermore, the blades have a narrow, cartilaginous border of brownish red color. They are distinctly parallel nerved by alternating lines of light and darker green and they are covered by a glaucous wax cover that repels water.

(6) The basic chromosome number $X=21$ in *Worsleya* sets it off distinctly from *Amaryllis* with a basic number of $X=11$.

As an uncommon occurrence within the *Amaryllis* Family should be noted, that the *Worsleya* perigone is dehiscent. While in all of the foliaceous seeded *Amaryllis* species, one can find the dried remains of their perigone attached to the unripe pod during its complete gestation period, the matter is different with *Worsleya*. There, a few days after the flower is wilted, it drops from the still small pod, leaving a big brown scar in form of a three-pointed star at top of it. When the pod becomes ripe and starts to crack, this scar tissue detaches and separates in the form of an extremely thin, papery tissue, from the three points of which hang short, fibrous sutures which had soldered the fruit valves. This triangular tissue is shown in Fig. 5 (4). It has a small, round hole in the center, through which formerly the style was connected to the ovary.

Another significant fact is the longevity of *Worsleya* seeds. Under ordinary storage conditions, this seed will keep its germinating capacity for over one year. This is extraordinary, when compared with the notoriously short lived seeds of the foliaceous seeded *Amaryllis*.

The peduncle that sustains the umbel of flowers in *Worsleya* is flat and sharply two-edged. It is *hollow* in its central part and grows almost straight, while the leaves are curved. Thus, the flowers open well above the foliage, though it is rarely possible to cut these flowers with a stem longer than 12". The peduncle will continue growing longer while the pods are developing. Strong plants develop two or even three peduncles, but the rule is one flower stem per bulb. The umbels are reported to consist of 4 to 14 flowers, but we did not count more than 8 flowers per stem, the average being 4.

Worsleya seems not to be happy when grown in pots. The bulbs have a spreading system of very thick roots that are easily broken. The plants always suffer when transplanted. Grown in large, flat containers, they do somewhat better and best of all, when grown in the open ground.

The plant requires perfect drainage, a porous soil and a very regular supply of moisture. Also they want an abundance of light and as much direct sun as can be allowed without burning the leaves. It seems that the best results were obtained by a grower who used a standardized soil mixture, composed of equal parts, by volume, of fibrous peat and fat, sticky loam.

Under no circumstances, should *Worsleya* be forced to dormancy after blooming. Though slowly, the plant will continue growing new leaves during winter, when temperatures may be rather low. Water should be given scantily but regularly during this season.

IN MEMORIAM—LEN WOELFLE

T. M. HOWARD

It is with great sadness that I must inform members of the Society of the passing of Len Woelfle, of Cincinnati, Ohio, who was well known for his work with *Hymenocallis* and other Amaryllids. Mr. Woelfle was born July 18, 1913 and died quite suddenly at his home on August 24, 1964, from a heart attack. His death was a shock to all who knew and loved him. He had been in good health seemingly until his final moments, having just finished mowing the lawn. Mr. Woelfle will long be remembered for his breeding program involving *Hymenocallis*. His hybrids are only now being channeled into the hands of enthusiasts and have been enthusiastically accepted by the few who have flowered them. An effort will be made to propagate his material and place it into commercial channels where it can be enjoyed by all. Mr. Woelfle will be sorely missed. He was a fine person, full of optimism and enthusiasm, and had a genuine love for his fellow man. It is hoped that his efforts to radiate enthusiasm for the plants that he loved will be absorbed by others and that his work will continue. Mr. Woelfle was Chairman of the Paneratiaeae Section of the APLS and had been active in Round Robins as well.

EDITOR'S MAIL BAG

Miss Elizabeth Lawrence, 348 Ridgewood Ave., Charlotte, North Carolina 28209, and Mrs. Richard Chase, 4563 Contour Blvd., San Diego, Calif., visited the editor's garden on March 25, 1965.

The members will be saddened to hear that Mrs. A. C. Pickard's husband, Dr. Alpha C. Pickard, aged 68, a renowned physician of Houston, Texas, died of a heart attack, on May 27, 1965. He was a keen gardener, and his wife's co-worker in the breeding and growing of hybrid *Amaryllis*.

Mr. and Mrs. L. S. Hannibal, Fair Oaks, Calif., visited the editor's garden on June 1, 1965.

Mr. Robert D. Goedert, of Jacksonville, Florida, writes under date of July 2, 1965, that he obtained *Amaryllis cybister spectabilis* from Brasil just in time since a dam will flood the area where they grow in Matto Grosso in the next few years.

Mr. V. Roger Fesmire, formerly of Denver, Colorado, has moved to California. His new address is 16938 Edgar St., Torrence, Calif. 90504.

Mr. Kenneth A. MacGowan, of Quincy, Florida, writes under date of June 18, 1965, that "On page 52 of the 1965 Amaryllis Year Book, you quote Mr. C. A. Campbell of Caringbah, New South Wales, as saying that to combat red leaf spot of *Amaryllis*, he had success with a spray made from 'Phenyle'. Then in an editorial note, you hope Mr. Campbell will give more information as to its composition. . . . Mr. Camp-

bell kindly sent me a label from a bottle of 'Phenyle' which proved to be a sheep dip composition used in Australia, with phenol as one of its components.'

The members will be interested to know that in 1964, Louisiana State University conferred the honorary degree of Doctor of Science, D. Sci., on Caroline Dorman, of Saline, Louisiana. This high honor is merited by Dr. Dorman who has contributed materially to art and plant science in the United States.

PLANT LIFE LIBRARY—continued from page 4.

ULTRASTRUCTURAL PLANT CYTOLOGY; WITH AN INTRODUCTION TO MOLECULAR BIOLOGY, by A. Frey-Wyssling and K. Muehlethaler. American Elsevier Publ. Co., 52 Vanderbilt Av., New York, N. Y. 10017. 1965. Pp. 377. Illus. \$24.00. This stimulating text on Ultrastructural cytology by two outstanding authorities will be welcomed by biologists generally. Following the introduction to ultrastructural morphology, the subject is developed under two major headings: (1) under molecular morphology, the principles of molecular structure, macromolecules and virus particles, are discussed; and (2) under cytological morphology, organelles of the plant cell, cytoplasm, nucleus, mitochondria, plastids, cell wall, and ectoplasmic differentiation, are explained. This text belongs in the library of every biologist.

THE HANDLING OF CHROMOSOMES, 4th edition, by C. D. Darlington and L. F. La Cour. Hafner Publ. Co., 31 E. 10th St., New York, N. Y. 10003. 1962. Pp. 263. Illus. \$5.00. This is the 4th revised edition of a well-known text on cytological technique by two outstanding authorities. The topics included in the main body of text are: scope of chromosome work, equipment, living chromosomes, bulk fixation, smears and squashes, paraffin methods, staining and mounting, special treatments, control of mitosis and fertilization, photography, autoradiography, and describing results. The appendices are concerned with sources of material, standard solutions, schedules of treatment, and catalogue of implements. Highly recommended.

READING IN ECOLOGY, by E. J. Kormondy (editor). Prentice-Hall, Englewood Cliffs, New Jersey. 1965. Pp. 219. Illus. Paperback, \$3.95. This compilation of papers covering a wide range of ecological literature is intended primarily as a textbook supplement for beginning college students in ecology, or general science, or for high school students in advanced biology. However, post graduate research workers will find these papers suitable review sources. The many papers are grouped under (1) early natural history; (2) the physical and chemical environment; (3) the study of communities; and (4) the concept of the ecosystem. Highly recommended.

THREE CENTURIES OF MICROBIOLOGY, by H. A. Lechevalier and M. Solorovsky. McGraw-Hill Book Co., 330 W. 42nd St., New York, N. Y. 10036. 1965. Pp. 536. Illus. Paperback, \$4.95. The purpose of the authors has been to reconstruct the growth of microbiology, stressing the main lines of development and in this they have been successful. The chapter headings are: From Fracastoro to Pasteur; Pasteur; Koch; bacteria as agents of disease; immunology, cellular and humoral; from soil microbiology to comparative biochemistry; viruses and Rickettsiae; mycology; protozoology; chemotherapy; and genetics. This stimulating text is highly recommended.

PLANT LIFE LIBRARY—continued on page 70.

1. REGIONAL ACTIVITY AND EXHIBITIONS

THE 1965 AMARYLLIS SHOWS

The Official Amaryllis Shows for the year 1965 began April 3—4, with two shows on these same dates—the Corpus Christi (Texas) Show, and the Men's Amaryllis Club of New Orleans Show. Then followed in succession the New Orleans Amaryllis Show staged by the Garden Circles Amaryllis Club on April 10—11; the Houston Amaryllis Society Show on April 17; the Greater Gulf Amaryllis Show at Mobile April 17—18; and April 24—25, the two shows: the Hattiesburg (Miss.) Amaryllis Society Show and the first Southern California Amaryllis Show at Arcadia, Calif., staged by the Southern California Hemerocallis and Amaryllis Society.

Mrs. Polly Fox, Corresponding Secretary, of the Greater Houston Amaryllis Club, reports that "Although we had a rather mild winter, the month of March was very cold and overcast and our Amaryllis did not develop enough blooms of show quality to warrant a show. This was very disappointing to us all. We will be in there pitching to put on a good show next year. The date of April 17 (the Sunday after Easter) has been reserved for the Garden Center to accommodate the Show."

1965 CORPUS CHRISTI AMARYLLIS SHOW

MRS. CARL C. HENNY, *President,*

Coastal Bend Amaryllis Society, Corpus Christi, Texas

The Coastal Bend Amaryllis Society conducted its annual Amaryllis Show in conjunction with the Lola Forrester Flower Show, held here in the Exposition Hall, April 3rd and 4th, 1965. Due to very unpredictable weather conditions this winter, our exhibit was not as good as we had hoped for. We had only 67 entries of *Amaryllis* in comparison to 96 entries of last year.

Among the pot-grown registered Leopoldii Type entries were: 'Franklin Roosevelt', 'Front Page', 'Mother's Day', 'Brilliant', 'Champion's Reward', 'Masterpiece', 'Rocket', 'Prima Donna', 'Spring Dream', 'Apple Blossom', 'Ace', 'Candy Cane', 'Fantasy', 'Early White' and 'Ludwig's Dazzler'. Members receiving blue ribbons in these were Mr. Charles Sanders and Mrs. L. Materne; red ribbons were received by Mr. H. E. Lemoine, Mrs. Carl Henny, Mrs. L. Materne and Mr. Sanders.

Mr. Fred Jones received a blue ribbon in the "Breeder's Class" for his seedling—'Dutch to Dutch'.

In the Garden-grown registered and named plants, Mrs. Carl Henny received a blue ribbon for 'Prima Donna'. Mrs. E. L. Caldwell received

a blue ribbon on her cut scape garden-grown, unnamed.

In the Miniature—Gracilis type, Mr. H. E. Lemoine received a blue ribbon for his 'Fire Fly'; Mr. Charles Sanders, blue for his 'Little Sweetheart' entry.

An added attraction to our exhibit was an outstanding flower arrangement of amaryllis blossoms prepared by Mrs. E. L. Caldwell, a member of our Society.

Another display of equal interest and importance was a Special Exhibit prepared by Mr. Fred Jones, club member,—entitled "From Seed to Mature Plant". Mr. Jones received a "Green Ribbon Special Award" for this display.

Three Accredited National Amaryllis Judges from San Antonio, Texas were here to judge our show. Twenty two blue ribbons, 15 red ribbons, 12 gold ribbons and three white ribbons were awarded, making a total of 52 awards.

OFFICIAL MEN'S AMARYLLIS CLUB SHOW NEW ORLEANS 1965

JAMES E. MAHAN, *Show Standards Chairman,*

3028 Palmyra St., New Orleans, La. 70119

The eighth annual show was held by the Men's Amaryllis Club of New Orleans, Inc., on April 3rd and 4th, 1965 at the Edward Hynes School, 990 Harrison Avenue. As in the past the show was all horticulture devoted exclusively to *Amaryllis* with competition open to the public. It attracted numerous entries other than those of club members and drew many visitors not only from New Orleans but also from other points in Louisiana, Alabama, Mississippi, Texas and even from Kingston, Jamaica. The show was well conceived by Show Chairman Walter Latapie and set up in accordance with official rules as set forth by the American Amaryllis Society with which the local club is affiliated. Nine Official Amaryllis judges made the various awards.

The usual ribbons for first, second, third and honorable mention were awarded in the various sections and classes. In addition to ribbons the following trophies were awarded: Jessee Nursery Gold Cup for best Dutch hybrid, to Rodney Broussard; Reuter Seed Co., Inc., Gold Cup for sweepstakes winner in Dutch hybrid, to Rodney Broussard; Swetman Silver Cup for runner-up in Dutch hybrid class, to Rodney Broussard; Swetman Amaryllis Garden Silver tray (challenge) for winner of most blue ribbons in Dutch hybrid class, both potted and cut specimens, to Rodney Broussard; the President's trophy Gold Cup for most blue ribbons won by a member of the Men's Amaryllis Club, to Rodney Broussard; W. J. Perrin Silver Tray for outstanding registered specimen in owner's possession for one year or more, to Rodney Broussard; Alatex Construction Service, Inc., Gold Cup for best home-bred, grown and developed Amaryllis, to E. M. Beckham.

American Amaryllis Society Awards of Merit were given to Messrs. Beckham, and Broussard and Preliminary Commendations went to Messrs. Beckham, Milo Virgin and W. C. Creecy.

The AlateX trophy which was donated through the courtesy of Mr. Lewis Lloyd, a member of the Men's Amaryllis Club, is a new addition to the list of trophies and is designed to encourage the individual enthusiast to "start from scratch", from selective breeding and then bringing to maturity and exhibiting the results of his own efforts. This,



Fig. 7. Part of exhibits at the Men's Amaryllis Club Show, New Orleans, 1965.

in turn, will encourage others to follow the same course and thus further increase breeding and development of new clones by the amateur. The W. J. Perrin award, new this year and donated by another member of the club, is also designed to encourage exhibitors to exert themselves toward positive action on their own part to bring the plants to perfection through their own efforts rather than accept and exhibit a "ready-made" package which is the result of someone else's handiwork.

The rewards of one's own breeding efforts were amply demonstrated by an exhibit in the show, entered by Mr. Walter Latapie, who

developed a new double specimen, nearly pure white (see Fig. 13) with merely a few red lines in some of the inner petals. It is a very handsome and striking seedling which certainly must be satisfaction and incentive enough to the breeder to continue his efforts.

Plans for the coming year's show are already in progress and we are looking forward to an even greater show when next spring rolls around. The date has been set for April 16th and 17th, 1966 and a cordial invitation to attend the show is extended to all *Amaryllis* lovers.

1965 OFFICIAL NEW ORLEANS AMARYLLIS SHOW

MRS. A. R. ODDO, *Show Chairman,*

435 Bonnabe Blvd., Metairie, La. 70005

The 16th Official Amaryllis All Horticulture Amaryllis Show was held Saturday, April 10th and Sunday, April 11th, under the sponsorship of the Garden Circle Amaryllis Club. Mrs. A. R. Oddo was general chairman, and Mrs. Ed. Landry, Club President was honorary chairman.

The Award of Merit for the best specimen of Dutch Horticulture, presented by the American Amaryllis Society, went to Edward Beckham of Baton Rouge, La. for a A Happy Memory entry which also was awarded the Ludwig Challenge Cup. The Reuter Seed Company Tray for the most outstanding Dutch Specimen also went to the Award of Merit Winner in Dutch Horticulture Mr. Edward Beckham.

The Award of Merit for the best specimen of American Horticulture went to Miss Elizabeth Weed. The Harry St. John Memorial Challenge Trophy for the most outstanding American specimen also went to Edward Beckham. Awards of Merit, presented by the American Amaryllis Society, for specimens in American horticulture, went to Edward Beckham and George Merz, Jr.

The Klein Award, Silver Tray for the most blue ribbons in Dutch Horticulture, went to Edward Beckham.

The Sweepstakes trophy a gold cup for the most blue ribbons in American Horticulture was presented to Mrs. Walter R. Latapie of the Garden Circle Amaryllis Club who also won the Single Floret Award to Members Only.

A special award, A Silver Tray, for the best two-floret entry went to James Robertson of the Men's Amaryllis Club of New Orleans, La.

Awards of appreciation went to non competitive arrangement exhibitors as follows: Mrs. Fernando Cuquet, Sr., Mrs. Richard Heaney, Mrs. John Hennessy, Mrs. A. L. Herberger, Mrs. Casey W. Jones, and Mrs. Tully Ward.

Blue Ribbon winners in Dutch Horticulture were Milo C. Virgin, Melvin Zivicki, George Merz, Jr., Edward Beckham, Mrs. Miriam G. Authement, Mrs. Edna Dopp, Mrs. W. J. Perrin, and James Robertson.

Blue Ribbon winners in American Horticulture were Mrs. W. R. Latapie, Mrs. W. J. Perrin, Mrs. F. L. Ramos, Mrs. A. A. Autry, Miss

Edith Dickenson, Mrs. Rosina Tamburello, Mrs. Miriam G. Authement, Melvin Zivicki, Mrs. W. C. Creevy, Miss Elizabeth Weed, Miss Antoinette Weed, Santo Cuchinotto, Mrs. E. Dopp, Mrs. Jessie Solis, and Mrs. Josie Davis.

The Gold Cup the Public School Award won for the past five years by McDonogh #7 School was presented to them for permanent possession.

The Award of Merit were presented as follows: Mr. Edward Beckham, 'Happy Memory', Mr. Edward Beckham, 'Zenith', Mr. Edward Beckham, 'Streaking Stripes', Mr. Edward Beckham, 'Carousel', Mr. Geo. Merz, Jr., 'Alycone'.

Preliminary Commendations were presented as follows: Miss Elizabeth Weed, Named American 'Gernato'; Milo Virgin, White Seedling; Mrs. Walter R. Latapie, White Double Seedling; Miss Edith Dickenson, Pink Seedling; Melvin Zivicki, Pink Dutch Seedling.

There were six Invitational Arrangements displayed on Pedestals by non Competitive Guest Artists. The 16th Official Amaryllis Show was displayed by Divisions 1 to 9 as per Revised Show Schedule for Official Amaryllis Shows (in 1961 Amaryllis Year Book). There were 228 entries in the Show.

1965 OFFICIAL HOUSTON AMARYLLIS SHOW

MRS. A. C. PICKARD, *Show Standards Chairman,*

1702 North Blvd., Houston, Texas 77006

The Houston Amaryllis Society's Official Show was held in the auditorium of the Garden Center, April 17, 1965.

It was based on the theme, "Amaryllis on Parade". The weatherman was very temperamental and full of tricks, so many sudden changes. However, the dark clouds turned to silver and the Society staged a very successful show.

Classification in the five divisions included named and registered Dutch cultivars and American hybrids by color, with separate sections, including the cut and potted specimens.

In addition to the classes of cultivars, specimens of more than one hundred seedlings were displayed on a non-competitive basis, all grown by members of the Society.

Collections, minimum of five named and registered cultivars, all different, added extra beauty in the collection class.

All classes were judged by official Amaryllis judges.

Special ribbon awards were given in the invitational class for cut specimens of named and registered Dutch and American Amaryllis.

The Educational exhibit consisted of methods of propagation from seed to clone; and a sexual propagation of bulbs. This section merits horticultural achievement on the highest level.

Much interest centered around the Amaryllid section of potted "Clivia" in full bloom; and cut specimens of *Crinum x powellii album*, and *Ornithogalum*.

In the Artistic Division of the show (non-competitive), members were given an opportunity to show their talents as creative artists in flower arrangement.

One of the most interesting special exhibits of the show was "Easter Parade", displayed on the stage of the auditorium by a local florist which could only be rightly portrayed in Kodachrome.

The special awards table, staging all the medal winners was the center of attraction and proved the outstanding success of the show:



Fig. 8. President, Mrs. Tracy T. Word, at the special awards table, Houston Amaryllis Society Show, 1965.

'Square Dance' (Lud) R; A-704, D-5B, A.M. and award of Excellence—Mrs. H. W. Blair

'Boquet' (Lud) R; A-424, D-5A, A.M. & Ludwig Cup—Mr. M. B. Quigles

'Maria Goretti' (Lud) R; A-445, D-5B, A.M.—Mrs. T. T. Word

'Fire Fly' (Lud) R; A-469, D-8, A.M.—Mrs. M. E. Shelton

Collection of 5 named and registered Dutch Cultivars, A.M.—Mrs. A. C. Pickard

- 'Spring Dream' (Lud) R; A-542, D-5A
 'Television' (W-WS) R; A-691, D-5A
 'White Crane' (Goed) R; A-681, D-5B
 'Apple Blossom' (Lud) R; A-422, D-5B
 'Catherine Valente' (W-WS) R; A-688, D-5B

Breeders Class, "American Seedling" P.C.—Mrs. R. I. Stansbury

Breeders Class, "Dutch Seedling", P.C.—Mr. M. B. Quigles

Non-competitive, Invitational Class: 'Apple Blossom' (Lud) R; A-422, D-5B—Mrs. E. R. Bertgstrom; 'Reginae hybrid' - D; 4-B, P.C.—Mr. Earlton Koon

The Houston Junior Amaryllis Society and Junior Garden Club, sponsored by the Houston Amaryllis Society, presented their section of exhibits on horticulture, nature and conservation, and an educational display.

This year introduces the first in classes of Artistic Design and a class of dish gardens and terrariums with naturalistic planting.

Junior sections are given increasing prominence with more Junior exhibits a "natural" for their talents.

Another year of most interesting and rewarding effort has come to a close for a plant society of great appeal and which furnished a wealth of excellent horticultural information.

GREATER GULF AMARYLLIS SHOW, MOBILE, 1965

MISS MILDRED LAUGHLIN, 701 *Dauphin Isle Parkway*,
Mobile, Alabama 36606

The Amaryllis Society of Mobile, Alabama presented AMARYLLIS EASTER PARADE at their Thirteenth Annual Greater Gulf Amaryllis Show on Saturday and Sunday, April 17 and 18, 1965, in the Murphy High School Cafeteria; admission free.

The focal point of interest was a large white cross in the center of the building with Amaryllis attractively arranged at its base. The artistic Designs were calculated to carry out the theme further.

Officers of the Society for 1964-1965 are as follows: President, W. A. McCollum; Vice-President, S. A. Shannon; Secretary, Mrs. A. B. Palmer; Treasurer, J. C. McRae.

S. A. Shannon officiated as Show Chairman and Master of Ceremonies; and serving as his Co-Chairmen were: W. A. McCollum, Russel Ludlow, J. C. McRae.

Standard Judging was done by accredited judges and trainees from Mississippi and Florida.

Beautiful silver trophies were won by the following:

W. A. McCollum, Winner of the most Blue Ribbons in Show, including Horticultural and the Artistic Arrangements Division. Sterling Silver Paul Revere Bowl.

Mrs. M. E. Chancey, Winner of the most Blue Ribbons in the Artistic Arrangements Division. Sterling Silver Vase.

W. A. McCollum, Winner of the most Blue Ribbons in the Combined Dutch Hybrid Potted and Cut Amaryllis Divisions. Large Silver Tray with handles.

Mrs. Gertrude Marshall, Winner of the most Outstanding Horticultural Potted Bulb Specimen of Dutch Amaryllis in Show. Sterling Silver Sandwich Tray.

W. A. McCollum, Winner of the most Blue Ribbons in the Dutch Hybrid Potted Amaryllis Division. Silver tray with handles.

W. A. McCollum, Winner of the most Outstanding Horticultural Potted Bulb Specimen of American Hybrid Amaryllis in Show.

Mrs. W. P. Cazalas, Winner most Outstanding Artistic Arrangement of Amaryllis in Show.

Mrs. Virginia Sherwood, Winner best painting of Amaryllis (Adult Section).

Maxey J. Roberts, Winner Best Painting of Amaryllis. (Student of Art 16 years of age and under.)

Herbert O. Hackmeyer, Winner most Outstanding Horticultural Cut Specimen of Dutch Amaryllis in Show.

Mrs. H. R. Young, Winner of the most Blue Ribbons in the Dutch Hybrid Cut Amaryllis Division.

W. C. Strain, Winner most Outstanding Horticultural Cut Specimen of American Hybrid Amaryllis in Show.

Rose Garden Club, Trophy awarded for the Blue Ribbon Winner in the Invitational Class (Open to Garden Clubs only.)

Mrs. W. A. McCollum, winner most Artistic Design of Amaryllis with Elements other than Fresh Plant Material Predominating.

Miss Darby Hickson, Winner Trophy awarded to the Junior with the Most Blue Ribbons.

The following won Annual Awards to be retained by the first year winners permanently: W. A. McCollum, winner most Blue Ribbons in the Dutch Named Clones. Sterling Silver Cup. Maxwell E. Stewart, winner most Blue Ribbons in the Single Bloom Named Division.

Wilmer Smith was winner of four trophies as follows: Most Outstanding Hobby Collection of Amaryllis. Silver Cup; Most Blue Ribbons in the Unnamed Cut Seedlings. Silver Bowl; Most Blue Ribbons in the unnamed potted seedlings. Silver Bowl; Most Blue Ribbons in the Single Bloom Unnamed Division.

In addition to these lovely trophies The Men's Garden Club of Mobile gave a Certificate of Honor awarded for Best American Hybrid Seedling (In Horticulture) Shown for First Time and it was presented to W. A. McCollum.

The trophies and awards were presented to the winners at 4 P. M. Sunday, April 18th at the Show.

Both President W. A. McCollum, and Show Chairman S. A. Shannon, stated that the membership had done outstanding work in presenting the show along with the very able assistance of the following judges: Mrs. W. S. Barlow, Mrs. Jessie Barfield, Mrs. E. S. Northup, Mrs. Riley

Moffett, Mrs. Florence Renau, all Pensacola; Mrs. M. G. Ness, Mrs. Dewey Regan, both from Biloxi, Miss., and the following from Hattiesburg, Miss.: Mrs. M. M. Thomas, Mrs. R. A. Fowler, Mrs. U. J. Lucas, Mrs. Charles Bell, Mrs. B. P. Russum, Mrs. B. M. Lewis, Mrs. Sam Forbert, Mrs. J. W. Snowden, Mrs. F. T. Newton, Mrs. I. M. Culpepper, and Mrs. L. M. Davis.

1965 OFFICIAL HATTIESBURG AMARYLLIS SOCIETY SHOW

MRS. LUTHER N. DAVIS, *Society President*

2206 Hardy Street, Hattiesburg, Miss.

The officials of the Hattiesburg Amaryllis Society have marked "Complete Success" across their records for the 1964-65 society year that came to a close with the staging of the Society's Fifth Annual Show that was in every respect the most successful in the history of the organization.

Even though the weather during the winter had been most unfavorable in this area the enthusiastic members of the Society and their host of friends who are growers and exhibitors of this majestic flower showed both courage and skill in bringing their *Amaryllis* through the dreadful winter with very little noticeable damage.

From a very small beginning when the Society was organized, July 14, 1956, the interest has steadily increased until today the Hattiesburg Amaryllis Society has taken its place among the largest and most alert groups in the entire country, and its shows rank with the best anywhere.

Outgrowing the show rooms of the Hattiesburg Garden Center, the show this year was moved to the Community Center which afforded a highly appropriate place for the hundreds of exhibits that were of unusually high quality. The show was open Saturday evening and Sunday evening (April 24-25) and hundreds of visitors from several states viewed the magnificent showing of the majestic *Amaryllis* exhibited by local growers.

The horticulture section of the show was especially strong this year with a profusion of potted Dutch hybrids with first places going to displays of 'Cardinal', 'Lucky Strike', 'White Giant', 'Happy Memory' and many others. Mrs. L. T. Brown, Mrs. Charlie Bell, Mrs. A. M. Wilson and Mrs. R. A. Fowler were winners in this category.

In the seedling category first place awards went to Mrs. O. F. Coursey, Mrs. Charlie Bell, Mrs. Sam Forbert and Miss Evelyn Arledge.

Mrs. Charlie Bell won the American Amaryllis Society Award of Merit Certificate for her 'Faust' and 'Albino'. An American Amaryllis Society Award of Merit went to Miss Evelyn Arledge of her Candy Cane.

In the artistic design section where the theme "Motion In Space" was appropriately carried out, Mrs. B. M. Lewis won first place, and she also won the Tri-Color Award in this category.

In the exhibition table display firsts went to Mrs. B. M. Lewis and Mrs. Paul Bailey.

Highly coveted silver tray awards were made to Mrs. Charlie Bell who won the President's Award and the horticultural sweepstakes award. Mrs. Sam Forbert gained the silver tray for the best potted *Amaryllis* in the entire show while Miss Evelyn Arledge won the silver award for the best potted specimen of Dutch *Amaryllis* in the show. Mrs. Melvin Thomas won a silver award for the best cut bloom in the show. The tray for the most blue ribbons in the show in the Dutch Hybrid Class went to Mrs. Leonard Brown while Mrs. Charlie Bell gained the award of a silver tray for the most outstanding unnamed seedling in the show.

In the single bloom category blue ribbons were won by Mrs. Luther N. Davis, Mrs. O. F. Coursey, Mrs. Ruth Bethea, Mrs. L. T. Brown and Mrs. Knox Cole.

Space will not permit a full description of this outstanding show but all agreed that in both quality and quantity it was the most outstanding exhibition of the Society's entire history. Attendance at the show broke all previous records and many visitors have assured the Society that next year will find them among the exhibitors.

The Hattiesburg *Amaryllis* Society is well on its way with enlarged plans for the new year and it is looking towards the spring show with an abundance of enthusiasm.

FIRST SOUTHERN CALIFORNIA OFFICIAL AMARYLLIS SHOW 1965

MRS. BERT WILLIAMS, *Show Chairman*,
2601 La Prensa, South San Gabriel, Calif. 91777

The first Official *Amaryllis* Show ever to be held in Southern California was staged at the Los Angeles State and County Arboretum, 301 N. Baldwin Ave., Arcadia, Calif., by the Southern California Hemerocallis and *Amaryllis* Society on April 24 and 25, 1965.

The show was a real success in spite of uncooperative cold weather, which had delayed most outdoor spikes, and despite the fact that much of the display hall had been relinquished to the spring flower show, which had been rained out twice on earlier scheduled dates. By dint of diligent searching by the show committee, a very substantial number of exhibitors participated and had entries in a large part of the scheduled twenty-two classes. Over eight thousand visitors came through the turnstiles at the main gate, indicating a very creditable attendance for this first show.

Awards included the S. August Phillips Trophy, given to Mr. Hubert C. Lloyd for the best seedling, a fine orange scarlet; the President's Trophy awarded to Mrs. Eva Turnquist for the most popular exhibit in the show, an extremely beautiful potted specimen of 'Purple Queen' (Warmenhoven); the sweepstakes prize, the Cecil Houdyshel

Memorial Trophy, a handsome silver bowl perpetual trophy established to honor Cecil Houdyshel, who died in 1964, went to Mr. W. Quinn Buck, who had the largest number of blue ribbons in various classes. *Amaryllis* bulbs were given as awards to the winners of blue ribbons. Many of these bulbs were fine new Dutch clones donated by Mr. Robert Goedert, of Jacksonville, Fla., a leading importer.



Fig. 9. Part of the exhibits at the First Southern California Amaryllis Show, 1965. Photo by Jack V. McCaskill.

A special award was given for the three beautiful amaryllis arrangements shown by Chadwick Gardens of Redondo Beach, Calif. Although not in competition, these arrangements were most outstanding for the quality of the white, rose, and salmon scarlet Dutch strain seedlings used to make them up, the rose group being especially fine in color, shape, and texture.

EMPHASIS ON JUDGING AMARYLLIS

Mrs. A. C. Pickard, *Houston, Texas*
Official Amaryllis Judging Instructor

There is a growing consciousness that working knowledge of horticulture is a vital part of our growing the plants and judging them at flower shows which feature a particular flower, and where at least a year's study and cultivation of this flower precedes the show.

People who exhibit *Amaryllis* would be much better exhibitors if they would take a little time to study the rules for Amaryllis shows by which all Amaryllis Judges work.

The primary objective of the Judges Training course is to train Judges and up-grade judging standards. A judge must be of unquestioned integrity, and should have the interest of the Amaryllis Society at heart.

The importance of membership in the American Amaryllis Society (A. A. S.) was recognized very early after its founding. A candidate for a judgeship must be a member of the A. A. S. and have a record of attendance at Judges' Training Schools. As long as progress is being made in all classes of Amaryllis, the Judges Training Program must be considered in terms of continuous effort to provide the highest possible standard of judging.

Your A. A. S. gives you a classification system for all Amaryllis designed to maintain order and recognition for all species, named and registered, and unnamed horticultural clones.

A registration system is used to prevent chaos about clones in commerce. An award system gives full recognition of clones of outstanding quality and promotes development of new classes of Amaryllis.

It is possible that in future years, other specialized awards may be instituted by the Society in recognition of interest and progress in various special sections of the Amaryllis tribes.

Remember, judging is not difficult if you retain an open mind and a knowledge of the flower you are judging. Never be afraid to ask questions which might help you with a decision. No one is expected to know everything.

With descriptive catalogues from leading hybridizers, we enter a new era of Amaryllis production, and it is evident the new systems, based on their horticultural qualities, will provide the key to better understanding of the nine major classification divisions and additional necessary categories.

It is impossible to deal with all the conceivable factors which may arise in judging. Otherwise, the subject would become so technical and complicated that it would defeat its purpose. Those who are just getting acquainted with Amaryllis may find certain descriptive terms puzzling.

The following short glossary will explain some of the words and terms used in Amaryllis language:

(a) Species—kinds of plants as they appear in nature before hybridizing.

(b) Hybrid—a plant resulting from the cross between two parents differing in one or more traits: i.e.—a cross between two species, a species and a hybrid, or between two hybrids.

(c) Cultivar—kinds that are maintained under cultivation; may include cultivated species and hybrids.

(d) Perigone—a flower form in which the free divisions above the tepal tube are similar and arranged in a circle, surrounding the sexual organs of the plant—pistil and stamens.

(e) The six segments—3 outer are setegs, and 3 inner are petsegs; when taken together they are known as tepalsegs, or the limb.

All visible parts of the Amaryllis must be recognized in relationship to the whole. It is evident that there are many qualities which could be given importance in judging.

Point scoring should be followed and used to assess the relative importance of the different qualities specified, and all qualities must have ample consideration from the judges.

Competitive entries must be made according to divisions and classes included in the comprehensive schedule.

To judge a horticultural specimen, one attempts to measure perfection or quality and the faults.

Certain factors have been considered and a scale of points ranging from 0 to 100 established for scoring a specimen. Every judge is an individual with ideals of perfection and his own ability to see how nearly the flower before him matches his ideals.

At this point it may be helpful to elaborate a bit upon the several characteristics rated on the score card.

The form of the flower is the basis of classification. By this method genera, species, and varieties are identified and named within these gradations of form. Types can be recognized and workable definitions of these types can be written, permitting the classification of all Amaryllis according to type.

In Divisions 2 and 3 drooping is normal and should not be penalized but in other divisions, the somewhat more erect form is favored.

However appealing a certain Amaryllis may be to its owner, however artistic he may regard its formation, to win in a show it should excel by most nearly attaining a recognized standard of excellence in respect to form.

To add to point scoring, every flower has various attributes, physical or otherwise that make it more or less beautiful. Point scoring is simply the numerical expression of the value of each characteristic, point by point. The total points comprise the numerical rating by means of which you can compare the flower to another of like kind. The most natural way to appraise anything is to compare it with other similar kinds. Do not hesitate to use Point Scoring, for there is no more useful tool when wisely used.

Flower shape (form) receives 15 points and refers to shape of the bloom, stage of development, seg formation, conformity to type or variety.

Color—note that nearly half of the total points, 45, have been allotted to color, due to the fact that color is the most important attribute of an Amaryllis. The quality of the color may be notably enhanced by the texture of the segs. Texture is the term employed to describe the surface of the segs. The segs may have a dull texture, or satiny sparkling texture which veritably makes the flower "sing".

Color quality may respond to a certain extent favorably to cultural care, skillful handling of sunlight or shade, fertilizing, soil ingredients, climate moisture, etc.

Not to engage in an exhaustive discussion of the theory of color, it may be useful to point out the lighter tones of any color produced by reduction of the color content by white, diminishes the intensity of color, changing its tone or color value without altering its clarity.

In self colored *Amaryllis*, study the spread of color on the floral segs. It should be even, not streaked or veined.

In blends, there should be harmonious contrasting component colors. Otherwise, harshness results.

Bi-color is a clear separation of the contrasting colors with a minimum blending of darker into lighter color components. Preferably all segs should carry a substantial proportion of each color on its face. "Striped" refers to vertical bands or stripes of different colors.

Size—score value 15 points: Size is another character which is related directly to the division standard. In miniatures (intermediates) smallness contributes to daintiness. The pose of the flower on the scape is important enough to give it point consideration. For example—the *Leopoldii* hybrids being formal and flat have an asset in size. In certain *Reginae* hybrids (the less formal), if the flowers were too large they would be out of proportion in form.

Length and character of scape—score value 15 points: This character too represents harmony. It should be in proportion to the size and number of blooms. A strong, erect, graceful scape a trifle too long, other things being equal, is preferable to one too short. Heavy scapes with small flowers sometimes indicate forcing and, this condition destroys the gracefulness of the effect.

Number of flowers per scape and number of expanded flowers—rating 6 points: Buds are not considered expanded flowers but contribute toward classification and separation of judging a two flower scape with no evidence of another flower in competition with two expanded blooms and a bud. Only 3 or more flowers per scape are eligible for competition. For two expanded flowers per scape allow 3 points; for 3 flowers allow 4 points; for 4 or more flowers allow 6 points; Usually more than 4 open blooms per scape seem too crowded for good form. In miniatures, allow 4 points for 2 flowers and 6 points for 3 or more flowers. Miniatures flowering habits are from 2 to 6 flowers per scape.

Number of scapes per plant—allow 10 points: This category applies only to potted exhibits. Allow 8 points for one scape; 9 points for 2 scapes; 10 points for three scapes. It is hardly likely that any entry of three scapes will reveal no faults in any of its characteristics and is rarely seen in a show.

Fragrance—allotted 2 points: *Amaryllis* are not noticeably fragrant and the presence of fragrance is to be considered an asset. Some few species are recorded as slightly fragrant. If so, it is passed on in future generations. New fragrances have been produced from time to time but such new introductions will never permeate the home gardens with the delightful fragrance of a rose. Many flowers produce nectararies for the production of nectar and are of value in attracting insects that transfer pollen to the stigma of the blossoms thus carrying out pollination in nature.

Foliage—2 points: This applies to potted plants. Leaf growth that comes with the flower scape enhances the beauty, but some clones are slow to produce foliage until the flowers have appeared. Temperature control on a newly purchased bulb may have some effect on growth

of foliage. A high temperature will often produce lush foliage at the expense of a bloom scape.

Condition of exhibit—12 points for cut specimen, 10 points for potted plants: The really superb bloom is a candidate for a category called Distinctiveness. This has to do with the staging of the exhibit as well as with those attributes which tend to make it stand out supreme and proclaim its quality. A keen judge quickly recognizes the difference between a bloom scape casually stuck into a container and one whose scape is properly proportioned. Plants are too often injured in transportation to a show. The injuries will affect judging value.

Ten (10) points allotted for potted plants: Our score card takes full account of every factor which actually goes into the condition of an exhibit. Plants in prime condition are to receive full allowance points. It is permissible to remove any fading scapes and flowers. Proper and skillful cultural practices will be reflected in the general condition. Prime condition exists when the bloom is clean, no fading (over maturity), or loss in substance, or injury in any part.

Another removal: Such removal is allowable by the local show schedule committee in order to prevent pollen dusting on the segs in transit, which often mars the beauty of a pure color. Over ripened pollen and position of the stigma will usually reflect the age of the bloom.

Staking: Pot plant scapes grow tall and it is necessary, sometimes, to stake them. If the stake used does not attract attention to itself and if green twistems are used for tying, then no points are deducted. If the stake or tie is too conspicuous, then some deduction must be made.

It is sometimes difficult for judges to decide the number of points to deduct for a slight defect. One method is, if a fault is barely noticeable, deduct a couple of points. If the flower is only half as good as it might be, deduct half of the points. This gives plenty of room to add or subtract a point or two where it might be necessary for a final decision. A judge should be aware of the variations due the light factor, temperature and cultural practices.

In conclusion, it is evident that there are many qualities which should be given important consideration in judging. It is necessary for the schedule to set the standard which will fit the classes and guide the exhibitors and judges.

AMARYLLIS JUDGES CERTIFICATES

Since the last report in the 1965 Amaryllis Year Book (pages 50-51), the following numbered Amaryllis Judges Certificates have been issued by the American Amaryllis Society:

150. Mrs. Gladys L. Williams, 2601 La Prensa Av., South San Gabriel, Calif. 91777 (Horticulture only).
151. Mr. W. Quinn Buck, 26 East Camino Real, Arcadia, Calif. 91006 (Horticulture only).

152. Mrs. Eva Turnquist, 3342 N. Muscatel, South San Gabriel, Calif. 91777 (Horticulture only).
153. Mr. Jack McCaskill, 25 South Michillinda, Pasadena, Calif. 91107 (Horticulture and Arrangements).
154. Mr. H. L. Bush, P. O. Box 1371, Columbia, South Carolina 29202 (Horticulture and Arrangements).



Fig. 10. Amaryllid collected by Dr. C. G. Rueppel. Upper, shows native Andean habitat; 9,000 ft. elevation at Argentine-Chile border. Lower, close-up of flowers; golden yellow in color.

2. LINEAGICS

[BIOEVOLUTION, DESCRIPTION, DETERMINING RELATIONSHIPS,
GROUPING INTO LINEAGES]

AMARYLLIDS COLLECTED BY DR. RUEPPEL

JOSEPH C. SMITH, M. D.

It has always been difficult to obtain from South America as much live plant material for study as would be required to pick up some of the remaining unidentified species of amaryllids. Many botanists feel that ultimately over a hundred *Amaryllis* species alone may be described. With the seventy or so now catalogued this leaves at least thirty to go.

The Society is indebted to Dr. C. G. Rueppel, Casilla 370, Mendoza, Argentina, for collecting of two very interesting or possibly entirely new species, one in the genus *Amaryllis* and one in the genus *Rhodophiala*. Dr. Rueppel is an ardent amaryllid enthusiast who makes numerous collecting trips about the lower half of South America in search of new material. He is now in the process of retiring which takes about a year in his country, Argentina. Afterward he will have more time to travel and search out unusual plants. It is hoped he will remain in good health and able to make these trips for many years.

Dr. Rueppel recently forwarded to the writer a few bulbs of the most remarkable miniature *Amaryllis* species belonging to the striata group. The flower is long lasting about three and one-half inches in diameter with a much shorter tepaltube than in the striatas. On opening it is somewhat more formal in shape, but as it matures the aspect changes to a somewhat irregular shape, with the two lower setsegs falcate. It is even smaller than *Amaryllis traubii*. Had this one been available when the Dutch hybridizers created the Gracilis strains, real pixies would have resulted with the slender eight- to ten-inch scapes of *Amaryllis* "Agrilaga", the name with which this species comes to us from Santo Tomé.

Mr. Pablo Argilaga, a good friend of Dr. Rueppel for whom he names this *Amaryllis* species, lives in Santo Tomé, Corrientes. This amaryllis is stated to be growing everywhere along the banks of the Uruguay River under dense shade in "rich, sandy, stony, peaty, wet soil." It produces many offsets which result in a clump of plants.

The new *Rhodophiala* species has not flowered here, but we do have two interesting photos (see Fig. 10) from Dr. Rueppel of its native habitat and close up of the flower. It is an intense yellow color. It cannot so far be placed with any of the described species and may be a new species of *Rhodophiala*. Dr. Rueppel collected it near Lago (lake) del Maule on the Chile-Argentina border at an elevation of 9,000 feet where the ground is covered with snow during the Winter months. The bulbs are deeply seated in rich, sandy loam. From the color photos this appears to be a very pretty species with flowers that may rival the yellow *Lycoris*. Nothing is known of its culture, but coming from a high moun-

tain terrain it may require an acid soil and enough winter cold for complete dormancy.

There are so many of the *Rhodophiala* species that we are not growing in this country, and who knows how many yet undescribed species there may be, that we are much indebted to Dr. Rueppel for his service to the Society in supplying these amaryllids. He has promised to send along many others as he obtains them on his collecting trips.

AMARYLLIS CALYPTRATA HYBRIDS REPORT, 1965

W. QUINN BUCK, *Arcadia, Calif.*

Since earlier crosses of *Amaryllis Calyptrata* on two Ludwig white clones gave such interesting results, another such combination was tried in the spring of 1963. The white seed parent was a beautiful seedling tentatively named 'Peg Dabagh', selected out of a population of around 120 from a cross of Ludwig strain whites. The pollen came from one of the original *Amaryllis Calyptrata* bulbs flowered at the Los Angeles State and County Arboretum in Arcadia.

The seed of this cross were planted on April 9, 1963, and the first spike appeared on a ridiculously small seedling just a bit over two years later.

Our two pictures in Fig. 11 show side and front views of this first spike of 'Peg Dabagh' x *Amaryllis Calyptrata*. So much of the grace and charm derived from the orchid-flowered *calyptrata* parent were evident that it seemed worthy of recording this first spike. This seedling also gave no pods when selfed or crossed with named clones, as was true of the earlier crosses.

AMARYLLIS VITTATA RE-DISCOVERED

MRS. ROBERT E. HEROLD, *203 Cromwell Drive,
San Antonio, Texas 78228*

Through the efforts of Mrs. Paul A. Kane, chairman of the General Amaryllid Committee; Mr. Claude W. Davis, Professor Emeritus, Agricultural Extension Service, Louisiana State University; Sister Mary Clare, C. D. P., Academic Dean of Our Lady of Lake College and Dr. Hamilton P. Traub; at long last, I have identification on a lovely little *Amaryllis* that I have grown and enjoyed for about twenty years.

On June 2, 1965, Dr. Traub identified the botanical specimen as *Amaryllis vittata* L'Hérit., culminating ten years of asking gardeners, writing inquiries and answering letters after my mentioning of it in the 1964 *Amaryllis Yearbook*. (For further reference, read page 112, *TRIBE AMARYLLEAE* by Traub and Moldenke, 1949).

My first clone was given to me by my mother-in-law, the late Mrs. J. F. Herold of Corpus Christi, Texas who in turn had received hers from one of her daughters, Mrs. Jack Hamilton of Corpus Christi, also; her "striped lilies" coming from her mother-in-law, a Mrs. Hamilton of Goldthwaite, Texas.

Like genealogy, you aren't interested or don't become interested, until the ones that might know, have already gone. My brother-in-law



Fig. 11. Front & side view of Buck's beautiful orchid-flowered hybrid *Amaryllis*; a cross between 'Peg Dabagh' and *A. calyptrata*. Photo by Jack V. McCaskill

doesn't remember where his mother secured hers, not knowing if they came from her sister-in-law who also loved and grew flowers. He remembers his mother moving bulbs with her to California after the death of his father and his sister remarking how lovely "Mama's striped

lilies from Texas'' were and how well they grew. So like the legend of the Yellow Rose of Texas, they have traveled far and wide in the hearts and gardens of many Texas relatives and neighbors, growing along the by-paths like the trees of Johnny Apple-Seed of long ago.

I have grown them in their present environment sixteen years along a winding sidewalk. The mother clone producing many offsets, I have shared offsets and thus their beauty with so many others, and also have found them very desirable in flower arrangements.

Fig. 12(1) *A. vittata* L'Hérit., showing 3 plants; one clone showing one scape past its prime, the second plant showing 2 scapes and the third plant with one scape growing among pansies.

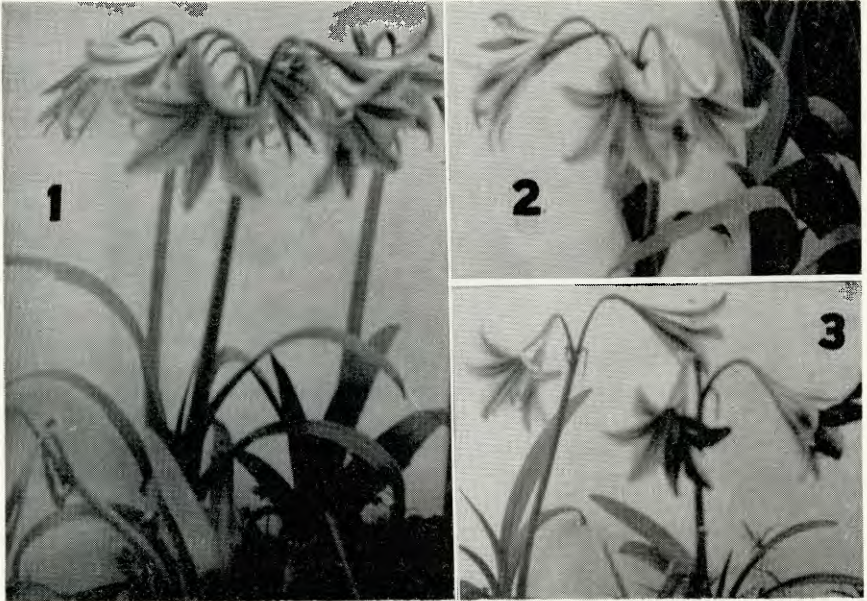


Fig. 12. *Amaryllis vittata* re-discovered by Mrs. Robt. E. Herold, San Antonio, Texas. (1) three plants in flower; (2) Another plant; and (3) plant showing somatic color mutations.

Fig. 12(2) *A. vittata* L'Hérit, across the sidewalk between phlox subulata and bearded Iris. In background, may be seen vittata hybrids in planter box.

Fig. 12(3) Shows *A. vittata* L'Hérit., with one floret showing mutation of two segs to red, one, half red and half white and three segs normally striped mauve-red.

I have another clone that is typical but with only $\frac{1}{2}$ of one seg red and the other five and half striped normally.

The original soil composition was "black gumbo" enriched with sand, leaf mold and barnyard fertilizers. They were grown over the years in full sunshine. They are fed an organic base fertilizer (35%

manure) 5-10-5 (Wonder-Gro) used as a top dressing. Soil is alkaline, but fertilizer is acid in reaction, containing both organic and inorganic nutrients, thereby providing food over a longer period of time.

CRINUM BRASILENSE SP. NOV.

HAMILTON P. TRAUB

In 1963, Dr. Cesar Vargas made a collecting trip for Mr. Robert D. Goedert. One of the items sent back by Dr. Vargas was a *Crinum* sp. (Goedert SA63-11) which he had collected near Itajai, Brasil, "at Flor de Santa Antonio, alt. sea level, in half shade, large, pure white flowers in spring." Some of the stock was sent on to the writer for identification, and the plants flowered at La Jolla, California, in his garden, June 20, 1965. This is a very unusual *Crinum* species with obovate-triangular leaves rather short in a sub-rosette. The flowers are a beautiful pure white, excepting that the tepaltube is greenish-yellowish to yellowish, and the tepalsegs are banded pale yellowish on the outside. A search showed that such a species had apparently not been recorded, and it has been named for the great United States of Brasil.

Crinum brasilense Traub, sp. nov.

Foliis monnullis obovato-triangularibus subcaespitosis; scapo 23 cm. longo; valvis spathae 2 viridibus lanceolatis; umbella 6-flora; tubo tepalorum flavida-subviridibus 12.5 cm. longis; segmentis tepalorum albis 10.7—11.2 cm. longis 2.7—3.3 cm. latis; staminibus segmentis tepalorum $\frac{1}{4}$ brevioribus; stylo segmentis tepalorum paullo breviori; stigmatate capitato.

The *bulbs* are deeply seated in the soil; *leaves* several, up to 27.5 cm. long; up to 8.5 cm. wide, obovate-triangular, dull green, the larger leaves with undulated margin to 2.5 cm. inwards, arranged in a sub-rosette, the older leaves prostrate, the younger horizontal to somewhat upright; winter deciduous; *scape* up to 23 cm. tall, 1—1.7 cm. in diam. at the base, 0.9—1.6 cm. in diam. at the apex, light green, compressed, with roundish edges; *spathe-valves* 2, green, 9.3—9.8 cm. long, lanceolate, apex rounded or acute; *umbel* 6-flowered, the flowers pure white, except the tepaltube greenish-yellowish to yellowish, tepalsegs banded pale yellowish on the outside; style pale yellowish below, greenish in upper $\frac{1}{4}$; fragrant; *ovary* sessile, 1.8 cm. long, 1.1 cm. in diam, green, subglobose; tepaltube 12.5 cm. long, 6 mm. in diam., greenish-yellowish in lower $\frac{1}{3}$, pale yellowish above, slightly declined in upper part before opening; *setepalsegs* 11.2 cm. long, 2.7 cm. wide, lanceolate, acute; *petepalsegs* 10.7 cm. long, 3.3 cm. wide, oblanceolate, bluntly acute; *stamens* about $\frac{3}{4}$ as long as the tepalsegs; *style* slightly shorter than the tepalsegs, filiform; *stigma* capitata.

Holotype (nomenifer): No. 993a+b (TRA), flowered at La Jolla, Calif., from bulbs (Goedert SA63-11) collected by Dr. Vargas in Brasil, and shipped to Mr. Robt. D. Goedert, Jacksonville, Fla., in 1963.

THE LIGHT PRIMROSE YELLOW CRINUM LUTEOLUM

HAMILTON P. TRAUB

Until recently no yellow-flowering *Crinum* species was on record, but this has now been changed with the naming of the light primrose yellow flowering species, *Crinum luteolum* Traub & Hannibal (see Plant Life 21: 96. 1965).

The material was obtained by Mr. William Morris, formerly of Warners Bay, New South Wales, but now of Cairns, Queensland. The members are indebted Mr. Morris for his enthusiasm about the amaryllids and for his introduction of this new *Crinum*, and also for other native Australian amaryllids, including in addition to *Crinum luteolum*, *flaccidum*, *angustifolium*, and various species of *Calostemma*. In his new home State, he will be able to collect other amaryllids, including species of *Crinum*, *Eurycles* and *Calostemma*.

Crinum luteolum was pictured in Plant Life 19: fig. 12. 1963, before it was named in the following year. The forms of *Crinum luteolum* introduced earlier had relatively smaller flowers than most forms of *Crinum flaccidum*. However, in 1965, a form of *Crinum luteolum* with larger flowers bloomed under cultivation at La Jolla, Calif. This form is taken into consideration in the preparation of the amplified description presented here. *Crinum luteolum* is related to *C. flaccidum*, but differs significantly from it. In *C. luteolum* the leaves are evergreen, larger, and the entire leaf withers with maturity; in its native habitat it flowers usually in late winter to spring; the flowers are light primrose yellow, with relatively heavier substance; the lower three stamens are shorter and grouped together, the upper three somewhat wider apart. There are other differences.

***Crinum luteolum* Traub & Hannibal, descr. emend.**

Plant Life 21: 96. 1965.

A. C. flaccido recedit foliis amplioribus longioribusque sempervirentibus in statu senectute omnino intermortuis; floribus crassiusculis in patria indigena tempo hiemali vernalique florentibus claro-primulino-flavis; et caeteris.

Bulb deeply seated in the soil, very large ovate, 7.5 cm. long or longer, 5.9—6.5 cm. in diam. or thicker, bulb-neck 15 cm. long or longer, 1.4—2.4 cm. in diam.; bulb-coats whitish, longitudinal veins brownish; aerial pseudo-neck above the ground, about 5 cm. long. *Leaves* evergreen, up to 10, or more, widely U-shaped in cross section, relatively long, arcuate for part of their length, the remainder resting on the ground, 120—126 cm. long or longer, 3.6—4 cm. wide or wider, narrowing to a point in new leaves, dying in upper portions with age; grass green, of medium heavy substance, margin hyaline and scabrous; entire leaf dying on senescence. *Scape* solid, flattish with rounded edges, very light yellowish-greenish, changing to slightly reddish near base, 38—40 cm. long, 1.1 x 1.9 to 1.4 x 2.1 cm. in diam. at the base, 0.9 x 1.4 to 1.1 x 1.7 cm. in diam. at the apex. *Spathe-valves* 2, lanceolate, acute or

bluntly acute, 7.2—8.3—12.5—13 cm. long, up to 2.6 cm. wide at the base, very light yellowish, finally changing to amberish or whitish, at first upright, later drooping. Umbel 6—14-flowered, flowers wide open, slightly declined at anthesis, light primrose yellow (HCC 601/1 to 601/2); odor not particularly pleasant. *Pedicels* green, 3.3—4.4—5 cm. long at anthesis. *Ovary* green, 1.2—1.8 cm. long, 4—6—7 mm. in diam. *Perigone* only slightly but definitely zygomorphic, tepalsegs not widely expanded; the lower 3 stamens fairly close together, the 3 upper farther apart. *Tepaltube* slightly curved, 3.4—4.5 cm. long, 4—5.5 mm. in diam. *Tepalsegs* of relatively thick texture, lanceolate, acute, to oblanceolate. *Setepalsegs* 4.6—8.5—9 cm. long, 1.8—2.3 cm. wide; *petepalsegs* 4.6—8.2—8.7 cm. long, 2—2.5 cm. wide. The three *stamen filaments* opposite the three *petepalsegs* slightly adnate to these at the base, the lower 3 somewhat close together, the upper 3 farther apart, 3.3 cm. long; anthers at anthesis 1.2 cm. long, becoming arcuate with age; versatile, introrse; pollen yellow. *Style* 1.1 cm. longer than the stamens, shorter than the tepalsegs; *stigma* minute, faintly pinkish.

Holotype (nomenifer): No. 985 (TRA), flowered at La Jolla, Calif., from a bulb collected at Pichi-Richi Pass, Flinders Range, near Port Augusta, South Australia, and sent to the United States by William Morris. No. 999 (TRA), from the same source.

Crinum luteolum is self-fertile to a limited extent and thus can be propagated from seeds, and in this way can be widely distributed in the United States. Since the plant is found in a cool location, and the bulbs are very deeply seated in the ground, it should be possible to cultivate this species as far north outdoors as middle eastern states, and even farther north on the south side of buildings with mulching protection.

NEAR WHITE DOUBLE HYBRID AMARYLLIS

W. R. LATAPIE, 3737 *Elysian Fields*,
New Orleans, Louisiana 70122

The writer and his wife, Hilda S. Latapie, have been breeding hybrid *Amaryllis* since 1940, and one of our main objectives has been to produce white double clones. This ideal has almost been reached with the appearance of a near-white double clone (Fig. 13). This is apparently the first one of its kind in existence.

It is interesting to note that in the seed batch from which this hybrid was selected, we also obtained several other different doubles, but the "McCann" coloring predominated. These were true doubles, triples, having eighteen to twenty-one tepalsegs in each flower. In this batch also some single red and white flowering hybrids were obtained.

The double hybrid flowered for the first time during the season of 1965 when the following detailed description was made:

Length of scape: 14 inches high; number of buds: three, each blooming separately; number of petals: 21; length of flower 2½ inches; length

of pedicel: 2 inches; length of tepaltube; $\frac{1}{2}$ inch; perigone width: 6 inches across; perigone 5 inches from top to bottom; color: white with cherry red faint streak each side of mid-rib, inner throat green; tepal-

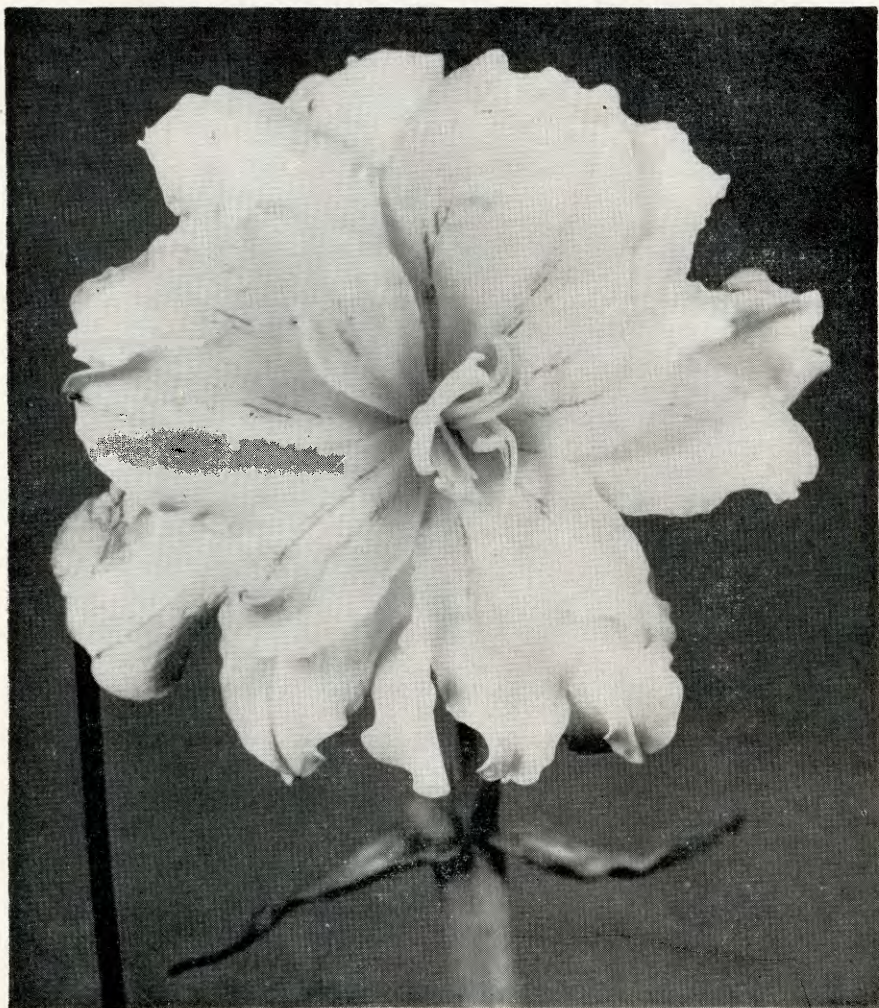


Fig. 13. Beautiful double near white hybrid *Amaryllis* produced by Walter and Hilda Latapie, of New Orleans, La.

segs (size) four outer segs (setepalsegs): 2 inches wide, graduating to $\frac{3}{4}$ inches in center; three anthers with no pollen; no visible pistil; size of bulb: 8 inches in circumference; flower has fragrance.

Leaves $1\frac{1}{2}$ inches wide; neck of bulb is short.

The hybrid is a cross of 'Captain McCann' red (double) x "Maria Goretti" (White).

POLYEMBRYONY IN HYMENOCALLIS MEXICANA

HAMILTON P. TRAUB

It is the usual practice to collect amaryllid seeds and store them in open dishes in the garage so to have them handy for distribution. Among the seeds exposed in this manner this season were those of *Hymenocallis mexicana* which blooms in late spring or early summer. The seeds soon burst the capsule walls and are exposed; and later fall to the ground. Seeds collected in early summer were stored in open dishes and produced sprouts which formed tiny bulblets at the end of the sprout as is usual with most amaryllids. On examination recently (9-26-65), it was noted that one seed had two such sprouts each with a tiny bulblet. This was unusual and had not been noted before in amaryllids. On further examination, the dish contained two additional seeds with two sprouts. Thus the original observation had been verified, and records were made. In the case of two seeds the sprouts were at opposite ends of the seed; in one, two sprouts were on the same end. Dissection of the seeds showed that each of the three seeds contained two embryos. This is the first case of polyembryony in amaryllids observed by the writer. Perhaps others have made similar observations. If this is so reports in Plant Life are welcomed.

THE TYPE OF LYCORIS AUREA HERB. 1821

HAMILTON P. TRAUB

Herbert based his genus *Lycoris* Herb. (App. 20, 1821) on *Lycoris aurea* (L'Herit.) Herb., (Bot. Mag. Lond. 409. 1789; *Amaryllis aurea* L'Herit.). syn.—*Amaryllis aurea* L'Herit., Sert. Angl. 14, pl. 15. 1784; with descriptions in Hort. Kew 1.: 419. 1789; and Miller's Diet. ed. Mart.

Herbert in the Appendix, 1821, remarks that the flowers are pale orange, having narrow and somewhat undulated segments, with a greenish keel; style very long, stigma bright red. An examination of the plate 409 in Botanical Magazine shows that the tepalsegs are narrow, long elliptic-lanceolate, the spathe valves lanceolate, rather long. Thus, it is certain that the plant at present recognized as *Lycoris aurea* is correctly identified. The reader should refer to Plate 313, *Lycoris aurea*, in Herbertia 14: 183. 1947 (1948). For the distinction between *Lycoris aurea* and *L. traubii* Hayward, the reader should refer to Hayward's article in PLANT LIFE 13: 40—42, fig. 13, 1957.

CRINUM CLONE 'CECIL HOUDYSHEL'

L. S. HANNIBAL, *Fair Oaks, Calif.*

According to *Herbertia*, Volume 2, page 111, *Crinum* x *powellii* 'Cecil Houdyshel' is apparently a *C. Bulbispermum roseum* x *C. moorei* cross. Crosses made by Major Pam and the writer using *C. b. roseum* have never duplicated the Cecil Houdyshel cross, and it was not until some *Crinodonna* hybrids and *C. americanum* hybrids were flowered where *C. 'Cecil Houdyshel'* was the pollen parent that we began to wonder just what was involved in the parentage of *C. 'Cecil Houdyshel'*. The reason for this reaction is that these secondary hybrids are either pure white or as deep a red as in several *Scabrum* crosses. Normally we would expect a dilution of the color gene, but this vividness appears to exceed anything which might come out of *C. bulbispermum roseum*.

At the moment we are wondering if Mr. Cecil Houdyshel used a *scabrum* x *moorei* pollen hybrid on *C. bulbispermum album*. This would explain the vivid color of *C. 'Cecil Houdyshel'* and the breeding behavior of the seedlings where it is a pollen parent.

As most *Crinum* fanciers know *C. 'Cecil Houdyshel'* selfs with considerable difficulty and the seedlings are weak, but it will often take other pollens such as those of *powelli album* or that of various species such as *C. bulbispermum album*. The writer's white-flowered *Crinodonna* is one of the most free flowering forms so far encountered and the form is very good. The tentative name is 'Grace'.

1965 DAYLILY REPORT

W. QUINN BUCK, *Chairman, Daylily Committee*

Greater interest in pinks and the lavenders and blues, and a better acceptance of the tetraploid daylilies as a real horticultural advancement may be said to characterize the year 1965. A few notes are given here in the hope of reflecting these developments:

One of the brightest of the new diploid pinks in my garden was 'Zadol' (Spalding), the color having a glow unmarred by any admixture of salmon; one had to marvel each morning at the freshness of its color. Of even better shape was 'Pink Fluff' (Spalding), which had a blended color tone. 'Edna Spalding', named for its originator, was an outstandingly beautiful pale pink of exquisite texture, and now an induced tetraploid form of this clone is reported as being even finer. 'Pink Superior' (Fay) also was a really fine pale pink and it repeated vigorously. This reblooming characteristic, one of Mr. Fay's important goals, was displayed by a small summer-planted division of 'Pink Venus', which was sending up a second spike before the first was finished; it is hoped that the color quality will improve as this clone becomes better established. The clear color of the lavender-pink bi-tone 'Grace Lenington' (Lenington) was refreshing on a small new plant.

Other large pinks that made a good show were 'Peach Petal' (Lester), 'Almond Pink' (Hardy), and 'Exotic Lady' (Childs); the

latter repeated strongly and beautifully. The florid pink blend 'Buddy' (Claar) was adversely affected by nights too cool for it; the real beauty of 'Annie Welch' (Claar) was not apparent until our warmest nights had come, and then it was a marvel in spite of its somewhat sprawling scapes.

For real lavender color 1965 honors must go to 'Lavender Flight' (Spalding), which was a larger and better finished flower than most clones in its class. For clean bluish color we must admire 'Lavender Touch' (Childs), but it did not rival the earlier brightness of 'Blue Jay' (Spalding), which continues to be one of the fine clones. The Kennedy 55-54C had no peer for blue-purple color. A new seedling 65D1 (Buck) was a real joy in its deep rose-magenta self color, which



Fig. 14. *Hemerocallis washingtonia* clone 'California Duchess', brighter barium yellow.

promises much for the breeding of lavenders. 'Wannetta' (Spalding) was a delightful miniature of bright lavender-purple that was most outstanding in color quality.

'Emperor's Robe' (Fay) was a huge flower, very fine, but in my inland California garden it was certainly more pink than lavender. Likewise, 'Ruffled Star' (Fay) had little of the lavender in its blended color; it and 'Breaking Dawn' (Fay) were very large and quite outstanding pink blends.

Among the melons 'Louise Simon' (MacMillan) was again unchallenged among the early ones—if at all. 'Mildred O'Neal' (Kraus) was a most beautiful new melon with rounded form, and 'Hopewell' (Kraus) had a deep apricot melon flower with great substance. 'Far East' (Fay) proved to be a vigorous, reblooming large orange melon of superior

bright quality. The new 'Christine Ann' (Fay) was a lovely firm-textured melon among the very late ones.

'Ruffled Wax' (Fay) was well named, having unparalleled substance among the new yellows; it was lacking in distinction of form, however. Beautiful form and ruffling and ample substance characterized the flowers on the wonderfully branched spikes of 'Carl Milliken' (Hager), which rebloomed vigorously and was in every way a worthy tribute to the late hybridizer.

Among the tetraploids it is difficult to single out any individual clones for mention because few reports have been received. From E. W. Brown III of Orange, Texas, comes word of two outstanding seedlings out of the Crestwood lines: TS-6-65P is a beautiful eyed, clear pink in his Kodachrome of it, and T-6-65R is a handsome green-throated, eyed rose. Dr. Virginia Peck has a most outstandingly fine melon in her induced T-1-65, which is incredibly round and ruffled.

One of the fine textured tetraploids is 'California Duchess' (Traub) which is a subtle barium yellow in color and perfectly rain and sun-proof; and is recurrent blooming. (Fig. 14)

The many visitors who saw the Fay-Griesbach tetraploids in 1964 have had much to do with the more favorable acceptance that begins to be evidenced in 1965. Still more visitors saw this planting in 1965, but the reports are that the seedling tetraploids, mainly of the Crestwood line, in the Mission Gardens fields in Techny, Ill., were the real eye-openers for the many visitors who went to see Brother Charles's work.—26 *E. Camino Real, Arcadia, Calif.*

THE CHROMOSOMES OF RAUHIA PERUVIANA TRAUB

WALTER S. FLORY,

Wake Forest College

The genus *Rauhia*, and its single known species *R. peruviana*, were both described by H. P. Traub in 1957. Dr. Traub has sent the writer a bulb of Clone A, and also a bulb of Clone B of this species for cytological study. The present article deals chiefly with the chromosomes of Clone B of *R. peruviana*.

The somatic chromosome number of this species is 46, this number having been seen clearly in eight different metaphase divisions of root tips from the single small bulb available. All divisions exhibited essentially the same chromosome types. Figure 15 shows one of these divisions from a root tip treated in .2 per cent colchicine for 5 hours, followed by alcohol: acetic acid, 3:1, fixation overnight and squashing in aceto-orcein solution. The drawing was made with a camera-lucida at a table magnification of approximately X2500.

When root tips are pretreated in colchicine for several hours the chromosomes are considerably contracted. Also, following this treat-

ment, the chromatids of the divided metaphase chromosomes remain loosely together for some time after they normally would have separated. This condition was quite apparent in our preparations, and is apparent in the accompanying drawing (Fig. 15).

THE CHROMOSOMES OF CLONE B

Four types of chromosomes occur in our bulb of Clone B. These types, with the number of each type, sizes of each type following the colchicine treatment, and the size range of each type, will be briefly described.

There are three long chromosomes with median, or near-median,

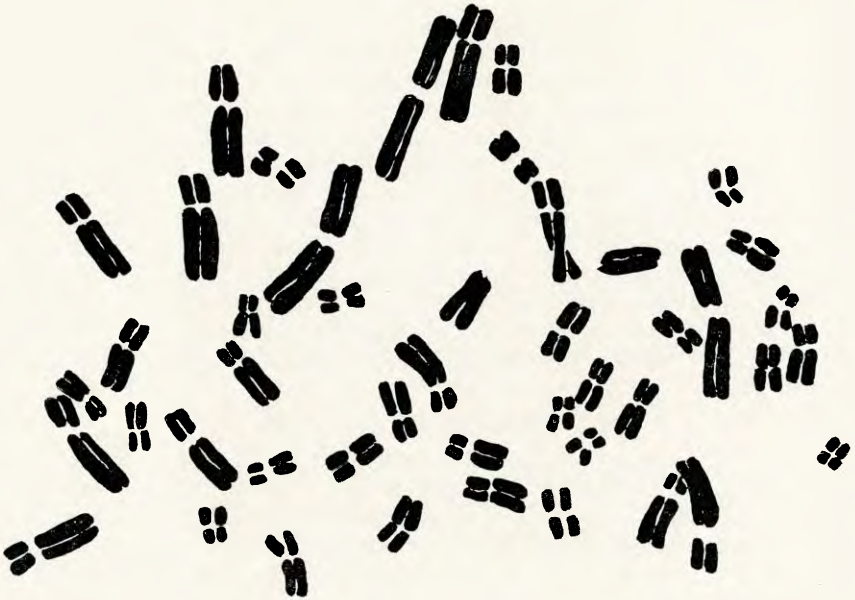


Fig. 15. Chromosomes of *Rauhia peruviana*, $2n=46$. Camera lucida drawing at X2500; reduced by about 15% in reproduction.

centromeric constrictions, each approximately 11 microns in length. In each, one arm is slightly over 5 microns, one arm is slightly less than 5 microns, and the centromere constriction space is approximately one micron in length.

There are 19 shorter submedian chromosomes, with several of these approaching the subterminal condition, ranging from just a little over 7 microns to—in one pair—just under 4 microns in length. The long arms of these chromosomes are approximately twice the length of their short arms. In this group there are 5 chromosomes which are 7 microns, or just a little more, in length, there are two, as mentioned, which are slightly less than 4 microns long, four which are 4 microns long, with

the remainder varying—in pairs—from more than 4 up to almost 7 microns in length.

The remaining two chromosomes comprise a fourth type since they are terminally constricted ones about 4 microns in length. This means they are approximately the same length as the shorter arms of the long, almost medianly constricted, chromosomes. Also, they are about the same length as the long arms of the longest chromosomes of the submedian group.

It has been pointed out that there are three long chromosomes with approximately median constrictions, and that there are five chromosomes each about 7 microns in length in the group with submedian attachment constrictions. The two terminal chromosomes appear to be the same length and would seem at first glance to be members of a pair. Considering the odd numbers of long median, and of long submedian, chromosomes—together with the similarity of length of short arm in the one, and of long arm in the other—it seems plausible that the two terminal chromosomes encountered here are actually the remnants of single fractured chromosomes of two different pairs. If such is true, the short arm of a long chromosome has been lost in one case, while the long arm of a shorter chromosome was also lost. If this is a true picture of events leading up to the presently observed and described karyotype, the observed karyotype would apparently have been derived from one in which only three types of chromosomes occurred. These types, with the numbers of each would be: (1) long median, or near-median, chromosomes—4; (2) short sub-median—20; and (3) short median, or near-median—22.

THE CHROMOSOMES OF CLONE A

Soon after receipt of the two *Rauhia* bulbs, cytological squashes were made of root tips of the Clone A one. Original observations indicated that there were 48, or approximately 48, somatic chromosomes in this accession. The bulb was lost before additional studies could be made of Clone A material. It is possible that this Clone (1) does have two more chromosomes than Clone B; (2) that the original tentative counts were in error and that this Clone also has 46 somatic chromosomes; or (3) that some other situation exists in Clone A.

If additional material becomes available the chromosome set-up in this Clone will be studied further.

BASIC CHROMOSOME NUMBER

Traub (1957) originally placed *Rauhia* in Tribe Pancreaticeae, along with *Chlidanthus*, *Pancreatium* and *Stenomesson*. In a more recent treatment (Traub, 1963) he places *Rauhia* in his Tribe Stenomesseseae, with *Chlidanthus*, *Pamianthe*, *Paramongaia* and *Stenomesson*.

Chromosome numbers are found in the literature for only two species in Tribe Stenomesseseae. La Cour (1956) reported *Pamianthe peruviana* to have $2n=46$, while Mookerjea (1955) found $2n$ to be 20 in *Chlidanthus fragrans*.

A number of years ago the present writer found *Stenomesson variegatum* to have $70 \pm$ somatic chromosomes. The possibility exists that in this species $2n$ may be 69, or a number derived from 69.

It thus appears that 23 is a base number in the genera *Rauhia*, *Pamianthe*, and possibly *Stenomesson*, of Tribe Stenomesseae. Just how *Chlidanthus fragrans*, with $2n=20$, relates cytologically to the three genera just mentioned appears problematical, as yet.

It seems of interest that considerable unpublished data on the chromosomes of *Hymenocallis*, of the closely related Tribe Euchareae, points to 23 as being an important base number in this genus.

SUMMARY

Rauhia peruviana (Clone B, from H. P. Traub) has 46 somatic chromosomes in the single bulb studied. These may be classified as: long, median constrictions—3; shorter, submedian—19; short, median—22; terminal constrictions—2. One of the chromosomes with terminal constriction may be the short arm of an originally long, median chromosome; while the similar element may be the long arm of a shorter, originally submedian chromosome. The base number appears to be 23.

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 ————. 1963. *Genera of Amaryllidaceae*. pp. 19, 71.

NERINE UNDULATA

L. S. HANNIBAL, 4008 Villa Ct., Fair Oaks, Calif.

Some years ago the writer received some very small hardy *Nerine* bulbs from Harrison's in New Zealand with the suggestion that they be properly identified. The foliage resembled that of *N. sarniensis* only it was only about six mm. wide and equally dwarf in other proportions. The scapes were about 15 inches high and 3 or 4 mm in diameter, and the blossoms were mere spidery filaments with the tepals some 3.5 to 4 cm. long by $1\frac{1}{2}$ to 2 mm. wide and rather well crisped. Some similarities to *Bowdennii* were noted, especially in seeding habits. It was found that the two would readily cross, despite the great difference in size. The resulting hybrids are both summer and winter growing and are as hardy as *N. bowdennii* or *N. humilis*.

Eventually through the cooperation of Dr. J. W. van der Walt bulbs were submitted to Bolus Herbarium and Miss Verdoorn has confirmed that these are definitely *N. undulata* (see Fig. 16). As a result we can report that *N. undulata*, *N. flexuosa* and *N. bowdennii* belong to the same alliance as it appears that all of their crosses are fairly vigorous and quite fertile. As a garden flower *N. undulata* is entirely too wispy to indicate its presence.

CRINUM CLONE 'GULF PRIDE'

L. S. HANNIBAL, 4008 Villa Court,
Fair Oaks, Calif.

A year or so back Dr. Thaddus Howard sent the writer a *Crinum* bulb labeled *C. Kunthianum* which was described as having rather fragrant waxy-like blossoms that tended to droop in warm weather. When the plant flowered here it was obviously not *C. Kunthianum* Roem., as the latter has long rayed tepalsegs which places the plant in the class with *C. americanum*, except that *C. Kunthianum* blossoms are generally colored a wine pink.



Fig. 16. *Nerine undulata*, grown by L. S. Hannibal, Fair Oaks, Calif.

In searching the literature I came across a hybrid listed by L. H. Bailey in the Cyclopedia of Horticulture as *C. Kunthianum* Hort. non Roem., which is given as a cross of *C. Bulbispermum* and *C. Scabrum*. Since the original bulb had come from Lakemont Gardens I am rather inclined to believe that Dr. Howard's contribution was this same clone that Bailey describes. In comparing the plant to several other *C. Bulbispermum* hybrids it is rather obvious from the foliage that it is a *Bulbi* termin if the other parent was *C. Scabrum* or *C. Kirkii*. The trumpet shaped blossoms are a waxy pink-white with the general concentration of the pink pigment along the keel of the tepalsegs. Such a waxy texture and coloring could be derived from either of the latter species. The plant has been reportedly sterile as it sets no seed but we have found

CRINUM CLONE 'GULF PRIDE'—continued on page 70.

CRINUM FLACCIDUM CLONE 'WILLIAM MORRIS'

HAMILTON P. TRAUB

Mr. William Morris of Cairns, Queensland, Australia, has sent to us many bulbs of *Crinum flaccidum* which is a very variable species. The tepalsegs of the flowers in most of the plants are narrowly ovate-

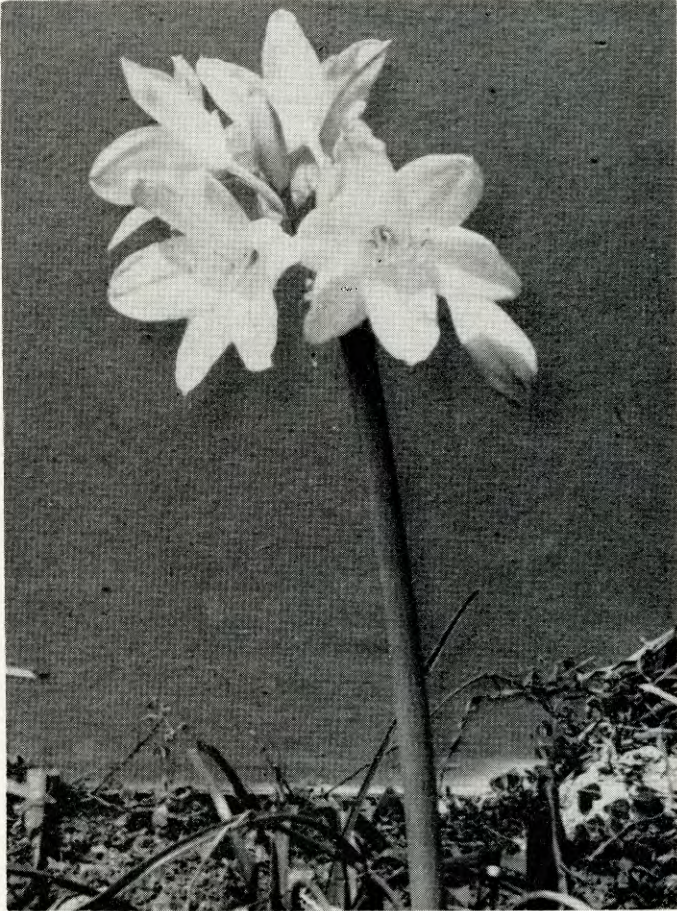


Fig. 17. *Crinum flaccidum* clone 'William Morris'; collected in the wild in Australia by William Morris, Cairns, Queensland.

acute, but in one clone, the tepalsegs are more broadly ovate. The setsegs are broadly-ovate, acute, and the petsegs are ovate, with apexes rounded, thus producing an imbricated effect (see Fig. 17). This outstanding plant was chosen from a large lot as the very finest for decorative purposes, and has been named 'William Morris' (Specimen No. 1000a+b



Fig. 18. *Lycoris albiflora* (?) as flowered at La Jolla, Calif. in 1965.



Fig. 19. *Lycoris josephinae* as flowered at La Jolla, Calif. in 1965.

(TRA), collected by Mr. Morris) for Mr. Morris of Australia who kindly sent a wealth of amaryllids to us. An attempt will be made to propagate this clone vegetatively.

THREE LITTLE KNOWN LYCORIS

HAMILTON P. TRAUB

The purpose of the present brief note is to report on the blooming of three relatively little known *Lycoris* species, *L. alliflora* (?), *L. josephinae* and *L. koreana* (?). The writer used his Fotron camera in photographing the plants in flower.

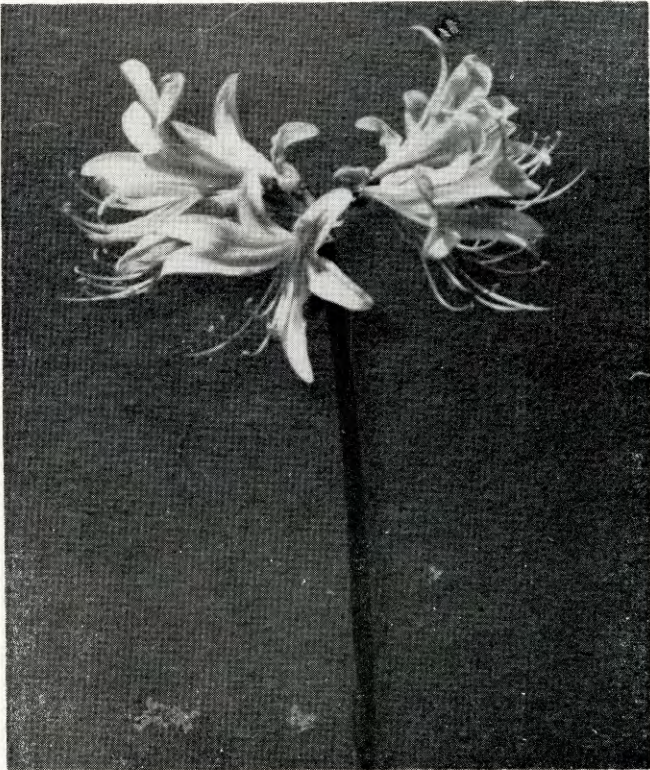


Fig. 20. *Lycoris koreana* (?) as flowered at La Jolla, Calif., in 1965.

Lycoris albiflora (?)

In 1958, Mr. Sam Caldwell sent us a tiny bulblet labeled "*Lycoris albiflora*". This plant had continually declined at Nashville over a num-

ber of years. Apparently, the climate was not favorable for its growth there. The bulblet was set out in the garden at La Jolla, and it very gradually recovered over the years, and to our surprise, after seven years, it bloomed on August 28, 1965. It turned out to be a very beautiful species. The umbel was 7-flowered, and the flowers were assurgent (see Fig. 18), slightly pinkish in bud, opening creamy-white, very slightly tinged or streaked pinkish, maturing to solid creamy-white, with deeper creamy band in the center of the segs; the stamens and style were very slightly tinged pinkish (specimen #1012(TRA), 8-28-65). A comparison of the original description of Koidzumi (see Traub & Moldk, *Amaryllidac.*; *Amaryll.* 1949, p. 178), which is incomplete in some details, shows that it comes near to that species, and may actually be this species. However, it is not white, but creamy-white and apparently Koidzumi was careless in indicating the flower color.

Lycoris josephinae

This species bloomed in 1964 and again in 1965. The bulbs were collected originally by Miss Josephine Henry in China as indicated in *Plant Life* 21: 63—64. (1965). It differs from the ordinary self-fertile *Lycoris radiata* var. *radiata* in having stouter scapes, and in blooming later (late August through mid-September), and in having Delft rose-colored flowers. The umbel is 8-flowered. See Fig. 19.

Lycoris Koreana (?)

In 1964, Mr. Goedert sent us some bulbs labeled "Lyoris Vermilion" which he had imported from Japan. These were set out in the garden, and made good foliage during the winter. In late August 1965, flowers were obtained. See Fig. 20. A comparison of this plant (specimen #1011 (TRA), 8-28-65) with the description given by Nakai (see Traub & Moldk., *Amaryllidac.*: *Tribe Amaryll.* 1949, p. 176) shows that it comes near to that species. The flower color is a light brick-red (which the Japanese grower had almost correctly indicated as vermilion). The umbel is 7-flowered, the segs are quite regular, not twisted and crisped. Thus this may actually be *Lycoris koreana*. However, further comparisons will be made during the 1966 flowering season.

FURTHER NOTES ON GETHYLLIS, KLINGIA APODOLIRION, HESSEA AND STRUMARIA

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Johannesburg, South Africa*

In a recent paper (Wilsenach, 1965) chromosome numbers and idiograms were presented for *Gethyllis*, *Klingia*, *Apodolirion*, *Hessea* and *Strumaria*. As the cytology of these genera was previously unknown, it led to new ideas on the relationships and to a discussion in which the systems of Pax and Hoffmann (1930), Gouws (1949) and Hutchinson (1934) were criticized. Unfortunately "The Genera of Amaryllidaceae"

(Traub, 1963) was not available to the author then and in these brief notes the results presented recently (Wilsenach, 1965) will be related to the grouping of genera according to Traub (1963).

In my recent paper the close relationship between *Hessea* (and *Strumaria*) and *Nerine* was demonstrated and this meant that these genera should be included in one tribe. Gouws' subtribe *Amaryllidinae* is identical to Traub's tribe *Crineae*. It is suggested that *Hessea* and *Strumaria* should be included here and this will create a big tribe which will include the following genera: *Hessea*, *Strumaria*, *Nerine*, *Brunsvigia*, *Boöphone*, *Ammacharis*, *Cybistetes*, *Crinum* and *Carpolyza* should tentatively also be included here. The basic chromosome number of this tribe will be $n=11$, but a few species have 12 as the haploid number.

Traub's suggestion that *Apodolirion* and *Gethyllis* may be congeneric is fully supported by the cytological data presented. *Klingia* was separated by Traub from these, being tentatively placed in the tribe *Pancretatieae*. This decision by Traub must have been based on the presence of a staminal cup in *Klingia*, but as Traub pointed out more evidence was required. The idiograms of *Gethyllis*, *Klingia* and *Apodolirion* were so surprisingly similar that it was suggested to sink the three genera, recognising only *Gethyllis* (Wilsenach, 1965).

As far as I know it is still unknown whether the fruit of *Klingia namaquensis* (there is only one species) is a berry, like the fruit of *Gethyllis* species. Hutchinson placed *Gethyllis* and *Apodolirion* in the tribe *Zephyrantheae* and this grouping is supported by cytological evidence since very few Amaryllids with inferior ovaries have retained the basic chromosome number of 6 as is the case in these plants.

In a brief note Traub (1965) modified his system in accordance with newer evidence (Wilsenach, 1965). He still separated the genera *Gethyllis* and *Klingia*, awaiting verification of fruit character referred to above. His tribe *Crineae* has been modified to accommodate also the genera *Hessea* and *Strumaria*, but he gave 6 and 11 as the haploid chromosome numbers of this tribe. In actual fact most genera and species have 11 as the haploid number, but $n=6$ has not been reported for any of the *Crineae*. Some have 12 as the haploid number.

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AMARYLLID NOTES, 1966

HAMILTON P. TRAUB

Eucrosia eucrosioides var. **rauhiana** (Traub) Traub, **comb. nov.**

syn.—**Callipsyche eucrosioides** var. **rauhiana** Traub, in *Plant Life* 13: 61. 1957.

Pancratium centrale (Chev.) Traub, **err. "P. centralis"**

Plant Life 19: 59. 1963. Syn.—**Mizonia centralis** Chev., in *Rev. Bot. Appliq.* 30: 626; 628, pl. 33 & 34. 1950.

Agapanthus africanus var. **henryae** Traub, **var. nov.**

Haec varietas a forma typica speciei floribus albis recedit.

Holotype (nomenifer): Traub #991 (TRA), June 18, 1965, grown at La Jolla, Calif.

This is a beautiful pure white variety, of the blue **Agapanthus africanus**, described from stock furnished by Mrs. Mary G. Henry, Gladwyne, Penna. It is very much worth growing in the garden in the South and in pot culture in the North.

Stenomesson moldenkei Traub, **sp. nov.** (Amaryllidac.)

Herba bulbosa; collo bulbi ca. 11 cm. longo, 1 cm. lato; foliis cum floribus sub ad anthesi productis lineari-acutis usque ad 33 cm. longis, 6—8 mm. latis; pedunculo usque ad 28 cm. alto; valvis spathae ab exemplari typico absentibus; umbella 4—6-flora; pedicellis inter se in longitudine variis 1.5—3 cm. longis; ovario sub anthesi 6 mm. longo; perigonia aurantiaco, ca. 4 cm. longo, apice segmentorum subviridi; tubo tepalorum usque ad 2.6 cm. longo, ad basin ca. 3 mm. lato, ad apicem usque ad 5 mm. dilatato; segmentis tepalorum 1.4 cm. longis, 6—7 mm. latis, elliptico-acutis; cyatho staminorum 7 mm. longo, inter filamenta microscopice irregulariterque emarginato; staminibus segmenta tepalorum subaequantibus; filamentis filiformibus 5 mm. longis; antheris 6 mm. longis; stylo staminibus paulo brevioribus; stigma capitato. Holotype: Ferreyra #6922 = #176 (TRA).

Eustephia latifolia (R. E. Fries) Traub, **comb. nov.** Syn.—**Eustephiopsis latifolia** R. E. Fries, in *Act. Soc. Sci. Upsal. Ser. IV.* 1: 164—165, pl. 8, figs. 12 & 13. 1905.

Eustephia speciosa (R. E. Fries) Traub, **comb. nov.** Syn.—**Eustephiopsis speciosa** R. E. Fries, *l. c.* 163-164, pl. 8, figs. 14 & 15. 1905.

Habranthus paxii Traub, **nom. nov.** Syn.—**Hippeastrum tubispathum** Pax, in *Engl. Bot. Jahrb.* 11: 329—330, pl. 7, fig. 9. 1890.

Eucrosia mirabilis (Bak.) Traub, **comb. nov.** Syn.—**Callipsyche mirabilis** in Saund. *Refug. Bot.* pl. 168. 1868-73.

Eucrosia aurantiaca (Bak.) Traub, **comb. nov.** Syn.—**Callipsyche aurantiaca** Bak., in Saund. *Refug. Bot.* pl. 167. 1868-73.

TRAUB—AMARYLLID NOTES, 1966, continued on page 5.

REGISTRATION OF NEW AMARYLLID CLONES

MR. W. D. MORTON, JR., *Emeritus Registrar*
 MR. EDWARD F. AUTHEMENT, *Registrar*
 MRS. EMMA D. MENNINGER, *Associate Registrar*

This department has been included since 1934 to provide a place for the registration of names of cultivated *Amaryllis* and other amaryllids on an International basis. The procedure is in harmony with the INTERNATIONAL CODE OF BOTANICAL NOMENCLATURE (edition publ. 1961) and the INTERNATIONAL CODE OF NOMENCLATURE FOR CULTIVATED PLANTS (edition publ. 1958). Catalogs of registered names, as well as unregistered validly published names, will be published from time to time as the need arises. The first one, "DESCRIPTIVE CATALOG OF HEMEROCALLIS CLONES. 1893-1948" by Norton, Stuntz and Ballard was published in 1949. This may be obtained at \$2.50 prepaid from: Dr. Thos. W. Whitaker, Executive Secy., THE AMERICAN PLANT LIFE SOCIETY, Box 150, La Jolla, Calif. CATALOG OF HYBRID NERINE CLONES, 1882-1958, by Emma D. Menninger; and CATALOG OF BRUNSVIGIA CULTIVARS, 1837-1959, by Hamilton P. Traub and L. S. Hannibal, were published in 1960 Plant Life, with additions to both in Plant Life 1961. In Plant Life 1961, the first edition of THE GENUS X CRINODONNA was published which serves also as a catalog of cultivars. In Plant Life 1964, the first edition of "CATALOG OF HYBRID AMARYLLIS CULTIVARS, 1799 to Dec. 31, 1963" was published. Other catalogs of cultivated amaryllids are scheduled for publication in future issues.

Only registered named clones of *Amaryllis* and other amaryllids are eligible for awards and honors of the AMERICAN AMARYLLIS SOCIETY at Official *Amaryllis* Shows.

Correspondence regarding registration of all amaryllids such as *Amaryllis*, *Lycoris*, *Brunsvigia*, *Clivia*, *Crinum*, *Hymenocallis*, and so on should be addressed to Mr. Edward F. Authement, *Registrar*, 2214 Gallier St., New Orleans, Louisiana 70117. The registration fee is \$2.00 for each clone to be registered. Make checks payable to AMERICAN PLANT LIFE SOCIETY.

CORRIGENDA

Plant Life, Vol. 21, 1965

Registration of New *Amaryllis* Clones

Page 51, line 8 from bottom, "G. C. Van Waveren & Sons" read "G. C. Van Meeuwen and Sons".

Page 98, line 23 from bottom, for "D-15A" read "D-5A".

NEW AMARYLLIS BREEDERS, 1965

Abbrev.

Forb.—Mrs. Sam Forbert, 1910 Evergreen Lane, Hattiesburg, Miss.
 Stat.—Mrs. Ioma Staton, 1216 Roosevelt Ave., San Antonio, Tex.

AMARYLLIS CLONES REGISTERED IN 1965

EDWARD AUTHEMENT, *Registrar*

Registered by Robert D. Goedert, Jacksonville, Fla. for Harry de Leeuw Co., Ltd., South Africa.

'Redstone' (HDL—1964), R; A-823, D-5A; U-4fld; 12"h; fls. 5 1/2" diam; dutch vermilion (HCC-717), darker shade in throat. I—Goed. 1964.

'Red Rover' (HDL—1964), R; A-824, D-5A; U-4fld; 10"h; fls. 6" diam; vermilion (HCC-18), faint white blotch in upper 3 segs. I—Goed. 1964.

'Red Hood' (HDL—1964), R; A-825, D-5A; U-4fld; 14"h; fls. 7" diam; scarlet (HCC-19). I—Goed. 1964.

'Vintage' (HDL—1964), R; A-826, D-5A; U-2-3fld; 17"h; fls. 7" diam; indian lake red (HCC-826). I—Goed. 1964.

Registered by G. C. Van Meeuwen & Sons, Heemstede, Holland

'Berenice' (VM—1964), R; A-827; D-5A; U-5fld; 18"h; fls. 7" diam; currant red (HCC-821) with velvety sheen; spr. dec.

'Daphne' (VM—1964), R; A-828, D-5A; U-4fld; 20"h; fls. 8" diam orient red (HCC-819), green to white midribs 3/4 up segs, white pencil stripes each side midrib in upper 3 segs; spr. dec.

'Durango' (VM—1963), R; A-829, D-5A; U-4fld; 21"h; fls. 8" diam; signal red (HCC-719), cardinal red throat; spr. dec.

'Fortuna' (VM—1964), R; A-830, D-5A; U-4fld; 18"h; fls. 6-7" diam; poppy red (HCC-16/1), darker shade in throat; spr. dec.

'Hecuba' (VM—1963), R; A-831, D-5A U-3-4fld; 22"h; fls. 7" diam; mandarin red (HCC-17), darker shade in throat, green midrib on reverse side; spr. dec.

'Odin' (VM—1963), R; A-832, D-5A; U-4-6fld; 18"h; 7" diam; signal red with cardinal red ring in throat, creamish midrib; spr. dec.

'Orin' (VM—1964), R; A-833, D-5A; U-4fld; 25"h; fls. 9-10" diam; vermilion red (HCC-18) on white, white border around edge of all segs; spr. dec.

Registered by Mrs. Sam Forbert, 1910 Evergreen Lane, Hattiesburg, Miss.

'Lisa Forbert' (Forb.—1965), R; A-834, D-8; U-3-4fld; 18"h; fls. 4 1/2" diam; chartreuse with picotee edge; spr.

'Shocking Pink' (Forb.—1965), R; A-841, D-5A; U-4fld; 18"h; fls. 8" diam; neyron rose (HCC-623/1), light green throat; spr.

Registered by Mrs. Paul A. Kane, 1001 McIlvaine St., San Antonio, Tex.

'Ioma Staton' (Stat.-1967), R; A-835, D-7; U-4fld; 22"h; fls. 7 1/2" diam; scarlet (HCC-19), minute amount of white deep in throat. I—Kane, 1967.

Registered by Ludwig & Co., Hillegom, Holland.

'Front Page' (Lud.-1965), R; A-836, D-5A; U-4fld; 26/28"h; fls. 7/9" diam; scarlet (HCC-19) with bloodred throat; spr.

'Gipsy Giant' (Lud.-1965), R; A-837, D-5B; U-4fld; 30"h; fls. 8/9" diam; with white suffused with salmon pink and distinct white star in throat; spr.

'Scarlatto' (Lud.-1965), R; A-838, D-5B; U-4fld; 26/28"h; fls. 7/9" scarlet (HCC-19) with bloodred throat; spr.

'Sparkling Gem' (Lud.-1965), R; A-839, D-8 (Gracilis); U-4/6fld; 20/24" h; fls. 3/4" diam; dark orient red, darker throat; spr.

'White Witch' (Lud.-1965), R; A-840, D-5B; U-4fld; 23/25"h; fls. 9/10" diam; white with applegreen throat; spr.

Registered by Mrs. Sam Forbert, 1910 Evergreen Lane, Hattiesburg, Miss.

'Leslie Forbert' (Forb. 1965), R; A-842, D-5A; U-4fld; 18"h; fls. 8" diam; camelia rose with scarlet throat; spr.

CRINODONNA CLONE

Introduced by Mrs. Polly Anderson, 4810 Palm Drive, La Canada, Calif.
'Raspbergg Ice', Flowers drooping, a deep raspberry color, open faced, 7-15 flowers per umbel; scape 4ft. tall; October to December.

PROCEDURE FOR STAGING AMARYLLIS SHOWS

EDWARD F. AUTHEMENT, *Registrar*

There seems to be a great deal of confusion and misunderstanding regarding the staging of official Amaryllis shows. The Men's Amaryllis Club of New Orleans, Inc. and The Garden Circle Amaryllis Club of New Orleans have been staging shows every spring for the past several years. With the help of Mrs. W. D. Morton, Jr., and after her passing, Mr. Morton, a certain procedure of the entire operation with less confusion and a more simplified method has gradually evolved. The following is submitted here with the hope it may be of some help to Amaryllis Clubs who stage official shows.

First, of course, the club must decide if it will stage an Amaryllis show and set the date. This must be decided early (Oct. or Nov.) in order that the show committee has ample time to make up the show schedule and appoint the various committees for the show. The Club's President then appoints the show chairman. With the help of past presidents and Show Chairmen, the new Chairman appoints the various committees who will be responsible for staging the show.

The most important of these, of course, is the classification committee. This committee should be the first to approve or reject the entries. It must also mark the entries as to flower division and correct name of the clone or species. The committee should consist of at least three members who are well familiar with the specimens likely to be offered for exhibit. This committee may also mark the entry as to their proper placement on the exhibit tables.

The registration committee has the task of filling the registration cards with the exhibitor's name, address, phone number and name of the clone or species being entered.

The placement committee is charged with the placing of the exhibits in their proper place on the tables. The exhibitor should never be allowed to bring specimens on the floor of the show room at any time. This is better done by the placement committee.

The publicity committee has the task of writing up the results of the show immediately after judging, for publication in the local newspaper.

The chairman of judges must contact the Amaryllis Judges for the show and advise them of the date and time for judging. The chairman also instructs the judges as to the various sections and their location on the floor. If special awards are to be made, the judges are so instructed and asked to designate the variety winning the award.

The duties of Hospitality is to provide refreshments for the judges and entertain prominent visitors.

The properties committee must see to it that all the necessary items used at the show are provided for. The arranging of the exhibit tables, the necessary identifying cards for sections and exhibits, and the general set up of the show is the job of all the club members. This is generally supervised by the show chairman or the co-chairman.

The chairman of clerks is responsible for instructing the clerks as to their duties in helping the judges and general supervision of the clerks while judging is taking place.

The show standards chairman is the go-between member who reports the results of the show to the Editor of the *Amaryllis Year Book* and interpreting the show rules as set forth by the American Amaryllis Society.

There are two arrangement choices by which an Official Amaryllis Show can be conducted. *First* is by *Flower division* and *color values*. This is by far the more simple method and less complicated. It was the method used before World War Two. The specimens are exhibited according to flower division and color values. The grower or country of origin is disregarded.

The *second* choice is by staging the exhibits as *Dutch* and *American* clones. The specimens are then separated according to the Amaryllis flower division and clones. The clones govern the color values and are separated as such. The species are always exhibited in one group, separated by color, with identifying cards.

In the second method, confusion is always the case when trying to distinguish between the Dutch and American clones. Hybridizing in this country and elsewhere has progressed to the extent that Amaryllis from all over the world can compete favorably with the Dutch clones. This method was allowed by the American Amaryllis Society after the second World War because the Dutch Amaryllis and American clones were the main ones on the market. It was always hoped by the Society that the various Amaryllis clubs who stage shows would go back to the pre-war method when sufficient clones were available.

The Garden Circle Amaryllis Club of New Orleans have staged their show since 1963 according to *flower division* and color values and growers. The Houston Amaryllis Society, Houston, Texas, have been staging shows for the past eight years, according to the Amaryllis flower division and color values. There are probably other clubs who do the same. Both of the clubs named above have found this method to be less complicated and easier. It also tends to be a more orderly show and permits fair competition by various growers.

The staging of Amaryllis Shows by the flower division and color values also minimizes the work of the judges. This is very important. The judges can do their work faster and are not hampered by exhibits of the same flower division being placed or scattered all over the floor. The judges are instructed to judge the individual exhibits according to the perfection of the flower and plant in each division. The point scoring is used by all Amaryllis judges and the country of origin makes no difference.

The following is an example of the schedule of the Men's Amaryllis Show of New Orleans for 1966.—Table 1.

Table 1. The Men's Amaryllis Club of New Orleans, Inc., 1966 Show Schedule.

All specimens must have three or more florets per scape to be eligible for entry in competition in any section.

POTTED PLANTS

SECTION I—REGISTERED AND NAMED

- Division 2—Long Trumpet Hybrids (D-2) By name
- Division 3—Belladonna Type Hybrids (D-3) By name
- Division 4—Reginae Type Hybrids
 - a—Markedly imbricated type (D-4a) By name
 - b—Less imbricated type (D-4b) By name
- Division 5—Leopoldi Type Hybrids
 - a—Markedly imbricated type (D-5a) By name
 - b—Less imbricated type (D-5b) By name
- Division 6—Orchid-Flowering Hybrids (D-6) By name
- Division 7—Double Hybrids (D-7) By name
- Division 8—Miniature Hybrids (D-8) By name
- Division 9—Unclassified Hybrids (D-9) By name

SECTION II—UNREGISTERED AND UNNAMED (BREEDER'S)

- Division 2—Long Trumpet Hybrids (D-2) By color
- Division 3—Belladonna Type Hybrids (D-3) By color
- Division 4—Reginae Type Hybrids
 - a—Markedly imbricated type (D-4a) By color
 - b—Less imbricated type (D-4b) By color
- Division 5—Leopoldi Type Hybrids
 - a—Markedly imbricated type (D-5a) By color
 - b—Less imbricated type (D-5b) By color
- Division 6—Orchid-Flowering Hybrids (D-6) By color
- Division 7—Double Hybrids (D-7) By color
- Division 8—Miniature Hybrids (D-8) By color
- Division 9—Unclassified Hybrids (D-9) By color

SECTION III—A. Cultivated Wild Species (D-1) By name

SECTION IV—UNREGISTERED AND NAMED—Same standards as Section I

CUT SCAPE SPECIMENS

SECTION V—Same standards as Section I By name

SECTION VI—Same standards as Section II By color

SINGLE FLORET SPECIMENS

SECTION VII—Registered and named specimens only By name
(Competition in this section open only to members of the Mens Amaryllis Club of New Orleans, Inc.).

ARRANGEMENTS FEATURING AMARYLLIS According to theme

AWARDS

The usual Ribbons—1st, 2nd, 3rd and honorable mention—will be awarded in sections I, II, III, V, and VI.

Tri-Color Ribbons—to be awarded to the outstanding specimen in Section I and Section II.

Sweepstakes Ribbons to be awarded, one each for most blue ribbons in Section I and Section II.

American Plant Life Society Awards of Merit and Preliminary Commendations to be awarded in accordance with rules of that society to meritorious specimens in Sections I, II, V and VI, as warranted.

CUPS—Gold Cup to Tri-color winner of Section I (Jessee)

Gold Cup to Tri-color winner of Section II (Rose Garden Center)

Silver Cup to Sweepstakes winner of Section I (Swetman)

Gold Cup to Sweepstakes winner of Section II (Reuter)

Gold Cup for most blue ribbons won in Sections I, II, III, V and VI together by a member of Men's Amaryllis Club of New Orleans, Inc.

Silver Tray to winner of most blue ribbons in Sections I and V (Swetman)

Gold Cup to best home-bred, grown and developed Amaryllis entered in either Section I or Section II (Alatex)

The following is an example of a schedule permitted after the second World War and used by the Men's Club in the past:

Horticulture

Section 1

- Class 1 Named Dutch Hybrids (Registered)
- Class 2 Named Dutch Hybrids (Unregistered)
- Class 3 Unnamed Dutch Hybrids (By Color)
- Class 4 Dutch Seedlings, First Year Bloom
- Class 5 Dutch Seedlings, Later Bloom

Section 2

- Class 1 Named American Hybrids (Registered)
- Class 2 Named American Hybrids (Unregistered)
- Class 3 Unnamed American Hybrids (By Color)
- Class 4 American Seedlings, First Year Bloom
- Class 5 American Seedlings, Later Bloom

Section 3

- Class 1 Double Hybrids
- Class 2 Miniatures or Dwarf—Dutch Hybrids
- Class 3 Miniatures or Dwarf—American Hybrids
- Class 4 Miniatures or Dwarf—Double Hybrids
- Class 5 Any Species. This includes *A. x johnsonii*.

In conclusion, we wish to point out to the Amaryllis Clubs that the physical set-up of the exhibits on the show floor is entirely up to the Show Committee. However, every effort should be made to make the work of the judges as easy as possible.

HERBERT'S "AMARYLLIDACEAE" (1837) REPRINTED

The firm, Verlag von Cramer, 694 Wienheim, Germany, will reprint Herbert's "Amaryllidaceae" (1837), with an introduction by H. P. Traub, in 1966. The many who have wanted a copy of this classic are now given the opportunity of obtaining this classic. The pre-publication or subscription price is \$30.00; after publication, the price is \$40.00. Send orders directly to the publisher.

AMARYLLID GENERA AND SPECIES

HAROLD N. MOLDENKE

[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 the readers.]

Section *Eutulbaghia*, genus *Tulbaghia*, Baker, J. Linn. Soc. Bot. 11: 370. 1871. Stamens fleshy, grown together with the corona, rarely almost free; staminodes deeply emarginate, free or connate only at the base (*capensis*) [or] grown together with an entire or crenate corona; corona 2—3.2 mm. high; leaves fleshy-herbaceous, 4.2—6.2 mm. wide or even wider (*alliacea*) [or] firm, filiform, 1.1—2.1 mm. wide (*acutiloba*); [or] corona 1.1 mm. high; perianth-segments obtuse, scarcely surpassing the corona (*dregeana*); [or] segments linear, 4—6 times as long as the corona (*hypoxides*).

Section *Omentaria*, genus *Tulbaghia*, Baker, J. Linn. Soc. Bot. 11: 370. 1871. Stamines small, strap-shaped, all free from each other; leaves 1.1—2.1 mm. wide; perianth 1.1—1.3 cm. long (*cepacea*) [or] leaves 4.2—6.3 mm. wide; perianth 1.7—1.9 cm. long (*violacea*).

Pancratium parviflorum J, Decaisne, in Ann. Sci. Nat. Ser. II. Bot. 4: 346. 1835. Scape slender; umbel many-flowered, perianth-segments oblong-lanceolate, green on the back, fleshy-apiculate; the segments [divisionals] of the corona subequaling the filaments; anthera ovate; style surpassing the stamens; ovary ovate-globose.

Subtribe *Miluleae* (*Milulinae*), Prain, tribe *Allieae*; in Ann. Roy. Bot. Gard., Calcutta 5(2): 164. 1896. Bulb tunicated; spike terminating a simple leafless scape; bract 1, membranous, beneath the spike; bracteoles none; perianth gamophyllous; androecium regular; capsule loculicidally dehiscent.

Genus *Milula* Prain, Subtribe *Milulinae* Prain, tribe *Allieae*; in Ann. Roy. Bot. Gard., Calcutta 5(2): 164—165. 1896. Bulb tunicated; leaves strap-shaped; inflorescence spicate, covered by a solitary membranous bract; perianth gamophyllous, 6-parted, the lobes rounded; stamens shortly epiphyllous, 6, opposite the petals; ovary syncarpous, 3-celled; style simple, filiform; ovules 2 in each cell; capsule loculicidally dehiscent; seeds 2 or 3; testa corrugated and very minutely punctulate.

Milula spicata Prain, in Ann. Roy. Bot Gard. Calcutta 5(2): 165. 1896. Bulk leek-colored, 4—7 cm. long, the scales fibrous, 2.5—3.5 cm. long, the roots 4—5 cm. long; leaves green, 10—15 cm. long, 3.3—5 mm. wide; scape green, free, 6—9 cm. long, 2.5—3.3 mm. thick; spike 2—5 cm. long, 1 cm. in diameter; bract 3 cm. long and 2 cm. wide; florets 2.5 mm. wide, the perianth 2.5 mm. long, the filaments 4—5 mm. long; ovary 1.5 mm. in diameter; style 2 mm. long; stigma very small, capsule slender, 3 mm. wide; seeds 2.5 mm. long, 1.5 mm. in diameter.

CRINUM CLONE 'GULF PRIDE'—continued from page 56.

that its pollen will strike quite readily on *C. Bulbispermum*, *C. x 'Cecil Houdyshel'* and *C. americanum*. Thus if it will strike on *C. Scabrum* and give backcross hybrids closely resembling *scabrum* we could confirm the cross.

Since the hybrid is definitely not *C. Kunthianum* we propose the garden name of 'Gulf Pride' since it is fairly wide spread in the south, a very good garden subject, and fairly hardy. And above all has a very well formed umbel of blossoms that are excellent for cutting and display purposes. We feel that the proposed garden name is well justified.

At this time we cannot determine if 'Gulf Pride' is the same clone as *C. x herbertii*, a cross between *bulbispermum* and *C. scabrum* which is described on page 273 of Dean William Herberts fascinating publication of 1837. Herbert presumably effected his cross sometime around 1815. Dr. Thaddus Howard has effected several similar crosses. His recently named hybrid *C. x 'Thaddus Howard'* is quite an outstanding plant for the form, quality and color of its near rose blossoms. The latter plant is much hardier than 'Gulf Pride'.

PLANT LIFE LIBRARY—continued from page 24.

PHYLOGENY AND FORM IN THE PLANT KINGDOM, by H. J. Dittmer. D. Van Nostrand Co., 120 Alexander St., Princeton, New Jersey. 1964. Pp. 642. Illus. This attractive book was designed "not only for the college student interested in continued work in botany, but also for the nonprofessional who may want a terminal course in this field. The term "plant kingdom" is used in a wide sense to include (1) the bacteria (Schizomycophyta) plus Blue-green algae (Cyanophyta); (2) the aglae; (3) the fungi (Myxomycophyta and Eumycophyta); (4) the Bryophyta; and (5) the vascular plants (Tracheophyta). In the text each topic is adequately illustrated and discussed. This stimulating text is highly recommended.

THE NATURE OF THE NATURAL SCIENCES, by Leonard K. Nash. Little, Brown & Co., 34 Beacon St., Boston 6, Mass. 1963. Pp. 406. Illus. \$6.50. This is among the outstanding texts on the philosophy of science. The subject is presented in all its aspects in the context of actual events in the history of science. The book is concisely written in easily readable English. The chapter headings are: common sense (and science); science (and common sense); the anatomy of science; cosmology and technology; colligative relations and scientific laws; empirical tools and empiricism; the principles of science; theories and models; the evolution of scientific theories; organized science; creative science; and the real world. If a person could have only one text on the philosophy of science, this is the one which should be chosen. Highly recommended.

THE PHOTOCHEMICAL ORIGIN OF LIFE, by A. Dauvillier. Academic Press, 111 5th Av., New York, N. Y. 10003. 1965. Pp. 193. Illus. \$7.50. We are indebted to Scripta Technica, Inc., for this fine translation into English. Prof. Dauvillier explains his ideas on the origin of life as an interdisciplinary subject of cosmic physics involving astronomy, geophysics and geochemistry. He emphasizes the role of paleovolcanism in bringing about the pyrogenetic synthesis of numerous heterocyclic compounds; and suggests that after condensation of the oceans, photochemical reactions occurred with the capacity of creating the optical rotation characteristic of living matter. This stimulating text is highly recommended.

PLANT LIFE LIBRARY—continued on page 110.

3. GENETICS AND BREEDING ENJOYING AMARYLLIS THE YEAR 'ROUND

V. ROGER FESMIRE,

16938 Elgar Ave., Torrance, Calif. 90504

In a previous article in the 1963 Year Book, there was outlined a 3-point program which I intended to follow in an attempt to secure flowers the year around in a small greenhouse in Colorado. Some results can now be reported, particularly under the first point of the program: careful bulb management.

There is no doubt that all *Amaryllis* bulbs, even species and evergreen types, require a definite resting period before blooming. I have noticed that even bulbs being raised from seed will take a rest, when they seem to stand still, before sending up their first flower scapes. When bulbs are grown in flower pots, it is possible to manipulate this resting period to a certain extent. By beginning the rest period of different bulbs in different months, I found it was possible to spread out the blooming season over a much longer period of time. In 1962, most of my bulbs bloomed, in the greenhouse, during February and March. By 1964, the main blooming season had been spread out over four months, with some flowers during eleven months of the year. It should be noted that some bulbs are very easy to handle in this way, particularly those with *Amaryllis striata* genes in their immediate ancestry, while others will persist in blooming late in the spring regardless of when their rest period is begun, and some are always quite unpredictable in their behavior.

In the previous article, a reference was also made to the orange-scarlet Houdyshel hybrids, which I had purchased under the name of "Rutila hybrids." These evidently do have some *Amaryllis striata* genes in their ancestry as Mr. Houdyshel believed, for they are very easy to bring into bloom at different times. I have had flowers from them in eight different months of the year. They also resemble *A. Striata* in their tendency to decay about the neck of the bulb; planting the entire bulb below the soil level helps to prevent this condition. Although I found it difficult to secure a self-cross with these bulbs, one was finally successful. The first seedlings have just bloomed (July, 1965), and the flowers are almost identical with the Houdyshel hybrids, indicating this strain is fairly well fixed. Both the original bulbs and the seedlings, however, resent being repotted or completely dried off, and resume growth again very reluctantly. When I moved from Denver to southern California about four months ago, I brought with me only two bulbs of the original Houdyshel hybrids, dried off and packed in bags, as were most of my other mature bulbs. All of the other bulbs, with one exception, have resumed growth again since being repotted, but not these two!

The Houdyshel hybrids were also crossed with *Amaryllis striata* var. *fulgida*, and the results so far have been quite a surprise. The

cross was made both ways, but the plants with *striata* as the pollen parent grew much faster and resemble more the Houdyshel hybrids in leaf characteristic than the plants with *striata* as the seed parent. The first seedling bloomed this past January in 4" pots in the greenhouse, but the flowers bore no resemblance to the Houdyshel hybrids. They did resemble very closely *A. striata* var. *hana*, in size, color, and scape height. The first seedling to bloom of the reverse cross is now sending up a flower bud, and since the plant resembles *A. striata* in leaf, I am very curious to see what type of flower it produces.

Most of my breeding work can be classified under the second point of my 3-point plan, which is to produce a strain of *Amaryllis* that will be recurrent in its blooming habits, and also small enough both in foliage and bulb size to be grown satisfactorily on a window sill in the house or in a small greenhouse. A number of plant breeders in the past have produced such hybrids, although their work has apparently been lost. Possibly some member of this society is even now growing such a type of *Amaryllis*, and if so, I would appreciate hearing about it.

Most work along this line in the past has apparently been done with *A. Striata*, var. *fulgida*, as one of the parents, since it is a recurrent bloomer. In my greenhouse in Colorado, this species bloomed every four to eight months, and so it has been used extensively in my program. Close to a hundred crosses involving this species have been made so far, and some have already bloomed, with gratifying results in respect to flowers, but only a few bulbs show definite promise of being recurrent in bloom habit. However, back-crosses and self-crosses have been made, and in these the recurrent-blooming trait will perhaps appear more frequently. In addition to these crosses, several crosses have been made between *A. Striata* and a miniature hybrid from India, which hybrid flowers regularly every six months. These seedlings have not yet reached blooming size, but I anticipate much from them. Many of the crosses have produced plants of small size, and so it is now evident that the most difficult part of the goal is to secure the recurrent-blooming habit. As an individual "bonus", growing *Amaryllis* from seed is another method of securing flowers all the year around, since bulbs grown from seed are likely to send up their first flower scape at any time of the year.

The third point of my program is to develop hybrids which will bloom naturally at other seasons of the year in addition to the spring season. This means going back to species which bloom at other seasons of the year for breeding stock. Here I have made but little progress, although such species and hybrids do exist. I have a considerable number of species growing, but few have bloomed thus far. Crosses involving *A. aulica* have not been successful, although four crosses involving *A. pardina* are now growing nicely. At the present time, a flower bud is showing on an *aulica* cross which I recently secured from an importer, and other species should bloom for me this fall. More material is being acquired steadily, and eventually I expect to report results along this line also.

SOME THOUGHTS ON NERINE HYBRIDS

EMMA D. MENNINGER, *California*

WHITE NERINES

Because of the dearth of pure white Nerines, both species and hybrids, I have attempted to hybridize a few of the white clones in our collection. From the Exbury Collection, we have 'King of the Belgians' X 'Pure White'; 'Snow'; 'Snowflake'; 'Solent Swan' and 'White', the latter sometimes has a faint tinge of pink. Of our own pure white hybrids, we have the following cultivars: 'Angel Wings'; 'Crystal Palace'; 'Denali'; 'Snow White' and a former clone 'Star White' which has since died, although we have two unflowered seedlings from it. For several years, I have isolated these white clones when in flower and have intercrossed them, not having the time to make specific crosses so that the pollen parent is known. Before this project, one of the earlier crosses with seed from the pure white 'Crystal Palace' disappointingly gave a pale pink hybrid.

Because of the scarcity of white species and hybrids, I suspect that white is recessive to pink and probably to other colors. There are reported to be two white sports of species, one of *bowdenii* and one of *sarniensis*. The former *bowdenii* var. *alba*, received an AM, RHS for Veitch on September 26, 1911. The *sarniensis* was reported by Mrs. Sina Eliofson in "South African Flowers for the Garden" as a pure white found on Table Mountain. The only other white species that I recollect is *Nerine pudica* which is white with pink median lines on the tepalsegs, or sometimes it is more or less pink. There is a good colored illustration of *N. pudica* in the Botanical Magazine, t. 5901. So far as I can ascertain the species *flexuosa* var. *alba* is pale pink, at least those in cultivation appear to be pink.

Besides the aforementioned white *Nerine* hybrids, there are three white cultivars listed in my "Catalog of Hybrid Nerine Clones" in the Amaryllis Yearbook for 1960. These are 'Candida', pure white, 'Snowdrift', good white and 'White Knight', the latter with pink median lines. 'Alice' the parent of the tetraploid 'Inchmery Kate' was said to be white with rose suffusion.

Whether any of the white species mentioned or the last four cultivars are in cultivation is unknown to me. It is interesting to speculate whether these white hybrids may have *N. pudica* in the background. These might include several whites with pink median lines on the tepalsegs that have appeared among our seedlings, the first of which was named 'Candystick'.

However, I am interested in securing more pure white hybrids. Hopefully, this season, a few may appear in our older seedlings with white seed parents, including a cross of 'Snowflake' ♀, a sibling of 'Snow White'; two of 'Star White' ♀ and a number of seedlings from 'Crystal Palace' ♀. Later white crosses are too small to flower.

The writer would be pleased to hear of any other pure white species or hybrids.

Table 1.

Royal Horticultural Society Awards to Hybrid Nerines, 1960-1964

| NAME | TO | AWARD | DATE | DESCRIPTION |
|-------------------|--------------------|---------|---------|-----------------------------------------------------------|
| 'Angela Limerick' | ..Clarke |AM | 8/27/60 | Bright Dutch vermilion |
| 'Carolside' |de Rothschild | ...AM | 9/11/60 | Mandarin red (HCC 17/1) |
| 'Plymouth' |de Rothschild | ...AM | 9/11/60 | 'Rotherside' x 'Herga' Claret rose (HCC 021) |
| 'Dorothy' |Clarke |PC | 9/11/60 | 'Joan' x 'Herga' No description |
| 'Norah Hamilton' | ..Clarke |PC | 8/27/60 | No description |
| 'Nicholas' |de Rothschild | ...PC | 9/25/60 | No description |
| 'Pamela' |de Rothschild | ...AM | 9/25/60 | Dawn pink (HCC 523/1) |
| 'Susan' |de Rothschild | ...PC | 9/24/61 | 'Aerolite' x 'Queen Mary' [Very fine large light pink] |
| 'Egryn' |de Rothschild | ...PC | 9/24/61 | No description |

There appear to be no further awards through 1964.

ABBREVIATIONS

| | |
|---------------|-----------------------------------------------------------------|
| AM | Award of Merit |
| PC | Preliminary Certificate |
| Clarke | Sir Ralph Clarke, Borde Hill, Haywards Heath, Sussex, England |
| de Rothschild | Edmund de Rothschild, Exbury nr Southampton, Hampshire, England |

MINIATURE NERINES

Hybrid miniature counterparts of well-loved larger flowers are now much in vogue and hybridizers are at work to fill this demand. Roses, Dahlias and Orchids are among those that are popular. In orchids, miniature Cymbidiums bred from the dwarf species such as *pumilum* and *ensifolium* are being raised by the thousands in Southern California and these are receiving as many or more awards than the standard Cymbidiums.

So far as I am aware miniature hybrids are practically unknown among Nerines. A species that offers promise in this direction, is *Nerine filifolia* with thread-like or chives-like leaves that with us are evergreen. Dainty pink flowers surmount the dark green foliage.

Dr. Hamilton P. Traub has made a beginning to correct this deficiency by crossing *filifolia* with pollen of the larger-flowered hybrids and species. One of his hybrids of *filifolia* with 'Rosalba' flowered in two years from seed. This short period from seed to flowering and the fact that the seedlings are evergreen, gives much encouragement to continue this type of breeding. I am sure that we shall hear more of this interesting project.

No doubt there are other dwarf species than *filifolia*, such as *masoniorum*, that could produce miniature hybrids, but my knowledge of these is too meager to mention some that might qualify as good subjects for hybridization. Also, although the fertility between dwarf and larger species may be low, a few seedlings from each crossing will be worthwhile and it will be interesting to learn if these miniature hybrids will produce seed and if they can be back-crossed with the dwarf parents or other dwarf species.

This is only a hint of the fascinating possibilities in this line of breeding.

VIRUS DISEASES

A practically incurable disease of virus origin may infect Nerines. In some types, the leaves become streaked with lighter green or yellow

and the plant becomes stunted. I have noticed a few pots of *Nerine* hybrids with these symptoms. Some have been destroyed, preferably by burning, but a few others were sent to the virologists of the University of California for diagnosis. So far, I have had no report on these. Virus diseases of various types occur in many plants including *Amaryllis* and *Orchids*. It is spread by insect vectors, contaminated cutting tools and possibly reused stakes, etc. Dr. Traub in his book "The *Amaryllis* Manual", 1958 (p. 179) has an enlightening section on virus diseases of *amaryllids*. He mentions Dr. Georges M. Morel's (1955) proposed method of eradication of virus by culturing the apical growing point which is believed to be free of virus.

A few weeks ago, I met and talked with Dr. Morel and heard his lecture which was primarily devoted to the multiplication of callus tissue from the apical meristem of orchids by aseptic tissue culture to increase division of valuable clones. Dr. Morel was not sanguine regarding the eradication of virus by this method and I had the feeling that the method was, at least, somewhat disappointing. So it, therefore, behoves the grower to be alert and destroy suspected plants before the disease spreads to healthy ones.

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NERINES IN ENGLAND

J. T. GALLAGHER, *England*

The old adage about travel broadening the mind might equally well apply to our plants as to the eminent Victorians about to embark on the Grand Tour. Two examples immediately spring to mind, the extraordinary evolution of the *Camellia* since it emigrated from China and Japan to your Southern States and the *Nerine* which after a lengthy stay in England is only now returning to its native South Africa in a decidedly sophisticated form. Gilding the *Nervine* Lily began in the first quarter of the last century when Dean Herbert crossed *Nerine* species in order to obtain information for his treatise on the family *Amaryllidaceae*. It is fortunate that he used so many different species as his hybrids form the foundation of modern *Nerine* collections today.

His work was continued by H. J. Elwes, whose many hybrids are still in cultivation and although outmoded by newer clones, do contain some aneuploids and at least two triploids—'Lady Llewellyn' and 'Lady Sterling Maxwell'. After his death, half the Elwes collection was sold to Col. Stevenson-Clarke at Borde Hill in Sussex, where they still flower wonderfully each year cared for by Lady Clarke and her Head Gardener, Brian Doe.

Perhaps the most important collection is at Exbury near Southampton. It was built up by the late Mr. Lionel De Rothschild since 1930 who succeeded in breeding a remarkably wide range of different coloured

hybrids of excellent form and quality. I have been fortunate enough to visit the collection in flower for the past few years and am constantly surprised by the remarkably high standard of all the seedlings. What is even more astonishing is that the whole collection has been achieved by making only 130 odd crosses. Over 20 named hybrids, many given awards of merit and one a first class certificate by the Royal Horticultural Society, were obtained from one cross alone—'Aerolite x Lionel'. Even more fascinating is the fact that these seedlings range from the white with a crimson tip of 'Coronation' and white with the pale pink edge of 'Jocelyn', through the deep salmon of 'Nell Gwynn' to the claret coloured 'Nelson'. I have both 'Aerolite' and 'Lionel' in my own collection and last Autumn with the help and guidance of Mr. LaCour, the eminent cytologist at the John Innes Institute, carried out a chromosome count on active root tips of 'Aerolite', only to find that it was a diploid ($2n=22$). Dr. Janaki Ammal has already published a count of 'Lionel' as being an aneuploid ($2n=24$).

The breeding of white Nerines has always been high on the agenda at Exbury and last Autumn Mr. Fred Wynniatt, the head gardener, had every cause to be proud of his latest successes. 'Vestal' had an enormous umbel and glittering flowers, white enough to make even the most ardent detergent manufacturer envious. 'Sacred Heart' from the same cross—'King of Belgiums' x 'Pure White'—was unfortunately not in flower. 'Wisley Bridesmaid' with rose pink flowers is quite outstanding and at last I have been able to add a bulb this year to my own collection.

Among the new seedlings flowering last year as yet un-named, a cross between ('Dolores' x 'Spitfire') has given some very attractive plants. This is the second season I have seen the seedlings from this cross in flower and this time there was a very fine salmon pink clone amongst them.

'Wellington Koo', the chance blue seedling responsible for so many of the unusual shades in the Exbury collection, is still turning out some very interesting seedlings. Two good mauves were from 'Carita' x 'Wellington Koo' and 'Wellington Koo' x 'Best Blue'. A good salmon pink with a darker line came from 'Pamela' x 'Caryatid' and a rather lovely white flushed pink from 'Chloe' x 'Snow Flake'. My own tiny offsets from these wonderful clones are slowly getting bigger and giving more flowers each year. On the breeding side I have concentrated more on attempting to cross Nerines with higher chromosome numbers and consequently have had a correspondingly high number of failures!

'Inchmery Kate' has obliged me with a small crop of seedlings using pollen from 'Ispahan', but I find these are very slow growing indeed.

This year we have had virtually no Summer in England to ripen the bulbs and even as I write in early August 'Mariloo' has decided that Autumn has arrived and is poking up flower buds.

*Graystead, Bovingdon,
Hertfordshire, England*

4. AMARYLLID CULTURE

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

AMARYLLIS REMINISCENCES

LEON BOSHOFF-MOSTERT

The cultivation of *Amaryllis* in South Africa during the past decade has assumed large proportions and it can be said to have developed into a major horticultural industry.

It is difficult to assess how much has been done in the direction of intensive endeavour towards the creation of more attractive types, colour breaks and departures from previous standards by the presentation of something "new and different".

To my knowledge, there are only a few of us, since the Buller era who harness our energies inclusively to this end. In each case we are not mass producers but, in the stricter sense of the word, devoted specialists to whom the wholesale distribution of commercial bulbs has never become an economic essential. During my visit to America I found this phenomenon to apply in an appreciable degree to the Iris world, in which the U. S. A. undoubtedly leads the field. In this sense I refer to the many outstanding specimens produced by fanciers in small private gardens.

A few years ago, through the medium of the Year Book, I urged members of your Amaryllis Societies to concentrate on this aspect since, from my personal observations in various States, success on show benches at that time could not be attributed to endeavour, but rather to acquisition. At the present time, however, it is clearly obvious that the States are well on the way in the right direction.

There is no doubt in my mind that the time is not far off when American bred *Amaryllis* will hold their own in any company. From what I have gathered, this tendency has developed rapidly, particularly in California. The same spirit is also actively permeating through South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Texas. American *Amaryllis* lovers owe a considerable debt of gratitude for the activities of and lead given by their countrymen whose names appear in the list of Herbert Medalists. All these names indicate great men of achievement and it would be presumptuous on my part to single out any one of them. I do feel, however, that my readers will agree with me when I say that, particularly in the "Advance the Amaryllis" campaign, Robert Goedert of Florida has earned our sincere good wishes for his continued success.

Reverting now to the Buller era, when this veteran was the King of Amaryllis in our fair land, only a negligible fraction of South African gardeners were then even aware of the existence of the *Amaryllis* which, at first sight, many would generally refer to as beautiful lilies. Therefore, when the wonderful opportunity came my way, I lost little time

in popularizing this flower among domestic gardeners. I do not claim to have been the first here to offer *Amaryllis* to the public when I commercially introduced a comprehensive range of the cream of the Buller collection. There were already nurserymen who allotted a portion of their activities to *Amaryllis*—rather by way of a horticultural Cinderella share.

But as the pen is claimed to be mightier than the sword, I accepted this axiom by contributing articles with 'photos to horticultural journals and other publications. This brought invitations from the South African Broadcasting Corporation to deliver radio talks on the subject, which I gladly accepted as a means of furthering my *Amaryllis* advancement campaign.

I was determined to honour the undertakings given to Mr. Buller to carry out his work and, at the same time, to prove myself to be worthy of his confidence when he wrote in September, 1950, rather in prophetic vein that he could "see the day coming when Kleinskuur *Amaryllis* will be supreme in the land. If you carry on . . . I shall be happy to hear of your good work. I am near 80 years old and cannot go on much longer." Additional stimulation was not lacking, such as that "It will be great fun for you to see your first big batch of seedlings opening their first flowers."

With such continuous encouragement and assistance with a fount of detailed advice on culture, breeding and propagation, Mr. Buller not only inspired me to boldness to write those articles but also instilled in me an unabating enthusiasm for breeding. In all my work I was constantly mindful of the fact that in the plant world, as in all other fields of achievement where advancement is a continuous challenge, nothing remains static. The day could be foreseen when, what was then the coveted collection, could not remain so without progressive improvement.

To a large extent, in all modesty I feel that, although not beyond recognition, I have nevertheless improved on the Buller collection in many directions except the pure whites. Especially in the direction of bi-colours, polychromes and picotees, the collection has been much enriched. In blends and monochromes, both in pinks and reds, there is also a marked improvement, particularly in reds with which I have had gratifying results in the intensification and depth of colour. Here I think in particular of a deep cherry red with an overlay and veining of rose red. This one I have named 'Buller's Memory'.

Then there is 'Porcelain Belle' which is an outstanding blend of porcelain rose and venetian pink in large blooms majestically carried on proportionate scapes. In the same category can be placed 'Ida Eleonore', named for our second daughter. This is a blend of porcelain rose and begonia with a flush or overlay of geranium lake.

In the picotees I have had my full share of success. 'Lady Jane', of all things named for my devoted Cavalier King Charles Spaniel, is a white with a slight veining of claret rose towards the edges and a complete claret rose line around the entire bloom. 'Harlequin' is a

blood red with white flushing towards the tips of the segs and distinctive veins and a picotee edge in currant red.

One of my best I have named for my esteemed friend and the well-known champion of the Amaryllis in Louisiana, namely, Louella Haydel. 'Mrs. Haydel' is a bi-colour picotee in geranium lake with white flushing and white central star. It is attractively framed in a pencil line of deep geranium lake. I could not think of any better way of paying tribute to this great lady for her charm, her unflagging enthusiasm and devotion to and infectious love of the Amaryllis.

In Mrs. Haydel's company I place 'Edith Myrle'—to my readers Mrs. Nahas of Sacramento, California, who, on behalf of the Mayor, presented my wife and myself with the Key of that Capital City. This is a white with vermilion tiger-markings and a blood red picotee all round. In spite of the delicacy of colouring and shading, it is a striking bloom which commands attention.

Another American lady to whom I wish to pay tribute is Mrs. Marie Fischer of Hinsdale, Illinois. 'Marie Fischer' is a currant red with a generous white flushing and overlay on the outer halves of the segs which are pin-pointed in currant red and completely framed in a deep currant red picotee.

'Hubert Fischer', although not a picotee, bears a strong resemblance to his wife. It is a cherry red with strong currant red influence and splashings of white towards the tips. 'Jan Hendrik', named for our youngest grand-son, is another striking bi-colour in crimson with a white central star and tiger-markings at the edges of the star. His sister Greta who is the eldest of our nine grand-children should have been grouped with the picotees, but for family ties is grouped in this paragraph. 'Greta' is an enlarged and improved 'Corpus Christi'. It is a white with claret rose pin-points and a pronounced picotee of the same colour in a darker shade.

Another exquisite bi-colour is 'Dazzler' which presents itself in orient red with a white flushing in the throat and along the inner halves of the midribs.

'Linette'—also named for a grand-daughter, ranks high among my polychromes. It is a fine and delicate bloom in dawn pink and empire rose beautifully set off against the white of its midribs.

These are all persistent four-bloomers which are proving that I am working along correct lines in my breeding schedule, a matter which Dr. Traub so kindly but emphatically stressed upon me during my visit to La Jolla about six years ago. The same was also confirmed by a substantial number of high-grade later varieties which bloomed for the first time this past season.

As a novelty, I am concentrating on green Amaryllis and have made encouraging progress in that direction. I am concentrating even harder—but not as a novelty—on breeding something equal to the best Buller whites such as 'Dallas Bride' and 'Avalanche'. I have not yet brought to light what I am looking for, but I shall persevere also in that direction.

In describing some of my successes, I do not wish to give the impression that I am laying claim to having out-moded the Buller creations. There are still some of his varieties, I am sincerely convinced, that will remain classics despite all claims and challenges.

During the past three years my health has left a lot to be desired. I was hospitalized for several spells and am still continuously under specialists' treatment. It is no exaggeration to say that over that period my effective labour output could not have been more than 50%, in consequence of which something perforce had to be neglected. As I have said in previous articles, my Amaryllis undertaking is a specialized one-man show where only routine unskilled activities can be entrusted to others, whilst administrative and executive responsibilities cannot be delegated. I am most fortunate, however, in having an outstandingly capable wife who relieves me of much of the supervisory as well as office work. This enabled me without interruption to keep up my breeding programme which at least suffered no set-back, whereas the commercial aspect had to be sacrificed. Luckily, my amaryllis concern is more a labour of love than a source of livelihood, otherwise we would by now have been on the dole!

I reluctantly refer to this somewhat personal aspect which is rather inappropriate in an epistle of this nature. It is done only for the purpose of conveying to the many correspondents the reason for my inability to respond to their enquiries for bulbs and price lists. Should the condition of my health continue to improve as it has done over recent months, I have every confidence that in the not too distant future I shall again be able to devote time to overseas enquiries and interests.

During each blooming season we have hundreds of visitors to Kleinskuur who are interested in Amaryllis as well as in my wife's Iris, Hemerocallis, Hostas, various varieties of Calla Lilies and other perennials. Among these visitors there is a fair number who, since they first acquired Amaryllis from me some ten or eleven years ago, have developed into discriminating fanciers. Year after year they regularly come to see what is new and to make selections from my latest would-be introductions. Some of these fanciers have by now also taken up hybridizing in which I have encouraged them. It is most difficult to refuse them even single off-sets of these selected hybrids before the mother bulbs go to incubation, with the result that it takes years before the would-be introductions can reach the catalogue stage. It has already happened that almost the entire incubator crop of such new hybrids were taken up at the year-old stage. This applies in particular to the new varieties previously described and their "stable-mates" which further adds to my difficulties in offering stocks for export.

In early September, 1965 I placed over 2,000 segments from many of my best varieties in the incubators in an endeavour to build up stocks to fulfill the needs of all my fancier clients and at the same time again to be of service to my overseas friends.

During recent years I have interested myself also in the *Crinum bulbispermum*. It was only after exploratory excursions that I found

our region to be comparatively richly endowed as far as variety is concerned. I have found a range varying from pale pink, almost verging on white, to some very deep reds. Since these excursions into uncultivated fields do not entail exhaustive walks, my method is to stake steel plate markers next to those I select when in bloom, to make a rough sketch of the area and then to lift the bulbs in the dormant season. I have also gathered seeds from crosses made in the veld and am looking forward with great expectation to the blooms of my own seedlings.

The scope offered in the field of breeding will always remain unlimited and each decade—in fact each added year, contributes its share to a change in face and pattern. In conclusion, therefore, I wish to assume the role of moralist by expressing the view that it is not only the privilege but also the pleasant duty of each true lover of the Amaryllis to make her or his own personal contribution towards this never ending wonder. Be assured, the reward will be lasting joy and happiness!

1964 & 1965 AMARYLLIS SEASONS IN FLORIDA

MRS. FRED TEBBEN, *Lake Hamilton, Florida*

The 1964 season of bloom opened with a lovely flower on my hybrid clivia, purchased many years ago from Houdyshel. It was a pretty thing, white with the upper one-fourth of each petal a deep orange, eight flowers on the scape. Buds began showing up in the borders in late February but no flowers appeared until March. On March 12th my husband and I took off for a Caribbean cruise which took us to Puerto Rico and to the Virgin Islands. I had hoped to see many amaryllis in bloom in the islands, but was much disappointed as I saw none anywhere there, but on our return to Miami I saw many beautiful blooms everywhere. One very impressive sight thrilled me there. Blooming all around a house were literally thousands of the orange-red variety with the greenish-yellow center spot which they tell me here is the original *Amaryllis belladonna* L. which grows so easily with no care or attention, and multiplies fast. I have a number of these but so far none have bloomed for me. There were many fine borders of *Amaryllis* x *johnsonii* too, and many throughout Miami that must have been Meade strain bulbs. All were so nice.

Returning home via the west coast of Florida, we stopped at Sarasota and had a nice visit with Dick Guerdan and saw his new place of business, and saw many fine orchids in bloom. Upon reaching home on March 22nd we found many amaryllis blooming here, among them 'Apple Blossom', 'Miss Margaret Truman' and 'Love's Desire'. There were several fine seedlings in bloom too, one much like 'Five Star General' and just as good, I'm sure. Next came 'Ludwig's Dazzler' and 'Doris Lillian' and then Picotee, which is very nice indeed. However, it seemed that some spots were empty where 'Bouquet' and 'Delilah' had been planted. They are two that do not like being planted

in the borders, it seems. There were many fine Meade blooms and many seedlings that were nice but not outstanding. I feel very frustrated because I cannot identify any of my seedlings since they became badly mixed and labels lost when planted in the gardens of friends here in Florida when we were moving down from Illinois. Quite a number of Dutch bulbs did not bloom but I would certainly recommend 'Apple Blossom' for outdoor planting. It is really a fine performer, producing several scapes from each bulb and many new offset bulbs.

In July, 1964, my husband suffered a serious heart attack and was hospitalized for five weeks. He seemed to come along well, however, and we had a happy Christmas season with a visit from our son and from nieces and nephews from various places around the country.

Our winter of 1964-65 was a very mild one, and so the first amaryllis buds showed up in old *Amaryllis striata* var. *fulgida* by mid-February in the borders, as well as buds in the erinums. I purchased a number of the smaller sized bulbs and these bloomed well, but I was disappointed to find 'Rose Marie' and 'Aphrodite' were exactly alike, and must have been seedlings. There were many blooms everywhere among the borders. 'Happy Memory' was lovely, and so were dozens of other Dutch bulbs for this has been my best season of bloom so far. In 1962 Polly Anderson sent me some tiny seedlings from crosses made by Quinn Buck, and all of these bloomed. They were really outstanding, light reds and pinks, with lovely round blooms, and I felt thrilled to get blooms from seedlings in three years. Then, too, an old, old bulb bloomed again, 'American Beauty', purchased at least twenty years ago from the Cammack Growers at Maitland, Fla. This is a lovely cross between Dutch and Meade strains, and I am so glad to find I have this one still for the Cammacks sold their flower farm and went out of business many years ago.

My amaryllis notes end on April 4th, as my husband suffered a number of severe heart attacks and passed away on April 14th. I will remain here in Florida as long as I can find help to maintain this large yard and the borders. It is home here now and I love it even tho I shall be very lonely without Fred to be here with me. He loved it too, and enjoyed the four years of retirement he spent here.

THE 1964—1965 AMARYLLIS SEASON

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ADAPTATION IN AMARYLLIS

After several seasons of rather severe winters especially in the amaryllis belt of the south, this past winter was much milder. Amaryllis had a rather long growing season with enough moisture in the soil in the fall to encourage the bulbs to set a good crop of roots which helped to carry them through the winter in fine condition. Reports from all

over the south this past spring were good. It appears to have been the best flowering season in many years. Old bulbs have recovered from their set back suffered during the past several cold winters. Exceptional flowers were reported and many are taking renewed interest after having been discouraged over the past several winters. This off and on interest is the story of amaryllis and I believe it comes from the belief that amaryllis are easy to grow while these same people might think orchids are hard to grow. Possibly the truth is that both are easy to grow if given the exact requirements they need; however orchids possibly have more of a universal requirement than amaryllis. Also orchids having more commercial value have received more attention. Much research on their culture has been accomplished. The orchid fancier goes to great lengths to provide exact conditions for his plants whereas the new amaryllis fancier does not. The new orchid hobbyist will perhaps acquire one or two plants, experience difficulty, and then at great expense and use of his time he will build a greenhouse exactly right for orchid culture. If by this time he has not lost his interest he is prepared to have success with his orchids. On the other hand someone seeing a beautiful amaryllis becomes extremely interested in this plant. He inquires about it and the owner of the amaryllis says "Oh, there's nothing to it. I just bought a couple of bulbs, went out in the back yard, got a little dirt, set the pot on my window sill and Presto!—the tri-color in the show." The new fancier never asks the one who won the tri-color several years ago why he hasn't won it since or why he doesn't have any flowers in the show this year. He could advise the new enthusiast that it was just luck that he happened to give the bulb the exact condition it wanted that particular year and that at least half of its performance was determined by the attention it got during the growing season before; that the Lord had been kind to the Holland growers that particular season with an abundance of sunshine and good weather.

Had this new fancier asked one who had been through the bitter experience of failure, I am afraid he would have possibly received the same answer in just a little different way. It would have been something like this—Oh, yes, amaryllis are easy for me to grow. I won this Tri-color several years ago. Don't try anymore, you know, one should not be hoggish. He probably hasn't had a nice flower since he won the Tri-color. I don't know why amaryllis fanciers have this psychological block when the orchid grower does not. But until we amaryllis growers want to admit that amaryllis are as hard to grow as orchids if not harder we will prevent this flower from becoming as popular as it should be.

A number of people will disagree with me on this view. They will point out many cases that will give weight to the fact that I don't know what I am talking about. Amaryllis are really easy to grow. They will point out several beds in their neighborhood that perpetuate themselves and bloom abundantly each spring. They also will tell you that they too had such a bed at one time. So did I but they are gone now. Once they become really interested in the flower their luck runs out. The fact is he knows nothing about the requirements of amaryllis and when

he becomes interested he notices that some of his did not flower each year. This he was going to correct. The more he did for them the poorer they flowered and finally he lost the bed.

I know where several of these beds of amaryllis in my neighbor are that flower each year with little or no care. I am afraid to approach the people who own the amaryllis as I know they believe it takes no special knowledge to grow them. If I said something to them they might dig the bed and replant them in another place in the yard and in a few years more or less they probably would lose every one of them.

I would like to tell you about three beds of amaryllis in my neighborhood and one bed of *A. belladonna albertii*. I asked the person who had this bed of beautiful *albertii* for just one or two bulbs. He immediately dug the clump of about 50 bulbs. He gave me half of them and he replanted the other half not 10 feet from the old bed. We lost all those bulbs within one year. Now, why did this happen? The fact is we both thought amaryllis were easy to grow and that all you had to do was stick them in the ground. We did not analyze the existing environment under which they were growing and although part of the bulbs were moved only ten feet they had an entirely new environment. It is my belief that we would also have lost them if we had replanted them at that time in the exact same spot.

Amaryllis belladonna will naturalize in peninsular Florida. However they often will perish if moved. I don't know all the answers to this problem but believe I have found some factors that are common to either success or failure by observing many naturalized clumps. These factors, I believe, can be applied to the hybrid amaryllis. These are applicable to the Florida area and should not be misinterpreted for use in other areas particularly those with little rainfall.

A. belladonna is considered to be evergreen; however, like most amaryllis in the tropics they more or less have a dormant season due usually to alternate dry and wet seasons rather than extreme changes in temperature. Whether the earth is in a cooling or warming cycle does however have some effect. I would like to point out that in the tropics although there is less change in temperature there are also two seasonal cycles a year where further south or north there is only one. In the tropics amaryllis therefore often flower in July and again in December during changes in these cycles.

Amaryllis in the wilds grow in various places. Many grow on rocks, stumps, or even in trees. Most of them grow where it is well drained especially during any dormant period or cold period. *Amaryllis belladonna* however will grow in muddy low areas in the tropics where the temperature is always above 70°F. but where night temperatures fall much below 70°F. it requires a dry area during low temperature levels and will rot easily if given a cool damp condition.

In the state of Florida where *A. belladonna* is found naturalized, generally a sandy soil exists. The summers are warm and damp; in winter there is less moisture and the springs usually very dry. Under these conditions *A. belladonna* will naturalize. The temperatures should not fall much below 50°F. for any long period of time and the soil

should be relatively dry during cool periods. I would like to point out that *A. belladonna* possibly has the widest growing range in the wilds. Even it however is not found growing in abundance but only in small habitats or individual clumps. They grow in very limited areas in nature often not more than a few feet in area. This is because its requirements are more exacting than those of many other plants. In Florida one usually finds *A. belladonna* naturalized only in ground where moisture is exceptionally low during the winter season and moisture is most plentiful during the summer growing season. One may take exception to this as they will be found growing in flat low land that does not appear to be particularly well drained but this fact still remains a prime requirement and there are reasons for apparent exceptions. Usually after a clump of amaryllis is well established their root system can help take up excess amount of water and will grow in damper areas when newly set out plants will not. One might ask if this is true how did the clump ever get established. The answer is that the bulbs when originally planted were planted before or during an active growing cycle and got established before cool weather set in. Possibly if one would check further the winter following the original planting would prove to have been mild and dry which had helped considerably in the bulbs getting established. Other factors play a part. I have found that soil where *A. belladonna* is naturalized is often matted with tree roots. These roots absorb excess moisture. Amaryllis seem to like this condition and often do well at the base of trees where they compete with tree roots for moisture. The tree roots taking up moisture keep the soil dry during the winter which helps insulate the bulb from cold damage. *A. belladonna* is often found growing under the eaves of houses where soil moisture is reduced. In most areas where I have found *A. belladonna* naturalized excess moisture in the soil is removed very rapidly after rains. Of course during the summer rains and the period of rapid growth there is an abundance of moisture for both the amaryllis and any root competition from the trees. Another factor that is important in the culture of amaryllis is that they do not like quick or sudden changes in soil temperatures. Most will do best where soil temperatures stay relatively the same. *A. belladonna* is particular in this respect and this is possibly the reason one finds it difficult to maintain this species in pots. The pot being small the soil changes much more in temperature during a day's time while the temperature of the open ground changes little. *A. belladonna* is often found growing in a protected area on the east side of houses which receives the early morning sun that keeps the temperature up during the winter.

Now back to the case of my friend who lost his *A. belladonna albertii*—his clump grew under the eave of his garage with an east exposure and the ground drained abruptly away from the building. He probably planted the original bulb in the spring after the weather had warmed up. It made good growth the first season and winters were possibly mild for several years until the clump was established. After the clump was established it could absorb excess moisture. Being under the eave of a building it received little moisture except with an east wind.

When the clump was dug it was replanted in the fall which was wrong. They were replanted in a poorly drained area and not against an east wall that could absorb a maximum of heat during winter days. So my friend lost his beautiful bed of *A. belladonna albertii*.

I believe we all can learn something from this experience. First, if you have a clump of amaryllis that is doing well, do not bother it or replant them until you have thoroughly determined why they do well there and can duplicate the environment. Even then you may fail. Amaryllis often will linger for years in a location under adverse conditions, then come forth with flower during some abnormal weather or other change in environment often lapsing back to a mere existence afterwards. Amaryllis do have exacting cultural requirements.

I would like to mention the three other clumps of amaryllis near my home that I spoke about. First is a bed of *A. x johnsonii* that grows on each side of a walk that leads to the front door of a small home. Along the walk on both sides are azaleas and there among the azaleas they grow and produce hundreds of spikes each year. Why they grow in this acid soil so well I do not know but *A. x johnsonii* appears to be tolerant to the acid soils in the south. A second clump grows not far away in a narrow space between azaleas and a drive way. These appear to be Nehrling hybrids and make a riot of beautiful airy orange red flowers each spring. They are possibly a hybrid between *A. belladonna* and *A. striata*. Another bed of Mead hybrids in a yard near a deep ditch makes an exceptional showing in my neighborhood. Generally the Mead's hybrids in Florida will grow in a wider range of soil conditions but as a rule where amaryllis are found naturalized in Florida they are *A. belladonna*, *A. striata* or a hybrid of these. These are much harder to transplant but in those rare cases where they find a suitable condition they grow and thrive with little attention if the environment is not changed. They do have exacting requirements.

Getting back to the past season the named Dutch varieties still demand the greatest interest among the hobbyists; however, there is more interest being shown for pot plants for home use and amaryllis as border plants. I feel the interesting show type flowers have been stressed too much by the American hobbyist to the detriment of the development of more vigorous types. The medium and miniature sizes for pot and border culture should be stressed more. A bulb can not support one or two huge spikes of flowers each year but could support a reasonable sized spike. Most complaints by customers are that their bulbs just do not flower each year or that they soon degenerate and rot away. But in spite of this they continue to buy the largest flowering sort in the catalog seldom realizing that many of these clones degenerate after they have flowered one or two seasons. *The public should seek and demand more vigorous clones.*

BULB SIZES

With the increased interest in amaryllis purely for personal pleasure more amaryllis in smaller bulb sizes are being sold. The 22/24 cm size being about the smallest size that will flower as a rule. These can

normally be purchased for about half the price of the 28/30 cm size. While the flowers they produce are normally small the first year these younger bulbs seem to establish themselves better with less care and less chance of decline has been observed. Of course for the show circuit the larger the bulb the more chance one has for obtaining that 1 in 1000 tri-color for the largest and best in the show.

HYBRIDIZING

I think generally more people are interested in planting seed both for pot and border use. While most want seed from Dutch clones many realize that these crossed with select hybrids of other origins will produce superior plants as far as vigor is concerned. More of these special hybrids should be developed. The Dutch hybrids have a limited color range whereas by crossing them with other selected hybrids one can get an endless range of color tones. Crossing the Dutch on species and the Dutch on selected clones of other strains if properly picked can produce many new color shades. I would like here to tell about a few such crosses and what they produced. Others can be made that will be just as different and outstanding.

The first hybrid I would like to talk about is a cross made by Mr. Howard Cooper of Hawaii. He crossed the hybrid clone 'Floriade' on *A. aulica platypetala*. This cross produced some interesting seedlings. All favor each other generally being rather large with a white background with pin stripes or bands. They are exceptionally beautiful, different and of an airy form. This cross produced mostly shades of pink, salmon, orange and red. All look like kissing cousins and grow vigorously. These seedlings are all very late flowering like its seed parent, *A. aulica platypetala*, and come into flower a full month after the regular hybrid. Other color shades can be obtained by crosses of other colors of Dutch hybrids on *A. aulica platypetala*. By crossing it or any other selected clone or species with inbred Dutch hybrid clones you can very nearly set the color for the inbred Dutch clone. The Dutch clones usually have little other color in them and the offspring normally will be a similar color blend of the Dutch clone used in the cross. Of course in crossing the Dutch clones on a species the form will generally be a blend of the two.

When one uses a select hybrid clone to cross with the inbred Dutch clones usually one can predict the color shading much more accurately than type or form of offsprings but neither can be predicted nearly as closely as when a species is used in a cross with an inbred Dutch clone. To illustrate this I would like to comment on a cross I made several years ago the seedlings of which I flowered this spring.

I used a Tunia's Australian clone I obtained from India as the seed parent and a Dutch clone as pollen parent. I do not remember the specific pollen parent I used. There may have been several which is not really too important. The seed parent was a large rose colored flower with green on the mid-rib. The color reminded me of *A. x johnsonii* but of course the flower was much bigger at least 8" and with wide segs. The seedlings produced from this cross with inbred Dutch clones had an

exceptionally wide color range from pink, salmon, orange, rose to red. They have the greatest number of shades of color of any other hybrids I have seen. The form of the flowers were reasonably good. Many, about 10 to 20, rivaled the best Dutch hybrids. There were some of the most exceptionally fine brick rose and brick red shades I have seen. A good percentage of the flowers were solid colors of the Dutch or Leopoldii form. The others show some green or white on the mid-rib of reasonably good form. Many of the pinks are the lightest I have seen and the pink particularly show the wide flat form of *A. psittacina*. However few except pink show this form.

Those who observed these hybrids said they had not seen anything to rival them and they seem to be exceptionally vigorous and would make wonderful border plants as well as show flowers. I mention these two crosses as it points out what can be obtained by using a select hybrid clone or species and crossing with the inbred Dutch clones.

SELFING

Another interesting group of seedlings, I flowered this year, are self pollinated seedlings of this clone with three distinct characteristics; flower that has a faint picotee edge and some dotting. It is the most free flowering clone I have and therefore deserves my attention. The self pollinated seedlings of this clone have three distinct characteristics. First the selfing produced some near whites with only a very slight trace of purplish red penciling. Some are rose and white and resemble the species *A. leopoldii*, at least the pictures I have seen of this species. The others range from nearly solid red with white tips on the petals. On those showing white generally the lower three segs were near white. A few were near duplications of the Dutch clone, 'Beacon'. By inbreeding these seedlings one or two more generations one could set, I believe, pure type and color and when crossed with inbred Dutch could predict the offsprings that would be reasonably similar in both color, form and growth. More work in this field is needed to develop good commercial garden and pot plant sorts at reasonable prices. A very interesting aspect of this is that further inbreeding of this particular clone could produce a duplicate of species *A. leopoldii*. My guess of the parentage of 'American Beauty' is $\frac{1}{4}$ *A. elegans*, $\frac{1}{4}$ *A. pardina* and $\frac{1}{2}$ *A. leopoldii*. I believe new hybrids can be developed that are much superior to those on the market today and in this respect I would like to suggest several crosses that I feel would be especially good for Florida and the southern states.

SUGGESTED CROSSES

Dutch clone x *A. aulica stenopetala*: *A. aulica stenopetala* is a fall bloomer and grows easily in the south, is reasonably resistant to insects and should make vigorous hybrids. It is a large flower type so you should expect large flowers.

Dutch clone x *A. striata* var. *striata* SA63-22: this species however is small or medium sized but is more vigorous growing and easiest to

maintain in my area. *A. striata* matures fast and generally makes lots of offsets. This particular species has much more vigor and does not fall victim to Mosaic disease nearly as rapidly as other varieties of *A. striata*. It seems to tolerate more water also.

Dutch clone x *A. Reginae*: while *A. Reginae* is not a particularly good grower for me I can say I have fair success with it but to develop baby pink shades of amaryllis I feel this is the only one available that does not have orange or yellow in the red pigment in the segs and if crossed with white Dutch should produce pink seedlings. Let's see if my guess is right.

There are other crosses on selected hybrids one might want to make also with the species but the above species seem to be in my opinion best for using to develop hybrids for the south eastern states.

I will make one noteworthy exception. From about 2 months experience with *A. cybister spectabilis* I would like to predict that this species will be well adapted to this region and I feel can be naturalized in Florida and along the Gulf and Atlantic. It may prove to be a real find for hybridizing both for new forms and more vigor in our hybrids.

I would like to comment here that one might find other more acceptable species for breeding purposes in the more arid climates of California and the western states. Northerners may find some of the other species that like a much cooler growing temperature better for their particular area. I feel in this respect everyone interested in hybridizing amaryllis should try some of the species. You will find most of them difficult to grow but then one never knows when he will discover one very well adapted to his particular culture and region. The limits of color shades and forms in amaryllis have hardly been touched and one can develop his own personal likings in new hybrids that can not be purchased.

NEW CLONES

In touching on the past season one can not neglect to comment on the new Dutch hybrid clones as well as those that have performed well for us for many years. One also must touch on the new clones from Africa. As the African clones are available first in the season I will make my remarks on them first.

HADECO CLONES

Of the Hadeco African named clones 'Rosaline' still is the best performer. It is a fine amaryllis in white pin striped brick rose, the general appearance of light brick rose. Next popular of the older clones is 'Tangerine', a free flowering orange that can make 3 spikes from a 24 cm bulb. How this can be possible is hard to imagine but it often does this. The flower of this clone is reasonably large. It is a wonderful pot plant. Clone #65 is scarlet and is exceptionally free flowering. 'Rose-dale' is a good turkey red or rose red. Clone #307 is a beautiful cardinal red that literally shines. 'Vintage' is the best dark red. Four outstanding new clones will appear next season. Best by far and one of the

most beautiful orange colored amaryllis I have seen is 'El Torro', a most beautiful coppery orange that just reminds me of Spain and the colorful pageantry of the bull fight. 'El Picador' slightly darker, is also outstanding in the orange tones and one most collectors will not want to miss. Clone #242 is a large new pink and white striped and flushed clone that gives promise of becoming a good one in this color. 'Rubra' is another fine promising clone in camellia rose. The African amaryllis are popular for early flowers and the newer clones appear to be much improved. One can now get named clones in shades of red, rose, orange and white & red. A full line of colors will be available in the future.

VAN MEEUWEN CLONES

The Van Meeuwen prepared amaryllis for early flowers which are available a month ahead of the regular stock are popular with many. This firm has been making rapid improvements in the quality of their clones both from the standpoint of perfection of flower as well as performance of bulbs. In recent years they have introduced many outstanding clones.

New this season is 'Bernice'. This is a very large tall growing dark red that is *fragrant*. It appears to be an improvement over their older 'Tristan'. It will become a leading dark red if not the leader in this field if its performance continues as good as it was in trials this past season. Look for this one to be the top dark red in coming seasons, a spectacular new one. New also this season is 'Queen of the Night', a very nice new dark red of regular form not as large as 'Bernice' but a fine one. 'Artemis', a new white flushed and striped rose red, is exceptionally tall and large flowering, a giant type.

I will try to name other outstanding clones from Van Meeuwen by performance. However I would like to say here that most of these listed here are also leaders in their color class in my opinion.

The most outstanding clone from Van Meeuwen is 'White Christmas'. It is most free flowering and extremely popular which it deserves. This is possibly the best white available for pot culture. 'Rembrandt' is one of the finest orange reds I have ever seen, large and easy to flower, very outstanding. 'Mars', a medium dark red is outstanding. This one appears to do exceptionally well in California. It is a very vigorous growing plant that reaches a height of 6 feet. 'Pygmalion' and 'Rose Marie' are exceptional free flowering whites, flushed pink, a color that is becoming very popular and these two are fine sister clones. 'Cupido' is a fine free flowering white and orange blend that grows large easily. The Van Meeuwen clones are among the most free-flowering for pot culture and those mentioned you will find to be exceptionally good.

W. S. WARMENHOVEN CLONES

W. S. Warmenhoven has introduced several new clones in the past few years in the blends that are becoming most popular. Among these are 'Catherine Valenti', rose pink to dark rose and white; 'Mount Everest', pastel brick rose and white and 'Television', French rose and white. All three of these are similar except in a different shade of rose. All

are worthy additions to any collection. Warmenhoven's 'Floriade' and 'Golden Triumphator' still remain popular in the blends and their popularity does not seem dented even by lower prices for similar clones.

'Bordeaux' and 'Moreno' are particularly good in dark rose and the only ones in this particular color. 'Violetta' in violet rose is still popular. 'Oasis' is still one of the top whites and a fine one. 'Beacon', 'Elvira', 'Armango', 'Little Diamond', 'Marion', 'Orange Wonder', 'Pink Beauty', 'Red Master' and 'Sweet Seventeen' all remain popular and are all outstanding clones.

C. WARMENHOVEN CLONES

C. Warmenhoven, a small firm, furnishes some of the best red colored clones. Possibly the most beautiful red I have seen is 'Flamboyant'. This is of flat form and a most beautiful medium red color and texture. It is not easy to grow but to those who will take the extra care it can be outstanding. 'Red Champion' is a huge large medium red that is an excellent show flower. 'Top Score' is a fine medium red and 'Apollo' is a very good easy flowering orange red, C. Warmenhoven's new orange, 'Mrs. Warmenhoven', is an excellent new orange. This coming season they will introduce a new dark red, 'President Kennedy'. As this firm is known for its beautiful dark red clones this first one to be named should prove to be outstanding.

LUDWIG & CO. CLONES

Ludwig & Co. in recent years has introduced some fine new clones in pink shades. These are much lighter than their previous introductions such as 'Pink Perfection' and 'Pink Favorite'. 'Dutch Belle', 'Heaven Sent' and 'Flora Queen' are all outstanding and a little different in shading. 'Flora Queen' has a lavender tone to it. Clone #101, not yet named, is as light but its color is not as clear. It, however, makes up for some of this by its vigorous growth. It is also a fine clone. 'Sight Show', just a little darker pink, is excellent and 'La Forest Morton' leads the pack in the rose pinks.

In whites Ludwig's 'Winter Carnival' is hard to beat. 'White Giant', 'Marie Goretti' are still among the best whites.

Ludwig's 'Home Decorator' in coppery salmon, 'Beautiful Lady' in rich medium salmon are good additions in this color. 'Bouquet' still is a leading clone in a lighter shade and 'Delilah' in tangerine orange is in a color class all of its own.

In salmon pink 'Spring Dream' and 'Prima Donna' are both outstanding.

In pink flushed whites 'Apple Blossom' and 'Love's Desire' are still popular but are finding competition from similar clones of other growers.

In the bi-tones 'Carousel' is outstanding. It makes late flowers of good quality to end the season. Not as striking as 'Five Star General' was at one time but it still is the best available.

The Picotee Clones—white with fine red edge—are extremely popular and beautiful. They are the most popular type today. Some diffi-

culty with cultivation has been experienced with these but they are most worthy pot subjects.

In reds, Ludwig's new 'Red Coralin', a medium dark color appeared last year. It seems to be a good new red. 'Ludwig's It' in darker red is exceptionally good. 'Ludwig's Goliath' is a huge free flowering sort. It gave 9" flowers on 24 cm bulbs last season.

'Streaking Stripes' is a fine white and green striped red variety that is *fragrant* and beautiful. It is a really fine amaryllis.

I nearly forgot to mention 'Trixie'. This is a most outstanding medium rose with fine flat form.

CLONES OF OTHER BREEDERS

There are other clones that should be mentioned from other growers. 'Cavaliere' is a huge orange red of excellent quality. 'Day Dream' is a sensation in a blend of shrimp pink and white much like 'Margaret Rose' or 'Sweet Seventeen'. 'Flying Cloud' is an exceptionally free flowering white. 'Mohawk' of which about 25 bulbs were shipped to the United States several years ago was a sensation. Propagation difficulties kept this one from being available for several years. This coming season it will be available again. It is a giant dark red much like 'Red Master' except that it makes 4 flowers per spike and appears to be more vigorous. Bulbs of it will surely be in demand. 'Fair Lady', a blend of vermilion red, is different, beautiful and a fine one. 'Orange Orchid', a very beautiful new orange, is so bearded that it appears double at times. It is possibly the leading orange. 'Scarlet Leader' is a very free-flowering medium red and exceptionally fine clone that one can force easily.

SPECIES

Before I leave you for another year I would like to touch on some of the species I have imported along with others I have had experience with. Possibly I may be able to help you identify some of the species that I have from time to time imported from South America and which you may have.

Species SA1-5, 1-60, 3-60, 4-60 and 6-60 and SA62-4 although all have not flowered, appear to be *A. aulica stenopetala*. This species grows vigorously in the south. The flowers vary in size from about 5" to 8" diameter and segs from 1/4 to about 1" wide. Segs are apple green about half way up their length with the outer portion light scarlet. The scarlet coloring varies in brightness quite a bit. This species sets seed poorly for me but I have self seeded it and crossed it with hybrids. It flowers in October-November and has an early summer dormant period. It has stood temperatures down to 25°F. when in full growth during the winter. Large bulbs are about 3" in diameter. It grows well in community pots several to a six or eight inch pot preferably in peat but have also flowered them in pure coarse sand.

Species 12-62, which I sold for *A. blumenavia*, has flowered once. It grows rather poorly here, the flower was about 5" crimson veined more

deeply colored with a star in throat, rays between veins were green, flower was latterly compressed. This flower picked up light from the back side of the segs from moon light which causes the interior of the flower to glow. It is possibly pollinated by a night flying insect. This species is considered to be *A. correiensis compressa*.

Species 14-62 which was sold as *A. cybister* has been identified by Dr. Traub as *A. maracasa*, an orchid flowering type. It does not do well here; however, with cultural changes this season it is doing much better.

Species SA62-1 appears to be *A. espiritensis*. However the photograph sent along with SA2-2 appears to be this species. The tag on this lot was evidently mixed when collected. Flowers that bloomed for me have been porcelain rose with green white throat. I have just received a second batch of these which has just flowered. The bulbs are about 1¼" to 1½" in diameter. The flowers are small type *A. belladonna*. Some appear to be very much like a form that is sold is "*A. equestris*" in India and which Dr. Traub has named *Amaryllis mostertii*.

Lot SA62-2 appears to consist of at least two species. This batch of bulbs comes from Esperito Santo, Brazil. I believe the majority of these bulbs are *A. apertispatha* as flowered and photographed by Sam Caldwell of Nashville, Tennessee. He describes it as follows: Scape 18" tall, 2 flowers open, flowers 6¼" top to bottom, bottom segment narrowest of all, clear salmon with white and greenish center. Scape grew with spathe valve open from start. Spathe valve looked like two green leaves starting up and the flower buds were visible as soon as spathe pushed out of ground. This is undoubtedly *A. apertispatha*. Bulb was in good leaf at time of bloom. I dug mine in two seasons and lost the largest bulbs. One flowered. It was definitely of the *A. striata* alliance.

My collector sent a photograph of this species and it appears to be *A. espiritensis*. It appears that SA62-1 and SA62-2 were mixed when collected.

Species SA62-3 is considered to be *A. striata Crocata* but appears to be difficult to flower. I had several flowers the first season but none since. The flowers were large, up to 7" across, very waved of light pink and yellow pastel color and very beautiful. The photograph furnished by the collector shows the same type. I will have to give this one more special care to get it to flower.

SA62-5 from reports and photographs sent me appears to be a form of *A. striata*; however, it has not been robust with me and I will have to change my culture in order to save this introduction.

Species SA62-6 appears to be a form of *A. striata* var. *striata* with flowers of intermediate size about 4" to 5" of reddish orange color. This species also does not grow well for me.

Species SA62-7 is the true species *A. blumenavia* with very small white striped lavender flower with up to 7 flowers per umbel.

Species SA63-11 turned out to be three different bulbs. One is a *Hymenocallis* with a semi-petioled leaf, and which makes four flowers per umbel, a nice evergreen type. The second is a *Crinum* of which I

have no flower as yet, but Dr. Traub has flowered it and has named it *Crinum brasilense*. The third is an *Amaryllis* that has not flowered and the same area as SA63-12; from its growth it appears to be a form of *A. striata fulgida* like SA63-12.

Species SA63-12 is no doubt *A. striata fulgida*. It grew well the first year but like all *A. striata* gets too fleshy if over fertilized and many rotted in storage. I hope to again have flowering size bulbs to observe next season.

Species LM63-1 is from San Martin, Peru. It is *A. reginae*. There are some bulbs of a pink form among them. The flowers are identical except in color, the red fades to pink or light rose.

The above report covers most of the unidentified species I have collected which have flowered. At the present writing I have many that are making fine growth and hope I can report that these have flowered by next season. I am particularly waiting to see *A. cybister spectabilis* flower. I have one which has two spikes starting up at this time.

AMARYLLID CULTURE IN THE PACIFIC NORTHWEST

ANDREW H. GRUBBS, 320 Robert Av., Richland, Washington

Washington's Columbia Basin, east of the mountains, is far from an ideal spot for the growing of *Amaryllis* and other amaryllids. During the summer excessive heat and dryness prevail. In the winter short, very dark cloudy days have to be reckoned with.

For me these conditions are partly controlled and only a fair degree of success has been achieved; that is, some years have been very rewarding and some have been much less than satisfying. It is not unlikely that a well equipped greenhouse with automatic heating, cooling, ventilation and humidifying would provide excellent growing conditions, even here.

For hybrids of my own crosses I have been using the system of growing in out-door beds in summer and dry storing in winter. With some limitation this is a satisfactory substitute for a more adequate greenhouse. Limitations I have encountered are: a season of bad weather can result in no blooms or scattered blooming; an unexpected early freeze can cause damage, losses or total loss. I have not had any losses of my own from early freezing but I have often dug them when they could have benefitted from six to eight more weeks for growing and ripening had I not been afraid of early freezing. With a storage area that can not be kept cool many bulbs will put out buds in April and if they are not put in the bed within a week or two the buds will not open when they are planted out. The hazards to bulbs due to insects, diseases and other accidents are much greater in out-door beds than in the greenhouse.

My two major misfortunes were, first, rather heavy losses from the *Narcissus* bulb fly and later more devastating losses from the Mosaic disease. The *Narcissus* bulb fly is now under control. The bulbs are all soaked for ten minutes or longer in a solution containing one table

spoon full of Aldrin in a gallon of water as explained in the "Amaryllis Manual" by H. P. Traub. Mosaic disease was first suspected from symptoms described in the same manual and was confirmed by sending some of the bulbs to Beltsville, Maryland where a study was being made by Doctor Robert P. Kahn. The result of the study was reported in "Plant Life" in 1963. Dr. Kahn reported the disease as Cucumber Mosaic Virus, a disease difficult to control on amaryllis grown out-doors because it is hosted by more than two hundred plants including many vegetables and weeds. I keep my beds as free of weeds as possible and spray as often as I can but unfortunately the beds are near the vegetable garden where tomatoes, cucumbers and beans are grown and I must dispose of every *amaryllis* that becomes marked as I suspect the plants mentioned are among the worst offenders as hosts.

Up to the present time, I have made about fifty crosses of *Amaryllis* using named Dutch clones, American hybrids, *A. evansiae*, *A. x johnsonii*, *A. belladonna* L., and making further crossings among the seedlings that resulted. The net result was a very pleasing display of flowers ranging from five to eight inches in diameter and in colors of red, orange and pink. There was a great variety of red shades, stripes, spots and borders. Most of these bulbs grew more easily than the Dutch hybrids, bloomed sooner while the bulbs were comparatively small. Many never did have bulbs as large as the Dutch hybrids and those that did have comparable size were among the least pleasing in color and shape.

It is probable that none of my clones was good enough, or different enough from clones already named and on the market to be introduced. I have never lived in an area where *Amaryllis* are common and I have never attended an Amaryllis show. All of my opinions hinge on the clones I have bought, pictures I have seen and information found in books and so it is probable that I am unable to judge properly just how good or different a clone is.

A large part of my collection was lost due to the mosaic and I do not know what those coming on will be like. If there is any lesson to be learned from my experience with mosaic, it is to not try to save any suspected clones. I was very reluctant to destroy any of my favorites before they were so badly marked that there could no longer be any doubt about their diseased condition. I was reluctant to destroy a good sized bulb that had not bloomed for fear it might be the unusual one I have been waiting for and so a source of infection was harbored where it could do the most harm.

I have numerous seedlings of crosses between *A. belladonna* L. and *A. evansiae*. These plants are in size, appearance and growth habit very much like *A. evansiae*. They do not seem to have acquired any hybrid vigor. When soil and drainage are not just right they are subject to root rot or the whole bulb may rot if the condition is not corrected. They will not grow out-doors in this locality. One of these bloomed early last spring. The flower was just like *A. belladonna* in size and shape. The color was a faded looking red, looking as if it had submerged stripes. The effect was not at all pleasing.

Crosses between *A. x johnsonii* and *A. evansiae* look and act just like those of *belladonna* X *evansiae*. None have bloomed yet. My methods of growing these may not be right. I have never tried letting them go dormant in the winter as they appear to be evergreen species. Perhaps they would benefit by a period of complete dormancy.

Eight seeds of the so called Blue Amaryllis, *Worsleya rayneri* were planted in 1957. All of them germinated easily and grew well for several months then I began losing them one at a time. I tried many different soils, fertilizers, temperatures and light variations. None of them did any good and I thought perhaps by trying too hard I was killing them with kindness and I let them alone with the same treatment the other plants were getting. One bulb survived and I put it in the out-door bed thinking Mother Nature might do something for it. In the fall I dug it and found it without roots and weaker than ever. It was again potted up in a four inch pot with plenty of drainage material at the bottom. A loose porous soil mix, to which was added a small amount of ground rock, and greensand and phosphate rock, and a pinch of trace elements. There is now some improvement. The neck of the bulb is five or six inches above the soil, the leaves are twelve or more inches long and fairly healthy looking. The bulb itself is probably about the size of a hickory nut.

Seed of *Amaryllis aulica* acted just like *Worsleya* except that they grew well from time to time and then a period of decline set in with losses until only one of these remains.

My latest addition is a bulb of *A. psittacina*, which has started off just like any other hybrid would and from appearances I do not expect any trouble with that one. It was planted this past autumn and already has an offset coming up beside the mother bulb.

Of other amaryllids I have tried to grow I will only make brief mention. Two *Hymenocallis* bulbs identified only as "Spider Lilies" grow like hybrid *Amaryllis* and the plants, when not in bloom, look just like *Amaryllis* among which they grow with the same care. When they bloomed they excited considerable interest and admiration because they were new and unusual to the people, who were seeing them for the first time. They interest me and sometime I will get some that are identified as to species.

For *Amaryllis* and amaryllids I have a shaded bed, about the same thing as a lath house. In this bed one bulb of *Lycoris squamigera* has grown for several years. It is winter hardy and has bloomed several times. This year it has set seed. I pollinized some florets with pollen from an *Amaryllis* that happened to be blooming but did not emasculate them nor screen them and so likely they were pollinated again by bees.

A Crinum 'Cecil Houdyshel' grows weakly and blooms half heartedly each year. It seems to be infected with mosaic but as it is away from the *Amaryllis* I have not destroyed it yet. The spots on it are less pronounced and not dark and waxy looking as are the blotches on some *Amaryllis*. Perhaps it is some climatic condition or cultural practice that it has not had time to adjust to.

Nerine bowdenii was tried in the greenhouse for three years with no success and now they are growing out of doors, where they seem to be winter hardy and they may in time establish themselves and give blooms.

Among seeds sent to me for trial here were: *Habranthus robustus*, *H. brachyandrus* and *H. texanus*. All of these were started from seed, grew easily and bloomed both in the greenhouse and out of doors, but only *H. texanus* seems to be reliably winter hardy. The others drop seed which will come up the following spring. I dig the bulbs in the fall and store them over winter. They are planted outside again in the spring.

Members of the genus *Rhodophiala* have not done very well in the greenhouse and most of them did not survive a winter outside. A few bulbs remain and I think they are *R. x huntiana*.

I can report real success with one other packet of seeds I received and that is *Littonia modesta*, a member of the climbing lily tribe. The seed grew easily and the bulbs or tubers multiply rapidly. Some left in the ground survived. Dropped seeds also come up in the spring. These in themselves are not especially desirable as an addition to the flower garden, but as was suggested they might be crossed with *Gloriosa* species, and this I may try when and if I get a chance.

AMARYLLIDACEAE NEEDED FOR CELL DIVISION STUDIES *

WM. T. JACKSON,
Department of Biological Sciences,
Dartmouth College, Hanover, N. H.

Endosperm cells contained in young seeds of the African Blood Lily (*Haemanthus katherinae* Baker) have been used for several years in cine-micrographic studies of cell division. The most complete description of the technique used in preparing endosperm cells for study is given by Mole-Bajer & Bajer (1963). The virtues of this particular species of *Haemanthus* for such studies can be summarized as follows:

1. The endosperm cells are suspended in a liquid in young seeds and the cells do not possess cell walls at this stage. Consequently, the cell-containing liquid can be squeezed from the cut seed onto an agar surface for easy microscopic examination.

2. If the excess liquid is drained from the agar surface the cells remain attached to the agar and flatten as surface tension of the liquid film covering them increases. Therefore, the chromosomes are spread into a monolayer during mitosis.

3. The cells undergo normal mitosis on the agar surface and the process is completed with a few hours. (It should be kept in mind that endosperm is a $3n$ tissue).

4. The nuclei are large (50 to 75 microns or even more in diameter).

* This work was supported by a grant from the National Science Foundation, GB 704.

The haploid chromosome number is 9. The chromosomes are large (4 microns in diameter and up to 100 microns in length during anaphase). The thickness of the cell when flattened for study is 6 to 10 microns.

5. Relatively few starch grains are present in young seeds, thereby permitting precise studies of changes in birefringence with the polarizing microscope.

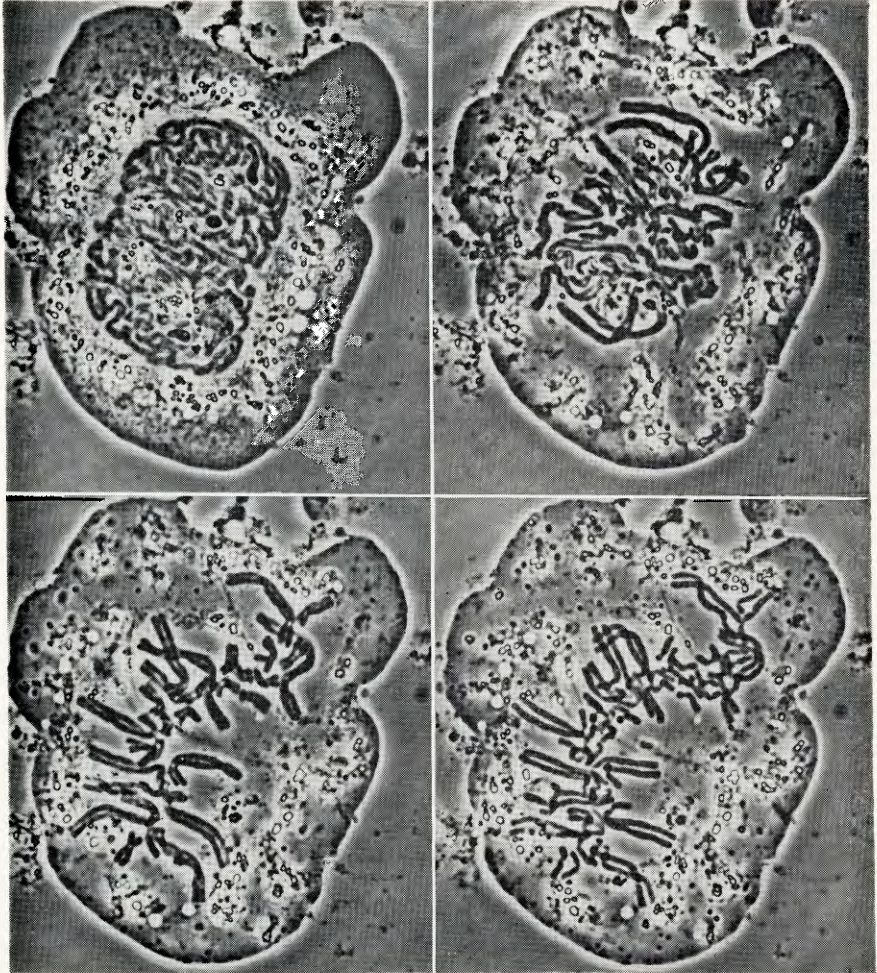


Fig. 21. Stages of mitosis in an endosperm cell of the Katherine's *Haemantus* (*H. katherinae* Bak.) observed by phase contrast microscopy, **upper left**, prophase; **upper right**, prometaphase; **lower left**, metaphase; **lower right**, onset of anaphase.

Time in minutes from prophase; to prometaphase. **110**; from prophase to metaphase, **170**; from prophase to onset of anaphase. **190**. Continued in Fig. 22.

6. The cells will undergo division on a very simple medium (3.5% glucose + 0.5% purified agar is used routinely). However, at present, they will not continue to divide under these conditions.

7. A single seed usually contains several hundred cells in all stages of division. Therefore, one has ample opportunity to select particular stages for study.

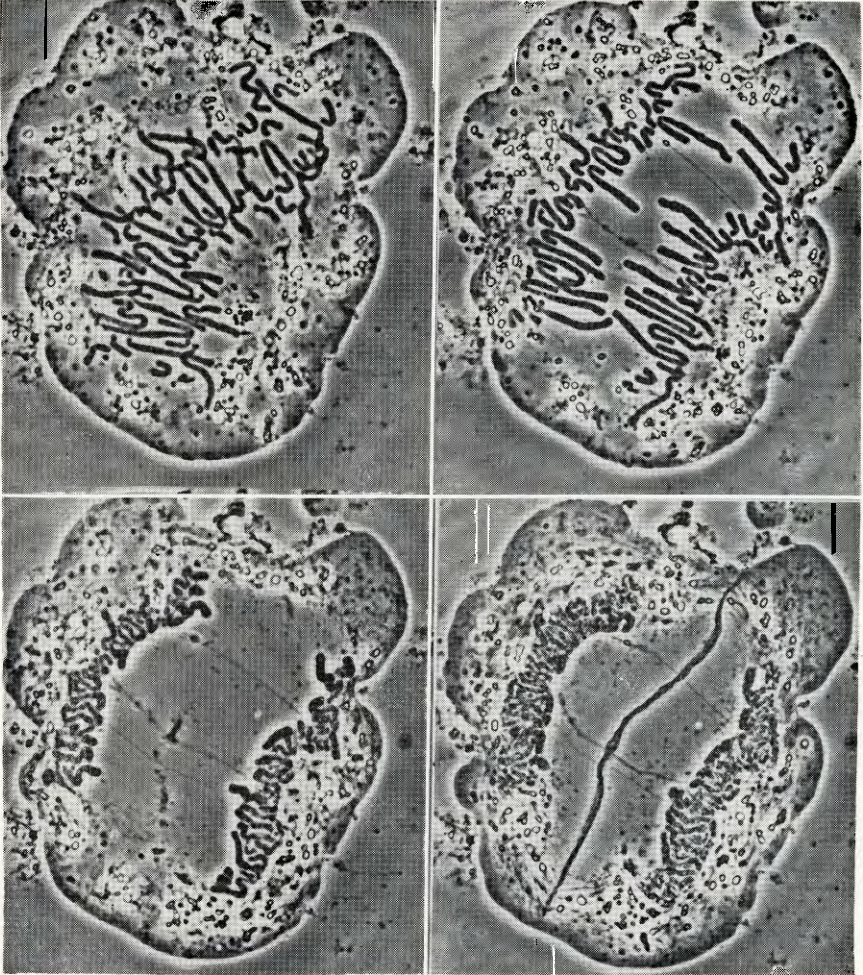


Fig. 22. Stages of mitosis in an endosperm cell of *Haemanthus katherine* Bak. (continued from Fig. 21) **Upper left**, mid anaphase; **upper right**, late anaphase; **lower left**, early telophase; and **lower right**, late telophase.

Time in minutes from prophase (in Fig. 21) to mid anaphase, **200**; from prophase to late anaphase, **220**; from prophase to early telophase, **240**; and from prophase to late telophase, **270**.

8. A single fruit contains one to three seeds, and a single plant of *Haemanthus katherinae* annually bears an inflorescence containing up to 100 single flowers. These fruits ripen over a three to five week period. Therefore, a single plant provides material for study for several weeks.

9. Although the plant normally flowers in the Northern Hemisphere during June and July, time of flowering can be controlled by holding the plant dormant or by breaking dormancy prematurely.

10. The plant is easily propagated from seed or offshoots, but it does require three to six years to reach maturity. In Europe, the plant is readily available commercially. It is less common in its native habitat of South Africa. It is not common in the United States, but it can be grown quite successfully outdoors in Southern California.

11. The plant, particularly the inflorescence, is striking and makes an excellent addition to a greenhouse. It requires very little care.

Unfortunately, very few species of plants have been examined for their suitability for *in vivo* cytological investigations. Of the species examined to date, members of the Amaryllidaceae have proven most promising. Therefore, we are undertaking an intensive examination of as many genera of this family as possible. We are most anxious to exchange mature bulbs, fruits, or seedlings of *Haemanthus katherinae* or *H. magnificus* for the same of other species.

If you are able and willing to send plant material (on an exchange basis or we will pay shipping charges), please send a *list* of material available to: Dr. Wm. T. Jackson, Department of Biological Sciences, 406 Gilman, Dartmouth College, Hanover, N. H. 03755 (U. S. A.)

The stages of mitosis in an endosperm cell of Katherine's *Haemanthus* (*H. katherinae* Bak.), observed by phase contrast microscopy are shown in Figs 21 and 22. Time in minutes:

| | |
|--------------------------------|-----|
| prophase to prometaphase, | 110 |
| prophase to metaphase, | 170 |
| prophase to onset of anaphase, | 190 |
| prophase to mid anaphase, | 200 |
| prophase to late anaphase, | 220 |
| prophase to early telophase, | 240 |
| prophase to late telophase, | 270 |

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ARTIFICIAL POLLINATION OF HAEMANTHUS
KATHERINAE *

WM. T. JACKSON,

*Department of Biological Sciences
Dartmouth College, Hanover, New Hampshire, U. S. A.*

Mole-Bajer and Bajer (1963) have emphasized for many years that the endosperm cells of several species of plants are suitable for *in vitro* studies of mitosis, and that the African Blood Lily (*Haemanthus katherinae* Baker) combines the most desirable characteristics of all species examined. During the so-called "milk stage" of endosperm development free nuclear and single cells without cell walls can be found. The chromosomes are large and identifiable, being about four microns in diameter and up to one hundred microns in length. Although endosperm is typically triploid, haploid ($n=9$) as well as polyploid cells are quite common. If a suspension of endosperm cells from the developing seed is spread on an agar surface (0.5% purified agar plus 3.5% glucose in glass distilled water) and enclosed in a saturated atmosphere, the cells will flatten spontaneously, and mitosis can be followed easily with the microscope (Bajer and Mole-Bajer, 1954, 1961, and Inoue and Bajer, 1961).

Even though cultivation of this plant began in 1877, it is rather uncommon in gardens and greenhouses and is becoming rare in its native habitat. Three to six years are required to obtain a bulb of flowering size from seed or offshoots. The mature plant normally flowers only in late spring or early summer, thereby restricting the period during which young seeds can be used for studies of mitosis. Fruit set is so poor under natural conditions that an inflorescence containing as many as a hundred flowers may produce fewer than ten seeds.

We are attempting to determine the factors controlling (a) time of flowering and (b) fruit set. When this is accomplished, we should be able to space the time of flowering of a group of plants so that some will be in flower throughout the year and we should be able to control fruit set so that each inflorescence will provide a large supply of developing seeds. It is the purpose of this note to describe a simple, rapid, and highly effective pollination procedure that results in a high percentage of fruit set.

Mole-Bajer and Bajer (1963) recommend that the flowers be hand pollinated with a camel's hair brush. This is a tedious and time consuming process resulting in about 30% fruit set. A fruit that sets will contain one to three seeds. We have found that if one simply gathers together the flowers of the inflorescence with one hand, and rubs the heel of the other hand over the exposed anthers and stigmas, pollination is effected. A large collection of plants can be pollinated within only a few minutes, and cross pollination is insured. This procedure is repeated daily.

* This work was supported by a grant from the National Science Foundation, GB 704.

Records were kept on nineteen plants growing and flowering in the greenhouse. The average number of flowers per inflorescence was 96 with a fruit set of 80%. The African Blood Lily possesses a trilocular fruit that contains only one seed per locule. Of the nearly 1300 fruits examined, 59% contained one seed, 34% two, and only 7% had a seed in each of the three locules. The first seeds in a given inflorescence reach the proper stage for study in about three weeks after anthesis begins, and the last is ready three weeks later. Therefore, a single plant will provide about 90 seeds spread over a three week study period.

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FURTHER NOTES ON USE OF CYGON

Prof. F. S. Morishita, of the University of California at Riverside, Calif., writes, under date of Aug. 11, 1964.—Cygon has been used quite regularly by many of the commercial nurserymen in southern California.

I would like to suggest that you try Cygon as a drench. This method seems to work the best for most people. The dosage would be 1:1600 (this would be about ½ teaspoon of Cygon 2.67 per gallon of water), also a drop or two of some type of sticker-spreader should be added. Do not expect immediate results from this treatment. From our experience with this material used in this manner, we have found that it will take about three to four weeks before you start seeing some results. I think that it would be advisable to try this treatment on a few of your plants to see the phytotoxic effects of Cygon.

AMARYLLIS FROM SEEDS UNDER ARTIFICIAL LIGHT

RICHARD J. SUDD, 750 South Cavan Lane,
Des Plaines, Ill. 60016

The seeds of all *Amaryllis*, which I have secured, have given good germination under artificial light. The determining factor in most cases was the freshness of the seeds. The longer the seeds were kept in storage, the lower the rate of germination.

Over the years with the increasing number of *Amaryllis* bulbs, my growing area has become limited. Presently, I have some two hundred

seedlings growing in an area 30" by 40" (thirty by forty inches), with two industrial fixtures overhead. I have tried to limit the growing area to seeds of a few crosses of the small flowering bulbs, and some of the species. In some instances it was possible to obtain flowering bulbs within two years.

All the seeds I have grown under artificial light are planted in plastic containers. The largest size of plastic container is cylindrical in shape, measuring 7" in diameter with a depth of 5 inches. This container is sufficient for a dozen seedlings for two seasons' continuous growth.

Those seedlings which were not planted out of doors, were transplanted in individual cylindrical plastic containers for continuous growth under artificial light. These plastic containers measure 3" in diameter and 6" in depth.

The basic growing media used for seeds and transplanted seedlings was coarse sphagnum moss and vermiculate. In the larger size of container for seeds, a 2" (two inch) layer of coarse sphagnum moss was overlaid by a 2" layer of vermiculate. The seeds were planted in the vermiculate to insure good germination.

Those seedlings, which were not transplanted out of doors after the second season under artificial light, were transplanted in individual containers. The same planting procedure was followed, as in the larger size container. The seedling root system was carefully surrounded by fresh sphagnum moss, with the bulb resting on and surrounded by a layer of vermiculate.

I started a program of fertilizing when the seedlings put forth their leaf growth. A soluble fertilizer "Hyponex" (7-6-19) was alternated with muriate of potash every second week, and a temperature of 70 degrees was maintained in the growing area.

The light source has remained the same for seedlings as mature bulbs (see Plant Life 1964, pages 111-115). A minimum of twelve hours of artificial light at a height of twelve inches is given the seedlings the first year of growth. At the end of the second year, the height of the light source was increased to eighteen inches to allow further growth of the leaves.

I have not carried out any breeding program with any idea of creating new recombinations within the amaryllis hybrids. However, I do believe a change would be welcomed in the small flowering amaryllis, i.e. greater color variety. Probably working with *Amaryllis blumenavia* would be a step in the right direction, but as everyone with an interest in the field of breeding knows, obtaining a working stock is very difficult. I hope in the near future more of the new species will be made available.

MORE ON GERMINATING AMARYLLIS SEEDS IN WATER

PHILIP G. CORLISS, M. D., *Arizona and California*

Until 1964 my plant originations (Spuria and Louisiana Iris, *Hemerocallis*, etc.) were introduced by other nurseries. Since it became necessary on account of my health to abandon my gardens in Arizona and to move my operations to San Diego, I put out a little catalog in 1964. My most successful efforts with amaryllis were in three lines: (1) doubles for field culture, (2) *A. striata* hybrids, and (3) a strain with a white picotee edge. I offered bulbs and seeds of these strains.

A customer from the southeast wrote me that she had poor germination with my amaryllis seeds, although she used procedure that had been previously successful. I sent her a replacement order and then decided to ascertain if something might have impaired the viability of my seeds, which had been shipped as soon as harvested and dried.

The method of germinating seeds in water as reported by Mr. Darold Decker in *Plant Life* (1964) appealed to me, since I would not be in constant residence in either Arizona or San Diego; and the inability to depend on caretakers to keep seed beds properly cared for during the vicious Arizona or the rain-free San Diego summers posed a problem. The gratifying results of my experience will, I hope, encourage others to use this method.

Having owned many cats for many years, I had acquired some years ago a rather extravagant number of clear plastic dishes offered as premiums by the Puss 'n Boots Company. These dishes are roughly 4½ inches in diameter and something under three inches in depth. The tightly fitting top section, which is about 1½ inches deep, overlaps the base section by ¼ inch. These dishes were washed with hot water and the lower section filled to a depth of ¾ inch with San Diego tap water.

In half the dishes I used a fungicidal powder provided by a leading chemical company. In the other half I used Lavioris (suggested by Mr. Decker) in amount sufficient to color the water a rather deep pink. Seeds were floated on the water to cover the entire surface but not to overlap. The Lavioris-treated dishes developed no mold, while most of those in which the powder was used became badly contaminated. In all "plantings" now I am using only Lavioris.

Germination of the amaryllis occurred in from ten days to ten weeks and was better than 50% despite the age of the seeds. The mortality of seedlings pricked out into flats and ferti-pots has been high, but that is due to my inexperience as a pot-grower, I am confident.

Having succeeded with the amaryllis, I am following Mr. Decker's suggestions to try other plant material. *Hemerocallis*, all kinds of iris, various amaryllids and irids, and even seeds of zapote and papaya are under test.

Mail address: (mail to Somerton will always be forwarded . . .)

P. O. Box 10502, San Diego 10, California 92110

New Garden (and mail) address:

2753 Ocean Front Walk San Diego 8 (Mission Beach), California 92108

GROWING AMARYLLIDS IN NORTH FLORIDA

BECKWITH D. SMITH, 2036 Post Street,
Jacksonville, Florida 32204

Numerous correspondents throughout the country and readers of Plant Life have written to inquire how I raise my seedling *Amaryllis*, and in order to furnish this information most advantageously this article is being written to describe my methods in the North Florida area.

First, in June when the seeds are generally at their peak of ripeness, I gather them and plant one-quarter inch deep in a mixture of coarse sand and granular peat, in which has been previously mixed ground limestone, cottonseed meal and bone meal. Seeds may be planted flat, or on edge, whichever one may prefer, but it is important that they not be crowded and overlap each other, and the planting mixture should be firmed around the seed. Coarse bagging is placed over the seeds and a light watering is given with some soluble fertilizer solution. All seeds are planted in wooden flats. A good idea to make the flats last longer than one season is to soak them some time in advance of planting in used motor oil. This assures a strong and easily managed flat during all of the growing season, as well as assuring another season's use. Flats are placed on corrugated sheets beneath the benches in the greenhouse out of the direct sun, and very shortly the seeds sprout and make a vigorous growth. At this time the bagging is removed. Bulblets are kept growing in the flats through the remainder of the year, and until the next March, at which time each bulb has from three to five leaves, are the size of a marble, and are ready to plant out as individuals in separate pots. The pots are placed out of doors in shade during the summer months, and are brought back under cover in the fall. I use four-inch clay pots for the first transplanting and six-inch pots for the second transplanting after the bulbs have grown for two years. Six-inch pots will enable you to retain the growing bulbs for several years without further repotting. Plants may be kept growing much longer each season by continuing to bring them inside before cold weather starts.

Where large bulbs are dug out of the garden, or may be purchased in season. I start with a six or seven-inch clay pot. I make the soil mixture equal parts rotted leaf mold (woods soil) or granulated peat, topsoil from garden and sharp sand. Well rotted dairy or chicken litter fertilizer if available, or commercial sheep, and one good handful of bonemeal per pot, are added.

The bulb is set in the pot with roots well spread out, leaving neck and one-half of bulb outside of planting soil. Water with lukewarm water to settle soil. Keep inside house where pot will receive average heat of 70 degrees during day, and place near window to obtain some sunlight if possible. The inside heat will enable bulb to bloom sooner.

The bulb can continue to grow in the pot after blooming, but when warm weather comes, it should be taken out of doors, and the pot with



Fig. 23. Beckwith D. Smith, of Jacksonville, Florida, and some of his choice hybrid *Amaryllis*.

bulb in it sunk in the ground, where it can get sun and natural moisture that promotes root growth. Partial shade is best. Fertilize lightly and water lightly once a week during the spring and summer growing seasons. It is necessary for leaves to grow, as well as roots, so the bulb can store up enough energy for next year's bloom.

While in the house, when leaves appear, turn the pot occasionally as the leaves will always try to lean toward the light outside. When bloom appears, tie bloomstalk lightly to bamboo or wooden stake for support. FEEDING: You may use any good soluble fertilizer or fish oil emulsion. OUTDOORS: Mix cottonseed meal or bonemeal in the outdoor planting soil.

Take up bulb in fall when leaves die down, bring inside and allow to dry off until ready to repot. Always preserve roots. Repot in fresh soil when ready to grow on in house, repeating the above cycle.

I am now growing seedlings from crosses made from blooms on the original A. C. Buller *Amaryllis* exhibited for the first time in U. S. at the Atlanta Flower Show, April, 1963. I hope that some of these will produce flowers of rare and distinguished beauty. Who knows? Perhaps they may.

WORSLEYA RYANERI FROM SEEDS

Reports on the growing of *Worsleya rayneri* from seeds were included in the 1964 and 1965 issues of PLANT LIFE. Mr. Clouette presents his third report below. Others are requested to report their experiences with this difficult subject in future issues.

5. THIRD REPORT FROM MR. BURR CLOUETTE (CALIFORNIA)

Only one of my two seedlings from Dec. 20, 1962 survives. It is growing well and has always been quite thrifty. It is planted in Black Magic potting mix in a 4-inch plastic pot. The use of plastic pots seems advisable because *Worsleya* resents drying out. The bulb is now about $\frac{7}{8}$ -inch in diam., and is $\frac{1}{3}$ out of the planting mix, the neck 3 inches long, and about $\frac{1}{2}$ -inch in diam. At present it has four mature leaves, and one just about 1-inch long emerging. The mature leaves are 6—8 inches long.

Of the five seedlings given me by Dr. Traub, four are surviving. Two are in my care and two are being grown on in the greenhouse by William Craig on the Campus of Southwestern University, San Diego, Calif.

The two I have vary greatly from the one that I raised, although they are approximately of the same age. One is slightly—over 1-inch in diam.—with a shorter neck $1\frac{1}{2}$ -inches long, and a neck-diameter of $\frac{5}{8}$ -inch. It carries seven leaves. The other is much smaller. The bulb is about $\frac{1}{2}$ -inch in diam., neck 2 inches long, and $\frac{1}{4}$ -inch diameter. It has 4 smaller leaves. Both of these bulbs share a 5-inch plastic pot, containing Black Magic potting mix.

On April 21, 1965, I floated some *Worsleya* seeds on tap water. Twelve had germinated by May 20, 1965, and had leaves starting. As I was moving again, I transplanted them. Two did not contain chlorophyll and of course died. As of June 10, 1965, ten fine, thrifty seedlings are surviving, and some are already forming the second leaf.

GROWING AMARYLLIS IN THE NORTH

JOHN J. SCHAEFER, *Dayton, Ohio*

Growing amaryllis in the northern states can be enjoyable and profitable depending on whether you are growing them as a hobby or as a means of livelihood. Of course, when I speak of *Amaryllis* I am referring only to the American species, which are sometimes erroneously listed under the synonym, "Hippeastrum".

Amaryllis growing presents quite different problems in the north than they do in the south, where they usually receive a more natural treatment depending on climate and soil. The closer one comes to a perfect climate and soil conditions the better. Since *Amaryllis* are not hardy here, one must protect them against cold by artificial means. This requires a greenhouse or a home. I have tried both.

In a greenhouse one can control the conditions quite well. Temperature and humidity can be controlled fairly well although the problem of air circulation is a difficult one. In the home it is still more difficult, since one must maintain, first of all, conditions more suitable to man himself than to his *Amaryllis*. The proper soil conditions may be obtained by selecting a suitable potting medium mixture formula.

In the Southeast the soil is usually loose, and porous, which permits the water to filter through at a fast pace. Porosity of the soil is important, and this importance can be noticed when one removes carefully a recently potted *Amaryllis* bulb from a clay pot and notices how the roots are mostly clinging to the sides of the pot to obtain air through the porous clay. I do not believe that I have ever read any reports of porosity tests with amaryllis, or any other flower, for that matter, but I do believe some reliable worker, with more space than I have available, should make tests to determine the value of porosity on amaryllis. The results may also have a bearing on the blooming and the fertilizing program.

Much of my young life was spent in a greenhouse, as my father was a florist. I learned to grow many flowers in a greenhouse, but none in a home. My father's first love was amaryllis, and I have inherited that love from him. When I left the greenhouse, the one thing I wanted to grow in my home was amaryllis, but growing flowers in a home is not like growing flowers in a greenhouse. I had heard many complaints of buyers who couldn't get their amaryllis to grow as we did in the greenhouse. I set out to determine what the problems were when growing amaryllis are grown in a home, so I planted many of

the best bulbs available, that could be handled at home, (My wife still thinks I have too many, except when they're blooming,) and I have been raising too many ever since.

I found out that most people who grew amaryllis in the home did not pay attention to the exacting instructions given them with the bulbs. Every word written on the instruction sheet is important, or the space would not have been used to print it, and every little instruction disregarded has a bearing on the vigor with which amaryllis grow.

When my father was in business we used to ship amaryllis to Detroit, Michigan. All shipping was done while they were in bud, as amaryllis blooms bruise easily. Nowadays I never ship amaryllis as cut flowers in this city or any other. They were used in baskets, sprays and other funeral arrangements as well as pot plants. I mention this because the present is another time in which experimentation should be carried out by the commercial grower and florist on the shipping and use of amaryllis as cut flowers.

One more thought about amaryllis. NEVER call them lilies. My father would have reprimanded anyone who did so, and so will I. But you must try raising amaryllis in your home. AMARYLLIS ARE FUN.

THE SANTA CATARINA ISLAND CRINUM MOOREI

L. S. HANNIBAL, *Fair Oaks, Calif.*

Several years ago Robert Goedert imported a number of *Crinum* from Santa Catarina Island off the coast of southern Brazil (City of Florianopolis, Ilha de Santa Catarina, State of Santa Catarina). To date five different bulbs have been released by number. Two turned out to be *powellii* hybrid types, one a *C. americanum* or *strictum* and the final #24 a *C. moorei* variation. Normally we would pass up reporting these plants but Claude W. Davis has found the Santa Catarina Island bulb better adapted to Gulf Coast conditions than the *moorei* forms normally in circulation. The blossoms have heavier substance and the root system is extremely vigorous. Previous to opening the blossoms have a faint odor of green walnut husk, and the seeds have longer radicles than a typical *moorei*. Otherwise there is no way to distinguish between the type and #24.

The writer was inclined to accept it as a new South African or South American form until he flowered a Drysdale hybrid between *C. x powellii album* and *C. moorei*. The similarity in flower substance and other habits now suggests that the Santa Catarina Island bulb is a F-2 or similar hybrid obtained by a *C. x powellii album* crossing on a *C. moorei*, a cross that could have occurred naturally under the humid conditions at Santa Catarina. The fact that other hybrids including two *powellii* turned up from this area may substantiate the conclusion.

Santa Catarina Island was a popular supply base during the days of the Clipper Ships and practically everyone passing around the Horn

would stop there coming or going. Similarly, ships in the slave trade between Africa and Brazil often made this a port of call, so we still have the possibility of an African import, despite the fact that some wealthy estate owner may have imported a collection of *Crinum*s from a Florida grower. It is hoped that the seedlings will disclose whether the plant is a hybrid. In the meanwhile it is a welcome addition to southern gardens where the common *moorei* flowers so poorly.

PLANT LIFE LIBRARY—continued from page 70.

FLOWERS FOR THE KING: THE EXPEDITION OF RUIZ AND PAVON AND THE FLORA OF PERU, by A. R. Steele. Duke University Press, Durham, N. C. 1964. Pp. 378. Illus. \$10.00. The first nine chapters of this interesting book are devoted to a brief sketch tracing the development of interest in plant science, including lineagics, in Spain during the 18th century, and to the telling of the story of the South American plant exploration trips of Ruiz and Pavon, and their French collaborator, Dombey. The remaining seven chapters deal with the until now unexplored subject of the partial publication of the projected "Flora of Peru". It was intended that this series should include the results of the South American expedition of Ruiz, Pavon and Dombey. However, due to the all too human behavior of Ruiz and Pavon and their contemporaries in Spain, France and England, only part of the results were published. It is a story that all interested in plant science must read as an object lesson, and Dr. Steele is to be congratulated on this important contribution to the history of lineagics. Most highly recommended.

OVERTURES TO BIOLOGY: THE SPECULATIONS OF THE 18th CENTURY NATURALISTS, by P. C. Ritterbush. Yale University Press, New Haven, Conn. 1964. Pp. 287. Illus. \$7.50. The author explores the ideas of the 18th century naturalists on the basis of two beliefs: (1) that "electricity was the most important agent in the economy of nature, sustaining life and perhaps its principal physical cause", and (2) that plants were analogous to animals because of their close proximity in the scheme of nature". He explains the long delay in establishing *empirical* and experimental procedures as due mainly to such *deductive* reasoning. The author indicates that the empirical approach was first exhibited to a minimal degree by John Hunter (1728—1795), and some others. This contribution to the history of biology is required reading for all biologists.

CATALOGUE OF THE LIBRARY OF THE BRITISH MUSEUM (NATURAL HISTORY). London. Vols. 1—5 (1903—1915); Supplements, Vols. 6—8 (1922—1940). Facsimile Reprints. Verlag J. Cramer, Weinheim, Bergster., Germany. 1964. Price DM 672. At the British Museum (Natural History) there is maintained one of the great and most complete collections of books, including periodicals, manuscripts, maps and drawings pertaining to Natural History—Botany (plant science), zoology (animal science), geology and mineralogy. This reprint edition now makes this important author catalogue available to the many all over the world who cannot consult it personally in London. The Catalogue is especially valuable to students of natural history, and to bibliographers generally. Highly recommended.

HOLIDAY FLOWER ARRANGEMENTS REVISED, by Emma H. Cyphers. Hearstside Press, 381 Park Av., S., New York, N. Y. 10016. 1965. Pp. 129. Illus. \$4.95. This revised edition of a well-known book on flower arrangements will be welcomed by homemakers. The subject matter is arranged by holidays—Thanksgiving, Christmas, Easter, etc.; and other occasions—as in the first edition. Highly recommended.

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1965 MEXICAN EXPLORATION TRIP

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As in previous years, the writer again invaded the interior of Mexico in search for new and rare bulb material. The first half of the trip was a repetition of the trip made in 1964, from San Antonio, Texas, to Mazatlan, Sinaloa, via Monterey and the city of Durango. My companion was again Chris Abee, a student, and we chose mid- to late July in order to pick up some of the later flowering plants. This proved to be a wise decision; it allowed us to find things in flower and in leaf that we might have missed had we been two weeks earlier. After leaving Mazatlan, we drove southward to Tepic and then turned eastward to Guadalajara, as before, but then we entered new territory (for us) when we made a loop southward to Manzanillo on the Pacific coast and returned to Guadalajara by way of Colima. From Guadalajara we drove northeastward to Leon, Guanajuato, and then turned southward again to Morelia, Michoacan, and then eastward to Toluca. From there we drove south to Taxco and Iguala before turning homeward by way of the Pan American Highway. The trip took ten days and covered more than 4000 miles. Except for one inevitable blown-out tire, we experienced no mechanical problems and everything went very smoothly.

We left Saturday afternoon of July 10, 1965, arriving at Laredo in time for supper and the usual customs inspection. By driving all night while still fresh, we were able to cover the many monotonous miles of the Coahuilan desert without boredom. Early morning found us in the state of Durango, nearing Durango City, where we would eat breakfast. This was fine for us, since it is here that bulbous plants begin to get more interesting. Unlike the previous July trip of 1964, the country was very dry with only evidence of widely scattered rainfall, and stockmen of the area were complaining of possibilities of drought if the rains did not come soon. Thus we missed seeing the *Hymenocallis* species that we had found in flower a few miles east of the city of Durango the year before. The lateness of the rains had kept them from coming up. No doubt that they were getting impatient at that late date. It really did not matter though, as my own collection of the previous year had grown well under cultivation, so there was no need to collect more. After breakfast we continued westward and found it still dry and looking more like autumn than midsummer. We were lucky in finding a little violet-blue *Nemastylis* species in flower and stopped to dig a few. These resembled *N. tenuis* of northern Mexico, but the latter is a late afternoon bloomer, and these were clearly morning bloomers. A few miles westward we stopped to search for the golden yellow *Tigridia dugesii*. Though we returned to the same spot in which we had found them flowering in abundance the year before, we con-

sidered ourselves lucky to find a tiny number after much peering on hands and knees. None were in bloom and it was obvious that the drought had inhibited growth. We found a few other odds and ends here—a small lavender *Oxalis*, a glaucous-leaved *Bravoa* species in bud, a small pink stoloniferous *Allium*, some scattered *Milla biflora*, a small yellow *Anthericum*, and a quaint little *Tradescantia* with grassy leaves and tuberous roots. A bit later we stopped at a spot where we had found a colony of *Sprekelia* in flower the year before, along with a species of *Manfreda*. Not a leaf of *Sprekelia* was to be seen. A few *Manfreda* were peeping above ground.

It is painfully clear that the presence or absence of seasonal rainfall can determine the success of any plant collecting field trip. Fortunately a few more miles and hours of driving brought us into greener, wetter, cooler country. There we found *Tigridia violacea* once more, flowering abundantly in low wet places at 7000 feet elevation. The dainty spotted flowers may be almost white with faint mauve-blue spots, but most of them are darker mauve-blue with heavy "freckles". Unlike the *Tigridia pavonia* hybrids of our gardens, the outer segments of this little *Tigridia* are spotted as well as the "cup" formed by the interior smaller segments. I collected these again, as experience taught me that they withstand drying out poorly after digging, and losses are apt to be high if not kept damp and replanted as soon as possible.

Maybe we brought luck to the state of Durango, or at least rain, for the entire afternoon was spent driving in a series of various forms of moisture—fog, drizzle, sudden showers, sleet, and even hail. Certainly this high mountainous country had all the outward appearance of a bleak wintry day—in July! I was pretty certain that there would be no more collecting for that day, and it gave us a good excuse to make fast driving time through this country, just as it had the previous year. I understand that in winter one may run into sudden snow storms in these mountains. Indeed, we passed through an area that had just had a sleet storm, and the ground was so completely covered with sleet as to give the appearance of snow.

Later in the afternoon we began the gradual, but dizzying descent to slightly lower mountainous country as we entered into the state of Sinaloa, and ultimately the coastal City of Mazatlan, where we would spend the first night's rest. I had now been without sleep for about 33 hours, and had been driving for about 24 hours. Surprisingly, I was not tired yet, but one does begin to look forward to a hot bath and a good night's rest! At Kilometer 1186 we stopped long enough to collect a *Hymenocallis* species akin to *H. speciosa*, with several petioled leaves and a smallish bulb. This one we had collected last year in flower, but now these had mainly completed flowering and were in fruit. The identity of this one is still a mystery and it may turn out to be a new species. Growing with it was a bulb-irid of the *Tigridia* group, but they were not yet in flower so identification was not possible. We dug a few anyway. In the same area we found some beautifully colored giant *Echeverias* with light green leaves heavily flushed with red. I usually

pass up succulents, but these were too choice to ignore. They are the largest species of *Echeveria* that I have encountered.

Dropping still lower in elevation into somewhat dryer country I found yet another species of *Hymenocallis* in leaf that I had overlooked the previous year. These were not yet in flower, but the broad glaucous leaves suggested a relationship to *H. choretis* and its allies. The finding of this type of *Hymenocallis* in this part of Mexico only served to puzzle me even more than I already had been. This now brought to a total of at least five different kinds of *Hymenocallis* to be found in the Durango-Sinaloa-Nayarit country and only seems to compound the problem of classifying them, rather than simplifying the matter. One wonders how many more species may be growing in adjacent country where there are no highways, waiting to be discovered?

The night in Mazatlan was pleasant and we had a delicious gourmet supper followed by much needed rest. Last year our trip southward through Sinaloa was dull because the country had not yet received any rains. This time the rains had been early and abundant and the country was cloaked in deep green with all kinds of roadside flowers in bloom. We found a *Hymenocallis* of the *horsmanii-repanda* group with linear glaucous leaves growing along mile after mile of roadside in low places. *Bessera* was growing in fair abundance in scattered colonies, but these were not yet in flower and we could not determine if they were the red kind or the violet forms. Not wishing to pass up any chances we collected them along with an unusually pretty dwarf *Oxalis* with large flowers in white or lavender. The three clover-like leaflets were unmarked and commonplace, but the flowers were larger than most and showier. We also found a plant that looked like a relative of *Bravoa*, but it was not yet in flower so we could not tell. Flowering along the roadside in low places was a little bulb irid akin to *Tigridia* in all shades of blue, purple, and white. Unlike *Tigridia*, these irids had the three larger segments curled upward and inward, as were the three smaller segments, suggesting a crumpled, globular effect. These little irids seemingly grew by the millions in Sinaloa and into the state of Nayarit. To be sure, we made it a point to collect these in all the various colors as they were quite showy.

Approaching Tepic, Nayarit, I spotted my first *Bessera elegans* in full flower. I could not hide my excitement when I discovered that in addition to the usual scarlet form, there were some beautiful carmine red kinds tinged with purplish-blue. I knew of these but this was my first experience at seeing them in full flower. Though of a darker coloring, they were every bit as showy and attractive as the coral-red forms. As they grew together, it was apparent that the carmine-red form was only a variation of the commoner coral-red *Bessera elegans* of our gardens. We also found a large colony of the lovely white *Tigridia passiflora* in flower and dug these also. Experience has shown that nearly every *Tigridia* species is worthy of superlatives when describing their fantastic form and beauty, but this one should rate near the top. The ivory white flowers are heavily spotted with gold, orange, brown,

and purple. Larger than most of the miniature Tigridias, they can hold their own in any garden. We dug a sizeable number of these, but as luck would have it, the bulbs did not dry out enough and nearly all were lost by a fungus which grew on them and destroyed most of them. I was only able to salvage a few at journey's end. The same fate was awaited my collection of carmine *Bessera*.

After eating a late lunch in Tepic, we drove eastward toward Guadalajara, hoping to make it by dark. But our collecting fortunes were not over. A few miles east of Tepic we again found *Bessera* in profusion. The scarlet ones were obviously the dominant form, but scattered here and there were the lovely carmine forms in fair numbers, but best of all, I finally found my first of the violet forms. Perhaps the word "violet" is too pat. Actually they might be called violet-pink, and violet-blue. Some were obviously more pink or rose than anything else, with just a touch of violet or blue. Others were deeper rosy-purple strongly tipped with prussian blue as seen in *Lycoris sprengeri*, and some *L. squamigera*. Except for this peculiar coloring, they were similar in form to the other *Bessera*. For awhile it looked as if they were too rare for us to find any quantity, but suddenly we spotted a little colony on a small hill along the road in which the lavender-pink forms predominated, with only a few scatterings of the carmine and scarlet forms. At long last we could dig them in quantity. It is my belief that these *Bessera* will prove a welcome addition to this little group and should become as popular as the coral-red forms.

Towards evening we made our last collection for this, our second day, a beautiful terrestrial orchid of the genus *Stenorynchus*. The tall hyacinth-like spike is of a lovely shade of soft rose-pink with salmon overtones. The flower stem usually precedes the foliage, which soon follows in a rosette of broad ground-hugging habit. As the thick roots are of tuberous habit, they can be handled like bulb plants, though the brittle roots should be treated gently.

The hour grew late and it was quickly darkening. We decided not to drive on to Guadalajara but instead stay in the little town of Ixtlan del Rio, in Eastern Nayarit. This proved to be a good idea, as we found a brand new little hotel, clean and modern in every way, and very inexpensive. The beds and mattresses were new, the plumbing was new, and they had hot water! What more could one wish for? Since we always make these trips with the idea that we are plant collecting and not vacationing as leisurely tourists, we generally stay in second and third class hotels to pinch pennies. Sometimes they are surprisingly good, and sometimes they are pretty grim, with hard pillows, sagging beds, perpetually cold water, and faulty plumbing fixtures. Thankfully this little hotel gave us the best at the same low price. We were pleased. Alas, the town did not have any really decent restaurant to match the hotel, since this is not a tourist town, and we had to eat the familiar hot enchiladas stuffed with chicken and green chilis. Having little else to do, we strolled about the town to see if there was anything of interest. A small town, not catering to tourists, Ixtlan del Rio is very quiet, but

we did find a small Fair in a residential area close to town. The only thing that seemed of interest was the Ferris Wheel. They must have thought that we were a couple of crazy tourists when we got on the thing for a spin. At least the view from the top was good!

The next morning we were at it again, digging up Mexico's roadsides. Our first stop found us examining *Hymenocallis* in bloom. These were the same as we had seen all day long the previous day. Some pretty white *Anthericum*s, and some bulb irids in leaf grew with them. But what caught my eye was an odd little member of the spiderwort family that reminded me of "Widow's Tear" native to Texas. Unlike the deep blue "Widow's Tears", these were of an odd shade of coppery-tan color, and all three segments were of equal size and color. It looked as if it might prove a weed, but I collected it anyway. A species of *Tradescantia* grew alongside their copper-tan "cousins", and these flowered from a hyacinth-like spike. They impressed me as being the showiest of the "spider-worts" that I had seen.

Near the Nayarit-Jalisco state line we once again stopped to collect a few bulbs of an *Oxalis* species with huge 3-parted leaves, faintly banded with reddish brown and lightly pubescent over the entire surface. This species is easily the showiest and largest of the Mexican *Oxalis* that I have seen. The bulbs were unusually deep seated, making the digging difficult. The predominate color was deep purplish-rose but a few tended toward dark purple shades and others approached red. Casually it resembled the familiar *Oxalis Bowiei* (a frequently cultivated cousin from Africa) in size, coloring, and general appearance.

We stopped a few miles more down the road, after entering the state of Jalisco to dig some fine specimens of *Bessera elegans* flowering in company of *Milla biflora*. In the brilliant morning sunshine these *Bessera* were vividly scarlet, almost approaching orange in appearance.

We lunched in Guadalajara, but decided not to tarry as we still had a long trip ahead of us if we hoped to reach the Pacific coastal town of Manzanillo, in the state of Colima, by dark. The highway from Guadalajara to Manzanillo had only recently been paved and it now offered an opportunity to explore new areas for plants.

A few miles out of Guadalajara we stopped to collect *Oxalis tetraphylla*, a pretty little miniature with vivid rose-red flowers and many leaflets. A pretty violet-blue *Nemastylis* was just beginning to open in the early afternoon sun, and it appeared to be a form of *N. tenuis*. Apparently this dainty little bulb irid is fairly widespread over much of central and northern Mexico. *Milla biflora* was common here too, and we dug some especially fine forms with very broad segments. There were *Bessera* scattered about too, and these were a dazzling red-orange, the brightest in these shades we had yet seen. We found a few of the odd *Tigridia meleagris* scattered here and there, with their strange pendant bell-shaped blooms in plum and gold resembling the Fritillarias of northern gardens. We did not dig many, as the bulbs were very deeply entrenched in the hard black earth. Here too grew

Calochortus, but these things though widely distributed, are never common.

Near San Cayetano I spotted *Hymenocallis* flowering in open grassy fields in very low wet places. We had some difficulty digging them out of the muck, and the soil had a sulphur-stench to it. So water logged was the ground that in certain spots the earth shifted and trembled under our footsteps, giving the same sensation of standing upright and attempting to walk in a small boat. The *Hymenocallis* were of the evergreen tropical type, with long swordlike leaves and pretty but undistinguished flowers of typical *Hymenocallis* form. The species was a new one to me, and though nice enough, it was not unusual enough to get excited about. A little later I did find something to get excited about though, when I spotted a large colony of *Bravoa geminiflora* in full bloom on a mountain curve. This was a fine compact growing form with orange-coral tubular bloom hanging loosely in pairs along the slender stem. The rosettes of narrow dark green leaves were prettily spotted with reddish purple at their bases. This being the largest colony I had yet seen, I was able to dig a nice supply of this little known relative of the cultivated tuberose.

At kilometer 1021, in southern Jalisco, I found in leaf what appeared to be a *Milla* of some sort. As none showed any evidence of flowering, I assumed that perhaps it belonged to that group of various *Milla* species that flower in the fall. I was able to flower one of these later on in my garden in September, but found it to be disappointingly similar to *Milla biflora*. Indeed I could see no differences at all, other than that it flowered later and the foliage was stiffly more upright. Only further study will solve this riddle. In this same spot we found a dwarf *Anthericum* species with tiny reflexed white flowers, opening in late afternoon. There were a few scattered Sprekelias with narrow glaucous leaves, but not in bloom, along with a bizarre member of the *Tradescantia* group with two broadly oval leaves hugging the ground.

Late in the afternoon we spotted some brilliant purple flowers on a mountainside and stopped to investigate. These proved to be a species of terrestrial orchid, perhaps *Bletia*, with tall spikes of large showy blooms. What appeared to be either a new *Bravoa* species, or a distinct form of *B. geminiflora* grew here too. These were not yet in flower, but the buds were showing enough color to indicate that they would likely be some shade of red. The foliage was unusually wide and flat, unspotted, and of a shiny light green color. These have done well under cultivation and it is hoped that they can be flowered in 1966 for comparison with the usual form of *B. geminiflora*. What appeared to be *Tigridia meleagris* were also in the bud stage, but these were difficult to dig because of growing so deeply. Bravoas, on the other hand, never grow deeply, but are just under the soil surface, making their digging a simple matter. Indeed, Bravoas resent being planted even so much as two inches deep and will immediately attempt to form a new bulb above the original one, just beneath the surface of the soil. In cultivation I have found that they like a rich well drained soil and plenty of moisture

while growing. They seem to resent alkalinity, deep planting, and dryness.

The sun was beginning to set when we made our final stop in the mountains, to check out *Hymenocallis* in flower. These had broad glaucous foliage and were very close to *H. choretis* and its allies. The flowers were large, but had a rather small staminal cup. I dug these along with some species of *Manfreda* and *Tigridia*, neither of which were in flower, though a few *Bessera* were. We had no road markers to tell us our location, but we knew we were still in the mountains of southern Jalisco, perhaps an hour or so from the coast. By the time we reached the little coastal village of Barro de Navidad, we were tired, so we decided to stay there for the night rather than drive on to Manzanillo which was still about 40 miles down the coastal highway. We had never heard of this little town, but it was a beautiful out-of-the-way place that adventurous tourists dream of—a place to get away from other tourists. We gorged ourselves on local lobster before retiring to our hotel. Perhaps it was the lobster, perhaps it was something else, but Chris awoke in the middle of the night with nausea and abdominal cramps. Those lobsters did not stay down long and old chief Moctezuma had once more taken this revenge on another gringo tourist! I had plenty of various pills for the occasion but in order for them to work, one must be able to retain them long enough in one's stomach, in order for them to be absorbed and go to work. Chris's stomach and old Moctezuma were not about to allow this to happen. I spent the rest of the night listening to Chris's pathetic groans, desperately trying to get some sleep. I don't know how many times Chris had to get up during that night. I was glad to see the sun come up and left Chris, more dead than alive in restless sleep, in order to take a brisk morning walk to get waked up. I walked along the beach and it was beautiful—certainly every bit as pretty as Acapulco. I returned to the hotel room and with great effort managed to get Chris to his feet and into the car. I then began the long work of trying to salvage this hulk that remained of the "Spanish quick step" with the drugs at hand. First some tablets to control nausea, then a crossing of the fingers. They threatened to return but did not. Good! Then some antibiotics, followed by paregoric. Everything stayed down. Good! From then on it was a combination of paregoric, Kao-pectate, and antibiotics for the greater part of the day. Chris was feverish, and did not know what went on most of that day, sleeping the hours away. Old Moctezuma made a stab at me too, but like always, I had a relatively light discomfort, with an annoying belly ache which I managed to keep soothed with paregoric. I suppose some people develop immunities to these things in time.

I stopped at Manzanillo to eat breakfast, leaving Chris in the car asleep. Then I drove on to Colima on highway 110. This would complete the "loop" from Guadalajara to the coast and back. While driving in the mountains once again, a flash of yellow caught my eye and I stopped to investigate. It proved to be one of the real "finds"

of the trip, a large flowered lemon-yellow irid allied to *Tigridia*. I have yet to get any kind of identification, but it seems to me to be a species of *Sphenostigma*, as the form is similar to the little white flowered *S. conzatti* that I found in the mountains of Oaxaca the year before. This yellow irid is unusually showy, as the color is one of those shades of yellow that fairly glows and the large flowers are nearly four inches broad! There are three long spreading segments and three smaller inner segments, all opening out flat, without any suggestion of a "cup" or hint of spotting. The foliage is in the tradition of *Tigridia pavonia*, being wide and pleated.

While digging these pretty yellow Irids I chanced to notice what appeared to be a robust sort of *Zephyranthes*. I dug a few bulbs and noted that several were ripening seed. Bulbs were typically of *Zephyranthes* size, and the seed pods were atop rather long pedicels. It suddenly dawned on me that these were not *Zephyranthes* at all, but a miniature *Sprekelia*. I had dug a few similar ones the evening before while collecting the fall blooming *Milla* species. As these too had glaucous leaves, I wondered if they might not be the same as the tiny *Sprekelia* species that I had collected in the mountains of Southern Puebla several years ago. Only time and more study will tell.

Just before reaching the city of Colima, I noticed a field of *Zephyranthes* in bloom and stopped. These turned out to be the only *Zephyranthes* that I found in bloom the entire trip and were familiar ones at that. I have collected this same species in Nayarit and Jalisco in other years. The majority of these were pink or white, but a few were deep rose-pink, almost rose-red in some individuals. There was a good deal of variation in form and size and I leisurely picked among them for the better forms. A little *Hymenocallis* growing with them caught my eye. One of the few true miniatures of the genus, I was impressed with the very narrow compact foliage of dark shiny green that lay close to the ground. A few were in flower or fruit and all scapes were either 1-2 flowered. The little bulbs were slightly more than an inch in diameter. Among the Mexican *Hymenocallis*, that I have seen, only *H. graminifolia* is as small, but it has prettier flowers than this Colima midget.

A little species of *Milla* grew here too in wet places and foliage was chive-like. None were showing any signs of flowering, so I assumed it must be another of the late blooming sorts. Judging from the density of the clumps and thickness of the colonies I judged it must seed freely and grow rampantly where conditions were wet enough for it. The corms were small as Millas go, and the chive-like leaves were glossy green and slightly flattened on one side. This is one species that will be closely watched until it flowers to find out just what it may be. It is such a weedy looking little thing that I can't see how a mousey plant can turn out to be very much! Maybe it is because it brought back old memories of collecting *Allium canadense* in Texas years ago. What a weed pest that one turned out to be! Never-the-less, I dug a goodly number of these *Milla* and crossed my fingers.

At mid-afternoon I spotted some purple *Tigridia* in flower along the roadside and stopped. Chris was still "out" cold. Indeed he even

slept through a rough hail storm that I had driven through in the mountains an hour earlier! I dug these *Tigridias* and a few plants that looked as if they might be akin to *Bravoa*, but these were not in bloom. The *Tigridias* were quite pretty, with large violet segments banded with yellow at the point where the "cup" is formed. The three inner segments were darker purple and the cup was spotted purple. This plant was quite similar to another *Tigridia* found in Michoacan, but the lighter coloring, yellow banding, and overall refinement made it seem more appealing.

My final collection for that afternoon was made east of Jiquilpan, in a pine tree forest where grew another *Tigridia*. This one was in leaf only, but it was the only species of the group that I found growing in such heavy shade. About this time Chris woke up and it was obvious that he suddenly felt much better. He had been sleeping the entire day and was now obviously rested. Except for his nearly lifeless body reminding me of his presence, I might just as well have been traveling alone that day. It was nice to see that his illness had run its course and have him back among the living. This is not my first experience at having a traveling companion succumb to the Aztec curse in Mexico, so I am pretty well familiar with all its miseries. It is one of those things that every tenderfoot may as well expect and it is next to impossible to avoid. Generally an attack or two makes one immune. The main thing is to assure the victims that they will not die, even though they may wish to. It is one of those things that travelers joke about but it is not funny to the poor victim.

We spent a pleasant evening at Chapala, a lovely tourist resort on the banks of Lake Chapala. We were both famished and ate supper twice. We departed the following morning, passing through Guadalajara without stopping, as we anticipated a pretty busy day ahead of us. A few miles north of Tepatitlan I stopped to investigate a large field of a pretty yellow flowered tuberous rooted *Sisyrinchium*. These little irids are found over much of Mexico, but this was the largest colony I had yet seen. I dug a few of these and then noted a splash of purple nearby. A check showed it to be a colony of *Nemastylis* that was not familiar to me. These were of a rich purple color and of a nice form and size and growing from unusually small bulbs, being little larger than peas. Though close to *N. tenuis*, this little jewel was, if anything, even prettier, being more brightly colored and flowering early in the morning. *N. tenuis* does not open until warmed by the afternoon sun. After digging enough bulbs, I stopped to take color photographs of this remarkable island of *Nemastylis* within a sea of *Sisyrinchium*. It was a sight to behold, but a short lived one as the *Sisyrinchiums* were beginning to close. By the time we got back into the car all *Sisyrinchiums* had closed and they had seemingly vanished into the grassy landscape!

We did not collect any more bulbs that morning as we did not see anything that we did not already have. I was surprised to find a few *Bessera elegans* flowering along the roadside in chalky soil near San

Juan de los Lagos. I did not expect these things so far north in this part of the central Mexican plateau country. We ate lunch in Lagos de Moreno and then turned southward once again towards Leon, Guanajuato, where Mr. and Mrs. Clint had once told me of finding a pinkish-white *Bravoa* species among other things. As it turned out we did not have to travel that far to find them as they grew in fair numbers just outside of Lagos de Moreno. This was one of the plants that I had placed on my "must find" list when I planned this trip. At first glance it closely resembles the tuberose of our gardens (*Polianthes tuberosa*) and is obviously related to it. The flowers of these may be creamy-white, or white flushed with pink, or even light pink in some cases. Though quite fragrant, its scent is very different from *Polianthes tuberosa*, and the flowers are smaller. A thoroughly delightful plant, this little *Bravoa* (or *Polianthes?*) species deserves to be cultivated. We passed a man walking along the roadside with a knapsack over his shoulder in what must have been an armload of these *Bravoas* picked to be sold in the markets for cut flowers. It made me realize that this species may become rare indeed before long. All of Mexico is now being crisscrossed with the familiar barbed wire fences. Since livestock will no longer be allowed to roam and graze at will, overgrazing within fenced in lands will be inevitable and many rare plants will disappear. This leaves them clinging to the roadside right of way where they will make their last stand. The constant raids on the remaining *Bravoas* for cut flowers will allow few to ripen seed. The result of all this is easy to predict. Their problem is that they are being loved to death. Cattle love them and the natives love them, and this kind of loving is not good for the future of this species!

While digging these *Bravoas* I noted the many other bulbous odds and ends that the Clints had mentioned. We dug merrily like a pair of gophers. There was an unusually pretty *Anthericum* with low foliage and large showy glistening white blooms. Certainly this was as fine as any *Anthericum* I had ever seen. There were bright rose-red *Oxalis tetraphylla* that fairly glowed like rubies, so brilliant were they. Another *Oxalis* species grew there too, but this one had lavender blooms and slightly different foliage, though both species had those many extra leaflets that distinguished them from kinds with clover-like leaves. There were *Nemastylis* there too, likely *N. tenuis*, though we did not see flowers. A pretty yellow flowered *Cyclobothra* (*Calochortus*) grew with these other things. I had a field day and collected a bit of everything in sight.

It was a long trip down to Morelia, Michoacan, but we saw little else of botanical interest to delay us and we arrived at dusk. We spent the night in Morelia and left the following morning after breakfast. A few miles east of the city we stopped to climb a mountain that we had climbed the year before. On this mountain grew *Bravoa geminiflora*, *Zephyranthes*, *Milla biflora*, *Sprekelia*, a small white flowered *Oxalis*, and a dainty little tuberous rooted *Tradescantia*. For reasons hard to explain, we decided to climb to the top of this mountain. This we did and the view was magnificent! We also had the satisfaction of ac-

complishment which I guess is the motivation of mountain climbers. We rested long enough to admire a hawk of the genus *Buteo* soaring in leisurely circles below us and noted that only at an elevation such as this mountain top might one look down at flying birds.

Back on the road again, we drove through the rugged Michoacan mountains known as "Mil Cumbres" and it was a relief later to find some straight stretches of plateau country. At kilometer 221 we stopped to collect a purple *Tigridia* that grew in great abundance in mucky soil. Later in the afternoon, at kilometer 185, near Zitacuaro we stopped to collect from a thick colony of *Tigridia meleagrís*. This species, with its pendent bells, has proved to be one of the easier ones under cultivation. Though not showy, the flowers are none-the-less very beautiful when seen at close range. Flower color is quite variable, but one form is yellow heavily spotted with plum purple on the exterior. The interior is white, spotted with purple and banded with ivory "glands" that reflect light like tiny sequins. It is one of those flowers that one is tempted to tear apart in order to fully appreciate. Growing with this *Tigridia* was that same mousey little *Milla* that weedyly grows in ditches and other damp low spots that I first collected in Colima. These were not in flower either.

We arrived at Toluca, in the state of Mexico, at mid-afternoon and from there turned southward on highway 55 toward the state of Guerro, and Taxco, where we would spend the night. Nearing Taxco in the early evening, we stopped to collect *Milla magnífica* growing in great abundance in a rocky outcropping. This relatively new species has proved to be very amenable to cultivation and should become popular in time. I was anxious to get a hundred or so corms in order to build up a supply for introduction of this fine species. A flowering sized corm usually produces three hollow leaves resembling those of an onion, but often growing three to four feet in length. The scape may have 20-30 fragrant white flowers striped with green on the reverse. These seem to belong to a group of Millas which flower at their best after dark. We dug a few *Sprekelia* bulbs which grew alongside the Millas.

We spent the night in Taxco, and after doing a bit of shopping the following morning, we hit the road again towards Iguala and what would be the end of our field trip before turning homeward. A few miles south of Taxco we stopped to collect a few *Nemastylis* in leaf. I had collected some pretty white-flowered *Nemastylis* in this area the year before and I hoped that perhaps these too would turn out to be white ones. Most *Nemastylis* run to shades of blue, violet, or purple, so white ones make a welcome change. There is a beautiful yellow species that grows around Chilpancingo, also in the state of Guerro, but we did not go that far on this trip. I have a few of these yellow ones in cultivation and, like all *Nemastylis*, they seem to do very well under cultivation.

We drove south of Iguala about 30 miles to the southernmost point of our trip, where we hoped to recollect an unusual member of the *Milla* clan which we had found in flower the year before. There is a

good possibility that this odd plant may turn out to be the long-lost *Diphalangium graminifolium*. The little white flowers grow in an *Allium*-like umbel and the segments recurve in the manner of *Cyclamen*. They seem to do well in cultivation, but they skipped blooming the first season after being collected. Indeed I find that nearly all members of the *Millinae* group will not flower the year following their collection while in active growth, but after that they bloom regularly. We found our plants easily enough and then turned homeward. With but a few exceptions, we now had nearly all the plants that we sought.

By late afternoon we were in Cuernavaca, and we made a brief detour towards Yautepec and Cuautla to recollect a tiny little *Milla* species that is closely allied to *M. biflora*. This one is undoubtedly a new species, and has characteristics that easily differentiate it from *M. biflora*, such as flowers with distinct pedicles, and numerous thread like leaves.

We stopped in Mexico City long enough to eat supper before driving on to Zimapan, on the Pan American highway, where we spent the night. The next morning we paused at Jacala to collect *Allium glandulosum*, a pretty wine colored stoloniferous species that flowers in the fall. We also dug a white-flowered *Zephyranthes* that grows just south of the city and these turned out to be our final excavations for that trip in Mexico. We then drove on to Laredo where our bulbs went through the usual inspection and fumigation ceremonies. Arriving home in San Antonio, I had the back breaking job of getting these plants back into the ground so that some of them could complete their growing cycle. Some of these resumed growing and a few things even flowered. Many will not flower until next year, while others will fail to appear at all. Nearly all survivors will be fully mature and should flower well in 1967. To be sure, not all collected plants survive the shock of being dug before they complete their growth cycle. Some will succumb to fumigation and others will fall prey to disease and soil parasites. Some may find our soil and/or our climate not to their liking and will gradually waste away. But the majority will adjust to cultivation and prove themselves worthy of all the effort spent in securing and pampering them. This then will be reward enough.

NECTARIES IN ALSTROEMERIA PULCHELLA

HAMILTON P. TRAUB

Dichogamy in *Alstroemeria pulchra*, *A. haemantha*, and *A. pulchella* was reported by Traub in *Herbertia* 10:131—132. fig. 103. 1943. At that time no attempt was made to consider also the role of insects and/or humming birds in any mechanisms for cross-pollination.

The late E. O. Orpet had earlier crossed *Alstroemeria violacea* and *A. pelegrina alba*, and had obtained a fine hybrid which was named in honor of his wife, *Alstroemeria x orpetiae*. This is an outstanding purple-flowering hybrid, with large, wide-open flowers and is an excellent garden subject. In the second generation, some very beautiful white-flowering segregates appear in the Mendelian ratio of about 3 purple to 1 white, if a large number of seedlings are grown.

In the course of attempts in 1965 to cross *Alstroemeria pulchella* ♀ with *A. x orpetiae* ♂, the presence of nectaries was noted in the first named species but not in the latter.

As soon as the flowers of *Alstroemeria pulchella* open, the presence of copious nectar is noted. In each flower, the two upper petsegs (4.5 cm. long) only are in part functional as nectaries. The basal portions of the two petsegs are flattened, with sides in each one infolded and fused into a nectary with an opening at 1.7 cm. from the base. At this opening a relatively copious globule of clear sweet-tasting nectar is exuded. *A. pulchella* is a typical Brazilian species and it apparently depends on humming birds and possibly also insects for transferring pollen from one flower to another. *A. violacea* and *A. pelegrina alba*, are Chilean species and the pollinating agents are at present unknown.

THE BLACK SURINAM-CHERRY, *EUGENIA UNIFLORA*

HAMILTON P. TRAUB

The usual red-fruited form of the Surinam-Cherry, *Eugenia uniflora* L., has long been grown in Florida as an ornamental shrub. However, the fruit as remembered by the present writer was not of high quality and was not relished due to a peculiar taste. Since the Second World War, a "black"-fruited form has become popular in Florida. Several years ago the writer obtained seeds of this form from Florida, and it appears to be adapted to the coastal area of San Diego County, at least it has thrived in his garden in La Jolla, where it has made a fine medium-sized hedge to replace the usual too-vigorous *Eugenia paniculata* Banks, the Australian Bush-Cherry with undesirable fruits, which soon gets out of hand, and assumes the size of forest trees. Even the smaller-sized form is not satisfactory as a hedge.

The fruit of the Surinam-Cherry is red to very deep-red black in color, and the dessert quality, especially of the black form is delicious when fully ripe. This stage of ripeness can be determined when the fruits separate from the pedicels easily, leaving the pedicels on the shrub.

The Surinam-Cherry can be easily propagated from seeds and comes into bearing in two to three years. It would be desirable to select superior clones to be propagated vegetatively, but so far the rooting of cuttings has not met with success. However, this difficulty most likely can be overcome on further study.

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ESSAYS ON CROP PLANT EVOLUTION, edited by Sir Joseph Hutchinson. Cambridge University Press, London, 1965. pp. 204. \$9.50. Since the time of Alphonse DeCandolle's classical work, "Origin of cultivated plants", published in 1882, there have been few comprehensive studies of this important group of plants. DeCandolle's work on the origin of cultivated plants was followed by a long period of dormancy until it was revived and stimulated by the studies and explorations of Vavilov and his Russian colleagues shortly after World War I. During the past twenty years a flood of information about the origin and domestication of crop plants has accumulated. Unfortunately, much of this work is scattered through the literature, and is available only to specialists.

It seems doubtful that all that is known about the evolution of crop plants could be recorded in a single volume of reasonable length. Accordingly, "Essays on crop plant evolution" does not attempt to cover the entire field of domesticated crop plants; instead, a few of man's most important and diverse crop plants are selected for discussion by competent experts. The book is edited by Sir Joseph Hutchinson, and is based upon a series of lectures delivered at Cambridge University in 1962. The initial essay by Prof. H. Godwin, "The beginnings of agriculture in North West Europe", lays the groundwork for much of what follows. Sir Joseph makes a most successful attempt to give unity to the effort with a terminal essay, "Crop plant evolution: A general discussion." Sandwiched between these contributions are essays on maize (Mangelsdorf), sorghums (Doggett), temperate zone cereals (Bell), wheat (Riley), potatoes (Dodds), and forage grasses and legumes (Cooper).

In point of time, the crops treated are as diverse as wheat, domesticated about 7000 B. C., contrasted with some of the grass and forage legumes that are just now commencing to become cultivated plants (Cooper). The coverage is not so satisfactory. It is regrettable that the book was not expanded to include an account of cotton to which Sir Joseph has made substantial contributions. Also, it is curious why rice was omitted from the discussion. Here is a crop plant which provides nearly the entire caloric intake of millions of people in the less developed countries, and its evolution has been thoroughly investigated. Given the limitations of space, however, it is doubtful if a list compiled by any two people would be identical.

Except for scope it is difficult to find fault with this well-written book. Each contributor has handled his material in comprehensive, but interesting fashion, and it would be unfair to comment favorably on one essay over the other. Nevertheless, this reviewer cannot refrain from commending the discussion of the "Evolution of Maize". Mangelsdorf has told the maize story in flawless fashion. Some new and critical data have been added from his own research along with several of Galinat's magnificent diagrams of maize morphology. Maize historians who choose to disagree with all or portions of Mangelsdorf ideas on the origin of this crop will have to come-up with some significant data to support theories other than those proposed in this essay.

Mangelsdorf presents a compelling argument to show that the tunicate gene (tu), with its system of modifiers and strong pleiotropic effects, was largely responsible for influencing the direction of maize evolution once maize became a cultivated plant. Thus indirectly all indigenous civilizations of the Americas were dependent upon a single locus of chromosome 4 for their development. In much the same way what is known as Western civilization was dependent for its development upon the diploidization of polyploid wheats. In a beautiful series of experiments Riley and his co-workers have shown that a mutation at the pairing locus of chromosome V has "imposed a diploid-like meiotic regime" upon tetraploid and hexaploid wheats. As a result, the polyploid wheats have a stable genotype, are highly fertile and immensely productive, essential requirements for a successful, cultivated seed crop.

The book has an adequate bibliography, a good index, and is relatively free of irritating typographical errors.—*Thomas W. Whitaker*

AGRICULTURAL GENETICS, by James L. Brewbaker. Prentice-Hall, Inc., Englewood Cliffs, New Jersey. 1964. pp. 156. \$4.95. The audience for which this small book of 156 pages is intended is not immediately apparent. Neither the remarks of the editors or the author's Preface are helpful in suggesting an appropriate niche for the book. Judging from its content the book could be used as an adjunct to a course in plant or animal breeding, or possibly as supplementary reading for graduate students in the agricultural sciences. To be read with understanding, however, some background in genetics and cytology, along with an elementary knowledge of statistics will surely be needed.

According to the Editors, the aim of the Foundation of Modern Genetics series is to provide a stimulating, selective account of certain areas of genetics. In compliance with this directive Brewbaker has discussed a number of aspects of genetics important in agriculture such as polygenic inheritance, genotype-environment reactions, host-parasite relationships, polyploidy, genetic lethals, breeding systems, mutation, and others. Obviously, with a great number of topics to be treated in limited space, not all could be explored in depth. Furthermore, a broad treatment of each topic would have forced the author to infringe upon the territory of his colleagues who have prepared books in this series on Gene Action, Population Genetics and Evolution, and other subjects germane to agricultural genetics.

Like most successful texts in genetics a list of problems (usually 4 or 5) terminates each chapter. Evidently for the purpose of conserving space, references are to general works rather than to original papers. This can be a source of annoyance and frustration for the inquisitive student and investigator.

To the uninitiated some of the examples used to illustrate certain phenomena are likely to be more confusing than enlightening. For instance, in discussing Stakman's classical work with physiological races of wheat rust, the data cited are for races of wheat *bunt* rather than races of *rust*. No explanation is offered for the sudden switch between rust and bunt.

The book is never dull, and is not overburdened with technical jargon. Brewbaker writes clearly and concisely, and he is adept at coining sharply worded phrases. There are several noticeable grammatical lapses and a few typographical errors. These could have been eliminated with better editing. There is an index of 4 pages; one error was detected in a sample of 10 items. The faults are mostly of a minor nature and in the opinion of this reviewer the book will achieve its objective of stimulating the thoughtful reader to take a close look at the fascinating genetic problems of modern agriculture.—*Thomas W. Whitaker.*

PLANT HYBRIDIZATION BEFORE MENDEL, by H. F. Roberts. Hafner Publishing Company, New York and London. 1965. 374 pp. \$6.75. The Hafner Publishing Company deserves the thanks of plant breeders, plant geneticists, and indeed all biologists for reprinting "Plant Hybridization Before Mendel". Originally published in 1929, the first edition has long been out of print. In the intervening years Roberts' book has become a classic for the period it covers. Plant breeders and plant geneticists with an interest in the historical development of their discipline will welcome an opportunity to consult this standard reference on hybridization prior to 1900. Except for some of the illustrations the book is neatly reproduced, fully the equivalent of the original.

Roberts lets the early hybridizers tell their own story. This system, using long quotations interspersed with narrative, can be both good and bad depending upon the skill of the investigator in describing his observations and experiments. At times it is intensely interesting, but on the whole it tends to be dull reading. This comment, however, is not intended to reflect upon the usefulness of the book as a reference source.—*Thomas W. Whitaker.*

KURZE GESCHICHTE DER GENETIK BIS ZUR WIEDERENTDECKUNG DER VERERBUNGSREGELN GREGOR MENDELS. 2 Auflage. [A short history of genetics up to the rediscovery of Gregor Mendel's laws. Second Edition.] by Hans Stubbe, Gatersleben. Veb Gustav Fischer, Verlag, Jena. 1965. Illus. The first edition of this book published in 1963 was reviewed in *Plant Life* Vol. 20 (1964).

The new edition published in 1965 is essentially identical with the first edition, except the second edition has been increased by 40 pages over the earlier edition.

The new material consists mostly of a facsimile reproduction of Mendel's famous letter to Carl von Nägeli, and the addition of the portraits of 5 distinguished investigators, the best known being William Bateson. It would have been helpful if a German printing of Mendel's letter had accompanied the facsimile reproduction. Only an expert could decipher the combination of German script and Mendel's handwriting.

Portions of some chapters have been rewritten to include new material but the original text remains largely unaltered. This book is one of the best accounts of the history of genetics up to 1900. Its usefulness and popularity would undoubtedly expand if a good English translation were available.—*Thomas W. Whitaker.*

FERTILIZATION, by C. R. Austin. Prentice-Hall, Englewood Cliffs, N. J. 07632. 1965. Pp. 145. Illus. Cloth bound, \$4.95; paperback, \$2.95. This stimulating new text dealing with general knowledge about fertilization in organisms is intended primarily for students and research workers. Chapter I is concerned with general cytology as a basic cellular background for the rest of the discussions. The other chapter headings are: significance of fertilization; form and differentiation of gametes; approximation of gametes; contact and fusion of gametes; immediate consequences of fertilization; and unusual and abnormal forms of fertilization. This excellent text is highly recommended.

PLANT PATENTS, WITH COMMON NAMES, 1964 SUPPLEMENT, 2337 THROUGH 2464. Publ. by the Amer. Assoc. of Nurserymen, 835 Southern Bldg. Washington, D. C. 20005. Pp. 7. \$0.50. This is a supplement to the listings of plant patents previously published. The subject matter is arranged under three parts: I. Numerical listings; II. Alphabetical listing under common names; and III. Alphabetical listings of names and addresses of originators or discoverers and assignees.

THE JOYS OF GERANIUMS, by Helen Van Pelt Wilson. M. Barrows & Co., 425 Park Av. S., New York, N. Y. 10016. 1965. Pp. 364. Illus. \$6.95. This is a revised and enlarged edition of the well-known book on geraniums (pelargoniums) with which the readers are already familiar. It is a guide to the species and named clones, propagation by cuttings, breeding and culture, including the control of pests and diseases. Recommended to all interested in geraniums.

IT'S YOUR COMMUNITY, by H. B. Raymore and H. S. Ortloff. M. Barrows & Co., 425 Park Av. S., New York, N. Y. 10016, 1965. Pp. 240. \$3.95. Subtitled, "A Guide to Civic Development and Beautification", the objective of this new book is to provide a background for the "maintenance of beauty and fitness in our surroundings." Among the topics covered are "call for action", urban patterns, the modern American community, traffic and parking, open spaces, street trees, roadside beautification, local planning and zoning, urban renewal, organization of projects, etc. Recommended to all interested in civic improvement.

THE FLOWER ARRANGEMENT CALENDAR, 1966, by Helen Van Pelt Wilson. M. Barrows & Co., 425 Park Av. S., New York, N. Y. 10016. 1965. Paper with plastic ring binding. Illus. \$1.50. The publisher sponsors an annual flower arrangement calendar contest. In this little book, the 20th edition, some of the outstanding photographs of floral arrangements accepted by the publisher are reproduced in calendar form for 1966. This calendar will interest those engaged in flower arranging.

NATIVE WILD PLANTS OF NORTHEASTERN UNITED STATES AND EASTERN CANADA, by F. H. Montgomery. Frederick Warne & Co., 101 5th Av., New York, N. Y. 10003. 1965. Pp. 193. Illus. \$3.95. This book is designed for those who desire an intermediate guide that provides more than casual acquaintance with the native flora. The book is profusely illustrated with line drawings and some color plates. Following the key, the wild flowers, under common and scientific

names, commonly found in the areas indicated in the title, are very briefly described. Recommended to all interested in native American plants.

WEEDS OF THE NORTHERN UNITED STATES AND CANADA, by F. H. Montgomery. Frederick Warne & Co., 101 5th Av., New York, N. Y. 10003. 1965. Pp. 226. Illus. \$3.95. The purpose of this book is to provide an aid to the identification of particular weeds of the areas indicated in the title rapidly. The key is followed by the description of 365 weeds under common and scientific names. Highly recommended.

CREATIVE DECORATIONS WITH DRIED FLOWERS, by Dorothea S. Thompson. Hearthside Press, 381 Park Av. S., New York, N. Y. 10016. 1965. Pp. 125. Illus. \$6.95. In this book the silica-gel method of drying flowers is explained, and its application in creating designs is discussed. Highly recommended to all who are interested in flower arranging.

FLOWER ARRANGEMENT WITH ANTIQUES, by Beth Hemingway. Hearthside Press, 381 Park Av. S., New York, N. Y. 10016. 1965. Pp. 191. Illus. \$5.95. The purpose of this beautifully illustrated book is to "give both the flower arranger and the collector a simple and lucid account of the ways by which one art can enrich the other." The topics included are basic arrangements; arrangements for the living room, library, dining room, and other places and occasions. Highly recommended.

THE NEW BOOK OF FOLIAGE ARRANGEMENTS, by Emma H. Cyphers. Hearthside Press, 381 Park Av. S., New York, N. Y. 10016. 1965. Pp. 152. Illus. \$4.95. This revised and enlarged edition of a standard text on foliage arrangements by an authority brings the subject up-to-date. It is recommended to all who are interested in flower arranging.

THE ROSE QUESTION AND ANSWER BOOK, by John Milton. Hearthside Press, 381 Park Av. S., New York, N. Y. 10016. 1965. Pp. 192. \$3.95. This book, by an authority on roses, is concerned with the problems commonly met with by the rose gardeners. It is arranged on the questions and answers plan. The subject matter includes kinds, culture, insect and disease control, roses in garden design, hybridization, etc. Recommended to all interested in rose growing.

HOME AND GARDEN CALENDAR, 1966. Hearthside Press, 381 Park Av. S., New York, N. Y. 10016. Paper with plastic rings. Illus. \$1.50. The Federated Garden Clubs of New York State sponsor an annual flower arrangements calendar contest. In this little book, some of the outstanding photographs of floral arrangements accepted are reproduced in calendar form for 1966. The calendar will interest those engaged in flower arranging.

THE AFRICAN VIOLET CALENDAR, 1966. Hearthside Press, 381 Park Av. S., New York, N. Y. 10016. 1965. Paper with plastic rings. Illus. \$1.50. The publishers sponsor an annual African Violet Arrangements Calendar contest, including also Gloxinias and other gesneriads. In this little book, some of the outstanding photographs of arrangements accepted are reproduced in Calendar form for 1966. This calendar will interest those engaged in flower arranging.

FERNS OF THE SOUTHEASTERN STATES, by John Kunkel Small. Reprint of the 1938 text. Hafner Publ. Co., 31 E. 10th St., New York, N. Y. 10003. 1964. Pp. 517. Illus. \$10.00. Those interested in ferns will be grateful for this fine reprint of Small's 1938 text which has long been out of print. This includes a brief appreciation by Dr. Hume of Dr. Small who died in 1938. After an introduction giving the author's outlook on the grouping of the ferns and fern allies, and plant provinces of the Southeastern United States, there follows a key to the orders, families and genera for students; the description of 189 ferns and fern allies; the general and restricted distribution of the species; taxonomic lists, with citations; list of authorities cited; a glossary, and an index. This book is indispensable to those interested in the ferns and fern allies.

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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.

I. THE AMERICAN AMARYLLIS SOCIETY

[A Committee of the American Plant Life Society]

[AMERICAN AMARYLLIS SOCIETY, continued from page 2.]

(c) REGISTRATION OF PLANT NAMES

Mr. W. D. Morton, Jr., Emeritus Registrar, 3114 State St. Dr., New Orleans, 25, La.

Mr. Edward F. Authement, Registrar, 2214 Gallier St., New Orleans 17, La.

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All accredited Amaryllis judges of the AMERICAN AMARYLLIS SOCIETY are members of the COUNCIL.

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III. PUBLICATIONS OF THE AMERICAN PLANT LIFE SOCIETY

B O O K S

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. \$5.00 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 (1—X; 1—90), includes a portrait of George Yeld. \$5.00 postpaid.

3. THE GENERA OF AMARYLLIDACEAE, by Hamilton P. Traub. Includes a general introduction, a key to the subfamilies, infrafamilies, tribes, subtribes and genera of the Amaryllidaceae, and descriptions of all the genera. Every member of the Society should have this book for constant reference. Manila covers; publ. 1963; 85 pages. \$5.00 postpaid.

4. LINEAGICS, Hamilton P. Traub. This is the first outline text for the undergraduate student on the grouping of organisms into lineages. The text is divided into four parts: (a) the history of lineagics and lineagics as an integrated science; (b) basic lineagics, principles and procedures; (c) applied lineagics, principles and procedures; and (d) research methods in lineagics. Recommended for the student in biology. Publ. 1964. Manila covers, 163 pages, incl. 8 illus. \$5.00 postpaid.

PERIODICALS

(A) **HERBERTIA** [First series, 1934 to 1948, incl.], devoted exclusively to the amaryllids (Amaryllidaceae), and the workers concerned in their advancement. A complete set of these volumes is indispensable to all who are interested in the amaryllids. Libraries should note that this may be the last opportunity for complete sets.

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