

1. Regional Activities and Exhibitions

Notes on Amaryllid Activities in Australia

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1. The Cultivation of Amaryllids in Australia.

Australian climatic conditions favour the culture of most of the temperate and sub-tropical amaryllids in the open garden. In the Northern part of the Continent, tropical species, such as *Eucharis* flourish in the open garden, though in the South, they need, at least, the protection of a greenhouse.

Outstanding among the various genera of amaryllids that are cultivated here, are the *Hippeastrums*. These take kindly to our climatic conditions, and it is the general opinion of the enthusiasts in this class of amaryllids, who have seen the best of the oversea collections, that those strains, raised by Messrs. P. V. McCulloch of Warrawee and E. McCulloch of Mosman, in this State, are the best in the world.

These strains are more or less intermingled, though the latter possesses the greater range of colour, and are the result of many years of careful cross breeding and selection. The commencement of the strain was from plants of the once famous Bradley collection, in its day as outstanding as are those of the McCullochs today. Bradley was a very keen hybridist specialising in *Amaryllidaceae*, and he raised some very beautiful flowers. In the *Hippeastrum* he aimed at large regular flowers, with equal perianth segments, clear colours and well reflexed petals.

On Bradley's death Mr. P. V. McCulloch took up the work from where he left off, and gradually by patient work and always following the ideals laid down by Mr. Bradley, achieved the wonderful strain he possesses today. His nephew, Mr. E. McCulloch, who always took a keen interest in these plants, and the work of his uncle, during the past ten years or so, has made a good collection of plants, all seedlings of either P. V. McCulloch's raising or his own.

The method adopted in their culture, is to set out the bulbs in a fairly light soil, deeply worked and well enriched with manure. The bulbs are set out in rows about 2 feet apart and about 18 inches between the bulbs in the rows. Planting is done in February, the 1st month of Autumn, when the roots are making the Autumn growth. This means that the plants, already fully leaved move off as if nothing had happened. We find that if the bulbs are lifted in the winter as is the practice with most commercial houses, that they are very slow in starting and in many cases will rot with the spring rains.

Most *Hippeastrum* bulbs in the Sydney districts go to rest about May, and the new leaves appear just before the flowers in the spring. As many as 5 flower scapes are produced on large bulbs. Just before the flowers and leaves appear, the beds are given a dressing of fresh manure, horse manure for preference, and even if hot it goes on to the beds. The manure is applied as a mulch 2 to 3 inches thick. About this time too, a screen of scrim is thrown over the beds, so that the garden appears as being set with large tents. This has the effect of protecting the giant flowers against the winds and the scorching mid-day sun. It permits of them retaining their colours longer, and keeps the flowers in the pink of condition for a long period.

The flowers of these strains are in the main of a deep self crimson for it was this colour for which both Bradley and McCulloch bred, most of these possess a black eye and do not show one particle of green. Others have white grounds marked with red, brick red, and reds in many shades, selfs and mottled or striped, and of recent years some particularly good salmon

shades, and deep pinks. It is only during the last four or five years that any foreign strains have been introduced.

The flowers themselves are perfect. Large ones up to 14 inches across each individual flower being common, and very few are less than 10 inches across. The plants are very rigorously culled at flowering time, and many a plant is consigned to the dust bin, which, if it occurred in another raisers seed bed, would call forth exclamations of delight.

There are many other breeders of these flowers, the best of whom is Mr. W. Hawes of Gladesville. Mr. Hawes has been breeding *Hippeastrums* for the past 25 years, and has created a very worthy strain. During the past few years marked strides have been made in their form and shape. There is possibly a larger range of colour in these than in the McCulloch's strain.

I have raised a number of good seedlings myself, working pollen from the McCulloch's flowers upon bulbs imported from England. The latter though on the small size, the largest never attaining to a diameter of more than 9 inches, are very symmetrical and possess good colour. The crosses have given some very good things. I imported some bulbs from the U. S. A. from time to time about 6 or 7 years ago, but have discarded them all, as they are far too rough and ragged, and have a very narrow lip petal, and in addition the flowers were decidedly pointed. I should say that the illustration on p. 99 of the 1934 Year Book was quite typical of those imported by me. Owing to lack of space I have not raised any seed during the past three years.

There are a number of growers both in this State and in the other States who raise a number of seedlings, most of them commercially, but seem to work in a happy-go-lucky manner, making crosses without any consideration of what the result may be. Needless to say, they are creating nothing worth while, and making no progress towards the ideal flower.

The rate of increase is somewhat slow, and candidly is not much worried about. As the Amateur growers who possess the best collections do not worry so long as they possess the stock and a few bulbs every year or so to breed from, and the commercial growers have found it cheaper to grow the plants from seed. Seedlings take 30 months to flower with us, and give their best flowers in their 4th or 5th year. Plants are lifted every four or five years. The soil is thoroughly manured, and dug, and the bulbs are replanted. So far as I know they are subject to the attacks of no pests or diseases.

We find that the pollen parent gives colour and the seed parent shape and size.

Narcissi in their various forms are very popular, particularly in the Southern States, where there are many wonderful varieties raised each year. Messrs. West & Fell of Casterton, Victoria. Mr. H. A. Brown of Camberwell, Victoria, and Mr. Alister Clerk are all noted raisers of these wonderful flowers in their State, and one can confidently say that their new creations will hold their own with the best produced anywhere in the world. Mr. H. A. Brown is the most recent recruit of the three, but without doubt his productions are the most outstanding, particularly in the red cupped *Incomparabilis* varieties. Mr. Alister Clerk's varieties include some very wonderful *Leedsii* types, and Messrs. West & Fell have given us some of the best Trumpet sorts we possess.

In Tasmania there are a number of growers who have raised many beautiful sorts. As these growers are all amateurs none of their creations have as yet found their way into commerce, and we have seen none of them on the mainland.

In this State, Messrs. Holloway Bros. of Brookvale have about the largest commercial collection. They raised, in the past, some very wonderful flowers, but during the past 10 years practically none. Their giant Trumpets are particularly outstanding, but are now being superceded by still better varieties. One C. W. Holloway won the champion prize at the Royal Horticultural Societies show here in Sydney 7 times in the years 1922-1932.

Dr. H. R. G. Poate, who grows his bulbs in the congenial climate of Bowral, has a wonderful collection of imported varieties, and is raising seedlings on a large scale. Already,

those which have flowered show great promise. As he is using the best of the new varieties imported from the United Kingdom, as well as those of local production, some great things should come from his garden in the next few years. Mr. Hawes of Gladesville has been raising seedlings for very many years and in the past has introduced many very beautiful varieties.

The writer has been raising seedlings for the past twelve years and has had some very good results. One seedling Trumpet received Champion honours at R. H. S. Show in 1926, and another in 1927. As I was carrying on a series of experiments in line- and in-breeding I did not expect wonderful results in the first generation or so, but am now concentrating on the production of high class show flowers. Next year I should flower some 2,500 seedlings of first class percentage, and the year following twice as many. This year I produced more seed than I knew what to do with.

While the climatic conditions of Victoria and Tasmania, and the highlands of this State, are ideal for Narcissi culture, we in the Sydney districts, and along the coastal belt, have a climate just too warm for them. We are quite 3 to 4 weeks earlier than Dr. Poate on the highlands at Bowral, where he possesses the ideal Daffodil climate.

The early workers here in New South Wales in the Daffodil field aimed at the production of early flowers and the late Mr. H. Selkirk one of the earliest workers had Trumpets opening in May (the first month of winter) and the late Mr. H. B. Bradley had Trumpets opening in the last week in April.

They fixed their Show for the second week in August and set out to breed flowers to show at it. Flowers which appear in the second week of September onwards are too late with us and only last a few days as they are soon scorched by hot westerly winds.

When I first commenced hybridizing, I too, adopted this ideal of the early flower, but soon becoming interested in the showing of blooms concentrated on the production of mid-season flowers. During the past 5 years however, I have again returned to the old ideal and am endeavouring to produce a series of first class flowers in June and July, at which time of the year, they will last about 3 to 4 weeks on the plant. Using "Fortune" as a parent and the other good things of July and August flowering, one should gain this objective in a generation or two.

There are a number of other growers who raise a few seedlings each season, but they are not working along any set lines.

The scope of this paper is too wide for me to go into detail of the culture of Narcissi here in Australia, but I must mention that only one real pest worries the Narcissi grower and that is the eel worm, which plays havoc with all collections not regularly sterilised.

Next in importance are the true *Amaryllis*, or as some few call them "Belladonna Lilies", and their close relations, the *Brunsvigias*. About 1870 one Bidwell, a noted horticulturalist of his day in this country, raised a series of hybrids between the *A. belladonna* and *Brunsvigia grandiflora*. and these are the most widely grown of all Amaryllids today, under the name of "*Brunsvigia multiflora*", "*B. multiflora alba*" and "*B. multiflora rosea*". They are all good seeders and as one can quite well imagine, their offspring does not come true.

A well grown specimen will carry a head of thirty to forty flowers, *B. rosea* giving the largest heads, and *B. alba* the smallest. These have become widely dispersed throughout New South Wales gardens, and on account of the rapidity of their increase, and their taller stems and larger flower heads, are much more widely grown than *A. belladonna*. Of the "Belladonna Lily" proper we possess many forms of which "Rubra" is the brightest. The late Mr. H. B. Bradley raised a very fine seedling of the "Multiflora" type viz., "Haythor", pure white with an orange yellow eye. This is very quick in increase and is becoming widely spread throughout Sydney gardens.

Of recent years many seedlings have been raised by the trade from self set seeds of the "Multifloras", and presumably a number of crosses between the various varieties have taken

place. Messrs. Holloway Bros. have given us "Harboard", a good white, and "Oviato", a deep pink.

I myself have raised many thousands of seedlings of these beautiful plants and will deal with them in a later part of this paper. These plants make very good growth with us, making most of their foliage in the Autumn and winter, and early spring, the wettest period of the year. In Sydney the bulk of our 46 inch rainfall occurs in that period. They flourish in any sort of soil, and I find that full sunshine or partial shade suits them very well indeed.

In planting we set the bulbs about 2 feet apart each way and with their neck and shoulder projecting above the soil. As a group, they resent interference in a very marked degree and seem to flower best when crowded. I am quite positive that with these plants the same bulb does not flower year after year, but say once in every two or three years. Deep digging of the soil before planting, and a dressing of manure just as the bulbs push through the ground helps materially in building up large bulbs and consequently in flower production.

Where they have been left alone in old gardens they quickly spread on account of the production of seed. Cross fertilization produces far more seed than self fertilized flowers. This I have carefully noted over a number of years. A cross fertilized seed pod will average 40 to 50 seeds and I have seen as high as 70, while a self fertilized seed pod will average not more than 20. The white varieties are the shyest seeders and the seedlings are the poorest growers of all, though, after their first three years they settle down and there is not much difference between the white and coloured forms. Colour is the dominant characteristic of the pollen parent. "Haythor" particularly transmits it in a marked degree.

Clivias are popular as pot plants, and are always at their best as such on account of their flowering best when pot-bound. Quite a number of good hybrids were raised 20 to 25 years ago by Messrs. Selkirk and Arthur Yates, but never in any great quantity. The late Mr. Selkirk thought it wonderful if he got from his plant half a dozen seeds. I get from some of mine 300 seeds per head.

A number of hybrid forms were imported from England, and from them the Clivias sold today were derived. There are practically no pure *C. nobilis* or *C. miniata* to be had in the trade today. The few which exist are to be found in old gardens.

C. cyrthanthiflorum is also scarce. This is a so called hybrid of a reputed parentage, *C. nobilis* x *C. miniata*. I have raised hundreds of this cross and have never had a seedling yet with flowers in narrow drooping umbels as in *C. cyrthanthiflorum*. It only survives in old gardens today.

Mr. R. M. Finch has raised some very fair varieties, and had some very good pale ones. One in particular was almost a white. Holloway Bros. of Brookvale purchased a lot of Mr. R. M. Finch's stock and have raised a number of seedlings of merit. In the Sydney Botanical Gardens there are a number of seedlings of rather dubious merit. Of my own experiments and their results you will read later in this paper.

*Crinum*s are not widely grown, except in a few species. Our native *C. pedunculatum* is found in many gardens, as are also *C. powellii*, *C. moorei*, *C. latifolium* and *C. capense*. In the past a number of hybrids of the *C. moorei* type were raised by the late Mr. H. B. Bradley; some of which are very vivid pink, but all totally infertile. Messrs. Holloway Bros. had a very beautiful hybrid *C. pedunculatum* x *C. moorei* of a brilliant pink. I know of another seedling of this cross in an old garden which is a delightful pale pink. In a period of 15 years this plant has only made two bulbs. It is quite infertile. Other than these I know of no hybrid *Crinum*s raised in Australia except the few raised by myself and of which more later. There are of course a number of named forms of *C. moorei*.

All the above do well in good garden soil. They seem to prefer full sunlight, though many are grown in shade and semi-shade but these do not flower as well as they might if set in the open. Plenty of water while growing is a necessity.

Nerines are good plants for our conditions, though I find that they do very much better in Tasmania and Victoria. A number of hybrids have been raised here in Australia, but not one grower seems to have raised any number or to have recorded their parentage. I have raised a few, some of which are quite interesting as hybrids. They like to become crowded before flowering freely.

Zephyranthes do very well though not grown to any extent. *Z. Candida* used to be commonly used as a border for many gardens, but recently it has almost disappeared. *Z. ajax* is a variety which does well with me, also *Z. texana*, *Z. rosea* and another pink variety, and the *Cooperias*. I have raised many seedlings, *Z. candida* x *Z. ajax*; *Z. Candida* x *Z. texana* (known here as *Z. sulphurea*) and *Z. rosea* x *C. drummondii*. I find that *Z. Candida* is the dominant parent in the two former crosses. In the second generation some good cream coloured flowers appeared, and also some good pale yellow ones. By inbreeding the second generation I procured a good number of deep yellows, and one or two with bronze outside and a deep buff inside. Seedlings flower in about the second year. In the cross *Z. rosea* x *C. drummondii* some very fine flowers were produced, mostly of a very large size and of a pink or salmon pink shade, though one or two almost pure white ones appeared. They multiply fairly rapidly, and seedlings flower about the second year. The cross is quite fertile and seeds freely. The seedlings themselves of the second generation give no marked improvement. A number of interesting forms have been isolated and are being grown on.

In addition to the above we have a great number of amaryllids of all sorts growing in our gardens, and all doing well.

2. Raising Seedling Clivias, Amaryllis, and Crinums.

Some fourteen years ago, I possessed several plants of *Clivia nobilis* and a plant or two of *C. miniata*. The former were orange red, and the latter were orange. In September of 1920 I crossed the flowers of these plants both ways. The resulting seedlings, to the number of 73, grew steadily but slowly. The first flowered in August 1925. All were vigorous, and on the whole, far more robust than their parents. The flowers produced in quite 90 per cent. of the plants were decidedly larger than those borne by either of their parents. The colours varied very little being mostly orange red.

One might suppose that from this generation would have come some little colour variation, as quite a range of colour is found in these plants in their native habitat. But both parents being of the same shade almost, no colour break occurred.

The flowers that appeared, as compared with those I now possess were decidedly ugly, and with very narrow perianth segments with pointed tips as in their parents. From these were selected those with the widest segments, the roundest tips, the largest flowers, and most robust in growth. These were intercrossed.

The seedlings resulting from these secondary crosses were decidedly an improvement on their parents. Not only was there a marked increase in their vigor, but they attained to a flowering state in four years, from the sowing of the seed.

Some of the flowers in this batch, compared with those of their grandparents, were truly remarkable. From some three hundred seedling plants 25 were selected of exceptional horticultural merit. Among them were to be found the perfectly symmetrical flower, with large broad overlapping perianth segments, all of the same size, and with nicely rounded and reflexed tips. The range of colour or rather shade has increased, but not to the extent I had anticipated. No pale flowers had appeared as was confidently expected, though one of a deep brick red colour of somewhat poor shape stood out as a decided acquisition. For the most part they were all deep orange red with deep yellow eyes, though in some few the yellow was more or less replaced by white and in others had advanced up the perianth segments at the expense of the orange colour.

The best of this batch had a head of flower standing last season 32 inches high, and was composed of 23 perfect flowers in a globular head. The individual flowers were 5 inches across, perfectly round and reflexed. It has caused no little comment when exhibited at the R. H. S. Show in August during the past three years.

From the second generation, I raised a third batch all of which were "selfed". Whereas I had no difficulty at all in obtaining seed berries containing as many as 10 seeds from flowers fertilized with the pollen from another plant, I discovered that the "selfed" flowers set seed badly, and where they did set it, I did not obtain more than 2 seeds from any one berry. Some of the seedlings flowered in the third year from sowing. And last season, the 4th from the sowing, some 125 flowered leaving but few still to flower. Those which flowered early were dwarf plants with a slender flower stem, and pendulous starry flowers all much alike.

They attain a height of 15 inches and make excellent pot plants. They increased little in size for the second season's flowering. So the new type appears fixed. Is it possible that the *Clivia* species as we now know them are of hybrid origin, and that these are throwbacks to an older and now lost species?

Many of the others of this batch reverted to the starry form of *C. nobilis*, and one can hardly tell them from the original plant from which they sprung. Variation in foliage is very marked, and it is particularly noticeable that whereas the original species possessed foliage 1½ inches wide some of the seedlings of this batch which are some 4 feet high, possess foliage quite 4 inches across. The flowers of these broad leafed sorts are invariably large, round and reflexed.

Another feature is that many are rapid in increase. All the former were slow, no plant after seven years flowering had more than 4 new growths, but some of the new seedlings even before they flowered had three or four growths breaking away, and one in particular (a poor flower type it is true) has in its third year of flowering, made upwards of 15 new growths.

Seedlings have already been raised from these. Selected seedlings were again intercrossed with the idea of securing colour variation for in the colour range no pale variety was found, though the number of deep brick red ones had increased in a marked degree. It should also be noted that greater areas of white appeared in those varieties where the white was apparently displacing the yellow; and in cases where the yellow was displacing the orange, this colour had crept up the perianth segment nearer the top. Perhaps the next generation will give (a) a red flower, (b) an orange and/or a white one, and (c) a yellow one. These are my present objectives.

I find *Clivias* the easiest of plants to grow, and one can justly say that the seemingly the worse they are treated, the better they respond. Mine are all growing in bush houses in pots, for I have found that when their roots are pot bound they flower the best. One is astonished at the small quantity of soil necessary to support them, and the amount of dry conditions they will stand. They thrive equally well out in the garden, though the plants will not push their flower spokes well above the foliage.

Seed takes a year to ripen, and when ripened will stay quite twelve months on the plant if not harvested. When ripened, the berry, as large as a walnut, contains upwards of 10 seeds. The bright scarlet berries, are, to many, equally attractive as the flowers. By the way, I find a variation in the colours of the berries in the newer hybrids, for whereas in the old species they were scarlet, those of some of the new seedlings are a deep cerise pink.

Germination after sowing is slow but sure. Once sown the plant will eventually appear and make rapid growth. Any soil seems to suit them well though one on the light side possibly is best. If grown in a pot perfect drainage is essential. Potting on from size to size should be done as soon as the plants have become too large for their pots. A final potting is recommended the year after flowering into 10 inch pots in which they can remain until they need dividing.

About the same time that I became interested in *Clivias*, I commenced raising seedling *Amaryllis*, *Brunsvigias*. and *Crinum*s. As a start I possessed an *A. belladonna*, a good pink variety; *Brunsvigia multiflora*, *B. multiflora alba*, and *B. multiflora rosea*. Later on *B. josephinae* and another of the "Multiflora" type viz., "Haythor", raised by the late Mr. H. B. Bradley, and reputed to be a seedling between *A. belladonna* and *Brunsvigia multiflora alba*. This I doubt for the reason that will later appear.

Of *Crinum*s I possessed *C. capense* and *C. moorei* and *C. latifolium*, all African species, and *C. pedunculatum*, our native *Crinum*, a number of hybrid forms of *C. powellii*, and some seedlings of the late H. B. Bradley. The so called *Brunsvigia multiflora* and its varieties are in fact bigeneric hybrids between *A. belladonna*, and in all probability *Brunsvigia grandiflora*. These were raised by Mr. Bidwell, a well known florist in this city, about 1870, and owing to the vigor of their growth their large heads of flowers, and the rapidity of their increase, they are as widely grown about Sydney as the "Belladonna Lily" itself.

Seedlings from any of the "Multiflora" types do not come true if the flower is selfed, some diverging to *A. belladonna* and some reverting to the lowly stature of *B. grandiflora*. This also occurs in breeding. I found that these and *A. belladonna* would intercross in any way and would all produce fertile seed. But the variety "Haythor", a beautiful pure white with a small yellow eye, raised by Mr. Bradley, would not give me any seed at all, though its pollen is extremely potent. Thus we have a plant of a reputed parentage similar to some five hundred seedlings I have raised, not one of which has refused to set seeds, which over a period of some 12 years with me has not given the slightest indication of even a swollen ovary. Unlike the seedlings of *A. belladonna* x *B. multiflora* which I have raised, "Haythor" has ruffled petals, with crimped edges.

All the seedlings from its pollen are somewhat weak in growth, mostly white with an eye of yellow, and will not set seed though in almost every case their pollen is extremely potent. I am rather inclined to think that Mr. Bradley was mistaken in its parentage, and that it is a particularly good form of *B. josephinae* x *B. multiflora alba*.

The first crossings were *A. belladonna* with each of the three varieties of *B. multiflora* which I possessed. The quantity of seed obtained was very great in the case where the "Multiflora" varieties were the seed parents, and not so great in the case where "Belladonna" was the seed parent. In the former case, I have had as many as 105 fertile seeds from one pod, and over a season have averaged 70.

The resulting seedlings flowering some four years later were more or less disappointing, mostly taking after *B. multiflora* (which at that time I considered to be a true species of *Brunsvigia*), and a very few after "Belladonna." The colour variation was not great, and one would have had great difficulty in finding more variation in these than in any batch of "Multiflora" or "Belladonna" seedlings. But I found that all the seedlings on flowering were fertile and set seed with the utmost freedom, and were particularly-rapid in their increase.

Accordingly I selfed those which possessed good form, and other promising characteristics, as I could see no advantage to intercross them. The results were extremely interesting. Some have attained to great size of flower stalk, size of flower and number of flowers in a head. The colour variation is considerable. Some are of the deepest carmine pink, others of a pure glistening white with a yellow eye, like "Haythor", but without the wavy petals of that variety. Amongst these I selected many as being worthy of propagation. The segments of the perianth in those selected are equal in size, round and slightly reflexed.

Some of these are of a delightful blend of pink and orange. The latter colour which is present in all the seedlings in the form of an eye, has in these examples, run almost to the tip of the segments. Others are of shades of pink inside, but with the exterior of the segments picked out and stained bronze. Still others are of a small stature attaining to a height of not more than 15 inches with small flowers of a soft self pink shade. This latter type, while strong

growing and vigorous, is easily smothered in a seed bed and needs isolating as soon as discovered.

Another interesting type has appeared in these seedlings perhaps forming 5 per cent. of the whole. These possess no flower stalks at all, but have large pink flowers of excellent form carried on long peduncles and as the leaves appear with the flowers give the plants the appearance of a giant pink crocus. So far I have been unable to secure any seed from these plants as the ovaries are situated down among the base of the leaves, and so apparently cannot swell. Their pollen, is, however, fertile, and seedlings from it are now being grown on.

At present all breeding being done is aimed at (a) larger flowers, (b) perfection of two types, large and small, (c) larger colour range by endeavouring to (1) exclude the yellow eye, (2) increase the yellow eye so that the whole flower becomes yellow, (3) produce a bronze flower, (4) produce a red flower; (d) produce large symmetrical flowers on large globular heads; and (e) rapidity of increase.

Some surprising results have been had in intercrossing *Crinums*. As mentioned in the former part I have been somewhat restricted in cross breeding in this genus on account of the few species I have been able to procure.

I find that *C. moorei* seeds well, with the exception of one group of plants which were produced from an old garden. These are not entirely infertile but from over 300 flowers pollinated, either with their own pollen or from other species, only three seeds were obtained. There is little difference between this and the usual type, with which we are so familiar, except that perhaps, the perianth segments are just a little wider.

From *C. moorei* I have raised many seedlings, for every flower which is not cut, in some seasons, sets seed. And in spite of claims to the contrary, I have found no more variation in its offspring than one would expect in a species. I am quite at a loss to understand how some claim that *C. moorei* is not a true species.

On the other hand, the seedlings I have obtained from the *C. moorei* which does not set seed freely, and which for purposes of identification I will designate as *C. moorei* 11, have shown considerable variation in the few raised even where self fertilized. Is it not possible that hybrid forms such as this undoubtedly is, going under the name of *C. moorei* have given rise to the belief that *C. moorei* varies from seed?

I find Variation in *C. capense*. From the same seed pod I have had flowers ranging from white to deep pink. Some forms are at first glance difficult to separate from *C. latifolium*.

Even in our native species *C. pedunculatum*, I find variation, though it is here regional. Some have long segments, others short, some long peduncles, and others short, and still others have purple filaments and anthers. As already mentioned I have seen hybrids between *C. pedunculatum* x *C. moorei* in deep and pale pink. In 1924 I raised a seed from this cross, the only one in the pod. This grew rapidly, and increased by offsets in an amazing manner in the style of *C. moorei*. In 1929 at Christmas time it flowered for the first time. I then possessed some 9 bulbs. The growth of the plant was intermediate between the two parents, more massive than *C. moorei*, and not so tall as *C. pedunculatum*, with its foliage appearing, much like the latter. It is deciduous like *C. moorei*. The flowers, which are highly perfumed, are of perfect *C. moorei* shape, and of a pure glistening white like *C. pedunculatum*. One might say that here we have the pure white *Crinum* inheriting all the good qualities of both parents and none of their faults. It is intermediate between the two and, in spite of numerous attempts to obtain seed or use its pollen, completely infertile.

The two other hybrids of this same cross referred to, while possessing the pink coloured flowers, had much the growth habit of "Pedunculatum", and were evergreen like that species. The flowers however were ugly. In one case they were intermediate between the two parents, and the other had starry flowers after the style of "Pedunculatum", but with broader perianth segments. I have quite a number of this cross growing on.

C. capense x *C. latifolium* offspring give flowers much like their parents, for there is very little dissimilarity between these two species. They, however, take-after the yellowish green foliage of the latter and not after the blue green foliage of the former. "Capense" is a good seeder with me to either its own pollen, or that of "latifolium", but to any of the "Moorei" group or to "Pedunculatum" a peculiar thing takes place. The seed pod swells to an immense size, and in due course like all other seed pods it bursts and reveals a mass of seeds within and to all appearance perfect. On examination, however, we find that they are all so grown one into the other that they cannot be separated without injury and even when separated would not grow, rotting in a few days. This has occurred on every occasion, and there have been some hundreds, upon which I have attempted to raise seed upon "Capense" by either "Moorei" or "Pedunculatum."

Two years ago I determined to germinate some of these seeds, and separated them as carefully as possible with a sharp knife, sealing the wound where it occurred with paraffin. Some 800 seeds were separated in this manner and of these some 50 germinated, and though very weakly in their young period, some 20 still remain alive and are making sure but slow progress. I trust that they will flower in due course, and not be like a series of seedlings raised by me in 1923 from "Moorei" x "Magnifica", a variety raised by Mr. H. B. Bradley of the "Moorei" type, and from which although they increase in a most wonderful manner I have only had one flower in 8 years.

By crossing "Moorei" and "Capense" I have raised "Powelii" on many occasions. However, the pollen of this variety on either of the parents has never led to seed production. "Pedunculatum" x "Capense" has given me a few seedlings which have not yet flowered.

In *Nerines* I have raised a few seedlings. One of these is outstanding from a horticultural and scientific point of view,—*N. bowdeni* x *N. ficifolia*. This was the only one of this cross which attained to flowering size, although some forty were raised. It is extremely interesting, having the foliage of *N. bowdeni* and the late flowering properties of that variety, but the shape of the flower is like *N. ficifolia*, though much larger and of much the same shade. The flowers are carried on three foot stems, in large numbers in May of each year, some bulbs having three or four flower scapes. Although raised in 1925 I already possess not less than 300 bulbs, so one can realize the rapidity of its increase. In 1929 I succeeded in seeding to its pollen *N. sarniensis* and this year one of the progeny produced flowers of a beautiful salmon pink shade, three scapes to the bulb!

I have raised a number of *Nerine* seedlings from hybrid varieties imported from time to time, but I am concentrating now upon the "Bowdenii" x "Ficifolia" crosses as they are the ideal florist flower.

These few notes summarize my hybridizing experiments among the *Amaryllidaceae*.

3. Australian Amaryllidaceae.

The following is a list of the *Amaryllidaceae* native to Eastern Australia arranged according to Dr. Hutchinson's system. It is not a complete list, though representing most of the recorded species. There is some slight confusion in the identity of a few species, especially those recorded from the West. I will endeavour to have a complete list with descriptions for the 1936 Year Book.

TRIBE 6. CRINEAE

Crinum pedunculatum

C. douglasii

C. venosum

C. brachyandrum

C. brevestylum

C. uniflorum
C. angustifolium
C. pestalensis
C. brishanicum
C. flaccidum

TRIBE 10. EUCHARIDEAE

Calostemma luteum
C. album
Eurycles amboenensis
E. cunninghami